



7210 SAS D, E OS System Management Guide

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About This Guide

This guide describes system concepts and provides configuration explanations and examples to configure 7210 SAS-Seriesboot option file (BOF), file system and system management functions.

This document is applicable for both 7210 SAS-E and 7210 SAS-D devices.

This document is organized into functional chapters and provides concepts and descriptions of the implementation flow, as well as Command Line Interface (CLI) syntax and command usage.

Audience

This manual is intended for network administrators who are responsible for configuring the 7210 SAS-Series routers. It is assumed that the network administrators have an understanding of networking principles and configurations. Protocols, standards, and processes described in this manual include the following:

- CLI concepts
- File system concepts
- Boot option, configuration, image loading, and initialization procedures
- Basic system management functions such as the system name, router location and coordinates, and CLI code, time zones, Network Time Protocol (NTP), Simple Network Time Protocol (SNTP), and synchronization properties

List of Technical Publications

The 7210-SAS D, E OS documentation set is composed of the following books:

- 7210-SAS D, E OS Basic System Configuration Guide
This guide describes basic system configurations and operations.
- 7210-SAS D, E OS System Management Guide
This guide describes system security and access configurations as well as event logging and accounting logs.
- 7210-SAS D, E OS Interface Configuration Guide
This guide describes card, Media Dependent Adapter (MDA), and port provisioning.
- 7210-SAS D, E OS Router Configuration Guide
This guide describes logical IP routing interfaces and associated attributes such as an IP address, port, link aggregation group (LAG) as well as IP-based filtering.
- 7210-SAS D, E OS Routing Protocols Guide
This guide provides an overview of routing concepts and provides configuration examples for protocols and route policies.
- 7210-SAS D, E OS Services Guide
This guide describes how to configure service parameters such as customer information, and user services.
- 7210-SAS D, E OS OAM and Diagnostic Guide
This guide describes how to configure features such as service mirroring and Operations, Administration and Management (OAM) tools.
- 7210-SAS D, E OS Quality of Service Guide
This guide describes how to configure Quality of Service (QoS) policy management.

Technical Support

If you purchased a service agreement for your 7210 SAS device and related products from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller for assistance. If you purchased an Alcatel-Lucent service agreement, contact your welcome center:

Web: http://www1.alcatel-lucent.com/comps/pages/carrier_support.jhtml

Getting Started

In This Chapter

This chapter provides process flow information to configure system security and access functions as well as event and accounting logs.

Alcatel-Lucent 7210 SAS Router Configuration Process

[Table 1](#) lists the tasks necessary to configure system security and access functions and logging features. Each chapter in this book is presented in an overall logical configuration flow. Each section describes a software area and provides CLI syntax and command usage to configure parameters for a functional area.

Table 1: Configuration Process

Area	Task	Chapter
System security	Configure system security parameters, such as authentication, authorization, and accounting.	Security on page 17
Network management	Configure SNMP elements.	SNMP on page 151
Operational functions	Configure event and accounting logs.	Event and Accounting Logs on page 203
Reference	List of IEEE, IETF, and other proprietary entities.	

In This Chapter

This chapter provides information to configure security parameters. Topics in this chapter include:

- [Authentication, Authorization, and Accounting on page 18](#)
 - [Authentication on page 19](#)
 - [Authorization on page 24](#)
 - [Accounting on page 26](#)
- [Security Controls on page 28](#)
 - [When a Server Does Not Respond on page 28](#)
 - [Access Request Flow on page 29](#)
- [Vendor-Specific Attributes \(VSAs\) on page 30](#)
- [Other Security Features on page 37](#)
 - [Secure Shell \(SSH\) on page 37](#)
 - [Encryption on page 41](#)
- [Configuration Notes on page 45](#)

Authentication, Authorization, and Accounting

This chapter describes authentication, authorization, and accounting (AAA) used to monitor and control network access on 7210 SAS routers. Network security is based on a multi-step process. The first step, authentication, validates a user's name and password. The second step is authorization, which allows the user to access and execute commands at various command levels based on profiles assigned to the user.

Another step, accounting, keeps track of the activity of a user who has accessed the network. The type of accounting information recorded can include a history of the commands executed, the amount of time spent in the session, the services accessed, and the data transfer size during the session. The accounting data can then be used to analyze trends, and also for billing and auditing purposes.

You can configure 7210 SAS routers to use local, Remote Authentication Dial In User Service (RADIUS), or Terminal Access Controller Access Control System Plus (TACACS+) security to validate users who attempt to access the router by console, Telnet, or FTP. You can select the authentication order which determines the authentication method to try first, second, and third.

7210 SAS supports the following security features:

- RADIUS can be used for authentication, authorization, and accounting.
- TACACS+ can be used for authentication, authorization, and accounting.
- Local security can be implemented for authentication and authorization.

Figure 1 depicts end user access-requests sent to a RADIUS server. After validating the user names and passwords, the RADIUS server returns an access-accept message to the users on ALA-1 and ALA-2. The user name and password from ALA-3 could not be authenticated, thus access was denied.

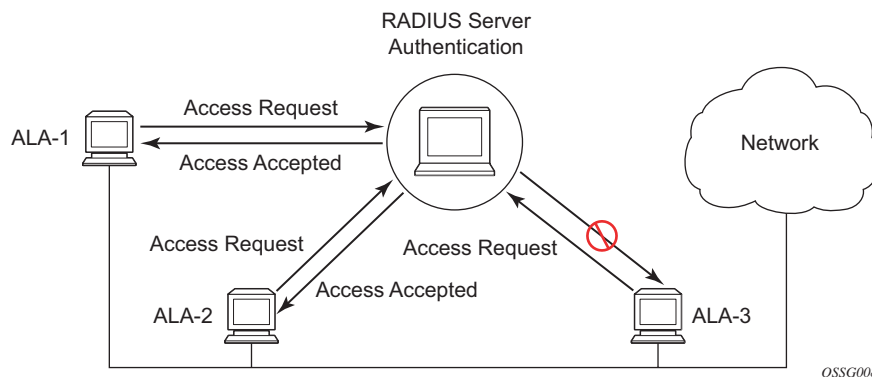


Figure 1: RADIUS Requests and Responses

Authentication

Authentication validates a user name and password combination when a user attempts to log in.

When a user attempts to log in through the console, Telnet, SSH, SCP, or FTP, the 7210 SAS-Series client sends an access request to a RADIUS, TACACS+, or local database.

Transactions between the client and a RADIUS server are authenticated through the use of a shared secret. The secret is never transmitted over the network. User passwords are sent encrypted between the client and RADIUS server which prevents someone snooping on an insecure network to learn password information.

If the RADIUS server does not respond within a specified time, the router issues the access request to the next configured servers. Each RADIUS server must be configured identically to guarantee consistent results.

If any RADIUS server rejects the authentication request, it sends an access reject message to the router. In this case, no access request is issued to any other RADIUS servers. However, if other authentication methods such as TACACS+ and/or local are configured, then these methods are attempted. If no other authentication methods are configured, or all methods reject the authentication request, then access is denied.

For the RADIUS server selection, round-robin is used if multiple RADIUS servers are configured. Although, if the first alive server in the list cannot find a user-name, the router does not re-query the next server in the RADIUS server list and denies the access request. It may get authenticated on the next login attempt if the next selected RADIUS server has the appropriate user-name. It is recommended that the same user databases are maintained for RADIUS servers in order to avoid inconsistent behavior.

The user login is successful when the RADIUS server accepts the authentication request and responds to the router with an access accept message.

Implementing authentication without authorization for the 7210 SAS-Series routers does not require the configuration of VSAs (Vendor Specific Attributes) on the RADIUS server. However, users, user access permissions, and command authorization profiles must be configured on each router.

Any combination of these authentication methods can be configured to control network access from a 7210 SAS-Series router:

- [Local Authentication on page 20](#)
- [RADIUS Authentication on page 20](#)
- [TACACS+ Authentication on page 23](#)

Local Authentication

Local authentication uses user names and passwords to authenticate login attempts. The user names and passwords are local to each router not to user profiles.

By default, local authentication is enabled. When one or more of the other security methods are enabled, local authentication is disabled. Local authentication is restored when the other authentication methods are disabled. Local authentication is attempted if the other authentication methods fail and local is included in the authentication order password parameters.

Locally, you can configure user names and password management information. This is referred to as local authentication. Remote security servers such as RADIUS or TACACS+, are not enabled.

RADIUS Authentication

Remote Authentication Dial-In User Service (RADIUS) is a client/server security protocol and software that enables remote access servers to communicate with a central server to authenticate dial-in users and authorize access to the requested system or service.

RADIUS allows you to maintain user profiles in a shared central database and provides better security, allowing a company to set up a policy that can be applied at a single administered network point.

RADIUS Server Selection

The RADIUS server selection algorithm is used by different applications:

- RADIUS operator management
- RADIUS authentication for Enhanced Subscriber Management
- RADIUS accounting for Enhanced Subscriber Management
- RADIUS PE-discovery

In all these applications, up to 5 RADIUS servers pools (per RADIUS policy, if used) can be configured.

The RADIUS server selection algorithm can work in 2 modes, either Direct mode or Round-robin mode.

Direct Mode

The first server is used as the primary server. If this server is unreachable, the next server, based on the server index, of the server pool is used. This continues until either all servers in the pool have been tried or an answer is received.

If a server is unreachable, it will not be used again by the RADIUS application for the next 30 seconds to allow the server to recover from its unreachable state. After 30 seconds the unreachable server is available again for the RADIUS application. If in these 30 seconds the RADIUS application receives a valid response for a previously sent RADIUS packet on that unreachable server, the server will be available for the RADIUS application again, immediately after reception of that response.

Round-Robin Mode

The RADIUS application sends the next RADIUS packet to the next server in the server pool. The same server non-reachability behavior is valid as in the Direct mode.

Server Reachability Detection

A server is reachable, when the operational state UP, when a valid response is received within a timeout period which is configurable by the retry parameter on the RADIUS policy level.

A server is treated as not-reachable, when the operational state down, when the following occurs:

- A timeout — If a number of consecutive timeouts are encountered for a specific server. This number is configurable by the retry parameter on RADIUS policy level.
- A send failed — If a packet cannot be sent to the RADIUS server because the forwarding path towards the RADIUS server is broken (for example, the route is not available, the interface shutdown, etc.), then, no retry mechanism is invoked and immediately, the next server in line is used.

A server that is down can only be used again by the RADIUS algorithm after 30 seconds, unless, during these 30 seconds a valid RADIUS reply is received for that server. Then, the server is immediately marked UP again.

The operational state of a server can also be “unknown” if the RADIUS application is not aware of the state of the RADIUS server (for example, if the server was previously down but no requests had been sent to the server, thus, it is not certain yet whether the server is actually reachable).

Application Specific Behavior

Operator Management

The server access mode is fixed to Round-Robin (Direct cannot be configured for operator management). A health-check function is available for operator management, which can optionally be disabled. The health-check polls the server once every 10 seconds with an improbable user name. If the server does not respond to this health-check, it will be marked down.

If the first server in the list cannot find a user, the next server in the RADIUS server list is not queried and access is denied. If multiple RADIUS servers are used, it is assumed they all have the same user database.

RADIUS Authentication

If the first server in the list cannot find a user, the next server in the RADIUS server list is not queried and access is denied. If multiple RADIUS servers are used, it is assumed they all have the same user database.

RADIUS Accounting

The RADIUS accounting application will try to send all the concerned packets of a subscriber host to the same server. If that server is down, then the packet is sent to the next server and, from that moment on, the RADIUS application uses that server to send its packets for that subscriber host.

RADIUS PE-Discovery

If the first server in the list cannot find a user, the next server in the RADIUS server list is not queried and access is denied. If multiple RADIUS servers are used, it is assumed they all have the same user database.

The RADIUS PE-discovery application makes use of a 10 second time period instead of the generic 30 seconds and uses a fixed consecutive timeout value of 2 (see [Server Reachability Detection on page 21](#)).

As long as the Session-Timeout (attribute in the RADIUS user file) is specified, it is used for the polling interval. Otherwise, the configured polling interval will be used (60 seconds by default).

TACACS+ Authentication

Terminal Access Controller Access Control System, commonly referred to as TACACS is an authentication protocol that allows a remote access server to forward a user's logon password to an authentication server to determine whether access can be allowed to a given system. TACACS is an encryption protocol and therefore less secure than the later Terminal Access Controller Access Control System Plus (TACACS+) and RADIUS protocols.

TACACS+ and RADIUS have largely replaced earlier protocols in the newer or recently updated networks. TACACS+ uses Transmission Control Protocol (TCP) and RADIUS uses the User Datagram Protocol (UDP). TACACS+ is popular as TCP is thought to be a more reliable protocol. RADIUS combines authentication and authorization. TACACS+ separates these operations.

Authorization

routers support local, RADIUS, and TACACS+ authorization to control the actions of specific users by applying a profile based on user name and password configurations once network access is granted. The profiles are configured locally as well as VSAs on the RADIUS server. See [Vendor-Specific Attributes \(VSAs\) on page 30](#).

Once a user has been authenticated using RADIUS (or another method), the router can be configured to perform authorization. The RADIUS server can be used to:

- Download the user profile to the router
- Send the profile name that the node should apply to the router.

Profiles consist of a suite of commands that the user is allowed or not allowed to execute. When a user issues a command, the authorization server looks at the command and the user information and compares it with the commands in the profile. If the user is authorized to issue the command, the command is executed. If the user is not authorized to issue the command, then the command is not executed.

Profiles must be created on each router and should be identical for consistent results. If the profile is not present, then access is denied.

[Table 2](#) displays the following scenarios:

- Remote (RADIUS) authorization cannot be performed if authentication is done locally (on the router).
- The reverse scenario is supported if RADIUS authentication is successful and no authorization is configured for the user on the RADIUS server, then local (router) authorization is attempted, if configured in the authorization order.

When authorization is configured and profiles are downloaded to the router from the RADIUS server, the profiles are considered temporary configurations and are not saved when the user session terminates.

Table 2: Supported Authorization Configurations

	RADIUS Supplied Profile	
configured user	Supported	Not Supported
RADIUS server configured user	Supported	Supported
TACACS+ server configured user	Supported	Not Supported

When using authorization, maintaining a user database on the router is not required. User names can be configured on the RADIUS server. User names are temporary and are not saved in the configuration when the user session terminates. Temporary user login names and their associated passwords are not saved as part of the configuration.

- [Local Authorization on page 25](#)
 - [RADIUS Authorization on page 25](#)
 - [TACACS+ Authorization on page 25](#)
-

Local Authorization

Local authorization uses user profiles and user access information after a user is authenticated. The profiles and user access information specifies the actions the user can and cannot perform.

By default, local authorization is enabled. Local authorization is disabled only when a different remote authorization method is configured (RADIUS authorization). Local authorization is restored when RADIUS authorization is disabled.

You must configure profile and user access information locally.

RADIUS Authorization

RADIUS authorization grants or denies access permissions for a router. Permissions include the use of FTP, Telnet, SSH (SCP), and console access. When granting Telnet, SSH (SCP) and console access to the router, authorization can be used to limit what CLI commands the user is allowed to issue and which file systems the user is allowed or denied access.

TACACS+ Authorization

Like RADIUS authorization, TACACS+ grants or denies access permissions for a router. The TACACS+ server sends a response based on the username and password.

TACACS+ separates the authentication, authorization, and accounting function. RADIUS combines the authentication and authorization functions.

Accounting

When enabled, RADIUS accounting sends command line accounting from the router to the RADIUS server. The router sends accounting records using UDP packets at port 1813 (decimal).

The router issues an accounting request packet for each event requiring the activity to be recorded by the RADIUS server. The RADIUS server acknowledges each accounting request by sending an accounting response after it has processed the accounting request. If no response is received in the time defined in the timeout parameter, the accounting request must be retransmitted until the configured retry count is exhausted. A trap is issued to alert the NMS (or trap receiver) that the server is unresponsive. The router issues the accounting request to the next configured RADIUS server (up to 5).

User passwords and authentication keys of any type are never transmitted as part of the accounting request.

RADIUS Accounting

Accounting tracks user activity to a specified host. When RADIUS accounting is enabled, the server is responsible for receiving accounting requests and returning a response to the client indicating that it has successfully received the request. Each command issued on the router generates a record sent to the RADIUS server. The record identifies the user who issued the command and the timestamp.

Accounting can be configured independently from RADIUS authorization and RADIUS authentication.

TACACS+ Accounting

allows you to configure the type of accounting record packet that is to be sent to the TACACS+ server when specified events occur on the device. The accounting **record-type** parameter indicates whether TACACS+ accounting start and stop packets be sent or just stop packets be sent. Start/stop messages are only sent for individual commands, not for the session.

When a user logs in to request access to the network using Telnet or SSH, or a user enters a command for which accounting parameters are configured, or a system event occurs, such as a reboot or a configuration file reload, the router checks the configuration to see if TACACS+ accounting is required for the particular event.

If TACACS+ accounting is required, then, depending on the accounting record type specified, sends a start packet to the TACACS+ accounting server which contains information about the event.

The TACACS+ accounting server acknowledges the start packet and records information about the event. When the event ends, the device sends a stop packet. The stop packet is acknowledged by the TACACS+ accounting server.

Security Controls

You can configure routers to use RADIUS, TACACS+, and local authentication to validate users requesting access to the network. The order in which password authentication is processed among RADIUS, TACACS+ and local passwords can be specifically configured. In other words, the authentication order can be configured to process authorization through TACACS+ first, then RADIUS for authentication and accounting. Local access can be specified next in the authentication order in the event that the RADIUS and TACACS+ servers are not operational.

Table 3: Security Methods Capabilities

Method	Authentication	Authorization	Accounting*
Local	Y	Y	N
TACACS+	Y	Y	Y
RADIUS	Y	Y	Y

* Local commands always perform account logging using the **config log** command.

When a Server Does Not Respond

A trap is issued if a RADIUS + server is unresponsive. An alarm is raised if RADIUS is enabled with at least one RADIUS server and no response is received to either accounting or user access requests from any server.

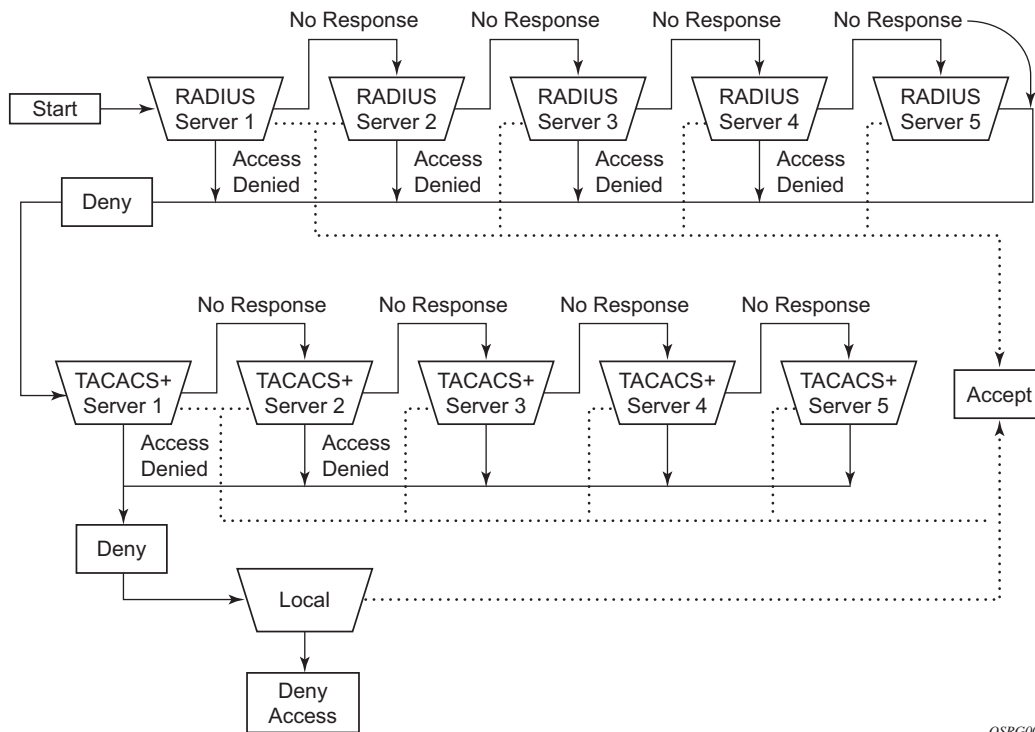
Periodic checks to determine if the primary server is responsive again are not performed. If a server is down, it will not be contacted for 5 minutes. If a login is attempted after 5 minutes, then the server is contacted again. When a server does not respond with the health check feature enabled, the server's status is checked every 30 seconds. Health check is enabled by default. When a service response is restored from at least one server, the alarm condition is cleared. Alarms are raised and cleared on Alcatel-Lucent's Fault Manager or other third party fault management servers.

The servers are accessed in order from lowest to highest specified index (from 1 to 5) for authentication requests until a response from a server is received. A higher indexed server is only queried if no response is received, implying a lower indexed server is not available. If a response from the server is received, no other server is queried.

Access Request Flow

In [Figure 2](#), the authentication process is defined in the `config>system>security>password` context. The authentication order is determined by specifying the sequence in which password authentication is attempted among RADIUS, TACACS+, and local passwords. This example uses the authentication order of RADIUS, then TACACS+, and finally, local. An access request is sent to RADIUS server 1. One of two scenarios can occur. If there is no response from the server, the request is passed to the next RADIUS server with the next lowest index (RADIUS server 2) and so on, until the last RADIUS server is attempted (RADIUS server 5). If server 5 does not respond, the request is passed to the TACACS+ server 1. If there is no response from that server, the request is passed to the next TACACS+ server with the next lowest index (TACACS+ server 2) and so on.

If a request is sent to an active RADIUS server and the user name and password is not recognized, access is denied and passed on to the next authentication option, in this case, the TACACS+ server. The process continues until the request is either accepted, denied, or each server is queried. Finally, if the request is denied by the active TACACS+ server, the local parameters are checked for user name and password verification. This is the last chance for the access request to be accepted.



OSRG009

Figure 2: Security Flow

Vendor-Specific Attributes (VSAs)

software supports the configuration of Alcatel-Lucent-specific RADIUS attributes. These attributes are known as vendor-specific attributes (VSAs) and are discussed in RFC 2138. VSAs must be configured when RADIUS authorization is enabled. It is up to the vendor to specify the format of their VSA. The attribute-specific field is dependent on the vendor's definition of that attribute. The Alcatel-Lucent-defined attributes are encapsulated in a RADIUS vendor-specific attribute with the vendor ID field set to 6527, the vendor ID number.

Note that the PE-record entry is required in order to support the RADIUS Discovery for Layer 2 VPN feature. Note that a PE-record is only relevant if the RADIUS Discovery feature is used, not for the standard RADIUS setup.

The following RADIUS vendor-specific attributes (VSAs) are supported by Alcatel-Lucent.

- `timetra-access <ftp> <console> <both>` — This is a mandatory command that must be configured. This command specifies if the user has FTP and /or console (serial port, Telnet, and SSH) access.
- `timetra-profile <profile-name>` — When configuring this VSA for a user, it is assumed that the user profiles are configured on the local router and the following applies for local and remote authentication:
 1. The `authentication-order` parameters configured on the router must include the `local` keyword.
 2. The user name may or may not be configured on the router.
 3. The user must be authenticated by the RADIUS server
 4. Up to 8 valid profiles can exist on the router for a user. The sequence in which the profiles are specified is relevant. The most explicit matching criteria must be ordered first. The process stops when the first complete match is found.

If all the above mentioned conditions are not met, then access to the router is denied and a failed login event/trap is written to the security log.

- `timetra-default-action <permit-all|deny-all|none>` — This is a mandatory command that must be configured even if the `timetra-cmd` VSA is not used. This command specifies the default action when the user has entered a command and no entry configured in the `timetra-cmd` VSA for the user resulted in a match condition.
- `timetra-cmd <match-string>` — Configures a command or command subtree as the scope for the match condition.

The command and all subordinate commands in subordinate command levels are specified.

software supports the configuration of Alcatel-Lucent-specific RADIUS attributes. These attributes are known as vendor-specific attributes (VSAs) and are discussed in RFC 2138. VSAs must be configured when RADIUS authorization is enabled. It is up to the vendor to specify the format of their VSA. The attribute-specific field is dependent on the vendor's definition of that attribute. The Alcatel-Lucent-defined attributes are encapsulated in a RADIUS vendor-specific attribute with the vendor ID field set to 6527, the vendor ID number.

Note that the PE-record entry is required in order to support the RADIUS Discovery for Layer 2 VPN feature. Note that a PE-record is only relevant if the RADIUS Discovery feature is used, not for the standard RADIUS setup.

The following RADIUS vendor-specific attributes (VSAs) are supported by Alcatel-Lucent.

- `timetra-access <ftp> <console> <both>` — This is a mandatory command that must be configured. This command specifies if the user has FTP and /or console (serial port, Telnet, and SSH) access.
- `timetra-profile <profile-name>` — When configuring this VSA for a user, it is assumed that the user profiles are configured on the local router and the following applies for local and remote authentication:
 1. The authentication-order parameters configured on the router must include the local key-word.
 2. The user name may or may not be configured on the router.
 3. The user must be authenticated by the RADIUS server
 4. Up to 8 valid profiles can exist on the router for a user. The sequence in which the profiles are specified is relevant. The most explicit matching criteria must be ordered first. The process stops when the first complete match is found.

If all the above mentioned conditions are not met, then access to the router is denied and a failed login event/trap is written to the security log.

- `timetra-default-action <permit-all|deny-all|none>` — This is a mandatory command that must be configured even if the `timetra-cmd` VSA is not used. This command specifies the default action when the user has entered a command and no entry configured in the `timetra-cmd` VSA for the user resulted in a match condition.
- `timetra-cmd <match-string>` — Configures a command or command subtree as the scope for the match condition.

The command and all subordinate commands in subordinate command levels are specified.

Configure from most specific to least specific. The implementation exits on the first match, subordinate levels cannot be modified with subsequent action commands. Subordinate level VSAs must be entered prior to this entry to be effective.

All commands at and below the hierarchy level of the matched command are subject to the `timetra-action` VSA.

Vendor-Specific Attributes (VSAs)

Multiple match-strings can be entered in a single timetra-cmd VSA. Match strings must be semicolon (;) separated (maximum string length is 254 characters).

One or more timetra-cmd VSAs can be entered followed by a single timetra-action VSA.

- `timetra-action <deny|permit>` — Causes the permit or deny action to be applied to all match strings specified since the last timetra-action VSA.
- `timetra-home-directory <home-directory string>` — Specifies the home directory that applies for the FTP and CLI user. If this VSA is not configured, the home directory is Compact Flash slot 1 (cf1:).
- `timetra-restrict-to-home-directory <true|false>` — Specifies if user access is limited to their home directory (and directories and files subordinate to their home directory). If this VSA is not configured the user is allowed to access the entire file system.
- `timetra-login-exec <login-exec-string>` — Specifies the login exec file that is executed when the user login is successful. If this VSA is not configured no login exec file is applied.

If no VSAs are configured for a user, then the following applies:

1. The password authentication-order command on the router must include local.
2. The user name must be configured on the router.
3. The user must be successfully be authenticated by the RADIUS server
4. A valid profile must exist on the router for this user.

If all conditions listed above are not met, then access to the router is denied and a failed login event/trap is written to the security log.

The complete list of TiMetra VSAs is available on a file included on the compact flash shipped with the image.

Sample User (VSA) Configuration

The following example displays a user-specific VSA configuration. This configuration shows attributes for users named **ruser1** and **ruser2**.

The following example shows that user **ruser1** is granted console access. **ruser1**'s home directory is in compact flash slot 3 and is limited to the home directory. The default action permits all packets when matching conditions are not met. The **timetra-cmd** parameters allow or deny the user to use the **tools;telnet;configure system security** commands. Matching strings specified in the **timetra-action** command are denied for this user since the **timetra-action** is deny.

The user **ruser2** is granted FTP access. The default action denies all packets when matching conditions are not met. The **timetra-cmd** parameters allow the user to use the **configure, show,** and **debug** commands. Matching strings specified in the **timetra-action** command are permitted for this user.

```
users.timetra

ruser1  Auth-Type := System, Password == "ruser1"
        Service-Type = Login-User,
        Idle-Timeout = 600,
        Timetra-Access = console,
        Timetra-Home-Directory = cf1:
        Timetra-Restrict-To-Home = true
        Timetra-Default-Action = permit-all,
        Timetra-Cmd = "tools;telnet;configure system security",
        Timetra-Action = deny

ruser2 Auth-Type := System, Password == "ruser2"
        Service-Type = Login-User,
        Idle-Timeout = 600,
        Timetra-Access = ftp
        Timetra-Default-Action = deny-all,
        Timetra-Cmd = "configure",
        Timetra-Cmd = "show",
        Timetra-Action = permit,
        Timetra-Cmd = "debug",
        Timetra-Action = permit,
```

Alcatel-Lucent Dictionary

```

# Revision: 1.29.6.2

VENDOR          Alcatel-IPD          6527

# User management VSAs
ATTRIBUTE Timetra-Access          1          integer Alcatel-IPD

VALUE          Timetra-Access          ftp          1
VALUE          Timetra-Access          console      2
VALUE          Timetra-Access          both        3

ATTRIBUTE Timetra-Home-Directory    2          string   Alcatel-IPD
ATTRIBUTE Timetra-Restrict-To-Home   3          integer  Alcatel-IPD

VALUE          Timetra-Restrict-To-Home true        1
VALUE          Timetra-Restrict-To-Home false       2

ATTRIBUTE Timetra-Profile            4          string   Alcatel-IPD
ATTRIBUTE Timetra-Default-Action     5          integer  Alcatel-IPD

VALUE          Timetra-Default-Action permit-all  1
VALUE          Timetra-Default-Action deny-all   2
VALUE          Timetra-Default-Action none        3

ATTRIBUTE Timetra-Cmd                6          string   Alcatel-IPD
ATTRIBUTE Timetra-Action              7          integer  Alcatel-IPD

VALUE          Timetra-Action          permit      1
VALUE          Timetra-Action          deny        2

ATTRIBUTE Timetra-Exec-File          8          string   Alcatel-IPD

# RADIUS subscriber authorization and CoA VSAs
ATTRIBUTE Alc-Primary-Dns            9          ipaddr   Alcatel-IPD
ATTRIBUTE Alc-Secondary-Dns          10         ipaddr   Alcatel-IPD
ATTRIBUTE Alc-Subsc-ID-Str           11         string   Alcatel-IPD
ATTRIBUTE Alc-Subsc-Prof-Str         12         string   Alcatel-IPD
ATTRIBUTE Alc-SLA-Prof-Str           13         string   Alcatel-IPD
ATTRIBUTE Alc-Force-Renew            14         string   Alcatel-IPD      # CoA
ATTRIBUTE Alc-Create-Host            15         string   Alcatel-IPD      # CoA
ATTRIBUTE Alc-ANCP-Str               16         string   Alcatel-IPD
ATTRIBUTE Alc-Retail-Serv-Id         17         integer  Alcatel-IPD
ATTRIBUTE Alc-Default-Router         18         ipaddr   Alcatel-IPD

# RADIUS subscriber accounting VSAs
ATTRIBUTE Alc-Acct-I-Inprof-Octets-64 19         octets   Alcatel-IPD
ATTRIBUTE Alc-Acct-I-Outprof-Octets-64 20         octets   Alcatel-IPD
ATTRIBUTE Alc-Acct-O-Inprof-Octets-64 21         octets   Alcatel-IPD
ATTRIBUTE Alc-Acct-O-Outprof-Octets-64 22         octets   Alcatel-IPD
ATTRIBUTE Alc-Acct-I-Inprof-Pkts-64   23         octets   Alcatel-IPD
ATTRIBUTE Alc-Acct-I-Outprof-Pkts-64  24         octets   Alcatel-IPD
ATTRIBUTE Alc-Acct-O-Inprof-Pkts-64   25         octets   Alcatel-IPD
ATTRIBUTE Alc-Acct-O-Outprof-Pkts-64  26         octets   Alcatel-IPD

ATTRIBUTE Alc-Client-Hardware-Addr    27         string   Alcatel-IPD

```

```

ATTRIBUTE Alc-Int-Dest-Id-Str          28      string  Alcatel-IPD
ATTRIBUTE Alc-Primary-Nbns            29      ipaddr  Alcatel-IPD
ATTRIBUTE Alc-Secondary-Nbns         30      ipaddr  Alcatel-IPD
ATTRIBUTE Alc-MSAP-Serv-Id           31      integer Alcatel-IPD
ATTRIBUTE Alc-MSAP-Policy             32      string  Alcatel-IPD
ATTRIBUTE Alc-MSAP-Interface          33      string  Alcatel-IPD
ATTRIBUTE Alc-PPPoE-PADO-Delay       34      integer Alcatel-IPD
ATTRIBUTE Alc-PPPoE-Service-Name     35      string  Alcatel-IPD
ATTRIBUTE Alc-DHCP-Vendor-Class-Id   36      string  Alcatel-IPD

# RADIUS subscriber accounting VSAs (HSMDDA override counters)
ATTRIBUTE Alc-Acct-OC-I-Inprof-Octets-64 37      octets  Alcatel-IPD
ATTRIBUTE Alc-Acct-OC-I-Outprof-Octets-64 38      octets  Alcatel-IPD
ATTRIBUTE Alc-Acct-OC-O-Inprof-Octets-64 39      octets  Alcatel-IPD
ATTRIBUTE Alc-Acct-OC-O-Outprof-Octets-64 40      octets  Alcatel-IPD
ATTRIBUTE Alc-Acct-OC-I-Inprof-Pkts-64  41      octets  Alcatel-IPD
ATTRIBUTE Alc-Acct-OC-I-Outprof-Pkts-64  42      octets  Alcatel-IPD
ATTRIBUTE Alc-Acct-OC-O-Inprof-Pkts-64  43      octets  Alcatel-IPD
ATTRIBUTE Alc-Acct-OC-O-Outprof-Pkts-64  44      octets  Alcatel-IPD

ATTRIBUTE Alc-App-Prof-Str            45      string  Alcatel-IPD
ATTRIBUTE Alc-Tunnel-Group            46      string  Alcatel-IPD
ATTRIBUTE Alc-Tunnel-Algorithm        47      integer Alcatel-IPD

VALUE      Alc-Tunnel-Algorithm        weighted-access 1
VALUE      Alc-Tunnel-Algorithm        existing-first  2

ATTRIBUTE Alc-BGP-Policy              55      string  Alcatel-IPD
ATTRIBUTE Alc-BGP-Auth-Keychain        56      string  Alcatel-IPD
ATTRIBUTE Alc-BGP-Auth-Key             57      octets  Alcatel-IPD
ATTRIBUTE Alc-BGP-Export-Policy        58      string  Alcatel-IPD
ATTRIBUTE Alc-BGP-Import-Policy        59      string  Alcatel-IPD
ATTRIBUTE Alc-BGP-PeerAS               60      integer Alcatel-IPD
ATTRIBUTE Alc-IPsec-Serv-Id           61      integer Alcatel-IPD
ATTRIBUTE Alc-IPsec-Interface          62      string  Alcatel-IPD
ATTRIBUTE Alc-IPsec-Tunnel-Template-Id 63      integer Alcatel-IPD
ATTRIBUTE Alc-IPsec-SA-Lifetime        64      integer Alcatel-IPD
ATTRIBUTE Alc-IPsec-SA-PFS-Group       65      integer Alcatel-IPD

# Match TC TmnxIkePolicyDHGroup in TIMETRA-IPSEC-MIB
VALUE      Alc-IPsec-SA-PFS-Group       group1         1
VALUE      Alc-IPsec-SA-PFS-Group       group2         2
VALUE      Alc-IPsec-SA-PFS-Group       group5         5

ATTRIBUTE Alc-IPsec-SA-Encr-Algorithm   66      integer Alcatel-IPD

# Match TC TmnxEncrAlgorithm in TIMETRA-IPSEC-MIB
VALUE      Alc-IPsec-SA-Encr-Algorithm   null           1
VALUE      Alc-IPsec-SA-Encr-Algorithm   des            2
VALUE      Alc-IPsec-SA-Encr-Algorithm   des3           3
VALUE      Alc-IPsec-SA-Encr-Algorithm   aes128         4
VALUE      Alc-IPsec-SA-Encr-Algorithm   aes192         5
VALUE      Alc-IPsec-SA-Encr-Algorithm   aes256         6

ATTRIBUTE Alc-IPsec-SA-Auth-Algorithm   67      integer Alcatel-IPD

# Match TC TmnxAuthAlgorithm in TIMETRA-IPSEC-MIB
VALUE      Alc-IPsec-SA-Auth-Algorithm   null           1
VALUE      Alc-IPsec-SA-Auth-Algorithm   md5            2

```

Vendor-Specific Attributes (VSAs)

```

VALUE      Alc-IPsec-SA-Auth-Algorithm      sha1      3

ATTRIBUTE  Alc-IPsec-SA-Replay-Window      68      integer  Alcatel-IPD

# RADIUS subscriber accounting VSAs (custom records)
ATTRIBUTE  Alc-Acct-I-High-Octets-Drop_64  69      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-I-Low-Octets-Drop_64   70      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-I-High-Pack-Drop_64    71      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-I-Low-Pack-Drop_64     72      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-I-High-Octets-Offer_64 73      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-I-Low-Octets-Offer_64  74      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-I-High-Pack-Offer_64   75      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-I-Low-Pack-Offer_64    76      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-I-Unc-Octets-Offer_64  77      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-I-Unc-Pack-Offer_64    78      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-I-All-Octets-Offer_64  79      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-I-All-Pack-Offer_64    80      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-O-Inprof-Pack-Drop_64  81      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-O-Outprof-Pack-Drop_64 82      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-O-Inprof-Octs-Drop_64  83      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-O-Outprof-Octs-Drop_64 84      octets   Alcatel-IPD

# RADIUS subscriber accounting VSAs (custom records, HSMDA)
ATTRIBUTE  Alc-Acct-OC-I-All-Octs-Offer_64 85      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-OC-I-All-Pack-Offer_64 86      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-OC-I-Inpr-Octs-Drop_64 87      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-OC-I-Outpr-Octs-Drop_64 88      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-OC-I-Inpr-Pack-Drop_64 89      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-OC-I-Outpr-Pack-Drop_64 90      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-OC-O-Inpr-Pack-Drop_64 91      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-OC-O-Outpr-Pack-Drop_64 92      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-OC-O-Inpr-Octs-Drop_64 93      octets   Alcatel-IPD
ATTRIBUTE  Alc-Acct-OC-O-Outpr-Octs-Drop_64 94      octets   Alcatel-IPD

#credit control VSAs
ATTRIBUTE  Alc-Credit-Control-CategoryMap  95      string   Alcatel-IPD
ATTRIBUTE  Alc-Credit-Control-Quota        96      string   Alcatel-IPD

ATTRIBUTE  Alc-Force-Nak                    98      string   Alcatel-IPD      # CoA

```

Other Security Features

Secure Shell (SSH)

Secure Shell Version 1 (SSH) is a protocol that provides a secure, encrypted Telnet-like connection to a router. A connection is always initiated by the client (the user). Authentication takes place by one of the configured authentication methods (local, RADIUS, or TACACS+). With authentication and encryption, SSH allows for a secure connection over an insecure network.

7210 SAS-Series allows you to configure Secure Shell (SSH) Version 2 (SSH2). SSH1 and SSH2 are different protocols and encrypt at different parts of the packets. SSH1 uses server as well as host keys to authenticate systems whereas SSH2 only uses host keys. SSH2 does not use the same networking implementation that SSH1 does and is considered a more secure, efficient, and portable version of SSH.

SSH runs on top of a transport layer (like TCP or IP), and provides authentication and encryption capabilities. SSH supports remote login to another computer over a network, remote command execution, and file relocation from one host to another.

7210 SAS-Series has a global SSH server process to support inbound SSH and SCP sessions initiated by external SSH or SCP client applications. The SSH server supports SSHv1. Note that this server process is separate from the SSH and SCP client commands on the routers which initiate outbound SSH and SCP sessions.

Inbound SSH sessions are counted as inbound telnet sessions for the purposes of the maximum number of inbound sessions specified by Login Control. Inbound SCP sessions are counted as inbound ftp sessions by Login Control.

When SSH server is enabled, an SSH security key is generated. The key is only valid until either the node is restarted or the SSH server is stopped and restarted (unless the preserve-key option is configured for SSH). The key size is non-configurable and set at 1024 bits. When the server is enabled, both inbound SSH and SCP sessions will be accepted provided the session is properly authenticated.

When the global SSH server process is disabled, no inbound SSH or SCP sessions will be accepted.

When using SCP to copy files from an external device to the file system, the SCP server will accept either forward slash (“/”) or backslash (“\”) characters to delimit directory and/or filenames. Similarly, the SCP client application can use either slash or backslash characters, but not all SCP clients treat backslash characters as equivalent to slash characters. In particular, UNIX systems will often times interpret the backslash character as an “escape” character which does not get transmitted to the SCP server. For example, a destination directory specified as

Other Security Features

“cf1:\dir1\file1” will be transmitted to the SCP server as “cf1:dir1file1” where the backslash escape characters are stripped by the SCP client system before transmission. On systems where the client treats the backslash like an “escape” character, a double backslash “\\” or the forward slash “/” can typically be used to properly delimit directories and the filename.

Exponential Login Backoff

A malicious user may attempt to gain CLI access by means of a dictionary attack using a script to automatically attempt to login as an “admin” user and using a dictionary list to test all possible passwords. Using the exponential-backoff feature in the **config>system>login-control** context the 7210 SAS increases the delay between login attempts exponentially to mitigate attacks.

A malicious user may attempt to gain CLI access by means of a dictionary attack using a script to automatically attempt to login as an “admin” user and using a dictionary list to test all possible passwords. Using the exponential-backoff feature in the **config>system>login-control** context the 7210 SAS increases the delay between login attempts exponentially to mitigate attacks.

When a user tries to login to a router using a Telnet or an SSH session, there are a limited number of attempts allowed to enter the correct password. The interval between the unsuccessful attempts change after each try (1, 2 and 4 seconds). If the system is configured for user lockout, then the user will be locked out when the number of attempts is exceeded.

However, if lockout is not configured, there are three password entry attempts allowed after the first failure, at fixed 1, 2 and 4 second intervals, in the first session, and then the session terminates. Users do not have an unlimited number of login attempts per session. After each failed password attempt, the wait period becomes longer until the maximum number of attempts is reached.

The 7210 SAS OS terminates after four unsuccessful tries. A wait period will never be longer than 4 seconds. The periods are fixed and will restart in subsequent sessions.

Note that the **config>system>login-control>[no] exponential-backoff** command works in conjunction with the **config>system>security>password>attempts** command which is also a system wide configuration.

For example:

```
*A:ALA-48>config>system# security password attempts
- attempts <count> [time <minutes1>] [lockout <minutes2>]
- no attempts

<count>           : [1..64]
<minutes1>        : [0..60]
<minutes2>        : [0..1440]
```

Exponential backoff applies to any user and by any login method such as console, SSH and Telnet.

Refer to [Configuring Login Controls on page 73](#). The commands are described in [Login, Telnet, SSH and FTP Commands on page 86](#).

User Lockout

When a user exceeds the maximum number of attempts allowed (the default is 3 attempts) during a certain period of time (the default is 5 minutes) the account used during those attempts will be locked out for a pre-configured lock-out period (the default is 10 minutes). Additionally, the system generates a trap (if the trap is not suppressed) when the number of attempts exceed the allowed number of attempts.

An security event log will be generated as soon as a user account has exceeded the number of allowed attempts and the **show>system>security>user** command can be used to display the total number of failed attempts per user.

The account will be automatically re-enabled as soon as the lock-out period has expired.

Encryption

Data Encryption Standard (DES) and Triple DES (3DES) are supported for encryption.

- DES is a widely-used method of data encryption using a private (secret) key. Both the sender and the receiver must know and use the same private key.
 - 3DES is a more secure version of the DES protocol.
-

802.1x Network Access Control

The Alcatel-Lucent 7210 SAS supports network access control of client devices (PCs, STBs, etc.) on an Ethernet network using the IEEE. 802.1x standard. 802.1x is known as Extensible Authentication Protocol (EAP) over a LAN network or EAPOL.

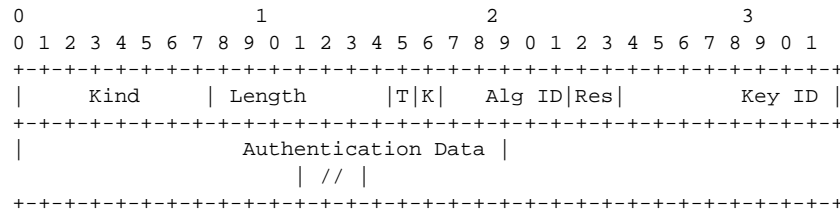
TCP Enhanced Authentication Option

The TCP Enhanced Authentication Option, currently covered in draft-bonica-tcp-auth-05.txt, Authentication for TCP-based Routing and Management Protocols, extends the previous MD5 authentication option to include the ability to change keys without tearing down the session, and allows for stronger authentication algorithms to be used.

The TCP Enhanced Authentication Option is a TCP extension that enhances security for BGP, LDP and other TCP-based protocols. This includes the ability to change keys in a BGP or LDP session seamlessly without tearing down the session. It is intended for applications where secure administrative access to both the end-points of the TCP connection is normally available.

TCP peers can use this extension to authenticate messages passed between one another. This strategy improves upon current practice, which is described in RFC 2385, Protection of BGP Sessions via the TCP MD5 Signature Option. Using this new strategy, TCP peers can update authentication keys during the lifetime of a TCP connection. TCP peers can also use stronger authentication algorithms to authenticate routing messages.

Packet Formats



Option Syntax

- Kind: 8 bits
The Kind field identifies the TCP Enhanced Authentication Option. This value will be assigned by IANA.
- Length: 8 bits
The Length field specifies the length of the TCP Enhanced Authentication Option, in octets. This count includes two octets representing the Kind and Length fields.
The valid range for this field is from 4 to 40 octets, inclusive.
For all algorithms specified in this memo the value will be 16 octets.
- T-Bit: 1 bit
The T-bit specifies whether TCP Options were omitted from the TCP header for the purpose of MAC calculation. A value of 1 indicates that all TCP options other than the Extended Authentication Option were omitted. A value of 0 indicates that TCP options were included.
The default value is 0.
- K-Bit: 1 bit
This bit is reserved for future enhancement. Its value MUST be equal to zero.
- Alg ID: 6 bits
The Alg ID field identifies the MAC algorithm.
- Res: 2 bits
These bits are reserved. They MUST be set to zero.
Key ID: 6 bits
The Key ID field identifies the key that was used to generate the message digest.
- Authentication Data: Variable length
- The Authentication Data field contains data that is used to authenticate the TCP segment. This data includes, but need not be restricted to, a MAC. The length and format of the Authentication Data Field can be derived from the Alg ID.

- The Authentication for TCP-based Routing and Management Protocols draft provides an overview of the TCP Enhanced Authentication Option. The details of this feature are described in draft-bonica-tcp-auth-04.txt.

Keychain

A keychain is a set of up to 64 keys, where each key is {A[i], K[i], V[i], S[i], T[i], S'[i], T'[i]} as described in draft-bonica-tcp-auth-05.txt, *Authentication for TCP-based Routing and Management Protocols*. The keys can be assigned to both sides of a LDP peer. The individual keys in a keychain have a begin- and end-time indicating when to use this key.

These fields map to the CLI tree as:

Table 4: Keychain Mapping

Field	Definition	CLI
i	The key identifier expressed as an integer (0...63)	config>system>security>keychain>direction>bi>entry config>system>security>keychain>direction>uni>receive>entry config>system>security>keychain>direction>uni>send>entry
A[i]	Authentication algorithm to use with key[i]	config>system>security>keychain>direction>bi>entry with algorithm <i>algorithm</i> parameter. config>system>security>keychain>direction>uni>receive>entry with algorithm <i>algorithm</i> parameter. config>system>security>keychain>direction>uni>send>entry with algorithm <i>algorithm</i> parameter.
K[i]	Shared secret to use with key[i].	config>system>security>keychain>direction>uni>receive>entry with shared secret parameter config>system>security>keychain>direction>uni>send>entry with shared secret parameter config>system>security>keychain>direction>bi>entry with shared secret parameter
V[i]	A vector that determines whether the key[i] is to be used to generate MACs for inbound segments, outbound segments, or both.	config>system>security>keychain>direction
S[i]	Start time from which key[i] can be used by sending TCPs.	config>system>security>keychain>direction>bi>entry>begin-time config>system>security>keychain>direction>uni>send>entry >begin-time
T[i]	End time after which key[i] cannot be used by sending TCPs.	Inferred by the begin-time of the next key (youngest key rule).
S'[i]	Start time from which key[i] can be used by receiving TCPs.	config>system>security>keychain>direction>bi>entry>begin-time config>system>security>keychain>direction>bi>entry>tolerance config>system>security>keychain>direction>uni>receive>entry >begin-time config>system>security>keychain>direction>uni>receive>entry >tolerance
T'[i]	End time after which key[i] cannot be used by receiving TCPs	config>system>security>keychain>direction>uni>receive>entry>end-time

Configuration Notes

This section describes security configuration caveats.

General

- If a RADIUS or a TACACS+ server is not configured, then password, profiles, and user access information must be configured on each router in the domain.
- If a RADIUS authorization is enabled, then VSAs must be configured on the RADIUS server.

Configuring Security with CLI

This section provides information to configure security using the command line interface.

Topics in this section include:

- [Setting Up Security Attributes on page 48](#)
 - [Configuring Authorization on page 49](#)
 - [Configuring Authorization on page 49](#)
 - [Configuring Accounting on page 51](#)
- [Configuration Tasks on page 54](#)
- [Security Configuration Procedures on page 55](#)
 - [Configuring Management Access Filters on page 55](#)
 - [Configuring Password Management Parameters on page 57](#)
 - [Configuring Profiles on page 58](#)
 - [Configuring Users on page 59](#)
 - [Copying and Overwriting Users and Profiles on page 61](#)
 - [Enabling SSH on page 72](#)
 - [Configuring Login Controls on page 73](#)
 - [RADIUS Configurations on page 65](#)
 - [Configuring RADIUS Authentication on page 65](#)
 - [Configuring RADIUS Authorization on page 66](#)
 - [Configuring RADIUS Accounting on page 67](#)
 - [TACACS+ Configurations on page 69](#)
 - [Enabling TACACS+ Authentication on page 69](#)
 - [Configuring TACACS+ Authorization on page 70](#)
 - [Configuring TACACS+ Accounting on page 71](#)

Setting Up Security Attributes

Configuring Authentication

Refer to the following sections to configure authentication:

- Local authentication
 - [Configuring Password Management Parameters on page 57](#)
 - [Configuring Profiles on page 58](#)
 - [Configuring Users on page 59](#)
- RADIUS authentication (only)

By default, authentication is enabled locally. Perform the following tasks to configure security on each participating router:

 - [Configuring Profiles on page 58](#)
 - [Configuring RADIUS Authentication on page 65](#)
 - [Configuring Users on page 59](#)
- RADIUS authentication
To implement only RADIUS authentication, *with* authorization, perform the following tasks on each participating router:
 - [Configuring RADIUS Authentication on page 65](#)
 - [Configuring RADIUS Authorization on page 66](#)
- TACACS+ authentication
To implement only TACACS+ authentication, perform the following tasks on each participating router:
 - [Configuring Profiles on page 58](#)
 - [Configuring Users on page 59](#)
 - [Enabling TACACS+ Authentication on page 69](#)

Configuring Authorization

Refer to the following sections to configure authorization.

- Local authorization
For local authorization, configure these tasks on each participating router:
 - [Configuring Profiles on page 58](#)
 - [Configuring Users on page 59](#)

- RADIUS authorization (only)
For RADIUS authorization (without authentication), configure these tasks on each participating router:
 - [Configuring RADIUS Authorization on page 66](#)
 - [Configuring Profiles on page 58](#)For RADIUS authorization, VSAs must be configured on the RADIUS server. See [Vendor-Specific Attributes \(VSAs\) on page 30](#).

- RADIUS authorization
For RADIUS authorization (with authentication), configure these tasks on each participating router:
 - [Configuring RADIUS Authorization on page 66](#)
 - For RADIUS authorization, VSAs must be configured on the RADIUS server. See [Vendor-Specific Attributes \(VSAs\) on page 30](#).
 - [Configuring RADIUS Authentication on page 65](#)
 - [Configuring Profiles on page 58](#)

- TACACS+ authorization (only)
For TACACS+ authorization (without authentication), configure these tasks on each participating router:
 - [Configuring TACACS+ Authorization on page 70](#)

- TACACS+ authorization

Setting Up Security Attributes

For TACACS+ authorization (with authentication), configure these tasks on each participating router:

- [Enabling TACACS+ Authentication on page 69](#)
- [Configuring TACACS+ Authorization on page 70](#)

Configuring Accounting

Refer to the following sections to configure accounting.

- Local accounting is not implemented. For information about configuring accounting policies, refer to [Configuring Logging with CLI on page 235](#)
- [Configuring RADIUS Accounting on page 67](#)
- [Configuring TACACS+ Accounting on page 71](#)

Security Configurations

This section provides information to configure security and configuration examples of configuration tasks.

To implement security features, configure the following components:

- Management access filters
- Profiles
- User access parameters
- Password management parameters
- Enable RADIUS and/or TACACS+
 - One to five RADIUS and/or TACACS+ servers
 - RADIUS and/or TACACS+ parameters

The following example displays default values for security parameters.

```
A:ALA-1>config>system>security# info detail
-----
no hash-control
telnet-server
no telnet6-server
no ftp-server
management-access-filter
exit
profile "default"
  default-action none
  no li
  entry 10
    no description
    match "exec"
    action permit
...
password
  authentication-order radius tacplus local
  no aging
  minimum-length 6
  attempts 3 time 5 lockout 10
  complexity
exit
user "admin"
  password "./3kQWERTYn0Q6w" hash
  access console
no home-directory
no restricted-to-home
  console
    no login-exec
    no cannot-change-password
    no new-password-at-login
  member "administrative"
exit
```

```
exit
snmp
    view iso subtree 1
        mask ff type included
    exit
...
    access group snmp-ro security-model snmpv1 security-level no-auth-no-privacy read
no-security notify no-security
    access group snmp-ro security-model snmpv2c security-level no-auth-no-privacy
read no-security notify no-security
    access group snmp-rw security-model snmpv1 security-level no-auth-no-privacy read
no-security write no-security notify no-security
    access group snmp-rw security-model snmpv2c security-level no-auth-no-privacy
read no-security write no-security notify no-security
    access group snmp-rwa security-model snmpv1 security-level no-auth-no-privacy
read iso write iso notify iso
    access group snmp-rwa security-model snmpv2c security-level no-auth-no-privacy
read iso write iso notify iso
    access group snmp-trap security-model snmpv1 security-level no-auth-no-privacy
notify iso
    access group snmp-trap security-model snmpv2c security-level no-auth-no-privacy
notify iso
    access group cli-readonly security-model snmpv2c security-level
no-auth-no-privacy read iso notify iso
    access group cli-readwrite security-model snmpv2c security-level
no-auth-no-privacy read iso write iso notify iso
    attempts 20 time 5 lockout 10
    exit
no ssh
```

Configuration Tasks

This section provides a brief overview of the tasks that must be performed to configure security and provides the CLI commands. [Table 5](#) depicts the capabilities of authentication, authorization, and accounting configurations. For example, authentication can be enabled locally and on RADIUS and TACACS+ servers. Authorization can be executed locally, on a RADIUS server, or on a TACACS+ server. Accounting can be performed on a RADIUS or TACACS+ server.

Table 5: Security Configuration Requirements

Authentication	Authorization	Accounting
Local	Local	None
RADIUS	Local and RADIUS	RADIUS
TACACS+	Local	TACACS+

Security Configuration Procedures

- [Configuring Management Access Filters on page 55](#)
- [Configuring Password Management Parameters on page 57](#)
- [Configuring Profiles on page 58](#)
- [Configuring Users on page 59](#)
- [Copying and Overwriting Users and Profiles on page 61](#)
- [Enabling SSH on page 72](#)

Configuring Management Access Filters

Creating and implementing management access filters is optional. Management access filters control all traffic going in to the , including all routing protocols. They apply to packets from all ports. The filters can be used to restrict management of the 7210 SAS router by other nodes outside either specific (sub)networks or through designated ports. By default, there are no filters associated with security options. The management access filter and entries must be explicitly created on each router. These filters also apply to the management Ethernet port.

