Nokia Service Router Linux
7215 Interconnect System
7220 Interconnect Router
7250 Interconnect Router

Release 26.10

Troubleshooting Toolkit

3HE 22249 AAAC TQZZA
Edition: 01
November 2026

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1 About this guide

This document describes how to use and configure diagnostic tools for the Nokia Service Router Linux (SR Linux).

This document is intended for network technicians, administrators, operators, service providers, and others who need to understand how to use and configure diagnostic tools.

Note:
This manual covers the current release and may also contain some content that will be released in later maintenance loads. See the *SR Linux Software Release Notes* for information about features supported in each load.

Configuration and command outputs shown in this guide are examples only; actual displays may differ depending on supported functionality and user configuration.

1.1 Precautionary and information messages

The following are information symbols used in the documentation.

DANGER: Danger warns that the described activity or situation may result in serious personal injury or death. An electric shock hazard could exist. Before you begin work on this equipment, be aware of hazards involving electrical circuitry, be familiar with networking environments, and implement accident prevention procedures.

WARNING: Warning indicates that the described activity or situation may, or will, cause equipment damage, serious performance problems, or loss of data.

Caution: Caution indicates that the described activity or situation may reduce your component or system performance.

Note: Note provides additional operational information.

Tip: Tip provides suggestions for use or best practices.

1.2 Conventions

The Nokia SR Linux documentation uses the following command conventions:

- **Bold** type indicates a command that the user must enter.
- Input and output examples are displayed in `Courier` text.
- A vertical bar (|) indicates a mutually exclusive argument.
- Square brackets ([ ]) indicate optional elements.

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- Braces ({ }) indicate a required choice. When braces are contained within square brackets, they indicate a required choice within an optional element.
- *Italic* type indicates a variable.

The following table outlines platform grouping conventions used in the SR Linux documentation suite.

Note: Some platforms in the 7250 IXR support mixed systems. For more information about mixed system support, see "Chassis types" in the *Configuration Basics Guide*.

Table 1: Platform grouping legend

Platform group	Description
7215 IXS	7215 IXS-A1[1]
7220 IXR	All 7220 IXR platforms
7220 IXR-D*x*	7220 IXR-D1, 7220 IXR-D2, 7220 IXR-D2L, 7220 IXR-D3, 7220 IXR-D3L, 7220 IXR-D4, 7220 IXR-D5
7220 IXR-H*x*	7220 IXR-H2, 7220 IXR-H3, 7220 IXR-H4, 7220 IXR-H4-32D, 7220 IXR-H5-32D, 7220 IXR-H5-64D, 7220 IXR-H5-64O, 7220 IXR-H5-64O-512, 7220 IXR-H6-64
7250 IXR[2]	7250 IXR platforms
7250 IXR Gen 2	7250 IXR-6, 7250 IXR-10
7250 IXR Gen 2c+	7250 IXR-6e with IMM2, 7250 IXR-10e with IMM2, 7250 IXR-X1b, 7250 IXR-X3b
7250 IXR Gen 3	7250 IXR-6e with IMM3, 7250 IXR-10e with IMM3, 7250 IXR-18e, 7250 IXR-X4, 7250 IXR-X4 OSFP
7250 IXR-6e/10e (mixed system)	7250 IXR-6e (mixed system)[3], 7250 IXR-10e (mixed system)[3]

1 References to 7215 IXS may be appended with (AA variant) or (AB variant) to indicate the chassis variant. Both variants are 7215 IXS platforms; they are identified by part numbers ending with AA or AB.

2 References to the 7250 IXR platform group may be appended with (including mixed systems) or (excluding mixed systems) to indicate support for a mix of 7250 IXR Gen 2c+ (IMM2) and 7250 IXR Gen 3 (IMM3) line cards in the same chassis.

