Configuration Commands

Generic Commands

description

Syntax   **description** *description-string*
          no description

Context   config>mirror>mirror-dest
          config>li>log>log-id
          config>li>li-filter>li-mac-filter
          config>li>li-filter>li-mac-filter>entry
          config>li>li-filter>li-ip-filter
          config>li>li-filter>li-ip-filter>entry
          config>li>li-filter>li-ipv6-filter
          config>li>li-filter>li-ipv6-filter>entry
          config>li>li-filter-block-reservation>li-reserved-block

Description   This command creates a text description stored in the configuration file for a configuration context to help the administrator identify the content of the file.

The **no** form of the command removes the description string from the configuration.

Default   There is no default description associated with the configuration context.

Parameters   *description-string —* 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

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

Context   config>mirror>mirror-dest
          debug>mirror-source
          config>mirror>mirror-dest>spoke-sdp>egress
          config>li>li-source
          config>li>log>log-id

Description   The **shutdown** command administratively disables an entity. When disabled, an entity does not change, reset, or remove any configuration settings or statistics. Many entities must be explicitly enabled using the **no shutdown** command.

The **shutdown** command administratively disables an entity. 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.

Unlike other commands and parameters where the default state is not indicated in the configuration file, **shutdown** and **no shutdown** are always indicated in system generated configuration files.

The **no** form of the command puts an entity into the administratively enabled state.

Default   See Special Cases below.

Special Cases   **Mirror Destination —** When a mirror destination service ID is shutdown, mirrored packets associated with the service ID are not accepted from the mirror source or remote source7750 SR router. The associated mirror source is put into an operationally down mode. Mirrored packets are not transmitted out of the SAP or SDP. Each mirrored packet is silently discarded. If the mirror destination is a SAP, the SAP's discard counters are incremented.

The **shutdown** command places the mirror destination service or mirror source into an administratively down state. The **mirror-dest** service ID must be shut down in order to delete the service ID, SAP or SDP association from the system.

The default state for a mirror destination service ID is **shutdown**. A **no shutdown** command is required to enable the service.

Mirror Source — Mirror sources do not need to be shutdown in order to remove them from the system.

When a mirror source is **shutdown**, mirroring is terminated for all sources defined locally for the **mirror-dest** service ID. If the **remote-source** command has been executed on the **mirror-dest** associated with the shutdown **mirror-source**, mirroring continues for remote sources.

The default state for a mirror source for a given **mirror-dest** service ID is **no shutdown**. A **shutdown** command is required to disable mirroring from that mirror-source.

Mirror Destination Configuration Commands

enable-port-id

Syntax	[**no**] **enable-port-id**
Context	configure>mirror>mirror-dest
Description	This command includes the mirrored packet system's port-id. The system port ID can be used to identify which port the packet was received or sent on. Inclusion of the port-id is only supported for mirror-dest type ppp.
Default	no enable-port-id

endpoint

Syntax	**endpoint** *endpoint-name* [**create**] **no endpoint** *endpoint-name*
Context	configure>mirror>mirror-dest configure>mirror>mirror-dest>sap configure>mirror>mirror-dest>sdp
Description	A mirror service supports two implicit endpoints managed internally by the system. The following applies to endpoint configurations.

Up to two (2) named endpoints may be created per service mirror/LI service. The endpoint name is locally significant to the service mirror/LI service.

- Objects (SAPs or sdp's) may be created on the service mirror/LI with the following limitations:
    - two implicit endpoint objects (without explicit endpoints defined)
    - one implicit and multiple explicit object with the same endpoint name
    - multiple explicit objects each with one of two explicit endpoint names
- All objects become associated implicitly or indirectly with the implicit endpoints 'x' and 'y'.
- Objects may be created without an explicit endpoint defined.
- Objects may be created with an explicit endpoint defined.
- Objects without an explicit endpoint may have an explicit endpoint defined without deleting the object.
- Objects with an explicit endpoint defined may be dynamically moved to another explicit endpoint or may have the explicit endpoint removed.

Creating an object without an explicit endpoint:

- If an object on a mirror/LI service has no explicit endpoint name associated, the system attempts to associate the object with implicit endpoint 'x' or 'y'.
- The implicit endpoint cannot have an existing object association.

- If both 'x' and 'y' are available, 'x' will be selected.
- If an 'x' or 'y' association cannot be created, the object cannot be created.

Creating an object with an explicit endpoint name:

- The endpoint name must exist on the mirror/LI service.
- If this is the first object associated with the endpoint name:
  - the object is associated with either implicit endpoint 'x' or 'y'
  - the implicit endpoint cannot have an existing object associated
  - if both 'x' and 'y' are available, 'x' will be selected
  - if 'x' or 'y' is not available, the object cannot be created
  - the implicit endpoint is now associated with the named endpoint
  - f this is not the first object associated with the endpoint name:
  - the object is associated with the named endpoint's implicit association

Changing an objects implicit endpoint to an explicit endpoint name

- If the explicit endpoint name is associated with an implicit endpoint, the object is moved to that implicit endpoint
- If the object is the first to be associated with the explicit endpoint name:
  - the object is associated with either implicit endpoint 'x' or 'y'
  - the implicit endpoint cannot have an existing object associated (except this one)
  - if both 'x' and 'y' are available, 'x' will be selected
  - if 'x' or 'y' is not available, the object cannot be moved to the explicit endpoint
  - if moved, the implicit endpoint is now associated with the named endpoint

Changing an objects explicit endpoint to another explicit endpoint name

- If the new explicit endpoint name is associated with an implicit endpoint, the object is moved to that implicit endpoint
- If the object is the first to be associated with the new explicit endpoint name:
  - the object is associated with either implicit endpoint 'x' or 'y'
  - the implicit endpoint cannot have an existing object associated (except this one)
  - if both 'x' and 'y' are available, 'x' will be selected
  - if 'x' or 'y' is not available, the object cannot be moved to the new endpoint
  - if moved, the implicit endpoint is now associated with the named endpoint

An explicitly named endpoint can have a maximum of one SAP and one ICB. Once a SAP is added to the endpoint, only one more object of type ICB sdp is allowed. The ICB sdp cannot be added to the endpoint if the SAP is not part of a MC-LAG instance. Conversely, a SAP which is not part of a MC-LAG instance cannot be added to an endpoint which already has an ICB sdp.

An explicitly named endpoint which does not have a SAP object can have a maximum of four SDPs which can include any of the following: a single primary SDP, one or many secondary SDPs with precedence, and a single ICB SDP.

The user can only add a SAP configured on a MC-LAG instance to this endpoint. Conversely, the user will not be able to change the mirror service type away from mirror service without first deleting the MC-LAG SAP.

The **no** form of the command removes the association of a SAP or a sdp with an explicit endpoint name. Removing an objects explicit endpoint association:

- The system attempts to associate the object with implicit endpoint 'x' or 'y'.
- The implicit endpoint cannot have an existing object association (except this one).
- If both 'x' and 'y' are available, 'x' will be selected.
- If an 'x' or 'y' association cannot be created, the explicit endpoint cannot be removed.

Parameters *endpoint-name —* Specifies the endpoint name.

create — Mandatory keyword to create this entry.

revert-time

Syntax **revert-time** {*revert-time* | **infinite**}
no revert-time

Context configure>mirror>mirror-dest>endpoint

Description This command has an effect only when used in conjunction with a endpoint which contains a SDP of type 'primary'. It is ignored and has no effect in all other cases. The revert-timer is the delay in seconds the system waits before it switches the path of the mirror service from an active secondary SDP in the endpoint into the endpoint primary SDP after the latter comes back up.

The **no** form of the command resets the timer to the default value of 0. This means that the mirror-service path will be switched back to the endpoint primary sdp immediately after it comes back up.

Default 0 — The VLL path will be switched back to the endpoint primary SDP immediately after it comes back up.

Parameters *revert-time —* Specifies a delay, in seconds, the system waits before it switches the path of the mirror service from an active secondary SDP in the endpoint into the endpoint primary SDP after the latter comes back up.

Values 0 — 600

infinite — Forces the mirror/LI service path to never revert to the primary SDP as long as the currently active secondary -SDP is UP.

fc

Syntax	**fc** *fc-name* **no fc**
Context	config>mirror>mirror-dest
Description	This command specifies a forwarding class for all mirrored packets transmitted to the destination SAP or SDP overriding the default (be) forwarding class. All packets are sent with the same class of service to minimize out-of-sequence issues. The mirrored packet does not inherit the forwarding class of the original packet.

When the destination is on a SAP, a single egress queue is created that pulls buffers from the buffer pool associated with the *fc-name*.

When the destination is on an SDP, the *fc-name* defines the DiffServ-based egress queue that will be used to reach the destination. The *fc-name* also defines the encoded forwarding class of the encapsulation.

The fc configuration also affects how mirrored packets are treated at the ingress queueing point on the line cards. One ingress queue is used per mirror destination (service) and that will be an expedited queue if the configured FC is expedited (one of nc, h1, ef or h2). The ingress mirror queues have no CIR, but a line-rate PIR.

The **no** form of the command reverts the **mirror-dest** service ID forwarding class to the default forwarding class.

Default	The best effort (be) forwarding class is associated with the **mirror-dest** service ID.
Parameters	*fc-name* — The name of the forwarding class with which to associate mirrored service traffic. The forwarding class name must already be defined within the system. If the fc-name does not exist, an error will be returned and the **fc** command will have no effect. If the *fc-name* does exist, the forwarding class associated with *fc-name* will override the default forwarding class.

> **Values**   be, l2, af, l1, h2, ef, h1, nc

isa-aa-group

Syntax	**isa-aa-group** *aa-group-id traffic-direction*
Context	config>mirror>mirror-dest
Description	This command specifies ISA AA group parameters.
Parameters	*aa-group-id* — Specifies the particular application group to match against to resolve to an AQP action. If set to an empty string, no match on application group is done.
	traffic-direction — Specifies the traffic directions to match against to resolve to an AQP action. This allows different policer bandwidths to apply in each direction.

mirror-dest

Syntax	**mirror-dest** *service-id* [**type** *mirror-type*] [create] **no mirror-dest**
Context	config>mirror

Description This command creates a context to set up a service that is intended for packet mirroring. It is configured as a service to allow mirrored packets to be directed locally (within the same 7750 SR router) or remotely, over the core of the network and have a far end 7750 SR decode the mirror encapsulation.

The **mirror-dest** service is comprised of destination parameters that define where the mirrored packets are to be sent. It also specifies whether the defined *service-id* will receive mirrored packets from far end 7750 SR over the network core.

The **mirror-dest** service IDs are persistent between boots of the router and are included in the configuration saves. The local sources of mirrored packets for the service ID are defined within the **debug mirror mirror-source** command that references the same *service-id*. Up to 255 **mirror-dest** service IDs can be created within a single system.

The **mirror-dest** command is used to create or edit a service ID for mirroring purposes. If the *service-id* does not exist within the context of all defined services, the **mirror-dest** service is created and the context of the CLI is changed to that service ID. If the *service-id* exists within the context of defined **mirror-dest** services, the CLI context is changed for editing parameters on that service ID. If the *service-id* exists within the context of another service type, an error message is returned and CLI context is not changed from the current context.

LI source configuration is saved using the **li>save** command.

The **no** form of the command removes a mirror destination from the system. The **mirror-source** or **li-source** associations with the **mirror-dest** *service-id* do not need to be removed or shutdown first. The **mirror-dest** *service-id* must be shutdown before the service ID can be removed. When the service ID is removed, all **mirror-source** or **li-source** commands that have the service ID defined will also be removed from the system.

Default No packet mirroring services are defined.

Parameters *service-id* — The service identification identifies the service in the service domain. This ID is unique to this service and cannot be used by any other service, regardless of service type. The same service ID must be configured on every 7750 SR router that this particular service is defined on.

If particular a service ID already exists for a service, then the same value cannot be used to create a mirror destination service ID with the same value. For example:

If an Epipe service-ID **11** exists, then a mirror destination service-ID **11** cannot be created. If a VPLS service-ID **12** exists, then a mirror destination service-ID **12** cannot be created.
If an IES service-ID **13** exists, then a mirror destination service-ID **13** cannot be created.

Values *service-id*: 1 — 2147483647
svc-name: 64 characters maximum

type *encap-type* — The type describes the encapsulation supported by the mirror service.

Values ether, frame-relay, ppp, ip-only, atm-sdu, satop-e1, satop-e3, satop-t1, cesopsn, cesopsn-cas

remote-source

Syntax [**no**] **remote-source**

Context config>mirror>mirror-dest

Description This command is used on a destination router in a remote mirroring solution. The mirroring (packet copy) is performed on the source router and sent via an SDP to the destination router. Remote mirroring requires remote-source configuration on the destination router.

Remote mirroring allows a destination router to terminate SDPs from multiple remote source routers.   This allows consolidation of packet sniffers/analyzers at a single or small set of points in a network (e.g., a sniffer/analyze farm, or lawful interception gateway).

A remote-source entry must be configured on the destination router for each source router from which mirrored traffic is being sent via SDPs.

A mirror destination service that is configured for a destination router must not be configured as for a source router.

Remote-source configuration is not applicable when routable LI encapsulation is being used on the mirror source router. Remote-source configuration is only used when a source router is sending mirrored traffic to a destination router via SDPs.

Two types of remote-source entries can be configured:

- far-end
- spoke-sdp

Certain remote-source types are applicable with certain SDP types. For descriptions of the command usage in the mirror-dest context, see and .

The 'no' form of the command removes all remote-source entries.

Default No remote source devices defined

far-end

Syntax **far-end** *ip-address* [**vc-id** *vc-id*] [**ing-svc-label** *ing-vc-label* | **tldp**] [**icb**]
no far-end *ip-addr*

Context config>mirror>mirror-dest>remote-source

Description This command is used on a destination router in a remote mirroring solution. See the description of the remote-source command for additional information.

When using L2TPv3, MPLS-TP or LDP IPv6 LSP SDPs in the remote mirroring solution, the destination node should be configured with **remote-source>spoke-sdp** entries. For all other types of SDPs, **remote-source>far-end** entries are used.

Up to 50 far-end entries can be specified.

Default No far end service ingress addresses are defined.

Parameters *ip-address —* The service IP address (system IP address) of the remote device sending mirrored traffic to

this mirror destination service. If 0.0.0.0 is specified, any remote is allowed to send to this service.

> **Values**   1.0.0.1 — 223.255.255.254

vc-id *vc-id* — This is the virtual circuit identifier of the remote source. For mirror services, the *vc-id* defaults to the *service-id*. However, if the *vc-id* is being used by another service a unique vc-id is required to created an SDP binding. For this purpose the mirror service SDP bindings accepts *vc-ids*. This VC ID must match the VC ID used on the spoke-sdp that is configured on the source router.

ing-svc-label *ing-svc-label* — Specifies the ingress service label for mirrored service traffic on the **far end** device for manually configured mirror service labels.

The defined *ing-svc-label* is entered into the ingress service label table which causes ingress packet with that service label to be handled by this **mirror-dest** service.

The specified *ing-svc-label* must not have been used for any other service ID and must match the egress service label being used on the spoke-sdp that is configured on the source router. It must be within the range specified for manually configured service labels defined on this router. It may be reused for other far end addresses on this *mirror-dest-service-id*.