The 7210 SAS implementation exits the filter when the first match is found and execute the actions according to the specified action. For this reason, entries must be sequenced correctly from most to least explicit.

An entry may not have any match criteria defined (in which case, everything matches) but must have at least the one keyword to be considered complete. Entries without the action keyword are considered incomplete and will be rendered inactive.

Use the following CLI commands to configure a management access filter. This example only accepts packets matching the criteria specified in entries 1 and 2. Non-matching packets are denied.

CLI Syntax:

```

config>system
  security
    management-access-filter
      default-action {permit|deny|deny-host-unreachable}
      renum old-entry-number new-entry-number
      no shutdown
      entry entry-id
        description description-string
        src-port {port-id cpm|laglag-id}
        src-ip {ip-prefix/mask | ip-prefix netmask}
        protocol protocol-id
        dst-port port [mask]
  
```

```
action {permit|deny|deny-host-unreachable}  
log
```

Configuring Password Management Parameters

Password management parameters consists of defining aging, the authentication order and authentication methods, password length and complexity, as well as the number of attempts a user can enter a password.

Depending on the your authentication requirements, password parameters are configured locally.

Use the following CLI commands to configure password support:

CLI Syntax: `config>system>security`
`password`
`admin-password password [hash|hash2]`
`aging days`
`attempts count [time minutes1] [lockout minutes2]`
`authentication-order [method-1] [method-2] [method-3]`
`[exit-on-reject]`
`complexity [numeric] [special-character] [mixed-case]`
`health-check`
`minimum-length value`

The following example displays a password configuration:

```
A:ALA-1>config>system>security# info
-----
password
authentication-order radius tacplus local
aging 365
minimum-length 8
attempts 5 time 5 lockout 20
exit
-----
A:ALA-1>config>system>security#
```

Configuring Profiles

Profiles are used to deny or permit access to a hierarchical branch or specific commands. Profiles are referenced in a user configuration. A maximum of sixteen user profiles can be defined. A user can participate in up to sixteen profiles. Depending on the the authorization requirements, passwords are configured locally or on the RADIUS server.

Use the following CLI commands to configure user profiles:

CLI Syntax:

```
config>system>security
  profile user-profile-name
    default-action {deny-all|permit-all|none}
    renum old-entry-number new-entry-number
    entry entry-id
      description description-string
      match command-string
      action {permit|deny}
```

The following example displays a user profile output:

```
A:ALA-1>config>system>security# info
-----
...
    profile "ghost"
      default-action permit-all
      entry 1
        match "configure"
        action permit
      exit
      entry 2
        match "show"
      exit
      entry 3
        match "exit"
      exit
    exit
...
-----
A:ALA-1>config>system>security#
```

Configuring Users

Configure access parameters for individual users. For user, define the login name for the user and, optionally, information that identifies the user. Use the following CLI commands to configure RADIUS support:

```
CLI Syntax: config>system>security
                user-template template-name
                user user-name
                access [ftp] [snmp] [console]
                console
                    cannot-change-password
                    login-exec url-prefix:source-url
                    member user-profile-name [user-profile-name...(up to 8
                        max)]
                    new-password-at-login
                home-directory url-prefix [directory] [directory/directory
                    ..]
                password [password] [hash|hash2]
                restricted-to-home
                snmp
                    authentication { [none] | [[hash] {md5 key-1|sha key-1} pri-
                        vacy {none|des-key key-2}] }
                    group group-name
```

The following displays a user configuration example:

```
A:ALA-1>config>system>security# info
-----
...
        user "49ers"
            password "qQbnuzLd7H/VxGdUqdh7bE" hash2
            access console ftp snmp
            restricted-to-home
            console
                member "default"
                member "ghost"
            exit
        exit
...
-----
A:ALA-1>config>system>security#
```

Configuring Keychains

The following displays a keychain configuration.

```
A:ALA-1>config>system>security# info
-----
...
    keychain "abc"
        direction
            bi
                entry 1 key "ZcvSElJzJx/wBZ9biCtOVQJ9YZQvVU.S" hash2 alg
algorithm aes-128-cmac-96
                begin-time 2006/12/18 22:55:20
                exit
            exit
        exit
    exit
    keychain "basasd"
        direction
            uni
                receive
                    entry 1 key "Ee7xdKlYO2D0m7v3IJv/84LIu96R2fZh" hash2
algorithm aes-128-cmac-96
                    tolerance forever
                exit
            exit
        exit
    exit
    exit
...
-----
A:ALA-1>config>system>security#
```

Copying and Overwriting Users and Profiles

You can copy a profile or user. You can copy a profile or user or overwrite an existing profile or user. The **overwrite** option must be specified or an error occurs if the destination profile or username already exists.

User

CLI Syntax: `config>system>security# copy {user source-user | profile source-profile} to destination [overwrite]`

Example:

```
config>system>security# copy user testuser to testuserA
MINOR: CLI User "testuserA" already exists - use overwrite
flag.

config>system>security#
config>system>security# copy user testuser to testuserA
overwrite
config>system>security#
```

The following output displays the copied user configurations:

```
A:ALA-12>config>system>security# info
-----
...
    user "testuser"
        password "F6XjryaATzM" hash
        access snmp
        snmp
            authentication hash md5 e14672e71d3e96e7a1e19472527ee969 privacy none
            group "testgroup"
        exit
    exit
    user "testuserA"
        password "" hash2
        access snmp
        console
            new-password-at-login
        exit
        snmp
            authentication hash md5 e14672e71d3e96e7a1e19472527ee969 privacy none
            group "testgroup"
        exit
    exit
...
-----
A:ALA-12>config>system>security# info
```

Note that the cannot-change-password flag is not replicated when a copy user command is performed. A new-password-at-login flag is created instead.

```
A:ALA-12>config>system>security>user# info
-----
password "F6XjryaATzM" hash
access snmp
console
cannot-change-password
exit
snmp
authentication hash md5 e14672e71d3e96e7a1e19472527ee969 privacy none
group "testgroup"
exit
-----
A:ALA-12>config>system>security>user# exit
A:ALA-12>config>system>security# user testuserA
A:ALA-12>config>system>security>user# info
-----
password "" hash2
access snmp
console
new-password-at-login
exit
snmp
authentication hash md5 e14672e71d3e96e7a1e19472527ee969 privacy none
group "testgroup"
exit
-----
A:ALA-12>config>system>security>user#
```

Profile

CLI Syntax: `config>system>security# copy {user source-user | profile source-profile} to destination [overwrite]`

Example: `config>system>security# copy profile default to testuser`

The following output displays the copied profiles:

```
A:ALA-49>config>system>security# info
-----
...
A:ALA-49>config>system>security# info detail
-----
...
        profile "default"
            default-action none
            entry 10
                no description
                match "exec"
                action permit
            exit
            entry 20
                no description
                match "exit"
                action permit
            exit
            entry 30
                no description
                match "help"
                action permit
            exit
            entry 40
                no description
                match "logout"
                action permit
            exit
            entry 50
                no description
                match "password"
                action permit
            exit
            entry 60
                no description
                match "show config"
                action deny
            exit
            entry 70
                no description
                match "show"
                action permit
            exit
            entry 80
                no description
                match "enable-admin"
```

Security Configuration Procedures

```
        action permit
    exit
exit
profile "testuser"
    default-action none
    entry 10
        no description
        match "exec"
        action permit
    exit
    entry 20
        no description
        match "exit"
        action permit
    exit
    entry 30
        no description
        match "help"
        action permit
    exit
    entry 40
        no description
        match "logout"
        action permit
    exit
    entry 50
        no description
        match "password"
        action permit
    exit
    entry 60
        no description
        match "show config"
        action deny
    exit
    entry 70
        no description
        match "show"
        action permit
    exit
    entry 80
        no description
        match "enable-admin"
        action permit
    exit
exit
profile "administrative"
    default-action permit-all exit
...
-----
A:ALA-12>config>system>security#
```

RADIUS Configurations

- [Configuring RADIUS Authentication on page 65](#)
- [Configuring RADIUS Authorization on page 66](#)
- [Configuring RADIUS Accounting on page 67](#)
- [Configuring 802.1x RADIUS Policies on page 68](#)

Configuring RADIUS Authentication

RADIUS is disabled by default and must be explicitly enabled. The mandatory commands to enable RADIUS on the local router are **radius** and `server server-index address ip-address secret key`.

Also, the system IP address must be configured in order for the RADIUS client to work. See [Configuring a System Interface of the](#) .

The other commands are optional. The `server` command adds a RADIUS server and configures the RADIUS server's IP address, index, and key values. The index determines the sequence in which the servers are queried for authentication requests.

On the local router, use the following CLI commands to configure RADIUS authentication:

CLI Syntax:

```
config>system>security
radius
  port port
  retry count
  server server-index address ip-address secret key
  timeout seconds
  no shutdown
```

The following displays a RADIUS authentication configuration example:

```
A:ALA-1>config>system>security# info
-----
      retry 5
      timeout 5
      server 1 address 10.10.10.103 secret "test1"
      server 2 address 10.10.0.1 secret "test2"
      server 3 address 10.10.0.2 secret "test3"
      server 4 address 10.10.0.3 secret "test4"
      ...
-----
A:ALA-1>config>system>security#
```

Configuring RADIUS Authorization

In order for RADIUS authorization to function, RADIUS authentication *must* be enabled first. See [Configuring RADIUS Authentication on page 65](#).

In addition to the local configuration requirements, VSAs must be configured on the RADIUS server. See [Vendor-Specific Attributes \(VSAs\) on page 30](#).

On the local router, use the following CLI commands to configure RADIUS authorization:

```
CLI Syntax: config>system>security
                radius
                authorization
```

The following displays a RADIUS authorization configuration example:

```
A:ALA-1>config>system>security# info
-----
...
    radius
        authorization
        retry 5
        timeout 5
        server 1 address 10.10.10.103 secret "test1"
        server 2 address 10.10.0.1 secret "test2"
        server 3 address 10.10.0.2 secret "test3"
        server 4 address 10.10.0.3 secret "test4"
    exit
...
-----
A:ALA-1>config>system>security#
```

Configuring RADIUS Accounting

On the local router, use the following CLI commands to configure RADIUS accounting:

```
CLI Syntax: config>system>security
               radius
               accounting
```

The following displays RADIUS accounting configuration example:

```
A:ALA-1>config>system>security# info
-----
...
    radius
    shutdown
    authorization
    accounting
    retry 5
    timeout 5
    server 1 address 10.10.10.103 secret "test1"
    server 2 address 10.10.0.1 secret "test2"
    server 3 address 10.10.0.2 secret "test3"
    server 4 address 10.10.0.3 secret "test4"
    exit
...
-----
A:ALA-1>config>system>security#
```

Configuring 802.1x RADIUS Policies

Use the following CLI commands to configure generic authentication parameters for clients using 802.1x EAPOL. Additional parameters are configured per Ethernet port. Refer to the 7210 SAS OS D, E Interface Configuration Guide

To configure generic parameters for 802.1x authentication, enter the following CLI syntax.

CLI Syntax:

```
config>system>security
  dot1x
    radius-plcy policy-name
      server server-index address ip-address secret key [port]
      source-address ip-address
    no shutdown
```

The following displays a 802.1x configuration example:

```
A:ALA-1>config>system>security# info
-----
      dot1x
        radius-plcy "dot1x_plcy" create
          server 1 address 1.1.1.1 port 65535 secret "a"
          server 2 address 1.1.1.2 port 6555 secret "a"
          source-address 1.1.1.255
          no shutdown
      ...
-----
A:ALA-1>config>system#
```

TACACS+ Configurations

- [Enabling TACACS+ Authentication on page 69](#)
 - [Configuring TACACS+ Authorization on page 70](#)
 - [Configuring TACACS+ Accounting on page 71](#)
-

Enabling TACACS+ Authentication

To use TACACS+ authentication on the router, configure one or more TACACS+ servers on the network.

Use the following CLI commands to configure profiles:

CLI Syntax: `config>system>security`
`tacplus`
`server server-index address ip-address secret key`
`timeout seconds`
`no shutdown`

The following displays a TACACS+ authentication configuration example:

```
A:ALA-1>config>system>security>tacplus# info
-----
        timeout 5
        server 1 address 10.10.0.5 secret "test1"
        server 2 address 10.10.0.6 secret "test2"
        server 3 address 10.10.0.7 secret "test3"
        server 4 address 10.10.0.8 secret "test4"
        server 5 address 10.10.0.9 secret "test5"
-----
A:ALA-1>config>system>security>tacplus#
```

Configuring TACACS+ Authorization

In order for TACACS+ authorization to function, TACACS+ authentication *must* be enabled first. See [Enabling TACACS+ Authentication on page 69](#).

On the local router, use the following CLI commands to configure RADIUS authorization:

CLI Syntax: config>system>security
tacplus
authorization
no shutdown

The following displays a TACACS+ authorization configuration example:

```
A:ALA-1>config>system>security>tacplus# info
-----
      authorization
      timeout 5
      server 1 address 10.10.0.5 secret "test1"
      server 2 address 10.10.0.6 secret "test2"
      server 3 address 10.10.0.7 secret "test3"
      server 4 address 10.10.0.8 secret "test4"
      server 5 address 10.10.0.9 secret "test5"
-----
A:ALA-1>config>system>security>tacplus#
```

Configuring TACACS+ Accounting

On the local router, use the following CLI commands to configure TACACS+ accounting:

```
CLI Syntax: config>system>security
               tacplus
               accounting
```

The following displays a TACACS+ accounting configuration example:

```
A:ALA-1>config>system>security>tacplus# info
-----
      accounting
      authorization
      timeout 5
      server 1 address 10.10.0.5 secret "test1"
      server 2 address 10.10.0.6 secret "test2"
      server 3 address 10.10.0.7 secret "test3"
      server 4 address 10.10.0.8 secret "test4"
      server 5 address 10.10.0.9 secret "test5"
-----
A:ALA-1>config>system>security>tacplus#
```

Enabling SSH

Use the SSH command to configure the SSH server as SSH1, SSH2 or both. The default is SSH2 (SSH version 2). This command should only be enabled or disabled when the SSH server is disabled. This setting should not be changed while the SSH server is running since the actual change only takes place after SSH is disabled or enabled.

CLI Syntax: `config>system>security
ssh
preserve-key
no server-shutdown
version ssh-version`

The following displays a SSH server configuration as both SSH and SSH2 using a host-key:

```
A:sim1>config>system>security>ssh# info
-----
                preserve-key
                version 1-2
-----
A:sim1>config>system>security>ssh#
```

Configuring Login Controls

Configure login control parameters for console, Telnet, and FTP sessions.

To configure login controls, enter the following CLI syntax.

```
CLI Syntax: config>system
                login-control
                  exponential-backoff
                  ftp
                    inbound-max-sessions value
                telnet
                  inbound-max-sessions value
                  outbound-max-sessions value
                  idle-timeout {minutes |disable}
                  pre-login-message login-text-string [name]
                  login-banner
                  motd {url url-prefix: source-url|text motd-text-string}
```

The following displays a login control configuration example:

```
A:ALA-1>config>system# info
-----
...
    login-control
      ftp
        inbound-max-sessions 5
      exit
      telnet
        inbound-max-sessions 7
        outbound-max-sessions 2
      exit
      idle-timeout 1440
      pre-login-message "Property of Service Routing Inc. Unauthorized access prohib-
ited."
      motd text "Notice to all users: Software upgrade scheduled 3/2 1:00 AM"
      exit
      no exponential-backoff
    ...
-----
A:ALA-1>config>system#
```

Security Command Reference

Command Hierarchies

Configuration Commands

- [Security Commands](#)
 - [Password Commands on page 78](#)
 - [Profile Commands on page 78](#)
 - [RADIUS Commands on page 78](#)
 - [SSH Commands on page 79](#)
 - [TACACS+ Commands on page 79](#)
 - [User Commands on page 79](#)
 - [Dot1x Commands on page 80](#)
 - [Keychain Commands on page 80](#)
 - [TCP Enhanced Authentication Commands on page 80](#)
- [Login Control Commands on page 81](#)
- [Show Commands on page 82](#)
- [Clear Commands on page 93](#)
- [Debug Commands on page 82](#)

Security Commands

```
config
  — system
    — security
      — copy {user source-user | profile source-profile} to destination [overwrite]
      — dot1x
      — [no] ftp-server
      — hash-control [read-version {1 | 2 | all}] [write-version {1 | 2}]
      — no hash-control
      — [no] keychain keychain-name
      — management-access-filter
      — password
      — [no] profile user-profile-name
      — [no] radius
      — snmp
      — source-address
        — application app [ip-int-name|ip-address]
        — no application app
      — [no] telnet-server
      — ssh
      — [no] tacplus
      — [no] user user-name
      — user-template {tacplus_default | radius_default}
```

Management Access Filter Commands

```

config
  — system
    — security
      — [no] management-access-filter
        — [no] ip-filter
        — default-action {permit | deny | deny-host-unreachable}
        — [no] entry entry-id
          — action {permit | deny | deny-host-unreachable}
          — no action
          — description description-string
          — no description
          — dst-port port [mask]
          — no dst-port
          — [no] log
          — protocol protocol-id
          — no protocol
          — router router-instance
          — no router
          — src-ip {ip-prefix/mask | ip-prefix netmask}
          — no src-ip
          — src-port {port-id | lag lag-id }
          — no src-port
        — renum old-entry-number new-entry-number
        — [no] shutdown

```

Security Password Commands

```

config
  — system
    — security
      — password
        — admin-password password [hash | hash2]
        — no admin-password
        — aging days
        — no aging
        — attempts count [time minutes1] [lockout minutes2]
        — no attempts
        — authentication-order [method-1] [method-2] [method-3] [exit-on-reject]
        — no authentication-order
        — [no] complexity [numeric] [special-character] [mixed-case]
        — [no] health-check [interval interval]
        — minimum-length value
        — no minimum-length
    
```

Profile Commands

```

config
  — system
    — security
      — [no] profile user-profile-name
        — default-action {deny-all | permit-all | none}
        — [no] entry entry-id
          — action {deny | permit}
          — description description-string
          — no description
          — match command-string
          — no match
        — renum old-entry-number new-entry-number
    
```

RADIUS Commands

```

config
  — system
    — security
      — [no] radius
        — [no] accounting
        — accounting-port port
        — no accounting-port
        — [no] authorization
        — port port
        — no port
        — retry count
        — no retry
        — server server-index address ip-address secret key [hash | hash2]
        — no server server-index
        — [no] shutdown
        — timeout seconds
        — no timeout
    
```

- [no] **use-default-template**

SSH Commands

```

config
  — system
    — security
      — ssh
        — [no] preserve-key
        — [no] server-shutdown
        — [no] version SSH-version

```

TACPLUS Commands

```

config
  — system
    — security
      — [no] tacplus
        — accounting [record-type {start-stop | stop-only}]
        — no accounting
        — [no] authorization
        — server server-index address ip-address secret key [hash | hash2] [port port]
        — no server server-index
        — [no] shutdown
        — [no] single-connection
        — timeout seconds
        — no timeout
        — [no] use-default-template

```

User Commands

```

config
  — system
    — security
      — [no] user user-name
        — [no] access [ftp] [snmp] [console]
        — console
          — [no] cannot-change-password
          — login-exec url-prefix::source-url
          — no login-exec
          — member user-profile-name [user-profile-name... (up to 8 max)]
          — no member user-profile-name
          — [no] new-password-at-login
        — home-directory url-prefix [directory] [directory/directory...]
        — no home-directory
        — password [password] [hash | hash2]
        — [no] restricted-to-home
        — snmp
          — authentication {[none] | [[hash] {md5 key-1 | sha key-1 } privacy
            {privacy-level key-2}]
          — group group-name
          — no group

```

User Template Commands

```

config
  — system
    — security
      — user-template {tacplus_default | radius_default}
        — [no] access [ftp] [console]
        — console
          — login-exec url-prefix:source-url
          — no login-exec
        — home-directory url-prefix [directory][directory/directory..]
        — no home-directory
        — [no] restricted-to-home
  
```

Dot1x Commands

```

config
  — system
    — security
      — dot1x
        — radius-pley name [create]
          — retry count
          — no retry
          — server server-index address ip-address secret key [hash|hash2]
            [auth-port auth-port] [acct-port acct-port] [type server-type]
          — source-address ip-address
          — [no] shutdown
          — timeout seconds
          — no timeout
        — [no] shutdown
  
```

Keychain Commands

```

config
  — system
    — security
      — [no] keychain keychain-name
        — description description-string
        — no description
        — direction {uni | bi}
          — bi
            — entry {null-key | entry-id key authentication-key | hash-
              key | hash2-key [hash | hash2] algorithm algorithm}
            — no entry {null-key | entry-id}
              — begin-time [date] [hours-minutes] [UTC] {now|for-
                ever}
              — [no] shutdown
              — tolerance [seconds | forever]
          — uni
            — receive
              — entry {null-key | entry-id key authentication-key |
                hash-key | hash2-key [hash | hash2] algorithm algo-
                rithm}
              — no entry {null-key | entry-id}
  
```

- **begin-time** *[date] [hours-minutes] [UTC]* {**now**|**forever**}
- **end-time** *[date][hours-minutes] [UTC]* {**now**|**forever**}
- **[no] shutdown**
- **tolerance** *[seconds | forever]*
- **send**
 - **entry** *entry-id key [authentication-key | hash-key | hash2-key] [hash | hash2] algorithm algorithm*
 - **begin-time** *[date] [hours-minutes] [UTC]* {**now**|**forever**}
 - **[no] shutdown**
- **[no] shutdown**
- **tcp-option-number**
 - **receive** *option-number*
 - **send** *option-number*

Login Control Commands

- ```
config
 — system
 — login-control
 — [no] exponential-backoff
 — ftp
 — inbound-max-sessions value
 — no inbound-max-sessions
 — idle-timeout {minutes | disable}
 — no idle-timeout
 — [no] login-banner
 — motd {url url-prefix: source-url | text motd-text-string}
 — no motd
 — pre-login-message login-text-string [name]
 — no pre-login-message
 — telnet
 — inbound-max-sessions value
 — no inbound-max-sessions
 — outbound-max-sessions value
 — no outbound-max-sessions
```

## Show Commands

### Security

```
show
 — system
 — security
 — access-group [group-name]
 — authentication [statistics]
 — communities
 — keychain [key-chain] [detail]
 — management-access-filter
 — ip-filter [entry entry-id]
 — password-options
 — profile [user-profile-name]
 — source-address
 — ssh
 — user [user-id] [detail]
 — view [view-name] [detail]
```

## Login Control

```
show
 — user
```

## Debug Commands

```
debug
 — radius [detail] [hex]
 — no radius
```

---

## Configuration Commands

---

### General Security Commands

#### description

|                    |                                                                                                                                                                                                                                                                                               |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>description</b> <i>description-string</i><br><b>no description</b>                                                                                                                                                                                                                         |
| <b>Context</b>     | config>system>security>mgmt-access-filter>entry<br>config>sys>security>keychain>direction>bi>entry<br>config>system>security>keychain>direction>uni>receive>entry<br>config>system>security>keychain>direction>uni>send>entry                                                                 |
| <b>Description</b> | This command creates a text description stored in the configuration file for a configuration context. This command associates a text string with a configuration context to help identify the context in the configuration file.<br><br>The <b>no</b> form of the command removes the string. |
| <b>Default</b>     | No description associated with the configuration context.                                                                                                                                                                                                                                     |
| <b>Parameters</b>  | <i>string</i> — The description character string. Allowed values are any string up to 80 characters long composed of printable, 7-bit ASCII characters. If the string contains special characters (#, \$, spaces, etc.), the entire string must be enclosed within double quotes.             |

#### shutdown

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] shutdown</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Context</b>     | config>system>security>mgmt-access-filter<br>config>system>security>keychain>direction>bi>entry<br>config>system>security>keychain>direction>uni>receive>entry<br>config>system>security>keychain>direction>uni>send>entry                                                                                                                                                                                                                                                                                                           |
| <b>Description</b> | The <b>shutdown</b> command administratively disables the entity. When disabled, an entity does not change, reset, or remove any configuration settings or statistics. Many entities must be explicitly enabled using the <b>no shutdown</b> command. The operational state of the entity is disabled as well as the operational state of any entities contained within. Many objects must be shut down before they may be deleted.<br><br>The <b>no</b> form of the command puts an entity into the administratively enabled state. |
| <b>Default</b>     | no shutdown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

### security

|                    |                                                                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>security</b>                                                                                                                                                                                    |
| <b>Context</b>     | config>system                                                                                                                                                                                      |
| <b>Description</b> | <p>This command creates the context to configure security settings.</p> <p>Security commands manage user profiles and user membership. Security commands also manage user login registrations.</p> |

### ftp-server

|                    |                                                                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] ftp-server</b>                                                                                                                                                                                                                          |
| <b>Context</b>     | config>system>security                                                                                                                                                                                                                          |
| <b>Description</b> | <p>This command enables FTP servers running on the system.</p> <p>FTP servers are disabled by default. At system startup, only SSH server are enabled.</p> <p>The <b>no</b> form of the command disables FTP servers running on the system.</p> |

### hash-control

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>hash-control [read-version {1   2   all}] [write-version {1   2}]<br/>no hash-control</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Context</b>     | config>system>security                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Description</b> | <p>Whenever the user executes a <b>save</b> or <b>info</b> command, the system will encrypt all passwords, MD5 keys, etc., for security reasons. At present, two algorithms exist.</p> <p>The first algorithm is a simple, short key that can be copied and pasted in a different location when the user wants to configure the same password. However, because it is the same password and the hash key is limited to the password/key, even the casual observer will notice that it is the same key.</p> <p>The second algorithm is a more complex key, and cannot be copied and pasted in different locations in the configuration file. In this case, if the same key or password is used repeatedly in different contexts, each encrypted (hashed) version will be different.</p> |
| <b>Default</b>     | all — read-version set to accept both versions 1 and 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Parameters</b>  | <p><b>read-version {1   2   all}</b> — When the read-version is configured as “all,” both versions 1 and 2 will be accepted by the system. Otherwise, only the selected version will be accepted when reading configuration or exec files. The presence of incorrect hash versions will abort the script/startup.</p> <p><b>write-version {1   2}</b> — Select the hash version that will be used the next time the configuration file is saved (or an info command is executed). Be careful to save the read and write version correctly, so that the file can be properly processed after the next reboot or exec.</p>                                                                                                                                                               |

## source-address

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>source-address</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Context</b>     | config>system>security                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b> | <p>This command specifies the source address that should be used in all unsolicited packets sent by the application.</p> <p>This feature only applies on inband interfaces and does not apply on the outband management interface. Packets going out the management interface will keep using that as source IP address. IN other words, when the RADIUS server is reachable through both the management interface and a network interface, the management interface is used despite whatever is configured under the source-address statement.</p> |

## application

|                    |                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>application</b> <i>app</i> [ <i>ip-int-name</i>   <i>ip-address</i> ]<br><b>no application</b> <i>app</i>                                                                                                                                                                                                                                                                                        |
| <b>Context</b>     | config>system>security>source-address                                                                                                                                                                                                                                                                                                                                                               |
| <b>Description</b> | This command specifies the application to use the source-IP address specified by the <b>source-address</b> command.                                                                                                                                                                                                                                                                                 |
| <b>Parameters</b>  | <p><i>app</i> — Specify the application name.</p> <p><b>Values</b> telnet, ftp, ssh, radius, tacplus, snmptrap, syslog, ping, traceroute, dns, sntp, ntp, cflowd</p> <p><i>ip-int-name</i> / <i>ip-address</i> — Specifies the name of the IP interface, IP address . If the string contains special characters (#, \$, spaces, etc.), the entire string must be enclosed within double quotes.</p> |

## telnet-server

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] telnet-server</b>                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Context</b>     | config>system>security                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Description</b> | <p>This command enables Telnet servers running on the system.</p> <p>Telnet servers are off by default. At system startup, only SSH servers are enabled.</p> <p>Telnet servers in networks limit a Telnet clients to three retries to login. The Telnet server disconnects the Telnet client session after three retries.</p> <p>The <b>no</b> form of the command disables Telnet servers running on the system.</p> |

---

## Login, Telnet, SSH and FTP Commands

### exponential-backoff

|                    |                                                                                                                                                                                                                                                                                                                                     |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] exponential-backoff</b>                                                                                                                                                                                                                                                                                                     |
| <b>Context</b>     | config>system>login-control                                                                                                                                                                                                                                                                                                         |
| <b>Description</b> | This command enables the exponential-backoff of the login prompt. The exponential-backoff command is used to deter dictionary attacks, when a malicious user can gain access to the CLI by using a script to try <b>admin</b> with any conceivable password.<br><br>The <b>no</b> form of the command disables exponential-backoff. |
| <b>Default</b>     | no exponential-backoff                                                                                                                                                                                                                                                                                                              |

### ftp

|                    |                                                                             |
|--------------------|-----------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>ftp</b>                                                                  |
| <b>Context</b>     | config>system>login-control                                                 |
| <b>Description</b> | This command creates the context to configure FTP login control parameters. |

### idle-timeout

|                    |                                                                                                                                                                                                                                                                                                                                                  |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>idle-timeout</b> { <i>minutes</i>   <b>disable</b> }<br><b>no idle-timeout</b>                                                                                                                                                                                                                                                                |
| <b>Context</b>     | config>system>login-control                                                                                                                                                                                                                                                                                                                      |
| <b>Description</b> | This command configures the idle timeout for FTP, console, or Telnet sessions before the session is terminated by the system.<br><br>By default, an idle FTP, console, SSH or Telnet session times out after 30 minutes of inactivity. This timer can be set per session.<br><br>The <b>no</b> form of the command reverts to the default value. |
| <b>Default</b>     | <b>30</b> — Idle timeout set for 30 minutes.                                                                                                                                                                                                                                                                                                     |
| <b>Parameters</b>  | <i>minutes</i> — The idle timeout in minutes. Allowed values are 1 to 1440. 0 implies the sessions never timeout.<br><br><b>Values</b> 1 — 1440<br><br><b>disable</b> — When the <b>disable</b> option is specified, a session will never timeout. To re-enable idle timeout, enter the command without the disable option.                      |

## inbound-max-sessions

|                    |                                                                                                                                                                                                                   |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>inbound-max-sessions</b> <i>value</i><br><b>no inbound-max-sessions</b>                                                                                                                                        |
| <b>Context</b>     | config>system>login-control>ftp                                                                                                                                                                                   |
| <b>Description</b> | This command configures the maximum number of concurrent inbound FTP sessions. This value is the combined total of inbound and outbound sessions. The <b>no</b> form of the command reverts to the default value. |
| <b>Default</b>     | 3                                                                                                                                                                                                                 |
| <b>Parameters</b>  | <i>value</i> — The maximum number of concurrent FTP sessions on the node.<br><b>Values</b> 0 — 5                                                                                                                  |

## inbound-max-sessions

|                    |                                                                                                                                                                                                                                                             |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>inbound-max-sessions</b> <i>value</i><br><b>no inbound-max-sessions</b>                                                                                                                                                                                  |
| <b>Context</b>     | config>system>login-control>telnet                                                                                                                                                                                                                          |
| <b>Description</b> | This parameter limits the number of inbound Telnet and SSH sessions. A maximum of 15 telnet and ssh connections can be established to the router. The local serial port cannot be disabled. The <b>no</b> form of the command reverts to the default value. |
| <b>Default</b>     | 5                                                                                                                                                                                                                                                           |
| <b>Parameters</b>  | <i>value</i> — The maximum number of concurrent inbound Telnet sessions, expressed as an integer.<br><b>Values</b> 0 — 7                                                                                                                                    |

## login-banner

|                    |                                                                                                                                                                                                                                                                                                   |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] login-banner</b>                                                                                                                                                                                                                                                                          |
| <b>Context</b>     | config>system>login-control                                                                                                                                                                                                                                                                       |
| <b>Description</b> | This command enables or disables the display of a login banner. The login banner contains the 7210 SAS OS copyright and build date information for a console login attempt. The <b>no</b> form of the command causes only the configured pre-login-message and a generic login prompt to display. |

### login-control

|                    |                                                                                                |
|--------------------|------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>login-control</b>                                                                           |
| <b>Context</b>     | config>system                                                                                  |
| <b>Description</b> | This command creates the context to configure the session control for console, Telnet and FTP. |

### motd

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>motd</b> { <i>url url-prefix: source-url</i>   <b>text</b> <i>motd-text-string</i> }<br><b>no motd</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Context</b>     | config>system>login-control                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Description</b> | This command creates the message of the day displayed after a successful console login. Only one message can be configured.<br><br>The <b>no</b> form of the command removes the message.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Default</b>     | No <b>motd</b> is defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Parameters</b>  | <b>url</b> <i>url-prefix: source-url</i> — When the message of the day is present as a text file, provide both url-prefix and the source-url of the file containing the message of the day. The URL prefix can be local or remote.<br><br><b>text</b> <i>motd-text-string</i> — The text of the message of the day. The <i>motd-text-string</i> must be enclosed in double quotes. Multiple text strings are not appended to one another.<br><br>Some special characters can be used to format the message text. The “\n” character creates multi-line MOTDs and the “\r” character restarts at the beginning of the new line. For example, entering “\n\r” will start the string at the beginning of the new line, while entering “\n” will start the second line below the last character from the first line. |

### outbound-max-sessions

|                    |                                                                                                                                                                                                                                                                       |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>outbound-max-sessions</b> <i>value</i><br><b>no outbound-max-sessions</b>                                                                                                                                                                                          |
| <b>Context</b>     | config>system>login-control>telnet                                                                                                                                                                                                                                    |
| <b>Description</b> | This parameter limits the number of outbound Telnet and SSH sessions. A maximum of 15 telnet and ssh connections can be established from the router. The local serial port cannot be disabled.<br><br>The <b>no</b> form of the command reverts to the default value. |
| <b>Default</b>     | 5                                                                                                                                                                                                                                                                     |
| <b>Parameters</b>  | <i>value</i> — The maximum number of concurrent outbound Telnet sessions, expressed as an integer.<br><br><b>Values</b> 0 — 7                                                                                                                                         |

## pre-login-message

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>pre-login-message</b> <i>login-text-string</i> [ <b>name</b> ]<br><b>no pre-login-message</b>                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Context</b>     | config>system>login-control                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Description</b> | This command creates a message displayed prior to console login attempts on the console via Telnet. Only one message can be configured. If multiple <b>pre-login-messages</b> are configured, the last message entered overwrites the previous entry.<br><br>It is possible to add the name parameter to an existing message without affecting the current <b>pre-login-message</b> .<br><br>The <b>no</b> form of the command removes the message.                                                         |
| <b>Default</b>     | No <b>pre-login-message</b> is defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Parameters</b>  | <i>login-text-string</i> — The string can be up to 900 characters. Any printable, 7-bit ASCII characters can be used. If the string contains special characters (#, \$, spaces, etc.), the entire string must be enclosed within double quotes.<br><br><b>name</b> — When the keyword <i>name</i> is defined, the configured system name is always displayed first in the login message. To remove the name from the login message, the message must be cleared and a new message entered without the name. |

## disable-graceful-shutdown

|                    |                                                                                                                                              |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] disable-graceful-shutdown</b>                                                                                                        |
| <b>Context</b>     | config>system>login-control>ssh                                                                                                              |
| <b>Description</b> | This command enables graceful shutdown of SSH sessions.<br><br>The <b>no</b> form of the command disables graceful shutdown of SSH sessions. |

## preserve-key

|                    |                                                                                                                                                                                                                                                                                                                                     |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] preserve-key</b>                                                                                                                                                                                                                                                                                                            |
| <b>Context</b>     | config>system>security>ssh                                                                                                                                                                                                                                                                                                          |
| <b>Description</b> | After enabling this command, private keys, public keys, and host key file will be saved by the server. It is restored following a system reboot or the ssh server restart.<br><br>The <b>no</b> form of the command specifies that the keys will be held in memory by the SSH server and is not restored following a system reboot. |
| <b>Default</b>     | no preserve-key                                                                                                                                                                                                                                                                                                                     |

## server-shutdown

|                    |                                                             |
|--------------------|-------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] server-shutdown</b>                                 |
| <b>Context</b>     | config>system>security>ssh                                  |
| <b>Description</b> | This command enables the SSH servers running on the system. |
| <b>Default</b>     | At system startup, only the SSH server is enabled.          |

## version

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>version <i>ssh-version</i></b><br><b>no version</b>                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Context</b>     | config>system>security>ssh                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b> | Specifies the SSH protocol version that will be supported by the SSH server.                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Default</b>     | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Parameters</b>  | <i>ssh-version</i> — Specifies the SSH version.<br><br><b>Values</b><br>1 — Specifies that the SSH server will only accept connections from clients that support SSH protocol version 1<br>2 — Specifies that the SSH server will accept connections from clients supporting either SSH protocol version 2<br>1-2 — Specifies that the SSH server will accept connections from clients supporting either SSH protocol version 1, or SSH protocol version 2 or both. |

## telnet

|                    |                                                                                    |
|--------------------|------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>telnet</b>                                                                      |
| <b>Context</b>     | config>system>login-control                                                        |
| <b>Description</b> | This command creates the context to configure the Telnet login control parameters. |

---

## Management Access Filter Commands

### management-access-filter

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] management-access-filter</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Context</b>     | config>system>security                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Description</b> | <p>This command creates the context to edit management access filters and to reset match criteria.</p> <p>Management access filters control all traffic in and out of the . They can be used to restrict management of the router by other nodes outside either specific (sub)networks or through designated ports.</p> <p>Management filters, as opposed to other traffic filters, are enforced by system software.</p> <p>The <b>no</b> form of the command removes management access filters from the configuration.</p> |
| <b>Default</b>     | No management access filters are defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

### ip-filter

|                    |                                                                                       |
|--------------------|---------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] ip-filter</b>                                                                 |
| <b>Context</b>     | config>system>security>mgmt-access-filter                                             |
| <b>Description</b> | This command enables the context to configure management access IP filter parameters. |

### action

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>action {permit   deny   deny-host-unreachable}</b><br><b>no action</b>                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Context</b>     | config>system>security>mgmt-access-filter>ip-filter>entry                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Description</b> | <p>This command creates the action associated with the management access filter match criteria entry.</p> <p>The <b>action</b> keyword is required. If <b>no action</b> is defined, the filter is ignored. If multiple action statements are configured, the last one overwrites previous configured actions.</p> <p>If the packet does not meet any of the match criteria the configured <b>default action</b> is applied.</p>                     |
| <b>Default</b>     | none — The action is specified by default-action command.                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Parameters</b>  | <p><i>permit</i> — Specifies that packets matching the configured criteria will be permitted.</p> <p><b>deny</b> — Specifies that packets matching the configured selection criteria will be denied and that a ICMP host unreachable message will not be issued.</p> <p><b>deny-host-unreachable</b> — Specifies that packets matching the configured selection criteria will be denied and that a host unreachable message will not be issued.</p> |

## default-action

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>default-action</b> { <b>permit</b>   <b>deny</b>   <b>deny-host-unreachable</b> }                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Context</b>     | config>system>security>mgmt-access-filter>ip-filter                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Description</b> | <p>This command creates the default action for management access in the absence of a specific management access filter match.</p> <p>The <b>default-action</b> is applied to a packet that does not satisfy any match criteria in any of the management access filters. Whenever management access filters are configured, the <b>default-action</b> must be defined.</p>                                                                                       |
| <b>Default</b>     | No default-action is defined.                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Parameters</b>  | <p><b>permit</b> — Specifies that packets not matching the configured selection criteria in any of the filter entries will be permitted.</p> <p><b>deny</b> — Specifies that packets not matching the selection criteria be denied and that an ICMP host unreachable message will not be issued..</p> <p><b>deny-host-unreachable</b> — Specifies that packets not matching the selection criteria be denied and a host unreachable message will be issued.</p> |

## dst-port

|                    |                                                                                                                                                                                                                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | [no] <b>dst-port</b> <i>port</i> [ <i>mask</i> ]                                                                                                                                                                                                                                           |
| <b>Context</b>     | config>system>security>mgmt-access-filter>ip-filter>entry                                                                                                                                                                                                                                  |
| <b>Description</b> | <p>This command configures a source TCP or UDP port number or port range for a management access filter match criterion.</p> <p>The <b>no</b> form of the command removes the source port match criterion.</p>                                                                             |
| <b>Default</b>     | No dst-port match criterion.                                                                                                                                                                                                                                                               |
| <b>Parameters</b>  | <p><i>port</i> — The source TCP or UDP port number as match criteria.</p> <p><b>Values</b> 1 — 65535 (decimal)</p> <p><i>mask</i> — Mask used to specify a range of source port numbers as the match criterion.</p> <p>This 16 bit mask can be configured using the following formats:</p> |

| Format Style | Format Syntax      | Example            |
|--------------|--------------------|--------------------|
| Decimal      | DDDDD              | 63488              |
| Hexadecimal  | 0xHHHH             | 0xF800             |
| Binary       | 0bBBBBBBBBBBBBBBBB | 0b1111100000000000 |

To select a range from 1024 up to 2047, specify 1024 0xFC00 for value and mask.

**Default** 65535 (exact match)

**Values** 1 — 65535 (decimal)

## log

**Syntax** [no] log

**Context** config>system>security>mgmt-access-filter>ip-filter>entry

**Description** This command enables match logging. When enabled, matches on this entry will cause the Security event mafEntryMatch to be raised.

**Default** no log

## entry

[no] entry *entry-id*

**Context** config>system>security>mgmt-access-filter>ip-filter

**Description** This command is used to create or edit a management access filter entry. Multiple entries can be created with unique *entry-id* numbers. The 7210 SAS OS exits the filter upon the first match found and executes the actions according to the respective action command. For this reason, entries must be sequenced correctly from most to least explicit.

An entry may not have any match criteria defined (in which case, everything matches) but must have at least the keyword **action** defined to be considered complete. Entries without the **action** keyword are considered incomplete and inactive.

The **no** form of the command removes the specified entry from the management access filter.

**Default** No entries are defined.

**Parameters** *entry-id* — An entry ID uniquely identifies a match criteria and the corresponding action. It is recommended that entries are numbered in staggered increments. This allows users to insert a new entry in an existing policy without having to renumber the existing entries.

**Values** 1 — 9999

## protocol

**Syntax** [no] protocol *protocol-id*

**Context** config>system>security>mgmt-access-filter>ip-filter>entry

**Description** This command configures an IP protocol type to be used as a management access filter match criterion.

## Configuration Commands

The protocol type, such as TCP, UDP, and OSPF, is identified by its respective protocol number. Well-known protocol numbers include ICMP (1), TCP (6), and UDP (17).

The **no** form of the command removes the protocol from the match criteria.

**Default** No protocol match criterion is specified.

**Parameters** *protocol* — The protocol number for the match criterion.

**Values** 1 to 255 (decimal)

## router

**Syntax** **router** {*router-instance*}  
**no router**

**Context** config>system>security>mgmt-access-filter>ip-filter>entry

**Description** The command configures a router name or service ID to be used as a management access filter match criterion.

The **no** form of the command removes the router name or service ID from the match criteria.

**Default** Base

**Parameters** *router-instance* — Specifies the router name.

**Values** Base, Vpls-management (for 7210 SAS D)

**Values** Base, Management, Vpls-management (for 7210 SAS E)

## renum

**Syntax** **renum** *old-entry-number new-entry-number*

**Context** config>system>security>mgmt-access-filter>ip-filter

**Description** This command renumbers existing management access filter entries to re-sequence filter entries.

The exits on the first match found and executes the actions in accordance with the accompanying **action** command. This may require some entries to be re-numbered differently from most to least explicit.

**Parameters** *old-entry-number* — Enter the entry number of the existing entry.

**Values** 1 — 9999

*new-entry-number* — Enter the new entry number that will replace the old entry number.

**Values** 1 — 9999

## src-port

|                    |                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>src-port</b> { <i>port-id</i>   <b>lag</b> <i>port-id</i> }<br><b>no src-port</b>                                                                                                                                                                                                                                                               |
| <b>Context</b>     | config>system>security>mgmt-access-filter>ip-filter>entry                                                                                                                                                                                                                                                                                          |
| <b>Description</b> | <p>This command restricts ingress management traffic to either the CPM Ethernet port or any other logical port (LAG or port) on the device.</p> <p>When the source interface is configured, only management traffic arriving on those ports satisfy the match criteria.</p> <p>The <b>no</b> form of the command reverts to the default value.</p> |
| <b>Default</b>     | any interface                                                                                                                                                                                                                                                                                                                                      |
| <b>Parameters</b>  | <p><i>port-id</i> — The port ID in the following format: slot[/mda]/port.</p> <p><b>Syntax:</b>    port-id:    slot/mda/port</p>                                                                                                                                                                                                                   |

## src-ip

|                    |                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] src-ip</b> {[ <i>ip-prefix/mask</i> ]   [ <i>ip-prefix</i> ]}                                                                                                                                                                                                                                                                                                                   |
| <b>Context</b>     | config>system>security>mgmt-access-filter>ip-filter>entry                                                                                                                                                                                                                                                                                                                               |
| <b>Description</b> | <p>This command configures a source IP address range to be used as a management access filter match criterion.</p> <p>To match on the source IP address, specify the address and the associated mask (e., 10.1.0.0/16). The conventional notation of 10.1.0.0 255.255.0.0 can also be used.</p> <p>The <b>no</b> form of the command removes the source IP address match criterion.</p> |
| <b>Default</b>     | No source IP match criterion is specified.                                                                                                                                                                                                                                                                                                                                              |
| <b>Parameters</b>  | <p><i>ip-prefix' mask</i> — The IP prefix for the IP match criterion in dotted decimal notation.</p> <p><i>mask</i> — Specifies the subnet mask length expressed as a decimal integer.</p> <p><b>Values</b>      1 — 32 (mask length), 0.0.0.0 — 255.255.255.255 (dotted decimal)</p>                                                                                                   |

---

## Password Commands

### admin-password

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>admin-password</b> <i>password</i> [ <b>hash</b>   <b>hash2</b> ]<br><b>no admin-password</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Context</b>     | config>system>security>password                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Description</b> | <p>This command allows a user (with admin permissions) to configure a password which enables a user to become an administrator.</p> <p>This password is valid only for one session. When enabled, no authorization to TACACS+ or RADIUS is performed and the user is locally regarded as an admin user.</p> <p>This functionality can be enabled in two contexts:</p> <pre>config&gt;system&gt;security&gt;password&gt;admin-password &lt;global&gt; enable-admin</pre> <p><b>NOTE:</b> See the description for the <b>enable-admin</b> on the next page. If the admin-password is configured in the config&gt;system&gt;security&gt;password context, then any user can enter the special mode by entering the <b>enable-admin</b> command.</p> <p><b>enable-admin</b> is in the default profile. By default, all users are given access to this command.</p> <p>Once the <b>enable-admin</b> command is entered, the user is prompted for a password. If the password matches, user is given unrestricted access to all the commands.</p> <p>The minimum length of the password is determined by the <b>minimum-length</b> command. The complexity requirements for the password is determined by the <b>complexity</b> command.</p> <p>NOTE: The <i>password</i> argument of this command is not sent to the servers. This is consistent with other commands which configure secrets.</p> <p>Also note that usernames and passwords in the FTP and TFTP URLs will not be sent to the authorization or accounting servers when the <b>file&gt;copy source-url dest-url</b> command is executed.</p> <p>For example:</p> <pre>file copy ftp://test:secret@131.12.31.79/test/srcfile cf1:\destfile</pre> <p>In this example, the username 'test' and password 'secret' will not be sent to the AAA servers (or to any logs). They will be replaced with '****'.</p> <p>The <b>no</b> form of the command removes the admin password from the configuration.</p> |
| <b>Default</b>     | no admin-password                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Parameters</b>  | <p><i>password</i> — Configures the password which enables a user to become a system administrator. The maximum length can be up to 20 characters if unhashed, 32 characters if hashed, 54 characters if the hash2 keyword is specified.</p> <p><b>hash</b> — Specifies the key is entered in an encrypted form. If the <b>hash</b> parameter is not used, the key is assumed to be in a non-encrypted, clear text form. For security, all keys are stored in encrypted</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

**hash2** — Specifies the key is entered in a more complex encrypted form. If the **hash2** parameter is not used, the less encrypted **hash** form is assumed.

## enable-admin

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>enable-admin</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Context</b>     | <global>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b> | <p><b>NOTE:</b> See the description for the <b>admin-password</b> on the previous page. If the <b>admin-password</b> is configured in the <code>config&gt;system&gt;security&gt;password</code> context, then any user can enter the special administrative mode by entering the <b>enable-admin</b> command.</p> <p><b>enable-admin</b> is in the default profile. By default, all users are given access to this command.</p> <p>Once the <b>enable-admin</b> command is entered, the user is prompted for a password. If the password matches, user is given unrestricted access to all the commands.</p> <p>The minimum length of the password is determined by the <b>minimum-length</b> command. The complexity requirements for the password is determined by the <b>complexity</b> command.</p> <p>There are two ways to verify that a user is in the enable-admin mode:</p> <ul style="list-style-type: none"> <li>• <code>show users</code> — Administrator can know which users are in this mode.</li> <li>• Enter the <code>enable-admin</code> command again at the root prompt and an error message will be returned.</li> </ul> |

```
A:ALA-1# show users
=====
User Type From Login time Idle time
=====
admin Console -- 10AUG2006 13:55:24 0d 19:42:22
admin Telnet 10.20.30.93 09AUG2006 08:35:23 0d 00:00:00 A

Number of users : 2
'A' indicates user is in admin mode
=====
A:ALA-1#
A:ALA-1# enable-admin
MINOR: CLI Already in admin mode.
A:ALA-1#
```

## aging

|                    |                                                                                                                                                                                                                                                                                               |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>aging</b> <i>days</i><br><b>no aging</b>                                                                                                                                                                                                                                                   |
| <b>Context</b>     | config>system>security>password                                                                                                                                                                                                                                                               |
| <b>Description</b> | <p>This command configures the number of days a user password is valid before the user must change their password. This parameter can be used to force the user to change the password at the configured interval.</p> <p>The <b>no</b> form of the command reverts to the default value.</p> |
| <b>Default</b>     | No aging is enforced.                                                                                                                                                                                                                                                                         |
| <b>Parameters</b>  | <i>days</i> — The maximum number of days the password is valid.                                                                                                                                                                                                                               |
|                    | <b>Values</b> 1 — 500                                                                                                                                                                                                                                                                         |

## attempts

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>attempts</b> <i>count</i> [ <b>time</b> <i>minutes1</i> [ <b>lockout</b> <i>minutes2</i> ]]<br><b>no attempts</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Context</b>     | config>system>security>password                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Description</b> | <p>This command configures a threshold value of unsuccessful login attempts allowed in a specified time frame. The threshold for the number of login attempts can be configured by using the CLI parameter '<b>count</b>' in the command. A SNMP trap is generated by the device, when the number of login attempts exceeds the configured threshold. Generation of the trap can be suppressed, by using the <b>config&gt;log&gt; event-control</b> command. By default, the device generates a trap when the login attempts exceed the configured threshold. The trap carries information about the user ID used for the login attempt. A SNMP trap will not be sent for every failed attempt.</p> <p>If the threshold is exceeded, the user is locked out for a specified time period.</p> <p>If multiple <b>attempts</b> commands are entered, each command overwrites the previously entered command.</p> <p>The <b>no attempts</b> command resets all values to default.</p> |
| <b>Default</b>     | <b>count:</b> 3<br><b>time</b> <i>minutes:</i> 5<br><b>lockout</b> <i>minutes:</i> 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Parameters</b>  | <i>count</i> — The number of unsuccessful login attempts allowed for the specified <b>time</b> . This is a mandatory value that must be explicitly entered.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                    | <b>Values</b> 1 — 64                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

**time** *minutes* — The period of time, in minutes, that a specified number of unsuccessful attempts can be made before the user is locked out.

**Values** 0 — 60

**lockout** *minutes* — The lockout period in minutes where the user is not allowed to login. Allowed values are decimal integers.

**Values** 0 — 1440

When the user exceeds the attempted count times in the specified time, then that user is locked out from any further login attempts for the configured time period.

**Default** 10

**Values** 0 — 1440

## authentication-order

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>authentication-order</b> [ <i>method-1</i> ] [ <i>method-2</i> ] [ <i>method-3</i> ] [ <b>exit-on-reject</b> ]<br><b>no authentication-order</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Context</b>     | config>system>security>password                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Description</b> | <p>This command configures the sequence in which password authentication, authorization, and accounting is attempted among RADIUS, TACACS+, and local passwords.</p> <p>The order should be from the most preferred authentication method to the least preferred. The presence of all methods in the command line does not guarantee that they are all operational. Specifying options that are not available delays user authentication.</p> <p>If all (operational) methods are attempted and no authentication for a particular login has been granted, then an entry in the security log register the failed attempt. Both the attempted login identification and originating IP address is logged with the a timestamp.</p> <p>The <b>no</b> form of the command reverts to the default authentication sequence.</p> |
| <b>Default</b>     | <b>authentication-order radius tacplus local</b> - The preferred order for password authentication is 1. RADIUS, 2. TACACS+ and 3. local passwords.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Parameters</b>  | <p><i>method-1</i> — The first password authentication method to attempt.</p> <p><b>Default</b> radius</p> <p><b>Values</b> radius, tacplus, local</p> <p><i>method-2</i> — The second password authentication method to attempt.</p> <p><b>Default</b> tacplus</p> <p><b>Values</b> radius, tacplus, local</p> <p><i>method-3</i> — The third password authentication method to attempt.</p> <p><b>Default</b> local</p> <p><b>Values</b> radius, tacplus, local</p>                                                                                                                                                                                                                                                                                                                                                     |

**radius** — RADIUS authentication.

**tacplus** — TACACS+ authentication.

**local** — Password authentication based on the local password database.

**exit-on-reject** — When enabled and if one of the AAA methods configured in the authentication order sends a reject, then the next method in the order will not be tried. If the **exit-on-reject** keyword is not specified and if one AAA method sends a reject, the next AAA method will be attempted. If in this process, all the AAA methods are exhausted, it will be considered as a reject.

Note that a rejection is distinct from an unreachable authentication server. When the **exit-on-reject** keyword is specified, authorization and accounting will only use the method that provided an affirmation authentication; only if that method is no longer readable or is removed from the configuration will other configured methods be attempted. If the local keyword is the first authentication and:

- **exit-on-reject** is configured and the user does not exist, the user will not be authenticated.
- The user is authenticated locally, then other methods, if configured, will be used for authorization and accounting.
- The user is configured locally but without console access, login will be denied.

## complexity

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] complexity [numeric] [special-character] [mixed-case]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Context</b>     | config>system>security>password                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Description</b> | <p>This command configures the complexity requirements of locally administered passwords, HMAC-MD5-96, HMAC-SHA-96 and des-keys configured in the <b>authentication</b> section.</p> <p>If more than one complexity command is entered, each command overwrites the previous command.</p> <p>The <b>no</b> form of the command cancels all requirements. To remove a single requirement, enter the <b>no</b> form of the command followed by the requirement that needs to be removed.</p> <p>For example, <b>no complexity numeric</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Default</b>     | No complexity requirements are configured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Parameters</b>  | <p><b>mixed-case</b> — Specifies that at least one upper and one lower case character must be present in the password. This keyword can be used in conjunction with the <b>numeric</b> and <b>special-character</b> parameters. However, if this command is used with the <b>authentication none</b> command, the <b>complexity</b> command is rejected.</p> <p><b>numeric</b> — Specifies that at least one numeric character must be present in the password. This keyword can be used in conjunction with the <b>mixed-case</b> and <b>special-character</b> parameters. However, if this command is used with the <b>authentication none</b> command, the <b>complexity</b> command is rejected.</p> <p><b>special-character</b> — Specifies that at least one special character must be present in the password. This keyword can be used in conjunction with the <b>numeric</b> and <b>special-character</b> parameters.</p> |

However, if this command is used with the **authentication** *none* command, the **complexity** command is rejected.

Special characters include: ~!@#\$\$%^&\*()\_+{|}:”<>?`-=[];’,./.