3 References to this platform as part of 7250 IXR (mixed system) indicate mixed system support of 7250 IXR Gen 2c+ (IMM2) and 7250 IXR Gen 3 (IMM3). That is, the 7250 IXR-6e and 7250 IXR-10e can hold and support both IMM2 and IMM3 at the same time.

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2 What's new

Table 2: What's new in Release 26.10.1

Topic	Location
Tools system traffic-monitoring - interface/sub-interface match with ingress/egress capture	Using the interactive traffic-monitoring tool

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3 Interactive traffic-monitoring tool

SR Linux features an interactive traffic-monitoring tool that allows you to capture and monitor traffic either based on 5-tuple match criteria or by (sub)interface. The tools command can either capture based on the 5 tuple or interface not both at the same time. The system supports the execution of one tools traffic-monitoring command at one time. For the 5-tuple match, Tthe match criteria is injected into a packet capture filter ACL entry that is applied to all subinterfaces. For capture based on interface or subinterface, all packets traversing the specified interfaces and subinterfaces are captured; information from all matching packets can be displayed on screen or directed to a file.

3.1 Using the interactive traffic-monitoring tool

About this task

You can specify the match criteria either by using the **tools system traffic-monitor** CLI command, or by defining capture-filter ACL entries.

ACL capture

If you use the **tools system traffic-monitor** command to specify the match criteria, SR Linux dynamically creates a capture-filter entry with the match criteria. Packets that match the capture-filter entry are sent to the traffic-monitoring tool running on the CPM and displayed until the traffic-monitoring tool is exited, at which time the dynamically created capture-filter entries are removed.

Use the following syntax to configure the **tools system traffic-monitor** command:

tools system traffic-monitor [source-address <*ip-addr/len*>**] [destination-address** <*ip-addr/len*>**] [protocol** <*proto-val*>**] [source-port** <*value* | *range*>**] [destination-port** <*value* | *range*>**] [verbose] [output-file** <*file-name*>**] [hex-output]**

The command parameters are described in Table 3: Traffic monitoring command parameters.

Table 3: Traffic monitoring command parameters

Command/parameter	Description
tools system traffic-monitor	Initiates an interactive monitor session
source-address <*ip-addr/len*>	Source IP address (IPv4 or IPv6) prefix and netmask length value. For example: 10.10.11.0/24
destination-address <*ip-addr/len*>	Destination IP address (IPv4 or IPv6) prefix and netmask length value. For example: 10.10.20.0/24
protocol <*proto-val*>	Specifies the protocol type value to match (required if either port values are specified)

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Command/parameter	Description
source-port <*value* | *range*>	Source port integer value or port range in the format of port1..port2
destination-port <*value* | *range*>	Destination port integer value or port range in the format of port1..port2
verbose	Displays detailed output
output-file <*file-name*>	Directs output to a file
hex-output	Displays output in hex format
direction <*ingress* | *egress*>	Mirroring direction when `interface` is specified.
interface <*value*>	Interface, subinterface, or LAG to mirror. Only one interface per command.

If you specify the match criteria by defining capture-filter ACL entries, starting the traffic-monitoring tool with the **tools system traffic-monitor** command causes the system to send packets that match the defined capture-filter entries to the CPM and display them until the traffic-monitoring tool is exited. Unlike the dynamically created capture-filter entries, the defined capture-filter entries are not removed from the system when the traffic-monitoring tool is exited.

There is one packet capture filter for IPv4 traffic and another packet capture filter for IPv6 traffic. The default IPv4 packet capture filter copies no IPv4 packets, and the default IPv6 packet capture filter copies no IPv6 packets. To configure a packet capture filter, you create an IPv4 or IPv6 ACL filter named `capture` and specify match conditions and actions.

Note: The name **capture** is reserved for packet capture filters; an ACL named **capture** cannot be associated with any interface.