> **Values**   2048 — 18431

tldp — Specifies that the label is obtained through signaling via the LDP.

icb — Specifies that the remote source is an inter-chassis backup SDP binding.

sap

Syntax	**sap** *sap-id* [**create**] [**no-endpoint**] **sap** *sap-id* [**create**] **endpoint** *name* **no sap**
Context	config>mirror>mirror-dest
Description	This command creates a service access point (SAP) within a mirror destination service. The SAP is owned by the mirror destination service ID.

The SAP is defined with port and encapsulation parameters to uniquely identify the (mirror) SAP on the interface and within the box. The specified SAP may be defined on an Ethernet access port with a dot1q, null, or q-in-q encapsulation type.

Only one SAP can be created within a **mirror-dest** service ID. If the defined SAP has not been created on any service within the system, the SAP is created and the context of the CLI will change to the newly created SAP. In addition, the port cannot be a member of a multi-link bundle, LAG, APS group or IMA bundle.

If the defined SAP exists in the context of another service ID, **mirror-dest** or any other type, an error is generated.

Mirror destination SAPs can be created on Ethernet interfaces that have been defined as an access interface. If the interface is defined as network, the SAP creation returns an error.

When the **no** form of this command is used on a SAP created by a mirror destination service ID, the SAP with the specified port and encapsulation parameters is deleted.

> **Default**   No default SAP for the mirror destination service defined.

Parameters   *sap-id —* Specifies the physical port identifier portion of the SAP definition. See Common CLI Command Descriptions on page 639 for command syntax.

endpoint *name* **—** Specifies the name of the endpoint associated with the SAP.

no endpoint — Removes the association of a SAP or a sdp with an explicit endpoint name.

cem

Syntax   **cem**

Context   config>mirror>mirror-dest>sap

Description   This command enables the context to specify circuit emulation (CEM) mirroring properties.

Ingress and egress options cannot be supported at the same time on a CEM encap-type SAP. The options must be configured in either the ingress **or** egress contexts.

packet

Syntax   **packet jitter-buffer** *milliseconds* [**payload-size** *bytes*]
packet payload-size *bytes*
no packet *bytes*

Context   config>mirror>mirror-dest>sap>cem

Description   This command specifies the jitter buffer size, in milliseconds, and payload size, in bytes.

Default   The default value depends on the CEM SAP endpoint type, and if applicable, the number of timeslots:

Endpoint Type	Timeslots	Default Jitter Buffer (in ms)
unstructuredE1	n/a	5
unstructuredT1	n/a	5
unstructuredE3	n/a	5
unstructuredT3	n/a	5
nxDS0 (E1/T1)	N = 1	32
	N = 2..4	16
	N = 5..15	8
	N >= 16	5
nxDS0WithCas (E1)	N	8
nxDS0WithCas (T1)	N	12

Parameters *milliseconds* — Specifies the jitter buffer size in milliseconds (ms).

Configuring the payload size and jitter buffer to values that result in less than 2 packet buffers or greater than 32 packet buffers is not allowed.

Setting the jitter butter value to 0 sets it back to the default value.

Values 1 — 250

payload-size *bytes* — Specifies the payload size (in bytes) of packets transmitted to the packet service network (PSN) by the CEM SAP. This determines the size of the data that will be transmitted over the service. If the size of the data received is not consistent with the payload size then the packet is considered malformed.

Default The default value depends on the CEM SAP endpoint type, and if applicable, the number of timeslots:

Endpoint Type	Timeslots	Default Payload Size (in bytes)
unstructuredE1	n/a	256
unstructuredT1	n/a	192
unstructuredE3	n/a	1024
unstructuredT3	n/a	1024
nxDS0 (E1/T1)	N = 1	64
	N = 2..4	N x 32
	N = 5..15	N x 16
	N >= 16	N x 8
nxDS0WithCas (E1)	N	N x 16
nxDS0WithCas (T1)	N	N x 24

For all endpoint types except for nxDS0WithCas, the valid payload size range is from the default to 2048 bytes.

For nxDS0WithCas, the payload size divide by the number of timeslots must be an integer factor of the number of frames per trunk multiframe (for example, 16 for E1 trunk and 24 for T1 trunk).

For 1xDS0, the payload size must be a multiple of 2.

For NxDS0, where N > 1, the payload size must be a multiple of the number of timeslots.

For unstructuredE1, unstructuredT1, unstructuredE3 and unstructuredT3, the payload size must be a multiple of 32 bytes.

Configuring the payload size and jitter buffer to values that result in less than 2 packet buffers or greater than 32 packet buffer is not allowed.

Setting the payload size to 0 sets it back to the default value.

Values 0, 16 — 2048

rtp-header

Syntax	[no] **rtp-header**
Context	config>mirror>mirror-dest>sap>cem
Description	This command specifies whether an RTP header is used when packets are transmitted to the packet service network (PSN) by the CEM SAP.
Default	no rtp-header

egress

Syntax	**egress**
Context	config>mirror>mirror-dest>sap
Description	This command enables access to the context to associate an egress SAP Quality of Service (QoS) policy with a mirror destination SAP.
	If no QoS policy is defined, the system default SAP egress QoS policy is used for egress processing.

ip-mirror

Syntax	**ip-mirror**
Context	config>mirror>mirror-dest>sap>egress
Description	This command configures IP mirror information.

sa-mac

Syntax	**sa-mac** *ieee-address* **da-mac** *ieee-address* **no sa-mac**
Context	config>mirror>mirror-dest>sap>egress>ip-mirror
Description	This command configures the source and destination MAC addresses for IP mirroring.
Parameters	**sa-mac** *ieee-address* — Specifies the source MAC address. Multicast, Broadcast and zeros are not allowed.
	da-mac *ieee-address* — Specifies the destination MAC address. Zeros are not allowed.

qos

Syntax   **qos** *policy-id*
             no qos

Context   config>mirror>mirror-dest>sap>egress

Description This command associates a QoS policy with an egress SAP for a mirrored service.

             By default, no specific QoS policy is associated with the SAP for egress, so the default QoS policy is used.

             The **no** form of the command removes the QoS policy association from the SAP, and the QoS policy reverts to the default.

Default   QoS policy-id 1.

Parameters *policy-id —* The QoS policy ID to associate with SAP for the mirrored service. The policy ID must already exist.

             Values   1 — 65535

service-name

Syntax   **service-name** *service-name*
             no service-name

Context   config>mirror>mirror-dest

Description This command specifies an existing service name, up to 64 characters in length, which adds a name identifier to a given service to then use that service name in configuration references as well as display and use service names in show commands throughout the system. This helps the service provider/administrator to identify and manage services.

slice-size

Syntax   **slice-size** *bytes*
             no slice-size

Context   config>mirror>mirror-dest

Description This command enables mirrored frame truncation and specifies the maximum size, in bytes, of a mirrored frame that can be transmitted to the mirror destination.

             This command enables mirroring larger frames than the destination packet decode equipment can handle. It also allows conservation of mirroring resources by limiting the size of the packet stream through the router and the core network.

             When defined, the mirror **slice-size** creates a threshold that truncates a mirrored frame to a specific size. For example, if the value of 256 bytes is defined, a frame larger than 256 bytes will only have the first 256 bytes transmitted to the mirror destination. The original frame is not affected by the truncation. The mirrored

frame size may increase if encapsulation information is added during transmission through the network core or out the mirror destination SAP to the packet/protocol decode equipment.

The actual capability of the router to transmit a sliced or non-sliced frame is also dictated by the mirror destination SDP **path-mtu** and/or the mirror destination SAP physical MTU. Packets that require a larger MTU than the mirroring destination supports are discarded if the defined **slice-size** does not truncate the packet to an acceptable size.

Notes:

- When configuring IP mirroring, packet slice will be rejected as an incorrect option as it will cause IP packets to be rejected by the next hop with an IP header verification error.
- Slice-size is not supported by CEM encap-types or IP-mirroring.

The **no** form of the command disables mirrored packet truncation.

Default   **no slice-size** — Mirrored packet truncation is disabled.

Parameters   *bytes —* The number of bytes to which mirrored frames will be truncated, expressed as a decimal integer.

   Values   128 — 9216

spoke-sdp

Syntax   **spoke-sdp** *sdp-id:vc-id* [**create**] [**no-endpoint**]
   spoke-sdp *sdp-id:vc-id* [**create**] **endpoint** *name* [**icb**]
   no sdp *sdp-id:vc-id*

Context   config>mirror>mirror-dest
   config>mirror>mirror-dest>remote-source

Description   This command binds an existing (mirror) service distribution path (SDP) to the mirror destination service ID.

   Spoke SDPs are used to send and receive mirrored traffic between mirror source and destination routers in a remote mirroring solution. A spoke SDP configured in the remote-source context (**remote-source>spoke-sdp**) is used on the destination router. A spoke SDP configured in the mirror service context (**mirror-dest>spoke-sdp**) is used on the source router.

   The destination node should be configured with **remote-source>spoke-sdp** entries when using L2TPv3, MPLS-TP or LDP IPv6 LSP SDPs in the remote mirroring solution. For all other types of SDPs, r**emote-source>far-end** entries should be used.

   Spoke SDPs are not applicable when routable LI encapsulation is employed (mirror-dest>encap).

   A mirror destination service that is configured for a destination router must not be configured as for a source router.

   The **no** form of the command removes the SDP binding from the mirror destination service.

Default   No default SDP ID is bound to a mirror destination service ID. If no SDP is bound to the service, the mirror destination will be local and cannot be to another router over the core network.

Parameters   *sdp-id*[:*vc-id*] — A locally unique SDP identification (ID) number. The SDP ID must exist. If the SDP ID does not exist, an error will occur and the command will not execute.

For mirror services, the *vc-id* defaults to the *service-id*. However, there are scenarios where the *vc-id* is being used by another service. In this case, the SDP binding cannot be created. So, to avoid this, the mirror service SDP bindings now accepts *vc-ids*.

Values   1 — 17407

endpoint *name* — Specifies the name of the endpoint associated with the SAP.

no endpoint — Removes the association of a SAP or a SDP with an explicit endpoint name.

icb — Indicates that the SDP is of type Inter-Chassis Backup (ICB). This is a special pseudowire used for MC-LAG and pseudowire redundancy application.

An explicitly named endpoint can have a maximum of one SAP and one ICB. Once a SAP is added to the endpoint, only one more object of type ICB SDP is allowed. The ICB SDP cannot be added to the endpoint if the SAP is not part of a MC-LAG instance. This means that all other SAP types cannot exist on the same endpoint as an ICB SDP since non Ethernet SAP cannot be part of a MC-LAG instance. Conversely, a SAP which is not part of a MC-LAG instance cannot be added to an endpoint which already has an ICB SDP.

An explicitly named endpoint, which does not have a SAP object, can have a maximum of four SDPs, which can include any of the following: a single primary SDP, one or many secondary SDPs with precedence, and a single ICB SDP.

Null. The user should explicitly configure this option at create time. The user can remove the ICB type simply by retyping the SDP configuration without the **icb** keyword.control-channel-status

Syntax   [**no**] **control-channel-status**

Context   config>mirror>mirror-dest>remote-source>spoke-sdp
config>mirror>mirror-dest>spoke-sdp>

Description This command enables the configuration of static pseudowire status signaling on a spoke-SDP for which signaling for its SDP is set to OFF. For more information about control channel status configuration for the spoke-sdp, see the SR OS Services Guide.

Default   no control-channel-status

acknowledgment

Syntax   [**no**] **acknowledgment**

Context   config>mirror>mirror-dest>remote-source>spoke-sdp>control-channel-status
config>mirror>mirror-dest>spoke-sdp>control-channel-status

Description This command enables the acknowledgement of control channel status messages. By default, no acknowledgement packets are sent.

refresh-timer

Syntax   **refresh-timer** *value*
              no refresh-timer

Context   config>mirror>mirror-dest>remote-source>spoke-sdp>control-channel-status
              config>mirror>mirror-dest>spoke-sdp>control-channel-status

Description This command configures the refresh timer for control channel status signaling packets. By default, no referesh packets are sent.

Default   no refresh-timer

Parameters *value —* Specifies the refresh timer value.

request-timer

Syntax   **request-timer** *timer1* **retry-timer** *timer2* **timeout-multiplier** *multiplier*
              no request-timer

Context   config>mirror>mirror-dest>remote-source>spoke-sdp>control-channel-status
              config>mirror>mirror-dest>spoke-sdp>control-channel-status

Description This command configures the control channel status request mechanism. When it is configured, control channel status request procedures are used. These augment the procedures for control channel status messaging from RFC 6478. This command is mutually exclusive with a non-zero refresh-timer value.

Parameters *timer1 —* Specifies the interval at which pseudowire status messages, including a reliable delivery TLV, with the "request" bit set, are sent.

               Values   10 — 65535 seconds

               retry-timer *timer2* **—** Specifies the timeout interval if no response to a pseudowire status request is received. This parameter must be configured. A value of zero (0) disables retries.

               Values   0, 3 — 60 seconds

               timeout-multiplier *multiplier* **—** If a requesting node does not receive a valid response to a pseudowire status request within this multiplier times the retry timer, then it will assume the pseudowire is down. This parameter is optional.

               Values   3 — 20 seconds

control-word

Syntax   [no] **control-word**

Context   config>mirror>mirror-dest>remote-source>spoke-sdp>control-channel-status
              config>mirror>mirror-dest>spoke-sdp>control-channel-status

Description   This command enables/disables the PW control word on spoke-sdps terminated on an IES or VPRN interface. The control word must be enabled to allow MPLS-TP OAM on the spoke-sdp

It is only valid for MPLS-TP spoke-sdps when used with IES and VPRN services.

Default   no control-word

egress

Syntax   **egress**

Context   config>mirror>mirror-dest>spoke-sdp
config>mirror>mirror-dest>remote-source>spoke-sdp

Description   This command enters the context to configure spoke SDP egress parameters.

ingress

Syntax   **ingress**

Context   config>mirror>mirror-dest>spoke-sdp

config>mirror>mirror-dest>remote-source>spoke-sdp

Description   This command enters the context to configure spoke SDP ingress parameters.

l2tpv3

Syntax   **l2tpv3**

Context   config>mirror>mirror-dest>spoke-sdp>egress
config>mirror>mirror-dest>remote-source>spoke-sdp>ingress

Description   This command enters the context to configure an RX/TX cookie for L2TPv3 egress spoke-SDP or for the remote-source ingress spoke-sdp.

cookie

Syntax   **cookie** *cookie1-value* [*cookie2-value*]
no cookie

Context   config>mirror>mirror-dest>spoke-sdp>egress>l2tpv3
config>mirror>mirror-dest>remote-source>spoke-sdp>ingress>l2tpv3

Description   This command configures the RX/TX cookie for L2TPv3 spoke-SDPs for the mirror destination. The command can configure L2TPv3 a single cookie for the egress spoke-SDP or one or two cookies for the remote-source ingress spoke-sdp.

The purpose of the cookie is to provide validation against misconfiguration of service endpoints, and to ensure that the right service egress is being used.

When a cookie is not configured, SR-OS assumes a value of 00:00:00:00:00:00:00:00. A cookie is not mandatory. An operator may delete the egress cookie or either or both ingress cookies.