### health-check

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] health-check [interval <i>interval</i>]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Context</b>     | config>system>security>password                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Description</b> | <p>This command specifies that RADIUS and TACACS+ servers are monitored for 3 seconds each at 30 second intervals. Servers that are not configured will have 3 seconds of idle time. If in this process a server is found to be unreachable, or a previously unreachable server starts responding, based on the type of the server, a trap will be sent.</p> <p>The <b>no</b> form of the command disables the periodic monitoring of the RADIUS and TACACS+ servers. In this case, the operational status for the active server will be up if the last access was successful.</p> |
| <b>Default</b>     | health-check                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Parameters</b>  | <i>interval</i> — Specifies the interval of the health check in seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Values</b>      | 6 — 1500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

### minimum-length

|                    |                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>minimum-length <i>value</i></b><br><b>no minimum-length</b>                                                                                                                                                                                                                                                                                                                 |
| <b>Context</b>     | config>system>security>password                                                                                                                                                                                                                                                                                                                                                |
| <b>Description</b> | <p>This command configures the minimum number of characters required for locally administered passwords, HMAC-MD5-96, HMAC-SHA-96, and des-keys configured in the system security section.</p> <p>If multiple minimum-length commands are entered each command overwrites the previous entered command.</p> <p>The <b>no</b> form of the command reverts to default value.</p> |
| <b>Default</b>     | <b>minimum-length 6</b>                                                                                                                                                                                                                                                                                                                                                        |
| <b>Parameters</b>  | <i>value</i> — The minimum number of characters required for a password.                                                                                                                                                                                                                                                                                                       |
| <b>Values</b>      | 1 — 8                                                                                                                                                                                                                                                                                                                                                                          |

### password

|                    |                                                                               |
|--------------------|-------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>password</b>                                                               |
| <b>Context</b>     | config>system>security                                                        |
| <b>Description</b> | This command creates the context to configure password management parameters. |

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## Profile Management Commands

### action

|                    |                                                                                                                                                                                                           |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>action</b> {deny   permit}                                                                                                                                                                             |
| <b>Context</b>     | config>system>security>profile <i>user-profile-name</i> >entry <i>entry-id</i>                                                                                                                            |
| <b>Description</b> | This command configures the action associated with the profile entry.                                                                                                                                     |
| <b>Parameters</b>  | <b>deny</b> — Specifies that commands matching the entry command match criteria are to be denied.<br><b>permit</b> — Specifies that commands matching the entry command match criteria will be permitted. |

### match

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>match</b> <i>command-string</i><br><b>no match</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Context</b>     | config>system>security>profile <i>user-profile-name</i> >entry <i>entry-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Description</b> | This command configures a command or subtree commands in subordinate command levels are specified.<br><br>Because the exits when the first match is found, subordinate levels cannot be modified with subsequent action commands. More specific action commands should be entered with a lower entry number or in a profile that is evaluated prior to this profile.<br><br>All commands below the hierarchy level of the matched command are denied.<br><br>The <b>no</b> form of this command removes a match condition |
| <b>Default</b>     | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Parameters</b>  | <i>command-string</i> — The CLI command or CLI tree level that is the scope of the profile entry.                                                                                                                                                                                                                                                                                                                                                                                                                         |

### copy

|                    |                                                                                                                                                        |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>copy</b> { <b>user</b> <i>source-user</i>   <b>profile</b> <i>source-profile</i> } <b>to</b> <i>destination</i> [ <b>overwrite</b> ]                |
| <b>Context</b>     | config>system>security                                                                                                                                 |
| <b>Description</b> | This command copies a profile or user from a source profile to a destination profile.                                                                  |
| <b>Parameters</b>  | <i>source-profile</i> — The profile to copy. The profile must exist.<br><i>dest-profile</i> — The copied profile is copied to the destination profile. |

## Configuration Commands

**overwrite** — Specifies that the destination profile configuration will be overwritten with the copied source profile configuration. A profile will not be overwritten if the **overwrite** command is not specified.

### default-action

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>default-action</b> { <b>deny-all</b>   <b>permit-all</b>   <b>none</b> }                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Context</b>     | config>system>security>profile <i>user-profile-name</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Description</b> | This command specifies the default action to be applied when no match conditions are met.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Default</b>     | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Parameters</b>  | <b>deny-all</b> — Sets the default of the profile to deny access to all commands.<br><b>permit-all</b> — Sets the default of the profile to permit access to all commands.<br><b>Note:</b> <b>permit-all</b> does not change access to security commands. Security commands are only and always available to members of the super-user profile.<br><b>none</b> — Sets the default of the profile to no-action. This option is useful to assign multiple profiles to a user.<br>For example, if a user is a member of two profiles and the default action of the first profile is <b>permit-all</b> , then the second profile will never be evaluated because the <b>permit-all</b> is executed first. Set the first profile default action to <b>none</b> and if no match conditions are met in the first profile, then the second profile will be evaluated. If the default action of the last profile is <b>none</b> and no explicit match is found, then the default <b>deny-all</b> takes effect. |

### description

|                    |                                                                                                                                                                                                                                                                                                                           |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>description</b> <i>description-string</i><br><b>no description</b>                                                                                                                                                                                                                                                     |
| <b>Context</b>     | config>system>security>profile <i>user-profile-name</i> >entry <i>entry-id</i>                                                                                                                                                                                                                                            |
| <b>Description</b> | This command creates a text description stored in the configuration file for a configuration context. The <b>description</b> command associates a text string with a configuration context to help identify the context in the configuration file. The <b>no</b> form of the command removes the string from the context. |
| <b>Default</b>     | No description is configured.                                                                                                                                                                                                                                                                                             |
| <b>Parameters</b>  | <i>string</i> — The description character string. Allowed values are any string up to 80 characters long composed of printable, 7-bit ASCII characters. If the string contains special characters (#, \$, spaces, etc.), the entire string must be enclosed within double quotes.                                         |

## entry

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] entry</b> <i>entry-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Context</b>     | config>system>security>profile <i>user-profile-name</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Description</b> | <p>This command is used to create a user profile entry.</p> <p>More than one entry can be created with unique <i>entry-id</i> numbers. Exits when the first match is found and executes the actions according to the accompanying <b>action</b> command. Entries should be sequenced from most explicit to least explicit.</p> <p>An entry may not have any match criteria defined (in which case, everything matches) but must have at least the keyword <b>action</b> for it to be considered complete.</p> <p>The <b>no</b> form of the command removes the specified entry from the user profile.</p> |
| <b>Default</b>     | No entry IDs are defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Parameters</b>  | <p><i>entry-id</i> — An entry-id uniquely identifies a user profile command match criteria and a corresponding action. If more than one entry is configured, the <i>entry-ids</i> should be numbered in staggered increments to allow users to insert a new entry without requiring renumbering of the existing entries.</p> <p><b>Values</b>      1 — 9999</p>                                                                                                                                                                                                                                           |

## profile

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] profile</b> <i>user-profile-name</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Context</b>     | config>system>security                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Description</b> | <p>This command creates a context to create user profiles for CLI command tree permissions.</p> <p>Profiles are used to either deny or permit user console access to a hierarchical branch or to specific commands.</p> <p>Once the profiles are created, the <b>user</b> command assigns users to one or more profiles. You can define up to 16 user profiles but a maximum of 8 profiles can be assigned to a user. The <i>user-profile-name</i> can consist of up to 32 alphanumeric characters.</p> <p>The <b>no</b> form of the command deletes a user profile.</p> |
| <b>Default</b>     | user-profile default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Parameters</b>  | <p><i>user-profile-name</i> — The user profile name entered as a character string. The string is case sensitive and limited to 32 ASCII 7-bit printable characters with no spaces.</p>                                                                                                                                                                                                                                                                                                                                                                                   |

## renum

|                |                                                         |
|----------------|---------------------------------------------------------|
| <b>Syntax</b>  | <b>renum</b> <i>old-entry-number new-entry-number</i>   |
| <b>Context</b> | config>system>security>profile <i>user-profile-name</i> |

## Configuration Commands

**Description** This command renumbers profile entries to re-sequence the entries.  
Since the exits when the first match is found and executes the actions according to accompanying action command, re-numbering is useful to rearrange the entries from most explicit to least explicit.

**Parameters** *old-entry-number* — Enter the entry number of an existing entry.

**Values** 1 — 9999

*new-entry-number* — Enter the new entry number.

**Values** 1 — 9999

---

## User Management Commands

### access

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <code>[no] access [ftp] [snmp] [console]</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Context</b>     | config>system>security>user<br>config>system>security>user-template                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Description</b> | <p>This command grants a user permission for FTP, SNMP, console or lawful intercept (LI) access.</p> <p>If a user requires access to more than one application, then multiple applications can be specified in a single command. Multiple commands are treated additively.</p> <p>The <b>no</b> form of command removes access for a specific application.</p> <p><b>no access</b> denies permission for all management access methods. To deny a single access method, enter the <b>no</b> form of the command followed by the method to be denied, for example, <b>no access FTP</b> denies FTP access.</p> |
| <b>Default</b>     | No access is granted to the user by default.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Parameters</b>  | <p><b>ftp</b> — Specifies FTP permission.</p> <p><b>snmp</b> — Specifies SNMP permission. This keyword is only configurable in the <b>config&gt;system&gt;security&gt;user</b> context.</p> <p><b>console</b> — Specifies console access (serial port or Telnet) permission.</p>                                                                                                                                                                                                                                                                                                                              |

### authentication

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <code>authentication {[none]   [[hash] {md5 key-1   sha key-1} privacy {privacy-level key-2}]}</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Context</b>     | config>system>security>user>snmp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Description</b> | <p>This command configures the authentication and encryption method the user must use in order to be validated by the device. SNMP authentication allows the device to validate the managing node that issued the SNMP message and determine if the message has been tampered.</p> <p>The <b>user password</b> is encrypted first by the MD5/SHA/DES algorithm. The output of the algorithm is always a fixed length string (key). Copy the <b>password</b> key and paste the output in the appropriate <b>authentication</b> command <i>key</i> parameter.</p> |
| <b>Default</b>     | <b>authentication none</b> - No authentication is configured and privacy cannot be configured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Parameters</b>  | <p><b>none</b> — Do not use authentication. If <b>none</b> is specified, then privacy cannot be configured.</p> <p><b>hash</b> — When <b>hash</b> is not specified, then non-encrypted characters can be entered. When <b>hash</b> is configured, then all specified keys are stored in an encrypted format in the configuration file. The password must be entered in encrypted form when the <b>hash</b> parameter is used.</p> <p><b>md5 key</b> — The authentication protocol can either be HMAC-MD5-96 or HMAC-SHA-96.</p>                                 |

## Configuration Commands

The MD5 authentication key is stored in an encrypted format. The minimum key length is determined by the **config>system>security>password>minimum-length** value. The maximum length is 16 octets (32 printable characters).

The complexity of the key is determined by the **complexity** command.

**sha key** — The authentication protocol can be either HMAC-MD5-96 or HMAC-SHA-96.

The **sha** authentication key is stored in an encrypted format. The minimum key length is determined by the **config>system>security>password>minimum-length** value. The maximum length is 20 octets (40 printable characters).

The complexity of the key is determined by the **complexity** command.

**privacy none** — Do not perform SNMP packet encryption.

**Default**     **privacy none**

**privacy des-key key** — Configure the **des-key** for SNMP packet encryption. This key is stored in an encrypted format. The minimum key length is determined by the **config>system>security>password>minimum-length** value. The maximum length is 16 octets (32 printable characters). If privacy is configured then **authentication** must be enabled.

To remove a previously configured **des-key**, enter **privacy none**.

The complexity of the key is determined by the **complexity** command.

**Default**     **privacy none**

## group

|                    |                                                                                                                                                                                                                                                                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>group</b> <i>group-name</i><br><b>no group</b>                                                                                                                                                                                                                                                                              |
| <b>Context</b>     | config>system>security>user>snmp                                                                                                                                                                                                                                                                                               |
| <b>Description</b> | This command associates (or links) a user to a group name. The group name must be configured with the <b>config&gt;system&gt;security&gt;user &gt;snmp&gt;group</b> command. The <b>access</b> command links the group with one or more views, security model (s), security level (s), and read, write, and notify permissions |
| <b>Default</b>     | No group name is associated with a user.                                                                                                                                                                                                                                                                                       |
| <b>Parameters</b>  | <i>group-name</i> — Enter the group name (between 1 and 32 alphanumeric characters) that is associated with this user. A user can be associated with one group-name per security model.                                                                                                                                        |

## cannot-change-password

|                    |                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] cannot-change-password</b>                                                                                                                                                                                                                                                                                                                                      |
| <b>Context</b>     | config>system>security>user>console                                                                                                                                                                                                                                                                                                                                     |
| <b>Description</b> | This command allows a user the privilege to change their password for both FTP and console login. To disable a user's privilege to change their password, use the <b>cannot-change-password</b> form of the command.<br><br>Note that the cannot-change-password flag is not replicated when a user copy is performed. A new-password-at-login flag is created instead. |
| <b>Default</b>     | no cannot-change-password                                                                                                                                                                                                                                                                                                                                               |

## console

|                    |                                                                                                                            |
|--------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>console</b>                                                                                                             |
| <b>Context</b>     | config>system>security>user<br>config>system>security>user-template                                                        |
| <b>Description</b> | This command creates the context to configure user profile membership for the console (either Telnet or serial port user). |

## copy

|                    |                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>copy {user <i>source-user</i>   profile <i>source-profile</i>} to <i>destination</i> [overwrite]</b>                                                                                                                                                                                                                                                                        |
| <b>Context</b>     | config>system>security                                                                                                                                                                                                                                                                                                                                                         |
| <b>Description</b> | This command copies a specific user's configuration parameters to another (destination) user. The password is set to a carriage return and a new password at login must be selected.                                                                                                                                                                                           |
| <b>Parameters</b>  | <i>source-user</i> — The user to copy. The user must already exist.<br><i>dest-user</i> — The copied profile is copied to a destination user.<br><b>overwrite</b> — Specifies that the destination user configuration will be overwritten with the copied source user configuration. A configuration will not be overwritten if the <b>overwrite</b> command is not specified. |

## home-directory

|               |                                                                                                   |
|---------------|---------------------------------------------------------------------------------------------------|
| <b>Syntax</b> | <b>home-directory <i>url-prefix</i> [<i>directory</i>] [<i>directory</i>/<i>directory</i>...]</b> |
|---------------|---------------------------------------------------------------------------------------------------|

### **no home-directory**

|                    |                                                                                                                                                                                                                                                                                                                |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Context</b>     | config>system>security>user<br>config>system>security>user-template                                                                                                                                                                                                                                            |
| <b>Description</b> | This command configures the local home directory for the user for both console and FTP access.<br>If the URL or the specified URL/directory structure is not present, then a warning message is issued and the default is assumed.<br>The <b>no</b> form of the command removes the configured home directory. |
| <b>Default</b>     | no home-directory<br>NOTE: If restrict-to-home has been configured no file access is granted and no home-directory is created, if restrict-to-home is not applied then root becomes the user's home-directory.                                                                                                 |
| <b>Parameters</b>  | <i>local-url-prefix</i> [ <i>directory</i> ] [ <i>directory/directory...</i> ] — The user's local home directory URL prefix and directory structure up to 190 characters in length.                                                                                                                            |

## login-exec

|                    |                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] login-exec</b> <i>url-prefix: source-url</i>                                                                                                                                                                                                                                                                                                                             |
| <b>Context</b>     | config>system>security>user>console<br>config>system>security>user-template>console                                                                                                                                                                                                                                                                                              |
| <b>Description</b> | This command configures a user's login exec file which executes whenever the user successfully logs in to a console session.<br>Only one exec file can be configured. If multiple <b>login-exec</b> commands are entered for the same user, each subsequent entry overwrites the previous entry.<br>The <b>no</b> form of the command disables the login exec file for the user. |
| <b>Default</b>     | No login exec file is defined.                                                                                                                                                                                                                                                                                                                                                   |
| <b>Parameters</b>  | <i>url-prefix: source-url</i> — Enter either a local or remote URL, up to 200 characters in length, that identifies the exec file that will be executed after the user successfully logs in.                                                                                                                                                                                     |

## member

|                    |                                                                                                                                                                                        |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>member</b> <i>user-profile-name</i> [ <i>user-profile-name...up to 8max</i> ]<br><b>no member</b> <i>user-profile-name</i>                                                          |
| <b>Context</b>     | config>system>security>user>console                                                                                                                                                    |
| <b>Description</b> | This command is used to allow the user access to a profile.<br>A user can participate in up to eight profiles.<br>The <b>no</b> form of this command deletes user access to a profile. |
| <b>Default</b>     | default                                                                                                                                                                                |

**Parameters** *user-profile-name* — The user profile name.

## new-password-at-login

**Syntax** **[no] new-password-at-login**

**Context** config>system>security>user>console

**Description** This command forces the user to change a password at the next console login. The new password applies to FTP but the change can be enforced only by the console, SSH, or Telnet login. The **no** form of the command does not force the user to change passwords.

**Default** no new-password-at-login

## password

**Syntax** **password** [*password*] [**hash** | **hash2**]

**Context** config>system>security>user

**Description** This command configures the user password for console and FTP access. The use of the **hash** keyword sets the initial password when the user is created or modifies the password of an existing user and specifies that the given password was hashed using hashing algorithm version 1. The password is stored in an encrypted format in the configuration file when specified. Passwords should be encased in double quotes (" ") at the time of the password creation. The double quote character (") is not accepted inside a password. It is interpreted as the start or stop delimiter of a string. The use of the **hash2** keyword specifies that the given password is already hashed using hashing algorithm version 2. A semantic check is performed on the given password field to verify if it is a valid hash 2 key to store in the database. For example,

```
config>system>security# user testuser1
config>system>security>user$ password "zx/Uhcn6ReMOZ3BVrWcvk." hash2
config>system>security>user# exit

config>system>security# info

...
 user "testuser1"
 password "zx/Uhcn6ReMOZ3BVrWcvk." hash2
 exit
...

config>system>security#
```

**Parameters** *password* — This is the password for the user that must be entered by this user during the login procedure. The minimum length of the password is determined by the **minimum-length**

## Configuration Commands

command. The maximum length can be up to 20 chars if unhashed, 32 characters if hashed. The complexity requirements for the password is determined by the **complexity** command.

All password special characters (#, \$, spaces, etc.) must be enclosed within double quotes.

For example: `config>system>security>user# password "south#bay?"`

The question mark character (?) cannot be directly inserted as input during a telnet connection because the character is bound to the **help** command during a normal Telnet/console connection.

To insert a # or ? characters, they must be entered inside a notepad or clipboard program and then cut and pasted into the Telnet session in the password field that is encased in the double quotes as delimiters for the password.

If a password is entered without any parameters, a password length of zero is implied: (carriage return).

**hash** — Specifies that the given password is already hashed using hashing algorithm version 1. A semantic check is performed on the given password field to verify if it is a valid hash 1 key to store in the database.

**hash2** — Specifies that the given password is already hashed using hashing algorithm version 2. A semantic check is performed on the given password field to verify if it is a valid hash 2 key to store in the database.

## restricted-to-home

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] restricted-to-home</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Context</b>     | <code>config&gt;system&gt;security&gt;user</code><br><code>config&gt;system&gt;security&gt;user-template</code>                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Description</b> | <p>This command prevents users from navigating above their home directories for file access. A user is not allowed to navigate to a directory higher in the directory tree on the home directory device. The user is allowed to create and access subdirectories below their home directory.</p> <p>If a home-directory is not configured or the home directory is not available, then the user has no file access.</p> <p>The <b>no</b> form of the command allows the user access to navigate to directories above their home directory.</p> |
| <b>Default</b>     | no restricted-to-home                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## snmp

|                    |                                                                                                                                               |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>snmp</b>                                                                                                                                   |
| <b>Context</b>     | <code>config&gt;system&gt;security&gt;user</code>                                                                                             |
| <b>Description</b> | This command creates the context to configure SNMP group membership for a specific user and defines encryption and authentication parameters. |

All SNMPv3 users must be configured with the commands available in this CLI node.

7210 SAS OS always uses the configured SNMPv3 user name as the security user name.

## user-template

|                    |                                                                                                                                                                                                                                                                                                                      |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>user-template</b> { <b>tacplus_default</b>   <b>radius_default</b> }                                                                                                                                                                                                                                              |
| <b>Context</b>     | config>system>security                                                                                                                                                                                                                                                                                               |
| <b>Description</b> | This command configures default security user template parameters.                                                                                                                                                                                                                                                   |
| <b>Parameters</b>  | <p><b>tacplus_default</b> — Specifies that the default TACACS+ user template is actively applied to the TACACS+ user.</p> <p><b>radius_default</b> — specifies that the default RADIUS user template is actively applied to the RADIUS user if no VSAs are returned with the auth-accept from the RADIUS server.</p> |

## user

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] user</b> <i>user-name</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Context</b>     | config>system>security                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b> | <p>This command creates a local user and a context to edit the user configuration.</p> <p>If a new <i>user-name</i> is entered, the user is created. When an existing <i>user-name</i> is specified, the user parameters can be edited.</p> <p>When creating a new user and then entering the <b>info</b> command, the system displays a password in the output. This is expected behavior in the hash2 scenario. However, when using that user name, there will be no password required. The user can login to the system and then &lt;ENTER&gt; at the password prompt, the user will be logged in.</p> <p>Unless an administrator explicitly changes the password, it will be null. The hashed value displayed uses the username and null password field, so when the username is changed, the displayed hashed value will change.</p> <p>The <b>no</b> form of the command deletes the user and all configuration data. Users cannot delete themselves.</p> |
| <b>Default</b>     | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Parameters</b>  | <i>user-name</i> — The name of the user up to 16 characters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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## RADIUS Client Commands

### accounting

|                    |                                                                                                           |
|--------------------|-----------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] accounting</b>                                                                                    |
| <b>Context</b>     | config>system>security>radius                                                                             |
| <b>Description</b> | This command enables RADIUS accounting.<br>The <b>no</b> form of this command disables RADIUS accounting. |
| <b>Default</b>     | no accounting                                                                                             |

### accounting-port

|                    |                                                                                                         |
|--------------------|---------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>accounting-port</b> <i>port</i><br><b>no accounting-port</b>                                         |
| <b>Context</b>     | config>system>security>radius                                                                           |
| <b>Description</b> | This command specifies a UDP port number on which to contact the RADIUS server for accounting requests. |
| <b>Parameters</b>  | <i>port</i> — Specifies the UDP port number.                                                            |
| <b>Values</b>      | 1 — 65535                                                                                               |
| <b>Default</b>     | 1813                                                                                                    |

### authorization

|                    |                                                                         |
|--------------------|-------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] authorization</b>                                               |
| <b>Context</b>     | config>system>security>radius                                           |
| <b>Description</b> | This command configures RADIUS authorization parameters for the system. |
| <b>Default</b>     | no authorization                                                        |

### port

|                |                                           |
|----------------|-------------------------------------------|
| <b>Syntax</b>  | <b>port</b> <i>port</i><br><b>no port</b> |
| <b>Context</b> | config>system>security>radius             |

|                    |                                                                                                                                              |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b> | This command configures the TCP port number to contact the RADIUS server.<br>The <b>no</b> form of the command reverts to the default value. |
| <b>Default</b>     | <b>1812</b> (as specified in RFC 2865, <i>Remote Authentication Dial In User Service (RADIUS)</i> )                                          |
| <b>Parameters</b>  | <i>port</i> — The TCP port number to contact the RADIUS server.                                                                              |
|                    | <b>Values</b> 1 — 65535                                                                                                                      |

## radius

|                    |                                                                                                                                                                                                                                                                       |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] radius</b>                                                                                                                                                                                                                                                    |
| <b>Context</b>     | config>system>security                                                                                                                                                                                                                                                |
| <b>Description</b> | This command creates the context to configure RADIUS authentication on the 7210 SAS series router. Implement redundancy by configuring multiple server addresses for each 7210 SAS series router. The <b>no</b> form of the command removes the RADIUS configuration. |

## retry

|                    |                                                                                                                                                                                                                                         |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>retry count</b><br><b>no retry</b>                                                                                                                                                                                                   |
| <b>Context</b>     | config>system>security>radius<br>config>system>security>dot1x>radius-plcy                                                                                                                                                               |
| <b>Description</b> | This command configures the number of times the router attempts to contact the RADIUS server for authentication if there are problems communicating with the server.<br>The <b>no</b> form of the command reverts to the default value. |
| <b>Default</b>     | 3                                                                                                                                                                                                                                       |
| <b>Parameters</b>  | <i>count</i> — The retry count.                                                                                                                                                                                                         |
|                    | <b>Values</b> 1 — 10                                                                                                                                                                                                                    |

## server

|                    |                                                                                                       |
|--------------------|-------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>server index address ip-address secret key [hash   hash2]</b><br><b>no server index</b>            |
| <b>Context</b>     | config>system>security>radius                                                                         |
| <b>Description</b> | This command adds a RADIUS server and configures the RADIUS server IP address, index, and key values. |

## Configuration Commands

Up to five RADIUS servers can be configured at any one time. RADIUS servers are accessed in order from lowest to highest index for authentication requests until a response from a server is received. A higher indexed server is only queried if no response is received from a lower indexed server (which implies that the server is not available). If a response from a server is received, no other RADIUS servers are queried. It is assumed that there are multiple identical servers configured as backups and that the servers do not have redundant data.

The **no** form of the command removes the server from the configuration.

**Default** No RADIUS servers are configured.

**Parameters** *index* — The index for the RADIUS server. The index determines the sequence in which the servers are queried for authentication requests. Servers are queried in order from lowest to highest index.

**Values** 1 — 5

**address** *ip-address* — The IP address of the RADIUS server. Two RADIUS servers cannot have the same IP address. An error message is generated if the server address is a duplicate.

**Values**      *ipv4-address*      a.b.c.d (host bits must be 0)  
                  *ipv6-address*      x:x:x:x:x:x:x (eight 16-bit pieces)  
                                          x:x:x:x:x:d.d.d.d  
                                          x: [0..FFFF]H  
                                          d: [0..255]D

**secret** *key* — The secret key to access the RADIUS server. This secret key must match the password on the RADIUS server.

**Values** Up to 20 characters in length.

**hash** — Specifies the key is entered in an encrypted form. If the **hash** parameter is not used, the key is assumed to be in a non-encrypted, clear text form. For security, all keys are stored in encrypted form in the configuration file with the **hash** parameter specified.

**hash2** — Specifies the key is entered in a more complex encrypted form. If the **hash2** parameter is not used, the less encrypted **hash** form is assumed.

## shutdown

**Syntax** [no] shutdown

**Context** config>system>security>radius

**Description** This command administratively disables the RADIUS protocol operation. Shutting down the protocol does not remove or change the configuration other than the administrative state.

The operational state of the entity is disabled as well as the operational state of any entities contained within. Many objects must be shut down before they may be deleted.

The **no** form of the command administratively enables the protocol which is the default state.

**Default** no shutdown

## timeout

|                    |                                                                                                                                                                            |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>timeout</b> <i>seconds</i><br><b>no timeout</b>                                                                                                                         |
| <b>Context</b>     | config>system>security>radius                                                                                                                                              |
| <b>Description</b> | This command configures the number of seconds the router waits for a response from a RADIUS server.<br><br>The <b>no</b> form of the command reverts to the default value. |
| <b>Default</b>     | 3 seconds                                                                                                                                                                  |
| <b>Parameters</b>  | <i>seconds</i> — The number of seconds the router waits for a response from a RADIUS server, expressed as a decimal integer.<br><br><b>Values</b> 1 — 90                   |

## use-default-template

|                    |                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] use-default-template</b>                                                                                                                                                                                                                                                                                                                                   |
| <b>Context</b>     | config>system>security>radius                                                                                                                                                                                                                                                                                                                                      |
| <b>Description</b> | This command specifies whether the RADIUS user template is actively applied to the RADIUS user if no VSAs are returned with the auth-accept from the RADIUS server. When enabled, the RADIUS user template is actively applied if no VSAs are returned with the auth-accept from the RADIUS server.<br><br>The <b>no</b> form of the command disables the command. |

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## TACACS+ Client Commands

### server

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                     |              |                               |  |              |                                     |  |  |                   |  |  |               |  |  |              |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------|-------------------------------|--|--------------|-------------------------------------|--|--|-------------------|--|--|---------------|--|--|--------------|
| <b>Syntax</b>      | <b>server</b> <i>index</i> <b>address</b> <i>ip-address</i> <b>secret</b> <i>key</i><br><b>no server</b> <i>index</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                     |              |                               |  |              |                                     |  |  |                   |  |  |               |  |  |              |
| <b>Context</b>     | config>system>security>tacplus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                     |              |                               |  |              |                                     |  |  |                   |  |  |               |  |  |              |
| <b>Description</b> | <p>This command adds a TACACS+ server and configures the TACACS+ server IP address, index, and key values.</p> <p>Up to five TACACS+ servers can be configured at any one time. TACACS+ servers are accessed in order from lowest index to the highest index for authentication requests.</p> <p>The <b>no</b> form of the command removes the server from the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                     |              |                               |  |              |                                     |  |  |                   |  |  |               |  |  |              |
| <b>Default</b>     | No TACACS+ servers are configured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                     |              |                               |  |              |                                     |  |  |                   |  |  |               |  |  |              |
| <b>Parameters</b>  | <p><i>index</i> — The index for the TACACS+ server. The index determines the sequence in which the servers are queried for authentication requests. Servers are queried in order from the lowest index to the highest index.</p> <p><b>Values</b> 1 — 5</p> <p><b>address</b> <i>ip-address</i> — The IP address of the TACACS+ server. Two TACACS+ servers cannot have the same IP address. An error message is generated if the server address is a duplicate.</p> <table> <tr> <td><b>Values</b></td> <td>ipv4-address</td> <td>a.b.c.d (host bits must be 0)</td> </tr> <tr> <td></td> <td>ipv6-address</td> <td>x:x:x:x:x:x:x (eight 16-bit pieces)</td> </tr> <tr> <td></td> <td></td> <td>x:x:x:x:x:d.d.d.d</td> </tr> <tr> <td></td> <td></td> <td>x: [0..FFFF]H</td> </tr> <tr> <td></td> <td></td> <td>d: [0..255]D</td> </tr> </table> <p><b>secret</b> <i>key</i> — The secret key to access the RADIUS server. This secret key must match the password on the RADIUS server.</p> <p><b>Values</b> Up to 128 characters in length.</p> <p><b>hash</b> — Specifies the key is entered in an encrypted form. If the <b>hash</b> parameter is not used, the key is assumed to be in a non-encrypted, clear text form. For security, all keys are stored in encrypted form in the configuration file with the <b>hash</b> parameter specified.</p> <p><b>hash2</b> — Specifies the key is entered in a more complex encrypted form. If the <b>hash2</b> parameter is not used, the less encrypted <b>hash</b> form is assumed.</p> <p><b>Values</b></p> | <b>Values</b>                       | ipv4-address | a.b.c.d (host bits must be 0) |  | ipv6-address | x:x:x:x:x:x:x (eight 16-bit pieces) |  |  | x:x:x:x:x:d.d.d.d |  |  | x: [0..FFFF]H |  |  | d: [0..255]D |
| <b>Values</b>      | ipv4-address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | a.b.c.d (host bits must be 0)       |              |                               |  |              |                                     |  |  |                   |  |  |               |  |  |              |
|                    | ipv6-address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | x:x:x:x:x:x:x (eight 16-bit pieces) |              |                               |  |              |                                     |  |  |                   |  |  |               |  |  |              |
|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | x:x:x:x:x:d.d.d.d                   |              |                               |  |              |                                     |  |  |                   |  |  |               |  |  |              |
|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | x: [0..FFFF]H                       |              |                               |  |              |                                     |  |  |                   |  |  |               |  |  |              |
|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | d: [0..255]D                        |              |                               |  |              |                                     |  |  |                   |  |  |               |  |  |              |

### single-connection

**Syntax** [no] single-connection

|                    |                                                                                                                                                                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Context</b>     | config>system>security>tacplus                                                                                                                                                                                                                                                  |
| <b>Description</b> | This command sets up a single connection to the TACACS+ server and validates everything via that connection. Normally, each authentication event sets up a connection to validate that particular event. The <b>no</b> form of the command disables TACACS+ protocol operation. |
| <b>Default</b>     | <b>no single-connection</b>                                                                                                                                                                                                                                                     |

## shutdown

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] shutdown</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Context</b>     | config>system>security>tacplus                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b> | This command administratively disables the TACACS+ protocol operation. Shutting down the protocol does not remove or change the configuration other than the administrative state. The operational state of the entity is disabled as well as the operational state of any entities contained within. Many objects must be shut down before they may be deleted. The <b>no</b> form of the command administratively enables the protocol which is the default state. |
| <b>Default</b>     | no shutdown                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## tacplus

|                    |                                                                                                                                                                                                                              |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] tacplus</b>                                                                                                                                                                                                          |
| <b>Context</b>     | config>system>security                                                                                                                                                                                                       |
| <b>Description</b> | This command creates the context to configure TACACS+ authentication on the router. Configure multiple server addresses for each router for redundancy. The <b>no</b> form of the command removes the TACACS+ configuration. |

## accounting

|                    |                                                                                                                                                                                                                                           |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>accounting [record-type {start-stop   stop-only}]</b><br><b>no accounting</b>                                                                                                                                                          |
| <b>Context</b>     | config>system>security>tacplus                                                                                                                                                                                                            |
| <b>Description</b> | This command configures the type of accounting record packet that is to be sent to the TACACS+ server. The <b>record-type</b> parameter indicates whether TACACS+ accounting start and stop packets be sent or just stop packets be sent. |
| <b>Default</b>     | record-type stop-only                                                                                                                                                                                                                     |

## Configuration Commands

- Parameters**    **record-type start-stop** — Specifies that a TACACS+ start packet is sent whenever the user executes a command.
- record-type stop-only** — Specifies that a stop packet is sent whenever the command execution is complete.

### authorization

- Syntax**        **[no] authorization**
- Context**        config>system>security>tacplus
- Description**    This command configures TACACS+ authorization parameters for the system.
- Default**        no authorization

### timeout

- Syntax**        **timeout *seconds***  
**no timeout**
- Context**        config>system>security>tacplus
- Description**    This command configures the number of seconds the router waits for a response from a TACACS+ server.
- The **no** form of the command reverts to the default value.
- Default**        3
- Parameters**    *seconds* — The number of seconds the router waits for a response from a TACACS+ server, expressed as a decimal integer.
- Values**        1 — 90

### shutdown

- Syntax**        **[no] shutdown**
- Context**        config>system>security>tacplus
- Description**    This command administratively disables the TACACS+ protocol operation. Shutting down the protocol does not remove or change the configuration other than the administrative state.
- The operational state of the entity is disabled as well as the operational state of any entities contained within. Many objects must be shut down before they may be deleted.
- The **no** form of the command administratively enables the protocol which is the default state.
- Default**        no shutdown

## use-default-template

- Syntax** [no] use-default-template
- Context** config>system>security>tacplus
- Description** This command specifies whether or not the user template defined by this entry is to be actively applied to the TACACS+ user.

---

## Generic 802.1x COMMANDS

### dot1x

|                    |                                                                                                                                                                                   |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] dot1x</b>                                                                                                                                                                 |
| <b>Context</b>     | config>system>security                                                                                                                                                            |
| <b>Description</b> | This command creates the context to configure 802.1x network access control on the 7210 SAS-Series router.<br>The <b>no</b> form of the command removes the 802.1x configuration. |

### radius-plcy

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] radius-plcy <i>name</i> [create]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Context</b>     | config>system>security> dot1x                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Description</b> | This command creates the context to configure RADIUS server parameters for 802.1x network access control on the 7210 SAS-Series router.<br><br>NOTE: The RADIUS server configured under the config>system>security>dot1x>radius-plcy context authenticates clients who get access to the data plane of the 7210 SAS-Series as opposed to the RADIUS server configured under the <b>config&gt;system&gt;radius</b> context which authenticates CLI login users who get access to the management plane of the 7210 SAS-Series.<br><br>The <b>no</b> form of the command removes the RADIUS server configuration for 802.1x. |
| <b>Parameters</b>  | <i>name</i> — Specifies the name of the RADIUS policy.<br><b>Values</b> 1 — 32 characters<br><b>create</b> — This keyword is mandatory to create a RADIUS policy.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

### retry

|                    |                                                                                                                                                                                                                                         |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>retry <i>count</i></b><br><b>no retry</b>                                                                                                                                                                                            |
| <b>Context</b>     | config>system>security> dot1x                                                                                                                                                                                                           |
| <b>Description</b> | This command configures the number of times the router attempts to contact the RADIUS server for authentication if there are problems communicating with the server.<br>The <b>no</b> form of the command reverts to the default value. |
| <b>Default</b>     | 3                                                                                                                                                                                                                                       |

**Parameters** *count* — The retry count.

**Values** 1 — 10

## server

**Syntax** **server** *server-index* **address** *ip-address* **secret** *key* [**hash** | **hash2**] [**auth-port** *auth-port*] [**acct-port** *acct-port*] [**type** *server-type*]  
**no server** *index*

**Context** config>system>security> dot1x>radius-plcy

**Description** This command adds a Dot1x server and configures the Dot1x server IP address, index, and key values.

Up to five Dot1x servers can be configured at any one time. Dot1x servers are accessed in order from lowest to highest index for authentication requests until a response from a server is received. A higher indexed server is only queried if no response is received from a lower indexed server (which implies that the server is not available). If a response from a server is received, no other Dot1x servers are queried. It is assumed that there are multiple identical servers configured as backups and that the servers do not have redundant data.

The **no** form of the command removes the server from the configuration.

**Default** No Dot1x servers are configured.

**Parameters** *server-index* — The index for the Dot1x server. The index determines the sequence in which the servers are queried for authentication requests. Servers are queried in order from lowest to highest index.

**Values** 1 — 5

**address** *ip-address* — The IP address of the Dot1x server. Two Dot1x servers cannot have the same IP address. An error message is generated if the server address is a duplicate.

**secret** *key* — The secret key to access the Dot1x server. This secret key must match the password on the Dot1x server.

**Values** Up to 128 characters in length.

**hash** — Specifies the key is entered in an encrypted form. If the **hash** parameter is not used, the key is assumed to be in a non-encrypted, clear text form. For security, all keys are stored in encrypted form in the configuration file with the **hash** parameter specified.

**hash2** — Specifies the key is entered in a more complex encrypted form. If the **hash2** parameter is not used, the less encrypted **hash** form is assumed.

**acct-port** *acct-port* — The UDP port number on which to contact the RADIUS server for accounting requests.

**auth-port** *auth-port* — specifies a UDP port number to be used as a match criteria.

**Values** 1 — 65535

**type** *server-type* — Specifies the server type.

**Values** authorization, accounting, combined

### source-address

**Syntax** **source-address** *ip-address*  
**no source-address**

**Context** config>system>security> dot1x>radius-plcy

**Description** This command configures the NAS IP address to be sent in the RADIUS packet.  
The **no** form of the command reverts to the default value.

**Default** By default the System IP address is used in the NAS field.

**Parameters** *ip-address* — The IP prefix for the IP match criterion in dotted decimal notation.  
**Values** 0.0.0.0 — 255.255.255.255

### shutdown

**Syntax** [**no**] **shutdown**

**Context** config>system>security>dot1x  
config>system>security>dot1x>radius-plcy

**Description** This command administratively disables the 802.1x protocol operation. Shutting down the protocol does not remove or change the configuration other than the administrative state.  
The operational state of the entity is disabled as well as the operational state of any entities contained within.  
The **no** form of the command administratively enables the protocol which is the default state.

**Default** shutdown

### timeout

**Syntax** **timeout** *seconds*  
**no timeout**

**Context** config>system>security> dot1x>radius-plcy

**Description** This command configures the number of seconds the router waits for a response from a RADIUS server.  
The **no** form of the command reverts to the default value.

**Default** 3 seconds

**Parameters**    *seconds* — The number of seconds the router waits for a response from a RADIUS server, expressed as a decimal integer.

**Values**        1 — 90

---

## TCP Enhanced Authentication

### keychain

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] keychain</b> <i>keychain-name</i>                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Context</b>     | config>system>security                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b> | <p>This command enables the context to configure keychain parameters. A keychain must be configured on the system before it can be applied to a session.</p> <p>The <b>no</b> form of the command removes the keychain nodal context and everything under it from the configuration. If the keychain to be removed is in use when the no keychain command is entered, the command will not be accepted and an error indicating that the keychain is in use will be printed.</p> |
| <b>Default</b>     | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Parameters</b>  | <i>keychain-name</i> — Specifies a keychain name which identifies this particular keychain entry.                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Values</b>      | An ASCII string up to 32 characters.                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### direction

|                    |                                                                                                     |
|--------------------|-----------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>direction</b>                                                                                    |
| <b>Context</b>     | config>system>security>keychain                                                                     |
| <b>Description</b> | This command specifies the data type that indicates the TCP stream direction to apply the keychain. |
| <b>Default</b>     | none                                                                                                |

### bi

|                    |                                                                           |
|--------------------|---------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>bi</b>                                                                 |
| <b>Context</b>     | config>system>security>keychain>direction                                 |
| <b>Description</b> | This command configures keys for both send and receive stream directions. |
| <b>Default</b>     | none                                                                      |

### uni

|                |                                           |
|----------------|-------------------------------------------|
| <b>Syntax</b>  | <b>uni</b>                                |
| <b>Context</b> | config>system>security>keychain>direction |

**Description** This command configures keys for send or receive stream directions.

**Default** none

## receive

**Syntax** **receive**

**Context** config>system>security>keychain>direction>uni

**Description** This command enables the receive nodal context. Entries defined under this context are used to authenticate TCP segments that are being received by the router.

**Default** none

## send

**Syntax** **send**

**Context** config>system>security>keychain>direction>uni

**Description** This command specifies the send nodal context to sign TCP segments that are being sent by the router to another device.

**Default** none

## entry

**Syntax** **entry** *entry-id* **key** [*authentication-key* | *hash-key* | *hash2-key*] [**hash** | **hash2**] **algorithm**  
*algorithm*  
**no entry** *entry-id*

**Context** config>system>security>keychain>direction>bi  
config>system>security>keychain>direction>uni>receive  
config>system>security>keychain>direction>uni>send

**Description** This command defines a particular key in the keychain. Entries are defined by an entry-id. A keychain must have valid entries for the TCP Enhanced Authentication mechanism to work.

The **no** form of the command removes the entry from the keychain. If the entry is the active entry for sending, then this will cause a new active key to be selected (if one is available using the youngest key rule). If it is the **ONLY** possible send key, then the system will reject the command with an error indicating the configured key is the only available send key.

If the key is one of the eligible keys for receiving, it will be removed. If the key is the **ONLY** possible eligible key, then the command will not be accepted, and an error indicating that this is the only eligible key will be output.

The **no** form of the command deletes the entry.

## Configuration Commands

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b>    | There are no default entries.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Parameters</b> | <p><i>entry-id</i> — Specifies an entry that represents a key configuration to be applied to a keychain.</p> <p><b>Values</b> 0 — 63</p> <p><b>key</b> — Specifies a key ID which is used along with <i>keychain-name</i> and <b>direction</b> to uniquely identify this particular key entry.</p> <p><i>authentication-key</i> — Specifies the <i>authentication-key</i> that will be used by the encryption algorithm. The key is used to sign and authenticate a protocol packet.</p> <p>The <i>authentication-key</i> can be any combination of letters or numbers. .</p> <p><b>Values</b> A key must be 160 bits for algorithm hmac-sha-1-96 and must be 128 bits for algorithm aes-128-cmac-96. If the key given with the entry command amounts to less than this number of bits, then it is padded internally with zero bits up to the correct length.</p> <p><b>algorithm-<i>algorithm</i></b> — Specifies an enumerated integer that indicates the encryption algorithm to be used by the key defined in the keychain.</p> <p><b>Values</b> aes-128-cmac-96 — Specifies an algorithm based on the AES standard<br/>hmac-sha-1-96 — Specifies an algorithm based on SHA-1.</p> <p><i>hash-key</i> / <i>hash2-key</i> — The hash key. The key can be any combination of ASCII characters up to 33 for the <i>hash-key</i> and 96 characters for the <i>hash2-key</i> in length (encrypted). If spaces are used in the string, enclose the entire string in quotation marks (“ ”).</p> <p>This is useful when a user must configure the parameter, but, for security purposes, the actual unencrypted key value is not provided.</p> <p><b>hash</b> — Specifies the key is entered in an encrypted form. If the <b>hash</b> parameter is not used, the key is assumed to be in a non-encrypted, clear text form. For security, all keys are stored in encrypted form in the configuration file with the <b>hash</b> parameter specified.</p> <p><b>hash2</b> — Specifies the key is entered in a more complex encrypted form.</p> |

## begin-time

|                    |                                                                                                                                                                                                                                                                                                                                   |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>begin-time</b> [ <i>date</i> ] [ <i>hours-minutes</i> ] [UTC] [now] [forever]                                                                                                                                                                                                                                                  |
| <b>Context</b>     | config>system>security>keychain>direction>bi>entry<br>config>system>security>keychain>direction>uni>receive>entry<br>config>system>security>keychain>direction>uni>send>entry                                                                                                                                                     |
| <b>Description</b> | <p>This command specifies the calendar date and time after which the key specified by the keychain authentication key is used to sign and/or authenticate the protocol stream.</p> <p>If no date and time is set, the begin-time is represented by a date and time string with all NULLs and the key is not valid by default.</p> |
| <b>Parameters</b>  | <p><i>date hours-minutes</i> — Specifies the date and time for the key to become active.</p> <p><b>Values</b> date: YYYY/MM/DD<br/>hours-minutes: hh:mm[:ss]</p>                                                                                                                                                                  |

**now** — Specifies the the key should become active immediately.

**forever** — Specifies that the key should always be active.

## end-time

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>end-time</b> [ <i>date</i> ] [ <i>hours-minutes</i> ] [ <b>UTC</b> ] [ <b>now</b> ] [ <b>forever</b> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Context</b>     | config>system>security>keychain>direction>uni>receive>entry<br>config>system>security>keychain>direction>uni>send>entry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Description</b> | This command specifies the calendar date and time after which the key specified by the authentication key is no longer eligible to sign and/or authenticate the protocol stream.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Default</b>     | forever                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Parameters</b>  | <p><i>date</i> — Specifies the calendar date after which the key specified by the authentication key is no longer eligible to sign and/or authenticate the protocol stream in the YYYY/MM/DD format. When no year is specified the system assumes the current year.</p> <p><i>hours-minutes</i> — Specifies the time after which the key specified by the authentication key is no longer eligible to sign and/or authenticate the protocol stream in the hh:mm[:ss] format. Seconds are optional, and if not included, assumed to be 0.</p> <p><b>UTC</b> — Indicates that time is given with reference to Coordinated Universal Time in the input.</p> <p><b>now</b> — Specifies a time equal to the current system time.</p> <p><b>forever</b> — Specifies a time beyond the current epoch.</p> |

## tolerance

|                    |                                                                                                                                                                                                                                                                         |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>tolerance</b> [ <i>seconds</i>   <b>forever</b> ]                                                                                                                                                                                                                    |
| <b>Context</b>     | config>system>security>keychain>direction>bi>entry<br>config>system>security>keychain>direction>uni>receive>entry<br>config>system>security>keychain>direction>uni>send>entry                                                                                           |
| <b>Description</b> | This command configures the amount of time that an eligible receive key should overlap with the active send key or to never expire.                                                                                                                                     |
| <b>Parameters</b>  | <p><i>seconds</i> — Specifies the duration that an eligible receive key overlaps with the active send key.</p> <p><b>Values</b>     0 — 4294967294 seconds</p> <p><b>forever</b> — Specifies that an eligible receive key overlap with the active send key forever.</p> |

## tcp-option-number

**Syntax**     **tcp-option-number**

## Configuration Commands

**Context** config>system>security>keychain

**Description** This command enables the context to configure the TCP option number to be placed in the TCP packet header.

### receive

**Syntax** **receive** *option-number*

**Context** config>system>security>keychain>tcp-option-number

**Description** This command configures the TCP option number accepted in TCP packets received.

**Default** 254

**Parameters** *option-number* — Specifies an enumerated integer that indicates the TCP option number to be used in the TCP header.

**Values** 253, 254, 253&254

### send

**Syntax** **send** *option-number*

**Context** config>system>security>keychain>tcp-option-number

**Description** This command configures the TCP option number accepted in TCP packets sent.

**Default** 254

**Parameters** *option-number* — Specifies an enumerated integer that indicates the TCP option number to be used in the TCP header.

**Values** 253, 254

### dst-port

**Syntax** **dst-port** [**tcp/udp** *port-number*] [*mask*]  
**no dst-port**

**Context** config>sys>sec>cpm>entry>match

**Description** This command specifies the TCP/UDP port to match the destination-port of the packet. Note that an entry containing L4 match criteria will not match non-initial (2nd, 3rd, etc) fragments of a fragmented packet since only the first fragment contains the L4 information.

The **no** form of the command removes the destination port match criterion.

**Parameters** *dst-port-number* — Specifies the destination port number to be used as a match criteria expressed as a decimal integer.

**Values** 0 — 65535 (accepted in decimal hex or binary)

*mask* — Specifies the 16 bit mask to be applied when matching the destination port.

Note that an entry containing L4 match criteria will not match non-initial (2nd, 3rd, etc) fragments of a fragmented packet since only the first fragment contains the L4 information. Note that an entry containing L4 match criteria will not match non-initial (2nd, 3rd, etc) fragments of a fragmented packet since only the first fragment contains the L4 information. Note that an entry containing L4 match criteria will not match non-initial (2nd, 3rd, etc) fragments of a fragmented packet since only the first fragment contains the L4 information. Note that an entry containing L4 match criteria will not match non-initial (2nd, 3rd, etc) fragments of a fragmented packet since only the first fragment contains the L4 information. Note that an entry containing L4 match criteria will not match non-initial (2nd, 3rd, etc) fragments of a fragmented packet since only the first fragment contains the L4 information. Note that an entry containing L4 match criteria will not match non-initial (2nd, 3rd, etc) fragments of a fragmented packet since only the first fragment contains the L4 information. Note that an entry containing L4 match criteria will not match non-initial (2nd, 3rd, etc) fragments of a fragmented packet since only the first fragment contains the L4 information.



---

## Show Commands

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### Security Commands

#### access-group

|                    |                                                                                                           |
|--------------------|-----------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>access-group</b> [ <i>group-name</i> ]                                                                 |
| <b>Context</b>     | show>system>security                                                                                      |
| <b>Description</b> | This command displays SNMP access group information.                                                      |
| <b>Parameters</b>  | <i>group-name</i> — This command displays information for the specified access group.                     |
| <b>Output</b>      | <b>Security Access Group Output</b> — The following table describes security access group output fields.. |

**Table 6: Show System Security Access Group Output Fields**

| Label          | Description                                                                                           |
|----------------|-------------------------------------------------------------------------------------------------------|
| Group name     | The access group name.                                                                                |
| Security model | The security model required to access the views configured in this node.                              |
| Security level | Specifies the required authentication and privacy levels to access the views configured in this node. |
| Read view      | Specifies the variable of the view to read the MIB objects.                                           |
| Write view     | Specifies the variable of the view to configure the contents of the agent.                            |
| Notify view    | Specifies the variable of the view to send a trap about MIB objects.                                  |

#### Sample Output

```
A:ALA-4# show system security access-group
=====
Access Groups
=====
group name security security read write notify
 model level view view view

snmp-ro snmpv1 none no-security no-security
snmp-ro snmpv2c none no-security no-security
snmp-rw snmpv1 none no-security no-security no-security
snmp-rw snmpv2c none no-security no-security no-security
snmp-rwa snmpv1 none iso iso iso
snmp-rwa snmpv2c none iso iso iso
```

```
snmp-trap snmpv1 none iso
snmp-trap snmpv2c none iso
=====
A:ALA-7#
```

## authentication

- Syntax**     **authentication [statistics]**
- Context**    show>system>security
- Description** This command displays system login authentication configuration and statistics.
- Parameters** **statistics** — Appends login and accounting statistics to the display.
- Output**     **Authentication Output** — The following table describes system security authentication output fields.

**Table 7: Show System Security Authentication Output Fields**

| Label             | Description                                                                                                                                                               |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sequence          | The sequence in which authentication is processed.                                                                                                                        |
| Server address    | The IP address of the RADIUS server.                                                                                                                                      |
| Status            | Current status of the RADIUS server.                                                                                                                                      |
| Type              | The authentication type.                                                                                                                                                  |
| Timeout (secs)    | The number of seconds the router waits for a response from a RADIUS server.                                                                                               |
| Single connection | Enabled — Specifies a single connection to the TACACS+ server and validates everything via that connection.<br><br>Disabled — The TACACS+ protocol operation is disabled. |
| Retry count       | Displays the number of times the router attempts to contact the RADIUS server for authentication if there are problems communicating with the server.                     |
| Connection errors | Displays the number of times a user has attempted to login irrespective of whether the login succeeded or failed.                                                         |
| Accepted logins   | The number of times the user has successfully logged in.                                                                                                                  |
| Rejected logins   | The number of unsuccessful login attempts.                                                                                                                                |
| Sent packets      | The number of packets sent.                                                                                                                                               |
| Rejected packets  | The number of packets rejected.                                                                                                                                           |

## Sample Output

```

A:ALA-4# show system security authentication
=====
Authentication sequence : radius tacplus local
=====
server address status type timeout(secs) single connection retry count

10.10.10.103 up radius 5 n/a 5
10.10.0.1 up radius 5 n/a 5
10.10.0.2 up radius 5 n/a 5
10.10.0.3 up radius 5 n/a 5

radius admin status : down
tacplus admin status : up
health check : enabled

No. of Servers: 4
=====
A:ALA-4#

A:ALA-7>show>system>security# authentication statistics
=====
Authentication sequence : radius tacplus local
=====
server address status type timeout(secs) single connection retry count

10.10.10.103 up radius 5 n/a 5
10.10.0.1 up radius 5 n/a 5
10.10.0.2 up radius 5 n/a 5
10.10.0.3 up radius 5 n/a 5

radius admin status : down
tacplus admin status : up
health check : enabled

No. of Servers: 4
=====
Login Statistics
=====
server address connection errors accepted logins rejected logins

10.10.10.103 0 0 0
10.10.0.1 0 0 0
10.10.0.2 0 0 0
10.10.0.3 0 0 0
local n/a 1 0
=====
Authorization Statistics (TACACS+)
=====
server address connection errors sent packets rejected packets

Accounting Statistics
=====
server address connection errors sent packets rejected packets

10.10.10.103 0 0 0

```

## Show Commands

```

10.10.0.1 0 0 0
10.10.0.2 0 0 0
10.10.0.3 0 0 0
=====
A:ALA-7#

```

## communities

- Syntax** **communities**
- Context** show>system>security
- Description** This command displays SNMP communities.
- Output** **Communities Output** — The following table describes community output fields.

**Table 8: Show Communities Output Fields**

| Label             | Description                                                                                                                                                      |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community         | The community string name for SNMPv1 and SNMPv2c access only.                                                                                                    |
| Access            | r — The community string allows read-only access.<br>rw — The community string allows read-write access.<br>rwa — The community string allows read-write access. |
| View              | mgmt — The unique SNMP community string assigned to the management router.                                                                                       |
| Version           | The view name.                                                                                                                                                   |
| Group Name        | The SNMP version.                                                                                                                                                |
| No of Communities | The access group name.                                                                                                                                           |
|                   | The total number of configured community strings.                                                                                                                |

### Sample Output

```

A:ALA-48# show system security communities
=====
Communities
=====
community access view version group name

cli-readonly r iso v2c cli-readonly
cli-readwrite rw iso v2c cli-readwrite
public r no-security v1 v2c snmp-ro

No. of Communities: 3
=====
A:ALA-48#

```

## keychain

- Syntax** **keychain** [*key-chain*] [**detail**]
- Context** show>system>security
- Description** This command displays keychain information.
- Parameters** *key-chain* — Specifies the keychain name to display.  
**detail** — Displays detailed keychain information.

**Sample Output**

```
*A:ALA-A# show system security keychain test
=====
Key chain:test
=====
TCP-Option number send : 254 Admin state : Up
TCP-Option number receive : 254 Oper state : Up
=====
*A:ALA-A#

*A:ALA-A# show system security keychain test detail
=====
Key chain:test
=====
TCP-Option number send : 254 Admin state : Up
TCP-Option number receive : 254 Oper state : Up
=====
Key entries for key chain: test
=====
Id : 0
Direction : send-receive Algorithm : hmac-sha-1-96
Admin State : Up Valid : Yes
Active : Yes Tolerance : 300
Begin Time : 2007/02/15 18:28:37 Begin Time (UTC) : 2007/02/15 17:28:37
End Time : N/A End Time (UTC) : N/A
=====
Id : 1
Direction : send-receive Algorithm : aes-128-cmac-96
Admin State : Up Valid : Yes
Active : No Tolerance : 300
Begin Time : 2007/02/15 18:27:57 Begin Time (UTC) : 2007/02/15 17:27:57
End Time : 2007/02/15 18:28:13 End Time (UTC) : 2007/02/15 17:28:13
=====
Id : 2
Direction : send-receive Algorithm : aes-128-cmac-96
Admin State : Up Valid : Yes
Active : No Tolerance : 500
Begin Time : 2007/02/15 18:28:13 Begin Time (UTC) : 2007/02/15 17:28:13
End Time : 2007/02/15 18:28:37 End Time (UTC) : 2007/02/15 17:28:37
=====
```

```
=====
*A:ALA-A#
```

## management-access-filter

- Syntax** `management-access-filter`
- Context** `show>system>security`
- Description** This command displays management access filter information for IP and MAC filters.