The following is an example of a capture-filter ACL entry:

```
--{ + candidate shared default }--[  ]--
# info with-context acl acl-filter capture type ipv4
    acl {
        acl-filter capture type ipv4 {
            entry 1 {
                match {
                    ipv4 {
                        protocol icmp
                        destination-ip {
                            address 10.1.1.1
                            mask 255.255.255.255
                        }
                        source-ip {
                            address 10.2.2.2
                            mask 255.255.255.255
                        }
                    }
                }
                action {
                    copy {
                    }
```


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```
                }
            }
        }
    }
```

Capture filters are applied to traffic after any subinterface filters, but before CPM filters. If a packet is dropped by a subinterface filter, it is not evaluated by a capture filter.

Only a single instance of the traffic-monitoring tool can be running at a time.

If no capture-filter entries are already defined, you must specify the match criteria with the **tools system traffic-monitor** command. If capture-filter entries are already defined, match criteria specified with the **tools system traffic-monitor** command is ignored.

Interface and subinterface capture

On 7250 IXR platforms, you can specify an `interface` in the **tools system traffic-monitor** command. In this case, the system does not create a capture-filter entry. Instead, it creates an internal mirror with traffic monitoring as the destination and sends the mirrored packets to the same traffic-monitoring tool on the CPM, including PCAP output if an output file is specified.

Note:

- The system can capture about 5000 packets per second. Exceeding this rate results in missing packets.
- Only one interface can be captured at one time and is mutually exclusive with ACL capture
- If the capture interface or subinterface is already a mirror source, executing the **tool traffic-monitoring** command for that interface or subinterface is rejected.
- Interface or subinterface capture depends on available mirroring resources and if those resources are exhausted, the system returns an error message.

The command syntax adds optional interface mirroring parameters.

tools system traffic-monitor [direction <*ingress*|*egress*>**] [interface** <*interface-name*>**] [source-address** <*ip-addr/len*>**] [destination-address** <*ip-addr/len*>**] [protocol** <*proto-val*>**] [source-port** <*value* | *range*>**] [destination-port** <*value* | *range*>**] [verbose] [output-file** <*file-name*>**] [hex-output]**

3.1.1 Monitoring ICMP Packets

Procedure

The following is an example of using the traffic-monitoring tool to monitor ICMP packets. In this example, information about ICMP packets with source address 10.2.2.2/32 and destination address 10.1.1.1/32 is displayed in the monitor window, including the arrival time and source port (`ethernet-1/20.1`) of each packet. The traffic-monitoring tool captures ICMP packets until you press Ctrl-C.

Example: Traffic-monitoring tool

```
# tools system traffic-monitor destination-address 10.1.1.1/32 source-address 10.2.2.2/32 protocol
 icmp
Capturing on 'monit'
1 0.000   ethernet-1/20.1 10.1.1.1 10.2.2.2  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=
63
2 1.803   ethernet-1/20.1 10.1.1.1 10.2.2.2  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=
63
```


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```
3 2.895   ethernet-1/20.1 10.1.1.1 10.2.2.2  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=
63
4 3.749   ethernet-1/20.1 10.1.1.1 10.2.2.2  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=
63
5 4.250   ethernet-1/20.1 10.1.1.1 10.2.2.2  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=
63
6 5.759   ethernet-1/20.1 10.1.1.1 10.2.2.2  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=
63
7 6.644   ethernet-1/20.1 10.1.1.1 10.2.2.2  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=
63
^C
7 packets captured
Command execution aborted : 'tools system traffic-monitor destination-address 10.1.1.1/32 source-
address 10.2.2.2/32 protocol icmp'
```

When you execute the **tools system traffic-monitor** command in the example above, it dynamically creates the following traffic monitoring policy:

```
    acl {
        acl-filter capture type ipv4 {
            entry 1 {
                match {
                    ipv4 {
                        protocol icmp
                        destination-ip {
                            address 10.1.1.1
                            mask 255.255.255.255
                        }
                        source-ip {
                            address 10.2.2.2
                            mask 255.255.255.255
                        }
                    }
                }
                action {
                    copy {
                    }
                }
            }
        }
    }
```

When you terminate the command by pressing Ctrl-C, the dynamically created traffic monitoring policy is removed from all ingress interfaces.