Default   no cookie1 cookie2

Parameters   *cookie1-value —* Specifies a 64-bit colon separated hex value.

cookie2-value — Specifies a second 64-bit colon separated hex value.

vc-label

Syntax   **vc-label** *egress-vc-label*
no vc-label [*egress-vc-label*]

Context   config>mirror>mirror-dest>spoke-sdp>egress
config>mirror>mirror-dest>remote-source>spoke-sdp>egress

Description   **This command configures the spoke-SDP egress VC label.**

Parameters   *egress-vc-label —* A VC egress value that indicates a specific connection.

Values   16 — 1048575

vc-label

Syntax   [**no**] **vc-label** *vc-label*

Context   config>mirror>mirror-dest>spoke-sdp>egress
config>mirror>mirror-dest>remote-source>spoke-sdp>egress

Description   This command configures the ingress VC label.

Parameters   *vc-label —* A VC ingress value that indicates a specific connection.

Values   2048 — 18431

pw-path-id

Syntax   [**no**] **pw-path-id**

Context   config>service>epipe>spoke-sdp
config>service>cpipe>spoke-sdp
config>service>apipe>spoke-sdp

config>service>vpls>spoke-sdp
config>service>ies>interface>spoke-sdp
config>service>vprn>interface>spoke-sdp

Description   This command enables the context to configure an MPLS-TP Pseudowire Path Identifier for a spoke-sdp. All elements of the PW path ID must be configured in order to enable a spoke-sdp with a PW path ID.

For an IES or VPRN spoke-sdp, the pw-path-id is only valid for ethernet spoke-sdps.

The **pw-path-id** is only configurable if all of the following is true:

- The system is using network chassis mode D
- SDP signaling is off
- control-word is enabled (control-word is disabled by default)
- the service type is epipe, vpls, cpipe, apipe, or IES/VPRN interface
- mate SDP signaling is off for vc-switched services

The **no** form of the command deletes the PW path ID.

Default   no pw-path-id

agi

Syntax   **agi** *agi*
no agi

Context   config>service>epipe>spoke-sdp>pw-path-id
config>service>cpipe>spoke-sdp>pw-path-id
config>service>apipe>spoke-sdp>pw-path-id
config>service>vpls>spoke-sdp>pw-path-id
config>service>ies>interface>>spoke-sdp>pw-path-id
config>service>vprn>interface>>spoke-sdp>pw-path-id

Description   This command configures the attachment group identifier for an MPLS-TP PW.

Parameters   *agi —* Specifies the attachment group identifier.

Values   0 — 4294967295

saii-type2

Syntax   **saii-type2** *global-id:node-id:ac-id*
no saii-type2

Context   config>service>epipe>spoke-sdp>pw-path-id
config>service>cpipe>spoke-sdp>pw-path-id
config>service>apipe>spoke-sdp>pw-path-id
config>service>vpls>spoke-sdp>pw-path-id
config>service>ies>interface>>spoke-sdp>pw-path-id

config>service>vprn>interface>>spoke-sdp>pw-path-id

Description   This command configures the source individual attachement identifier (SAII) for an MPLS-TP spoke-sdp. If this is configured on a spoke-sdp for which vc-switching is also configured (for example, it is at an S-PE), then the values must match those of the taii-type2 of the mate spoke-sdp.

Parameters   *global-id* — Specifies the global ID at the source PE or T-PE for the MPLS-TP PW for a spoke-SDP.

> **Values**   0 — 4294967295

node-id — Specifies the node ID at the source PE or T-PE for the MPLS-TP PW for a spoke-SDP.

> **Values**   a.b.c.d or 0 — 4294967295

ac-id — Specifies the attachment circuit ID at the source PE or T-PE for the MPLS-TP PW for a spoke-SDP. If this node is the source of the PW, then the AC ID must be set to a locally unique value.

> **Values**   1 — 4294967295

taii-type2

Syntax   **taii-type2** *global-id:node-id:ac-id*
no taii-type2

Context   config>service>epipe>spoke-sdp>pw-path-id
config>service>cpipe>spoke-sdp>pw-path-id
config>service>apipe>spoke-sdp>pw-path-id
config>service>vpls>spoke-sdp>pw-path-id
config>service>ies>interface>>spoke-sdp>pw-path-id
config>service>vprn>interface>>spoke-sdp>pw-path-id

Description   This command configures the target individual attachement identifier (TAII) for an MPLS-TP spoke-sdp. If this is configured on a spoke-sdp for which vc-switching is also configured (for example, it is at an S-PE), then the values must match those of the saii-type2 of the mate spoke-sdp.

Parameters   *global-id* — Specifies the global ID at the target PE or T-PE for the MPLS-TP PW for a spoke-SDP.

> **Values**   0 — 4294967295

node-id — Specifies the node ID at the target PE or T-PE for the MPLS-TP PW for a spoke-SDP.

> **Values**   a.b.c.d or 0 — 4294967295

ac-id — Specifies the attachment circuit ID at the target PE or T-PE for the MPLS-TP PW for a spoke-SDP. If this node is the source of the PW, then the AC ID must be set to a locally unique value.

> **Values**   1 — 4294967295

precedence

precedence *precedence-value* | **primary**
no precedence

Context   config>mirror>mirror-dest>spoke-sdp>egress

Description   This command indicates that the SDP is of type secondary with a specific precedence value or of type primary.

The mirror/LI service always uses the primary type as the active pseudowire and only switches to a secondary pseudowire when the primary is down. The mirror service switches the path back to the primary pseudowire when it is back up. The user can configure a timer to delay reverting back to primary or to never revert back.

If the active pseudowire goes down, the mirror service switches the path to a secondary sdp with the lowest precedence value. That is, secondary SDPs which are operationally up are considered in the order of their precedence value, 1 being the lowest value and 4 being the highest value. If the precedence value is the same, then the SDP with the lowest SDP ID is selected.

An explicitly named endpoint can have a maximum of one SAP and one ICB. Once a SAP is added to the endpoint, only one more object of type ICB SDP is allowed. An explicitly named endpoint, which does not have a SAP object, can have a maximum of four SDPs, which can include any of the following: a single primary SDP, one or many secondary SDPs with precedence, and a single ICB SDP.

Context   An SDP is created with type secondary and with the lowest precedence value of 4.

Parameters   *prec-value —* The precedence of the SDP.

        Values   1-4

    primary — A special value of the precedence which assigns the SDP the lowest precedence and enables the revertive behavior.

encap

Syntax   **encap**

Context   config>mirror>mirror-dest

Description   This command enters the encap branch in order to configure encapsulation options for the mirrored traffic. Note that the use of encap is mutually exclusive with sap or spoke-sdp options in the same mirror-dest. Only one type of encapsulation can be specified for a single mirror-dest. Slicing and encap are mutually exclusive in the same mirror-dest.

layer-3-encap

layer-3-encap {ip-udp-shim| ip-gre} [create]
no layer-3-encap

Context   config>mirror>mirror-dest>encap

Description   This command specifies the format of the routable encapsulation to add to each copied packet. Layer-3-encap takes precedence over ethernet-encap configuration in an li-source. No changes are allowed to the layer-3-encap once a gateway is configured.

Default   no layer-3-encap

Parameters   **ip-udp-shim** — indicates the type of layer-3 encapsulation is an IPv4 header, UDP header and LI-Shim. Added to the mirrored packets.

             ip-gre — indicates the type of layer-3 encapsulation is nn IPv4 header and GRE header. Added to the mirrored packets. Only supported with mirror-dest type ip-only.

direction-bit

Syntax   **direction-bit**
no direction-bit

Context   config>mirror>mirror-dest>encap>layer-3-encap

Description   This command is used to steal one bit from the intercept-id in the LI-Shim and use it to indicate the direction of traffic flow for an LI session. Using a direction bit may be used by a LI Mediation Gateway to distinguish between the two directions of traffic flow for an LI session when both directions share a common mirror-dest, intercept-id and session-id. If the direction bit is enabled then the Mirror Header Version (2 bit mhv) in the LI-Shim will be set to binary 01, and the next bit after the mhv is set to 0 for ingress traffic and 1 for egress traffic.

            For NAT based LI, ingress means the traffic is arriving at the node from the subscriber host.

            No changes are allowed to the direction-bit configuration once a gateway is configured.

Default   no direction-bit

router

Syntax   **router** *router-instance*
router service-name *service-name*
no router

Context   config>mirror>mirror-dest>encap>layer-3-encap

Description   This command specifies the routing instance into which to inject the mirrored packets. The packets will be forwarded in the routing instance based on the configurable destination IP address in the inserted IP header. If a mirror-dest is configured to inject into a VPRN service, then that VPRN service cannot be deleted. A

mirror-dest with layer-3-encap will be set to operationally down if the configured destination IP address is not reachable via an interface in the routing instance or service configured for the mirror-dest. No changes are allowed to the router configuration once a gateway is configured. A service must already exist before it is specified as a router-instance. Note that vprns and ies services share the same number space for the service-id, but ies services cannot be specified as the router-instance for routable LI encap.

Default   router "Base"

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

> **Values**   *<router-name> | <service-id>*
>
> *router-name*—"Base"|*name* Default - Base
>
> *service-id*—1 to 2147483647

service-name — Specifies the service name. Specify a character string, 64 characters maximum.

gateway

Syntax   **gateway** [**create**]
no gateway

Context   config>mirror>mirror-dest>encap>layer-3-encap

Description   Configures the parameters to send the mirrored packets to a remote destination gateway. Once a gateway is created, no changes to the layer-3-encap type, router or direction-bit are allowed.

Default   None

ip

Syntax   **ip src** *ip-address* **dest** *ip-address*
no ip

Context   config>mirror>mirror-dest>encap>layer-3-encap>gateway

Description   Configures the source IPv4 address and destination IPv4 address to use in the IPv4 header part of the routable LI encapsulation.

Default   no ip

Parameters   **src** *ip-address —* Specifies source IP address.

> **Values**   a.b.c.d

dest *ip-address —* Specifies destination IP address.

> **Values**   a.b.c.d

udp

Syntax **udp src** *udp-port* **dest** *udp-port*
no udp

Context config>mirror>mirror-dest>encap>layer-3-encap>gateway

Description Configures the source UDP port and destination UDP port to use in the UDP header part of the routable LI encapsulation.

Default no udp

Parameters **src** *ip-address* — Specifies source UDP port.

    Values 1 to 65535

dest *ip-address* — Specifies destination UDP port.

    Values 1 to 65535

Mirror Source Configuration Commands

mirror-source

Syntax	[no] **mirror-source** *service-id*
Context	debug
Description	This command configures mirror source parameters for a mirrored service.

The **mirror-source** command is used to enable mirroring of packets specified by the association of the **mirror-source** to sources of packets defined within the context of the *mirror-dest-service-id*. The mirror destination service must already exist within the system.

A mirrored packet cannot be mirrored to multiple destinations. If a mirrored packet is properly referenced by multiple mirror sources (for example, a SAP on one **mirror-source** and a port on another **mirror-source**), then the packet is mirrored to a single *mirror-dest-service-id* based on the following hierarchy:

1. Filter entry
2. Subscriber mirror priority
3. Service access port (SAP)
4. Physical port

The hierarchy is structured so the most specific match criteria has precedence over a less specific match. For example, if a **mirror-source** defines a port and a SAP on that port, then the SAP mirror-source is accepted and the mirror-source for the port is ignored because of the hierarchical order of precedence.

The **mirror-source** configuration is not saved when a configuration is saved. A **mirror-source** manually configured within an ASCII configuration file will not be preserved if that file is overwritten by a **save** command. Define the **mirror-source** within a file associated with a **config exec** command to make a **mirror-source** persistent between system reboots.

By default, all **mirror-dest** service IDs have a **mirror-source** associated with them. The **mirror-source** is not technically created with this command. Instead the service ID provides a contextual node for storing the current mirroring sources for the associated **mirror-dest** service ID. The **mirror-source** is created for the mirror service when the operator enters the **debug>mirror-source** *svcId* for the first time. If the operator enters **li>li-source** *svcId* for the first time, an LI source is created for the mirror service. The **mirror-source** is also automatically removed when the **mirror-dest** service ID is deleted from the system.

The **no** form of the command deletes all related source commands within the context of the **mirror-source** *service-id*. The command does not remove the service ID from the system.

Default	No mirror source match criteria is defined for the mirror destination service.
Parameters	*service-id* — The mirror destination service ID for which match criteria will be defined. The *service-id* must already exist within the system.

Values	*service-id*:	1 — 2147483647
	svc-name:	64 characters maximum

ip-filter

Syntax	**ip-filter** *ip-filter-id* **entry** *entry-id* [*entry-id …*] **no ip-filter** *ip-filter-id* **no ip-filter** *ip-filter-id* **entry** *entry-id* [*entry-id …*]
Context	debug>mirror-source
Description	This command enables mirroring of packets that match specific entries in an existing IP filter.

The **ip-filter** command directs packets which match the defined list of entry IDs to be mirrored to the mirror destination referenced by the *mirror-dest-service-id* of the **mirror-source**.

The IP filter must already exist in order for the command to execute. Filters are configured in the **config>filter** context. If the IP filter does not exist, an error will occur. If the filter exists but has not been associated with a SAP or IP interface, an error is not generated but mirroring will not be enabled (there are no packets to mirror). Once the IP filter is defined to a SAP or IP interface, mirroring is enabled.

If the IP filter is defined as ingress, only ingress packets are mirrored. Ingress mirrored packets are mirrored to the mirror destination prior to any ingress packet modifications.

If the IP filter is defined as egress, only egress packets are mirrored. Egress mirrored packets are mirrored to the mirror destination after all egress packet modifications.

An *entry-id* within an IP filter can only be mirrored to a single mirror destination. If the same *entry-id* is defined multiple times, an error occurs and only the first **mirror-source** definition is in effect.

By default, no packets matching any IP filters are mirrored. Mirroring of IP filter entries must be explicitly defined.

The **no ip-filter** command, without the **entry** keyword, removes mirroring on all *entry-id*'s within the *ip-filter-id*.

When the **no** command is executed with the **entry** keyword and one or more *entry-id*'s, mirroring of that list of *entry-id*'s is terminated within the *ip-filter-id*. If an *entry-id* is listed that does not exist, an error will occur and the command will not execute. If an *entry-id* is listed that is not currently being mirrored, no error will occur for that *entry-id* and the command will execute normally.

Default	IP filter mirroring is not defined.
Parameters	*ip-filter-id* — The IP filter ID whose entries are mirrored. If the *ip-filter-id* does not exist, an error will occur and the command will not execute. Mirroring of packets will commence once the *ip-filter-id* is defined on a SAP or IP interface.

entry *entry-id* [*entry-id …*] — The IP filter entries to use as match criteria for packet mirroring. The **entry** keyword begins a list of *entry-id*'s for mirroring. Multiple *entry-id* entries may be specified with a single command. Each *entry-id* must be separated by a space.

If an *entry-id* does not exist within the IP filter, an error occurs and the command will not execute.