## ip-filter

- Syntax** `ip-filter [entry entry-id]`
- Context** `show>system>security>mgmt-access-filter`
- Description** this command displays management-access IP filters.
- Parameters** *entry-id* — Displays information for the specified entry.

**Values** 1 — 9999

**Output Management Access Filter Output** — The following table describes management access filter output fields.

**Table 9: Show Management Access Filter Output Fields**

| Label         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Def. action   | Permit — Specifies that packets not matching the configured selection criteria in any of the filter entries are permitted.<br>Deny — Specifies that packets not matching the configured selection criteria in any of the filter entries are denied and that a ICMP host unreachable message will be issued.<br>Deny-host-unreachable — Specifies that packets not matching the configured selection criteria in the filter entries are denied. |
| Entry         | The entry ID in a policy or filter table.                                                                                                                                                                                                                                                                                                                                                                                                      |
| Description   | A text string describing the filter.                                                                                                                                                                                                                                                                                                                                                                                                           |
| Src IP        | The source IP address used for management access filter match criteria.                                                                                                                                                                                                                                                                                                                                                                        |
| Src Interface | The interface name for the next-hop to which the packet should be forwarded if it hits this filter entry.                                                                                                                                                                                                                                                                                                                                      |
| Dest port     | The destination port.                                                                                                                                                                                                                                                                                                                                                                                                                          |

**Table 9: Show Management Access Filter Output Fields (Continued)**

| Label    | Description                                                            |
|----------|------------------------------------------------------------------------|
| Match    | The number of times a management packet has matched this filter entry. |
| Protocol | The IP protocol to match.                                              |
| Action   | The action to take for packets that match this filter entry.           |

```

Output *7210-SAS>show>system>security>management-access-filter# ip-filter entry 1

=====
IPv4 Management Access Filter
=====
filter type : ip
Def. Action : permit
Admin Status : enabled (no shutdown)

Entry : 1
Description : (Not Specified)
Src IP : undefined
Src interface : undefined
Dest port : undefined
Protocol : undefined
Router : undefined
Action : none
Log : disabled
Matches : 0
=====
*7210-SAS>show>system>security>management-access-filter#

```

## password-options

- Syntax** password-options
- Context** show>system>security
- Description** This command displays configured password options.
- Output** **Password Options Output** — The following table describes password options output fields.

**Table 10: Show Management Access Filter Output Fields**

| Label                                          | Description                                                                                      |
|------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Password aging in days                         | Displays the number of days a user password is valid before the user must change their password. |
| Number of invalid attempts permitted per login | Displays the number of unsuccessful login attempts allowed for the specified <b>time</b> .       |

**Table 10: Show Management Access Filter Output Fields (Continued)**

| Label                                    | Description                                                                                                                                                              |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Time in minutes per login attempt        | Displays the period of time, in minutes, that a specified number of unsuccessful attempts can be made before the user is locked out.                                     |
| Lockout period (when threshold breached) | Displays the lockout period in minutes where the user is not allowed to login.                                                                                           |
| Authentication order                     | Displays the sequence in which password authentication is attempted among RADIUS, TACACS+, and local passwords.                                                          |
| Configured complexity options            | Displays the complexity requirements of locally administered passwords, HMAC-MD5-96, HMAC-SHA-96 and DES-keys configured in the <b>authentication</b> section.           |
| Minimum password length                  | Displays the minimum number of characters required for locally administered passwords, HMAC-MD5-96, HMAC-SHA-96, and DES-keys configured in the system security section. |

**Sample Output**

```
A:ALA-7# show system security password-options
=====
Password Options
=====
Password aging in days : none
Number of invalid attempts permitted per login : 3
Time in minutes per login attempt : 5
Lockout period (when threshold breached) : 10
Authentication order : radius tacplus local
Configured complexity options :
Minimum password length : 6
=====
A:ALA-7#
```

profile

- Syntax**     **profile** [*profile-name*]
- Context**    show>system>security
- Description** This command displays user profile information.  
If the *profile-name* is not specified, then information for all profiles are displayed.
- Parameters** **profile-name** — Displays information for the specified user profile.

**Output**    **User Profile Output** — The following table describes user profile output fields.

**Table 11: Show User Profile Output Fields**

| Label           | Description                                                                                                                                                        |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| User Profile    | Displays the profile name used to deny or permit user console access to a hierarchical branch or to specific commands.                                             |
| Def. action     | Permit all — Permits access to all commands.<br>Deny — Denies access to all commands.<br>None — No action is taken.                                                |
| Entry           | The entry ID in a policy or filter table.                                                                                                                          |
| Description     | Displays the text string describing the entry.                                                                                                                     |
| Match Command   | Displays the command or subtree commands in subordinate command levels.                                                                                            |
| Action          | Permit all — Commands matching the entry command match criteria are permitted.<br>Deny — Commands not matching the entry command match criteria are not permitted. |
| No. of profiles | The total number of profiles listed.                                                                                                                               |

### Sample Output

```
A:ALA-7# show system security profile administrative
=====
User Profile
=====
User Profile : administrative
Def. Action : permit-all

Entry : 10
Description :
Match Command: configure system security
Action : permit

Entry : 20
Description :
Match Command: show system security
Action : permit

No. of profiles:
=====
A:ALA-7#
```

## source-address

- Syntax** `source-address`
- Context** `show>system>security`
- Description** This command displays source-address configured for applications.
- Output** **Source Address Output** — The following table describes source address output fields.

**Table 12: Show Source Address Output Fields**

| Label                        | Description                                                                                      |
|------------------------------|--------------------------------------------------------------------------------------------------|
| Application                  | Displays the source-address application.                                                         |
| IP address<br>Interface Name | Displays the source address IP address or interface name.                                        |
| Oper status                  | Up — The source address is operationally up.<br>Down — The source address is operationally down. |

### Sample Output

```
A:SR-7# show system security source-address
=====
Source-Address applications
=====
Application IP address/Interface Name Oper status

telnet 10.20.1.7 Up
radius loopback1 Up
=====
A:SR-7#
```

## ssh

- Syntax** `ssh`
- Context** `show>system>security`
- Description** This command displays all the SSH sessions as well as the SSH status and fingerprint.
- Output** **SSH Options Output** — The following table describes SSH output fields .

| Label      | Description                                                                                                      |
|------------|------------------------------------------------------------------------------------------------------------------|
| SSH status | SSH is enabled — Displays that SSH server is enabled.<br>SSH is disabled — Displays that SSH server is disabled. |

| Label                  | Description (Continued)                                                                                                                                                                                                                            |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SSH Preserve Key       | Enabled – Displays that preserve-key is enabled.<br>Disabled – Displays that preserve-key is disabled.                                                                                                                                             |
| SSH protocol version 1 | Enabled – Displays that SSH1 is enabled.<br>Disabled – Displays that SSH1 is disabled.                                                                                                                                                             |
| SSH protocol version 2 | Enabled – Displays that SSH2 is enabled.<br>Disabled – Displays that SSH2 is disabled.                                                                                                                                                             |
| Key fingerprint        | The key fingerprint is the server's identity. Clients trying to connect to the server verify the server's fingerprint. If the server fingerprint is not known, the client may not continue with the SSH session since the server might be spoofed. |
| Connection             | The IP address of the connected router(s) (remote client).                                                                                                                                                                                         |
| Encryption             | des — Data encryption using a private (secret) key.<br>3des — An encryption method that allows proprietary information to be transmitted over untrusted networks.                                                                                  |
| Username               | The name of the user.                                                                                                                                                                                                                              |
| Number of SSH sessions | The total number of SSH sessions.                                                                                                                                                                                                                  |

### Sample output

```

ALA-7# show system security ssh
SSH is enabled
SSH preserve key: Enabled
SSH protocol version 1: Enabled
RSA host key finger print:c6:a9:57:cb:ee:ec:df:33:1a:cd:d2:ef:3f:b5:46:34

SSH protocol version 2: Enabled
DSA host key finger print:ab:ed:43:6a:75:90:d3:fc:42:59:17:8a:80:10:41:79
=====
Connection Encryption Username
=====
192.168.5.218 3des admin

Number of SSH sessions : 1
=====
ALA-7#

A:ALA-49>config>system>security# show system security ssh
SSH is disabled
A:ALA-49>config>system>security#

```

user

**Syntax** `user [user-id] [detail]`

**Context** `show>system>security`

**Description** This command displays user registration information.  
If no command line options are specified, summary information for all users displays.

**Parameters** *user-id* — Displays information for the specified user.

**Default** All users

**detail** — Displays detailed user information to the summary output.

**Output** **User Output** — The following table describes user output fields.

| Label            | Description                                                                                                                                                                                                                                                                                                                          |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| User ID          | The name of a system user.                                                                                                                                                                                                                                                                                                           |
| Need new pwd     | Y — The user must change his password at the next login.<br>N — The user is not forced to change his password at the next login.                                                                                                                                                                                                     |
| Cannot change pw | Y — The user has the ability to change the login password.<br>N — The user does not have the ability to change the login password.                                                                                                                                                                                                   |
| User permissions | Console — Y - The user is authorized for console access.<br>N- The user is not authorized for console access.<br><br>FTP — Y - The user is authorized for FTP access.<br>N - The user is not authorized for FTP access.<br><br>SNMP — Y - The user is authorized for SNMP access.<br>N - The user is not authorized for SNMP access. |
| Password expires | The number of days in which the user must change his login password.                                                                                                                                                                                                                                                                 |
| Attempted logins | The number of times the user has attempted to login irrespective of whether the login succeeded or failed.                                                                                                                                                                                                                           |
| Failed logins    | The number of unsuccessful login attempts.                                                                                                                                                                                                                                                                                           |
| Local conf       | Y — Password authentication is based on the local password database.<br>N — Password authentication is not based on the local password database.                                                                                                                                                                                     |
| Home directory   | Specifies the local home directory for the user for both console and FTP access.                                                                                                                                                                                                                                                     |

| Label              | Description (Continued)                                                                                                                                                                                                                          |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Restricted to home | <p>Yes – The user is not allowed to navigate to a directory higher in the directory tree on the home directory device.</p> <p>No – The user is allowed to navigate to a directory higher in the directory tree on the home directory device.</p> |
| Login exec file    | Displays the user's login exec file which executes whenever the user successfully logs in to a console session.                                                                                                                                  |

### Sample Output

```
A:ALA-7# show system security user
=====
Users
=====
user id need user permissions password attempted failed local
 new pwd console ftp snmp expires logins logins conf

admin n y n n never 21 0 y
=====
A:ALA-7#

A:
ALA-7# show system security user detail
=====
Users
=====
user id need user permissions password attempted failed local
 new pwd console ftp snmp expires logins logins conf

admin n y n n never 21 0 y
=====

=====
User Configuration Detail
=====
user id : admin

console parameters

new pw required : no cannot change pw : no
home directory : cf1:\
restricted to home : no
login exec file :
profile : administrative

snmp parameters
=====
A:ALA-7#
```

view

- Syntax** `view [view-name] [detail]`
- Context** `show>system>security`
- Description** This command displays the SNMP MIB views.
- Parameters** *view-name* — Specify the name of the view to display output. If no view name is specified, the complete list of views displays.  
**detail** — Displays detailed view information.
- Output** **View Output** — The following table describes show view output fields.

**Table 13: Show View Output Fields**

| Label        | Description                                                                                                       |
|--------------|-------------------------------------------------------------------------------------------------------------------|
| view name    | The name of the view. Views control the accessibility of a MIB object within the configured MIB view and subtree. |
| oid tree     | The object identifier of the ASN.1 subtree.                                                                       |
| mask         | The bit mask that defines a family of view subtrees.                                                              |
| permission   | Indicates whether each view is included or excluded                                                               |
| No. of Views | Displays the total number of views.                                                                               |

**Sample Output**

```
A:ALA-48# show system security view
=====
Views
=====
view name oid tree mask permission

iso 1 11111111 included
read1 1.1.1.1 11111111 included
write1 2.2.2.2 11111111 included
testview 1 11111111 included
testview 1.3.6.1.2 11111111 excluded
mgmt-view 1.3.6.1.2.1.2 included
mgmt-view 1.3.6.1.2.1.4 included
mgmt-view 1.3.6.1.2.1.5 included
mgmt-view 1.3.6.1.2.1.6 included
mgmt-view 1.3.6.1.2.1.7 included
mgmt-view 1.3.6.1.2.1.31 included
mgmt-view 1.3.6.1.2.1.77 included
mgmt-view 1.3.6.1.4.1.6527.3.1.2.3.7 included
mgmt-view 1.3.6.1.4.1.6527.3.1.2.3.11 included
no-security 1 included
no-security 1.3.6.1.6.3 excluded
```

|               |                    |          |          |
|---------------|--------------------|----------|----------|
| no-security   | 1.3.6.1.6.3.10.2.1 |          | included |
| no-security   | 1.3.6.1.6.3.11.2.1 |          | included |
| no-security   | 1.3.6.1.6.3.15.1.1 |          | included |
| on-security   | 2                  | 00000000 | included |
| -----         |                    |          |          |
| No. of Views: |                    |          |          |
| =====         |                    |          |          |
| A:ALA-48#     |                    |          |          |

# Login Control

## users

- Syntax**    **users**
- Context**    show
- Description**    Displays console user login and connection information.
- Output**    **Users Output** — The following table describes show users output fields.

**Table 14: Show Users Output Fields**

| Label           | Description                                   |
|-----------------|-----------------------------------------------|
| User            | The user name.                                |
| Type            | The user is authorized this access type.      |
| From            | The originating IP address.                   |
| Login time      | The time the user logged in.                  |
| Idle time       | The amount of idle time for a specific login. |
| Number of users | Displays the total number of users logged in. |

### Sample Console Users Output

```
A:ALA-7# show users
=====
User Type From Login time Idle time
=====
testuser Console -- 21FEB2007 04:58:55 0d 00:00:00 A
=====
Number of users : 1
'A' indicates user is in admin mode
=====
A:ALA-7#
```

---

## Debug Commands

### radius

|                    |                                                                                                                     |
|--------------------|---------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>radius [detail] [hex]</b><br><b>no radius</b>                                                                    |
| <b>Context</b>     | debug                                                                                                               |
| <b>Description</b> | This command enables debugging for RADIUS connections.<br>The <b>no</b> form of the command disables the debugging. |
| <b>Parameters</b>  | <b>detail</b> — Displays detailed output.<br><b>hex</b> — Displays the packet dump in hex format.                   |

Show Commands

---

## In This Chapter

This chapter provides information to configure SNMP.

Topics in this chapter include:

- [SNMP Overview on page 152](#)
  - [SNMP Architecture on page 152](#)
  - [Management Information Base on page 152](#)
  - [SNMP Protocol Operations on page 153](#)
  - [SNMP Versions on page 153](#)
  - [Management Information Access Control on page 154](#)
  - [User-Based Security Model Community Strings on page 155](#)
  - [Views on page 155](#)
  - [Access Groups on page 155](#)
  - [Users on page 156](#)
- [Which SNMP Version to Use? on page 157](#)
- [Configuration Notes on page 159](#)

## SNMP Overview

---

### SNMP Architecture

The Service Assurance Manager (SAM) is comprised of two elements: managers and agents. The manager is the entity through which network management tasks are facilitated. Agents interface managed objects. Managed devices, such as bridges, hubs, routers, and network servers can contain managed objects. A managed object can be a configuration attribute, performance statistic, or control action that is directly related to the operation of a device.

Managed devices collect and store management information and use Simple Network Management Protocol (SNMP). SNMP is an application-layer protocol that provides a message format to facilitate communication between SNMP managers and agents. SNMP provides a standard framework to monitor and manage devices in a network from a central location.

An SNMP manager controls and monitors the activities of network hosts which use SNMP. An SNMP manager can obtain (get) a value from an SNMP agent or store (set) a value in the agent. The manager uses definitions in the management information base (MIB) to perform operations on the managed device such as retrieving values from variables or blocks of data, replying to requests, and processing traps.

Between the SNMP agent and the SNMP manager the following actions can occur:

- The manager can get information from the agent.
- The manager can set the value of a MIB object that is controlled by an agent.
- The agent can send traps to notify the manager of significant events that occur on the router.

---

### Management Information Base

A MIB is a formal specifications document with definitions of management information used to remotely monitor, configure, and control a managed device or network system. The agent's management information consists of a set of network objects that can be managed with SNMP. Object identifiers are unique object names that are organized in a hierarchical tree structure. The main branches are defined by the Internet Engineering Task Force (IETF). When requested, the Internet Assigned Numbers Authority (IANA) assigns a unique branch for use by a private organization or company. The branch assigned to Alcatel-Lucent (TiMetra) is 1.3.6.1.4.1.6527.

The SNMP agent provides management information to support a collection of IETF specified MIBs and a number of MIBs defined to manage device parameters and network data unique to Alcatel-Lucent's router.

---

## SNMP Protocol Operations

Between the SNMP agent and the SNMP manager the following actions can occur:

- The manager can get information from the agent.
  - The manager can set the value of a MIB object that is controlled by an agent.
  - The agent notifies the manager of significant events that occur on the router.
- 

## SNMP Versions

The agent supports multiple versions of the SNMP protocol.

- SNMP Version 1 (SNMPv1) is the original Internet-standard network management framework.  
SNMPv1 uses a community string match for authentication.
- The implementation uses SNMPv2c, the community-based administrative framework for SNMPv2. SNMPv2c uses a community string match for authentication.
- In SNMP Version 3 (SNMPv3), USM defines the user authentication and encryption features. View Access Control MIB (VACM) defines the user access control features. The SNMP-COMMUNITY-MIB is used to associate SNMPv1/SNMPv2c community strings with SNMPv3 VACM access control.  
SNMPv3 uses a username match for authentication.

## Management Information Access Control

By default, the implementation of SNMP uses SNMPv3. SNMPv3 incorporates security model and security level features. A security model is the authentication type for the group and the security level is the permitted level of security within a security model. The combination of the security level and security model determines which security mechanism handles an SNMP packet.

To implement SNMPv1 and SNMPv2c configurations, several access groups are predefined. These access groups provide standard read-only, read-write, and read-write-all access groups and views that can simply be assigned community strings. In order to implement SNMP with security features, security models, security levels, and USM communities must be explicitly configured. Optionally, additional views which specify more specific OIDs (MIB objects in the subtree) can be configured.

Access to the management information in an SNMPv1/SNMPv2c agent is controlled by the inclusion of a community name string in the SNMP request. The community defines the subset of the agent's managed objects that can be accessed by the requester. It also defines what type of access is allowed: read-only or read-write.

The use of community strings provides minimal security and context checking for both agents and managers that receive requests and initiate trap operations. A community string is a text string that acts like a password to permit access to the agent on the router.

Alcatel-Lucent's implementation of SNMP has defined three levels of community-named access:

- Read-Only permission — Grants only read access to objects in the MIB, except security objects.
- Read-Write permission — Grants read and write access to all objects in the MIB, except security objects.
- Read-Write-All permission — Grants read and write access to all objects in the MIB, including security objects.

## User-Based Security Model Community Strings

User-based security model (USM) community strings associates a community string with an SNMPv3 access group and its view. The access granted with a community string is restricted to the scope of the configured group.

---

### Views

Views control the access to a managed object. The total MIB of a router can be viewed as a hierarchical tree. When a view is created, either the entire tree or a portion of the tree can be specified and made available to a user to manage the objects contained in the subtree. Object identifiers (OIDs) uniquely identify managed objects. A view defines the type of operations for the view such as read, write, or notify.

OIDs are organized in a hierarchical tree with specific values assigned to different organizations. A view defines a subset of the agent's managed objects controlled by the access rules associated with that view.

Pre-defined views are available that are particularly useful when configuring SNMPv1 and SNMPv2c.

The Alcatel-Lucent SNMP agent associates SNMPv1 and SNMPv2c community strings with a SNMPv3 view.

---

### Access Groups

Access groups associate a user group and a security model to the views the group can access. An access group is defined by a unique combination of a group name, security model (SNMPv1, SNMPv2c, or SNMPv3), and security level (no-authorization-no-privacy, authorization-no-privacy, or privacy).

An access group, in essence, is a template which defines a combination of access privileges and views. A group can be associated to one or more network users to control their access privileges and views.

Additional access parameters must be explicitly configured if the preconfigured access groups and views for SNMPv1 and SNMPv2c do not meet your security requirements.

## Users

By default, authentication and encryption parameters are not configured. Authentication parameters which a user must use in order to be validated by the device can be modified. SNMP authentication allows the device to validate the managing node that issued the SNMP message and determine if the message has been tampered with.

User access and authentication privileges must be explicitly configured. In a user configuration, a user is associated with an access group, which is a collection of users who have common access privileges and views (see [Access Groups](#)).

## Which SNMP Version to Use?

SNMPv1 and SNMPv2c do not provide security, authentication, or encryption. Without authentication, a non authorized user could perform SNMP network management functions and eavesdrop on management information as it passes from system to system. Many SNMPv1 and SNMPv2c implementations are restricted read-only access, which, in turn, reduces the effectiveness of a network monitor in which network control applications cannot be supported.

To implement SNMPv3, an authentication and encryption method must be assigned to a user in order to be validated by the device. SNMP authentication allows the router to validate the managing node that issued the SNMP message and determine if the message was tampered with.

[Figure 3](#) depicts the configuration requirements to implement SNMPv1/SNMPv2c, and SNMPv3.

# Which SNMP Version to Use?

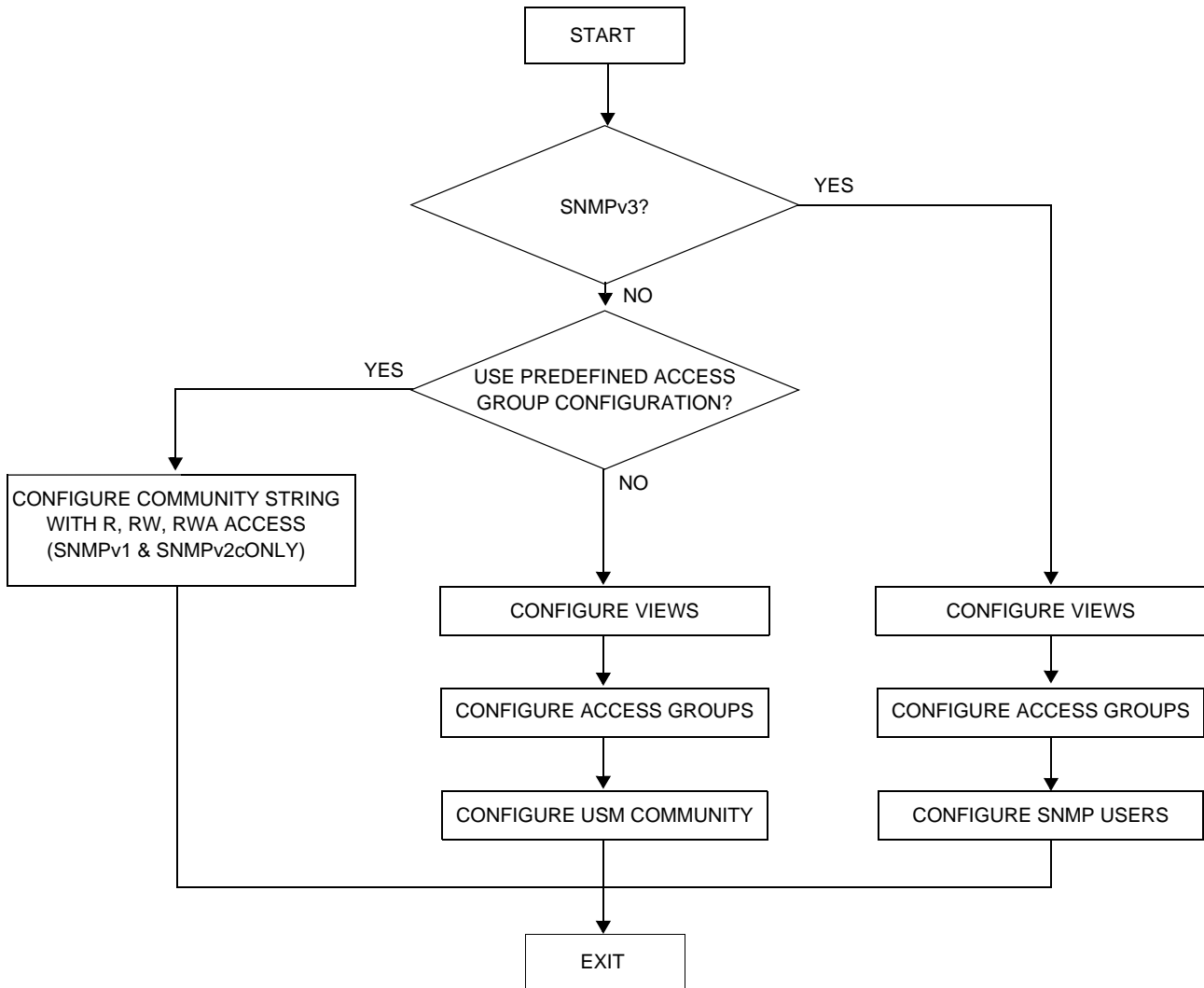


Figure 3: SNMPv1 and SNMPv2c Configuration and Implementation Flow

## Configuration Notes

This section describes SNMP configuration caveats.

---

### General

- To avoid management systems attempting to manage a partially booted system, SNMP will remain in a shut down state if the configuration file fails to complete during system startup. While shutdown, SNMP gets and sets are not processed. However, notifications are issued if an SNMP trap group has been configured.

In order to enable SNMP, the portions of the configuration that failed to load must be initialized properly. Start SNMP with the **config>system>snmp>no shutdown** CLI command.

- Use caution when changing the SNMP engine ID. If the SNMP engine ID is changed in the **config>system>snmp> engineID** *engine-id* context, the current configuration must be saved and a reboot must be executed. If not, the previously configured SNMP communities and logger trap-target notify communities will not be valid for the new engine ID.



## Configuring SNMP with CLI

This section provides information about configuring SNMP with CLI.

Topics in this chapter include:

- [SNMP Configuration Overview on page 162](#)
- [Basic SNMP Security Configuration on page 163](#)
- [Configuring SNMP Components on page 164](#)

## SNMP Configuration Overview

This section describes how to configure SNMP components which apply to SNMPv1 and SNMPv2c, and SNMPv3 on the router.

- [Configuring SNMPv1 and SNMPv2c on page 162](#)
  - [Configuring SNMPv3 on page 162](#)
- 

### Configuring SNMPv1 and SNMPv2c

Alcatel-Lucent routers are based on SNMPv3. To use the routers with SNMPv1 and/or SNMPv2c, SNMP community strings must be configured. Three pre-defined access methods are available when SNMPv1 or SNMPv2c access is required. Each access method (**r**, **rw**, or **rwa**) is associated with an SNMPv3 access group that determines the access privileges and the scope of managed objects available. The **community** command is used to associate a community string with a specific access method and the required SNMP version (SNMPv1 or SNMPv2c). The access methods are:

- Read-Only — Grants read only access to the entire management structure with the exception of the security area.
- Read-Write — Grants read and write access to the entire management structure with the exception of the security area.
- Read-Write-All — Grants read and write access to the entire management structure, including security.

If the predefined access groups do not meet your access requirements, then additional access groups and views can be configured. The **usm-community** command is used to associate an access group with an SNMPv1 or SNMPv2c community string.

SNMP trap destinations are configured in the **config>log>snmp-trap-group** context.

---

### Configuring SNMPv3

implements SNMPv3. If security features other than the default views are required, then the following parameters must be configured:

- Configure views
- Configure access groups
- Configure SNMP users

## Basic SNMP Security Configuration

This section provides information to configure SNMP parameters and provides examples of common configuration tasks. The minimal SNMP parameters are:

For SNMPv1 and SNMPv2c:

- Configure community string parameters.

For SNMPv3:

- Configure view parameters
- Configure SNMP group
- Configure access parameters
- Configure user with SNMP parameters

The following displays SNMP default views, access groups, and attempts parameters.

```
A:ALA-1>config>system>security>snmp# info detail

 view iso subtree 1
 mask ff type included
 exit
 view no-security subtree 1
 mask ff type included
 exit
 view no-security subtree 1.3.6.1.6.3
 mask ff type excluded
 exit
 view no-security subtree 1.3.6.1.6.3.10.2.1
 mask ff type included
 exit
 view no-security subtree 1.3.6.1.6.3.11.2.1
 mask ff type included
 exit
 view no-security subtree 1.3.6.1.6.3.15.1.1
 mask ff type included
 exit
 access group snmp-ro security-model snmpv1 security-level no-auth-no-pri-
vacancy read no-security notify no-security
 access group snmp-ro security-model snmpv2c security-level no-auth-no-pri-
vacancy read no-security notify no-security
 access group snmp-rw security-model snmpv1 security-level no-auth-no-pri-
vacancy read no-security write no-security notify no-security
 access group snmp-rw security-model snmpv2c security-level no-auth-no-pri-
vacancy read no-security write no-security notify no-security
 access group snmp-rwa security-model snmpv1 security-level no-auth-no-pri-
vacancy read iso write iso notify iso
 access group snmp-rwa security-model snmpv2c security-level no-auth-no-pri-
vacancy read iso write iso notify iso
 access group snmp-trap security-model snmpv1 security-level no-auth-no-pri-
vacancy notify iso
 access group snmp-trap security-model snmpv2c security-level no-auth-no-
privacy notify iso
 attempts 20 time 5 logout 10
```

## Configuring SNMP Components

Use the CLI syntax displayed below to configure the following SNMP scenarios:

- [Configuring a Community String on page 165](#)
- [Configuring View Options on page 166](#)
- [Configuring Access Options on page 167](#)
- [Configuring USM Community Options on page 169](#)
- [Configuring Other SNMP Parameters on page 170](#)

---

**CLI Syntax:** `config>system>security>snmp`  
`attempts [count] [time minutes1] [lockout minutes2]`  
`community community-string access-permissions [version SNMP`  
`version]`  
`usm-community community-string group group-name`  
`view view-name subtree oid-value`  
`mask mask-value [type {included|excluded}]`  
`access group group-name security-model security-model secu-`  
`rity-level security-level [context context-name [pre-`  
`fix-match]] [read view-name-1] [write view-name-2]`  
`[notify view-name-3]`

## Configuring a Community String

SNMPv1 and SNMPv2c community strings are used to define the relationship between an SNMP manager and agent. The community string acts like a password to permit access to the agent. The access granted with a community string is restricted to the scope of the configured group.

One or more of these characteristics associated with the string can be specified:

- Read-only, read-write, and read-write-all permission for the MIB objects accessible to the community.
- The SNMP version, SNMPv1 or SNMPv2c.

Default access features are pre-configured by the agent for SNMPv1/SNMPv2c.

Use the following CLI syntax to configure community options:

**CLI Syntax:** `config>system>security>snmp  
community community-string access-permissions [version SNMP  
version]`

The following displays an SNMP community configuration example:

```
*A:cses-A13>config>system>security>snmp# info

community "uTdc9j48PBRkxn5DcSjchk" hash2 rwa version both
community "Lla.RtAyRW2" hash2 r version v2c
community "r0a159kIOfg" hash2 r version both

*A:cses-A13>config>system>security>snmp#
```

## Configuring View Options

Use the following CLI syntax to configure view options:

**CLI Syntax:** config>system>security>snmp  
view view-name subtree oid-value  
mask mask-value [type {included|excluded}]

The following displays a view configuration example:

```
*A:cses-A13>config>system>security>snmp# info

view "testview" subtree "1"
mask ff
exit
view "testview" subtree "1.3.6.1.2"
mask ff type excluded
exit
community "uTdc9j48PBRkxn5DcSjchk" hash2 rwa version both
community "Lla.RtAyRW2" hash2 r version v2c
community "r0a159kIOfg" hash2 r version both

*A:cses-A13>config>system>security>snmp#
```

## Configuring Access Options

The **access** command creates an association between a user group, a security model and the views that the user group can access. Access must be configured unless security is limited to the preconfigured access groups and views for SNMPv1 and SNMPv2. An access group is defined by a unique combination of the group name, security model and security level.

Use the following CLI syntax to configure access features:

**CLI Syntax:** `config>system>security>snmp`  
`access group group-name security-model security-model security-level security-level [context context-name [prefix-match]] [read view-name-1] [write view-name-2] [notify view-name-3]`

The following displays an access configuration with the view configurations.

```
*A:cses-A13>config>system>security>snmp# info

view "testview" subtree "1"
 mask ff
 exit
view "testview" subtree "1.3.6.1.2"
 mask ff type excluded
 exit
access group "test" security-model usm security-level auth-no-privacy read "testview" write "testview" notify "testview"
 community "uTdc9j48PBRkxn5DcSjchk" hash2 rwa version both
 community "Lla.RtAyRW2" hash2 r version v2c
 community "r0a159kIOfg" hash2 r version both

*A:cses-A13>config>system>security>snmp#
```

## Configuring SNMP Components

Use the following CLI syntax to configure user group and authentication parameters:

```
CLI Syntax: config>system>security# user user-name
 access [ftp] [snmp] [console]
 snmp
 authentication [none]|[[hash]{md5 key|sha key } privacy
 {none|des-key key}]
 group group-name
```

The following displays a user's SNMP configuration example.

```
A:ALA-1>config>system>security# info

 user "testuser"
 access snmp
 snmp
 authentication hash md5 e14672e71d3e96e7a1e19472527ee969 privacy none
 group testgroup
 exit
 exit
...

A:ALA-1>config>system>security#
```

## Configuring USM Community Options

User-based security model (USM) community strings associate a community string with an SNMPv3 access group and its view. The access granted with a community string is restricted to the scope of the configured group.

By default, the implementation of SNMP uses SNMPv3. However, to implement SNMPv1 and SNMPv2c, USM community strings must be explicitly configured.

Use the following CLI syntax to configure USM community options:

**CLI Syntax:** `config>system>security>snmp`  
`usm-community community-string group group-name`

The following displays a SNMP community configuration example:

```
A:ALA-1>config>system>security>snmp# info

view "testview" subtree "1"
 mask ff
 exit
 view "testview" subtree "1.3.6.1.2"
 mask ff type excluded
 exit
access group "test" security-model usm security-level auth-no-pr
ivacy read "testview" write "testview" notify "testview"
 community "uTdc9j48PBRkxn5DcSjchk" hash2 rwa version both
 community "Lla.RtAyRW2" hash2 r version v2c
 community "r0a159kIOfg" hash2 r version both

A:ALA-1>config>system>security>snmp#
```

The group **grouptest** was configured in the `config>system>security>snmp>access` CLI context.

## Configuring Other SNMP Parameters

Use the following CLI syntax to modify the system SNMP options:

**CLI Syntax:** `config>system>snmp`  
                  `engineID engine-id`  
                  `general-port port`  
                  `packet-size bytes`  
                  `no shutdown`

The following example displays the system SNMP default values:

```
A:ALA-104>config>system>snmp# info detail

 shutdown
 engineID "0000xxxx000000000xxxxx00"
 packet-size 1500
 general-port 161

A:ALA-104>config>system>snmp#
```

---

## SNMP Command Reference

---

### Command Hierarchies

#### Configuration Commands

##### SNMP System Commands

```

config
 — system
 — snmp
 — engineID engine-id
 — no engineID
 — general-port port
 — no general-port
 — packet-size bytes
 — no packet-size
 — [no] shutdown

```

##### SNMP Security Commands

```

config
 — system
 — security
 — snmp
 — access group-name security-model security-model security-level security-level [context context-name [prefix-match]] [read view-name-1] [write view-name-2] [notify view-name-3]
 — no access group-name [security-model security-model] [security-level security-level] [context context-name [prefix-match]] [read view-name-1] [write view-name-2] [notify view-name-3]
 — attempts [count] [time minutes1] [lockout minutes2]
 — no attempts
 — community community-string [hash | hash2] access-permissions [version SNMP-version]
 — no community community-string [hash | hash2]
 — usm-community community-string [hash | hash2] group group-name
 — no usm-community community-string [hash | hash2]
 — view view-name subtree oid-value
 — no view view-name [subtree oid-value]
 — mask mask-value [type {included | excluded}]
 — no mask

```

## SNMP Command Reference

The following commands configure user-specific SNMP features. Refer to the **Security** section for CLI syntax and command descriptions.

```
config
 — system
 — security
 — [no] user user-name
 — [no] snmp
 — authentication {[none] | [[hash] {md5 key-1 | sha key-1}
 privacy {privacy-level key-2}]
 — group group-name
 — [no] group
```

## Show Commands

```
show
 — snmp
 — counters
 — system
 — information
 — security
 — access-group [group-name]
 — authentication [statistics]
 — communities
 — keychain [key-chain] [detail]
 — management-access-filter
 — ip-filter [entry entry-id]
 — password-options
 — profile [profile-name]
 — ssh
 — user [user-id] [detail]
 — view [view-name] [detail]
```

---

## Configuration Commands

---

### SNMP System Commands

#### engineID

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] engineID</b> <i>engine-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Context</b>     | config>system>snmp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Description</b> | <p>This command sets the SNMP engineID to uniquely identify the SNMPv3 node. By default, the engineID is generated using information from the system backplane.</p> <p>If SNMP engine ID is changed in the <b>config&gt;system&gt;snmp&gt; engineID</b> <i>engine-id</i> context, the current configuration must be saved and a reboot must be executed. If not, the previously configured SNMP communities and logger trap-target notify communities will not be valid for the new engine ID.</p> <p><b>Note:</b> In conformance with IETF standard RFC 2274, <i>User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)</i>, hashing algorithms which generate SNMPv3 MD5 or SHA security digest keys use the engineID. Changing the SNMP engineID invalidates all SNMPv3 MD5 and SHA security digest keys and may render the node unmanageable.</p> <p>When a chassis is replaced, use the engine ID of the first system and configure it in the new system to preserve SNMPv3 security keys. This allows management stations to use their existing authentication keys for the new system.</p> <p>Ensure that the engine IDs are not used on multiple systems. A management domain can only have one instance of each engineID.</p> <p>The <b>no</b> form of the command reverts to the default setting.</p> |
| <b>Default</b>     | The engine ID is system generated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Parameters</b>  | <i>engine-id</i> — An identifier from 10 to 64 hexadecimal digits (5 to 32 octet number), uniquely identifying this SNMPv3 node. This string is used to access this node from a remote host with SNMPv3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

#### general-port

|                    |                                                                                                                                                                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>general-port</b> <i>port-number</i><br><b>no general-port</b>                                                                                                                                                                                                                |
| <b>Context</b>     | config>system>snmp                                                                                                                                                                                                                                                              |
| <b>Description</b> | This command configures the port number used by this node to receive SNMP request messages and to send replies. Note that SNMP notifications generated by the agent are sent from the port specified in the <b>config&gt;log&gt;snmp-trap-group&gt;trap-target</b> CLI command. |

## Configuration Commands

The **no** form of the command reverts to the default value.

**Default** 161

**Parameters** *port-number* — The port number used to send SNMP traffic other than traps.

**Values** 1 — 65535 (decimal)

## packet-size

**Syntax** **packet-size** *bytes*  
**no packet-size**

**Context** config>system>snmp

**Description** This command configures the maximum SNMP packet size generated by this node. If the packet size exceeds the MTU size of the egress interface the packet will be fragmented.

The **no** form of this command to revert to default.

**Default** 1500 bytes

**Parameters** *bytes* — The SNMP packet size in bytes.

**Values** 484 — 9216

## snmp

**Syntax** **snmp**

**Context** config>system

**Description** This command creates the context to configure SNMP parameters.

## shutdown

**Syntax** [**no**] **shutdown**

**Context** config>system>snmp

**Description** This command administratively disables SNMP agent operations. System management can then only be performed using the command line interface (CLI). Shutting down SNMP does not remove or change configuration parameters other than the administrative state. This command does not prevent the agent from sending SNMP notifications to any configured SNMP trap destinations. SNMP trap destinations are configured under the **config>log>snmp-trap-group** context.

This command is automatically invoked in the event of a reboot when the processing of the configuration file fails to complete or when an SNMP persistent index file fails while the **bof persist on** command is enabled.

The **no** form of the command administratively enables SNMP which is the default state.

**Default**    **no shutdown**

---

## SNMP Security Commands

### access

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] access</b> group <i>group-name</i> <b>security-model</b> <i>security-model</i> <b>security-level</b> <i>security-level</i> [ <b>context</b> <i>context-name</i> [ <b>prefix-match</b> ]] [ <b>read</b> <i>view-name-1</i> ] [ <b>write</b> <i>view-name-2</i> ] [ <b>notify</b> <i>view-name-3</i> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Context</b>     | config>system>security>snmp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Description</b> | <p>This command creates an association between a user group, a security model, and the views that the user group can access. Access parameters must be configured unless security is limited to the preconfigured access groups and views for SNMPv1 and SNMPv2. An access group is defined by a unique combination of the group name, security model and security level.</p> <p>Access must be configured unless security is limited to SNMPv1/SNMPv2c with community strings (see the <b>community</b> on page 178).</p> <p>Default access group configurations cannot be modified or deleted.</p> <p>To remove the user group with associated, security model(s), and security level(s), use:<br/> <b>no access group</b> <i>group-name</i></p> <p>To remove a security model and security level combination from a group, use:<br/> <b>no access group</b> <i>group-name</i> <b>security-model</b> {snmpv1   snmpv2c   usm} <b>security-level</b> {no-auth-no-privacy   auth-no-privacy   privacy }</p>                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Default</b>     | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Parameters</b>  | <p><i>group-name</i> — Specify a unique group name up to 32 characters.</p> <p><b>security-model</b> {snmpv1   snmpv2c   usm} — Specifies the security model required to access the views configured in this node. A group can have multiple security models. For example, one view may only require SNMPv1/ SNMPv2c access while another view may require USM (SNMPv3) access rights.</p> <p><b>security-level</b> {no-auth-no-priv   auth-no-priv   privacy} — Specifies the required authentication and privacy levels to access the views configured in this node.</p> <p><b>security-level no-auth-no-privacy</b> — Specifies that no authentication and no privacy (encryption) is required. When configuring the user's authentication, select the <b>none</b> option.</p> <p><b>security-level auth-no-privacy</b> — Specifies that authentication is required but privacy (encryption) is not required. When this option is configured, both the <b>group</b> and the <b>user</b> must be configured for authentication.</p> <p><b>security-level privacy</b> — Specifies that both authentication and privacy (encryption) is required. When this option is configured, both the <b>group</b> and the user must be configured for <b>authentication</b>. The user must also be configured for <b>privacy</b>.</p> <p><b>context</b> <i>context-name</i> — Specifies a set of SNMP objects that are associated with the context-name.</p> |

The *context-name* is treated as either a full context-name string or a context name prefix depending on the keyword specified (**exact** or **prefix**).

**read** *view-name* — Specifies the keyword and variable of the view to read the MIB objects. This command must be configured for each view to which the group has read access.

**Default** none

**write** *view-name* — Specifies the keyword and variable of the view to configure the contents of the agent. This command must be configured for each view to which the group has write access.

**Values** Up to 32 characters

**notify** *view-name* — specifies keyword and variable of the view to send a trap about MIB objects. This command must be configured for each view to which the group has notify access.

**Values** none

## attempts

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>attempts</b> [ <i>count</i> ] [ <b>time</b> <i>minutes1</i> ] [ <b>lockout</b> <i>minutes2</i> ]<br><b>no attempts</b>                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Context</b>     | config>system>security>snmp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Description</b> | <p>This command configures a threshold value of unsuccessful SNMP connection attempts allowed in a specified time frame. The command parameters are used to counter denial of service (DOS) attacks through SNMP.</p> <p>If the threshold is exceeded, the host is locked out for the lockout time period.</p> <p>If multiple <b>attempts</b> commands are entered, each command overwrites the previously entered command.</p> <p>The <b>no</b> form of the command resets the parameters to the default values.</p> |
| <b>Default</b>     | <b>attempts 20 time 5 lockout 10</b> — 20 failed SNMP attempts allowed in a 5 minute period with a 10 minute lockout for the host if exceeded.                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Parameters</b>  | <p><i>count</i> — The number unsuccessful SNMP attempts allowed for the specified <b>time</b>.</p> <p><b>Default</b> 20</p> <p><b>Values</b> 1 — 64</p> <p><b>time</b> <i>minutes1</i> — The period of time, in minutes, that a specified number of unsuccessful attempts can be made before the host is locked out.</p> <p><b>Default</b> 5</p> <p><b>Values</b> 0 — 60</p>                                                                                                                                          |

**lockout** *minutes2* — The lockout period in minutes where the host is not allowed to login. When the host exceeds the attempted count times in the specified time, then that host is locked out from any further login attempts for the configured time period.

**Default** 10

**Values** 0 — 1440

## community

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>community</b> <i>community-string</i> [ <b>hash</b>   <b>hash2</b> ] <i>access-permissions</i> [ <b>version</b> <i>SNMP-version</i> ]<br><b>no community</b> <i>community-string</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Context</b>     | config>system>security>snmp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Description</b> | This command creates SNMP community strings for SNMPv1 and SNMPv2c access. This command is used in combination with the predefined access groups and views. To create custom access groups and views and associate them with SNMPv1 or SNMPv2c access use the <code>usm-community</code> command.<br><br>When configured, <code>community</code> implies a security model for SNMPv1 and SNMPv2c only. For SNMPv3 security, the <code>access</code> command on page 176 must be configured.<br><br>The <code>no</code> form of the command removes a community string.                                                                                                                                                                                                          |
| <b>Default</b>     | <b>none</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Parameters</b>  | <i>community-string</i> — Configure the SNMPv1 / SNMPv2c community string.<br><br><b>Values</b> hash, hash2<br><br><i>access-permissions</i> — <b>r</b> — Grants only read access to objects in the MIB, except security objects. <ul style="list-style-type: none"> <li><b>rw</b> — Grants read and write access to all objects in the MIB, except security.</li> <li><b>rwa</b> — Grants read and write access to all objects in the MIB, including security.</li> <li><b>vpls-mgmt</b> — Assigns a unique SNMP community string to the management virtual router.</li> </ul> <b>version</b> { <b>v1</b>   <b>v2c</b>   <b>both</b> } — Configures the scope of the community string to be for SNMPv1, SNMPv2c, or both SNMPv1 and SNMPv2c access.<br><br><b>Default</b> both |

## mask

|                    |                                                                                                                                                                                                                |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>mask</b> <i>mask-value</i> [ <b>type</b> { <b>included</b>   <b>excluded</b> } ]<br><b>no mask</b>                                                                                                          |
| <b>Context</b>     | config>system>security>snmp>view <i>view-name</i>                                                                                                                                                              |
| <b>Description</b> | The mask value and the mask type, along with the <i>oid-value</i> configured in the <code>view</code> command, determines the access of each sub-identifier of an object identifier (MIB subtree) in the view. |

Each bit in the mask corresponds to a sub-identifier position. For example, the most significant bit for the first sub-identifier, the next most significant bit for the second sub-identifier, and so on. If the bit position on the sub-identifier is available, it can be included or excluded.

For example, the MIB subtree that represents MIB-II is 1.3.6.1.2.1. The mask that catches all MIB-II would be 0xfc or 0b11111100.

Only a single mask may be configured per view and OID value combination. If more than one entry is configured, each subsequent entry overwrites the previous entry.

Per RFC 2575, *View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)*, each MIB view is defined by two sets of view subtrees, the included view subtrees, and the excluded view subtrees. Every such view subtree, both the included and the excluded ones, are defined in this table. To determine if a particular object instance is in a particular MIB view, compare the object instance's object identifier (OID) with each of the MIB view's active entries in this table. If none match, then the object instance is not in the MIB view. If one or more match, then the object instance is included in, or excluded from, the MIB view according to the value of `vacmViewTreeFamilyType` in the entry whose value of `vacmViewTreeFamilySubtree` has the most sub-identifiers.

The **no** form of this command removes the mask from the configuration.

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b>    | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Parameters</b> | <p><i>mask-value</i> — The mask value associated with the OID value determines whether the sub-identifiers are included or excluded from the view. (Default: all 1<sup>s</sup>)</p> <p>The mask can be entered either:</p> <ul style="list-style-type: none"> <li>• In hex. For example, 0xfc.</li> <li>• In binary. For example, 0b11111100.</li> </ul> <p>Note: If the number of bits in the bit mask is less than the number of sub-identifiers in the MIB subtree, then the mask is extended with ones until the mask length matches the number of sub-identifiers in the MIB subtree.</p> <p><b>type {included   excluded}</b> — Specifies whether to include or exclude MIB subtree objects. <i>included</i> - All MIB subtree objects that are identified with a 1 in the mask are available in the view. (Default: <i>included</i>).</p> <p><i>excluded</i> - All MIB subtree objects that are identified with a 1 in the mask are denied access in the view. (Default: <i>included</i>).</p> <p><b>Default</b>      <b>included</b></p> |

### snmp

|                    |                                                                                      |
|--------------------|--------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>snmp</b>                                                                          |
| <b>Context</b>     | config>system>security                                                               |
| <b>Description</b> | This command creates the context to configure SNMPv1, SNMPv2, and SNMPv3 parameters. |

### usm-community

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>usm-community</b> <i>community-string</i> [ <b>hash</b>   <b>hash2</b> ] <b>group</b> <i>group-name</i><br><b>no usm-community</b> <i>community-string</i> [ <b>hash</b>   <b>hash2</b> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Context</b>     | config>system>security>snmp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Description</b> | <p>This command is used to associate a community string with an SNMPv3 access group and its view. The access granted with a community string is restricted to the scope of the configured group.</p> <p>Alcatel-Lucent's SR OS implementation of SNMP uses SNMPv3. In order to implement SNMPv1 and SNMPv2c configurations, several access groups are predefined. In order to implement SNMP with security features (Version 3), security models, security levels, and USM communities must be explicitly configured. Optionally, additional views which specify more specific OIDs (MIB objects in the subtree) can be configured.</p> <p>The <b>no</b> form of this command removes a community string.</p> |
| <b>Default</b>     | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Parameters</b>  | <p><i>community-string</i> — Configures the SNMPv1/SNMPv2c community string to determine the SNMPv3 access permissions to be used.</p> <p><b>Values</b> hash, hash2</p> <p><i>group</i> — Specify the group that governs the access rights of this community string. This group must be configured first in the <b>config system security snmp access group</b> context.<br/>(Default: none)</p>                                                                                                                                                                                                                                                                                                              |

### view

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>view</b> <i>view-name</i> <b>subtree</b> <i>oid-value</i><br><b>no view</b> <i>view-name</i> [ <b>subtree</b> <i>oid-value</i> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Context</b>     | config>system>security>snmp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Description</b> | <p>This command configures a view. Views control the accessibility of a MIB object within the configured MIB view and subtree. Object identifiers (OIDs) uniquely identify MIB objects in the subtree. OIDs are organized hierarchically with specific values assigned by different organizations.</p> <p>Once the subtree (OID) is identified, a mask can be created to select the portions of the subtree to be included or excluded for access using this particular view. See the <b>mask</b> command. The view(s) configured with this command can subsequently be used in read, write, and notify commands which</p> |

are used to assign specific access group permissions to created views and assigned to particular access groups.

Multiple subtrees can be added or removed from a view name to tailor a view to the requirements of the user access group.

The **no view** *view-name* command removes a view and all subtrees.

The **no view** *view-name subtree oid-value* removes a sub-tree from the view name.

**Default** No views are defined.

**Parameters** *view-name* — Enter a 1 to 32 character view name. (Default: *none*)

*oid-value* — The object identifier (OID) value for the *view-name*. This value, for example, 1.3.6.1.6.3.11.2.1, combined with the mask and include and exclude statements, configures the access available in the view.

It is possible to have a view with different subtrees with their own masks and include and exclude statements. This allows for customizing visibility and write capabilities to specific user requirements.



---

## Show Commands

### counters

- Syntax** `counters`
- Context** `show>snmp`
- Description** This command displays SNMP counters information. SNMP counters will continue to increase even when SNMP is shut down. Some internal modules communicate using SNMP packets.
- Output** **Counters Output** — The following table describes SNMP counters output fields.

**Table 15: Counters Output Fields**

| Label                            | Description                                                                                            |
|----------------------------------|--------------------------------------------------------------------------------------------------------|
| <code>in packets</code>          | Displays the total number of messages delivered to SNMP from the transport service.                    |
| <code>in gets</code>             | Displays the number of SNMP get request PDUs accepted and processed by SNMP.                           |
| <code>in getnexts</code>         | Displays the number of SNMP get next PDUs accepted and processed by SNMP.                              |
| <code>in sets</code>             | Displays the number of SNMP set request PDUs accepted and processed by SNMP.                           |
| <code>out packets</code>         | Displays the total number of SNMP messages passed from SNMP to the transport service.                  |
| <code>out get responses</code>   | Displays the number of SNMP get response PDUs generated by SNMP.                                       |
| <code>out traps</code>           | Displays the number of SNMP Trap PDUs generated by SNMP.                                               |
| <code>variables requested</code> | Displays the number of MIB objects requested by SNMP.                                                  |
| <code>variables set</code>       | Displays the number of MIB objects set by SNMP as the result of receiving valid SNMP set request PDUs. |

### Sample Output

```
A:ALA-1# show snmp counters
=====
SNMP counters:
=====
 in packets : 463
```

```

 in gets : 93
 in getnexts : 0
 in sets : 370
 out packets: 463

 out get responses : 463
 out traps : 0
 variables requested: 33
 variables set : 497

A:ALA-1#

```

## information

- Syntax**     **information**
- Context**    show>system
- Description** This command lists the SNMP configuration and statistics.
- Output**     **System Information Output Fields** — The following table describes system information output fields.