Example: tools system traffic-monitor interface

```
# tools system traffic-monitor interface lag8 direction egress
Capturing on 'monit'
1  0.000000000  ethernet-1/30 00:31:26:7c:31:55  01:80:c2:00:00:02  00:31:26:7c:31:55
 01:80:c2:00:00:02  LACP  172  v1 ACTOR 00:31:26:7c:29:38 P: 15 K: 32775 **DCSGSA PARTNER
 00:31:26:7b:99:38 P: 15 K: 32775 **DCSGSA

2  0.491820319  ethernet-1/32 00:31:26:7c:31:57  01:80:c2:00:00:02  00:31:26:7c:31:57
 01:80:c2:00:00:02  LACP  172  v1 ACTOR 00:31:26:7c:29:38 P: 16 K: 32775 **DCSGSA PARTNER
 00:31:26:7b:99:38 P: 16 K: 32775 **DCSGSA
```


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When you execute the **tools system traffic-monitor interface** command in the above example, it dynamically creates the following mirroring session:

```
mirroring-instance __tm_mirror_capture_0xffe6_internal {
    admin-state enable
    oper-state up
    mirror-source {
        interface lag8 {
            direction egress-only
        }
    }
    mirror-destination {
        pcap {
            capture-type [
                capture-interface
            ]
        }
    }
}
```

3.1.2 Displaying verbose output

Procedure

If you include the **verbose** option in the **tools system traffic-monitor** command, it displays the header fields and additional information from the shim header, followed by the original packet.

Example: Verbose output

The following example shows verbose output for an ICMP packet:

```
--{ + candidate shared default }--[  ]--
# tools system traffic-monitor destination-address 10.1.1.1/32 source-address 10.2.2.2/32 protocol
 icmp verbose
Capturing on 'monit'
Frame 1: 146 bytes on wire (1168 bits), 146 bytes captured (1168 bits) on interface monit, id 0
    Section number: 1
    Interface id: 0 (monit)
        Interface name: monit
    Encapsulation type: Ethernet (1)
    Arrival Time: Oct 16, 2026 10:01:02.801848603 UTC
    UTC Arrival Time: Oct 16, 2026 10:01:02.801848603 UTC
    Epoch Arrival Time: 1792144862.801848603
    [Time shift for this packet: 0.000000000 seconds]
    [Time delta from previous captured frame: 0.000000000 seconds]
    [Time delta from previous displayed frame: 0.000000000 seconds]
    [Time since reference or first frame: 0.000000000 seconds]
    Frame Number: 1
    Frame Length: 146 bytes (1168 bits)
    Capture Length: 146 bytes (1168 bits)
    [Frame is marked: False]
    [Frame is ignored: False]
    [Protocols in frame: eth:srlinux:eth:ethertype:ip:icmp:data]
Srlinux Packet
    Ingress Port: ethernet-1/13.0
    Padding: 000000
Ethernet II, Src: 08:47:4c:c7:bd:a7, Dst: 08:47:4c:c7:b5:a7
    Destination: 08:47:4c:c7:b5:a7
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
```