If the filter's *entry-id* is renumbered within the IP filter definition, the old *entry-id* is removed but the new *entry-id* must be manually added to the configuration to include the new (renumbered) entry's criteria.

isa-aa-group

Syntax	**isa-aa-group** *isa-aa-group-id* {**all**|**unknown**} **no isa-aa-group** *isa-aa-group-id*
Context	debug>mirror-source
Description	This command configures AA ISAgroup as a mirror source for this mirror service. Traffic is mirrored after AA processing takes place on AA ISAs of the group, therefore, any packets dropped as part of that AA processing are not mirrored.
Parameters	*isa-aa-group-id* — Specifies the ISA ISA-AA group ID.

> **Values**   1 — 255

all — Specifies that all traffic after AA processing will be mirrored.

unknown — Specifies that all traffic during the identification phase (may match policy entry or entries that have mirror action configured) and traffic that had been identified as unknown_tcp or unknown_udp after AA processing will be mirrored.

mac-filter

Syntax	**mac-filter** *mac-filter-id* **entry** *entry-id* [*entry-id …*] **no mac-filter** *mac-filter-id* **no mac-filter** *mac-filter-id* **entry** *entry-id* [*entry-id …*]
Context	debug>mirror-source
Description	This command enables mirroring of packets that match specific entries in an existing MAC filter.

The **mac-filter** command directs packets which match the defined list of entry IDs to be mirrored to the mirror destination referenced by the *mirror-dest-service-id* of the **mirror-source**.

The MAC filter must already exist in order for the command to execute. Filters are configured in the config>filter context. If the MAC filter does not exist, an error will occur. If the filter exists but has not been associated with a SAP or IP interface, an error is not be generated but mirroring will not be enabled (there are no packets to mirror). Once the filter is defined to a SAP or MAC interface, mirroring is enabled.

If the MAC filter is defined as ingress, only ingress packets are mirrored. Ingress mirrored packets are mirrored to the mirror destination prior to any ingress packet modifications.

If the MAC filter is defined as egress, only egress packets are mirrored. Egress mirrored packets are mirrored to the mirror destination after all egress packet modifications.

An *entry-id* within a MAC filter can only be mirrored to a single mirror destination. If the same *entry-id* is defined multiple times, an error occurs and only the first **mirror-source** definition is in effect.

By default, no packets matching any MAC filters are mirrored. Mirroring of MAC filter entries must be explicitly defined.

The **no mac-filter** command, without the **entry** keyword, removes mirroring on all *entry-id*'s within the *mac-filter-id*.

When the **no** command is executed with the **entry** keyword and one or more *entry-id*'s, mirroring of that list of *entry-id*'s is terminated within the *mac-filter-id*. If an *entry-id* is listed that does not exist, an error will occur and the command will not execute. If an *entry-id* is listed that is not currently being mirrored, no error will occur for that *entry-id* and the command will execute normally.

Default   No MAC filter mirroring defined.

Parameters   *mac-filter-id* — The MAC filter ID whose entries are mirrored. If the *mac-filter-id* does not exist, an error will occur and the command will not execute. Mirroring of packets will commence once the *mac-filter-id* is defined on a SAP.

    entry *entry-id* [*entry-id* ...] — The MAC filter entries to use as match criteria for packet mirroring. The **entry** keyword begins a list of *entry-id*'s for mirroring. Multiple *entry-id* entries may be specified with a single command. Each *entry-id* must be separated by a space. Up to 8 entry IDs may be specified in a single command.

    Each *entry-id* must exist within the *mac-filter-id*. If the *entry-id* is renumbered within the MAC filter definition, the old *entry-id* is removed from the list and the new *entry-id* will need to be manually added to the list if mirroring is still desired.

    If no *entry-id* entries are specified in the command, mirroring will not occur for that MAC filter ID. The command will have no effect.

port

Syntax   **port** {*port-id* | **lag** *lag-id*} {[**egress**] [**ingress**]}
    no port {*port-id* | **lag** *lag-id*} [**egress**] [**ingress**]

Context   debug>mirror-source

Description   This command enables mirroring of traffic ingressing or egressing a port (Ethernet port, SONET/SDH channel, TDM channel, or Link Aggregation Group (LAG)).

    The **port** command associates a port or LAG to a mirror source. The port is identified by the *port-id*. The defined port may be Ethernet, Access or network, SONET/SDH, or TDM channel access. A network port may be a single port or a Link Aggregation Group (LAG) ID. When a LAG ID is given as the *port-id*, mirroring is enabled on all ports making up the LAG. If the port is a SONET/SDH interface, the *channel-id* must be specified to identify which channel is being mirrored. Either a LAG port member *or* the LAG port can be mirrored.

    The port is only referenced in the mirror source for mirroring purposes. The mirror source association does not need to be removed before deleting the card to which the port belongs. If the port is removed from the system, the mirroring association will be removed from the mirror source.

    The same port may not be associated with multiple mirror source definitions with the **ingress** parameter defined. The same port may not be associated with multiple mirror source definitions with the **egress** parameter defined.

    If a SAP is mirrored on an access port, the SAP mirroring will have precedence over the access port mirroring when a packet matches the SAP mirroring criteria. Filter and label mirroring destinations will also precedence over a port-mirroring destination.

If the port is not associated with a **mirror-source**, packets on that port will not be mirrored. Mirroring may still be defined for a SAP, label or filter entry, which will mirror based on a more specific criteria.

The encapsulation type on an access port or channel cannot be changed to Frame Relay if it is being mirrored.

The **no port** command disables port mirroring for the specified port. Mirroring of packets on the port may continue due to more specific mirror criteria. If the **egress** or **ingress** parameter keywords are specified in the **no** command, only the ingress or egress mirroring condition will be removed.

Default No ports are defined.

Parameters *port-id —* Specifies the port ID.

Syntax:	port-id:	*slot/mda/port*[*.channel*]
		bundle-id:bundle-*type-slot*/*mda.bundle-num*
		bundle keyword
		type ima, fr, ppp
		bundle-num 1 — 336
		bpgrp-id:bpgrp-*type-bpgrp-num*
		bpgrp keyword
		type ima, ppp
		bpgrp-num 1 — 2000
		aps-id: aps-*group-id.channel*
		aps keyword
		group-id 1 — 64
		ccag-id: ccag-*id.path-id cc-type*:cc-id
		ccag keyword
		id 1 — 8
		path-id a, b
		cc-type .sap-net, .net-sap
		cc-id 0 — 4094
		ccag-id ccag-*id.path-id*[*cc-type*]:*cc-id*
		ccag keyword
		id 1 — 8
		path-id a, b
		cc-type .sap-net, .net-sap
		cc-id 0 — 4094

lag-id — The LAG identifier, expressed as a decimal integer.

> **Note:** On the 7950, The XMA ID takes the place of the MDA.

Values 1 — 800

egress — Specifies that packets egressing the port should be mirrored. Egress packets are mirrored to the mirror destination after egress packet modification.

ingress — Specifies that packets ingressing the port should be mirrored. Ingress packets are mirrored to the mirror destination prior to ingress packet modification.

sap

Syntax	**sap** *sap-id* {[**egress**] [**ingress**]} **no sap** *sap-id* [**egress**] [**ingress**]
Context	debug>mirror-source

Description   This command enables mirroring of traffic ingressing or egressing a service access port (SAP). A SAP that is defined within a mirror destination cannot be used in a mirror source. The mirror source SAP referenced by the *sap-id* is owned by the service ID of the service in which it was created. The SAP is only referenced in the mirror source name for mirroring purposes. The mirror source association does not need to be removed before deleting the SAP from its service ID. If the SAP is deleted from its service ID, the mirror association is removed from the mirror source.

More than one SAP can be associated within a single **mirror-source**. Each SAP has its own **ingress** and **egress** parameter keywords to define which packets are mirrored to the mirror destination.

The SAP must be valid and properly configured. If the associated SAP does not exist, an error occurs and the command will not execute.

The same SAP cannot be associated with multiple mirror source definitions for ingress packets.
The same SAP cannot be associated with multiple mirror source definitions for egress packets.

If a particular SAP is not associated with a mirror source name, then that SAP will not have mirroring enabled for that mirror source.

Note that the ingress and egress options cannot be supported at the same time on a CEM encap-type SAP. The options must be configured in either the ingress **or** egress contexts.

The **no** form of the command disables mirroring for the specified SAP. All mirroring for that SAP on ingress and egress is terminated. Mirroring of packets on the SAP can continue if more specific mirror criteria is configured. If the **egress** or **ingress** parameter keywords are specified in the **no** command, only the ingress or egress mirroring condition is removed.

Default   No SAPs are defined by default.

Parameters   *sap-id* — Specifies the physical port identifier portion of the SAP definition. See Common CLI Command Descriptions on page 639 for command syntax.

channel-id — The SONET/SDH or TDM channel on the port of the SAP. A period separates the physical port from the *channel-id*. The port must be configured as an access port.

egress — Specifies that packets egressing the SAP should be mirrored. Egress packets are mirrored to the mirror destination after egress packet modification.

ingress — Specifies that packets ingressing the SAP should be mirrored. Ingress packets are mirrored to the mirror destination prior to ingress packet modification.

ingress-label

Syntax	[**no**] **ingress-label** *label* [*label* …up to 8 max] **no ingress-label** *label* [*label* …up to 8 max]
Context	debug>mirror-source
Description	This command enables ingress MPLS frame mirroring based on the top-of-stack MPLS label. Multiple labels can be defined simultaneously.

The **ingress-label** command is used to mirror ingressing MPLS frames with specific MPLS labels to a specific mirror destination. The ingress label must be at the top of the label stack and can only be mirrored to a single mirror destination. If the same label is defined with multiple mirror destinations, an error is generated and the original mirror destination remains.

The **ingress-label** mirror source overrides all other mirror source definitions. The MPLS frame is mirrored to the mirror destination as it is received on the ingress network port. The router MPLS label space is global for the system. A specific label is mirrored to the mirror destination regardless of the ingress interface.

By default, no ingress MPLS frames are mirrored. The **ingress-label** command must be executed to start mirroring on a specific MPLS label.

The **no ingress-label** command removes all label mirroring for the mirror source. To stop mirroring on specific labels, use the **no ingress-label** *label* form of the command. Multiple labels may be given in a single **no ingress-label** command.

Default	No ingress MPLS labels for mirroring are defined.
Parameters	*label* — The top-of-stack label received on ingress to be mirrored. A label can only be mirrored to a single mirror destination.

If the label does not exist on any ingress network ports, no packets are mirrored for that label. An error will not occur. Once the label exists on a network port, ingress mirroring commences for that label.

Values   0 — 1048575. The local MPLS stack may not support portions of this range.

Lawful Intercept Commands

li

Syntax	**li**
Context	config
Description	This command configures the context to configure lawful intercept (LI) parameters.

li-filter

Syntax	**li-filter**
Context	config>li
Description	This command enters the li-filter branch in order to create lawful intercept filter lists and entries.

li-mac-filter

Syntax	**li-mac-filter** filter-name **[create]** **no li-mac-filter** *filter-name*
Context	config>li>li-filter
Description	This command creates a Lawful Interception (LI) MAC filter list, or enters the CLI context for a LI MAC filter list. LI MAC filters are used as a manner to create confidential MAC filter based li-source entries. The LI MAC filter entries are inserted/merged into normal MAC filters as configured via the li-filter-associations and li-filter-block-reservation commands, but the LI MAC filter entries are not visible to users without LI permissions.
Parameters	*filter-name* — Specifies the name of the MAC filter. Filter names cannot start with an underscore character (e.g. "_my-filter") and cannot use the name "default".

li-ip-filter

Syntax	**li-ip-filter** filter-name **[create]** **no li-ip-filter** *filter-name*
Context	config>li>li-filter
Description	This command creates a Lawful Interception (LI) IPv4 filter list, or enters the CLI context for a LI IPv4 filter list. LI IPv4 filters are used as a manner to create confidential IPv4 filter based li-source entries. The LI IPv4 filter entries are inserted/merged into normal IPv4 filters as configured via the li-filter-associations

and li-filter-block-reservation commands, but the LI IPv4 filter entries are not visible to users without LI permissions.

Parameters   *filter-name —* Specifies the name of the IPv4 address filter. Filter names cannot start with an underscore character (e.g. "_my-filter") and cannot use the name "default".

li-ipv6-filter

Syntax   **li-ipv6-filter** filter-name **[create]**
no li-ipv6-filter *filter-name*

Context   config>li>li-filter

Description   This command creates a Lawful Interception (LI) IPv6 filter list, or enters the CLI context for a LI IPv6 filter list.   LI IPv6 filters are used as a manner to create confidential IPv6 filter based li-source entries.   The LI IPv6 filter entries are inserted/merged into normal IPv6 filters as configured via the li-filter-associations and li-filter-block-reservation commands, but the LI IPv6 filter entries are not visible to users without LI permissions.

Parameters   *filter-name —* Specifies the name of the IPv6 address filter. Filter names cannot start with an underscore character (e.g. "_my-filter") and cannot use the name "default".

entry

Syntax   **entry** *li-entry-id* **[create]**
no entry *li-entry-id*

Context   config>li>li-filter>li-ip-filter
config>li>li-filter>li-ipv6-filter
config>li>li-filter>li-mac-filter

Description   This command creates or edits a Lawful Interception filter entry. Multiple entries can be created using unique entry-id numbers within the filter.

An entry in a LI filter always has an implicit action of "forward".

The no form of the command removes the specified entry from the filter. Entries removed from the filter are immediately removed from all services or network ports where the associated filter is applied.

LI filter entries can be used as li-source entries.

The entry numbers for li filters serve purely as keys for managing the entries (deleting entries, etc). The order of LI filter entries is not guaranteed to match the entry numbers and s/w may reorder entries. Operators must use LI entries in a manner such that relative order of the LI entries amongst themselves is not important.

Parameters   *li-entry-id —* Identifies the Lawful Interception filter entry.

Values   1 — 65536

match

Syntax **match** [**frame-type** {**802dot3|802dot2-llc|802dot2-snap|ethernet_II**}]
no match

Context config>li>li-filter>li-mac-filter>entry

Description This command creates the context for entering/editing match criteria for the filter entry and specifies an Ethernet frame type for the entry.

If more than one match criteria (within one match statement) are configured then all criteria must be satisfied (AND function) for a match to occur.

A match context may consist of multiple match criteria, but multiple match statements cannot be entered per entry.

The **no** form of the command removes the match criteria for the entry.

Parameters **frame-type** — Filters can continue to be edited by all users even when an li-source references an entry in that filter.

>**Values**   802dot3, 802dot2-llc, 802dot2-snap, ethernet_II
>
>**Default**   802dot3

802dot3 — Specifies the frame type is Ethernet IEEE 802.3.

802dot2-llc — Specifies the frame type is Ethernet IEEE 802.2 LLC.

802dot2-snap — Specifies the frame type is Ethernet IEEE 802.2 SNAP.

ethernet_II — Specifies the frame type is Ethernet Type II.

match

Syntax **match** [**protocols** *protocols-id*]
no match

Context config>li>li-filter>li-ip-filter>entry

Description This command enables context to enter match criteria for LI IPv4 filter and optionally allows specifying protocol value to match on.

If more than one match criterion are configured then all criteria must be satisfied for a match to occur (logical "AND"). Multiple criteria must be configured within a single match context for a given entry.