**Table 16: Show System Information Output Fields**

| Label                 | Description                                                                                                                                                                   |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System Name           | The name configured for the device.                                                                                                                                           |
| System Contact        | The text string that identifies the contact name for the device.                                                                                                              |
| System Location       | The text string that identifies the location of the device.                                                                                                                   |
| System Coordinates    | The text string that identifies the system coordinates for the device location. For example, "37.390 -122.0550" is read as latitude 37.390 north and longitude 122.0550 west. |
| System Up Time        | The time since the last reboot.                                                                                                                                               |
| SNMP Port             | The port which SNMP sends responses to management requests.                                                                                                                   |
| SNMP Engine ID        | The ID for either the local or remote SNMP engine to uniquely identify the SNMPv3 node.                                                                                       |
| SNMP Max Message Size | The maximum size SNMP packet generated by this node.                                                                                                                          |
| SNMP Admin State      | Enabled — SNMP is administratively enabled.<br>Disabled — SNMP is administratively disabled.                                                                                  |
| SNMP Oper State       | Enabled — SNMP is operationally enabled.<br>Disabled — SNMP is operationally disabled.                                                                                        |

**Table 16: Show System Information Output Fields (Continued)**

| Label                   | Description                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SNMP Index Boot Status  | <p><code>Persistent</code> – Persistent indexes at the last system reboot was enabled.</p> <p><code>Disabled</code> – Persistent indexes at the last system reboot was disabled.</p>                                                                                                                                                                                                         |
| SNMP Sync State         | The state when the synchronization of configuration files between the primary and secondary s finish.                                                                                                                                                                                                                                                                                        |
| Telnet/SSH/FTP Admin    | Displays the administrative state of the Telnet, SSH, and FTP sessions.                                                                                                                                                                                                                                                                                                                      |
| Telnet/SSH/FTP Oper     | Displays the operational state of the Telnet, SSH, and FTP sessions.                                                                                                                                                                                                                                                                                                                         |
| BOF Source              | The boot location of the BOF.                                                                                                                                                                                                                                                                                                                                                                |
| Image Source            | <p><code>primary</code> – Specifies whether the image was loaded from the primary location specified in the BOF.</p> <p><code>secondary</code> – Specifies whether the image was loaded from the secondary location specified in the BOF.</p> <p><code>tertiary</code> – Specifies whether the image was loaded from the tertiary location specified in the BOF.</p>                         |
| Config Source           | <p><code>primary</code> – Specifies whether the configuration was loaded from the primary location specified in the BOF.</p> <p><code>secondary</code> – Specifies whether the configuration was loaded from the secondary location specified in the BOF.</p> <p><code>tertiary</code> – Specifies whether the configuration was loaded from the tertiary location specified in the BOF.</p> |
| Last Booted Config File | Displays the URL and filename of the configuration file used for the most recent boot.                                                                                                                                                                                                                                                                                                       |
| Last Boot Cfg Version   | Displays the version of the configuration file used for the most recent boot.                                                                                                                                                                                                                                                                                                                |
| Last Boot Config Header | Displays header information of the configuration file used for the most recent boot.                                                                                                                                                                                                                                                                                                         |
| Last Boot Index Version | Displays the index version used in the most recent boot.                                                                                                                                                                                                                                                                                                                                     |
| Last Boot Index Header  | Displays the header information of the index used in the most recent boot.                                                                                                                                                                                                                                                                                                                   |
| Last Saved Config       | Displays the filename of the last saved configuration.                                                                                                                                                                                                                                                                                                                                       |

**Table 16: Show System Information Output Fields (Continued)**

| Label                   | Description                                                                                                                                                 |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Time Last Saved         | Displays the time the configuration was most recently saved.                                                                                                |
| Changes Since Last Save | Yes – The configuration changed since the last save.                                                                                                        |
|                         | No – The configuration has not changed since the last save.                                                                                                 |
| Time Last Modified      | Displays the time of the last modification.                                                                                                                 |
| Max Cfg/BOF Backup Rev  | The maximum number of backup revisions maintained for a configuration file. This value also applies to the number of revisions maintained for the BOF file. |
| Cfg-OK Script           | URL – The location and name of the CLI script file executed following successful completion of the boot-up configuration file execution.                    |
|                         | N/A – No CLI script file is executed.                                                                                                                       |
| Cfg-OK Script Status    | Successful/Failed – The results from the execution of the CLI script file specified in the Cfg-OK Script location.                                          |
|                         | Not used – No CLI script file was executed.                                                                                                                 |
| Cfg-Fail Script         | URL – The location and name of the CLI script file executed following a failed boot-up configuration file execution.                                        |
|                         | Not used – No CLI script file was executed.                                                                                                                 |
| Cfg-Fail Script Status  | Successful/Failed – The results from the execution of the CLI script file specified in the Cfg-Fail Script location.                                        |
|                         | Not used – No CLI script file was executed.                                                                                                                 |
| Management IP address   | The Management IP address of the node.                                                                                                                      |
| DNS Server              | The DNS address of the node.                                                                                                                                |
| DNS Domain              | The DNS domain name of the node.                                                                                                                            |
| BOF Static Routes       | To – The static route destination.                                                                                                                          |
|                         | Next Hop – The next hop IP address used to reach the destination.                                                                                           |
|                         | Metric – Displays the priority of this static route versus other static routes.                                                                             |
|                         | None – No static routes are configured.                                                                                                                     |

**Sample Output**

```
*A:7210 SAS E>show>system# information
```

```
=====
System Information
=====
System Name : SAS-E
System Type : 7210 SAS-E-1
System Version : B-3.0.B1-44
System Contact :
System Location :
System Coordinates :
System Up Time : 31 days, 01:22:07.50 (hr:min:sec)

SNMP Port : 161
SNMP Engine ID : 0000197f00002889ff000000
SNMP Max Message Size : 1500
SNMP Admin State : Disabled
SNMP Oper State : Disabled
SNMP Index Boot Status : Not Persistent
SNMP Sync State : N/A

Tel/Tel6/SSH/FTP Admin : Disabled/Disabled/Enabled/Disabled
Tel/Tel6/SSH/FTP Oper : Down/Down/Up/Down

BOF Source : cf1:
Image Source : primary
Config Source : N/A
Last Booted Config File: N/A
Last Boot Cfg Version : N/A
Last Boot Config Header: N/A
Last Boot Index Version: N/A
Last Boot Index Header : N/A
Last Saved Config : N/A
Time Last Saved : N/A
Changes Since Last Save: Yes
User Last Modified : admin
Time Last Modified : 2011/03/14 00:21:55
Max Cfg/BOF Backup Rev : 5
Cfg-OK Script : N/A
Cfg-OK Script Status : not used
Cfg-Fail Script : N/A
Cfg-Fail Script Status : not used

Management IP Addr : 10.135.20.137/24
Primary DNS Server : 192.168.1.1
Secondary DNS Server : N/A
Tertiary DNS Server : N/A
DNS Domain :
DNS Resolve Preference : ipv4-only
BOF Static Routes :
 To Next Hop
 10.135.0.0/16 10.135.20.1
 10.135.24.0/24 10.135.20.1
```

## Show Commands

```
135.254.0.0/16 10.135.20.1
=====
*A:7210 SAS E>show>system#

Sample output for 7210 SAS D:

*A:SAS-D>show>system# information

=====
System Information
=====
System Name : SAS-D
System Type : 7210 SAS-D 6F4T-1
System Version : B-3.0.S66
System Contact :
System Location :
System Coordinates :
System Up Time : 10 days, 01:24:01.43 (hr:min:sec)

SNMP Port : 161
SNMP Engine ID : 0000197f0000003f11abca11
SNMP Max Message Size : 1500
SNMP Admin State : Disabled
SNMP Oper State : Disabled
SNMP Index Boot Status : Not Persistent
SNMP Sync State : N/A

Tel/Tel6/SSH/FTP Admin : Disabled/Disabled/Enabled/Disabled
Tel/Tel6/SSH/FTP Oper : Down/Down/Up/Down

BOF Source : N/A
Image Source : primary
Config Source : N/A
Last Booted Config File: N/A
Last Boot Cfg Version : N/A
Last Boot Config Header: N/A
Last Boot Index Version: N/A
Last Boot Index Header : N/A
Last Saved Config : cf1:\smitha.cfg
Time Last Saved : 1970/01/01 00:04:11
Changes Since Last Save: Yes
User Last Modified : admin
Time Last Modified : 1970/01/11 00:44:21
Max Cfg/BOF Backup Rev : 5
Cfg-OK Script : N/A
Cfg-OK Script Status : not used
Cfg-Fail Script : N/A
Cfg-Fail Script Status : not used

Management IP Addr : 0.0.0.0/0
Primary DNS Server : N/A
Secondary DNS Server : N/A
Tertiary DNS Server : N/A
DNS Domain :
DNS Resolve Preference : ipv4-only
BOF Static Routes : None
=====
*A:SAS-D>show>system#
```

## access-group

**Syntax** `access-group group-name`

**Context** `show>system>security`

**Description** This command displays access-group information.

**Output** **System Information Output** — The following table describes the access-group output fields.

**Table 17: Show System Information Output Fields**

| Label                | Description                                                                                           |
|----------------------|-------------------------------------------------------------------------------------------------------|
| Group name           | The access group name.                                                                                |
| Security model       | The security model required to access the views configured in this node.                              |
| Security level       | Specifies the required authentication and privacy levels to access the views configured in this node. |
| Read view            | Specifies the view to read the MIB objects.                                                           |
| Write view           | Specifies the view to configure the contents of the agent.                                            |
| Notify view          | Specifies the view to send a trap about MIB objects.                                                  |
| No. of access groups | The total number of configured access groups.                                                         |

### Sample Output

```
A:ALA-1# show system security access-group
=====
Access Groups
=====
group name security security read write notify
 model level view view view

snmp-ro snmpv1 none no-security no-security
snmp-ro snmpv2c none no-security no-security
snmp-rw snmpv1 none no-security no-security
snmp-rw snmpv2c none no-security no-security
snmp-rwa snmpv1 none iso iso
snmp-rwa snmpv2c none iso iso
snmp-trap snmpv1 none no-security iso
snmp-trap snmpv2c none no-security iso

No. of Access Groups: 8
=====
A:ALA-1#

A:ALA-1# show system security access-group detail
```

```

=====
Access Groups
=====
group name security security read write notify
 model level view view view

snmp-ro snmpv1 none no-security no-security

No. of Access Groups:
...
=====
A:ALA-1#

```

## authentication

- Syntax**     **authentication [statistics]**
- Context**    show>system>security
- Description** This command displays authentication information.
- Output**     **Authentication Output** — The following table describes the authentication output fields.

| Label                | Description                                                                                                                                                          |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| sequence             | The authentication order in which password authentication, authorization, and accounting is attempted among RADIUS, TACACS+, and local passwords.                    |
| server address       | The address of the RADIUS, TACACS+, or local server.                                                                                                                 |
| status               | The status of the server.                                                                                                                                            |
| type                 | The type of server.                                                                                                                                                  |
| timeout (secs)       | Number of seconds the server will wait before timing out.                                                                                                            |
| single connection    | Specifies whether a single connection is established with the server. The connection is kept open and is used by all the TELNET/SSH/FTP sessions for AAA operations. |
| retry count          | The number of attempts to retry contacting the server.                                                                                                               |
| radius admin status  | The administrative status of the RADIUS protocol operation.                                                                                                          |
| tacplus admin status | The administrative status of the TACACS+ protocol operation.                                                                                                         |

| Label          | Description                                                                                                                                                                                                                                                                                          |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| health check   | Specifies whether the RADIUS and TACACS+ servers will be periodically monitored. Each server will be contacted every 30 seconds. If in this process a server is found to be unreachable, or a previously unreachable server starts responding, based on the type of the server, a trap will be sent. |
| No. of Servers | The total number of servers configured.                                                                                                                                                                                                                                                              |

### Sample Output

```
A:ALA-49>show>system>security# authentication
=====
Authentication sequence : radius tacplus local
=====
server address status type timeout(secs) single connection retry count

10.10.10.103 up radius 5 n/a 5
10.10.0.1 up radius 5 n/a 5
10.10.0.2 up radius 5 n/a 5
10.10.0.3 up radius 5 n/a 5

radius admin status : down
tacplus admin status : up
health check : enabled

No. of Servers: 4
=====
A:ALA-49>show>system>security#
```

## communities

- Syntax** `communities`
- Context** `show>system>security`
- Description** This command lists SNMP communities and characteristics.
- Output** **Communities Output** — The following table describes the communities output fields.

### Sample Output

**Table 18: Show Communities Output Fields**

| Label             | Description                                                                                                                                                                                                                                                                                                        |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community         | The community string name for SNMPv1 and SNMPv2c access only.                                                                                                                                                                                                                                                      |
| Access            | <ul style="list-style-type: none"> <li>r — The community string allows read-only access.</li> <li>rw — The community string allows read-write access.</li> <li>rwa — The community string allows read-write access.</li> <li>mgmt — The unique SNMP community string assigned to the management router.</li> </ul> |
| View              | The view name.                                                                                                                                                                                                                                                                                                     |
| Version           | The SNMP version.                                                                                                                                                                                                                                                                                                  |
| Group Name        | The access group name.                                                                                                                                                                                                                                                                                             |
| No of Communities | The total number of configured community strings.                                                                                                                                                                                                                                                                  |

```
A:ALA-1# show system security communities
=====
Communities
=====
community access view version group name

private rw iso v1 v2c snmp-rwa
public r no-security v1 v2c snmp-ro
rwa rwa n/a v2c snmp-trap

No. of Communities: 3
=====
A:ALA-1#
```

## keychain

|                    |                                                                                                                                                                                                  |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>keychain</b> [ <i>key-chain</i> ] [ <b>detail</b> ]                                                                                                                                           |
| <b>Context</b>     | show>system>security                                                                                                                                                                             |
| <b>Description</b> | This command displays keychain information.                                                                                                                                                      |
| <b>Parameters</b>  | <i>key-chain</i> — Specifies the keychain name to display.<br><b>detail</b> — Displays detailed keychain information.                                                                            |
| <b>Output</b>      | <pre>*A:ALA-A# show system security keychain test ===== Key chain:test ===== TCP-Option number send : 254 Admin state : Up TCP-Option number receive : 254 Oper state : Up ===== *A:ALA-A#</pre> |

## management-access-filter

|                    |                                                                                    |
|--------------------|------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>management-access-filter</b>                                                    |
| <b>Context</b>     | show>system>security                                                               |
| <b>Description</b> | This command displays management access filter information for IP and MAC filters. |

## ip-filter

|                    |                                                                 |
|--------------------|-----------------------------------------------------------------|
| <b>Syntax</b>      | <b>ip-filter</b> [ <b>entry</b> <i>entry-id</i> ]               |
| <b>Context</b>     | show>system>security>mgmt-access-filter                         |
| <b>Description</b> | this command displays management-access IP filters.             |
| <b>Parameters</b>  | <i>entry-id</i> — Displays information for the specified entry. |
| <b>Values</b>      | 1 — 9999                                                        |

**Output Management Access Filter Output** — The following table describes management access filter output fields.

**Table 19: Show Management Access Filter Output Fields**

| Label         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Def. action   | Permit — Specifies that packets not matching the configured selection criteria in any of the filter entries are permitted.<br>Deny — Specifies that packets not matching the configured selection criteria in any of the filter entries are denied and that a ICMP host unreachable message will be issued.<br>Deny-host-unreachable — Specifies that packets not matching the configured selection criteria in the filter entries are denied. |
| Entry         | The entry ID in a policy or filter table.                                                                                                                                                                                                                                                                                                                                                                                                      |
| Description   | A text string describing the filter.                                                                                                                                                                                                                                                                                                                                                                                                           |
| Src IP        | The source IP address used for management access filter match criteria.                                                                                                                                                                                                                                                                                                                                                                        |
| Src Interface | The interface name for the next-hop to which the packet should be forwarded if it hits this filter entry.                                                                                                                                                                                                                                                                                                                                      |
| Dest port     | The destination port.                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Match         | The number of times a management packet has matched this filter entry.                                                                                                                                                                                                                                                                                                                                                                         |
| Protocol      | The IP protocol to match.                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Action        | The action to take for packets that match this filter entry.                                                                                                                                                                                                                                                                                                                                                                                   |

**Output**

```
*7210-SAS>show>system>security>management-access-filter# ip-filter entry 1

=====
IPv4 Management Access Filter
=====
filter type : ip
Def. Action : permit
Admin Status : enabled (no shutdown)

Entry : 1
Description : (Not Specified)
Src IP : undefined
Src interface : undefined
Dest port : undefined
Protocol : undefined
Router : undefined
Action : none
Log : disabled
Matches : 0
=====
*7210-SAS>show>system>security>management-access-filter#
```

## password-options

- Syntax** `password-options`
- Context** `show>system>security`
- Description** This command displays password options.
- Output** **Password-Options Output** — The following table describes password-options output fields.

| Label                                          | Description                                                                                                                                                    |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Password aging in days                         | Number of days a user password is valid before the user must change his password.                                                                              |
| Number of invalid attempts permitted per login | Displays the maximum number of unsuccessful login attempts allowed for a user.                                                                                 |
| Time in minutes per login attempt              | Displays the time in minutes that user is to be locked out.                                                                                                    |
| Lockout period (when threshold breached)       | Displays the number of minutes the user is locked out if the threshold of unsuccessful login attempts has exceeded.                                            |
| Authentication order                           | Displays the most preferred method to authenticate and authorize a user.                                                                                       |
| Configured complexity options                  | Displays the complexity requirements of locally administered passwords, HMAC-MD5-96, HMAC-SHA-96 and DES-keys configured in the <b>authentication</b> section. |
| Minimum password length                        | Displays the minimum number of characters required in the password.                                                                                            |

**Sample Output**

```
A:ALA-48>show>system>security# password-options
=====
Password Options
=====
Password aging in days : 365
Number of invalid attempts permitted per login : 5
Time in minutes per login attempt : 5
Lockout period (when threshold breached) : 20
Authentication order : radius tacplus local
Configured complexity options :
Minimum password length : 8
=====
```

```
A:ALA-48>show>system>security#
```

## profile

**Syntax** `profile [profile-name]`

**Context** `show>system>security`

**Description** This command displays user profiles for CLI command tree permissions.

**Parameters** *profile-name* — Specify the profile name to display information about a single user profile. If no profile name is displayed, the entire list of profile names are listed.

**Output** **Profile Output** — The following table describes the profile output fields.

| Label        | Description                                                                                                                                                                                                  |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| User Profile | <p><code>default</code> — The action to be given to the user profile if none of the entries match the command.</p> <p><code>administrative</code> — specifies the administrative state for this profile.</p> |
| Def. Action  | <p><code>none</code> — No action is given to the user profile when none of the entries match the command.</p> <p><code>permit-all</code> — The action to be taken when an entry matches the command.</p>     |
| Entry        | <p><code>10 - 80</code> — Each entry represents the configuration for a system user.</p>                                                                                                                     |
| Description  | <p>A text string describing the entry.</p>                                                                                                                                                                   |

| Label         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Match Command | <p><code>administrative</code> – Enables the user to execute all commands.</p> <p><code>configure system security</code> – Enables the user to execute the <b>config system security</b> command.</p> <p><code>enable-admin</code> – Enables the user to enter a special administrative mode by entering the <b>enable-admin</b> command.</p> <p><code>exec</code> – Enables the user to execute (exec) the contents of a text file as if they were CLI commands entered at the console.</p> <p><code>exit</code> – Enables the user to execute the <b>exit</b> command.</p> <p><code>help</code> – Enables the user to execute the <b>help</b> command.</p> <p><code>logout</code> – Enables the user to execute the <b>logout</b> command.</p> <p><code>password</code> – Enables the user to execute the <b>password</b> command.</p> <p><code>show config</code> – Enables the user to execute the <b>show config</b> command.</p> <p><code>show</code> – Enables the user to execute the <b>show</b> command.</p> <p><code>show system security</code> – Enables the user to execute the <b>show system security</b> command.</p> |
| Action        | <p><code>permit</code> – Enables the user access to all commands.</p> <p><code>deny-all</code> – Denies the user access to all commands.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

```
A:ALA-48>config>system>snmp# show system security profile
=====
User Profile
=====
User Profile : test
Def. Action : none

Entry : 1
Description :
Match Command:
Action : unknown
=====
User Profile : default
Def. Action : none

Entry : 10
Description :
Match Command: exec
Action : permit

Entry : 20
Description :
Match Command: exit
```

## Show Commands

```
Action : permit

Entry : 30
Description :
Match Command: help
Action : permit

...

Entry : 80
Description :
Match Command: enable-admin
Action : permit
=====

User Profile : administrative
Def. Action : permit-all

Entry : 10
Description :
Match Command: configure system security
Action : permit

Entry : 20
Description :
Match Command: show system security
Action : permit
=====

No. of profiles: 3
=====
A:ALA-48>config>system>snmp#
```

## ssh

**Syntax** ssh**Context** show>system>security**Description** This command displays all the SSH sessions as well as the SSH status and fingerprint.**Output** **SSH Options Output** — The following table describes SSH output fields.**Table 20: Show SSH Output Fields**

| Label                  | Description                                                                                                                                                                                                                                        |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SSH status             | SSH is enabled — Displays that SSH server is enabled.<br>SSH is disabled — Displays that SSH server is disabled.                                                                                                                                   |
| Key fingerprint        | The key fingerprint is the server's identity. Clients trying to connect to the server verify the server's fingerprint. If the server fingerprint is not known, the client may not continue with the SSH session since the server might be spoofed. |
| Connection             | The IP address of the connected router(s) (remote client).                                                                                                                                                                                         |
| Encryption             | des — Data encryption using a private (secret) key.<br>3des — An encryption method that allows proprietary information to be transmitted over untrusted networks.                                                                                  |
| Username               | The name of the user.                                                                                                                                                                                                                              |
| Number of SSH sessions | The total number of SSH sessions.                                                                                                                                                                                                                  |

**Sample output**

```
A:ALA-7# show system security ssh
SSH is enabled
Key fingerprint: 34:00:f4:97:05:71:aa:b1:63:99:dc:17:11:73:43:83
=====
Connection Encryption Username
=====
192.168.5.218 3des admin

Number of SSH sessions : 1
=====
A:ALA-7#
```

```
A:ALA-49>config>system>security# show system security ssh
```

## Show Commands

```
SSH is disabled
A:ALA-49>config>system>security#
```

## USER

- Syntax** `users [user-id] [detail]`
- Context** `show>system>security`
- Description** This command displays user information.
- Output** **User Output** — The following table describes user information output fields.

**Table 21: Show User Output Fields**

| Label            | Description                                                                                                                                                                                          |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| User ID          | The name of a system user.                                                                                                                                                                           |
| Need New PWD     | Yes — The user must change his password at the next login.<br>No — The user is not forced to change his password at the next login.                                                                  |
| User Permission  | Console — Specifies whether the user is permitted console/Telnet access.<br>FTP — Specifies whether the user is permitted FTP access.<br>SNMP — Specifies whether the user is permitted SNMP access. |
| Password expires | The date on which the current password expires.                                                                                                                                                      |
| Attempted logins | The number of times the user has attempted to login irrespective of whether the login succeeded or failed.                                                                                           |
| Failed logins    | The number of unsuccessful login attempts.                                                                                                                                                           |
| Local Conf.      | Y — Password authentication is based on the local password database.<br>N — Password authentication is not based on the local password database.                                                     |

### Sample Output

```
A:ALA-1# show system security user
=====
Users
=====
user id need user permissions password attempted failed local
 new pwd console ftp snmp expires logins logins conf

admin n y n n never 2 0 y
```

```

testuser n n n y never 0 0 y

Number of users : 2
=====
A:ALA-1#

```

## view

- Syntax** `view [view-name] [detail]`
- Context** `show>system>security`
- Description** This command lists one or all views and permissions in the MIB-OID tree.
- Output** **System Security View Output** — The following table describes system security view output fields.

**Table 22: Show System Security View Output Fields**

| Label        | Description                                                                                                                                                                                              |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| View name    | The name of the view. Views control the accessibility of a MIB object within the configured MIB view and subtree.                                                                                        |
| OID tree     | The Object Identifier (OID) value. OIDs uniquely identify MIB objects in the subtree.                                                                                                                    |
| Mask         | The mask value and the mask type, along with the <i>oid-value</i> configured in the <b>view</b> command, determines the access of each sub-identifier of an object identifier (MIB subtree) in the view. |
| Permission   | Included — Specifies to include MIB subtree objects.<br>Excluded — Specifies to exclude MIB subtree objects.                                                                                             |
| No. of Views | The total number of configured views.                                                                                                                                                                    |
| Group name   | The access group name.                                                                                                                                                                                   |

### Sample Output

```

A:ALA-1# show system security view
=====
Views
=====
view name oid tree mask permission

iso 1 included
no-security 1 included
no-security 1.3.6.1.6.3 excluded
no-security 1.3.6.1.6.3.10.2.1 included
no-security 1.3.6.1.6.3.11.2.1 included
no-security 1.3.6.1.6.3.15.1.1 included

```

## Show Commands

```

No. of Views: 6
=====
```

A:ALA-1#

```
A:ALA-1# show system security view no-security detail
=====
```

| view name   | oid tree           | mask | permission |
|-------------|--------------------|------|------------|
| no-security | 1                  |      | included   |
| no-security | 1.3.6.1.6.3        |      | excluded   |
| no-security | 1.3.6.1.6.3.10.2.1 |      | included   |
| no-security | 1.3.6.1.6.3.11.2.1 |      | included   |
| no-security | 1.3.6.1.6.3.15.1.1 |      | included   |

```

No. of Views: 5
=====
```

no-security used in

```
=====
```

group name

```

snmp-ro
snmp-rw
=====
```

A:ALA-1#

# Event and Accounting Logs

---

## In This Chapter

This chapter provides information about configuring event and accounting logs in the 7210 SAS.

Topics in this chapter include:

- [Logging Overview on page 204](#)
- [Log Destinations on page 206](#)
- [Event Logs on page 211](#)
  - [Event Sources on page 212](#)
  - [Event Control on page 214](#)
  - [Log Manager and Event Logs on page 216](#)
  - [Event Filter Policies on page 217](#)
  - [Event Log Entries on page 218](#)
  - [Simple Logger Event Throttling on page 220](#)
  - [Default System Log on page 221](#)
- [Accounting Logs on page 222](#)
  - [Accounting Records on page 222](#)
- [Configuration Notes on page 233](#)

## Logging Overview

The two primary types of logging supported in the 7210 SAS OS are event logging and accounting logs.

Event logging controls the generation, dissemination and recording of system events for monitoring status and troubleshooting faults within the system. The 7210 SAS groups events into three major categories or event sources:

- Security events — Events that pertain to attempts to breach system security.
- Change events — Events that pertain to the configuration and operation of the node.
- Main events — Events that pertain to applications that are not assigned to other event categories/sources.
- Debug events — Events that pertain to trace or other debugging information.

The following are events within the 7210 SAS and have the following characteristics:

- A time stamp in UTC or local time.
- The generating application.
- A unique event ID within the application.
- The VRF-ID.
- A subject identifying the affected object.
- A short text description.

Event control assigns the severity for each application event and whether the event should be generated or suppressed. The severity numbers and severity names supported in the 7210 SAS OS conform to ITU standards M.3100 X.733 & X.21 and are listed in [Table 23](#).

**Table 23: Event Severity Levels**

| Severity Number | Severity Name        |
|-----------------|----------------------|
| 1               | cleared              |
| 2               | indeterminate (info) |
| 3               | critical             |
| 4               | major                |
| 5               | minor                |
| 6               | warning              |

Events that are suppressed by event control will not generate any event log entries. Event control maintains a count of the number of events generated (logged) and dropped (suppressed) for each application event. The severity of an application event can be configured in event control.

An event log within the 7210 SAS OS associates the event sources with logging destinations. Examples of logging destinations include, the console session, a specific telnet or SSH session, memory logs, file destinations, SNMP trap groups and syslog destinations. A log filter policy can be associated with the event log to control which events will be logged in the event log based on combinations of application, severity, event ID range, VRF ID, and the subject of the event.

The 7210 SAS accounting logs collect comprehensive accounting statistics to support a variety of billing models. The routers collect accounting data on services and network ports on a per-service class basis. In addition to gathering information critical for service billing, accounting records can be analyzed to provide insight about customer service trends for potential service revenue opportunities. Accounting statistics on network ports can be used to track link utilization and network traffic pattern trends. This information is valuable for traffic engineering and capacity planning within the network core.

Accounting statistics are collected according to the parameters defined within the context of an accounting policy. Accounting policies are applied to . Accounting statistics are collected by counters for individual service defined on the customer's SAP or by the counters within forwarding class (FC) queues defined on the network ports.

The type of record defined within the accounting policy determines where a policy is applied, what statistics are collected and time interval at which to collect statistics.

The only supported destination for an accounting log is a compact flash system device (cf1:). Accounting data is stored within a standard directory structure on the device in compressed XML format.

## Log Destinations

Both event logs and accounting logs use a common mechanism for referencing a log destination. 7210 SAS-Series devices support the following log destinations:

- [Console on page 206](#)
- [Session on page 206](#)
- [Memory Logs on page 206](#)
- [Log Files on page 207](#)
- [SNMP Trap Group on page 209](#)
- [Syslog on page 209](#)

Only a single log destination can be associated with an event log or with an accounting log. An event log can be associated with multiple event sources, but it can only have a single log destination.

A file destination is the only type of log destination that can be configured for an accounting log.

---

### Console

Sending events to a console destination means the message will be sent to the system console. The console device can be used as an event log destination.

---

### Session

A session destination is a temporary log destination which directs entries to the active telnet or SSH session for the duration of the session. When the session is terminated, for example, when the user logs out, the event log is removed. Event logs configured with a session destination are not stored in the configuration file. Event logs can direct log entries to the session destination.

---

### Memory Logs

A memory log is a circular buffer. When the log is full, the oldest entry in the log is replaced with the new entry. When a memory log is created, the specific number of entries it can hold can be specified, otherwise it will assume a default size. An event log can send entries to a memory log destination.

## Log Files

Log files can be used by both event logs and accounting logs and are stored on the compact flash devices (specifically cf1:) in the file system.

A log file is identified with a single log file ID, but a log file will generally be composed of a number individual files in the file system. A log file is configured with a rollover parameter, expressed in minutes, which represents the length of time an individual log file should be written to before a new file is created for the relevant log file ID. The rollover time is checked only when an update to the log is performed. Thus, complying to this rule is subject to the incoming rate of the data being logged. For example, if the rate is very low, the actual rollover time may be longer than the configured value.

The retention time for a log file specifies the amount of time the file should be retained on the system based on the creation date and time of the file.

When a log file is created, only the compact flash device for the log file is specified. Log files are created in specific subdirectories with standardized names depending on the type of information stored in the log file.

Event log files are always created in the **\log** directory on the specified compact flash device. The naming convention for event log files is:

```
log eeff-timestamp
```

where:

*ee* is the event log ID

*ff* is the log file destination ID

*timestamp* is the timestamp when the file is created in the form of *yyyymmdd-hhmmss* where:

*yyyy* is the four-digit year (for example, 2007)

*mm* is the two digit number representing the month (for example, 12 for December)

*dd* is the two digit number representing the day of the month (for example, 03 for the 3rd of the month)

*hh* is the two digit hour in a 24-hour clock (for example, 04 for 4 a.m.)

*mm* is the two digit minute (for example, 30 for 30 minutes past the hour)

*ss* is the two digit second (for example, 14 for 14 seconds)

## Log Destinations

Accounting log files are created in the `\act-collect` directory on a compact flash device (*cfI*). The naming convention for accounting log files is nearly the same as for log files except the prefix **act** is used instead of the prefix **log**. The naming convention for accounting logs is:

```
act aa ff -timestamp.xml.gz
```

where:

*aa* is the accounting policy ID

*ff* is the log file destination ID

*timestamp* is the timestamp when the file is created in the form of *yyyymmdd-hhmmss*  
where:

*yyyy* is the four-digit year (for example, 2007)

*mm* is the two digit number representing the month (for example, 12 for December)

*dd* is the two digit number representing the day of the month (for example, 03 for the 3rd of the month)

*hh* is the two digit hour in a 24-hour clock (for example, 04 for 4 a.m.)

*mm* is the two digit minute (for example, 30 for 30 minutes past the hour)

*ss* is the two digit second (for example, 14 for 14 seconds)

Accounting logs are `.xml` files created in a compressed format and have a `.gz` extension.

The `\act-collect` directory is where active accounting logs are written. When an accounting log is rolled over, the active file is closed and archived in the `\act` directory before a new active accounting log file created in `\act-collect`.

## SNMP Trap Group

An event log can be configured to send events to SNMP trap receivers by specifying an SNMP trap group destination.

An SNMP trap group can have multiple trap targets. Each trap target can have different operational parameters.

A trap destination has the following properties:

- The IP address of the trap receiver.
- The UDP port used to send the SNMP trap.
- SNMP version (v1, v2c, or v3) used to format the SNMP notification.
- SNMP community name for SNMPv1 and SNMPv2c receivers.
- Security name and level for SNMPv3 trap receivers.

For SNMP traps that will be sent in-band, the source IP address of the trap is the system IP address of the 7210 SAS.

Each trap target destination of a trap group receives the identical sequence of events as defined by the log ID and the associated sources and log filter applied.

---

## Syslog

An event log can be configured to send events to one syslog destination. Syslog destinations have the following properties:

- Syslog server IP address.
- The UDP port used to send the syslog message.
- The Syslog Facility Code (0 - 23) (default 23 - local 7).
- The Syslog Severity Threshold (0 - 7) - events exceeding the configured level will be sent.

Because syslog uses eight severity levels whereas the 7210 SAS-Series uses six internal severity levels, the severity levels are mapped to syslog severities. [Table 24](#) displays the severity level mappings to syslog severities.

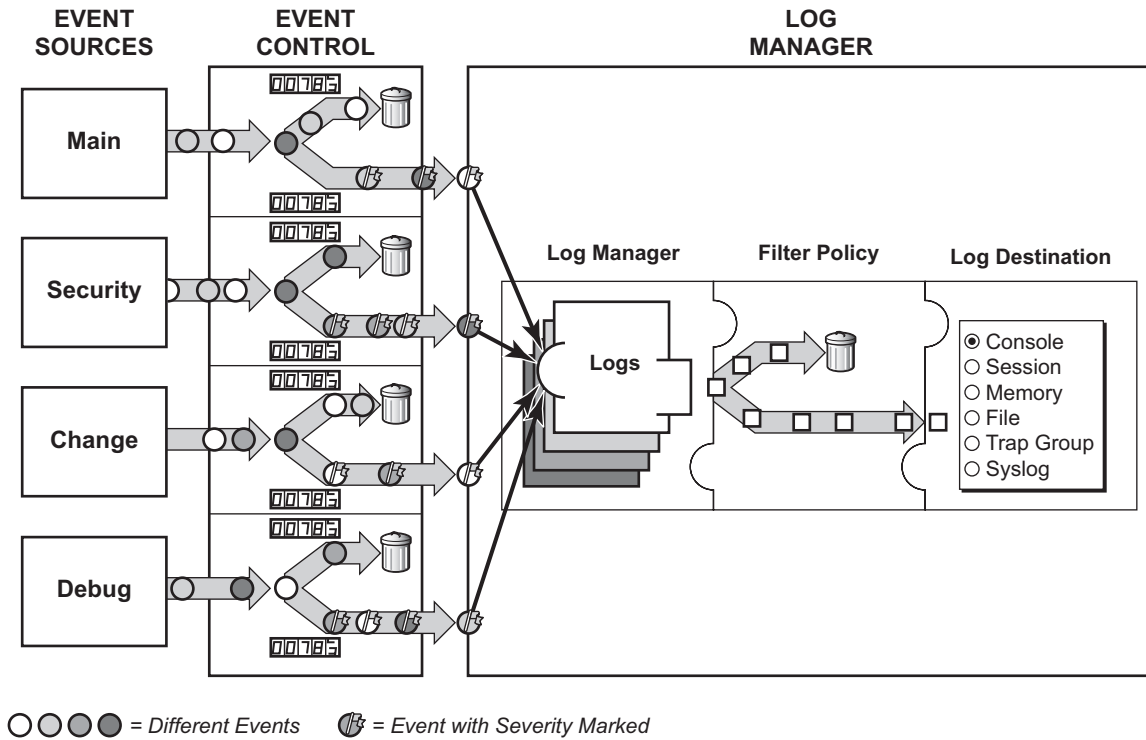
**Table 24: 7210 SAS-Series to Syslog Severity Level Mappings**

| <b>Severity Level</b>        | <b>Numerical Severity<br/>(highest to lowest)</b> | <b>Syslog<br/>Configured<br/>Severity</b> | <b>Definition</b>                |
|------------------------------|---------------------------------------------------|-------------------------------------------|----------------------------------|
|                              | 0                                                 | emergency                                 | System is unusable               |
| 3                            | 1                                                 | alert                                     | Action must be taken immediately |
| 4                            | 2                                                 | critical                                  | Critical conditions              |
| 5                            | 3                                                 | error                                     | Error conditions                 |
| 6                            | 4                                                 | warning                                   | Warning conditions               |
|                              | 5                                                 | notice                                    | Normal but significant condition |
| 1 cleared<br>2 indeterminate | 6                                                 | info                                      | Informational messages           |
|                              | 7                                                 | debug                                     | Debug-level messages             |

# Event Logs

Event logs are the means of recording system generated events for later analysis. Events are messages generated by the system by applications or processes within the 7210 SAS.

Figure 4 depicts a function block diagram of event logging.



CLI0001B

Figure 4: Event Logging Block Diagram

## Event Sources

In [Figure 4](#), the event sources are the main categories of events that feed the log manager.

- Security — The security event source is all events that affect attempts to breach system security such as failed login attempts, attempts to access MIB tables to which the user is not granted access or attempts to enter a branch of the CLI to which access has not been granted. Security events are generated by the SECURITY application and the authenticationFailure event in the SNMP application.
- Change — The change activity event source is all events that directly affect the configuration or operation of the node. Change events are generated by the USER application.
- Debug — The debug event source is the debugging configuration that has been enabled on the system. Debug events are generated by the DEBUG application.
- Main — The main event source receives events from all other applications within the 7210 SAS.

Examples of applications within 7210 SAS include IP, MPLS, OSPF, CLI, services, etc. [Figure 5](#) displays an example of the **show log applications** command output which displays all applications.

```
*A:ALU-7210# show log applications
=====
Log Event Application Names
=====
Application Name

CHASSIS
DEBUG
DOT1AG
DOT1X
EFM_OAM
FILTER
IGMP
IP
LAG
LOGGER
MIRROR
NTP
OAM
PORT
QOS
SECURITY
SNMP
STP
SVCNMR
SYSTEM
TIP
TOD
USER
VRTR
=====
*A:ALU-7210#
```

**Figure 5: Show Log Applications Command Output**

## Event Control

Event control pre-processes the events generated by applications before the event is passed into the main event stream. Event control assigns a severity to application events and can either forward the event to the main event source or suppress the event. Suppressed events are counted in event control, but these events will not generate log entries as it never reaches the log manager.

Simple event throttling is another method of event control and is configured similarly to the generation and suppression options. See [Simple Logger Event Throttling on page 220](#).

Events are assigned a default severity level in the system, but the application event severities can be changed by the user.

Application events contain an event number and description that explains why the event is generated. The event number is unique within an application, but the number can be duplicated in other applications.

The following example, generated by querying event control for application generated events, displays a partial list of event numbers and names.

```
router# show log event-control
=====
Log Events
=====
Application
ID# Event Name P g/s Logged Dropped

CHASSIS:
 2001 cardFailure MA gen 0 0
 2002 cardInserted MI gen 2 0
 2003 cardRemoved MI gen 0 0
 2004 cardWrong MI gen 0 0
 2005 EnvTemperatureTooHigh MA gen 0 0
 2006 fanFailure CR gen 0 0
 ...
EFM_OAM:
 2001 tmnxDot3OamPeerChanged MI gen 0 0
 2002 tmnxDot3OamLoopDetected MI gen 0 0
 2003 tmnxDot3OamLoopCleared MI gen 0 0
FILTER:
 2001 tIPFilterPBRPacketsDrop WA gen 0 0
 2002 tFilterEntryActivationFailed WA gen 0 0
 2003 tFilterEntryActivationRestored WA gen 0 0
IGMP:
 2001 vRtrIcmpIfRxQueryVerMismatch WA gen 0 0
 2002 vRtrIcmpIfCModeRxQueryMismatch WA gen 0 0
 2003 vRtrIcmpMaxGrpsLimitExceeded WA gen 0 0
 2004 vRtrIcmpMcacPlyDropped WA gen 0 0
IP:
L 2001 clearRTMError MI gen 0 0
L 2002 ipEtherBroadcast MI gen 0 0
L 2003 ipDuplicateAddress MI gen 0 0
L 2004 ipArpInfoOverwritten MI gen 0 0
```

```

L 2005 fibAddFailed MA gen 0 0
...
SYSTEM:
 2001 stiDateAndTimeChanged WA gen 0 0
 2002 ssiSaveConfigSucceeded MA gen 1 0
 2003 ssiSaveConfigFailed CR gen 1 0
 2004 sbiBootConfig MA gen 1 0
 2005 sbiBootSnmpd MA gen 1 0
...
VRTR:
 2001 tmnxVRtrMidRouteTCA MI gen 0 0
 2002 tmnxVRtrHighRouteTCA MI gen 0 0
 2003 tmnxVRtrHighRouteCleared MI gen 0 0
...
=====
router#

```

## Log Manager and Event Logs

Events that are forwarded by event control are sent to the log manager. The log manager manages the event logs in the system and the relationships between the log sources, event logs and log destinations, and log filter policies.

An event log has the following properties:

- A unique log ID  
The log ID is a short, numeric identifier for the event log. A maximum of ten logs can be configured at a time.
- One or more log sources  
The source stream or streams to be sent to log destinations can be specified. The source must be identified before the destination can be specified. The events can be from the main event stream, events in the security event stream, or events in the user activity stream.
- One event log destination  
A log can only have a single destination. The destination for the log ID destination can be one of console, session, syslog, snmp-trap-group, memory, or a file on the local file system.
- An optional event filter policy  
An event filter policy defines whether to forward or drop an event or trap-based on match criteria.

## Event Filter Policies

The log manager uses event filter policies to allow fine control over which events are forwarded or dropped based on various criteria. Like other policies with the 7210 SAS, filter policies have a default action. The default actions are either:

- Forward
- Drop

Filter policies also include a number of filter policy entries that are identified with an entry ID and define specific match criteria and a forward or drop action for the match criteria.

Each entry contains a combination of matching criteria that define the application, event number, router, severity, and subject conditions. The entry's action determines how the packets should be treated if they have met the match criteria.

Entries are evaluated in order from the lowest to the highest entry ID. The first matching event is subject to the forward or drop action for that entry.

Valid operators are displayed in [Table 25](#):

**Table 25: Valid Filter Policy Operators**

| Operator | Description              |
|----------|--------------------------|
| eq       | equal to                 |
| neq      | not equal to             |
| lt       | less than                |
| lte      | less than or equal to    |
| gt       | greater than             |
| gte      | greater than or equal to |

A match criteria entry can include combinations of:

- Equal to or not equal to a given system application.
- Equal to, not equal to, less than, less than or equal to, greater than or greater than or equal to an event number within the application.
- Equal to, not equal to, less than, less than or equal to, greater than or greater than or equal to a severity level.
- Equal to or not equal to a router name string or regular expression match.
- Equal to or not equal to an event subject string or regular expression match.

## Event Log Entries

Log entries that are forwarded to a destination are formatted in a way appropriate for the specific destination whether it be recorded to a file or sent as an SNMP trap, but log event entries have common elements or properties. All application generated events have the following properties:

- A time stamp in UTC or local time.
- The generating application.
- A unique event ID within the application.
- A router name identifying the VRF-ID that generated the event.
- A subject identifying the affected object.
- A short text description.

The general format for an event in an event log with either a memory, console or file destination is as follows.

```
nnnn YYYY/MM/DD HH:MM:SS.SS <severity>:<application> # <event_id> <router-name> <subject>
description
```

The following is an event log example:

```
475 2006/11/27 00:19:40.38 WARNING: SNMP #2007 Base 1/1/1
"interface 1/1/1 came up"
```

The specific elements that compose the general format are described in [Table 26](#).

**Table 26: Log Entry Field Descriptions**

| Label       | Description                                                                                                              |
|-------------|--------------------------------------------------------------------------------------------------------------------------|
| nnnn        | The log entry sequence number.                                                                                           |
| YYYY/MM/DD  | The UTC date stamp for the log entry.<br><i>YYYY</i> — Year<br><i>MM</i> — Month<br><i>DD</i> — Date                     |
| HH:MM:SS.SS | The UTC time stamp for the event.<br><i>HH</i> — Hours (24 hour format)<br><i>MM</i> — Minutes<br><i>SS.SS</i> — Seconds |

**Table 26: Log Entry Field Descriptions (Continued)**

| Label         | Description                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <severity>    | The severity level name of the event.<br>CLEARED — A cleared event (severity number 1).<br>INFO — An indeterminate/informational severity event (severity level 2).<br>CRITICAL — A critical severity event (severity level 3).<br>MAJOR — A major severity event (severity level 4).<br>MINOR — A minor severity event (severity level 5).<br>WARNING — A warning severity event (severity 6). |
| <application> | The application generating the log message.                                                                                                                                                                                                                                                                                                                                                     |
| <event_id>    | The application's event ID number for the event.                                                                                                                                                                                                                                                                                                                                                |
| <router>      | The router name representing the VRF-ID that generated the event.                                                                                                                                                                                                                                                                                                                               |
| <subject>     | The subject/affected object for the event.                                                                                                                                                                                                                                                                                                                                                      |
| <description> | A text description of the event.                                                                                                                                                                                                                                                                                                                                                                |

## Simple Logger Event Throttling

Simple event throttling provides a mechanism to protect event receivers from being overloaded when a scenario causes many events to be generated in a very short period of time. A throttling rate, # events/# seconds, can be configured. Specific event types can be configured to be throttled. Once the throttling event limit is exceeded in a throttling interval, any further events of that type cause the dropped events counter to be incremented. Dropped events counts are displayed by the **show>log>event-control** context. Events are dropped before being sent to one of the logger event collector tasks. There is no record of the details of the dropped events and therefore no way to retrieve event history data lost by this throttling method.

A particular event type can be generated by multiple managed objects within the system. At the point this throttling method is applied the logger application has no information about the managed object that generated the event and cannot distinguish between events generated by object "A" from events generated by object "B". If the events have the same event-id, they are throttled regardless of the managed object that generated them. It also does not know which events may eventually be logged to destination log-id <n> from events that will be logged to destination log-id <m>.

Throttle rate applies commonly to all event types. It is not configurable for a specific event-type.

A timer task checks for events dropped by throttling when the throttle interval expires. If any events have been dropped, a TIMETRA-SYSTEM-MIB::tmnxTrapDropped notification is sent.

## Default System Log

Log 99 is a pre-configured memory-based log which logs events from the main event source (not security, debug, etc.). Log 99 exists by default.

The following example displays the log 99 configuration.

```
ALA-1>config>log# info detail
#-----
echo "Log Configuration "
#-----
...
 snmp-trap-group 7
 exit
...
 log-id 99
 description "Default system log"
 no filter
 from main
 to memory 500
 no shutdown
 exit

ALA-1>config>log#
```

## Accounting Logs

Before an accounting policy can be created a target log file must be created to collect the accounting records. The files are stored in system memory on compact flash (*cf1:*) in a compressed (tar) XML format and can be retrieved using FTP or SCP.

A file ID can only be assigned to either one event log ID or one accounting log.

---

## Accounting Records

An accounting policy must define a record name and collection interval. Only one record name can be configured per accounting policy. Also, a record name can only be used in one accounting policy.

The record name, sub-record types, and default collection period for service and network accounting policies are shown below.

**Table 27: Accounting Record Name and Collection Periods (for 7210 SAS-D devices)**

| Record Name                     | Sub-Record Types   | Accounting Object | Default Collection Period (minutes) |
|---------------------------------|--------------------|-------------------|-------------------------------------|
| service-ingress-octets          | sio                | SAP               | 5                                   |
| service-egress-octets           | seo                | SAP               | 5                                   |
| service-ingress-packets         | sip                | SAP               | 5                                   |
| service-egress-packets          | sep                | SAP               | 5                                   |
| combined-service-ingress        | sip, sio           | SAP               | 5                                   |
| combined-service-egress         | seo, sep           | SAP               | 5                                   |
| complete-service-ingress-egress | sip, sio, seo, sep | SAP               | 5                                   |
| access-egress-packets           | aep                | access-port       | 5                                   |
| access-egress-octets            | aeo                | access-port       | 5                                   |
| combined-access-egress          | cmAeo, cmAep       | access-port       | 5                                   |
| network-ingress-octets          | nio                | network-port      | 15                                  |

**Table 27: Accounting Record Name and Collection Periods (for 7210 SAS-D devices) (Continued)**

| Record Name                            | Sub-Record Types | Accounting Object | Default Collection Period (minutes) |
|----------------------------------------|------------------|-------------------|-------------------------------------|
| network-ingress-packets                | nip              | network-port      | 15                                  |
| network-egress-octets                  | neo              | network-port      | 15                                  |
| network-egress-packetss                | neo              | network-port      | 15                                  |
| combined-network-egress                | cmNeo, cmNep     | network-port      | 15                                  |
| combined-network-ingress-egress-octets | cmNio, cmNeo     | network-port      | 15                                  |

**Table 28: Accounting Record Name and Collection Periods (for 7210 SAS-E devices)**

| Record Name                          | Sub-Record Types | Accounting Object | Default Collection Period (minutes) |
|--------------------------------------|------------------|-------------------|-------------------------------------|
| service-ingress-octets               | sio              | SAP               | 5                                   |
| service-ingress-packets              | sip              | SAP               | 5                                   |
| network-ingress-octets               | nio              | network port      | 15                                  |
| network-ingress-packets              | nip              | network port      | 15                                  |
| service-egress-pkts                  | sep              | SAP               | 5                                   |
| combined-service-ingress-egress-pkts | cmSip & cmSep    | SAP               | 5                                   |
| access-egress-packets                | aep              | access port       | 5                                   |
| network-egress-packets               | nep              | network port      | 15                                  |
| combined-network-ingress-egress-pkts | cmNip & cmNep    | network port      | 15                                  |

When creating accounting policies, one service accounting policy and one network accounting policy can be defined as default. If statistics collection is enabled on a SAP, access-uplink, or network port and no accounting policy is applied, then the respective default policy is used. If no default policy is defined, then no statistics are collected unless a specifically defined accounting policy is applied.

Each accounting record name is composed of one or more sub-records which is in turn composed of multiple fields. [Table 29](#) and [Table 30](#) lists the accounting policy record names and the statistics that are collected.

In 7210 SAS devices for VLL and VPLS services, the counter-mode of counters associated with SAP ingress meters/policers can be changed by executing the following command:

1. config>service>epipe/vpls>sap>statistics>ingress>counter-mode { in-out-profile-count|forward-drop-count }. (For 7210 SAS-D devices)
2. config>service>epipe/vpls>sap>statistics>ingress>counter-mode { packet | octet } { in-out-profile-count|forward-drop-count }. (For 7210 SAS-E devices)

For more information on the counter-mode command refer to the 7210 SAS E,D Services guide.

The statistics collected for the following accounting records listed below vary based on the counter-mode selected:

1. Service-ingress-octets
2. Service-ingress-packets
3. Combined-service-ingress
4. Complete-service-ingress-egress

Table 29 and 30 depict the changes in the records based on the counter-mode selected.