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```
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Source: 08:47:4c:c7:bd:a7
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Type: IPv4 (0x0800)
    [Stream index: 0]
Internet Protocol Version 4, Src: 10.2.2.2, Dst: 10.1.1.1
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
    Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
        0000 00.. = Differentiated Services Codepoint: Default (0)
        .... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
    Total Length: 84
    Identification: 0x8bd3 (35795)
    010. .... = Flags: 0x2, Don't fragment
        0... .... = Reserved bit: Not set
        .1.. .... = Don't fragment: Set
        ..0. .... = More fragments: Not set
    ...0 0000 0000 0000 = Fragment Offset: 0
    Time to Live: 64
    Protocol: ICMP (1)
    Header Checksum: 0x97d0 [validation disabled]
    [Header checksum status: Unverified]
    Source Address: 10.2.2.2
    Destination Address: 10.1.1.1
    [Stream index: 0]
Internet Control Message Protocol
    Type: 8 (Echo (ping) request)
    Code: 0
    Checksum: 0xd3c6 [correct]
    [Checksum Status: Good]
    Identifier (BE): 54219 (0xd3cb)
    Identifier (LE): 52179 (0xcbd3)
    Sequence Number (BE): 1 (0x0001)
    Sequence Number (LE): 256 (0x0100)
    Timestamp from icmp data: Oct 16, 2026 10:01:02.800981000 UTC
    [Timestamp from icmp data (relative): 0.000867603 seconds]
    Data (40 bytes)
0000  10 11 12 13 14 15 16 17 18 19 1a 1b 1c 1d 1e 1f   ................
0010  20 21 22 23 24 25 26 27 28 29 2a 2b 2c 2d 2e 2f    !"#$%&'()*+,-./
0020  30 31 32 33 34 35 36 37                          01234567
       Data: 101112131415161718191a1b1c1d1e1f202122232425262728292a2b2c2d2e2f3031323334353637
       [Length: 40]
```

3.1.3 Capturing packets to a file

Procedure

You can direct the captured packets to a file, which can be used as a source for the SR Linux packet trace utility or for Wireshark.

Example: Directing captured packets

The following example directs information about ICMP packets with source address 10.2.2.2/32 and destination address 10.1.1.1/32 to a `.pcap` file.

```
# tools system traffic-monitor destination-address 10.1.1.1/32 source-address 10.2.2.2/32
 protocol icmp output-file /home/linuxadmin/ICMP.pcap
Capturing on 'monit'
6 packets captured
```


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```
Command execution aborted : 'tools system traffic-monitor destination-address 10.1.1.1/32
 source-address 10.2.2.2/32 protocol icmp output-file /home/linuxadmin/ICMP.pcap '
```

Before opening the `.pcap` file, remove the shim header (the first 48 bytes of the file). For example:

```
$ editcap -C 0:48  /home/linuxadmin/ICMP.pcap /home/linuxadmin/ICMP_chopped.pcap
```

3.1.4 Capturing bidirectional transit traffic

Procedure

The 5-tuple matching criteria defined in a **tools system traffic-monitor** command applies in one direction only. To capture traffic in both directions, you define capture filters for each direction, then start the traffic-monitoring tool, which applies both capture filters on all ports.

Example: Capturing bidirectional transit traffic

The following example defines one capture filter entry that matches traffic with destination IP address 10.0.0.0/8 and source IP address 10.0.0.0/8.

```
--{ + candidate shared default }--[  ]--
# info acl acl-filter capture type ipv4
    acl {
        acl-filter capture type ipv4 {
            entry 1 {
                match {
                    ipv4 {
                        protocol icmp
                        destination-ip {
                            prefix 10.0.0.0/8
                        }
                        source-ip {
                            prefix 10.0.0.0/8
                        }
                    }
                }
            }
        }
    }
```

When you start the traffic-monitoring tool, it captures packets matching both filter entries. For example:

```
# tools system traffic-monitor

1 0.000000000  ethernet-1/1.1 10.1.1.1  10.2.2.2  ICMP  146 Echo (ping) request  id=0x8e3d, seq=23/
5888, ttl=64
2 0.000946459  ethernet-1/2.1 10.2.2.2  10.1.1.1  ICMP  146 Echo (ping) reply    id=0x8e3d, seq=23/
5888, ttl=64 (request in 1)
3 1.001009926  ethernet-1/1.1 10.1.1.1  10.2.2.2  ICMP  146 Echo (ping) request  id=0x8e3d, seq=24/
6144, ttl=64
4 1.002960526  ethernet-1/2.1 10.2.2.2  10.1.1.1  ICMP  146 Echo (ping) reply    id=0x8e3d, seq=24/
6144, ttl=64 (request in 3)
5 2.002007753  ethernet-1/1.1 10.1.1.1  10.2.2.2  ICMP  146 Echo (ping) request  id=0x8e3d, seq=25/
6400, ttl=64
6 2.002949632  ethernet-1/2.1 10.2.2.2  10.1.1.1  ICMP  146 Echo (ping) reply    id=0x8e3d, seq=25/
6400, ttl=64 (request in 5)
```