The **no** form removes the match criteria for the entry

Parameters **protocol** — The **protocol** keyword configures an IP protocol to be used as an IP filter match criterion. The protocol type such as TCP or UDP is identified by its respective protocol number.

protocol-id — Configures the decimal value representing the IP protocol to be used as an IP filter match criterion. Well known protocol numbers include ICMP(1), TCP(6), UDP(17). The **no** form the command removes the protocol from the match criteria.

Values 0 — 255 (values can be expressed in decimal, hexidecimal, or binary - DHB)
keywords: none, crtp, crudp, egp, eigrp, encap, ether-ip, gre, icmp, idrp, igmp, igp, ip, ipv6, ipv6-frag, ipv6-icmp, ipv6-no-nxt, ipv6-opts, ipv6-route, isis, iso-ip, l2tp, ospf-igp, pim, pnni, ptp, rdp, rsvp, stp, tcp, udp, vrrp
* — udp/tcp wildcard

Protocol	Protocol ID	Description
icmp	1	Internet Control Message
igmp	2	Internet Group Management
ip	4	IP in IP (encapsulation)
tcp	6	Transmission Control
egp	8	Exterior Gateway Protocol
igp	9	Any private interior gateway (used by Cisco for IGRP)
udp	17	User Datagram
rdp	27	Reliable Data Protocol
ipv6	41	IPv6
ipv6-route	43	Routing Header for IPv6
ipv6-frag	44	Fragment Header for IPv6
idrp	45	Inter-Domain Routing Protocol
rsvp	46	Reservation Protocol
gre	47	General Routing Encapsulation
ipv6-icmp	58	ICMP for IPv6
ipv6-no-nxt	59	No Next Header for IPv6
ipv6-opts	60	Destination Options for IPv6
iso-ip	80	ISO Internet Protocol
eigrp	88	EIGRP
ospf-igp	89	OSPFIGP
ether-ip	97	Ethernet-within-IP Encapsulation
encap	98	Encapsulation Header
pnni	102	PNNI over IP
pim	103	Protocol Independent Multicast

Protocol	Protocol ID	Description
vrrp	112	Virtual Router Redundancy Protocol
l2tp	115	Layer Two Tunneling Protocol
stp	118	Spanning Tree Protocol
ptp	123	Performance Transparency Protocol
isis	124	ISIS over IPv4
crtp	126	Combat Radio Transport Protocol
crudp	127	Combat Radio User Datagram

match

Syntax   **match** [**next-header** *next-header*]
no match

Context   config>li>li-filter>li-ipv6-filter>entry

Description   This command enables context to enter match criteria for LI IPv6 filter and optionally allows specifying IPv6 next-header value to match on.

If more than one match criterion are configured then all criteria must be satisfied for a match to occur (logical "AND"). Multiple criteria must be configured within a single match context for a given entry.

The **no** form removes the match criteria for the entry

Parameters   *next-header* — Specifies the IPv6 next header to match. Note that this parameter is analogous to the protocol parameter used in IP-Filter match criteria.

Values   [0 — 42 | 45 — 49 | 52 — 59 | 61— 255] — protocol numbers accepted in decimal, hexidecimal, or binary - DHB
keywords: none, crtp, crudp, egp, eigrp, encap, ether-ip, gre, icmp, idrp, igmp, igp, ip, ipv6, ipv6-icmp, ipv6-no-nxt, isis, iso-ip, l2tp, ospf-igp, pim, pnni, ptp, rdp, rsvp, stp, tcp, udp, vrrp
* — udp/tcp wildcard

dst-mac

Syntax   **dst-mac** *ieee-address* [*mask*]
no dst-mac

Context   config>li>li-filter>li-mac-filter>entry>match

Description   Configures a destination MAC address or range to be used as a MAC filter match criterion.

The **no** form of the command removes the destination mac address as the match criterion.

Default   no dst-mac

Parameters *ieee-address* — Enter the 48-bit IEEE mac address to be used as a match criterion.

> **Values** HH:HH:HH:HH:HH:HH or HH-HH-HH-HH-HH-HH where H is a hexadecimal digit

ieee-address-mask — This 48-bit mask can be configured using:

Format Style	Format Syntax	Example
Decimal	DDDDDDDDDDDDDD	281474959933440
Hexadecimal	0xHHHHHHHHHHHH	0x0FFFFF000000
Binary	0bBBBBBBB...B	0b11110000...B

To configure so that all packets with a destination MAC OUI value of 00-03-FA are subject to a match condition then the entry should be specified as: 003FA000000 0xFFFFFF000000

Default **0xFFFFFFFFFFFF** (exact match)

Values 0x00000000000000 — 0xFFFFFFFFFFFF

src-mac

Syntax **src-mac** *ieee-address* [*ieee-address-mask*]
no src-mac

Context config>li>li-filter>li-mac-filter>entry>match

Description Configures a source MAC address or range to be used as a MAC filter match criterion.

The **no** form of the command removes the source mac as the match criteria.

Default no src-mac

Parameters *ieee-address —* Enter the 48-bit IEEE mac address to be used as a match criterion.

> **Values** HH:HH:HH:HH:HH:HH or HH-HH-HH-HH-HH-HH where H is a hexadecimal digit

ieee-address-mask — This 48-bit mask can be configured using:

Format Style	Format Syntax	Example
Decimal	DDDDDDDDDDDDDD	281474959933440
Hexadecimal	0xHHHHHHHHHHHH	0x0FFFFF000000
Binary	0bBBBBBBB...B	0b11110000...B

To configure so that all packets with a source MAC OUI value of 00-03-FA are subject to a match condition then the entry should be specified as: 003FA000000 0xFFFFFF000000

Default **0xFFFFFFFFFFFF** (exact match)

Values 0x00000000000000 — 0xFFFFFFFFFFFF

dst-ip

Syntax	**dst-ip** {ip-address/mask | *ip-address ipv4-address-mask*}
Context	config>li>li-filter>li-ip-filter>entry>match
Description	This command configures destination IP address LI filter match criterion.
	The **no** form of this command removes any configured destination IP address. The match criterion is ignored.
Default	none
Parameters	*ip-address* — Any address specified as dotted quad.

        Values   a.b.c.d

    mask — Eight 16-bit hexadecimal pieces representing bit match criteria.

        Values   1—32

    ipv4-address-mask — Any mask epressed in dotted quad notation.

        Values   0.0.0.0 — 255.255.255.255

dst-ip

Syntax	**dst-ip** {ipv6-address/prefix-length | *ipv6-address ipv6-address-mask*}
Context	config>li>li-filter>li-ip-filter>entry>match
Description	This command configures destination IPv6 address LI filter match criterion.
	The **no** form of this command removes any configured destination IPv6 address. The match criterion is ignored.
Default	none
Parameters	*ipv6-address* — Any IPv6 address entered as:.

        Values   x:x:x:x:x:x:x:x (eight 16-bit pieces)
                        x:x:x:x:x:x:d.d.d.d
                        x - [0..FFFF]H
                        d - [0..255]D

    prefix-length — Prefix length.

        Values   1—128

    ipv6-address-mask — Any IPv6 address mask expressed as:

        Values   x:x:x:x:x:x:x:x (eight 16-bit pieces)
                        x:x:x:x:x:x:d.d.d.d
                        x - [0..FFFF]H
                        d - [0..255]D

dst-port

Syntax   **dst-port** {**lt** | **gt** | **eq**} *dst-port-number*
            dst-port *port-list-name*
            dst-port range *dst-port-number dst-port-number*
            no dst-port

Context   config>li>li-filter>li-ip-filter>entry>match
            config>li>li-filter>li-ipv6-filter>entry>match

Description   This command configures a destination TCP or UDP port number or port range for an IP LI filter match criterion. Note that an entry containing Layer 4 match criteria will not match non-initial (2nd, 3rd, etc) fragments of a fragmented packet since only the first fragment contains the Layer 4 information.

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

Default   **none**

Parameters   **lt** | **gt** | **eq** — Specifies the operator to use relative to *dst-port-number* for specifying the port number match criteria.

lt Specifies all port numbers less than *dst-port-number* match.

gt Specifies all port numbers greater than *dst-port-number* match.

eq Specifies that *dst-port-number* must be an exact match.

eq — Specifies the operator to use relative to *dst-port-number* for specifying the port number match criteria. The **eq** keyword specifies that *dst-port-number* must be an exact match.

dst-port-number — The destination port number to be used as a match criteria expressed as a decimal integer.

Values   0 — 65535

port-list-name — A string of up to 32 characters of printable ASCII characters. If special characters are used, the string must be enclosed within double quotes.

range *start end* — Specifies an inclusive range of port numbers to be used as a match criteria. The destination port numbers *start-port* and *end-port* are expressed as decimal integers.

Values   0 — 65535

src-ip

Syntax   **src-ip** {ip-address/mask | *ip-address ipv4-address-mask*}

Context   config>li>li-filter>li-ip-filter>entry>match

Description   This command configures source IP address LI filter match criterion.

The **no** form of this command removes any configured source IP. The match criterion is ignored.

Default   **no src-ip**

Parameters   *ip-address* — Any address specified as dotted quad.

      Values   a.b.c.d

    mask — Eight 16-bit hexadecimal pieces representing bit match criteria.

      Values   1—32

    ipv4-address-mask — Any mask epressed in dotted quad notation.

      Values   0.0.0.0 — 255.255.255.255

src-ip

Syntax   **src-ip** {ipv6-address/prefix-length | *ipv6-address ipv6-address-mask*}
no src-ip

Context   config>li>li-filter>li-ipv6-filter>entry>match

Description   This command configures source IPv6 address LI filter match criterion.

    The **no** form of this command removes any configured source IPv6 address. The match criterion is ignored.

Default   **no src-ip**

Parameters   *ipv6-address* — Any IPv6 address entered as:.

      Values   x:x:x:x:x:x:x:x   (eight 16-bit pieces)
                x:x:x:x:x:x:d.d.d.d
                x - [0..FFFF]H
                d - [0..255]D

    prefix-length — Prefix length.

      Values   1—128

    ipv6-address-mask — Any IPv6 address mask expressed as:

      Values   x:x:x:x:x:x:x:x   (eight 16-bit pieces)
                x:x:x:x:x:x:d.d.d.d
                x - [0..FFFF]H
                d - [0..255]D

src-port

Syntax   **src-port** {**lt** | **gt** | **eq**} *src-port-number*
src-port port-list *port-list-name*
src-port range *src-port-number src-port-number*
no src-port

Context   config>li>li-filter>li-ip-filter>entry>match
config>li>li-filter>li-ipv6-filter>entry>match

Description   This command configures a source TCP or UDP port number or port range for an IP LI filter match criterion. Note that an entry containing Layer 4 match criteria will not match non-initial (2nd, 3rd, etc) fragments of a fragmented packet since only the first fragment contains the Layer 4 information.

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

Default   no src-port

Parameters   **lt** | **gt** | **eq —** Specifies the operator to use relative to *src-port-number* for specifying the port number match criteria.

lt Specifies all port numbers less than *src-port-number* match.

gt Specifies all port numbers greater than *src-port-number* match.

eq Specifies that *src-port-number* must be an exact match.

src-port-number — The source port number to be used as a match criteria expressed as a decimal integer.

Values   0 — 65535

port-list-name — A string of up to 32 characters of printable ASCII characters. If special characters are used, the string must be enclosed within double quotes. **<<R12.0>>**

range *start end* **—** Specifies an inclusive range of port numbers to be used as a match criteria. The source port numbers *start-port* and *end-port* are expressed as decimal integers.

Values   0 — 65535

li-filter-block-reservation

Syntax   **li-filter-block-reservation**

Context   config>li

Description   This command enters the li-filter-block-reservation branch in order to create lawful intercept filter reservations.

li-reserved-block

Syntax   **li-reserved-block** block-name **[create]**
no li-reserved-block *block-name*

Context   config>li>li-filter-block-reservation

Description   This command creates or edits an LI reserved block. An LI reserved block allows an operator to define where entries from an LI filter should be inserted into a normal filter. The block reserves a configurable number of entries in the normal filter that can only be used for entries inserted from associated LI filters. The LI filter entries that get inserted into the reserved block in each normal filter are not visible to non-LI operators. The block also defines to which normal filters the reservation will be applied.

Parameters   *block-name —* Specifies the name of the MAC filter. Block names cannot start with an underscore character (e.g. "_my-filter") and cannot use the name "default".

start-entry

Syntax	**start-entry** *entry-id* **count** *count* **no start-entry**
Context	config>li>li-filter-block-reservation>li-reserved-block
Description	This command defines a block of reserved filter entries that are used to insert LI filter entries into a normal filter.
Default	**no start-entry**
Parameters	*entry-id —* The entry identification identifies the start of a block of reserved filter entries.

> **Values** 1—65536

count — This parameter identifies the number of entries in the block.

> **Values** 1—8192

mac-filter

Syntax	**mac-filter filter-id** **no mac-filter**
Context	config>li>li-filter-block-reservation>li-reserved-block
Description	This command configures to which normal MAC filters the entry reservation is applied.
Default	*filter-id —* The filter identification identifies the normal MAC filters.

> **Values** 1—65536 | *<name:64 char max>*

ip-filter

Syntax	**ip-filter filter-name create** **no ip-filter**
Context	config>li>li-filter-block-reservation>li-reserved-block
Description	This command configures to which normal IPv4 address filters the entry reservation is applied.
Default	*filter-id —* The filter identification identifies the normal IPv4 address filters.

> **Values** 1—65536 | *<name:64 char max>*

ipv6-filter

Syntax   **ipv6-filter filter-name create**
            no ipv6-filter

Context   config>li>li-filter-block-reservation>li-reserved-block

Description This command configures to which normal IPv6 address filters the entry reservation is applied.

Default   *filter-id* — The filter identification identifies the normal IPv6 address filters.

        Values   1—65536 | *<name:64 char max>*

li-filter-associations

Syntax   **li-filter-associations**

Context   config>li

Description This command enters the **li-filter-associations** branch in order to define which LI filter entries get inserted into which normal filters.

li-mac-filter

Syntax   **li-mac-filter** filter-name
            no li-mac-filter *filter-name*

Context   config>li>li-filter-assoc

Description Specifies the li-mac-filter that will have its entries inserted into a list of normal mac filters.

Parameters *filter-name* — Specifies the name of the LI MAC filter. Filter names cannot start with an underscore character (e.g. "_my-filter") and cannot use the name "default". 32 chars maximum.

mac-filter

Syntax   **mac-filter** *filter-id*
            no mac-filter *filter-id*

Context   config>li>li-filter-assoc>li-mac-fltr

Description Specifies the MAC filter(s) into which the entries from the specified **li-mac-filter** are to be inserted. The **li-mac-filter** and **mac-filter** must already exist before the association is made. If the normal MAC filter is deleted then the association is also removed (and not re-created if the MAC filter comes into existence in the future).

Parameters *filter-id* — The filter identification identifies the MAC filters.

        Values   1—65536 | *<name:64 char max>*

li-ip-filter

Syntax   **li-ip-filter** filter-name **i'm**
no li-ip-filter *filter-name*

Context   config>li>li-filter-assoc

Description   Specifies the li-ip-filter that will have its entries inserted into a list of normal IP filters.