**Table 29: Accounting Record Name Details (for 7210 SAS-E devices)**

| Record Name                                                                           | Sub-Record | Field | Field Description           |
|---------------------------------------------------------------------------------------|------------|-------|-----------------------------|
| Service-ingress-octets (sio) (**) (counter mode is <b>in-out-profile-count</b> )      | sio        | svc   | SvcId                       |
|                                                                                       |            | sap   | SapId                       |
|                                                                                       |            | mid   | MeterId                     |
|                                                                                       |            | iof   | InProfileOctetsForwarded    |
|                                                                                       |            | oof   | OutOfProfileOctetsForwarded |
| Service-ingress-octets (counter mode is <b>forward-drop-count</b> )                   | sio        | svc   | SvcId                       |
|                                                                                       |            | sap   | SapId                       |
|                                                                                       |            | mId   | MeterId                     |
|                                                                                       |            | of    | OctetsForwarded             |
|                                                                                       |            | od    | OctetsDropped               |
| Service-ingress-packets (sip) (*) (**) (counter mode is <b>in-out-profile-count</b> ) | sip        | svc   | SvcId                       |
|                                                                                       |            | sap   | SapId                       |
|                                                                                       |            | mid   | MeterId                     |
|                                                                                       |            | ipf   | InProfilePktsForwarded      |
|                                                                                       |            | opf   | OutOfProfilePktsForwarded   |

**Table 29: Accounting Record Name Details (for 7210 SAS-E devices) (Continued)**

| Record Name                                                                                      | Sub-Record     | Field       | Field Description           |
|--------------------------------------------------------------------------------------------------|----------------|-------------|-----------------------------|
| Service-ingress-packets<br>(counter mode is<br><b>forward-drop-count</b> )                       | sip            | svc         | SvcId                       |
|                                                                                                  |                | sap         | SapId                       |
|                                                                                                  |                | mId         | MeterId                     |
|                                                                                                  |                | pf          | PacketsForwarded            |
|                                                                                                  |                | p           | PacketsDropped              |
| Network-ingress-octets<br>(nio)                                                                  | nio            | port        | PortId                      |
|                                                                                                  |                | mid         | MeterId                     |
|                                                                                                  |                | iof         | InProfileOctetsForwarded    |
|                                                                                                  |                | oof         | OutOfProfileOctetsForwarded |
| Network-ingress-packets<br>(nip)                                                                 | nip            | port        | PortId                      |
|                                                                                                  |                | mid         | MeterId                     |
|                                                                                                  |                | ipf         | InProfilePktsForwarded      |
|                                                                                                  |                | opf         | OutOfProfilePktsForwarded   |
| Service-egress-pkts (sep)<br>(*)(**)                                                             | sep            | svc         | SvcId                       |
|                                                                                                  |                | sap         | SapId                       |
|                                                                                                  |                | epf         | PacketsForwarded            |
| Combined-service-<br>ingress-egress-pkts (<br>counter mode is <b>in-out-<br/>profile-count</b> ) | cmSip<br>cmSep | svc         | SvcId                       |
|                                                                                                  |                | sap         | SapId                       |
|                                                                                                  |                | epf         | PacketsForwarded            |
|                                                                                                  |                | ipo         | PacketsReceived             |
|                                                                                                  |                | mid         | MeterId                     |
|                                                                                                  |                | ipf         | InProfilePktsForwarded      |
|                                                                                                  |                | opf         | OutOfProfilePktsForwarded   |
| Combined-service-<br>ingress-egress-<br>pkts(counter mode is<br><b>forward-drop-count</b> )      | cmSip, cmSep   | (Per Meter) | (Per Meter)                 |
|                                                                                                  |                | svc         | SvcId                       |
|                                                                                                  |                | sap         | SapId                       |
|                                                                                                  |                | mId         | MeterId                     |
|                                                                                                  |                | pf          | PacketsForwarded            |
|                                                                                                  |                | pd          | PacketsDropped              |
|                                                                                                  |                | of          | OctetsForwarded             |
|                                                                                                  |                | od          | OctetsDropped               |
| Access-egress-packets                                                                            | aep            | port        | PortId                      |
|                                                                                                  |                | qId         | QueueId                     |
|                                                                                                  |                | epf         | PacketsForwarded            |
| Network-egress-packets                                                                           | nep            | port        | PortId                      |
|                                                                                                  |                | qId         | QueueId                     |
|                                                                                                  |                | epf         | PacketsForwarded            |

**Table 29: Accounting Record Name Details (for 7210 SAS-E devices) (Continued)**

| Record Name                             | Sub-Record     | Field | Field Description         |
|-----------------------------------------|----------------|-------|---------------------------|
| Combined-network-ingress-egress-packets | cmNip<br>cmNep | port  | PortId                    |
|                                         |                | mid   | MeterId                   |
|                                         |                | ipf   | InProfilePktsForwarded    |
|                                         |                | opf   | OutOfProfilePktsForwarded |
|                                         |                | qld   | QueueId                   |
|                                         |                | epf   | PacketsForwarded          |

**Table 30: Accounting Record Name Details (for 7210 SAS-D devices)**

| Record Name                                                           | Sub-Record | Field       | Field Description           |
|-----------------------------------------------------------------------|------------|-------------|-----------------------------|
|                                                                       |            | (Per Meter) | (Per Meter)                 |
| Service-ingress-octets (counter mode is <b>in-out-profile-count</b> ) | sio        | svc         | SvcId                       |
|                                                                       |            | sap         | SapId                       |
|                                                                       |            | mId         | MeterId                     |
|                                                                       |            | iof         | InProfileOctetsForwarded    |
|                                                                       |            | oof         | OutOfProfileOctetsForwarded |
|                                                                       |            | (Per SAP)   | (Per SAP)                   |
|                                                                       |            | svc         | SvcId                       |
|                                                                       |            | sap         | SapId                       |
|                                                                       |            | ioo         | IngressOctetsOffered        |
| Service-ingress-octets (counter mode is <b>forward-drop-count</b> )   | sio        | (Per Meter) | (Per Meter)                 |
|                                                                       |            | svc         | SvcId                       |
|                                                                       |            | sap         | SapId                       |
|                                                                       |            | mId         | MeterId                     |
|                                                                       |            | of          | OctetsForwarded             |
|                                                                       |            | od          | OctetsDropped               |
|                                                                       |            | (Per SAP)   | (Per SAP)                   |
|                                                                       |            | svc         | SvcId                       |
|                                                                       |            | sap         | SapId                       |
| Service-egress-octets                                                 | seo        | ioo         | IngressOctetsOffered        |
|                                                                       |            | (Per SAP)   | (Per SAP)                   |
|                                                                       |            | svc         | SvcId                       |
|                                                                       |            | sap         | SapId                       |
|                                                                       |            | eof         | EgressOctetsForwarded       |

Table 30: Accounting Record Name Details (for 7210 SAS-D devices) (Continued)

| Record Name                                                                | Sub-Record | Field       | Field Description           |
|----------------------------------------------------------------------------|------------|-------------|-----------------------------|
| Service-ingress-packets<br>( counter mode is <b>in-out-profile-count</b> ) | sip        | (Per Meter) | (Per Meter)                 |
|                                                                            |            | svc         | SvcId                       |
|                                                                            |            | sap         | SapId                       |
|                                                                            |            | mId         | MeterId                     |
|                                                                            |            | ipf         | InProfilePktsForwarded      |
|                                                                            |            | opf         | OutOfProfilePktsForwarded   |
|                                                                            |            | (Per SAP)   | (Per SAP)                   |
|                                                                            |            | svc         | SvcId                       |
|                                                                            |            | sap         | SapId                       |
|                                                                            |            | ipo         | IngressPktsOffered          |
| Service-ingress-packets<br>(counter mode is <b>forward-drop-count</b> )    | sip        | (Per Meter) | (Per Meter)                 |
|                                                                            |            | svc         | SvcId                       |
|                                                                            |            | sap         | SapId                       |
|                                                                            |            | mId         | MeterId                     |
|                                                                            |            | pf          | PacketsForwarded            |
|                                                                            |            | pd          | PacketsDropped              |
|                                                                            |            | (Per SAP)   | (Per SAP)                   |
|                                                                            |            | svc         | SvcId                       |
|                                                                            |            | sap         | SapId                       |
|                                                                            |            | ipo         | IngressPktsOffered          |
| Service-egress-packets                                                     | sep        | (Per SAP)   | (Per SAP)                   |
|                                                                            |            | svc         | SvcId                       |
|                                                                            |            | sap         | SapId                       |
|                                                                            |            | epf         | EgressPktsForwarded         |
| Combined-service-ingress (counter mode is <b>in-out-profile-count</b> )    | sio, sip   | (Per Meter) | (Per Meter)                 |
|                                                                            |            | svc         | SvcId                       |
|                                                                            |            | sap         | SapId                       |
|                                                                            |            | mId         | MeterId                     |
|                                                                            |            | iof         | InProfileOctetsForwarded    |
|                                                                            |            | oof         | OutOfProfileOctetsForwarded |
|                                                                            |            | ipf         | InProfilePktsForwarded      |
|                                                                            |            | opf         | OutOfProfilePktsFORwarded   |
|                                                                            |            | (Per SAP)   | (Per SAP)                   |
|                                                                            |            | seo, sep    | svc                         |
|                                                                            | sap        |             | SapId                       |
|                                                                            | ioo        |             | IngressOctetsOffered        |
|                                                                            | ipo        |             | IngressPktsOffered          |

**Table 30: Accounting Record Name Details (for 7210 SAS-D devices) (Continued)**

| Record Name                                                                    | Sub-Record | Field       | Field Description         |                       |
|--------------------------------------------------------------------------------|------------|-------------|---------------------------|-----------------------|
| Combined-service-ingress(counter mode is <b>forward-drop-count</b> )           | sip, sio   | (Per Meter) | (Per Meter)               |                       |
|                                                                                |            | svc         | SvcId                     |                       |
|                                                                                |            | sap         | SapId                     |                       |
|                                                                                |            | mId         | MeterId                   |                       |
|                                                                                |            | pf          | PacketsForwarded          |                       |
|                                                                                |            | pd          | PacketsDropped            |                       |
|                                                                                |            | of          | OctetsForwarded           |                       |
|                                                                                |            | od          | OctetsDropped             |                       |
|                                                                                |            | (Per SAP)   | (Per SAP)                 |                       |
|                                                                                |            | svc         | SvcId                     |                       |
|                                                                                |            | sap         | SapId                     |                       |
|                                                                                |            | ipo         | IngressPktsOffered        |                       |
|                                                                                |            | ioo         | IngressOctetsOffered      |                       |
| Combined-service-egress                                                        | seo, sep   | (Per SAP)   | (per SAP)                 |                       |
|                                                                                |            | svc         | SvcId                     |                       |
|                                                                                |            | sap         | SapId                     |                       |
|                                                                                |            | ioo         | IngressOctetsOffered      |                       |
|                                                                                |            | ipo         | IngressPktsOffered        |                       |
| Complete-service-ingress-egress (counter mode is <b>in-out-profile-count</b> ) | sio, sip   | (Per Meter) | (Per Meter)               |                       |
|                                                                                |            | svc         | SvcId                     |                       |
|                                                                                |            | sap         | SapId                     |                       |
|                                                                                |            | mId         | MeterId                   |                       |
|                                                                                |            | iof         | InProfileOctetsForwarded  |                       |
|                                                                                |            | oof         | OutProfileOctetsForwarded |                       |
|                                                                                |            | ipf         | InProfilePktsFORWARDED    |                       |
|                                                                                |            | opf         | OutOfProfilePktsForwarded |                       |
|                                                                                |            | (Per SAP)   | (Per SAP)                 |                       |
|                                                                                |            | svc         | SvcId                     |                       |
|                                                                                |            | sap         | SapId                     |                       |
|                                                                                |            | ioo         | IngressOctetsOffered      |                       |
|                                                                                |            | ipo         | IngressPktsOffered        |                       |
|                                                                                | seo, sep   |             | (Per SAP)                 | (Per SAP)             |
|                                                                                |            |             | svc                       | SvcId                 |
|                                                                                |            |             | sap                       | SapId                 |
|                                                                                |            |             | eof                       | EgressOctetsForwarded |
|                                                                                |            | epf         | EgressPktsForwarded       |                       |

**Table 30: Accounting Record Name Details (for 7210 SAS-D devices) (Continued)**

| Record Name                                                             | Sub-Record   | Field         | Field Description     |
|-------------------------------------------------------------------------|--------------|---------------|-----------------------|
| Complete-service-ingress-egress(counter mode is " forward-drop-count" ) | sip sio      | (Per Meter)   | (Per Meter)           |
|                                                                         |              | svc           | SvcId                 |
|                                                                         |              | sap           | SapId                 |
|                                                                         |              | mId           | MeterId               |
|                                                                         |              | pf            | PacketsForwarded      |
|                                                                         |              | pd            | PacketsDropped        |
|                                                                         |              | of            | OctetsForwarded       |
|                                                                         |              | od            | OctetsDropped         |
|                                                                         |              | (Per SAP)     | (Per SAP)             |
|                                                                         |              | svc           | SvcId                 |
|                                                                         |              | sap           | SapId                 |
|                                                                         |              | ipo           | IngressPktsOffered    |
|                                                                         |              | ioo           | IngressOctetsOffered  |
|                                                                         |              | (Per SAP)     | (Per SAP)             |
|                                                                         |              | svc           | SvcId                 |
|                                                                         |              | sap           | SapId                 |
|                                                                         |              | eof           | EgressOctetsForwarded |
|                                                                         |              | epf           | EgressPktsForwarded   |
| Access-egress-octets                                                    | aoe          | (Per Queue)   | (Per Queue)           |
|                                                                         |              | port          | PortId                |
|                                                                         |              | qId           | QueueId               |
|                                                                         |              | of            | OctetsForwarded       |
|                                                                         |              | od            | Octets Dropped        |
|                                                                         |              |               |                       |
| Access-egress-packets                                                   | aep          | (Per Queue)   | (Per Queue)           |
|                                                                         |              | port          | PortId                |
|                                                                         |              | qId           | QueueId               |
|                                                                         |              | pf            | PktsForwarded         |
|                                                                         |              | pd            | PktsDropped           |
| Combined-access-egress                                                  | cmAeo, cmAep | (Per Queue)   | (Per Queue)           |
|                                                                         |              | port          | PortId                |
|                                                                         |              | qId           | QueueId               |
|                                                                         |              | of            | OctetsForawrded       |
|                                                                         |              | pf            | PktsForwarded         |
|                                                                         |              | pd            | PktsDropped           |
|                                                                         | od           | OctetsDropped |                       |

**Table 30: Accounting Record Name Details (for 7210 SAS-D devices) (Continued)**

| Record Name                     | Sub-Record   | Field       | Field Description           |
|---------------------------------|--------------|-------------|-----------------------------|
| Network-ingress-octets          | nio          | (Per Meter) | (Per Meter)                 |
|                                 |              | port        | PortId                      |
|                                 |              | mId         | MeterId                     |
|                                 |              | iof         | InProfileOctetsForwarded    |
|                                 |              | oof         | OutProfileOctetsForwarded   |
| Network-ingress-packets         | nip          | (Per Meter) | (Per Meter)                 |
|                                 |              | port        | PortId                      |
|                                 |              | mId         | MeterId                     |
|                                 |              | ipf         | InProfilePktsForwarded      |
|                                 |              | opf         | OutProfilePktsForwarded     |
| Network-egress-octets           | neo          | (Per Queue) | (Per Queue)                 |
|                                 |              | port        | PortId                      |
|                                 |              | qId         | QueueId                     |
|                                 |              | of          | OctetsForwarded             |
|                                 |              | od          | Octets Dropped              |
| Network-egress-packets          | nep          | (Per Queue) | (Per Queue)                 |
|                                 |              | port        | PortId                      |
|                                 |              | qId         | QueueId                     |
|                                 |              | pf          | PktsForwarded               |
|                                 |              | pd          | PktsDropped                 |
| Combined-network-egress         | cmNeo, cmNep | (Per Queue) | (Per Queue)                 |
|                                 |              | port        | PortId                      |
|                                 |              | qId         | QueueId                     |
|                                 |              | of          | OctetsForwarded             |
|                                 |              | pf          | PktsForwarded               |
|                                 |              | pd          | PktsDropped                 |
|                                 |              | od          | Octets Dropped              |
| Combined-network-ing-egr-octets | cmNio, cmNeo | (Per Meter) | (Per Meter)                 |
|                                 |              | port        | PortId                      |
|                                 |              | mId         | MeterId                     |
|                                 |              | iof         | InProfileOctetsForwarded    |
|                                 |              | oof         | OutOfProfileOctetsForwarded |
|                                 |              | (Per Queue) | (Per Queue)                 |
|                                 |              | port        | PortId                      |
|                                 |              | qId         | QueueId                     |
|                                 |              | of          | OctetsForwarded             |
|                                 |              | od          | Octets Dropped              |

## Configuration Guidelines

1. In 7210 SAS-E devices, the ingress SAP counter operates in either octet or packet mode when either in-out-profile-count or forward-drop-count is in use. The mode of the counter can be configured to collect data in either packets or octets. The counter mode can be specified for ingress SAP counters only. The egress SAP counters collect only the number of packets. The accounting records collect the packet or octet count on a SAP based on the accounting policy associated with the SAP. The default mode of the ingress SAP counter is set to packet.
2. In 7210 SAS-D device, the ingress SAP counter counts both octets and packets simultaneously.
3. For 7210 SAS-D and 7210 SAS-E devices, the egress SAP counter is disabled by default.
4. In 7210 SAS-E, the mode of the counter cannot be changed if an accounting policy is already associated with a SAP.
5. Ensure that egress SAP counters are enabled on 7210 SAS-E devices before associating accounting records of type Service-egress-pkts and Combined- service-ingress-egress-pkts.
6. Ensure that egress SAP counters are enabled on 7210 SAS-D devices before associating accounting records of type Service-egress-octets, service-egress-packets,combined-service-egress and complete-service-ingress-egress
7. Before modifying the counter mode, disable account log generation. Execute the **no collect-stats** command. Changing the mode of the counter results in loss of previously collected counts and resets the counter.
8. Egress SAP statistics are not available on any of the SAPs of a port, on which a dot1q SAP and dot1q default SAP configuration are present at the same time.

## Reporting and Time-Based Accounting

Node support for volume and time-based accounting concept provides an extra level of intelligence at the network element level in order to provide service models such as “prepaid access” in a scalable manner. This means that the network element gathers and stores per-subscriber accounting information and compare it with “pre-defined” quotas. Once a quota is exceeded, the pre-defined action (such as re-direction to a web portal or disconnect) is applied.

## Configuration Notes

This section describes logging configuration caveats.

---

- A file or filter cannot be deleted if it has been applied to a log.
- File IDs, syslog IDs, or SNMP trap groups must be configured before they can be applied to a log ID.
- A file ID can only be assigned to *either* one log ID *or* one accounting policy.
- Accounting policies must be configured in the **config>log** context before they can be applied to a service SAP or service interface, or applied to a network port.
- The **snmp-trap-id** must be the same as the **log-id**.



## Configuring Logging with CLI

This section provides information to configure logging using the command line interface.

Topics in this section include:

- [Log Configuration Overview on page 236](#)  
→ [Log Types on page 236](#)
- [Basic Event Log Configuration on page 237](#)
- [Common Configuration Tasks on page 238](#)
- [Log Management Tasks on page 247](#)

## Log Configuration Overview

Configure logging parameters to save information in a log file or direct the messages to other devices. Logging does the following:

- Provides you with logging information for monitoring and troubleshooting.
  - Allows you to select the types of logging information to be recorded.
  - Allows you to assign a severity to the log messages.
  - Allows you to select the source and target of logging information.
- 

## Log Types

Logs can be configured in the following contexts:

- Log file — Log files can contain log event message streams or accounting/billing information. Log file IDs are used to direct events, alarms/traps and debug information to their respective targets.
- SNMP trap groups — SNMP trap groups contain an IP address and community names which identify targets to send traps following specified events.
- Syslog — Information can be sent to a syslog host that is capable of receiving selected syslog messages from a network element.
- Event control — Configures a particular event or all events associated with an application to be generated or suppressed.
- Event filters — An event filter defines whether to forward or drop an event or trap based on match criteria.
- Accounting policies — An accounting policy defines the accounting records that will be created. Accounting policies can be applied to one or more service access points (SAPs), access-uplink(network) ports, and access ports.
- .
- Event logs — An event log defines the types of events to be delivered to its associated destination.
- Event throttling rate — Defines the rate of throttling events.

## Basic Event Log Configuration

The most basic log configuration must have the following:

- Log ID or accounting policy ID
- A log source
- A log destination

The following displays a log configuration example.

```
A:ALA-12>config>log# info
#-----
echo "Log Configuration "
#-----
 event-control " " 2001 generate critical
 file-id 1
 description "This is a test file-id."
 location cf1:
 exit
 file-id 2
 description "This is a test log."
 location cf1:
 exit
 snmp-trap-group 7
 trap-target 11.22.33.44 "snmpv2c" notify-community "public"
 exit
 log-id 2
 from main
 to file 2
 exit

A:ALA-12>config>log#
```

## Common Configuration Tasks

The following sections are basic system tasks that must be performed.

- [Configuring a File ID on page 240](#)
  - [Configuring an Event Log on page 238](#)
  - [Configuring an Accounting Policy on page 241](#)
  - [Configuring Event Control on page 242](#)
  - [Configuring a Log Filter on page 244](#)
  - [Configuring an SNMP Trap Group on page 245](#)
  - [Configuring a Syslog Target on page 246](#)
- 

### Configuring an Event Log

An event log file contains information used to direct events, alarms, traps, and debug information to their respective destinations. One or more event sources can be specified. File IDs, SNMP trap groups, or syslog IDs must be configured before they can be applied to an event log ID.

Use the following CLI syntax to configure a log file:

```
CLI Syntax: config>log
 log-id log-id
 description description-string
 filter filter-id
 from {[main] [security] [change] [debug-trace]}
 to console
 to file file-id
 to memory [size]
 to session
 to snmp [size]
 to syslog syslog-id}
 time-format {local|utc}
 no shutdown
```

The following displays a log file configuration example:

```
ALA-12>config>log>log-id# info

...
 log-id 2
 description "This is a test log file."
 filter 1
 from main security
 to file 1
 exit
...

ALA-12>config>log>log-id#
```

## Configuring a File ID

To create a log file, a file ID is defined, the target CF drive or USB is specified, and the rollover ,retention interval period for the log file is defined. The rollover interval is defined in minutes and determines how long a file will be used before it is closed and a new log file is created. The retention interval determines how long the file will be stored on the CF before it is deleted.

Use the following CLI syntax to configure a log file using CF drive:

```
CLI Syntax: config>log
 file-id log-file-id
 description description-string
 location cflash-id
 rollover minutes [retention hours]
```

The following displays a log file configuration example :

```
A:ALA-12>config>log# info

 file-id 1
 description "This is a log file."
 location cfl:
 rollover 600 retention 24
 exit

A:ALA-12>config>log#
```

Use the following CLI syntax to configure a log file using USB:

```
CLI Syntax: config>log
 file-id log-file-id
 description description-string
 location usb-flash-id
 rollover minutes [retention hours]
```

The following displays a log file configuration example :

```
A:ALA-12>config>log# info

 file-id 1
 description "This is a log file."
 location ufl:
 rollover 600 retention 24
 exit

A:ALA-12>config>log#
```

## Configuring an Accounting Policy

Before an accounting policy can be created a target log file must be created to collect the accounting records. The files are stored in system memory or compact flash (cf1:) in a compressed (tar) XML format and can be retrieved using FTP or SCP. See [Configuring an Event Log on page 238](#) and [Configuring a File ID on page 240](#).

Accounting policies must be configured in the **config>log** context before they can be applied to a service SAP or service interface, or applied to a network port.

The default accounting policy statement cannot be applied to LDP nor RSVP statistics collection records.

An accounting policy must define a record type and collection interval. Only one record type can be configured per accounting policy.

When creating accounting policies, one access, one access port and one network accounting policy can be defined as default. If statistics collection is enabled on an accounting object, and no accounting policy is applied, then the respective default accounting policy is used. If no default policy is defined, then no statistics are collected unless a specifically-defined accounting policy is applied.

Use the following CLI syntax to configure an accounting policy:

**CLI Syntax:**

```
config>log>
 accounting-policy acct-policy-id interval minutes
 description description-string
 default
 record record-name
 to file log-file-id
 no shutdown
```

The following displays a accounting policy configuration example:

```
A:ALA-12>config>log# info

 accounting-policy 5
 description "This is a test accounting policy."
 record service-ingress-packets
 to file 3
 exit

A:ALA-12>config>log#
```

## Configuring Event Control

Use the following CLI syntax to configure event control. Note that the **throttle** parameter used in the **event-control** command syntax enables throttling for a specific event type. The **config>log>throttle-rate** command configures the number of events and interval length to be applied to all event types that have throttling enabled by this **event-control** command.

**CLI Syntax:**

```
config>log
 event-control application-id [event-name|event-number] generate
 [severity-level] [throttle]
 event-control application-id [event-name|event-number] suppress
 throttle-rate events [interval seconds]
```

The following displays an event control configuration:

```
A:ALA-12>config>log# info
#-----
echo "Log Configuration"
#-----
 throttle-rate 500 interval 10
 event-control "oam" 2001 generate throttle
 event-control "ospf" 2001 suppress
 event-control "ospf" 2003 generate cleared
 event-control "ospf" 2014 generate critical
..
#-----
A:ALA-12>config>log>filter#
```

## Configuring Throttle Rate

This command configures the number of events and interval length to be applied to all event types that have throttling enabled by the **event-control** command.

Use the following CLI syntax to configure the throttle rate.

**CLI Syntax:** `config>log#  
throttle-rate events [interval seconds]`

The following displays a throttle rate configuration example:

```
*A:gal171>config>log# info

throttle-rate 500 interval 10
event-control "aps" 2001 generate throttle

*A:gal171>config>log#
```

## Configuring a Log Filter

Use the following CLI syntax to configure a log filter:

```

CLI Syntax: config>log
 filter filter-id
 default-action {drop|forward}
 description description-string
 entry entry-id
 action {drop|forward}
 description description-string
 match
 application {eq|neq} application-id
 number {eq|neq|lt|lte|gt|gte} event-id
 router {eq|neq} router-instance [regex]
 severity {eq|neq|lt|lte|gt|gte} severity-level
 subject {eq|neq} subject [regex]

```

The following displays a log filter configuration example:

```

A:ALA-12>config>log# info
#-----
echo "Log Configuration "
#-----
 file-id 1
 description "This is our log file."
 location cfl:
 rollover 600 retention 24
 exit
 filter 1
 default-action drop
 description "This is a sample filter."
 entry 1
 action forward
 match
 application eq "mirror"
 severity eq critical
 exit
 exit
 exit
...
 log-id 2
 shutdown
 description "This is a test log file."
 filter 1
 from main security
 to file 1
 exit
...
#-----
A:ALA-12>config>log#

```

## Configuring an SNMP Trap Group

The associated *log-id* does not have to be configured before a **snmp-trap-group** can be created, however, the **snmp-trap-group** must exist before the *log-id* can be configured to use it.

Use the following CLI syntax to configure an SNMP trap group:

```
CLI Syntax: config>log
 snmp-trap-group log-id
 trap-target name [address ip-address] [port port]
 [snmpv1|snmpv2c| snmpv3] notify-community communi-
 tyName |snmpv3SecurityName [security-level {no-
 auth-no-privacy|auth-no-privacy|privacy}]
```

The following displays a basic SNMP trap group configuration example:

```
A:ALA-12>config>log# info

...
 snmp-trap-group 2
 trap-target 10.10.10.104:5 "snmpv3" notify-community "coummunitystring"
 exit
...
 log-id 2
 description "This is a test log file."
 filter 1
 from main security
 to file 1
 exit
...

A:ALA-12>config>log#
```

## Configuring a Syslog Target

Log events cannot be sent to a syslog target host until a valid syslog ID exists.

Use the following CLI syntax to configure a syslog file:

**CLI Syntax:** `config>log`  
                  `syslog syslog-id`  
                  `description description-string`  
                  `address ip-address`  
                  `log-prefix log-prefix-string`  
                  `port port`  
                  `level {emergency|alert|critical|error|warning|notice|in-`  
                  `fo|debug}`  
                  `facility syslog-facility`

The following displays a syslog configuration example:

```
A:ALA-12>config>log# info

...
 syslog 1
 description "This is a syslog file."
 address 10.10.10.104
 facility user
 level warning
 exit
...

A:ALA-12>config>log#
```

## Log Management Tasks

This section discusses the following logging tasks:

- [Modifying a Log File on page 248](#)
- [Deleting a Log File on page 250](#)
- [Modifying a File ID on page 251](#)
- [Deleting a File ID on page 253](#)
- [Modifying a Syslog ID on page 254](#)
- [Deleting a Syslog on page 255](#)
- [Modifying an SNMP Trap Group on page 256](#)
- [Deleting an SNMP Trap Group on page 257](#)
- [Modifying a Log Filter on page 258](#)
- [Deleting a Log Filter on page 260](#)
- [Modifying Event Control Parameters on page 261](#)
- [Returning to the Default Event Control Configuration on page 262](#)

## Modifying a Log File

Use the following CLI syntax to modify a log file:

**CLI Syntax:**

```
config>log
 log-id log-id
 description description-string
 filter filter-id
 from {[main] [security] [change] [debug-trace]}
 to console
 to file file-id
 to memory [size]
 to session
 to snmp [size]
 to syslog syslog-id}
```

The following displays the current log configuration:

```
ALA-12>config>log>log-id# info

...
 log-id 2
 description "This is a test log file."
 filter 1
 from main security
 to file 1
 exit
...

ALA-12>config>log>log-id#
```

The following displays an example to modify log file parameters:

**Example:**

```
config# log
config>log# log-id 2
config>log>log-id# description "Chassis log file."
config>log>log-id# filter 2
config>log>log-id# from security
config>log>log-id# exit
```

The following displays the modified log file configuration:

```
A:ALA-12>config>log# info

...
 log-id 2
 description "Chassis log file."
 filter 2
 from security
 to file 1
 exit
...

A:ALA-12>config>log#
```

## Deleting a Log File

The log ID must be shutdown first before it can be deleted. In a previous example, **file 1** is associated with **log-id 2**.

```
A:ALA-12>config>log# info

 file-id 1
 description "LocationTest."
 location cfl:
 rollover 600 retention 24
 exit
...
 log-id 2
 description "Chassis log file."
 filter 2
 from security
 to file 1
 exit
...

A:ALA-12>config>log#
```

Use the following CLI syntax to delete a log file:

**CLI Syntax:**

```
config>log
 no log-id log-id
 shutdown
```

The following displays an example to delete a log file:

**Example:**

```
config# log
config>log# log-id 2
config>log>log-id# shutdown
config>log>log-id# exit
config>log# no log-id 2
```

## Modifying a File ID

**NOTE:** When the **file-id** location parameter is modified, log files are not written to the new location until a rollover occurs or the log is manually cleared. A rollover can be forced by using the **clear>log** command. Subsequent log entries are then written to the new location. If a rollover does not occur or the log not cleared, the old location remains in effect.

The location can be CF (cflash-id) or USB(usb-flash-id).

Use the following CLI syntax to modify a log file:

**CLI Syntax:**

```
config>log
 file-id log-file-id
 description description-string
 location [cflash-id]
 rollover minutes [retention hours]
```

The following displays the current log configuration:

```
A:ALA-12>config>log# info

file-id 1
 description "This is a log file."
 location cf1:
 rollover 600 retention 24
exit

A:ALA-12>config>log#
```

The following displays an example to modify log file parameters:

**Example:**

```
config# log
config>log# file-id 1
config>log>file-id# description "LocationTest."
config>log>file-id# rollover 2880 retention 500
config>log>file-id# exit
```

The following displays the file modifications:

```
A:ALA-12>config>log# info

...
file-id 1
 description "LocationTest."
 location cf1:
 rollover 2880 retention 500
exit
...

```

## Log Management Tasks

```
A:ALA-12>config>log#
```

## Deleting a File ID

**NOTE:** All references to the file ID must be deleted before the file ID can be removed.

Use the following CLI syntax to delete a log ID:

**CLI Syntax:** `config>log`  
`no file-id log-file-id`

The following displays an example to delete a file ID:

**Example:** `config>log# no file-id 1`

## Modifying a Syslog ID

**NOTE:** All references to the syslog ID must be deleted before the syslog ID can be removed.

Use the following CLI syntax to modify a syslog ID parameters:

**CLI Syntax:**

```
config>log
 syslog syslog-id
 description description-string
 address ip-address
 log-prefix log-prefix-string
 port port
 level {emergency|alert|critical|error|warning|notice|info|debug}
 facility syslog-facility
```

The following displays an example of the syslog ID modifications:

**Example:**

```
config# log
config>log# syslog 1
config>log>syslog$ description "Test syslog."
config>log>syslog# address 10.10.0.91
config>log>syslog# facility mail
config>log>syslog# level info
```

The following displays the syslog configuration:

```
A:ALA-12>config>log# info

...
 syslog 1
 description "Test syslog."
 address 10.10.10.91
 facility mail
 level info
 exit
...

A:ALA-12>config>log#
```

## Deleting a Syslog

Use the following CLI syntax to delete a syslog file:

**CLI Syntax:** `config>log`  
`no syslog syslog-id`

The following displays an example to delete a syslog ID:

**Example:** `config# log`  
`config>log# no syslog 1`

## Modifying an SNMP Trap Group

Use the following CLI syntax to modify an SNMP trap group:

**CLI Syntax:** config>log  
 snmp-trap-group log-id  
 trap-target name [address ip-address] [port port]  
 [snmpv1|snmpv2c| snmpv3] notify-community communi-  
 tyName |snmpv3SecurityName [security-level {no-  
 auth-no-privacy|auth-no-privacy|privacy}]

The following displays the current SNMP trap group configuration:

```
A:ALA-12>config>log# info

...
 snmp-trap-group 10
 trap-target 10.10.10.104:5 "snmpv3" notify-community "coummunitystring"
 exit
...

A:ALA-12>config>log#
```

The following displays an example of the command usage to modify an SNMP trap group:

**Example:** config# log  
 config>log# snmp-trap-group 10  
 config>log>snmp-trap-group# no trap-target 10.10.10.104:5  
 config>log>snmp-trap-group# snmp-trap-group# trap-target  
 10.10.0.91:1 snmpv2c notify-community "com1"

The following displays the SNMP trap group configuration:

```
A:ALA-12>config>log# info

...
 snmp-trap-group 10
 trap-target 10.10.0.91:1 "snmpv2c" notify-community "com1"
 exit
...

A:ALA-12>config>log#
```

## Deleting an SNMP Trap Group

Use the following CLI syntax to delete a trap target and SNMP trap group:

**CLI Syntax:** `config>log`  
`no snmp-trap-group log-id`  
`no trap-target name`

The following displays the SNMP trap group configuration:

```
A:ALA-12>config>log# info

...
 snmp-trap-group 10
 trap-target 10.10.0.91:1 "snmpv2c" notify-community "com1"
 exit
...

A:ALA-12>config>log#
```

The following displays an example to delete a trap target and an SNMP trap group.

**Example:** `config>log# snmp-trap-group 10`  
`config>log>snmp-trap-group# no trap-target 10.10.0.91:1`  
`config>log>snmp-trap-group# exit`  
`config>log# no snmp-trap-group 10`

## Modifying a Log Filter

Use the following CLI syntax to modify a log filter:

```
CLI Syntax: config>log
 filter filter-id
 default-action {drop|forward}
 description description-string
 entry entry-id
 action {drop|forward}
 description description-string
 match
 application {eq|neq} application-id
 number {eq|neq|lt|lte|gt|gte} event-id
 router {eq|neq} router-instance [regex]
 severity {eq|neq|lt|lte|gt|gte} severity-level
 subject {eq|neq} subject [regex]
```

The following output displays the current log filter configuration:

```
ALA-12>config>log# info
#-----
echo "Log Configuration "
#-----
...
 filter 1
 default-action drop
 description "This is a sample filter."
 entry 1
 action forward
 match
 application eq "mirror"
 severity eq critical
 exit
 exit
 exit
 ...
#-----
ALA-12>config>log#
```

The following displays an example of the log filter modifications:

```
Example: config# log
config>log# filter 1
config>log>filter# description "This allows <n>."
config>log>filter# default-action forward
config>log>filter# entry 1
config>log>filter>entry$ action drop
config>log>filter>entry# match
config>log>filter>entry>match# application eq user
```

```
config>log>filter>entry>match# number eq 2001
config>log>filter>entry>match# no severity
config>log>filter>entry>match# exit
```

The following displays the log filter configuration:

```
A:ALA-12>config>log>filter# info

...
 filter 1
 description "This allows <n>."
 entry 1
 action drop
 match
 application eq "user"
 number eq 2001
 exit
 exit
 exit
...

A:ALA-12>config>log>filter#
```

## Deleting a Log Filter

Use the following CLI syntax to delete a log filter:

**CLI Syntax:** `config>log`  
`no filter filter-id`

The following output displays the current log filter configuration:

```
A:ALA-12>config>log>filter# info

...
 filter 1
 description "This allows <n>."
 entry 1
 action drop
 match
 application eq "user"
 number eq 2001
 exit
 exit
 exit
 ...

A:ALA-12>config>log>filter#
```

The following displays an example of the command usage to delete a log filter:

**Example:** `config>log# no filter 1`

## Modifying Event Control Parameters

Use the following CLI syntax to modify event control parameters:

**CLI Syntax:** `config>log`  
                   `event-control application-id [event-name|event-number] generate[severity-level] [throttle]`  
                   `event-control application-id [event-name|event-number] suppress`

The following displays the current event control configuration:

```
A:ALA-12>config>log# info

...
 event-control " " 2014 generate critical
...

A:ALA-12>config>log#
```

The following displays an example of an event control modifications:

**Example:** `config# log`  
                   `config>log# event-control 2014 suppress`

The following displays the log filter configuration:

```
A:ALA-12>config>log# info

...
 event-control " " 2014 suppress
...

A:ALA-12>config>log#
```

## Returning to the Default Event Control Configuration

The **no** form of the **event-control** command returns modified values back to the default values.

Use the following CLI syntax to modify event control parameters:

**CLI Syntax:** `config>log`  
`no event-control application [event-name |event-number]`

The following displays an example of the command usage to return to the default values:

**Example:** `config# log`  
`config>log# no event-control "" 2001`  
`config>log# no event-control "" 2002`  
`config>log# no event-control "" 2014`

```
A:ALA-12>config>log# info detail

#-----
echo "Log Configuration"
#-----
event-control "" 2001 generate minor
event-control "" 2002 generate warning
event-control "" 2003 generate warning
event-control "" 2004 generate critical
event-control "" 2005 generate warning
event-control "" 2006 generate warning
event-control "" 2007 generate warning
event-control "" 2008 generate warning
event-control "" 2009 generate warning
event-control "" 2010 generate warning
event-control "" 2011 generate warning
event-control "" 2012 generate warning
event-control "" 2013 generate warning
event-control "" 2014 generate warning
event-control "" 2015 generate critical
event-control "" 2016 generate warning
...

A:ALA-12>config>log#
```

## Configuring SNMP Dying Gasp

Use the following CLI syntax to configure SNMP dying gasp:

**CLI Syntax:** config>log  
                   no snmp-dying-gasp primary <trap-target-group-num> < trap-target-  
                                           name> [secondary {<trap-target-group-num><trap-target-name>}  
                                           [tertiary {<trap-target-group-num> <trap-target-  
                                           name>}]]

### Sample Configuration

```
*A:Dut-A>config>log# snmp-dying-gasp primary 7 server1 secondary 8 server2
*A:Dut-A>config>log# info

 snmp-trap-group 7
 trap-target "server1" address 1.1.1.1 snmpv2c notify-community "public"
 exit
 snmp-trap-group 8
 trap-target "server2" address 10.135.2.10 snmpv3 notify-community "snmpv3user"
security-level auth-no-privacy
 exit
 snmp-trap-group 9
 trap-target "server3" address 2.2.2.2 snmpv3 notify-community "snmpv3user"
security-level auth-no-privacy
 exit
 log-id 7
 from main
 to snmp
 exit
 log-id 8
 from main
 to snmp
 exit
 log-id 9
 from main
 to snmp
 exit
 snmp-dying-gasp primary 7 "server1" secondary 8 "server2"

*A:Dut-A>config>log#
```

## Configuration Guidelines for SNMP Dying Gasp Trap

The system does not try to resolve the ARP when it needs to send out the SNMP dying-gasp trap, since the amount of time available during power loss event is very less. Instead, the system assumes that ARP entry to the gateway used to reach the SNMP trap server is always available. It is recommended that user run a periodic ping query to the SNMP trap server in the background using the cron utility.

Sample configuration of a cron job which initiates a ping to the server mentioned in the pingscript file every 1 minute:

```
*7210-SAS># configure cron
*7210-SAS >config>cron# info

 script "pingserver"
 location "cf1:\pingscript"
 no shutdown
 exit
 action "pingserver"
 results "cf1:\results_pingserver"
 script "pingserver"
 no shutdown
 exit
 schedule "pingserver"
 interval 60
 action "pingserver"
 no shutdown
 exit

*7210-SAS >config>cron#
*7210-SAS >config>cron# exit
*7210-SAS # file type cf1:\pingscript
File: pingscript

ping 10.135.2.10
file delete force cf1:\results_pingserver*
```

---

# Log Command Reference

---

## Command Hierarchies

- [Log Command Reference on page 265](#)
  - [Accounting Policy Commands on page 266](#)
  - [File ID Commands on page 266](#)
  - [Event Filter Commands on page 266](#)
  - [Log ID Commands on page 267](#)
  - [SNMP Trap Group Commands on page 267](#)
  - [Syslog Commands on page 268](#)
- [Show Commands on page 269](#)
- [Clear Command on page 269](#)

## Log Configuration Commands

```
config
 — log
 — event-control application-id [event-name | event-number] [generate [severity-level] [throt-
tle]
 — event-control application-id [event-name | event-number] suppress
 — no event-control application [event-name | event-number]
 — throttle-rate events [interval seconds]
 — no throttle-rate
```

## ACCOUNTING POLICY COMMANDS

```
config
 — log
 — accounting-policy acct-policy-id
 — no accounting-policy acct-policy-id
 — [no] default
 — collection-interval minutes
 — [no] collection-interval
 — description description-string
 — no description
 — record record-name
 — no record
 — [no] shutdown
 — to file log-file-id
```

## FILE ID COMMANDS

```
config
 — log
 — [no] file-id log-file-id
 — description description-string
 — no description
 — location [<cflash-id> | <usb-flash-id>]
 — rollover minutes [retention hours]
 — no rollover
```

## EVENT FILTER COMMANDS

```
config
 — log
 — [no] filter filter-id
 — default-action {drop | forward}
 — no default-action
 — description description-string
 — no description
 — [no] entry entry-id
 — action {drop | forward}
 — no action
 — description description-string
 — no description
 — [no] match
 — application {eq | neq} application-id
 — no application
 — number {eq | neq | lt | lte | gt | gte} event-id
 — no number
 — router {eq | neq} router-instance [regex]
 — no router
 — severity {eq | neq | lt | lte | gt | gte} severity-level
 — no severity
 — subject {eq | neq} subject [regex]
 — no subject
```

## LOG ID COMMANDS

```

config
 — log
 — [no] log-id log-id
 — description description-string
 — no description
 — filter filter-id
 — no filter
 — from {[main] [security] [change] [debug-trace]}
 — no from
 — [no] shutdown
 — time-format {local | utc}
 — to console
 — to file log-file-id
 — to memory [size]
 — to session
 — to snmp [size]
 — to syslog syslog-id

```

## SNMP TRAP GROUP COMMANDS

```

config
 — log
 — [no] snmp-trap-group log-id
 — description description-string
 — no description
 — trap-target name address ip-address [port port] [snmpv1 | snmpv2c | snmpv3]
 notify-community communityName | snmpv3SecurityName [security-level {no-
 auth-no-privacy | auth-no-privacy | privacy}[replay]]]
 — no trap-target name
 — [no] snmp-dying-gasp primary trap-target-group-num trap-target-name [secondary {trap-
 target-group-num trap-target-name}] [tertiary {trap-target-group-num trap-target-name}]

```

SYSLOG COMMANDS

```
config
 — log
 — [no] syslog syslog-id
 — address ip-address
 — no address
 — description description-string
 — no description
 — facility syslog-facility
 — no facility
 — level syslog-level
 — no level
 — log-prefix log-prefix-string
 — no log-prefix
 — port port
 — no port
```

## Show Commands

```
show
 — log
 — accounting-policy [acct-policy-id] [access | network]
 — accounting-records
 — applications
 — event-control [application-id [event-name | event-number]]
 — file-id [log-file-id]
 — filter-id [filter-id]
 — log-collector
 — log-id [log-id] [severity severity-level] [application application] [sequence from-seq [to-seq]] [count count] [router router-instance [expression]] [subject subject [regexp]] [ascending | descending]
 — snmp-trap-group [log-id]
 — syslog [syslog-id]
```

## Clear Command

```
clear
 — log log-id
```



---

## Configuration Commands

---

### Generic Commands

#### description

|                    |                                                                                                                                                                                                                                                                                                                                        |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>description</b> <i>string</i><br><b>no description</b>                                                                                                                                                                                                                                                                              |
| <b>Context</b>     | config>log>filter<br>config>log>filter>entry<br>config>log>log-id<br>config>log>accounting-policy<br>config>log>file-id<br>config>log>syslog<br>config>log>snmp-trap-group                                                                                                                                                             |
| <b>Description</b> | This command creates a text description stored in the configuration file for a configuration context. The <b>description</b> command associates a text string with a configuration context to help identify the content in the configuration file.<br><br>The <b>no</b> form of the command removes the string from the configuration. |
| <b>Default</b>     | No text description is associated with this configuration. The string must be entered.                                                                                                                                                                                                                                                 |
| <b>Parameters</b>  | <i>string</i> — The description can contain a string of up to 80 characters composed of printable, 7-bit ASCII characters. If the string contains special characters (#, \$, spaces, etc.), the entire string must be enclosed within double quotes.                                                                                   |

#### shutdown

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>        | <b>[no] shutdown</b>                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Context</b>       | config>log>log-id<br>config>log>accounting-policy                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Description</b>   | This command administratively disables an entity. When disabled, an entity does not change, reset, or remove any configuration settings or statistics. The operational state of the entity is disabled as well as the operational state of any entities contained within. Many objects must be shut down before they may be deleted.<br><br>The <b>no</b> form of this command administratively enables an entity. |
| <b>Default</b>       | <b>no shutdown</b>                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Special Cases</b> | <b>log-id</b> <i>log-id</i> — When a <i>log-id</i> is shut down, no events are collected for the entity. This leads to the loss of event data.                                                                                                                                                                                                                                                                     |

**accounting-policy** *accounting Policy* — When an accounting policy is shut down, no accounting data is written to the destination log ID. Counters in the billing data reflect totals, not increments, so when the policy is re-enabled (**no shutdown**) the counters include the data collected during the period the policy was shut down.

---

## Event Control

### event-control

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <p><b>event-control</b> <i>application-id</i> [<i>event-name</i>   <i>event-number</i>] [<b>generate</b> [<i>severity-level</i>] [<b>throttle</b>]</p> <p><b>event-control</b> <i>application-id</i> [<i>event-name</i>   <i>event-number</i>] <b>suppress</b></p> <p><b>no event-control</b> <i>application</i> [<i>event-name</i>   <i>event-number</i>]</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Context</b>     | config>log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b> | <p>This command is used to specify that a particular event or all events associated with an application is either generated or suppressed.</p> <p>Events are generated by an application and contain an event number and description explaining the cause of the event. Each event has a default designation which directs it to be generated or suppressed.</p> <p>Events are generated with a default severity level that can be modified by using the <i>severity-level</i> option.</p> <p>Events that are suppressed by default are typically used for debugging purposes. Events are suppressed at the time the application requests the event's generation. No event log entry is generated regardless of the destination. While this feature can save processor resources, there may be a negative effect on the ability to troubleshoot problems if the logging entries are squelched. In reverse, indiscriminate application may cause excessive overhead.</p> <p>The rate of event generation can be throttled by using the <b>throttle</b> parameter.</p> <p>The <b>no</b> form of the command reverts the parameters to the default setting for events for the application or a specific event within the application. The severity, generate, suppress, and throttle options will also be reset to the initial values.</p> |
| <b>Default</b>     | Each event has a set of default settings. To display a list of all events and the current configuration use the <b>event-control</b> command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Parameters</b>  | <p><i>application-id</i> — The application whose events are affected by this event control filter.</p> <p><b>Default</b> None, this parameter must be explicitly specified.</p> <p><b>Values</b> A valid application name. To display a list of valid application names, use the <b>applications</b> command. Valid applications are:</p> <p><i>event-name</i>   <i>event-number</i> — To generate, suppress, or revert to default for a single event, enter the specific number or event short name. If no event number or name is specified, the command applies to all events in the application. To display a list of all event short names use the <b>event-control</b> command.</p> <p><b>Default</b> none</p> <p><b>Values</b> A valid event name or event number.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

**generate** — Specifies that logger event is created when this event occurs. The generate keyword can be used with two optional parameters, *severity-level* and **throttle**.

**Default** generate

*severity-name* — An ASCII string representing the severity level to associate with the specified generated events

**Default** The system assigned severity name

**Values** One of: cleared, indeterminate, critical, major, minor, warning.

**throttle** — Specifies whether or not events of this type will be throttled.  
By default, event throttling is on for most event types.

**suppress** — This keyword indicates that the specified events will not be logged. If the **suppress** keyword is not specified then the events are generated by default.

**Default** generate

---

## Log File Commands

### file-id

- Syntax** [no] **file-id** *file-id*
- Context** config>log
- Description** This command creates the context to configure a file ID template to be used as a destination for an event log or billing file.
- This command defines the file location and characteristics that are to be used as the destination for a log event message stream or accounting/billing information. The file defined in this context is subsequently specified in the **to** command under **log-id** or **accounting-policy** to direct specific logging or billing source streams to the file destination.
- A file ID can only be assigned to either *one* **log-id** or *one* **accounting-policy**. It cannot be reused for multiple instances. A file ID and associated file definition must exist for each log and billing file that must be stored in the file system.
- A file is created when the file ID defined in this command is selected as the destination type for a specific log or accounting record. Log files are collected in a “log” directory. Accounting files are collected in an “act” directory.

The file names for a log are created by the system as summarized in the table below:

| File Type       | File Name                |
|-----------------|--------------------------|
| Log File        | <i>logllff-timestamp</i> |
| Accounting File | <i>actaaff-timestamp</i> |

Where:

- *ll* is the *log-id*
- *aa* is the accounting *policy-id*
- *ff* is the file-id
- The *timestamp* is the actual timestamp when the file is created. The format for the timestamp is *yyyymmdd-hhmmss* where:
  - *yyyy* is the year (for example, 2006)
  - *mm* is the month number (for example, 12 for December)
  - *dd* is the day of the month (for example, 03 for the 3rd of the month)
  - *hh* is the hour of the day in 24 hour format (for example, 04 for 4 a.m.)
  - *mm* is the minutes (for example, 30 for 30 minutes past the hour)
  - *ss* is the number of seconds (for example, 14 for 14 seconds)
- The accounting file is compressed and has a *gz* extension.

## Configuration Commands

When initialized, each file will contain:

- The *log-id* description.
- The time the file was opened.
- The reason the file was created.
- If the event log file was closed properly, the sequence number of the last event stored on the log is recorded.

If the process of writing to a log file fails (for example, the compact flash card is full) and if a backup location is not specified or fails, the log file will not become operational even if the compact flash card is replaced. Enter either a **clear log** command or a **shutdown/no shutdown** command to reinitialize the file.

If the primary location fails (for example, the compact flash card fills up during the write process), a trap is sent and logging continues to the specified backup location. This can result in truncated files in different locations.

The **no** form of the command removes the *file-id* from the configuration. A *file-id* can only be removed from the configuration if the file is not the designated output for a log destination. The actual file remains on the file system.

**Default** No default file IDs are defined.

**Parameters** *file-id* — The file identification number for the file, expressed as a decimal integer.

**Values** 1 — 99

## location

**Syntax** **location** [*<cflash-id>* | *<usb-flash-id>*]  
**no location**

**Context** config>log>file *file-id*

**Description** This command specifies the primary location where the log or billing file will be created.

When creating files, the primary location is used as long as there is available space. If no space is available, an attempt is made to delete unnecessary files that are past their retention date.

If sufficient space is not available an attempt is made to remove the oldest to newest closed log or accounting files. After each file is deleted, the system attempts to create the new file.

A medium severity trap is issued to indicate that a compact flash is either not available or that no space is available on the specified flash and that the backup location is being used.

A high priority alarm condition is raised if none of the configured compact flash devices for this file ID are present or if there is insufficient space available. If space does become available, then the alarm condition will be cleared.

Use the **no** form of this command to revert to default settings.

**Default** Log files are created on cf1: and accounting files are created on cf1:.

**Parameters** *cflash-id* — Specifies the primary compact flash location.

**Values** cflash-id: cf1:

*usb-flash-id* — Specifies the USB location

**Values** usb-flash-id uf1:

## rollover

**Syntax** **rollover** *minutes* [**retention** *hours*]  
**no rollover**

**Context** config>log>file *file-id*

**Description** This command configures how often an event or accounting log is rolled over or partitioned into a new file.

An event or accounting log is actually composed of multiple, individual files. The system creates a new file for the log based on the **rollover** time, expressed in minutes.

The **retention** option, expressed in hours, allows you to modify the default time to keep the file in the system. The retention time is based on the rollover time of the file.

When multiple **rollover** commands for a *file-id* are entered, the last command overwrites the previous command.

**Default** **rollover 1440 retention 12**

**Parameters** *minutes* — The rollover time, in minutes.

**Values** 5 — 10080

*retention hours*. The retention period in hours, expressed as a decimal integer. The retention time is based on the time creation time of the file. The file becomes a candidate for removal once the creation timestamp + rollover time + retention time is less than the current timestamp.

**Default** 12

**Values** 1 — 500

---

## Log Filter Commands

### filter

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] filter</b> <i>filter-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Context</b>     | config>log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Description</b> | <p>This command creates a context for an event filter. An event filter specifies whether to forward or drop an event or trap based on the match criteria.</p> <p>Filters are configured in the <b>filter</b> <i>filter-id</i> context and then applied to a log in the <b>log-id</b> <i>log-id</i> context. Only events for the configured log source streams destined to the log ID where the filter is applied are filtered.</p> <p>Any changes made to an existing filter, using any of the sub-commands, are immediately applied to the destinations where the filter is applied.</p> <p>The <b>no</b> form of the command removes the filter association from log IDs which causes those logs to forward all events.</p> |
| <b>Default</b>     | No event filters are defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Parameters</b>  | <p><b>filter-id</b> — The filter ID uniquely identifies the filter.</p> <p><b>Values</b>     1 — 1001</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

### default-action

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>default-action {drop   forward}</b><br><b>no default-action</b>                                                                                                                                                                                                                                                                                                                                              |
| <b>Context</b>     | config>log>filter <i>filter-id</i>                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b> | <p>The default action specifies the action that is applied to events when no action is specified in the event filter entries or when an event does not match the specified criteria.</p> <p>When multiple <b>default-action</b> commands are entered, the last command overwrites the previous command.</p> <p>The <b>no</b> form of the command reverts the default action to the default value (forward).</p> |
| <b>Default</b>     | <b>default-action forward</b> — The events which are not explicitly dropped by an event filter match are forwarded.                                                                                                                                                                                                                                                                                             |
| <b>Parameters</b>  | <p><b>drop</b> — The events which are not explicitly forwarded by an event filter match are dropped.</p> <p><b>forward</b> — The events which are not explicitly dropped by an event filter match are forwarded.</p>                                                                                                                                                                                            |

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## Log Filter Entry Commands

### action

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>action</b> { <b>drop</b>   <b>forward</b> }<br><b>no action</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Context</b>     | config>log>filter <i>filter-id</i> >entry <i>entry-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Description</b> | <p>This command specifies a drop or forward action associated with the filter entry. If neither <b>drop</b> nor <b>forward</b> is specified, the <b>default-action</b> will be used for traffic that conforms to the match criteria. This could be considered a No-Op filter entry used to explicitly exit a set of filter entries without modifying previous actions.</p> <p>Multiple action statements entered will overwrite previous actions.</p> <p>The <b>no</b> form of the command removes the specified <b>action</b> statement.</p> |
| <b>Default</b>     | Action specified by the <b>default-action</b> command will apply.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Parameters</b>  | <p><b>drop</b> — Specifies packets matching the entry criteria will be dropped.</p> <p><b>forward</b> — Specifies packets matching the entry criteria will be forwarded.</p>                                                                                                                                                                                                                                                                                                                                                                  |

### entry

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | [ <b>no</b> ] <b>entry</b> <i>entry-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Context</b>     | config>log>filter <i>filter-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Description</b> | <p>This command is used to create or edit an event filter entry. Multiple entries may be created using unique <i>entry-id</i> numbers. The TiMOS implementation exits the filter on the first match found and executes the action in accordance with the action command.</p> <p>Comparisons are performed in an ascending entry ID order. When entries are created, they should be arranged sequentially from the most explicit entry to the least explicit. Matching ceases when a packet matches an entry. The entry action is performed on the packet, either drop or forward. To be considered a match, the packet must meet all the conditions defined in the entry.</p> <p>An entry may not have any match criteria defined (in which case, everything matches) but must have at least the keyword action for it to be considered complete. Entries without the action keyword will be considered incomplete and are rendered inactive.</p> <p>The <b>no</b> form of the command removes the specified entry from the event filter. Entries removed from the event filter are immediately removed from all log-id's where the filter is applied.</p> |
| <b>Default</b>     | No event filter entries are defined. An entry must be explicitly configured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Configuration Commands

**Parameters** *entry-id*. The entry ID uniquely identifies a set of match criteria corresponding action within a filter. Entry ID values should be configured in staggered increments so you can insert a new entry in an existing policy without renumbering the existing entries.

**Values** 1 — 999

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## Log Filter Entry Match Commands

### match

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | [no] match                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Context</b>     | config>log>filter <i>filter-id</i> >entry <i>entry-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Description</b> | <p>This command creates context to enter/edit match criteria for a filter entry. When the match criteria is satisfied, the action associated with the entry is executed.</p> <p>If more than one match parameter (within one match statement) is specified, then all the criteria must be satisfied (AND functional) before the action associated with the match is executed.</p> <p>Use the <b>application</b> command to display a list of the valid applications.</p> <p>Match context can consist of multiple match parameters (application, event-number, severity, subject), but multiple <b>match</b> statements cannot be entered per entry.</p> <p>The <b>no</b> form of the command removes the match criteria for the <i>entry-id</i>.</p> |
| <b>Default</b>     | No match context is defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

### application

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>application</b> {eq   neq} <i>application-id</i><br><b>no application</b>                                                                                                                                                                                                                                                                                                                                        |
| <b>Context</b>     | config>log>filter <i>filter-id</i> >entry <i>entry-id</i> >match                                                                                                                                                                                                                                                                                                                                                    |
| <b>Description</b> | <p>This command adds an OS application as an event filter match criterion.</p> <p>An OS application is the software entity that reports the event. Applications include IP, MPLS, OSPF, CLI, SERVICES etc. Only one application can be specified. The latest <b>application</b> command overwrites the previous command.</p> <p>The <b>no</b> form of the command removes the application as a match criterion.</p> |
| <b>Default</b>     | <b>no application</b> — No application match criterion is specified.                                                                                                                                                                                                                                                                                                                                                |
| <b>Parameters</b>  | <b>eq</b>   <b>neq</b> — The operator specifying the type of match. Valid operators are listed in the table below.                                                                                                                                                                                                                                                                                                  |

| Operator | Notes        |
|----------|--------------|
| eq       | equal to     |
| neq      | not equal to |

*application-id* — The application name string.

## number

|                    |                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>number</b> { <b>eq</b>   <b>neq</b>   <b>lt</b>   <b>lte</b>   <b>gt</b>   <b>gte</b> } <i>event-id</i><br><b>no number</b>                                                                                                                                                                                                                                                                    |
| <b>Context</b>     | config>log>filter <i>filter-id</i> >entry <i>entry-id</i> >match                                                                                                                                                                                                                                                                                                                                  |
| <b>Description</b> | This command adds an SR OS application event number as a match criterion.<br>SR OS event numbers uniquely identify a specific logging event within an application.<br>Only one <b>number</b> command can be entered per event filter entry. The latest <b>number</b> command overwrites the previous command.<br>The <b>no</b> form of the command removes the event number as a match criterion. |
| <b>Default</b>     | <b>no event-number</b> — No event ID match criterion is specified.                                                                                                                                                                                                                                                                                                                                |
| <b>Parameters</b>  | <b>eq</b>   <b>neq</b>   <b>lt</b>   <b>lte</b>   <b>gt</b>   <b>gte</b> — This operator specifies the type of match. Valid operators are listed in the table below. Valid operators are:                                                                                                                                                                                                         |

| Operator | Notes                    |
|----------|--------------------------|
| eq       | equal to                 |
| neq      | not equal to             |
| lt       | less than                |
| lte      | less than or equal to    |
| gt       | greater than             |
| gte      | greater than or equal to |

*event-id* — The event ID, expressed as a decimal integer.

**Values** 1 — 4294967295

## router

|                    |                                                                                                                                                                                                                                                                                                   |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>router</b> { <b>eq</b>   <b>neq</b> } <i>router-instance</i> [ <b>regex</b> ]<br><b>no router</b>                                                                                                                                                                                              |
| <b>Context</b>     | config>log>filter>entry>match                                                                                                                                                                                                                                                                     |
| <b>Description</b> | This command specifies the log event matches for the router.                                                                                                                                                                                                                                      |
| <b>Parameters</b>  | <b>eq</b> — Determines if the matching criteria should be equal to the specified value.<br><b>neq</b> — Determines if the matching criteria should not be equal to the specified value.<br><i>router-instance</i> — Specifies a router name up to 32 characters to be used in the match criteria. |

**regexp** — Specifies the type of string comparison to use to determine if the log event matches the value of **router** command parameters. When the **regexp** keyword is specified, the string in the **router** command is a regular expression string that will be matched against the subject string in the log event being filtered.

## severity

|                    |                                                                                                                                                                                                                                                                          |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>severity</b> { <b>eq</b>   <b>neq</b>   <b>lt</b>   <b>lte</b>   <b>gt</b>   <b>gte</b> } <i>severity-level</i><br><b>no severity</b>                                                                                                                                 |
| <b>Context</b>     | config>log>filter>entry>match                                                                                                                                                                                                                                            |
| <b>Description</b> | This command adds an event severity level as a match criterion. Only one severity command can be entered per event filter entry. The latest severity command overwrites the previous command.<br>The <b>no</b> form of the command removes the severity match criterion. |
| <b>Default</b>     | <b>no severity</b> — No severity level match criterion is specified.                                                                                                                                                                                                     |
| <b>Parameters</b>  | <b>eq</b>   <b>neq</b>   <b>lt</b>   <b>lte</b>   <b>gt</b>   <b>gte</b> — This operator specifies the type of match. Valid operators are listed in the table below.                                                                                                     |

| Operator | Notes                    |
|----------|--------------------------|
| eq       | equal to                 |
| neq      | not equal to             |
| lt       | less than                |
| lte      | less than or equal to    |
| gt       | greater than             |
| gte      | greater than or equal to |

*severity-level* — The ITU severity level name. The following table lists severity names and corresponding numbers per ITU standards M.3100 X.733 & X.21 severity levels.

| Severity Number | Severity Name        |
|-----------------|----------------------|
| 1               | cleared              |
| 2               | indeterminate (info) |
| 3               | critical             |
| 4               | major                |
| 5               | minor                |
| 6               | warning              |

**Values** cleared, intermediate, critical, major, minor, warning

## subject

- Syntax** **subject** {**eq**|**neq**} *subject* [**regexp**]  
**no subject**
- Context** config>log>filter *filter-id*>entry *entry-id*>match
- Description** This command adds an event subject as a match criterion.  
 The subject is the entity for which the event is reported, such as a port. In this case the port-id string would be the subject. Only one **subject** command can be entered per event filter entry. The latest **subject** command overwrites the previous command.  
 The **no** form of the command removes the subject match criterion.
- Default** **no subject** — No subject match criterion specified.
- Parameters** **eq** | **neq** — This operator specifies the type of match. Valid operators are listed in the following table:

| Operator | Notes        |
|----------|--------------|
| eq       | equal to     |
| neg      | not equal to |

*subject* — A string used as the subject match criterion.

**regexp** — Specifies the type of string comparison to use to determine if the log event matches the value of **subject** command parameters. When the **regexp** keyword is specified, the string in the **subject** command is a regular expression string that will be matched against the subject string in the log event being filtered.

When **regexp** keyword is not specified, the **subject** command string is matched exactly by the event filter.

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## Syslog Commands

### syslog

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] syslog</b> <i>syslog-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Context</b>     | config>log                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Description</b> | <p>This command creates the context to configure a syslog target host that is capable of receiving selected syslog messages from this network element.</p> <p>A valid <i>syslog-id</i> must have the target syslog host address configured.</p> <p>A maximum of 10 <i>syslog-id</i>'s can be configured.</p> <p>No log events are sent to a syslog target address until the <i>syslog-id</i> has been configured as the log destination (<b>to</b>) in the log-id node.</p> |
| <b>Default</b>     | No syslog IDs are defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Parameters</b>  | <p><i>syslog-id</i> — The syslog ID number for the syslog destination, expressed as a decimal integer.</p> <p><b>Values</b>      1 — 10</p>                                                                                                                                                                                                                                                                                                                                 |

### address

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |         |              |                                       |  |                   |  |               |  |              |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------|--------------|---------------------------------------|--|-------------------|--|---------------|--|--------------|
| <b>Syntax</b>      | <b>address</b> <i>ip-address</i><br><b>no address</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |              |         |              |                                       |  |                   |  |               |  |              |
| <b>Context</b>     | config>log>syslog <i>syslog-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |         |              |                                       |  |                   |  |               |  |              |
| <b>Description</b> | <p>This command adds the syslog target host IP address to/from a syslog ID.</p> <p>This parameter is mandatory. If no <b>address</b> is configured, syslog data cannot be forwarded to the syslog target host.</p> <p>Only one address can be associated with a <i>syslog-id</i>. If multiple addresses are entered, the last address entered overwrites the previous address.</p> <p>The same syslog target host can be used by multiple log IDs.</p> <p>The <b>no</b> form of the command removes the syslog target host IP address.</p> |              |         |              |                                       |  |                   |  |               |  |              |
| <b>Default</b>     | <b>no address</b> — There is no syslog target host IP address defined for the syslog ID.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              |         |              |                                       |  |                   |  |               |  |              |
| <b>Parameters</b>  | <p><i>ip-address</i> — The IP address of the syslog target host in dotted decimal notation.</p> <p><b>Values</b></p> <table> <tr> <td>ipv4-address</td> <td>a.b.c.d</td> </tr> <tr> <td>ipv6-address</td> <td>x:x:x:x:x:x:x(x(eight 16-bit pieces))</td> </tr> <tr> <td></td> <td>x:x:x:x:x:d.d.d.d</td> </tr> <tr> <td></td> <td>x: [0..FFFF]H</td> </tr> <tr> <td></td> <td>d: [0..255]D</td> </tr> </table>                                                                                                                             | ipv4-address | a.b.c.d | ipv6-address | x:x:x:x:x:x:x(x(eight 16-bit pieces)) |  | x:x:x:x:x:d.d.d.d |  | x: [0..FFFF]H |  | d: [0..255]D |
| ipv4-address       | a.b.c.d                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |              |         |              |                                       |  |                   |  |               |  |              |
| ipv6-address       | x:x:x:x:x:x:x(x(eight 16-bit pieces))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |              |         |              |                                       |  |                   |  |               |  |              |
|                    | x:x:x:x:x:d.d.d.d                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |              |         |              |                                       |  |                   |  |               |  |              |
|                    | x: [0..FFFF]H                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |              |         |              |                                       |  |                   |  |               |  |              |
|                    | d: [0..255]D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |         |              |                                       |  |                   |  |               |  |              |

## facility

- Syntax** `facility syslog-facility`  
**no facility**
- Context** `config>log>syslog syslog-id`
- Description** This command configures the facility code for messages sent to the syslog target host. Multiple syslog IDs can be created with the same target host but each syslog ID can only have one facility code. If multiple facility codes are entered, the last *facility-code* entered overwrites the previous facility-code. If multiple facilities need to be generated for a single syslog target host, then multiple **log-id** entries must be created, each with its own filter criteria to select the events to be sent to the syslog target host with a given facility code. The **no** form of the command reverts to the default value.
- Default** **local7** — syslog entries are sent with the local7 facility code.
- Parameters** *syslog-facility* — The syslog facility name represents a specific numeric facility code. The code should be entered in accordance with the syslog RFC. However, the software does not validate if the facility code configured is appropriate for the event type being sent to the syslog target host.
- Values** kernel, user, mail, systemd, auth, syslogd, printer, netnews, uucp, cron, authpriv, ftp, ntp, logaudit, logalert, cron2, local0, local1, local2, local3, local4, local5, local6, local7

Valid responses per RFC3164, *The BSD syslog Protocol*, are listed in the table below.

| Numerical Code | Facility Code |
|----------------|---------------|
| 0              | kernel        |
| 1              | user          |
| 2              | mail          |
| 3              | systemd       |
| 4              | auth          |
| 5              | syslogd       |
| 6              | printer       |
| 7              | net-news      |
| 8              | uucp          |
| 9              | cron          |
| 10             | auth-priv     |
| 11             | ftp           |
| 12             | ntp           |
| 13             | log-audit     |
| 14             | log-alert     |
| 15             | cron2         |
| 16             | local0        |

| Numerical Code | Facility Code |
|----------------|---------------|
| 17             | local1        |
| 18             | local2        |
| 19             | local3        |
| 20             | local4        |
| 21             | local5        |
| 22             | local6        |
| 23             | local7        |
| <b>Values</b>  | 0 — 23        |

## log-prefix

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>log-prefix</b> <i>log-prefix-string</i><br><b>no log-prefix</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Context</b>     | config>log>syslog <i>syslog-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Description</b> | <p>This command adds the string prepended to every syslog message sent to the syslog host. RFC3164, <i>The BSD syslog Protocol</i>, allows a alphanumeric string (tag) to be prepended to the content of every log message sent to the syslog host. This alphanumeric string can, for example, be used to identify the node that generates the log entry. The software appends a colon (:) and a space to the string and it is inserted in the syslog message after the date stamp and before the syslog message content.</p> <p>Only one string can be entered. If multiple strings are entered, the last string overwrites the previous string. The alphanumeric string can contain lowercase (a-z), uppercase (A-Z) and numeric (0-9) characters.</p> <p>The <b>no</b> form of the command removes the log prefix string.</p> |
| <b>Default</b>     | <b>no log-prefix</b> — no prepend log prefix string defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Parameters</b>  | <i>log-prefix-string</i> — An alphanumeric string of up to 32 characters. Spaces and colons (:) cannot be used in the string.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## level

|                    |                                                                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>level</b> <i>syslog-level</i><br><b>no level</b>                                                                                                                             |
| <b>Context</b>     | config>log>syslog <i>syslog-id</i>                                                                                                                                              |
| <b>Description</b> | This command configures the syslog message severity level threshold. All messages with severity level equal to or higher than the threshold are sent to the syslog target host. |

## Configuration Commands

Only a single threshold level can be specified. If multiple levels are entered, the last **level** entered will overwrite the previously entered commands.

The **no** form of the command reverts to the default value.

**Parameters** *value* — The threshold severity level name.

**Values** emergency, alert, critical, error, warning, notice, info, debug

| severity level               | Numerical Severity<br>(highest to lowest) | Configured<br>Severity | Definition                       |
|------------------------------|-------------------------------------------|------------------------|----------------------------------|
|                              | 0                                         | emergency              | system is unusable               |
| 3                            | 1                                         | alert                  | action must be taken immediately |
| 4                            | 2                                         | critical               | critical condition               |
| 5                            | 3                                         | error                  | error condition                  |
| 6                            | 4                                         | warning                | warning condition                |
|                              | 5                                         | notice                 | normal but significant condition |
| 1 cleared<br>2 indeterminate | 6                                         | info                   | informational messages           |
|                              | 7                                         | debug                  | debug-level messages             |

## port

**Syntax** **port** *port*  
**no port**

**Context** config>log>syslog *syslog-id*

**Description** This command configures the UDP port that will be used to send syslog messages to the syslog target host.

The port configuration is needed if the syslog target host uses a port other than the standard UDP syslog port 514.

Only one port can be configured. If multiple **port** commands are entered, the last entered port overwrites the previously entered ports.

The **no** form of the command reverts to default value.

**Default** **no port**

**Parameters** *port* — The value is the configured UDP port number used when sending syslog messages.

**Values** 0 — 65535

## throttle-rate

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>throttle-rate</b> <i>events</i> [ <b>interval</b> <i>seconds</i> ]<br><b>no throttle-rate</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Context</b>     | config>log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Description</b> | This command configures an event throttling rate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Parameters</b>  | <i>events</i> — Specifies the number of log events that can be logged within the specified interval for a specific event. Once the limit has been reached, any additional events of that type will be dropped, for example, the event drop count will be incremented. At the end of the throttle interval if any events have been dropped a trap notification will be sent.<br><b>Values</b> 10 — 20000<br><b>Default</b> 500<br><i>interval seconds</i> — Specifies the number of seconds that an event throttling interval lasts.<br><b>Values</b> 1 — 60<br><b>Default</b> 1 |

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## SNMP Trap Groups

### snmp-trap-group

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] snmp-trap-group</b> <i>log-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Context</b>     | config>log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Description</b> | <p>This command creates the context to configure a group of SNMP trap receivers and their operational parameters for a given <i>log-id</i>.</p> <p>A group specifies the types of SNMP traps and specifies the log ID which will receive the group of SNMP traps. A trap group must be configured in order for SNMP traps to be sent.</p> <p>To suppress the generation of all alarms and traps see the <b>event-control</b> command. To suppress alarms and traps that are sent to this <i>log-id</i>, see the <b>filter</b> command. Once alarms and traps are generated they can be directed to one or more SNMP trap groups. Logger events that can be forwarded as SNMP traps are always defined on the main event source.</p> <p>The <b>no</b> form of the command deletes the SNMP trap group.</p> |
| <b>Default</b>     | There are no default SNMP trap groups.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Parameters</b>  | <p><i>log-id</i> — The log ID value of a log configured in the <b>log-id</b> context. Alarms and traps cannot be sent to the trap receivers until a valid <i>log-id</i> exists.</p> <p><b>Values</b>      1 — 100</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

### snmp-dying-gasp

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>snmp-dying-gasp primary</b> <i>trap-target-group-num trap-target-name</i> [ <b>secondary</b> { <i>trap-target-group-num trap-target-name</i> }] [ <b>tertiary</b> { <i>trap-target-group-num trap-target-name</i> }] <b>no snmp-dying-gasp</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Context</b>     | config>log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Description</b> | <p>This command enables user to notify the SNMP trap server about node power failure. On power failure, the system sends dying gasp traps to the configured SNMP trap servers. Up to three SNMP trap servers can be configured to receive the trap. The traps are sent in the following order:</p> <ol style="list-style-type: none"> <li>1. Primary SNMP trap receiver.</li> <li>2. Secondary SNMP trap receiver.</li> <li>3. Tertiary SNMP trap receiver.</li> </ol> <p>When this command is enabled, the node does not generate EFM OAM dying gasp message even if EFM OAM is enabled. In other words, generation of SNMP dying gasp trap is mutually exclusive to use of EFM OAM dying gasp message.</p> |

By default, the system generates EFM OAM dying gasp message to remain compatible with older version of the software releases. User needs to explicitly configure the system to send out an SNMP trap on loss of power to the node, using this command. Generation of SNMP dying gasp trap is disabled by default.

The no form of the command disables generation of SNMP trap message. It enables generation of EFM OAM dying gasp on access-uplink ports, if EFM OAM is enabled on those ports.

Typically, SNMP traps are generated only if user configures a log to direct the system log events to SNMP. For SNMP dying gasp trap, it is not required to do so. The DSCP value used by a SNMP Dying Gasp packet is AF (Assured Forwarding class, DSCP value used is “0x22” or AF41).

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b>    | Disabled                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Parameters</b> | <p><b>primary</b> <i>trap-target-group-num trap-target-name</i> — Specify the primary SNMP trap receiver to which the system will address the SNMP trap to. The <i>trap-target-group-num</i> must correspond to one of the SNMP trap group configuration under <b>config&gt; log&gt; snmp-trap-group</b> <i>trap-num</i>. The 'target-name' must correspond to one of the SNMP trap receiver target configured under <b>config&gt; log&gt; snmp-trap-group</b> <i>trap-num</i> <b>trap-target</b> <i>target-name</i>.</p> <p><i>trap-target-group-num</i> — The trap target group number, expressed as a decimal integer.</p> <p><b>Values</b> 1 — 100</p> <p><i>trap-target-name</i> — The trap target name, specified as a string of characters.</p> <p><b>Values</b> Up to 28 characters</p> <p><b>secondary</b> <i>trap-target-group-num trap-target-name</i> — Specify the secondary SNMP trap receiver to which the system will address the SNMP trap to. The <i>trap-target-group-num</i> must correspond to one of the SNMP trap group configuration under <b>config&gt; log&gt; snmp-trap-group</b> <i>trap-num</i>. The 'target-name' must correspond to one of the SNMP trap receiver target configured under <b>config&gt; log&gt; snmp-trap-group</b> <i>trap-num</i> <b>trap-target</b> <i>target-name</i>.</p> <p><i>trap-target-group-num</i> — The trap target group number, expressed as a decimal integer.</p> <p><b>Values</b> 1 — 100</p> <p><i>trap-target-name</i> — The trap target name, specified as a string of characters.</p> <p><b>Values</b> Up to 28 characters</p> <p><b>tertiary</b> <i>trap-target-group-num trap-target-name</i> — Specify the tertiary SNMP trap receiver to which the system will address the SNMP trap to. The <i>trap-target-group-num</i> must correspond to one of the SNMP trap group configuration under <b>config&gt; log&gt; snmp-trap-group</b> <i>trap-num</i>. The 'target-name' must correspond to one of the SNMP trap receiver target configured under <b>config&gt; log&gt; snmp-trap-group</b> <i>trap-num</i> <b>trap-target</b> <i>target-name</i>.</p> <p><i>trap-target-group-num</i> — The trap target group number, expressed as a decimal integer.</p> <p><b>Values</b> 1 — 100</p> <p><i>trap-target-name</i> — The trap target name, specified as a string of characters.</p> <p><b>Values</b> Up to 28 characters</p> <p><b>Values</b></p> |

## trap-target

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |                               |              |                                     |  |                   |  |               |  |              |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------|--------------|-------------------------------------|--|-------------------|--|---------------|--|--------------|
| <b>Syntax</b>      | <b>trap-target</b> <i>name</i> <b>address</b> <i>ip-address</i> [ <b>port</b> <i>port</i> ] [ <b>snmpv1</b>   <b>snmpv2c</b>   <b>snmpv3</b> ] <b>notify-community</b> <i>communityName</i>   <i>snmpv3SecurityName</i> [ <b>security-level</b> { <b>no-auth-no-privacy</b>   <b>auth-no-privacy</b>   <b>privacy</b> }] [ <b>replay</b> ]<br><b>no trap-target</b> <i>name</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |                               |              |                                     |  |                   |  |               |  |              |
| <b>Context</b>     | config>log>snmp-trap-group                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |              |                               |              |                                     |  |                   |  |               |  |              |
| <b>Description</b> | <p>This command adds/modifies a trap receiver and configures the operational parameters for the trap receiver. A trap reports significant events that occur on a network device such as errors or failures. Before an SNMP trap can be issued to a trap receiver, the <b>log-id</b>, <b>snmp-trap-group</b> and at least one must be configured.</p> <p>The <b>no</b> command is used to add/remove a trap receiver from an <b>snmp-trap-group</b>. The operational parameters specified in the command include:</p> <ul style="list-style-type: none"> <li>• The IP address of the trap receiver</li> <li>• The UDP port used to send the SNMP trap</li> <li>• SNMP version</li> <li>• SNMP community name for SNMPv1 and SNMPv2c receivers.</li> <li>• Security name and level for SNMPv3 trap receivers.</li> </ul> <p>A single <b>snmp-trap-group</b> <i>log-id</i> can have multiple trap-receivers. Each trap receiver can have different operational parameters.</p> <p>An address can be configured as a trap receiver more than once as long as a different port is used for each instance.</p> <p>To prevent resource limitations, only configure a maximum of 10 trap receivers.</p> <p>Note that if the same <b>trap-target</b> <i>name</i> <b>port</b> <i>port</i> parameter value is specified in more than one SNMP trap group, each trap destination should be configured with a different <i>notify-community</i> value. This allows a trap receiving an application, such as NMS, to reconcile a separate event sequence number stream for each 7210 SAS event log when multiple event logs are directed to the same IP address and port destination.</p> <p>The <b>no</b> form of the command removes the SNMP trap receiver from the SNMP trap group.</p> |              |                               |              |                                     |  |                   |  |               |  |              |
| <b>Default</b>     | No SNMP trap targets are defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              |                               |              |                                     |  |                   |  |               |  |              |
| <b>Parameters</b>  | <p><i>name</i> — Specifies the name of the trap target up to 28 characters in length.</p> <p><b>address</b> <i>ip-address</i> — The IP address of the trap receiver in dotted decimal notation. Only one IP address destination can be specified per trap destination group.</p> <p><b>Values</b></p> <table border="0" style="margin-left: 20px;"> <tr> <td style="padding-right: 10px;">ipv4-address</td> <td>a.b.c.d (host bits must be 0)</td> </tr> <tr> <td>ipv6-address</td> <td>x:x:x:x:x:x:x (eight 16-bit pieces)</td> </tr> <tr> <td></td> <td>x:x:x:x:x:d.d.d.d</td> </tr> <tr> <td></td> <td>x: [0..FFFF]H</td> </tr> <tr> <td></td> <td>d: [0..255]D</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ipv4-address | a.b.c.d (host bits must be 0) | ipv6-address | x:x:x:x:x:x:x (eight 16-bit pieces) |  | x:x:x:x:x:d.d.d.d |  | x: [0..FFFF]H |  | d: [0..255]D |
| ipv4-address       | a.b.c.d (host bits must be 0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |              |                               |              |                                     |  |                   |  |               |  |              |
| ipv6-address       | x:x:x:x:x:x:x (eight 16-bit pieces)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |                               |              |                                     |  |                   |  |               |  |              |
|                    | x:x:x:x:x:d.d.d.d                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              |                               |              |                                     |  |                   |  |               |  |              |
|                    | x: [0..FFFF]H                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |              |                               |              |                                     |  |                   |  |               |  |              |
|                    | d: [0..255]D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |              |                               |              |                                     |  |                   |  |               |  |              |

**port** *port* — The destination UDP port used for sending traps to the destination, expressed as a decimal integer. Only one port can be specified per **trap-target** statement. If multiple traps need to be issued to the same address then multiple ports must be configured.

**Default** 162

**Values** 1 — 65535

*snmpv1* | *snmpv2c* | *snmpv3* — Specifies the SNMP version format to use for traps sent to the trap receiver.

The keyword **snmpv1** selects the SNMP version 1 format. When specifying **snmpv1**, the **notify-community** must be configured for the proper SNMP community string that the trap receiver expects to be present in alarms and traps messages. If the SNMP version is changed from **snmpv3** to **snmpv1**, then the **notify-community** parameter must be changed to reflect the community string rather than the *security-name* that is used by **snmpv3**.

The keyword **snmpv2c** selects the SNMP version 2c format. When specifying **snmpv2c**, the **notify-community** must be configured for the proper SNMP community string that the trap receiver expects to be present in alarms and traps messages. If the SNMP version is changed from **snmpv3** to **snmpv2c**, then the **notify-community** parameter must be changed to reflect the community string rather than the *security-name* that is used by **snmpv3**.

The keyword **snmpv3** selects the SNMP version 3 format. When specifying **snmpv3**, the **notify-community** must be configured for the SNMP *security-name*. If the SNMP version is changed from **snmpv1** or **snmpv2c** to **snmpv3**, then the **notify-community** parameter must be changed to reflect the *security-name* rather than the community string used by **snmpv1** or **snmpv2c**.

Pre-existing conditions are checked before the `snmpv3SecurityName` is accepted. These are:

- The user name must be configured.
- The v3 access group must be configured.
- The v3 notification view must be configured.

**Default** snmpv3

**Values** snmpv1, snmpv2c, snmpv3

**notify-community** *community* | *security-name* — Specifies the community string for **snmpv1** or **snmpv2c** or the **snmpv3** *security-name*. If no **notify-community** is configured, then no alarms nor traps will be issued for the trap destination. If the SNMP version is modified, the **notify-community** must be changed to the proper form for the SNMP version.

**community** — The community string as required by the **snmpv1** or **snmpv2c** trap receiver. The community string can be an ASCII string up to 31 characters in length.

*security-name* — The *security-name* as defined in the `config>system>security>user` context for SNMP v3. The *security-name* can be an ASCII string up to 31 characters in length.

**security-level** {*no-auth-no-privacy* | *auth-no-privacy* | *privacy*} — Specifies the required authentication and privacy levels required to access the views configured on this node when configuring an **snmpv3** trap receiver.

The keyword **no-auth-no-privacy** specifies no authentication and no privacy (encryption) are required.

The keyword **auth-no-privacy** specifies authentication is required but no privacy (encryption) is required. When this option is configured the *security-name* must be configured for **authentication**.

The keyword **privacy** specifies both authentication and privacy (encryption) is required. When this option is configured the *security-name* must be configured for **authentication** and **privacy**.

**Default** no-auth-no-privacy. This parameter can only be configured if SNMPv3 is also configured.

**Values** no-auth-no-privacy, auth-no-privacy, privacy

**replay** — Enables replay of missed events to target. If replay is applied to an SNMP trap target address, the address is monitored for reachability. Reachability is determined by whether or not there is a route in the routing table by which the target address can be reached. Before sending a trap to a target address, the SNMP module asks the PIP module if there is either an in-band or out-of-band route to the target address. If there is no route to the SNMP target address, the SNMP module saves the sequence-id of the first event that will be missed by the trap target. When the routing table changes again so that there is now a route by which the SNMP target address can be reached, the SNMP module replays (for example, retransmits) all events generated to the SNMP notification log while the target address was removed from the route table.

Note: The route table changes the convergence time so it is possible that one or more events may be lost at the beginning or end of a replay sequence.

---

## Logging Destination Commands

### filter

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>filter</b> <i>filter-id</i><br><b>no filter</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Context</b>     | config>log>log-id <i>log-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Description</b> | <p>This command adds an event filter policy with the log destination.</p> <p>The <b>filter</b> command is optional. If no event filter is configured, all events, alarms and traps generated by the source stream will be forwarded to the destination.</p> <p>An event filter policy defines (limits) the events that are forwarded to the destination configured in the log-id. The event filter policy can also be used to select the alarms and traps to be forwarded to a destination <b>snmp-trap-group</b>.</p> <p>The application of filters for debug messages is limited to application and subject only.</p> <p>Accounting records cannot be filtered using the <b>filter</b> command.</p> <p>Only one filter-id can be configured per log destination.</p> <p>The <b>no</b> form of the command removes the specified event filter from the <i>log-id</i>.</p> |
| <b>Default</b>     | <b>no filter</b> — No event filter policy is specified for a <i>log-id</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Parameters</b>  | <i>filter-id</i> . The event filter policy ID is used to associate the filter with the <i>log-id</i> configuration. The event filter policy ID must already be defined in <b>config&gt;log&gt;filter</b> <i>filter-id</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                    | <b>Values</b> 1 — 1001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

### from

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>from</b> {[main] [security] [change] [debug-trace]}<br><b>no from</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Context</b>     | config>log>log-id <i>log-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b> | <p>This command selects the source stream to be sent to a log destination.</p> <p>One or more source streams must be specified. The source of the data stream must be identified using the <b>from</b> command before you can configure the destination using the <b>to</b> command. The <b>from</b> command can identify multiple source streams in a single statement (for example: <b>from main change debug-trace</b>).</p> <p>Only one <b>from</b> command may be entered for a single <i>log-id</i>. If multiple <b>from</b> commands are configured, then the last command entered overwrites the previous <b>from</b> command.</p> <p>The <b>no</b> form of the command removes all previously configured source streams.</p> |

## Configuration Commands

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b>    | No source stream is configured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Parameters</b> | <p><i>main</i> — Instructs all events in the main event stream to be sent to the destination defined in the <b>to</b> command for this destination <i>log-id</i>. The main event stream contains the events that are not explicitly directed to any other event stream. To limit the events forwarded to the destination, configure filters using the <b>filter</b> command.</p> <p><i>security</i> — Instructs all events in the security event stream to be sent to the destination defined in the <b>to</b> command for this destination <i>log-id</i>. The security stream contains all events that affect attempts to breach system security such as failed login attempts, attempts to access MIB tables to which the user is not granted access or attempts to enter a branch of the CLI to which access has not been granted. To limit the events forwarded to the destination, configure filters using the <b>filter</b> command.</p> <p><i>change</i> — Instructs all events in the user activity stream to be sent to the destination configured in the <b>to</b> command for this destination <i>log-id</i>. The change event stream contains all events that directly affect the configuration or operation of this node. To limit the events forwarded to the change stream destination, configure filters using the <b>filter</b> command.</p> <p><i>debug-trace</i> — Instructs all debug-trace messages in the debug stream to be sent to the destination configured in the <b>to</b> command for this destination <i>log-id</i>. Filters applied to debug messages are limited to application and subject.</p> |

## log-id

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>[no] log-id</b> <i>log-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Context</b>     | config>log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Description</b> | <p>This command creates a context to configure destinations for event streams.</p> <p>The <b>log-id</b> context is used to direct events, alarms/traps, and debug information to respective destinations.</p> <p>A maximum of 10 logs can be configured.</p> <p>Before an event can be associated with this log-id, the <b>from</b> command identifying the source of the event must be configured.</p> <p>Only one destination can be specified for a <i>log-id</i>. The destination of an event stream can be an in-memory buffer, console, session, snmp-trap-group, syslog, or file.</p> <p>Use the <b>event-control</b> command to suppress the generation of events, alarms, and traps for all log destinations.</p> <p>An event filter policy can be applied in the log-id context to limit which events, alarms, and traps are sent to the specified log-id.</p> <p>Log-IDs 99 and 100 are created by the agent. Log-ID 99 captures all log messages. Log-ID 100 captures log messages with a severity level of major and above.</p> <p>Note that Log-ID 99 provides valuable information for the admin-tech file. Removing or changing the log configuration may hinder debugging capabilities. It is strongly recommended not to alter the configuration for Log-ID 99.</p> |

The **no** form of the command deletes the log destination ID from the configuration.

**Default** No log destinations are defined.

**Parameters** *log-id* — The log ID number, expressed as a decimal integer.

**Values** 1 — 100

## to console

**Syntax** **to console**

**Context** config>log>log-id *log-id*

**Description** This command specifies a log ID destination. This parameter is mandatory when configuring a log destination. This command instructs the events selected for the log ID to be directed to the console. If the console is not connected, then all the entries are dropped.

The source of the data stream must be specified in the **from** command prior to configuring the destination with the **to** command.

The **to** command cannot be modified or re-entered. If the destination or maximum size of an SNMP or memory log needs to be modified, the log ID must be removed and then re-created.

**Default** No destination is specified.

## to file

**Syntax** **to file** *log-file-id*

**Context** config>log>log-id *log-id*

**Description** This command specifies a log ID destination. This parameter is mandatory when configuring a log destination. This command instructs the events selected for the log ID to be directed to a specified file.

The source of the data stream must be specified in the **from** command prior to configuring the destination with the **to** command.

The **to** command cannot be modified or re-entered. If the destination or maximum size of an SNMP or memory log needs to be modified, the log ID must be removed and then re-created.

**Default** No destination is specified.

**Parameters** *log-file-id* — Instructs the events selected for the log ID to be directed to the *log-file-id*. The characteristics of the *log-file-id* referenced here must have already been defined in the **config>log>file** *log-file-id* context.

**Values** 1 — 99

### to memory

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>to memory</b> [ <i>size</i> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Context</b>     | config>log>log-id <i>log-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Description</b> | <p>This command specifies a log ID destination. This parameter is mandatory when configuring a log destination. This command instructs the events selected for the log ID to be directed to a memory log. A memory file is a circular buffer. Once the file is full, each new entry replaces the oldest entry in the log.</p> <p>The source of the data stream must be specified in the <b>from</b> command prior to configuring the destination with the <b>to</b> command.</p> <p>The <b>to</b> command cannot be modified or re-entered. If the destination or maximum size of an SNMP or memory log needs to be modified, the log ID must be removed and then re-created.</p> |
| <b>Default</b>     | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Parameters</b>  | <i>size</i> — The <i>size</i> parameter indicates the number of events that can be stored in the memory.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                    | <b>Default</b> 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                    | <b>Values</b> 50 — 1024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

### to session

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>to session</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Context</b>     | config>log>log-id <i>log-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Description</b> | <p>This command specifies a log ID destination. This parameter is mandatory when configuring a log destination. This command instructs the events selected for the log ID to be directed to the current console or telnet session. This command is only valid for the duration of the session. When the session is terminated the log ID is removed. A log ID with a <i>session</i> destination is not saved in the configuration file.</p> <p>The source of the data stream must be specified in the <b>from</b> command prior to configuring the destination with the <b>to</b> command.</p> <p>The <b>to</b> command cannot be modified or re-entered. If the destination or maximum size of an SNMP or memory log needs to be modified, the log ID must be removed and then re-created.</p> |
| <b>Default</b>     | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

## to snmp

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |               |           |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----|---------------|-----------|
| <b>Syntax</b>      | <b>to snmp</b> [ <i>size</i> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |     |               |           |
| <b>Context</b>     | config>log>log-id <i>log-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |               |           |
| <b>Description</b> | <p>This is one of the commands used to specify the log ID destination. This parameter is mandatory when configuring a log destination. This command instructs the alarms and traps to be directed to the <b>snmp-trap-group</b> associated with <i>log-id</i>.</p> <p>A local circular memory log is always maintained for SNMP notifications sent to the specified snmp-trap-group for the <i>log-id</i>.</p> <p>The source of the data stream must be specified in the <b>from</b> command prior to configuring the destination with the <b>to</b> command.</p> <p>The <b>to</b> command cannot be modified or re-entered. If the destination or maximum size of an SNMP or memory log needs to be modified, the log ID must be removed and then re-created.</p> |                |     |               |           |
| <b>Default</b>     | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |     |               |           |
| <b>Parameters</b>  | <p><i>size</i> — The <i>size</i> parameter defines the number of events stored in this memory log.</p> <table> <tr> <td><b>Default</b></td> <td>100</td> </tr> <tr> <td><b>Values</b></td> <td>50 — 1024</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Default</b> | 100 | <b>Values</b> | 50 — 1024 |
| <b>Default</b>     | 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |     |               |           |
| <b>Values</b>      | 50 — 1024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |     |               |           |

## to syslog

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |               |        |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|
| <b>Syntax</b>      | <b>to syslog</b> <i>syslog-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |        |
| <b>Context</b>     | config>log>log-id                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |        |
| <b>Description</b> | <p>This is one of the commands used to specify the log ID destination. This parameter is mandatory when configuring a log destination.</p> <p>This command instructs the alarms and traps to be directed to a specified syslog. To remain consistent with the standards governing syslog, messages to syslog are truncated to 1k bytes.</p> <p>The source of the data stream must be specified in the <b>from</b> command prior to configuring the destination with the <b>to</b> command.</p> <p>The <b>to</b> command cannot be modified or re-entered. If the destination or maximum size of an SNMP or memory log needs to be modified, the log ID must be removed and then re-created.</p> |               |        |
| <b>Default</b>     | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |        |
| <b>Parameters</b>  | <p><i>syslog-id</i> — Instructs the events selected for the log ID to be directed to the <i>syslog-id</i>. The characteristics of the <i>syslog-id</i> referenced here must have been defined in the <b>config&gt;log&gt;syslog</b> <i>syslog-id</i> context.</p> <table> <tr> <td><b>Values</b></td> <td>1 — 10</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                            | <b>Values</b> | 1 — 10 |
| <b>Values</b>      | 1 — 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |        |

### time-format

|                    |                                                                                                                                                                                                                               |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>time-format {local   utc}</b>                                                                                                                                                                                              |
| <b>Context</b>     | config>log>log-id                                                                                                                                                                                                             |
| <b>Description</b> | This command specifies whether the time should be displayed in local or Coordinated Universal Time (UTC) format.                                                                                                              |
| <b>Default</b>     | utc                                                                                                                                                                                                                           |
| <b>Parameters</b>  | <b>local</b> — Specifies that timestamps are written in the system's local time.<br><b>utc</b> — Specifies that timestamps are written using the UTC value. This was formerly called Greenwich Mean Time (GMT) and Zulu time. |

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## Accounting Policy Commands

### accounting-policy

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>accounting-policy</b> <i>policy-id</i> [ <b>interval</b> <i>minutes</i> ]<br><b>no accounting-policy</b> <i>policy-id</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Context</b>     | config>log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Description</b> | <p>This command creates an access or network accounting policy. An accounting policy defines the accounting records that are created.</p> <p>Access accounting policies are policies that can be applied to one or more SAPs or access ports. Changes made to an existing policy, using any of the sub-commands, are applied immediately to all SAPs or access ports where this policy is applied.</p> <p>If an accounting policy is not specified on a SAP or an access port, then accounting records are produced in accordance with the access policy designated as the default. If a default access policy is not specified, then no accounting records are collected other than the records for the accounting policies that are explicitly configured.</p> <p>Network accounting policies are policies that can be applied to one or more network ports. Any changes made to an existing policy, using any of the sub-commands, will be applied immediately to all network ports where this policy is applied.</p> <p>If no accounting policy is defined on a network port, accounting records will be produced in accordance with the default network policy as designated with the default command. If no network default policy is created, then no accounting records will be collected other than the records for the accounting policies explicitly configured.</p> <p>In the 7210 SAS-E a total of 9 accounting records are available. In the 7210 SAS-D a total of 16 accounting records are available.</p> <p>There are three types of accounting policies:</p> <ul style="list-style-type: none"><li>• Access</li><li>• Access port</li><li>• Network</li></ul> <p>When creating accounting policies, one access, one access port and one network accounting-policy can be defined as default. If statistics collection is enabled on an accounting object, and no accounting policy is applied, then the respective default accounting policy is used. If no default policy is defined, then no statistics are collected unless a specifically defined accounting policy is applied.</p> <p>The <b>no</b> form of the command deletes the policy from the configuration. The accounting policy cannot be removed unless it is removed from all the SAPs, network ports or channels where the policy is applied.</p> |
| <b>Default</b>     | No default accounting policy is defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## Configuration Commands

**Parameters** *policy-id* — The policy ID that uniquely identifies the accounting policy, expressed as a decimal integer.

**Values** 1 — 99

### collection-interval

**Syntax** **collection-interval** *minutes*  
**no collection-interval**

**Context** config>log>acct-policy

**Description** This command configures the accounting collection interval.

**Parameters** *minutes* — Specifies the interval between collections, in minutes.

**Values** 5 — 120  
A range of 1 — 4 is only allowed when the record type is set to SAA.

### default

**Syntax** **[no] default**

**Context** config>log>accounting-policy

**Description** This command configures the default accounting policy to be used with all SAPs that do not have an accounting policy.

If no accounting policy is defined on an access or network object, accounting records are produced in accordance with the default access policy. If no default access policy is created, then no accounting records will be collected other than the records for the accounting policies that are explicitly configured.

When creating accounting policies, one access, one access port and one network accounting policy can be defined as default.

The record name must be specified prior to assigning an accounting policy as default.

If a policy is configured as the default policy, then a no default command must be issued before a new default policy can be configured.

The **no** form of the command removes the default policy designation from the policy ID. The accounting policy will be removed from all access or network object ports that do not have this policy explicitly defined.

## record

**Syntax** [no] record *record-name*

**Context** config>log>accounting-policy *policy-id*

**Description** This command adds the accounting record type to the accounting policy to be forwarded to the configured accounting file. A record name can only be used in one accounting policy. To obtain a list of all record types that can be configured, use the **show log accounting-records** command.

Sample output for 7210 SAS-E:

```
A:7210-SASE>show>log# accounting-records

=====
Accounting Policy Records
=====
Record # Record Name Def. Interval

1 service-ingress-octets 5
3 service-ingress-packets 5
4 service-egress-packets 5
5 network-ingress-octets 15
7 network-ingress-packets 15
8 network-egress-packets 15
32 saa 5
36 access-egress-packets 5
41 combined-service-ing-egr-packets 5
42 combined-network-ing-egr-pkts 15
=====
A:7210-SASE>show>log#
```

Sample output for 7210 SAS-D:

```
A:7210-SASD>show>log# accounting-records

=====
Accounting Policy Records
=====
Record # Record Name Def. Interval

1 service-ingress-octets 5
2 service-egress-octets 5
3 service-ingress-packets 5
4 service-egress-packets 5
5 network-ingress-octets 15
6 network-egress-octets 15
7 network-ingress-packets 15
8 network-egress-packets 15
10 combined-service-ingress 5
11 combined-network-ing-egr-octets 15
13 complete-service-ingress-egress 5
32 saa 5
36 access-egress-packets 5
37 access-egress-octets 5
38 combined-access-egress 5
```

## Configuration Commands

```
39 combined-network-egress 15
40 combined-service-egress 5
=====
A:7210-SASD>show>log#
```

To configure an accounting policy for access SAPs, select a service record (for example, service-ingress-octets). To change the record name to another service record then the record command with the new record name can be entered and it will replace the old record name.

To configure an accounting policy for access ports, select access port type records such as access-egress packets. When changing the record name to another access port record, the record command with the new record name can be entered, and it will replace the old record name.

When configuring an accounting policy for network ports, a network record should be selected. When changing the record name to another network record, the record command with the new record name can be entered and it will replace the old record name.

If the change required modifies the record from one type to another, then the old record name must be removed using the **no** form of this command.

Only one record may be configured in a single accounting policy. For example, if an accounting-policy is configured with an **access-egress-packets** record, in order to change it to **service-ingress-octets**, use the **no record** command under the accounting-policy to remove the old record and then enter the **service-ingress-octets** record.

Note that collecting excessive statistics can adversely affect the CPU utilization and take up large amounts of storage space.

The **no** form of the command removes the record type from the policy.

**Default** No accounting record is defined

**Parameters** *record-name* — The accounting record name. The following table lists the accounting record names available and the default collection interval.

to

**Syntax** **to file** *file-id*

**Context** config>log>accounting-policy *policy-id*

This command specifies the destination for the accounting records selected for the accounting policy.

**Default** No destination is specified.

**Parameters** *file-id* — The *file-id* option specifies the destination for the accounting records selected for this destination. The characteristics of the file-id must have already been defined in the config>log>file context. A file-id can only be used once.

The file is generated when the file policy is referenced. This command identifies the type of accounting file to be created. The file definition defines its characteristics.

If the **to** command is executed while the accounting policy is in operation, then it becomes active during the next collection interval.

**Values** 1 — 99





## Show Commands

### accounting-policy

**Syntax** `accounting-policy [acct-policy-id] [access | network]`

**Context** show>log

**Description** This command displays accounting policy information.

**Parameters** *policy-id* — The policy ID that uniquely identifies the accounting policy, expressed as a decimal integer.

**Values** 1 — 99

**access** — Only displays access accounting policies.

**network** — Only displays network accounting policies.

**Output** **Accounting Policy Output** — The following table describes accounting policy output fields.

**Table 31: Show Accounting Policy Output Fields**

| Label       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Policy ID   | The identifying value assigned to a specific policy.                                                                                                                                                                                                                                                                                                                                                                                       |
| Type        | Identifies accounting record type forwarded to the configured accounting file.<br>access — Indicates that the policy is an access accounting policy.<br>network — Indicates that the policy is a network accounting policy.<br>access port — Indicates that the policy is an access port accounting policy which can be used to collect accounting records only for access ports.<br>none — Indicates no accounting record types assigned. |
| Def         | Yes — Indicates that the policy is a default access or network policy.<br>No — Indicates that the policy is not a default access or network policy.                                                                                                                                                                                                                                                                                        |
| Admin State | Displays the administrative state of the policy.<br>Up — Indicates that the policy is administratively enabled.<br>Down — Indicates that the policy is administratively disabled.                                                                                                                                                                                                                                                          |

**Table 31: Show Accounting Policy Output Fields (Continued)**

| Label                     | Description                                                                                                                                                     |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oper State                | Displays the operational state of the policy.<br>Up – Indicates that the policy is operationally up.<br>Down – Indicates that the policy is operationally down. |
| Intvl                     | Displays the interval, in minutes, in which statistics are collected and written to their destination. The default depends on the record name type.             |
| File ID                   | The log destination.                                                                                                                                            |
| Record Name               | The accounting record name which represents the configured record type.                                                                                         |
| This policy is applied to | Specifies the entity where the accounting policy is applied.                                                                                                    |

**Sample Output**

```
A:ALA-1# show log accounting-policy
=====
Accounting Policies
=====
Policy Type Def Admin Oper Intvl File Record Name
Id State State State Id

1 network No Up Up 15 1 network-ingress-packets
2 network Yes Up Up 15 2 network-ingress-octets
=====
A:ALA-1#
```

```
A:ALA-1# show log accounting-policy 10
=====
Accounting Policies
=====
Policy Type Def Admin Oper Intvl File Record Name
Id State State State Id

10 access Yes Up Up 5 3 service-ingress-octets

Description : (Not Specified)

This policy is applied to:
 Svc Id: 100 SAP : 1/1/8:0 Collect-Stats
 Svc Id: 101 SAP : 1/1/8:1 Collect-Stats
 Svc Id: 102 SAP : 1/1/8:2 Collect-Stats
 Svc Id: 103 SAP : 1/1/8:3 Collect-Stats
 Svc Id: 104 SAP : 1/1/8:4 Collect-Stats
 Svc Id: 105 SAP : 1/1/8:5 Collect-Stats
 Svc Id: 106 SAP : 1/1/8:6 Collect-Stats
 Svc Id: 107 SAP : 1/1/8:7 Collect-Stats
 Svc Id: 108 SAP : 1/1/8:8 Collect-Stats
```

```

 Svc Id: 109 SAP : 1/1/8:9 Collect-Stats
...
=====
A:ALA-1#

A:ALA-1# show log accounting-policy network
=====
Accounting Policies
=====
Policy Type Def Admin Oper Intvl File Record Name
Id State State

1 network No Up Up 15 1 network-ingress-packets
2 network Yes Up Up 15 2 network-ingress-octets
=====
A:ALA-1#

A:ALA-1# show log accounting-policy access
=====
Accounting Policies
=====
Policy Type Def Admin Oper Intvl File Record Name
Id State State

10 access Yes Up Up 5 3 service-ingress-octets
=====
A:ALA-1#

```

## accounting-records

- Syntax** `accounting-records`
- Context** `show>log`
- Description** This command displays accounting policy record names.
- Output** **Accounting Records Output.** The following table describes accounting records output fields.

**Table 32: Accounting Policy Output Fields**

| Label         | Description                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------|
| Record #      | The record ID that uniquely identifies the accounting policy, expressed as a decimal integer.         |
| Record Name   | The accounting record name.                                                                           |
| Def. Interval | The default interval, in minutes, in which statistics are collected and written to their destination. |

### Sample Output (for 7210 SAS-E)

```
A:7210-SASE>show>log# accounting-records
```

## Show Commands

```
=====
Accounting Policy Records
=====
Record # Record Name Def. Interval

1 service-ingress-octets 5
3 service-ingress-packets 5
4 service-egress-packets 5
5 network-ingress-octets 15
7 network-ingress-packets 15
8 network-egress-packets 15
32 saa 5
36 access-egress-packets 5
41 combined-service-ing-egr-packets 5
42 combined-network-ing-egr-pkts 15
=====
A:7210-SASE>show>log#
```

### Sample Output (for 7210 SAS-D)

```
A:7210-SASD>show>log# accounting-records

=====
Accounting Policy Records
=====
Record # Record Name Def. Interval

1 service-ingress-octets 5
2 service-egress-octets 5
3 service-ingress-packets 5
4 service-egress-packets 5
5 network-ingress-octets 15
6 network-egress-octets 15
7 network-ingress-packets 15
8 network-egress-packets 15
10 combined-service-ingress 5
11 combined-network-ing-egr-octets 15
13 complete-service-ingress-egress 5
32 saa 5
36 access-egress-packets 5
37 access-egress-octets 5
38 combined-access-egress 5
39 combined-network-egress 15
40 combined-service-egress 5
=====
A:7210-SASD>show>log#
```

## applications

|                    |                                                                                                              |
|--------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>applications</b>                                                                                          |
| <b>Context</b>     | show>log                                                                                                     |
| <b>Description</b> | This command displays a list of all application names that can be used in event-control and filter commands. |

**Output      Sample Output**

```

A:ALA-1# show log applications
=====
Log Event Application Names
=====
Application Name

CCAG
CHASSIS
CPMHWFILTER
DHCP
DEBUG
DOT1X
FILTER
IGMP
IGMP_SNOOPING
IP
ISIS
LAG
LDP
LOGGER
MIRROR
MPLS
OAM
OSPF
PORT
PPP
QOS
RIP
ROUTE_POLICY
RSVP
SECURITY
SNMP
STP
SVCNMR
SYSTEM
USER
VRRP
VRTR
=====
A:ALA-1#

```

**event-control**

- Syntax**      **event-control** [**application-id** [*event-name* | *event-number*]]
- Context**      show>log
- Description**      This command displays event control settings for events including whether the event is suppressed or generated and the severity level for the event.
- If no options are specified all events, alarms and traps are listed.

**Parameters** **application-id** — Only displays event control for the specified application.

**Default** All applications.

*event-name* — Only displays event control for the named application event.

**Default** All events for the application.

*event-number* — Only displays event control for the specified application event number.

**Default** All events for the application.

**Output** **Show Event Control Output** — The following table describes the output fields for the event control.

| Label       | Description                                                                                                                                                                                                                                                                                             |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application | The application name.                                                                                                                                                                                                                                                                                   |
| ID#         | The event ID number within the application.<br>L ID# — An “L” in front of an ID represents event types that do not generate an associated SNMP notification. Most events do generate a notification, only the exceptions are marked with a preceding “L”.                                               |
| Event Name  | The event name.                                                                                                                                                                                                                                                                                         |
| P           | CL — The event has a cleared severity/priority.<br>CR — The event has critical severity/priority.<br>IN — The event has indeterminate severity/priority.<br>MA — The event has major severity/priority.<br>MI — The event has minor severity/priority.<br>WA — The event has warning severity/priority. |
| g/s         | gen — The event will be generated/logged by event control.<br>sup — The event will be suppressed/dropped by event control.<br>thr — Specifies that throttling is enabled.                                                                                                                               |
| Logged      | The number of events logged/generated.                                                                                                                                                                                                                                                                  |
| Dropped     | The number of events dropped/suppressed.                                                                                                                                                                                                                                                                |

**Sample Output**

```
Sample output 7210 SAS-E:

*A:7210-SAS-E>show>log# event-control
=====
Log Events
=====
Application
ID# Event Name P g/s Logged Dropped

```

| CHASSIS: |                                 |    |     |   |   |  |
|----------|---------------------------------|----|-----|---|---|--|
| 2001     | cardFailure                     | MA | gen | 0 | 0 |  |
| 2002     | cardInserted                    | MI | gen | 4 | 0 |  |
| 2003     | cardRemoved                     | MI | gen | 0 | 0 |  |
| 2004     | cardWrong                       | MI | gen | 0 | 0 |  |
| 2005     | EnvTemperatureTooHigh           | MA | gen | 0 | 0 |  |
| 2006     | fanFailure                      | CR | gen | 0 | 0 |  |
| 2007     | powerSupplyOverTemp             | CR | gen | 0 | 0 |  |
| 2008     | powerSupplyAcFailure            | CR | gen | 0 | 0 |  |
| 2009     | powerSupplyDcFailure            | CR | gen | 0 | 0 |  |
| 2010     | powerSupplyInserted             | MA | gen | 1 | 0 |  |
| 2011     | powerSupplyRemoved              | MA | gen | 0 | 0 |  |
| 2012     | redPrimaryCPMFail               | CR | gen | 0 | 0 |  |
| 2016     | clearNotification               | MA | gen | 0 | 0 |  |
| 2017     | syncIfTimingHoldover            | CR | gen | 0 | 0 |  |
| 2018     | syncIfTimingHoldoverClear       | CR | gen | 0 | 0 |  |
| 2019     | syncIfTimingRef1Alarm           | MI | gen | 0 | 0 |  |
| 2020     | syncIfTimingRef1AlarmClear      | MI | gen | 0 | 0 |  |
| 2021     | syncIfTimingRef2Alarm           | MI | gen | 0 | 0 |  |
| 2022     | syncIfTimingRef2AlarmClear      | MI | gen | 0 | 0 |  |
| 2023     | flashDataLoss                   | MA | gen | 0 | 0 |  |
| 2024     | flashDiskFull                   | MA | gen | 0 | 0 |  |
| 2025     | softwareMismatch                | MA | gen | 0 | 0 |  |
| 2026     | softwareLoadFailed              | MA | gen | 0 | 0 |  |
| 2027     | bootloaderMismatch              | MA | gen | 1 | 0 |  |
| 2028     | bootromMismatch                 | MA | gen | 0 | 0 |  |
| 2029     | fpgaMismatch                    | MA | gen | 0 | 0 |  |
| 2030     | syncIfTimingBITSAlarm           | MI | gen | 0 | 0 |  |
| 2031     | syncIfTimingBITSAlarmClear      | MI | gen | 0 | 0 |  |
| 2032     | cardUpgraded                    | MA | gen | 0 | 0 |  |
| 2033     | cardUpgradeInProgress           | MA | gen | 0 | 0 |  |
| 2034     | cardUpgradeComplete             | MA | gen | 0 | 0 |  |
| 2050     | powerSupplyInputFailure         | CR | gen | 0 | 0 |  |
| 2051     | powerSupplyOutputFailure        | CR | gen | 0 | 0 |  |
| 2052     | mdaHiBwMulticastAlarm           | MI | gen | 0 | 0 |  |
| 2056     | mdaCfgNotCompatible             | MA | gen | 0 | 0 |  |
| 2057     | cardSyncFileNotPresent          | MI | gen | 0 | 0 |  |
| 2058     | tmnxEqMdaXplError               | MI | sup | 0 | 0 |  |
| 2059     | tmnxEqCardPChipError            | MI | sup | 0 | 0 |  |
| 2060     | tmnxEqCardSoftResetAlarm        | MI | gen | 0 | 0 |  |
| 2061     | tmnxEqMdaSyncENotCompatible     | MA | gen | 0 | 0 |  |
| 2062     | tmnxIPsecIsaGrpActiveIsaChgd    | MI | gen | 0 | 0 |  |
| 2063     | tmnxEqCardPChipMemoryEvent      | MI | sup | 0 | 0 |  |
| 2064     | tmnxIPsecIsaGrpUnableToSwitch   | MI | gen | 0 | 0 |  |
| 2065     | tmnxIPsecIsaGrpTnlLowWMark      | MI | gen | 0 | 0 |  |
| 2066     | tmnxIPsecIsaGrpTnlHighWMark     | MI | gen | 0 | 0 |  |
| 2067     | tmnxIPsecIsaGrpTnlMax           | MI | gen | 0 | 0 |  |
| 2076     | tmnxEqCardPChipCamEvent         | CR | gen | 0 | 0 |  |
| 2078     | tmnxEqHwEnhancedCapability      | MA | gen | 0 | 0 |  |
| 2068     | tmnxEqSyncIfTimingRef1Quality   | MI | gen | 0 | 0 |  |
| 2069     | tmnxEqSyncIfTimingRef2Quality   | MI | gen | 0 | 0 |  |
| 2072     | tmnxEqSyncIfTimingRefSwitch     | MI | gen | 0 | 0 |  |
| 2077     | tmnxEqSyncIfTimingSystemQuality | MI | gen | 0 | 0 |  |
| 3001     | tmnxSasAlarminput1StateChanged  | MA | gen | 0 | 0 |  |
| 3002     | tmnxSasAlarminput2StateChanged  | MA | gen | 0 | 0 |  |
| 3003     | tmnxSasAlarminput3StateChanged  | MA | gen | 0 | 0 |  |
| 3004     | tmnxSasAlarminput4StateChanged  | MA | gen | 0 | 0 |  |
| 3000     | EnvTemperatureTooLow            | MA | gen | 0 | 0 |  |
| DEBUG:   |                                 |    |     |   |   |  |

## Show Commands

```

L 2001 traceEvent MI gen 0 0
EFM_OAM:
 2001 tmnxDot3OamPeerChanged MI gen 0 0
 2002 tmnxDot3OamLoopDetected MI gen 0 0
 2003 tmnxDot3OamLoopCleared MI gen 0 0
 2008 dot3OamNonThresholdEvent MI gen 0 0
ETH_CFM:
 2001 dotlagCfmFaultAlarm MI gen 6297 0
 2002 tmnxDotlagCfmMepLbmTestComplete MI gen 0 0
 2003 tmnxDotlagCfmMepLtmTestComplete MI gen 0 0
 2004 tmnxDotlagCfmMepEthTestComplete MI gen 0 0
 2005 tmnxDotlagCfmMepDMTestComplete MI gen 0 0
 2006 tmnxDotlagCfmMepAisStateChanged MI gen 38 0
 2007 tmnxDotlagCfmMipEvaluation MI gen 0 0
ERING:
 2001 tmnxEthRingPathFwdStateChange MI gen 2911 0
 2002 tmnxEthRingApsPrvsNRaiseAlarm MI gen 0 0
 2003 tmnxEthRingApsPrvsNClearAlarm MI gen 0 0
ETUN:
 2001 tmnxEthTunnelApsCfgRaiseAlarm MI gen 0 0
 2002 tmnxEthTunnelApsCfgClearAlarm MI gen 0 0
 2003 tmnxEthTunnelApsPrvsNRaiseAlarm MI gen 0 0
 2004 tmnxEthTunnelApsPrvsNClearAlarm MI gen 0 0
 2005 tmnxEthTunnelApsNoRspRaiseAlarm MI gen 0 0
 2006 tmnxEthTunnelApsNoRspClearAlarm MI gen 0 0
 2007 tmnxEthTunnelApsSwitchoverAlarm MI gen 0 0
FILTER:
 2001 tIPFilterPBRPacketsDrop WA gen 0 0
 2002 tFilterEntryActivationFailed WA gen 0 0
 2003 tFilterEntryActivationRestored WA gen 0 0
IGMP_SNOOPING:
 2001 sapIgmpSnpgGrpLimitExceeded WA gen 0 0
 2002 sapIgmpSnpgMcacPlycDropped WA gen 0 0
 2003 sdpBndIgmpSnpgGrpLimitExceeded WA gen 0 0
 2004 sdpBndIgmpSnpgMcacPlycDropped WA gen 0 0
 2005 sapIgmpSnpgMcsFailure WA gen 0 0
 2006 sapIgmpSnpgSrcLimitExceeded WA gen 0 0
 2007 sdpBndIgmpSnpgSrcLimitExceeded WA gen 0 0
IP:
L 2001 clearRTMError MI gen 0 0
L 2002 ipEtherBroadcast MI gen 0 0
L 2003 ipDuplicateAddress MI gen 0 0
L 2004 ipArpInfoOverwritten MI gen 2 0
L 2005 fibAddFailed MA gen 0 0
L 2006 qosNetworkPolicyMallocFailed MA gen 0 0
L 2007 ipArpBadInterface MI gen 0 0
L 2008 ipArpDuplicateIpAddress MI gen 0 0
L 2009 ipArpDuplicateMacAddress MI gen 0 0
L 2010 ipAnyDuplicateAddress MI gen 0 0
LAG:
 2001 DynamicCostOn WA gen 0 0
 2002 DynamicCostOff WA gen 0 0
 2003 LagPortAddFailed WA gen 1672 0
 2004 LagSubGroupSelected WA gen 0 0
 2005 LagPortAddFailureCleared WA gen 1672 0
LLDP:
 2001 lldpRemTablesChange MI gen 1298 0
LOGGER:
L 2001 STARTED MI gen 5 0
 2002 tmnxLogTraceError CR gen 0 0
 2005 tmnxLogSpaceContention MA gen 0 0