Parameters   *filter-name —* Specifies an existing li-ip-filter. 32 chars maximum.

ip-filter

Syntax   **ip-filter** *filter-id*
no ip-filter *filter-id*

Context   config>li>li-filter-assoc>li-ip-fltr

Description   Specifies the IP-filter(s) into which the entries from the specified li-ip-filter are to be inserted. The li-ip-filter and ip-filter must already exist before the association is made.   If the normal ip-filter is deleted then the association is also removed (and not re-created if the ip-filter comes into existence in the future).

Parameters   *filter-id —* An existing IP filter policy

        Values   1—65536 | *<name:64 char max>*

li-ipv6-filter

Syntax   **li-ipv6-filter** filter-name
no li-ipv6-filter *filter-name*

Context   config>li>li-filter-assoc

Description   Specifies the li-ipv6-filter that will have its entries inserted into a list of normal IPv6 filters.

Parameters   *filter-name —* An existing li-ipv6-filter. 32 chars maximum.

ipv6-filter

Syntax   **ipv6-filter** *filter-id*
no ipv6-filter *filter-id*

Context   config>li>li-fltr-assoc>li-ipv6-fltr

Description   Specifies the IP-filter(s) into which the entries from the specified li-ipv6-filter are to be inserted. The li-ipv6-filter and ipv6-filter must already exist before the association is made.   If the normal ipv6-filter is deleted then the association is also removed (and not re-created if the ipv6-filter comes into existence in the future).

Parameters   *filter-id —* An existing IPv6 filter policy

> **Values**   1—65536 | *<name:64 char max>*

li-filter-lock-state

Syntax   **li-filter-lock-state {locked | unlocked-for-li-users | unlocked-for-all-users}**
no li-filter-lock-state

Context   config>li

Description   This command configures the lock state of the filters used by LI. With the configurable filter lock for LI feature an LI user can control the behavior of filters when they are used for LI.

In previous releases, when a filter entry was used as a Lawful Intercept (LI) mirror source criteria, all subsequent attempts to modify the filter were then blocked to avoid having the LI session impacted by a non-LI user.

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

Default   **locked**

Parameters   **locked —** When an li-source criteria is configured that references any entry of filter Y, then filter Y can no longer be changed (until there are no longer any li-sources references to entries of filter Y).

unlocked-for-li-users — Filters can continue to be edited by LI users only even when an li-source references an entry in that filter.

unlocked-for-all-users — Filters can continue to be edited by all users even when an li-source references an entry in that filter.

li-source

Syntax   [**no**] **li-source** *service-id*

Context   config>li

Description   This command configures a lawful intercept (LI) mirror source.

Parameters   *service-id —* The service identification identifies the service in the service domain. This ID is unique to this service and cannot be used by any other service, regardless of service type. The same service ID must be configured on every router that this particular service is defined on.

> **Values**   *service-id*:   1 — 2147483647
> *svc-name*:   64 characters maximum

ip-filter

Syntax	**ip-filter** *ip-filter-id* [**entry** *entry-id*...] [**intercept-id** *intercept-id*...] [**session-id** *session-id*...] **no ip-filter** *ip-filter-id*
Context	config>li>li-source
Description	This command enables lawful interception (LI) of packets that match specific entries in an existing IP filter.

The **ip-filter** command directs packets which match the defined list of entry IDs to be intercepted to the destination referenced by the *mirror-dest-service-id* of the **mirror-source**.

The IP filter must already exist in order for the command to execute. Filters are configured in the **config>filter** context. If the IP filter does not exist, an error will occur. If the filter exists but has not been associated with a SAP or IP interface, an error is not generated but mirroring will not be enabled (there are no packets to mirror). Once the IP filter is defined to a SAP, IP interface or subscriber, mirroring is enabled.

If the IP filter is defined as ingress, only ingress packets are intercepted. Ingress packets are sent to the destination prior to any ingress packet modifications.

If the IP filter is defined as egress, only egress packets are intercepted. Egress packets are sent to the destination after all egress packet modifications.

An *entry-id* within an IP filter can only be intercepted to a single destination. If the same *entry-id* is defined multiple times, an error occurs and only the first definition is in effect.

By default, no packets matching any IP filters are intercepted. Interception of IP filter entries must be explicitly defined.

When the **no** command is executed with the **entry** keyword and one or more *entry-id*'s, interception of that list of *entry-id*'s is terminated within the *ip-filter-id*. If an *entry-id* is listed that does not exist, an error will occur and the command will not execute. If an *entry-id* is listed that is not currently being intercepted, no error will occur for that *entry-id* and the command will execute normally.

Parameters	*ip-filter-id* — The IP filter ID whose entries are to be intercepted. If the *ip-filter-id* does not exist, an error will occur and the command will not execute. Intercepting packets will commence when the *ip-filter-id* is defined on a SAP or IP interface.

entry *entry-id* — The IP filter entries to use as match criteria for lawful intercept (LI). The **entry** keyword begins a list of *entry-id*'s for interception. Multiple *entry-id* entries can be specified with a single command. Each *entry-id* must be separated by a space. Up to <N><n> 8 entry IDs may be specified in a single command.

If an *entry-id* does not exist within the IP filter, an error occurs and the command will not execute.

If the filter's *entry-id* is renumbered within the IP filter definition, the old *entry-id* is removed but the new *entry-id* must be manually added to the configuration to include the new (renumbered) entry's criteria.

intercept-id *intercept-id* — This command configures the intercept-id that is inserted into the packet header for all mirrored packets of the associated li-source entry. This *intercept-id* can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs. For all types of **li-source** entries (filter, nat, sap, subscriber), when the mirror service is configured with **ip-udp-shim** routable encap, an *intercept-id* field (as part of the routable encap) is always present in the mirrored packets. If there is no *intercept-id* configured for an **li-source** entry, then the default value will be inserted. When the mirror service is configured with **ip-gre** routable encap, no *intercept-id* is

inserted and none should be specified against the **li-source** entries.

> **Values** 1..4294967295 (32b) For nat li-source entries that are using a mirror service that is not configured with routable encap

> **Values** 1..1,073,741,824 (30b) For all types of li-source entries that are using a mirror service with routable ip-udp-shim encap and no direction-bit.

> **Values** 1..536,870,912 (29b) For all types of li-source entries that are using a mirror service with routable ip-udp-shim encap and with the direction-bit enabled.

session-id *session-id* — This command configures the *session-id* that is inserted into the packet header for all mirrored packets of the associated **li-source** entry. This *session-id* can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs. The *session-id* is only valid and used for mirror services that are configured with **ip-udp-shim** routable encap (**config>mirror>mirror-dest>encap#ip-udp-shim**). For all types of **li-source** entries (filter, nat, sap, subscriber), when the mirror service is configured with **ip-udp-shim** routable encap, a *session-id* field (as part of the routable encap) is always present in the mirrored packets. If there is no *session-id* configured for an **li-source** entry, then the default value will be inserted. When a mirror service is configured with **ip-gre** routable encap, no *session-id* is inserted and none should be specified against the **li-source** entries.

> **Values** 1..4,294,967,295 (32b)

ipv6-filter

Syntax   **ipv6-filter** *ipv6-filter-id* [**entry** *entry-id*...] [**intercept-id** *intercept-id*...] [**session-id** *session-id*...]
  no ipv6-filter *ipv6-filter-id*

Context   config>li>li-source

Description   This command enables lawful interception (LI) of packets that match specific entries in an existing IPv6 filter.

The **ipv6-filter** command directs packets which match the defined list of entry IDs to be intercepted to the destination referenced by the *mirror-dest-service-id* of the **mirror-source**.

The IPv6 filter must already exist in order for the command to execute. Filters are configured in the **config>filter** context. If the IPv6 filter does not exist, an error will occur. If the filter exists but has not been associated with a SAP or IPv6 interface, an error is not generated but mirroring will not be enabled (there are no packets to mirror). Once the IPv6 filter is defined to a SAP, IPv6 interface or subscriber, mirroring is enabled.

If the IPv6 filter is defined as ingress, only ingress packets are intercepted. Ingress packets are sent to the destination prior to any ingress packet modifications.

If the IPv6 filter is defined as egress, only egress packets are intercepted. Egress packets are sent to the destination after all egress packet modifications.

An *entry-id* within an IPv6 filter can only be intercepted to a single destination. If the same *entry-id* is defined multiple times, an error occurs and only the first definition is in effect.

By default, no packets matching any IPv6 filters are intercepted. Interception of IPv6 filter entries must be explicitly defined.

When the **no** command is executed with the **entry** keyword and one or more *entry-id*'s, interception of that list of *entry-id*'s is terminated within the *ipv6-filter-id*. If an *entry-id* is listed that does not exist, an error will occur and the command will not execute. If an *entry-id* is listed that is not currently being intercepted, no error will occur for that *entry-id* and the command will execute normally.

Parameters   *ipv6-filter-id —* The IPv6 filter ID whose entries are to be intercepted. If the *ipv6-filter-id* does not exist, an error will occur and the command will not execute. Intercepting packets will commence when the *ipv6-filter-id* is defined on a SAP or IPv6 interface.

entry *entry-id* **—** The IPv6 filter entries to use as match criteria for lawful intercept (LI). The **entry** keyword begins a list of *entry-id*'s for interception. Multiple *entry-id* entries can be specified with a single command. Each *entry-id* must be separated by a space. Up to <N><n> 8 entry IDs may be specified in a single command.

If an *entry-id* does not exist within the IPv6 filter, an error occurs and the command will not execute.

If the filter's *entry-id* is renumbered within the IPv6 filter definition, the old *entry-id* is removed but the new *entry-id* must be manually added to the configuration to include the new (renumbered) entry's criteria.

intercept-id *intercept-id* **—** This command configures the intercept-id that is inserted into the packet header for all mirrored packets of the associated li-source entry.   This *intercept-id* can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs. For all types of **li-source** entries (filter, nat, sap, subscriber), when the mirror service is configured with **ip-udp-shim** routable encap, an *intercept-id* field (as part of the routable encap) is always present in the mirrored packets.   If there is no *intercept-id* configured for an **li-source** entry, then the default value will be inserted. When the mirror service is configured with **ip-gre** routable encap, no *intercept-id* is inserted and none should be specified against the **li-source** entries.

   Values   1..4294967295 (32b) For nat li-source entries that are using a mirror service that is not configured with routable encap

   Values   1..1,073,741,824 (30b) For all types of li-source entries that are using a mirror service with routable ip-udp-shim encap and no direction-bit.

   Values   1..536,870,912 (29b) For all types of li-source entries that are using a mirror service with routable ip-udp-shim encap and with the direction-bit enabled.

session-id *session-id* **—** This command configures the *session-id* that is inserted into the packet header for all mirrored packets of the associated **li-source** entry.   This *session-id* can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs. The *session-id* is only valid and used for mirror services that are configured with **ip-udp-shim** routable encap (**config>mirror>mirror-dest>encap#ip-udp-shim**). For all types of **li-source** entries (filter, nat, sap, subscriber), when the mirror service is configured with **ip-udp-shim** routable encap, a *session-id* field (as part of the routable encap) is always present in the mirrored packets.   If there is no *session-id* configured for an **li-source** entry, then the default value will be inserted.. When a mirror service is configured with **ip-gre** routable encap, no *session-id* is inserted and none should be specified against the **li-source** entries.

id — The session-id value to insert into the header of the mirrored packets.

   Values   1..4,294,967,295 (32b)

li-ip-filter

Syntax   **li-ip-filter** *filter-name* **entry** *li-entry-id* [*li-entry-id...(upto 8 max)*] [**intercept-id** *intercept-id*
[*intercept-id...(upto 8 max)*]] [**session-id** *session-id* [*session-id...(upto 8 max)*]]
no li-ip-filter *filter-name* [**entry** *li-entry-id* [*li-entry-id...(upto 8 max)*]]

Context   config>li>li-source

Description   This command enables lawful interception (LI) of packets that match specific entries in an existing LI IP fil-
ter that has been associated with a normal IP filter.   The specification of an li-ip-filter entry as an li-source
means that packets matching the li-ip-filter entry will be intercepted on all interfaces/saps/etc. where the
associated normal ip-filter(s) are applied.

Parameters   *filter-name* — The name of the li-ip-filter. 32 characters maximum

entry *li-entry-id* — The entry id in the li-ip-filter that is to be used as an li-source criteria.

Values   1—65535

intercept-id *intercept-id* — This command configures the intercept-id that is inserted into the packet header
for all mirrored packets of the associated li-source entry.   This *intercept-id* can be used (for example by
a downstream LI Gateway) to identify the particular LI session to which the packet belongs. For all
types of **li-source** entries (filter, nat, sap, subscriber), when the mirror service is configured with **ip-
udp-shim** routable encap, an *intercept-id* field (as part of the routable encap) is always present in the
mirrored packets.   If there is no *intercept-id* configured for an **li-source** entry, then the default value
will be inserted. When the mirror service is configured with **ip-gre** routable encap, no *intercept-id* is
inserted and none should be specified against the **li-source** entries.

session-id *session-id* — The session-id that is inserted into the packet header for all mirrored packets of the
associated li-source entry. This session-id can be used (for example by a downstream LI Gateway) to
identify the particular LI session to which the packet belongs. The session-id is only valid and used for
mirror services that are configured with ip-udp-shim routable encap (con¬fig>mirror>mirror-
dest>encap#ip-udp-shim). For all types of li-source entries (filter, nat, sap, sub¬scriber), when the mir-
ror service is configured with ip-udp-shim routable encap, a session-id field (as part of the routable
encap) is always present in the mirrored packets. If there is no session-id config¬ured for an li-source
entry, then the default value will be inserted. When a mirror service is configured with ip-gre routable
encap, no session-id is inserted and none should be specified against the li-source entries.

li-ipv6-filter

Syntax   **li-ipv6-filter** *filter-name* **entry** *li-entry-id* [*li-entry-id...(upto 8 max)*] [**intercept-id** *intercept-id*
[*intercept-id...(upto 8 max)*]] [**session-id** *session-id* [*session-id...(upto 8 max)*]]
no li-ipv6-filter *filter-name* [**entry** *li-entry-id* [*li-entry-id...(upto 8 max)*]]

Context   config>li>li-source

Description   This command enables lawful interception (LI) of packets that match specific entries in an existing LI IPv6
filter that has been associated with a normal IPv6 filter.   The specification of an li-ipv6-filter entry as an li-
source means that packets matching the li-ipv6-filter entry will be intercepted on all interfaces/saps/etc.
where the associated normal ip-filter(s) are applied.

Parameters   *filter-name* — The name of the li-ipv6-filter. 32 characters maximum.

entry *li-entry-id* — The entry id in the li-ipv6-filter that is to be used as an li-source criteria.