```

## Event and Accounting Logs

|         |      |                                |    |     |     |   |
|---------|------|--------------------------------|----|-----|-----|---|
|         | 2006 | tmnxLogAdminLocFailed          | MA | gen | 0   | 0 |
|         | 2007 | tmnxLogBackupLocFailed         | MA | gen | 0   | 0 |
|         | 2008 | tmnxLogFileRollover            | MA | gen | 0   | 0 |
|         | 2009 | tmnxLogFileDeleted             | MI | gen | 18  | 0 |
|         | 2010 | tmnxClear                      | IN | gen | 750 | 0 |
|         | 2011 | tmnxTestEvent                  | IN | gen | 0   | 0 |
|         | 2012 | tmnxLogEventThrottled          | MA | gen | 0   | 0 |
|         | 2013 | tmnxSysLogTargetProblem        | MA | gen | 0   | 0 |
|         | 2014 | tmnxLogAccountingDataLoss      | MA | gen | 0   | 0 |
|         | 2015 | tmnxStdEventsReplayed          | MA | gen | 0   | 0 |
| L       | 2016 | tmnxLogOnlyEventThrottled      | MA | gen | 0   | 0 |
| MIRROR: |      |                                |    |     |     |   |
|         | 2001 | sourceEnabled                  | MI | gen | 0   | 0 |
|         | 2002 | sourceDisabled                 | MI | gen | 0   | 0 |
|         | 2003 | destinationEnabled             | MI | gen | 0   | 0 |
|         | 2004 | destinationDisabled            | MI | gen | 0   | 0 |
|         | 2006 | sourceIpFilterChange           | MI | gen | 0   | 0 |
|         | 2007 | sourceMacFilterChange          | MI | gen | 0   | 0 |
|         | 2008 | sourceSapChange                | MI | gen | 0   | 0 |
|         | 2009 | sourceSubscriberChange         | MI | gen | 0   | 0 |
| NTP:    |      |                                |    |     |     |   |
|         | 2001 | tmnxNtpAuthMismatch            | WA | gen | 0   | 0 |
|         | 2002 | tmnxNtpNoServersAvail          | MA | gen | 0   | 0 |
|         | 2003 | tmnxNtpServersAvail            | MI | gen | 0   | 0 |
|         | 2008 | tmnxNtpOperChange              | WA | gen | 1   | 0 |
|         | 2009 | tmnxNtpServerChange            | MI | gen | 1   | 0 |
| OAM:    |      |                                |    |     |     |   |
|         | 2001 | tmnxOamPingProbeFailedV3       | MI | gen | 0   | 0 |
|         | 2002 | tmnxOamPingTestFailedV3        | MI | gen | 0   | 0 |
|         | 2003 | tmnxOamPingTestCompletedV3     | MI | gen | 0   | 0 |
|         | 2004 | tmnxAncpLoopbackTestCompleted  | WA | gen | 0   | 0 |
| L       | 2005 | tmnxAncpLoopbackTestCompletedL | WA | gen | 0   | 0 |
|         | 2050 | tmnxOamTrPathChange            | MI | gen | 0   | 0 |
|         | 2051 | tmnxOamTrTestFailed            | MI | gen | 0   | 0 |
|         | 2052 | tmnxOamTrTestCompleted         | MI | gen | 0   | 0 |
| L       | 2053 | svcIdInvalid                   | MI | gen | 0   | 0 |
| L       | 2054 | svcIdWrongType                 | MI | gen | 0   | 0 |
|         | 2055 | tmnxOamLdpTtraceAutoDiscState  | MI | gen | 0   | 0 |
|         | 2056 | tmnxOamLdpTtraceFecProbeState  | MI | gen | 0   | 0 |
|         | 2057 | tmnxOamLdpTtraceFecDisStatus   | MI | gen | 0   | 0 |
|         | 2101 | tmnxOamSaaThreshold            | MI | gen | 0   | 0 |
| PORT:   |      |                                |    |     |     |   |
|         | 2001 | sonetSDHAlarmSet               | MI | gen | 0   | 0 |
|         | 2002 | sonetSDHAlarmClear             | MI | gen | 0   | 0 |
|         | 2003 | sonetSDHChannelAlarmSet        | MI | gen | 0   | 0 |
|         | 2004 | sonetSDHChannelAlarmClear      | MI | gen | 0   | 0 |
|         | 2005 | SFPInserted                    | MI | gen | 11  | 0 |
|         | 2006 | SFPRemoved                     | MI | gen | 0   | 0 |
|         | 2008 | SFPStatusFailure               | MI | gen | 0   | 0 |
|         | 2009 | portError                      | MI | gen | 0   | 0 |
|         | 2010 | yellowDiffDelayExceeded        | MI | gen | 0   | 0 |
|         | 2011 | redDiffDelayExceeded           | MA | gen | 0   | 0 |
|         | 2012 | bndlBadEndPtDiscriminator      | MI | gen | 0   | 0 |
|         | 2017 | etherAlarmSet                  | MI | gen | 0   | 0 |
|         | 2018 | etherAlarmClear                | MI | gen | 0   | 0 |
|         | 2019 | ds1LoopbackStart               | MI | gen | 0   | 0 |
|         | 2020 | ds1LoopbackStop                | MI | gen | 0   | 0 |
|         | 2021 | ds3LoopbackStart               | MI | gen | 0   | 0 |
|         | 2022 | ds3LoopbackStop                | MI | gen | 0   | 0 |

## Show Commands

|               |                                  |                                  |     |     |      |   |
|---------------|----------------------------------|----------------------------------|-----|-----|------|---|
| 2023          | sdhLoopbackStart                 | MI                               | gen | 0   | 0    |   |
| 2024          | sdhLoopbackStop                  | MI                               | gen | 0   | 0    |   |
| 2025          | etherLoopDetected                | MI                               | gen | 0   | 0    |   |
| 2026          | etherLoopCleared                 | MI                               | gen | 0   | 0    |   |
| 2027          | etherSpeedNotCompatible          | MA                               | gen | 0   | 0    |   |
| 2028          | etherDuplexNotCompatible         | MA                               | gen | 0   | 0    |   |
| 2029          | etherIngressRateCfgNotCompatible | MA                               | gen | 0   | 0    |   |
| 2030          | digitalDiagnosticMonitorFailed   | MI                               | gen | 19  | 0    |   |
| 2031          | SFPStatusDDMCorrupt              | MI                               | gen | 0   | 0    |   |
| 2032          | SFPStatusReadError               | MI                               | gen | 0   | 0    |   |
| 2033          | SFPStatusUnsupported             | MI                               | gen | 0   | 0    |   |
| 2034          | dsxClockSyncStateChange          | MI                               | gen | 0   | 0    |   |
| 2035          | bundleMlfrMemberLoopback         | MI                               | gen | 0   | 0    |   |
| 2036          | tmnxPortUnsupportedFunction      | WA                               | gen | 0   | 0    |   |
| 2037          | otuAlarms                        | MI                               | gen | 0   | 0    |   |
| ROUTE_POLICY: |                                  |                                  |     |     |      |   |
| L             | 2001                             | trigPolicyPrevEval               | WA  | gen | 0    | 0 |
| SECURITY:     |                                  |                                  |     |     |      |   |
| L             | 2001                             | cli_user_login                   | MI  | gen | 6    | 0 |
| L             | 2002                             | cli_user_logout                  | MI  | gen | 3    | 0 |
| L             | 2003                             | cli_user_login_failed            | MI  | gen | 0    | 0 |
| L             | 2004                             | cli_user_login_max_attempts      | MI  | gen | 0    | 0 |
| L             | 2005                             | ftp_user_login                   | MI  | gen | 0    | 0 |
| L             | 2006                             | ftp_user_logout                  | MI  | gen | 0    | 0 |
| L             | 2007                             | ftp_user_login_failed            | MI  | gen | 0    | 0 |
| L             | 2008                             | ftp_user_login_max_attempts      | MI  | gen | 0    | 0 |
| L             | 2009                             | ssh_user_login                   | MI  | gen | 0    | 0 |
| L             | 2010                             | ssh_user_logout                  | MI  | gen | 0    | 0 |
| L             | 2011                             | ssh_user_login_failed            | MI  | gen | 0    | 0 |
| L             | 2012                             | ssh_user_login_max_attempts      | MI  | gen | 0    | 0 |
|               | 2014                             | radiusOperStatusChange           | MI  | gen | 1    | 0 |
| L             | 2015                             | user_disconnect                  | MA  | gen | 0    | 0 |
| L             | 2016                             | radiusSystemIpAddrNotSet         | MA  | gen | 0    | 0 |
|               | 2018                             | tacplusOperStatusChange          | MI  | gen | 2    | 0 |
| L             | 2019                             | mafEntryMatch                    | MA  | gen | 0    | 0 |
| L             | 2020                             | ftp_transfer_successful          | MI  | gen | 0    | 0 |
| L             | 2021                             | ftp_transfer_failed              | MI  | gen | 0    | 0 |
| L             | 2022                             | enable_admin                     | WA  | gen | 0    | 0 |
| L             | 2023                             | host_snmp_attempts               | WA  | gen | 0    | 0 |
|               | 2024                             | SSH_server_preserve_key_fail     | MI  | gen | 0    | 0 |
|               | 2025                             | tacplusInetSvrOperStatusChange   | MI  | gen | 1    | 0 |
|               | 2026                             | radiusInetServerOperStatusChange | MI  | gen | 0    | 0 |
|               | 2027                             | tmnxKeyChainAuthFailure          | MI  | gen | 0    | 0 |
|               | 2028                             | tmnxCpmProtViolPort              | WA  | gen | 0    | 0 |
|               | 2029                             | tmnxCpmProtViolPortAgg           | WA  | gen | 0    | 0 |
|               | 2030                             | tmnxCpmProtViolIf                | WA  | gen | 0    | 0 |
|               | 2031                             | tmnxCpmProtViolSap               | WA  | gen | 0    | 0 |
|               | 2032                             | tmnxCpmProtViolMac               | WA  | gen | 0    | 0 |
|               | 2033                             | tmnxCpmProtViolVdoSvcClient      | WA  | gen | 0    | 0 |
|               | 2034                             | tmnxCpmProtViolVdoVrtrClient     | WA  | gen | 0    | 0 |
|               | 2206                             | tmnxConfigModify                 | WA  | gen | 28   | 0 |
|               | 2207                             | tmnxConfigCreate                 | WA  | gen | 11   | 0 |
|               | 2208                             | tmnxConfigDelete                 | WA  | gen | 0    | 0 |
|               | 2209                             | tmnxStateChange                  | WA  | gen | 0    | 0 |
| SNMP:         |                                  |                                  |     |     |      |   |
|               | 2001                             | coldStart                        | MA  | gen | 1    | 0 |
|               | 2002                             | warmStart                        | MA  | gen | 0    | 0 |
|               | 2003                             | authenticationFailure            | MI  | sup | 0    | 0 |
|               | 2004                             | linkDown                         | WA  | gen | 6313 | 0 |
|               | 2005                             | linkUp                           | WA  | gen | 5315 | 0 |
|               | 2101                             | risingAlarm                      | MA  | gen | 2    | 0 |

## Event and Accounting Logs

|          |                                  |    |     |      |   |
|----------|----------------------------------|----|-----|------|---|
| 2102     | fallingAlarm                     | MA | gen | 4    | 0 |
| 2201     | snmpdError                       | MA | gen | 0    | 0 |
| STP:     |                                  |    |     |      |   |
| 2001     | topologyChangeSapMajorState      | WA | gen | 6756 | 0 |
| 2002     | newRootSap                       | WA | gen | 0    | 0 |
| 2003     | topologyChangeVcpState           | WA | gen | 0    | 0 |
| 2004     | newRootVcpState                  | WA | gen | 0    | 0 |
| 2005     | topologyChangeSapState           | WA | gen | 201  | 0 |
| 2006     | receivedTCN                      | WA | gen | 0    | 0 |
| 2007     | newRootBridge                    | WA | gen | 3138 | 0 |
| 2008     | unacknowledgedTCN                | WA | gen | 0    | 0 |
| 2009     | higherPriorityBridge             | WA | gen | 0    | 0 |
| 2011     | sapEncapPVST                     | MI | gen | 2    | 0 |
| 2012     | sapEncapDot1d                    | MI | gen | 0    | 0 |
| 2014     | tmnxSvcTopoChgSdpBindMajorState  | WA | gen | 0    | 0 |
| 2015     | tmnxSvcNewRootSdpBind            | WA | gen | 0    | 0 |
| 2016     | tmnxSvcTopoChgSdpBindState       | WA | gen | 0    | 0 |
| 2017     | tmnxSvcSdpBindRcvdTCN            | WA | gen | 0    | 0 |
| 2018     | tmnxSvcSdpBindRcvdHigherBriPrio  | WA | gen | 0    | 0 |
| 2019     | tmnxSvcSdpBindEncapPVST          | MI | gen | 0    | 0 |
| 2020     | tmnxSvcSdpBindEncapDot1d         | MI | gen | 0    | 0 |
| 2021     | tmnxNewCistRegionalRootBridge    | WA | gen | 373  | 0 |
| 2022     | tmnxNewMstiRegionalRootBridge    | WA | gen | 6279 | 0 |
| 2023     | tmnxStpRootGuardViolation        | WA | gen | 0    | 0 |
| 2024     | tmnxStpMeshNotInMstRegion        | WA | gen | 0    | 0 |
| 2025     | tmnxSapStpExcepCondStateChng     | WA | gen | 0    | 0 |
| 2026     | tmnxSdpBndStpExcepCondStateChng  | WA | gen | 0    | 0 |
| 2050     | sapActiveProtocolChange          | MI | gen | 0    | 0 |
| 2051     | tmnxSvcSdpActiveProtocolChange   | MI | gen | 0    | 0 |
| 2052     | vcpActiveProtocolChange          | MI | gen | 0    | 0 |
| 2053     | topologyChangePipMajorState      | WA | gen | 0    | 0 |
| 2054     | topologyChangePipState           | WA | gen | 0    | 0 |
| 2055     | tmnxPipStpExcepCondStateChng     | WA | gen | 0    | 0 |
| 2056     | pipActiveProtocolChange          | MI | gen | 0    | 0 |
| SVC MGR: |                                  |    |     |      |   |
| 2011     | svcTlsMacPinningViolation        | WA | gen | 0    | 0 |
| 2103     | svcStatusChanged                 | MI | gen | 1302 | 0 |
| 2104     | svcTlsFdbTableFullAlarmRaised    | MI | gen | 0    | 0 |
| 2105     | svcTlsFdbTableFullAlarmCleared   | MI | gen | 0    | 0 |
| 2108     | iesIfStatusChanged               | MI | gen | 10   | 0 |
| 2109     | tmnxSvcObjTodSuiteApplicFailed   | WA | gen | 0    | 0 |
| 2110     | tmnxEndPointTxActiveChanged      | WA | gen | 0    | 0 |
| 2111     | tmnxSvcPEDiscPolServOperStatChg  | MI | gen | 0    | 0 |
| 2120     | svcTlsMrpAttrRegistrationFailed  | MI | gen | 0    | 0 |
| 2125     | svcTlsMrpAttrTblFullAlarmRaised  | MI | gen | 0    | 0 |
| 2126     | svcTlsMrpAttrTblFullAlarmCleared | MI | gen | 0    | 0 |
| 2128     | svcEpipePbbOperStatusChanged     | MI | gen | 0    | 0 |
| 2203     | sapStatusChanged                 | MI | gen | 2138 | 0 |
| 2204     | sapTlsMacAddrLimitAlarmRaised    | MI | gen | 2    | 0 |
| 2205     | sapTlsMacAddrLimitAlarmCleared   | MI | gen | 0    | 0 |
| 2206     | hostConnectivityLost             | WA | gen | 0    | 0 |
| 2207     | hostConnectivityRestored         | WA | gen | 0    | 0 |
| 2208     | sapReceivedProtSrcMac            | MI | gen | 0    | 0 |
| 2209     | sapTlsMacMoveExceeded            | MI | gen | 0    | 0 |
| 2210     | sapPortStateChangeProcessed      | MA | gen | 3330 | 0 |
| 2211     | sapCemPacketDefectAlarm          | MI | gen | 0    | 0 |
| 2212     | sapCemPacketDefectAlarmClear     | MI | gen | 0    | 0 |
| 2213     | msapStateChanged                 | MI | gen | 0    | 0 |
| 2214     | msapCreationFailure              | MI | gen | 0    | 0 |

## Show Commands

|         |      |                                  |    |     |      |   |
|---------|------|----------------------------------|----|-----|------|---|
|         | 2303 | sdpStatusChanged                 | MI | gen | 0    | 0 |
|         | 2306 | sdpBindStatusChanged             | MI | gen | 0    | 0 |
| L       | 2307 | sdpKeepAliveStarted              | MI | gen | 0    | 0 |
| L       | 2308 | sdpKeepAliveStopped              | MI | gen | 0    | 0 |
| L       | 2309 | sdpKeepAliveProbeFailure         | MI | gen | 0    | 0 |
| L       | 2310 | sdpKeepAliveLateReply            | MI | gen | 0    | 0 |
|         | 2311 | sdpTlsMacAddrLimitAlarmRaised    | MI | gen | 0    | 0 |
|         | 2312 | sdpTlsMacAddrLimitAlarmCleared   | MI | gen | 0    | 0 |
|         | 2313 | sdpBindPwPeerStatusBitsChanged   | MI | gen | 0    | 0 |
|         | 2314 | sdpBindTlsMacMoveExceeded        | MI | gen | 0    | 0 |
|         | 2315 | sdpBindPwPeerFaultAddrChanged    | MI | gen | 0    | 0 |
|         | 2316 | sdpBindSdpStateChangeProcessed   | MA | gen | 0    | 0 |
|         | 2317 | sdpBandwidthOverbooked           | MA | gen | 0    | 0 |
|         | 2318 | sdpBindInsufficientBandwidth     | MA | gen | 0    | 0 |
|         | 2319 | dynamicSdpConfigChanged          | MA | gen | 0    | 0 |
|         | 2320 | dynamicSdpBindConfigChanged      | MA | gen | 0    | 0 |
|         | 2321 | dynamicSdpCreationFailed         | MA | gen | 0    | 0 |
|         | 2322 | dynamicSdpBindCreationFailed     | MA | gen | 0    | 0 |
|         | 2401 | svcTlsMfibTableFullAlarmRaised   | MI | gen | 0    | 0 |
|         | 2402 | svcTlsMfibTableFullAlarmCleared  | MI | gen | 0    | 0 |
|         | 2500 | tmnxSubscriberCreated            | WA | gen | 0    | 0 |
|         | 2501 | tmnxSubscriberDeleted            | WA | gen | 0    | 0 |
|         | 2502 | tmnxSubscriberRenamed            | WA | gen | 0    | 0 |
|         | 2503 | tmnxSubAcctPclyFailure           | WA | gen | 0    | 0 |
|         | 2504 | tmnxSubMcsRelatedProblem         | WA | gen | 0    | 0 |
|         | 2505 | tmnxSubAuthPclyRadSerOperStatChg | MI | gen | 0    | 0 |
|         | 2506 | tmnxSubAcctPclyRadSerOperStatChg | MI | gen | 0    | 0 |
|         | 2507 | svcEndPointMacLimitAlarmRaised   | MI | gen | 0    | 0 |
|         | 2508 | svcEndPointMacLimitAlarmCleared  | MI | gen | 0    | 0 |
|         | 2509 | tmnxSubRadSapDisconnectError     | WA | gen | 0    | 0 |
|         | 2510 | tmnxSubRadSdpBndDisconnectError  | WA | gen | 0    | 0 |
|         | 2511 | tmnxSubRadSapCoAError            | WA | gen | 0    | 0 |
|         | 2512 | tmnxSubRadSdpBndCoAError         | WA | gen | 0    | 0 |
|         | 2513 | tmnxSubRadSapSubAuthError        | WA | gen | 0    | 0 |
|         | 2514 | tmnxSubRadSdpBndSubAuthError     | WA | gen | 0    | 0 |
|         | 2515 | svcFdbMimDestTblFullAlrm         | MI | gen | 0    | 0 |
|         | 2516 | svcFdbMimDestTblFullAlrmCleared  | MI | gen | 0    | 0 |
|         | 2517 | svcPersistencyProblem            | WA | gen | 0    | 0 |
|         | 2520 | svcArpHostPopulateErr            | WA | gen | 0    | 0 |
|         | 2522 | svcEPMCEPConfigMismatch          | WA | gen | 0    | 0 |
|         | 2523 | svcEPMCEPConfigMismatchResolved  | WA | gen | 0    | 0 |
|         | 2524 | svcEPMCEPPassiveModeActive       | WA | gen | 0    | 0 |
|         | 2525 | svcEPMCEPPassiveModePassive      | WA | gen | 0    | 0 |
|         | 2526 | sapHostBGPPEeringSetupFailed     | MI | gen | 0    | 0 |
|         | 2527 | tmnxSubUserCategoryOutOfCredit   | MI | gen | 0    | 0 |
|         | 2528 | svcRestoreHostProblem            | WA | gen | 0    | 0 |
|         | 2529 | tmnxSubUserCategoryRefreshCredit | MI | gen | 0    | 0 |
|         | 2530 | tmnxSubUserCategoryError         | MI | gen | 0    | 0 |
| SYSTEM: |      |                                  |    |     |      |   |
|         | 2001 | stiDateAndTimeChanged            | WA | gen | 0    | 0 |
|         | 2002 | ssiSaveConfigSucceeded           | MA | gen | 0    | 0 |
|         | 2003 | ssiSaveConfigFailed              | CR | gen | 0    | 0 |
|         | 2004 | sbiBootConfig                    | MA | gen | 1    | 0 |
|         | 2005 | sbiBootSnmpd                     | MA | gen | 1    | 0 |
|         | 2006 | tmnxConfigModify                 | WA | gen | 9444 | 0 |
|         | 2007 | tmnxConfigCreate                 | WA | gen | 1340 | 0 |
|         | 2008 | tmnxConfigDelete                 | WA | gen | 401  | 0 |
|         | 2009 | tmnxStateChange                  | WA | gen | 1594 | 0 |
|         | 2010 | tmnxModuleMallocFailed           | MA | gen | 0    | 0 |
|         | 2011 | tmnxTrapDropped                  | MA | gen | 1    | 0 |
|         | 2012 | ssiSyncConfigOK                  | WA | gen | 0    | 0 |

## Event and Accounting Logs

|       |      |                                 |    |     |     |      |
|-------|------|---------------------------------|----|-----|-----|------|
|       | 2013 | ssiSyncConfigFailed             | CR | gen | 0   | 0    |
|       | 2014 | ssiSyncBootEnvOK                | WA | gen | 0   | 0    |
|       | 2015 | ssiSyncBootEnvFailed            | CR | gen | 0   | 0    |
| L     | 2016 | socket_bind_failed              | CR | gen | 0   | 0    |
| L     | 2017 | socket_conn_accept_failed       | CR | gen | 0   | 0    |
|       | 2018 | sntpTimeDiffExceedsThreshold    | MA | gen | 0   | 0    |
|       | 2022 | tmnxSssiMismatch                | MA | gen | 0   | 0    |
|       | 2023 | tmnxSnmpdStateChange            | MA | gen | 1   | 0    |
|       | 2024 | tmnxRedStandbySyncing           | MA | gen | 0   | 0    |
|       | 2025 | tmnxRedStandbyReady             | MA | gen | 0   | 0    |
|       | 2026 | tmnxRedStandbySyncLost          | CR | gen | 0   | 0    |
|       | 2027 | tmnxRedSwitchover               | CR | gen | 0   | 0    |
|       | 2028 | tmnxRedCpmActive                | CR | gen | 0   | 0    |
|       | 2029 | tmnxRedSingleCpm                | CR | gen | 0   | 0    |
|       | 2030 | persistenceClosedAlarmRaised    | MA | gen | 0   | 0    |
|       | 2031 | persistenceClosedAlarmCleared   | MA | gen | 0   | 0    |
|       | 2032 | tmnxSntpOperChange              | MA | gen | 0   | 0    |
|       | 2034 | tmnxFtpClientFailure            | MI | gen | 0   | 0    |
|       | 2037 | persistenceEventReport          | WA | gen | 0   | 0    |
|       | 2038 | sbiBootConfigFailFileError      | MA | gen | 0   | 0    |
|       | 2039 | sbiBootConfigOKFileError        | MA | gen | 0   | 0    |
|       | 2101 | schedActionFailure              | MA | gen | 0   | 0    |
|       | 2102 | smScriptAbort                   | MA | gen | 0   | 0    |
|       | 2103 | smScriptResult                  | MI | sup | 0   | 3    |
|       | 2104 | smScriptException               | MI | sup | 0   | 0    |
|       | 2500 | tmnxDyingGasp                   | MI | gen | 0   | 0    |
| USER: |      |                                 |    |     |     |      |
| L     | 2001 | cli_user_login                  | MI | gen | 6   | 0    |
| L     | 2002 | cli_user_logout                 | MI | gen | 3   | 0    |
| L     | 2003 | cli_user_login_failed           | MI | gen | 0   | 0    |
| L     | 2004 | cli_user_login_max_attempts     | MI | gen | 0   | 0    |
| L     | 2005 | ftp_user_login                  | MI | gen | 0   | 0    |
| L     | 2006 | ftp_user_logout                 | MI | gen | 0   | 0    |
| L     | 2007 | ftp_user_login_failed           | MI | gen | 0   | 0    |
| L     | 2008 | ftp_user_login_max_attempts     | MI | gen | 0   | 0    |
| L     | 2009 | cli_user_io                     | MI | sup | 0   | 4722 |
| L     | 2010 | snmp_user_set                   | MI | sup | 0   | 7881 |
| L     | 2011 | cli_config_io                   | MI | gen | 384 | 0    |
| VRTR: |      |                                 |    |     |     |      |
|       | 2001 | tmnxVRtrMidRouteTCA             | MI | gen | 0   | 0    |
|       | 2002 | tmnxVRtrHighRouteTCA            | MI | gen | 0   | 0    |
|       | 2003 | tmnxVRtrHighRouteCleared        | MI | gen | 0   | 0    |
|       | 2004 | tmnxVRtrIllegalLabelTCA         | MA | gen | 0   | 0    |
|       | 2008 | tmnxVRtrMaxArpEntriesTCA        | MA | gen | 0   | 0    |
|       | 2009 | tmnxVRtrMaxArpEntriesCleared    | MI | gen | 0   | 0    |
|       | 2011 | tmnxVRtrMaxRoutes               | MI | gen | 0   | 0    |
|       | 2012 | tmnxVRtrBfdSessionDown          | MA | gen | 0   | 0    |
|       | 2013 | tmnxVRtrBfdMaxSessionOnSlot     | MA | gen | 0   | 0    |
|       | 2014 | tmnxVRtrBfdPortTypeNotSupported | MA | gen | 0   | 0    |
|       | 2015 | tmnxVRtrBfdSessionUp            | MA | gen | 0   | 0    |
|       | 2016 | tmnxVRtrIPv6MidRouteTCA         | MI | gen | 0   | 0    |
|       | 2017 | tmnxVRtrIPv6HighRouteTCA        | MI | gen | 0   | 0    |
|       | 2018 | tmnxVRtrIPv6HighRouteCleared    | MI | gen | 0   | 0    |
|       | 2019 | tmnxVRtrStaticRouteCPEStatus    | MI | gen | 0   | 0    |
|       | 2020 | tmnxVRtrBfdSessionDeleted       | MI | gen | 0   | 0    |
|       | 2021 | tmnxVRtrBfdSessionProtChange    | MI | gen | 0   | 0    |
|       | 2022 | tmnxVRtrManagedRouteAddFailed   | MI | gen | 0   | 0    |
|       | 2023 | tmnxVRtrFibOccupancyThreshold   | MI | sup | 0   | 0    |
|       | 2024 | tmnxVRtrInetAddressAttachFailed | MI | gen | 0   | 0    |

```

 2029 tmnxVRtrIfLdpSyncTimerStart WA sup 0 0
 2030 tmnxVRtrIfLdpSyncTimerStop WA sup 0 0
=====
*A:7210-SAS-E>show>log#

```

## file-id

- Syntax** `file-id [log-file-id]`
- Context** `show>log`
- Description** This command displays event file log information.  
 If no command line parameters are specified, a summary output of all event log files is displayed.  
 Specifying a file ID displays detailed information on the event file log.
- Parameters** *log-file-id* — Displays detailed information on the specified event file log.
- Output** **Log File Output** — The following table describes the output fields for a log file summary.

| Label          | Description                                                                                                           |
|----------------|-----------------------------------------------------------------------------------------------------------------------|
| file-id        | The log file ID.                                                                                                      |
| rollover       | The rollover time for the log file which is how long in between partitioning of the file into a new file.             |
| retention      | The retention time for the file in the system which is how long the file should be retained in the file system.       |
| admin location | The primary flash device specified for the file location.<br>none — indicates no specific flash device was specified. |
| oper location  | The actual flash device on which the log file exists.                                                                 |
| file-id        | The log file ID.                                                                                                      |
| rollover       | The rollover time for the log file which is how long in between partitioning of the file into a new file.             |
| retention      | The retention time for the file in the system which is how long the file should be retained in the file system.       |
| file name      | The complete pathname of the file associated with the log ID.                                                         |
| expired        | Indicates whether or not the retention period for this file has passed.                                               |
| state          | in progress — Indicates the current open log file.<br>complete — Indicates the old log file.                          |

## filter-id

- Syntax** `filter-id [filter-id]`
- Context** `show>log`
- Description** This command displays event log filter policy information.
- Parameters** *filter-id* — Displays detailed information on the specified event filter policy ID.
- Values** 1 up to 65535
- Output** **Event Log Filter Summary Output** — The following table describes the output fields for event log filter summary information.

**Table 33: Event Log Filter Summary Output Fields**

| Label          | Description                                                                                                                                                                                                |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Filter Id      | The event log filter ID.                                                                                                                                                                                   |
| Applied        | no. The event log filter is not currently in use by a log ID.<br>yes. The event log filter is currently in use by a log ID.                                                                                |
| Default Action | drop. The default action for the event log filter is to drop events not matching filter entries.<br>forward. The default action for the event log filter is to forward events not matching filter entries. |
| Description    | The description string for the filter ID.                                                                                                                                                                  |

**Sample Output**

```
*A:ALA-48>config>log# show log filter-id
=====
Log Filters
=====
Filter Applied Default Description
Id Action

1 no forward
5 no forward
10 no forward
1001 yes drop Collect events for Serious Errors Log
=====
*A:ALA-48>config>log#
```

**Event Log Filter Detailed Output** — The following table describes the output fields for detailed event log filter information .

**Table 34: Event Log Filter Detail Output Fields**

| Label                      | Description                                                                                                                                                                                                  |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Filter-id                  | The event log filter ID.                                                                                                                                                                                     |
| Applied                    | no — The event log filter is not currently in use by a log ID.<br>yes — The event log filter is currently in use by a log ID.                                                                                |
| Default Action             | drop — The default action for the event log filter is to drop events not matching filter entries.<br>forward — The default action for the event log filter is to forward events not matching filter entries. |
| Description<br>(Filter-id) | The description string for the filter ID.                                                                                                                                                                    |

**Table 35: Log Filter Match Criteria Output Fields**

| Label                     | Description                                                                                                                                                                                                                                                                                            |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Entry-id                  | The event log filter entry ID.                                                                                                                                                                                                                                                                         |
| Action                    | default — There is no explicit action for the event log filter entry and the filter's default action is used on matching events.<br>drop — The action for the event log filter entry is to drop matching events.<br>forward — The action for the event log filter entry is to forward matching events. |
| Description<br>(Entry-id) | The description string for the event log filter entry.                                                                                                                                                                                                                                                 |
| Application               | The event log filter entry application match criterion.                                                                                                                                                                                                                                                |
| Event Number              | The event log filter entry application event ID match criterion.                                                                                                                                                                                                                                       |

**Table 35: Log Filter Match Criteria Output Fields (Continued)**

| Label    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Severity | <p><code>cleared</code> – The log event filter entry application event severity cleared match criterion.</p> <p><code>indeterminate</code> – The log event filter entry application event severity indeterminate match criterion.</p> <p><code>critical</code> – The log event filter entry application event severity critical match criterion.</p> <p><code>major</code> – The log event filter entry application event severity cleared match criterion.</p> <p><code>minor</code> – The log event filter entry application event severity minor match criterion.</p> <p><code>warning</code> – The log event filter entry application event severity warning match criterion.</p>                        |
| Subject  | Displays the event log filter entry application event ID subject string match criterion.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Router   | Displays the event log filter entry application event ID <b>router</b> <i>router-instance</i> string match criterion.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Operator | <p>There is an operator field for each match criteria: application, event number, severity, and subject.</p> <p><code>equal</code> – Matches when equal to the match criterion.</p> <p><code>greaterThan</code> – Matches when greater than the match criterion.</p> <p><code>greaterThanOrEqualTo</code> – Matches when greater than or equal to the match criterion.</p> <p><code>lessThan</code> – Matches when less than the match criterion.</p> <p><code>lessThanOrEqualTo</code> – Matches when less than or equal to the match criterion.</p> <p><code>notEqual</code> – Matches when not equal to the match criterion.</p> <p><code>off</code> – No operator specified for the match criterion.</p> |

**Sample Output**

```
*A:ALA-48>config>log# show log filter-id 1001
=====
Log Filter
=====
Filter-id : 1001 Applied : yes Default Action: drop
Description : Collect events for Serious Errors Log
```

```

Log Filter Match Criteria

Entry-id : 10 Action : forward
Application : Operator : off
Event Number : 0 Operator : off
Severity : major Operator : greaterThanOrEqualTo
Subject : Operator : off
Match Type : exact string :
Router : Operator : off
Match Type : exact string :
Description : Collect only events of major severity or higher

=====
*A:ALA-48>config>log#

```

## log-collector

- Syntax** **log-collector**
- Context** show>log
- Description** Show log collector statistics for the main, security, change and debug log collectors.
- Output** **Log-Collector Output** — The following table describes log-collector output fields.

**Table 36: Show Log-Collector Output Fields**

| Label            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <Collector Name> | <p><b>Main</b> — The main event stream contains the events that are not explicitly directed to any other event stream.</p> <p><b>Security</b> — The security stream contains all events that affect attempts to breach system security such as failed login attempts, attempts to access MIB tables to which the user is not granted access or attempts to enter a branch of the CLI to which access has not been granted.</p> <p><b>Change</b> — The change event stream contains all events that directly affect the configuration or operation of this node.</p> <p><b>Debug</b> — The debug-trace stream contains all messages in the debug stream.</p> |
| Dest. Log ID     | Specifies the event log stream destination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Filter ID        | The value is the index to the entry which defines the filter to be applied to this log's source event stream to limit the events output to this log's destination. If the value is 0, then all events in the source log are forwarded to the destination.                                                                                                                                                                                                                                                                                                                                                                                                   |
| Status           | <p><b>Enabled</b> — Logging is enabled.</p> <p><b>Disabled</b> — Logging is disabled.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

**Table 36: Show Log-Collector Output Fields (Continued)**

| Label      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dest. Type | <p><b>Console</b> — A log created with the console type destination displays events to the physical console device.</p> <p>Events are displayed to the console screen whether a user is logged in to the console or not.</p> <p>A user logged in to the console device or connected to the CLI via a remote telnet or SSH session can also create a log with a destination type of 'session'. Events are displayed to the session device until the user logs off. When the user logs off, the 'session' type log is deleted.</p> <p><b>Syslog</b> — All selected log events are sent to the syslog address.</p> <p><b>SNMP traps</b> — Events defined as SNMP traps are sent to the configured SNMP trap destinations and are logged in NOTIFICATION-LOG-MIB tables.</p> <p><b>File</b> — All selected log events will be directed to a file on one of the 's compact flash disks.</p> <p><b>Memory</b> — All selected log events will be directed to an in-memory storage area.</p> |

**Sample Output**

```

A:ALA-1# show log log-collector
=====
Log Collectors
=====
Main Logged : 1224 Dropped : 0
 Dest Log Id: 99 Filter Id: 0 Status: enabled Dest Type: memory
 Dest Log Id: 100 Filter Id: 1001 Status: enabled Dest Type: memory

Security Logged : 3 Dropped : 0

Change Logged : 3896 Dropped : 0

Debug Logged : 0 Dropped : 0

=====
A:ALA-1#

```

## log-id

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>log-id</b> [ <i>log-id</i> ] [ <b>severity</b> <i>severity-level</i> ] [ <b>application</b> <i>application</i> ] [ <b>sequence</b> <i>from-seq</i> [ <i>to-seq</i> ]] [ <b>count</b> <i>count</i> ] [ <b>router</b> <i>router-instance</i> [ <b>expression</b> ]] [ <b>subject</b> <i>subject</i> [ <b>regex</b> ]] [ <b>ascending</b>   <b>descending</b> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Context</b>     | show>log                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b> | <p>This command displays an event log summary with settings and statistics or the contents of a specific log file, SNMP log, or memory log.</p> <p>If the command is specified with no command line options, a summary of the defined system logs is displayed. The summary includes log settings and statistics.</p> <p>If the log ID of a memory, SNMP, or file event log is specified, the command displays the contents of the log. Additional command line options control what and how the contents are displayed.</p> <p>Contents of logs with console, session or syslog destinations cannot be displayed. The actual events can only be viewed on the receiving syslog or console device.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Parameters</b>  | <p><i>log-id</i> — Displays the contents of the specified file log or memory log ID. The log ID must have a destination of an SNMP or file log or a memory log for this parameter to be used.</p> <p><b>Default</b> Displays the event log summary</p> <p><b>Values</b> 1 — 99</p> <p><b>severity</b> <i>severity-level</i> — Displays only events with the specified and higher severity.</p> <p><b>Default</b> All severity levels</p> <p><b>Values</b> cleared, indeterminate, critical, major, minor, warning</p> <p><b>application</b> <i>application</i> — Displays only events generated by the specified application.</p> <p><b>Default</b> All applications</p> <p><b>expression</b> — Specifies to use a regular expression as match criteria for the router instance string.</p> <p><b>sequence</b> <i>from-seq</i> [<i>to-seq</i>] — Displays the log entry numbers from a particular entry sequence number (<i>from-seq</i>) to another sequence number (<i>to-seq</i>). The <i>to-seq</i> value must be larger than the <i>from-seq</i> value.</p> <p>If the <i>to-seq</i> number is not provided, the log contents to the end of the log is displayed unless the <b>count</b> parameter is present in which case the number of entries displayed is limited by the <b>count</b>.</p> <p><b>Default</b> All sequence numbers</p> <p><b>Values</b> 1 — 4294967295</p> <p><b>count</b> <i>count</i> — Limits the number of log entries displayed to the <i>number</i> specified.</p> <p><b>Default</b> All log entries</p> <p><b>Values</b> 1 — 4294967295</p> <p><i>router-instance</i> — Specifies a router name up to 32 characters to be used in the display criteria.</p> <p><b>subject</b> <i>subject</i> — Displays only log entries matching the specified text <i>subject</i> string. The subject is the object affected by the event, for example the port-id would be the subject for a link-up or link-down event.</p> |

**regexp** — Specifies to use a regular expression as parameters with the specified *subject* string..

**ascending / descending** — Specifies sort direction. Logs are normally shown from the newest entry to the oldest in **descending** sequence number order on the screen. When using the **ascending** parameter, the log will be shown from the oldest to the newest entry.

**Default** Descending

**Output Show Log-ID Output** — The following table describes the log ID field output.

| Label       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Log Id      | An event log destination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Source      | no — The event log filter is not currently in use by a log ID.<br>yes — The event log filter is currently in use by a log ID.                                                                                                                                                                                                                                                                                                                                                                                                                |
| Filter ID   | The value is the index to the entry which defines the filter to be applied to this log's source event stream to limit the events output to this log's destination. If the value is 0, then all events in the source log are forwarded to the destination.                                                                                                                                                                                                                                                                                    |
| Admin State | Up — Indicates that the administrative state is up.<br>Down — Indicates that the administrative state is down.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Oper State  | Up — Indicates that the operational state is up.<br>Down — Indicates that the operational state is down.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Logged      | The number of events that have been sent to the log source(s) that were forwarded to the log destination.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Dropped     | The number of events that have been sent to the log source(s) that were not forwarded to the log destination because they were filtered out by the log filter.                                                                                                                                                                                                                                                                                                                                                                               |
| Dest. Type  | Console — All selected log events are directed to the system console. If the console is not connected, then all entries are dropped.<br>Syslog — All selected log events are sent to the syslog address.<br>SNMP traps — Events defined as SNMP traps are sent to the configured SNMP trap destinations and are logged in NOTIFICATION-LOG-MIB tables.<br>File — All selected log events will be directed to a file on one of the 's compact flash disks.<br>Memory — All selected log events will be directed to an in-memory storage area. |
| Dest ID     | The event log stream destination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Label       | Description (Continued)                                                                                                                                                                                                                                                                                                   |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Size        | The allocated memory size for the log.                                                                                                                                                                                                                                                                                    |
| Time format | The time format specifies the type of timestamp format for events sent to logs where log ID destination is either syslog or file.<br>When the time format is UTC, timestamps are written using the Coordinated Universal Time value.<br>When the time format is local, timestamps are written in the system's local time. |

**Sample Output**

```
A:ALA-1# show log log-id
=====
Event Logs
=====
Log Source Filter Admin Oper Logged Dropped Dest Dest Size
Id Id State State Type Id

1 none none up down 52 0 file 10 N/A
2 C none up up 41 0 syslog 1 N/A
99 M none up up 2135 0 memory 500
=====
A:ALA-1#
```

**Sample Memory or File Event Log Contents Output**

```
A:gal171# show log log-id 99
=====
Event Log 99
=====
Description : Default System Log
Memory Log contents [size=500 next event=70 (not wrapped)]

69 2007/01/25 18:20:40.00 UTC CRITICAL: SYSTEM #2029 Base Redundancy
"The active CPM card A is operating in singleton mode. There is no standby CPM
card."

68 2007/01/25 17:48:38.16 UTC WARNING: SYSTEM #2006 Base LOGGER
"New event throttle interval 10, configuration modified"

67 2007/01/25 00:34:53.97 UTC CRITICAL: SYSTEM #2029 Base Redundancy
"The active CPM card A is operating in singleton mode. There is no standby CPM
card."

66 2007/01/24 22:59:22.00 UTC CRITICAL: SYSTEM #2029 Base Redundancy
"The active CPM card A is operating in singleton mode. There is no standby CPM
card."

65 2007/01/24 02:08:47.92 UTC CRITICAL: SYSTEM #2029 Base Redundancy
"The active CPM card A is operating in singleton mode. There is no standby CPM
card."
...
=====
A:gal171
```

```

A:NS061550532>config>log>snmp-trap-group# show log log-id 1
=====
Event Log 1
=====
SNMP Log contents [size=100 next event=3 (not wrapped)]
Cannot send to SNMP target address 10.1.1.1.

14 2000/01/05 00:54:09.11 UTC WARNING: MPLS #2007 Base VR 1:
"Instance is in administrative state: inService, operational state: inService"

13 2000/01/05 00:54:09.11 UTC WARNING: MPLS #2008 Base VR 1:
"Interface linkToIxia is in administrative state: inService, operational state:
inService"
....
=====
A:NS061550532>config>log>snmp-trap-group#

```

## snmp-trap-group

- Syntax** `snmp-trap-group [log-id]`
- Context** `show>log`
- Description** This command displays SNMP trap group configuration information.
- Parameters** *log-id* — Displays only SNMP trap group information for the specified trap group log ID.
- Values** 1 — 100
- Output** **SNMP Trap Group Output** — The following table describes SNMP trap group output fields.

**Table 37: SNMP Trap Group Output Fields**

| Label          | Description                                                                                                                                                       |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Log-ID         | The log destination ID for an event stream.                                                                                                                       |
| Address        | The IP address of the trap receiver,                                                                                                                              |
| Port           | The destination UDP port used for sending traps to the destination, expressed as a decimal integer.                                                               |
| Version        | Specifies the SNMP version format to use for traps sent to the trap receiver. Valid values are <code>snmpv1</code> , <code>snmpv2c</code> , <code>snmpv3</code> . |
| Community      | The community string required by <code>snmpv1</code> or <code>snmpv2c</code> trap receivers.                                                                      |
| Security-Level | The required authentication and privacy levels required to access the views on this node.                                                                         |

### Sample SNMP Trap Group Output

```
A:SetupCLI>config>log>snmp-trap-group# show log snmp-trap-group 44
```

```

=====
SNMP Trap Group 44
=====
Description : none

Name : ntt-test
Address : 10.10.10.3
Port : 162
Version : v2c
Community : ntttesting
Sec. Level : none

Name : test2
Address : 20.20.20.5
Port : 162
Version : v2c
Community : ntttesting
Sec. Level : none
=====
A: SetupCLI>config>log>snmp-trap-group#

```

## syslog

- Syntax**     **syslog** [*syslog-id*]
- Context**     show>log
- Description** This command displays syslog event log destination summary information or detailed information on a specific syslog destination.
- Parameters** *syslog-id* — Displays detailed information on the specified syslog event log destination.  
                   **Values**     1 — 10
- Output**     **Syslog Event Log Destination Summary Output** — The following table describes the syslog output fields.

**Table 38: Show Log Syslog Output Fields**

| Label                  | Description                                                                                                                                                                            |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Syslog ID              | The syslog ID number for the syslog destination.                                                                                                                                       |
| IP Address             | The IP address of the syslog target host.                                                                                                                                              |
| Port                   | The configured UDP port number used when sending syslog messages.                                                                                                                      |
| Facility               | The facility code for messages sent to the syslog target host.                                                                                                                         |
| Severity Level         | The syslog message severity level threshold.                                                                                                                                           |
| Below Level<br>Dropped | A count of messages not sent to the syslog collector target because the severity level of the message was above the configured severity. The higher the level, the lower the severity. |

**Table 38: Show Log Syslog Output Fields (Continued)**

| Label          | Description                                                                                                                                                           |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prefix Present | Yes – A log prefix was prepended to the syslog message sent to the syslog host.<br>No – A log prefix was not prepended to the syslog message sent to the syslog host. |
| Description    | A text description stored in the configuration file for a configuration context.                                                                                      |
| LogPrefix      | The prefix string prepended to the syslog message.                                                                                                                    |
| Log-id         | Events are directed to this destination.                                                                                                                              |

**Sample Syslog Event Log Destination Summary Output**

```
*A:ALA-48>config>log# show log syslog
=====
Syslog Target Hosts
=====
Id Ip Address Port Sev Level
 Below Level Drop Facility Pfx Level

2 unknown 514 info
 0 local7 yes
3 unknown 514 info
 0 local7 yes
5 unknown 514 info
 0 local7 yes
10 unknown 514 info
 0 local7 yes
=====
*A:ALA-48>config>log#

*A:MV-SR>config>log# show log syslog 1
=====
Syslog Target 1
=====
IP Address : 192.168.15.22
Port : 514
Log-ids : none
Prefix : Sr12
Facility : local1
Severity Level : info
Prefix Level : yes
Below Level Drop : 0
Description : Linux Station Springsteen
=====
*A:MV-SR>config>log#
```

---

## Clear Commands

### log

|                    |                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>      | <b>log</b> <i>log-id</i>                                                                                                                                                                                                                                                                                                                                                               |
| <b>Context</b>     | clear                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Description</b> | <p>Reinitializes/rolls over the specified memory/file event log ID. Memory logs are reinitialized and cleared of contents. File logs are manually rolled over by this command.</p> <p>This command is only applicable to event logs that are directed to file destinations and memory destinations.</p> <p>SNMP, syslog and console/session logs are not affected by this command.</p> |
| <b>Parameters</b>  | <p><i>log-id</i>. The event log ID to be initialized/rolled over.</p> <p><b>Values</b>     1 — 100</p>                                                                                                                                                                                                                                                                                 |

# Standards and Protocol Support (7210 SAS E)

## Standards Compliance

IEEE 802.1ab-REV/D3 Station And Media Access Control Connectivity Discovery  
IEEE 802.1d Bridging  
IEEE 802.1p/Q VLAN Tagging  
IEEE 802.1w Rapid Spanning Tree Protocol  
IEEE 802.1x Port Based Network Access Control  
IEEE 802.1ad Provider Bridges  
IEEE 802.1ag Service Layer OAM  
IEEE 802.3ah Ethernet in the First Mile  
IEEE 802.3 10BaseT  
IEEE 802.3ad Link Aggregation  
IEEE 802.3ah Ethernet OAM  
IEEE 802.3u 100BaseTX  
IEEE 802.3z 1000BaseSX/LX  
ITU-T Y.1731 OAM functions and mechanisms for Ethernet based networks  
IANA-IFType-MIB  
IEEE8023-LAG-MIB  
ITU-T G.8032 Ethernet Ring Protection Switching (version 1)

## Protocol Support

### DIFFERENTIATED SERVICES

RFC 2474 Definition of the DS Field the IPv4 and IPv6 Headers (Rev)  
RFC 2597 Assured Forwarding PHB Group (rev3260)  
RFC 2598 An Expedited Forwarding PHB  
RFC 3140 Per-Hop Behavior Identification Codes

### MULTICAST

RFC 1112 Host Extensions for IP Multicasting (Snooping)  
RFC 2236 Internet Group Management Protocol, (Snooping)  
RFC 3376 Internet Group Management Protocol, Version 3 (Snooping)

### TCP/IP

RFC 768 UDP

RFC 1350 The TFTP Protocol (Rev.  
RFC 791 IP  
RFC 792 ICMP  
RFC 793 TCP  
RFC 826 ARP  
RFC 854 Telnet  
RFC 1519 CIDR  
RFC 1812 Requirements for IPv4 Routers  
RFC 2347 TFTP option Extension  
RFC 2328 TFTP Blocksize Option  
RFC 2349 TFTP Timeout Interval and Transfer Size option

### RADIUS

RFC 2865 Remote Authentication Dial In User Service  
RFC 2866 RADIUS Accounting

### SSH

draft-ietf-secsh-architecture.txt SSH Protocol Architecture  
draft-ietf-secsh-userauth.txt SSH Authentication Protocol  
draft-ietf-secsh-transport.txt SSH Transport Layer Protocol  
draft-ietf-secsh-connection.txt SSH Connection Protocol  
draft-ietf-secsh-newmodes.txt SSH Transport Layer Encryption Modes

### TACACS+

draft-grant-tacacs-02.txt

### NETWORK MANAGEMENT

ITU-T X.721: Information technology-OSI-Structure of Management Information  
ITU-T X.734: Information technology-OSI-Systems Management: Event Report Management Function  
M.3100/3120 Equipment and Connection Models  
TMF 509/613 Network Connectivity Model  
RFC 1157 SNMPv1  
RFC 1215 A Convention for Defining Traps for use with the SNMP  
RFC 1907 SNMPv2-MIB  
RFC 2011 IP-MIB

RFC 2012 TCP-MIB  
RFC 2013 UDP-MIB  
RFC 2096 IP-FORWARD-MIB  
RFC 2138 RADIUS  
RFC 2571 SNMP-FRAMEWORKMIB  
RFC 2572 SNMP-MPD-MIB  
RFC 2573 SNMP-TARGET-&-NOTIFICATION-MIB  
RFC 2574 SNMP-USER-BASED-SMMIB  
RFC 2575 SNMP-VIEW-BASED-ACM-MIB  
RFC 2576 SNMP-COMMUNITY-MIB  
RFC 2665 EtherLike-MIB  
RFC 2819 RMON-MIB  
RFC 2863 IF-MIB  
RFC 2864 INVERTED-STACK-MIB  
RFC 3014 NOTIFICATION-LOGMIB  
RFC 3164 Syslog  
RFC 3273 HCRMON-MIB  
RFC 3411 An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks  
RFC 3412 - Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)  
RFC 3413 - Simple Network Management Protocol (SNMP) Applications  
RFC 3414 - User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)  
RFC 3418 - SNMP MIB  
draft-ietf-disman-alarm-mib-04.txt

### PROPRIETARY MIBs

ALCATEL-IGMP-SNOOPING-MIB.mib  
TIMETRA-CAPABILITY-7210-SAS-E-V1v0.mib  
TIMETRA-CHASSIS-MIB.mib  
TIMETRA-CLEAR-MIB.mib  
TIMETRA-DOT3-OAM-MIB.mib  
TIMETRA-FILTER-MIB.mib  
TIMETRA-GLOBAL-MIB.mib  
TIMETRA-IEEE8021-CFM-MIB.mib  
TIMETRA-LAG-MIB.mib

## Standards and Protocols

TIMETRA-LOG-MIB.mib  
TIMETRA-MIRROR-MIB.mib  
TIMETRA-NTP-MIB.mib  
TIMETRA-OAM-TEST-MIB.mib  
TIMETRA-PORT-MIB.mib  
TIMETRA-QOS-MIB.mib  
TIMETRA-SAS-ALARM-INPUT-  
MIB.mib  
TIMETRA-SAS-IEEE8021-CFM-  
MIB.mib  
TIMETRA-SAS-GLOBAL-MIB.mib  
TIMETRA-SAS-PORT-MIB.mib  
TIMETRA-SAS-QOS-MIB.mib  
TIMETRA-SAS-SYSTEM-MIB.mib  
TIMETRA-SCHEDULER-MIB.mib  
TIMETRA-SECURITY-MIB.mib  
TIMETRA-SERV-MIB.mib  
TIMETRA-SYSTEM-MIB.mib  
TIMETRA-TC-MIB.mib  
TIMETRA-VRTR-MIB.mib

# Standards and Protocol Support (7210 SAS D)

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IEEE 802.1d Bridging  
IEEE 802.1p/Q VLAN Tagging  
IEEE 802.1w Rapid Spanning Tree  
Protocol  
IEEE 802.1x Port Based Network Access  
Control  
IEEE 802.1ad Provider Bridges  
IEEE 802.1ag Service Layer OAM  
IEEE 802.3ah Ethernet in the  
First Mile  
IEEE 802.3 10BaseT  
IEEE 802.3ad Link Aggregation  
IEEE 802.3ah Ethernet OAM  
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IEEE 802.3z 1000BaseSX/LX  
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IEEE8023-LAG-MIB

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RFC 2597 Assured Forwarding PHB  
Group (rev3260)  
RFC 2598 An Expedited Forwarding  
PHB  
RFC 3140 Per-Hop Behavior  
Identification Codes  
RFC 4115 A Differentiated Service Two-  
Rate, Three-Color Marker with  
Efficient Handling of in-Profile  
Traffic

### TCP/IP

RFC 768 UDP  
RFC 1350 The TFTP Protocol (Rev.  
RFC 791 IP  
RFC 792 ICMP  
RFC 793 TCP  
RFC 826 ARP  
RFC 854 Telnet  
RFC 1519 CIDR

RFC 1812 Requirements for IPv4  
Routers  
RFC 2347 TFTP option Extension  
RFC 2328 TFTP Blocksize Option  
RFC 2349 TFTP Timeout Interval and  
Transfer Size option

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User Service  
RFC 2866 RADIUS Accounting

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draft-ietf-secsh-architecture.txt SSH  
Protocol Architecture  
draft-ietf-secsh-userauth.txt SSH  
Authentication Protocol  
draft-ietf-secsh-transport.txt SSH  
Transport Layer Protocol  
draft-ietf-secsh-connection.txt SSH  
Connection Protocol  
draft-ietf-secsh-newmodes.txt SSH  
Transport Layer Encryption Modes

### TACACS+

draft-grant-tacacs-02.txt

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OSI-Structure of Management  
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RFC 2012 TCP-MIB  
RFC 2013 UDP-MIB  
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RFC 2571 SNMP-FRAMEWORKMIB  
RFC 2572 SNMP-MPD-MIB

RFC 2573 SNMP-TARGET-&-  
NOTIFICATION-MIB  
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SMMIB  
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MIB  
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TIMETRA-LAG-MIB.mib  
TIMETRA-LOG-MIB.mib  
TIMETRA-MIRROR-MIB.mib  
TIMETRA-NTP-MIB.mib  
TIMETRA-OAM-TEST-MIB.mib  
TIMETRA-PORT-MIB.mib  
TIMETRA-QOS-MIB.mib  
TIMETRA-SAS-IEEE8021-CFM-  
MIB.mib  
TIMETRA-SAS-GLOBAL-MIB.mib  
TIMETRA-SAS-PORT-MIB.mib

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TIMETRA-SCHEDULER-MIB.mib  
TIMETRA-SECURITY-MIB.mib  
TIMETRA-SERV-MIB.mib  
TIMETRA-SYSTEM-MIB.mib  
TIMETRA-TC-MIB.mib  
TIMETRA-VRTR-MIB.mib

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