Values   1—65535

intercept-id *intercept-id* — The intercept-id that is inserted into the packet header for all mirrored packets of the associated li-source entry. This intercept-id can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs. For all types of li-source entries (filter, nat, sap, subscriber), when the mirror service is configured with ip-udp-shim routable encap, an intercept-id field (as part of the routable encap) is always present in the mirrored packets. If there is no intercept-id configured for an li-source entry, then the default value will be inserted. When the mirror service is configured with ip-gre routable encap, no intercept-id is inserted and none should be specified against the li-source entries.

session-id *session-id* — The session-id that is inserted into the packet header for all mirrored packets of the associated li-source entry. This session-id can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs. The session-id is only valid and used for mirror services that are configured with ip-udp-shim routable encap (con¬fig>mirror>mirror-dest>encap#ip-udp-shim). For all types of li-source entries (filter, nat, sap, sub¬scriber), when the mir¬ror service is configured with ip-udp-shim routable encap, a session-id field (as part of the routable encap) is always present in the mirrored packets. If there is no session-id config¬ured for an li-source entry, then the default value will be inserted. When a mirror service is configured with ip-gre routable encap, no session-id is inserted and none should be specified against the li-source entries.

li-mac-filter

Syntax   **li-mac-filter** *filter-name* **entry** *li-entry-id* [*li-entry-id...(upto 8 max)*] [**intercept-id** *intercept-id* [*intercept-id...(upto 8 max)*]] [**session-id** *session-id* [*session-id...(upto 8 max)*]]
no li-mac-filter *filter-name* [**entry** *li-entry-id* [*li-entry-id...(upto 8 max)*]]

Context   config>li>li-source

Description   This command enables lawful interception (LI) of packets that match specific entries in an existing LI MAC filter that has been associated with a normal MAC filter. The specification of an li-mac-filter entry as an li-source means that packets matching the li-mac-filter entry will be intercepted on all interfaces/saps/etc where the associated normal mac-filter(s) are applied.

Default   *filter-name* — The name of the li-mac-filter. 32 characters maximum.

li-entry-id — The entry id in the li-mac-filter that is to be used as an li-source criteria.

Values   1—65535

intercept-id *intercept-id* — This command configures the intercept-id that is inserted into the packet header for all mirrored packets of the associated li-source entry.   This *intercept-id* can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs. For all types of **li-source** entries (filter, nat, sap, subscriber), when the mirror service is configured with **ip-udp-shim** routable encap, an *intercept-id* field (as part of the routable encap) is always present in the mirrored packets.   If there is no *intercept-id* configured for an **li-source** entry, then the default value will be inserted. When the mirror service is configured with **ip-gre** routable encap, no *intercept-id* is inserted and none should be specified against the **li-source** entries.

session-id *session-id* — This command configures the *session-id* that is inserted into the packet header for all mirrored packets of the associated **li-source** entry.   This *session-id* can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs. The *session-id* is only valid and used for mirror services that are configured with **ip-udp-shim** routable encap (**config>mirror>mirror-dest>encap#ip-udp-shim**). For all types of **li-source** entries (filter, nat, sap, subscriber), when the mirror service is configured with **ip-udp-shim** routable encap, a *session-id* field (as part of the routable encap) is always present in the mirrored packets.   If there is no *session-id* configured for an **li-source** entry, then the default value will be inserted. When a mirror service is configured with **ip-gre** routable encap, no *session-id* is inserted and none should be specified against the **li-source** entries.

mac-filter

Syntax **mac-filter** *mac-filter-id* **entry** [*entry-id*...] [**intercept-id** *intercept-id*...] [**session-id** *session-id*...]
no mac-filter *mac-filter-id*

Context config>li>li-source

Description This command enables lawful interception (LI) of packets that match specific entries in an existing MAC filter. Multiple entries can be created using unique entry-id numbers within the filter. The router implementation exits the filter on the first match found and executes the actions in accordance with the accompanying 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** for it to be considered complete. Entries without the **action** keyword will be considered incomplete and hence will be rendered inactive.

An *entry-id* within an MAC filter can only be intercepted to a single destination. If the same *entry-id* is defined multiple times, an error occurs and only the first definition is in effect.

The **no** form of the command removes the specified entry from the IP or MAC filter. Entries removed from the IP or MAC filter are immediately removed from all services or network ports where that filter is applied.

Parameters *mac-filter-id* — Specifies the MAC filter ID. If the *mac-filter-id* does not exist, an error will occur and the command will not execute.

entry *entry-id* — The MAC filter entries to use as match criteria.

intercept-id *intercept-id* — This command configures the intercept-id that is inserted into the packet header for all mirrored packets of the associated li-source entry.   This *intercept-id* can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs. For all types of **li-source** entries (filter, nat, sap, subscriber), when the mirror service is configured with **ip-udp-shim** routable encap, an *intercept-id* field (as part of the routable encap) is always present in the mirrored packets.   If there is no *intercept-id* configured for an **li-source** entry, then the default value will be inserted. When the mirror service is configured with **ip-gre** routable encap, no *intercept-id* is inserted and none should be specified against the **li-source** entries.

Values 1..4294967295 (32b) For nat li-source entries that are using a mirror service that is not configured with routable encap

Values 1..1,073,741,824 (30b) For all types of li-source entries that are using a mirror service with routable ip-udp-shim encap and no direction-bit.

Values   1..536,870,912 (29b) For all types of li-source entries that are using a mirror service with routable ip-udp-shim encap and with the direction-bit enabled.

session-id *session-id* — This command configures the *session-id* that is inserted into the packet header for all mirrored packets of the associated **li-source** entry.   This *session-id* can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs. The *session-id* is only valid and used for mirror services that are configured with **ip-udp-shim** routable encap (**config>mirror>mirror-dest>encap#ip-udp-shim**). For all types of **li-source** entries (filter, nat, sap, subscriber), when the mirror service is configured with **ip-udp-shim** routable encap, a *session-id* field (as part of the routable encap) is always present in the mirrored packets.   If there is no *session-id* configured for an **li-source** entry, then the default value will be inserted. When a mirror service is configured with **ip-gre** routable encap, no *session-id* is inserted and none should be specified against the **li-source** entries.

Values   1..4,294,967,295 (32b)

nat

Syntax   **nat**

Context   config>li>li-source

Description   This command enables the context to configure LI NAT parameters.

classic-lsn-sub

Syntax   [no] **classic-lsn-sub router** *router-instance* **ip** *ip-address*

Context   config>li>li-source>nat

Description   This command configures a classic LSN subscriber sources.

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

Parameters   **router** *router-instance* — Specifies the router instance the pool belongs to, either by router name or service ID.

Values   *router-name*: "Base" | "management"

Default   Base

ip *ip-address* — Specifies the IP address in a.b.c.d format.

intercept-id

Syntax	**intercept-id** *id* **no intercept-id**
Context	config>li>li-source>nat>classic-lsn-sub config>li>li-source>nat>dslite-lsn-sub config>li>li-source>nat>ethernet-header config>li>li-source>nat>l2-aware-sub config>li>li-source>nat>nat64-lsn-sub

Description This command configures the intercept-id that is inserted into the packet header for all mirrored packets of the associated li-source entry. This intercept-id can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs.

For nat mirroring (a nat li-source entry type), when the mirror service is not configured with any routable encap (for example, no ip-udp-shim or ip-gre configured under config>mirror>mirror-dest>encap), the presence of a configured intercept-id against an li-source (nat) entry will cause the insertion of the intercept-id after a configurable mac-da, mac-sa and etype (configured under **li-source>nat>ethernet-header**), at the front of each packet mirrored for that particular li-source entry. If there is no intercept-id configured (for a nat entry using a mirror service without routable encap), then a configurable mac-da and mac-sa are added to the front of the packets (but no intercept-id). In both cases a non-configurable etype is also added immediately before the mirrored customer packet. Note that routable encapsulation configured in the mirror-dest takes precedence over the ethernet-header configuration in the li-source nat entries. If routable encapsulation is configured, then the ethernet-header config is ignored and no mac header is added to the packet (the encap is determined by the mirror-dest in this case).

For all types of li-source entries (filter, nat, sap, subscriber), when the mirror service is configured with ip-udp-shim routable encap, an intercept-id field (as part of the routable encap) is always present in the mirrored packets. If there is no intercept-id configured for an li-source entry, then the default value will be inserted. When the mirror service is configured with ip-gre routable encap, no intercept-id is inserted and none should be specified against the li-source entries.

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

Default	**no intercept-id (an id of 0, or no id)**
Parameters	*id —* The intercept-id value to insert into the header of the mirrored packets.

Values	1..4294967295 (32b) For nat li-source entries that are using a mirror service that is not configured with routable encap
Values	1..1,073,741,824 (30b) For all types of li-source entries that are using a mirror service with routable ip-udp-shim encap and no direction-bit.
Values	1..536,870,912 (29b) For all types of li-source entries that are using a mirror service with routable ip-udp-shim encap and with the direction-bit enabled.

session-id

Syntax   **session-id** *id*
              no session-id

Context   config>li>li-source>nat>classic-lsn-sub
              config>li>li-source>nat>dslite-lsn-sub
              config>li>li-source>nat>ethernet-header
              config>li>li-source>nat>l2-aware-sub
              config>li>li-source>nat>nat64-lsn-sub

Description This command configures the session-id that is inserted into the packet header for all mirrored packets of the associated li-source entry.   This session-id can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs.

The session-id is only valid and used for mirror services that are configured with ip-udp-shim routable encap (config>mirror>mirror-dest>encap# ip-gre-shim).

For all types of li-source entries (filter, nat, sap, subscriber), when the mirror service is configured with ip-udp-shim routable encap, a session-id field (as part of the routable encap) is always present in the mirrored packets.   If there is no session-id configured for an li-source entry, then the default value will be inserted. When a mirror service is configured with ip-gre routable encap, no session-id is inserted and none should be specified against the li-source entries.

The **no** form of the command removes the session-id from the configuration which results in the default value being used.

Default   **no session-id (an id of 0, or no id)**

Parameters *id —* The session-id value to insert into the header of the mirrored packets.

              Values   1..4,294,967,295 (32b)

dslite-lsn-sub

Syntax   [**no**] **dslite-lsn-sub router** *router-instance* **b4** *ipv6-prefix*

Context   config>li>li-source>nat

Description This command configures the Dual Stack Lite LSN subscriber source.

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

Parameters **router** *router-instance —* Specifies the router instance the pool belongs to, either by router name or service ID.

              Values   *router-name*: "Base" | "management"

              Default   Base

              b4 *ipv6-prefix —* Specifies the IPv6 address.

              Values   ipv6-prefix   : <prefix>/<length>
                            prefix   : x:x:x:x:x:x:x:x   (eight 16-bit pieces)

                              x:x:x:x:x:x:d.d.d.d
                              x - [0..FFFF]H
                              d - [0..255]D
                 <length>   : [0..128]

ethernet-header

Syntax   **ethernet-header** [**da** *ieee-address*] [**sa** *ieee-address*] [**etype** *ethertype*]
           no ethernet-header

Context   config>li>li-source>nat

Description This command configures the ethernet header for the NAT sources

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

l2-aware-sub

Syntax   [**no**] **l2-aware-sub** *sub-ident-string*

Context   config>li>li-source>nat

Description This command configures a Layer-2-Aware subscriber source.

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

Parameters *sub-ident-string —* Specifies a source name.

sap

Syntax   **sap** *sap-id* {[**ingress**] [**egress**]} [**intercept-id** *intercept-id*...] [**session-id** *session-id*...]
           no sap *sap-id*

Context   config>li>li-source

Description This command creates a service access point (SAP) within an LI configuration. The specified SAP must
           define a FastE, GigE, or XGigE, or XGigE access port with a dot1q, null, or q-in-q encapsulation type.

           The *intercept-id* parameter configures the intercept IDs that is inserted into the packet header for all mir-
           rored packets of the associated li-source entry.

           The *session-id* parameter inserts the specified IDs into the packet header for all mirrored packets of the asso-
           ciated li-source entry.

           When the **no** form of this command is used on a SAP, the SAP with the specified port and encapsulation
           parameters is deleted.

Default   none

Parameters *sap-id —* Specifies the physical port identifier portion of the SAP definition. See Common CLI Command

for command syntax.

egress — Specifies that packets egressing the SAP should be mirrored. Egress packets are mirrored to the mirror destination after egress packet modification.

ingress — Specifies that packets ingressing the SAP should be mirrored. Ingress packets are mirrored to the mirror destination prior to ingress packet modification.

intercept-id *intercept-id* — This command configures the intercept-id that is inserted into the packet header for all mirrored packets of the associated li-source entry. This *intercept-id* can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs.

For all types of **li-source** entries (filter, nat, sap, subscriber), when the mirror service is configured with **ip-udp-shim** routable encap, an *intercept-id* field (as part of the routable encap) is always present in the mirrored packets. If there is no *intercept-id* configured for an **li-source** entry, then the default value will be inserted. When the mirror service is configured with **ip-gre** routable encap, no *intercept-id* is inserted and none should be specified against the **li-source** entries.

Values   1..4294967295 (32b) For nat li-source entries that are using a mirror service that is not configured with routable encap

Values   1..1,073,741,824 (30b) For all types of li-source entries that are using a mirror service with routable ip-udp-shim encap and no direction-bit.

Values   1..536,870,912 (29b) For all types of li-source entries that are using a mirror service with routable ip-udp-shim encap and with the direction-bit enabled.

session-id *session-id* — This command configures the *session-id* that is inserted into the packet header for all mirrored packets of the associated **li-source** entry. This *session-id* can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs.

The *session-id* is only valid and used for mirror services that are configured with **ip-udp-shim** routable encap (**config>mirror>mirror-dest>encap#ip-udp-shim**).

For all types of **li-source** entries (filter, nat, sap, subscriber), when the mirror service is configured with **ip-udp-shim** routable encap, a *session-id* field (as part of the routable encap) is always present in the mirrored packets. If there is no *session-id* configured for an **li-source** entry, then the default value will be inserted. When a mirror service is configured with **ip-gre** routable encap, no *session-id* is inserted and none should be specified against the **li-source** entries.

Values   1..4,294,967,295 (32b)

subscriber

Syntax   **subscriber** *sub-ident-string* [**sap** *sap-id* [**ip** *ip-address*] [**mac** *ieee-address*]|**sla-profile** *sla-profile-name*] [**fc** {[**be**] [**l2**] [**af**] [**l1**] [**h2**] [**ef**] [**h1**] [**nc**]}] {[**ingress**] [**egress**]} [**intercept-id** *intercept-id*...] [**session-id** *session-id*...]
              no subscriber *sub-ident-string*

Context   config>li>li-source

Description   This command adds hosts of a subscriber to mirroring service.

Parameters   *sub-ident-string* — Specifies the name of the subscriber identification policy.

sap-id — Specifies the physical port identifier portion of the SAP definition. See Common CLI Command Descriptions on page 639 for command syntax.

ip-address — The service IP address (system IP address) of the remote device sending LI traffic. If 0.0.0.0 is specified, any remote router is allowed to send to this service.

Values   1.0.0.1 — 223.255.255.254

mac *mac-address* — Specify this optional parameter when defining a static host. The MAC address must be specified for **anti-spoof ip-mac** and **arp-populate**. Multiple static hosts may be configured with the same MAC address given that each definition is distinguished by a unique IP address.

sla-profile-name — Each host of a subscriber can use a different sla-profile. This option allows interception of only the hosts using the specified sla-profile. In some deployments sla-profiles are assigned per type of traffic. There can be, for example, a specific sla-profile for voice traffic (which could be used for all SIP-hosts).

Values   32 characters maximum.

fc — The name of the forwarding class with which to associate LI traffic. The forwarding class name must already be defined within the system. If the fc-name does not exist, an error will be returned and the **fc** command will have no effect. If the *fc-name* does exist, the forwarding class associated with *fc-name* will override the default forwarding class.

Values   be, l2, af, l1, h2, ef, h1, nc

ingress — Specifies information for the ingress policy.

egress — Specifies information for the egress policy.

intercept-id *intercept-id* — This command configures the intercept-id that is inserted into the packet header for all mirrored packets of the associated li-source entry.   This *intercept-id* can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs.

For all types of **li-source** entries (filter, nat, sap, subscriber), when the mirror service is configured with **ip-udp-shim** routable encap, an *intercept-id* field (as part of the routable encap) is always present in the mirrored packets.   If there is no *intercept-id* configured for an **li-source** entry, then the default value will be inserted. When the mirror service is configured with **ip-gre** routable encap, no *intercept-id* is inserted and none should be specified against the **li-source** entries.

Values   1..4294967295 (32b) For nat li-source entries that are using a mirror service that is not configured with routable encap

Values   1..1,073,741,824 (30b) For all types of li-source entries that are using a mirror service with routable ip-udp-shim encap and no direction-bit.

Values   1..536,870,912 (29b) For all types of li-source entries that are using a mirror service with routable ip-udp-shim encap and with the direction-bit enabled.

session-id *session-id* — This command configures the *session-id* that is inserted into the packet header for all mirrored packets of the associated **li-source** entry.   This *session-id* can be used (for example by a downstream LI Gateway) to identify the particular LI session to which the packet belongs. The *session-id* is only valid and used for mirror services that are configured with **ip-udp-shim** routable encap (**config>mirror>mirror-dest>encap#ip-udp-shim**).

For all types of **li-source** entries (filter, nat, sap, subscriber), when the mirror service is configured with **ip-udp-shim** routable encap, a *session-id* field (as part of the routable encap) is always present in the

mirrored packets.   If there is no *session-id* configured for an **li-source** entry, then the default value will be inserted. When a mirror service is configured with **ip-gre** routable encap, no *session-id* is inserted and none should be specified against the **li-source** entries.

Values   1..4,294,967,295 (32b)

wlan-gw

Syntax   **wlan-gw**

Context   config>li>li-source

Description   This command enters the wlan-gw context under li-srouce to create li-source related configuration.

Default   none

dsm-subscriber

Syntax   [**no**] **dsm-subscriber mac** *xx:xx:xx:xx:xx:xx or xx-xx-xx-xx-xx-xx*

Context   config>li>li-source>wlan-gw

Description   This command configures the DSM UE source.

Default   none

Parameters   **mac** *xx:xx...* — Specifies the MAC address.

        Values   mac-addr: xx:xx:xx:xx:xx:xx **example:** 00:0c:f1:99:85:b8
               or XX:XX:XX:XX:XX:XX **example:** 00-0C-F1-99-85-B8

intercept-id

Syntax   **intercept-id** [1..4294967295]
            no intercept-id

Context   config>li>li-source>wlan-gw

Description   This command configures the intercept-id inserted in the packet header for all mirrored packets of the associated li-source. When the mirror-service is configured with the ip-udp-shim routable encaps, intercept-id field (as part of the routable encap) is always present in the mirrored packets. The intercept-id can be used by the LIG to identify a particular LI session to which the packet belongs.

Default   none

Parameters   1..4294967295 — Specifies the intercept ID inserted in the LI header.

session-id

Syntax   **session-id** [1..4294967295]
             no session-id

Context   config>li>li-source>wlan-gw

Description This command configures the session-id inserted in the packet header for all mirrored packets of the associated li-source. When the mirror-service is configured with the ip-udp-shim routable encaps, session-id field (as part of the routable encap) is always present in the mirrored packets. The session-id can be used by the LIG to identify a particular LI session to which the packet belongs.

Default   none

Parameters   1..4294967295 — The session-id inserted in the LI header.

log

Syntax   **log**

Context   config>li

Description This command enables the context to configure an event log for Lawful Intercept.

log-id

Syntax   [**no**] **log-id** *log-id*

Context   config>li>log

Description This command configures an LI event log destination. The *log-id* is used to direct events, alarms/traps, and debug information to respective destinations.

Parameters   *log-id —* The log ID number, expressed as a decimal integer.

                 Values   1 — 100

filter

Syntax   **filter** *filter-id*
             no filter

Context   config>li>log>log-id

Description This command adds an event filter policy with the log destination.

                 The **filter** 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.

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 **snmp-trap-group**.

The application of filters for debug messages is limited to application and subject only.

Accounting records cannot be filtered using the **filter** command.

Only one filter-id can be configured per log destination.

The **no** form of the command removes the specified event filter from the *log-id*.

Default **no filter — No event filter policy is specified for a** *log-id.*

Parameters *filter-id —* The event filter policy ID is used to associate the filter with the *log-id* configuration. The event filter policy ID must already be defined in **config>log>filter** *filter-id*.

Values   1 — 1000

from

Syntax **from {[li]}**
no from

Context config>li>log>log-id

Description This command configures a bit mask that specifies the log event source stream(s) to be forwarded to the destination specified in the log destination (memory, session, SNMP). Events from more than one source can be forwarded to the log destination.

Parameters **li —** Specifies the **li** event stream that contains all events configured for Lawful Intercept activities. If the requestor does not have access to the **li** context, the event stream will fail.

time-format

Syntax **time-format {local | utc}**

Context config>li>log>log-id

Description This command specifies whether the time should be displayed in local or Coordinated Universal Time (UTC) format.

Default **utc**

Parameters **local** — Specifies that timestamps are written in the system's local time.

utc — Specifies that timestamps are written using the UTC value. This was formerly called Greenwich Mean Time (GMT) and Zulu time.

to

Syntax **to memory** [*size*]
   to session
   to snmp [*size*]

Context config>li>log>log-id

Description This command enables the context to configure the destination type for the event log.

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.

Parameters *size —* The size parameter indicates the number of events that can be stored into memory.

   Default 100

   Values 50 — 1024

save

Syntax **save**

Context config>li

Description This command is required to save LI configuration parameters.

df-peer

Syntax **df-peer** *df-peer-id* **df2-addr** *ip-address* **df2-port** *port* **df3-addr** *ip-address* **df3-port** *port*
   no df-peer *df-peer-id*

Context config>li>mobile

Description This command provisions a Delivery Function Peer, which includes Delivery Function2 used for IRI as well as Delivery Function3 used for CC, of a Lawful Intercept Gateway.

The **no** form of the command removes the Delivery Function Peer information from the configuration.

Parameters *df-peer-id —* Configures Delivery Function Peer parameters.

   Values 1 — 16

  df2-addr *ip-address* **—** Specifies the Delivery Function2 address. This is the IP address of the Delivery Function where the IRI is to be sent

  df2-port *port* **—** Specifies the DF2 port number. This is theTCP port of the Delivery Function where the IRI is to be sent

df3-addr *ip-address* **—** Specifies the Delivery Function3 address. This is the IP address of the Delivery Function where the CC is to be sent

df3-port *port* **—** Specifies the DF3 port number. This is the TCP port of the Delivery Function where the CC is to be sent.

local-interface

Syntax   **local-interface** *ip-address* [**router** *router-instance*]
              no local-interface

Context   config>li>mobile

Description This command configures the source IP address used by the xGW/GGSN for Lawful Intercept (LI) interface.

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

Default   no local-interface

Parameters   *ip-address —* Specifies the source IP address.

              Values   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:x:d.d.d.d
                                              x - [0..FFFF]H
                                              d - [0..255]D

              router *router-instance* **—** Specifies the router instance up to 32 characters in length.

target

Syntax   **target** *target-type* **id** *string* **intercept** *intercept* **peer** *df-peer-id* [**liid** *li-identifier*]
              no target *target-type* **id** *string*

Context   config>li>mobile

Description This command configures a target for interception and assign the Delivery Function Peer that receives the Intercept Related Information (IRI) and Content of Communication (CC) for this target.

              All IRI and CC messages for this target are sent to the newly specified DF peer, subsequent to target modifications.

              Only IMSI is currently supported as a target Identifier initially. Modifying the **target** command's parameters does not require a shutdown/no shutdown of the GW.

              The **no** form of the command de-activates a target that is being intercepted.

              target-type — Specifies the type of surveillance target identifier to be provisioned.

              Values   imsi, imei, msisdn

              id *string* **—** uniquely identifies a target for the interception up to 15 characters in length.

liid *li-identifier* — uniquely identifies the LI identifier up to 25 characters in length.

intercept *intercept* — Specifies the interception type for the target. The intercept type is allowed to change from IRI to IRI+CC and from IRI+CC to IRI,

> **Values**   iri — Intercept Related Information
> iricc —Intercept Related Information (IRI) and Content of Communication (CC)

> **Default**   iri

peer *df-peer-id* — Specifies the Delivery Function (DF) Peer associated with the target.

> **Values**   1 — 16

> **Default**   1

x2-iri-qos

Syntax   **[no] x2-iri-qos dscp** {*dscp-value* | *dscp-name*}

Context   config>li>mobile

Description   This command specifies the DSCP to be set for IRI (Intercept Related Information) messages sent to a LIG (Lawful Intercept Gateway). No form of the command reverts to the default.

Default   disable

Parameters   *dscp-value —* Specified the DSCP value.

> **Values**   [0..63]

dscp-name — Specifies the DSCP name.

> **Values**   none|be|ef|cp1|cp2|cp3|cp4|cp5|cp6|cp7|cp9|cs1|cs2|
> cs3|cs4|cs5|nc1|nc2|af11|af12|af13|af21|af22|af23|
> af31|af32|af33|af41|af42|af43|cp11|cp13|cp15|cp17|
> cp19|cp21|cp23|cp25|cp27|cp29|cp31|cp33|cp35|cp37|
> cp39|cp41|cp42|cp43|cp44|cp45|cp47|cp49|cp50|cp51|
> cp52|cp53|cp54|cp55|cp57|cp58|cp59|cp60|cp61|cp62|cp63

x3-cc-qos

Syntax   **[no] x3-cc-qos dscp** {*dscp-value* | *dscp-name*}

Context   config>li>mobile

Description   This command specifies the DSCP to be set for CC (content of Communication) traffic sent to a LIG (Lawful Intercept Gateway). No form of the command reverts to the default.

Applies to Transport Protocol and ULIC-Header versions :

- TCP with ULICv1
- UDP with ULICv1

• UDP with ULICv0

Default   disable

Parameters   *dscp-value —*

Values   [0..63]

dscp-name —

Values   none|be|ef|cp1|cp2|cp3|cp4|cp5|cp6|cp7|cp9|cs1|cs2|
cs3|cs4|cs5|nc1|nc2|af11|af12|af13|af21|af22|af23|
af31|af32|af33|af41|af42|af43|cp11|cp13|cp15|cp17|
cp19|cp21|cp23|cp25|cp27|cp29|cp31|cp33|cp35|cp37|
cp39|cp41|cp42|cp43|cp44|cp45|cp47|cp49|cp50|cp51|
cp52|cp53|cp54|cp55|cp57|cp58|cp59|cp60|cp61|cp62|cp63

x3-transport

Syntax   **x3-transport {tcp | udp} ulic-header {v0 | v1}**

Context   config>li>mobile

Description   This command specifies the transport option for an X3 interface, along with the ULIC Header version to be used. The same transport option is supported to all the Delivery Function (DF) peers in a service provider network. Changing the option requires a GW shutdown/no shutdown.

Following are the valid combinations of Transport protocol and ULIC Header versions supported:

• TCP with ULIC Header v1

• UDP with ULIC Header v1

• UDP with ULIC Header v0

The no form of the command reverts to the default.

Default   disable

Parameters   **tcp —** Specifies to use TCP as the transport option for an X3 interface.

Default   Only ULIC Header V1 is supported with this option.

udp — Specifies to use UDP as the transport option for an X3 interface.

Default   Only ULIC Header V0 is supported with this option.

ulic-header — Specifies the header option..

v0 — Specifies ULIC v0 Header option.

v1 — Specifies ULIC v1 Header option.

operator

Syntax	**operator-id** *op_id* **no operator-id**
Context	config>li>mobile
Description	This command is used to configure the operator identifier for an operator's deployment. The configured value is used to populate the operator-identifier field of the Network-Identifier IE. The "No" form of the command reverts to the default.
Default	"op_id"
Parameters	*op-id* — Specifies the operator identifier, string of up to 5 alphanumeric characters.

Other LI Configuration Commands

The following commands are also described in the Basic System Configuration Guide. Other LI commands are described in the System Management Guide

li-local-save

Syntax   [no] li-local-save

Context   bof

Description   This command specifies whether or not lawful intercept (LI) configuration is allowed to be save to a local file. Modifying this command will not take affect until the system is rebooted.

Default   **li-local-save**

li-separate

Syntax   [no] li-separate

Context   bof

Description   This command specifies whether or not a non-LI user has access to lawful intercept (LI) information. When this command is enabled, a user who does not have LI access will not be allowed to access CLI or SNMP objects in the li context. Modifying this command will not take affect until the system is rebooted.

When the **no li-separate** command is set (the default mode), those who are allowed access to the **config>system>security>profile** context and user command nodes are allowed to modify the configuration of the LI parameters. In this mode, a user that has a profile allowing access to the **config>li** and/or **show>li** command contexts can enter and use the commands under those nodes.

When the **li-separate** command is configured, only users that have the LI access capabilities set in the **config>system>security>user>access li** context are allowed to access the **config>li** and/or **show>li** command contexts. A user who does not have LI access is not allowed to enter the **config>li** and **show>li** contexts even though they have a profile that allows access to these nodes. When in the **li-separate** mode, only users with **config>system>security>user>access li** set in their user account have the ability modify the setting LI parameters in either their own or others profiles and user configurations.

Default   no li-separate

access

Syntax	[**no**] **access** [**ftp**] [**snmp**] [**console**] [**li**]
Context	config>>system>security>user
Description	This command grants a user permission for FTP, SNMP, console or lawful intercept (LI) access.

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.

The **no** form of command removes access for a specific application.
no access denies permission for all management access methods. To deny a single access method, enter the **no** form of the command followed by the method to be denied, for example, **no access FTP** denies FTP access.

Default	**No access is granted to the user by default.**
Parameters	**ftp** — Specifies FTP permission.

snmp — Specifies SNMP permission. This keyword is only configurable in the **config>system>security>user** context.

console — Specifies console access (serial port or Telnet) permission.

li — Allows user to access CLI commands in the lawful intercept (LI) context.

profile

Syntax	[**no**] **profile** *user-profile-name*
Context	config>system>security
Description	This command creates a context to create user profiles for CLI command tree permissions.

Profiles are used to either deny or permit user console access to a hierarchical branch or to specific commands.

Once the profiles are created, the **user** 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 *user-profile-name* can consist of up to 32 alphanumeric characters.

The **no** form of the command deletes a user profile.

Default	**user-profile default**
Parameters	*user-profile-name* — 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.

li

Syntax	**li**
Context	config>system>security>profile
Description	This command enables the Lawful Intercept (LI) profile identifier.
Default	no li