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```
7 3.001983363  ethernet-1/1.1 10.1.1.1  10.2.2.2  ICMP  146 Echo (ping) request  id=0x8e3d, seq=26/
6656, ttl=64
8 3.003938511  ethernet-1/2.1 10.2.2.2  10.1.1.1  ICMP  146 Echo (ping) reply    id=0x8e3d, seq=26/
6656, ttl=64 (request in 7)
9 4.003997530  ethernet-1/1.1 10.1.1.1  10.2.2.2  ICMP  146 Echo (ping) request  id=0x8e3d, seq=27/
6912, ttl=64
104.004949967  ethernet-1/2.1 10.2.2.2  10.1.1.1  ICMP  146 Echo (ping) reply    id=0x8e3d, seq=27/
6912, ttl=64 (request in 9)
```


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4 Switch fabric statistics

The switch fabric statistics tool allows you to monitor and troubleshoot common switch fabric issues at different points in the fabric.

The tool can be used to determine the current utilization level. Utilization data is displayed on a per-slot and line-card basis and includes aggregate line card/slot to switch fabric utilization (bidirectional).

See the *SR Linux Data Model Reference Guide* for details on all switch fabric statistic related commands and descriptions of all parameters.

4.1 Displaying switch fabric statistics

Procedure

Use this procedure to display switch fabric statistics:

```
# enter show
```

```
# tools platform show-fabric-bandwidth
```

Example: Displaying switch fabric statistics

```
/platform/show-fabric-bandwidth:

    Slot     to-fabric Gbps   from-fabric Gbps
    ----------------------------------------
     1        2369             2370
     2        2393             2393
    ----------------------------------------
    Total     4762             4764
```


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5 Packet-trace tool

The packet-trace tool is a troubleshooting command that allows the specification of a probe packet that is injected into the specified interface forwarding context. The tool records the forwarding destination or egress port for the probe packet, as well as any matched ACL records.

The packet-trace tool calculates the egress interfaces for an IP forward flow, while taking into account ECMP and LAG hashing.

The tool reports the following output:

- supplied input parameters
- calculated egress interface and port through which a packet with the specified fields is forwarded
- applied ACL (both ingress and egress)
- reason for a discarded packet

Note: Packet-trace is not supported on 7220 IXR-D4, 7220 IXR-D5, 7250 IXR Gen 3, and 7220 IXR-H6 platforms.

5.1 Configuring packet-trace tool commands

The **packet-trace** command is a tools command that reports the forwarding behavior for a test packet specified in one of the following formats:

- Scapy file format: file specifying the packet format in Scapy packet definition form
- base64 format: string specifying the packet to send in base64 format
- pcap file format: file containing pcap data

Only physical interface types can be used as the ingress interface for injected packets.

5.1.1 Configuring the packet-trace tool (using Scapy file format)

Procedure

Use this command to report the forwarding behavior for a specified test packet (file format) that contains a packet formatted in Scapy packet definition form:

tools system packet-trace file *<input file in Scapy format>* **interface** *<interface name>*

Packet trace command parameters for specifying an input file are described in Table 4: Packet trace command parameters using an input file.

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Table 4: Packet trace command parameters using an input file

Command/parameter	Description
tools system packet-trace	Reports the forwarding behavior for a specified test packet (file format)
file *<file name>*	File containing the packet format in Scapy packet definition form. The format of the packet definition should match that of the Linux utility Scapy.
interface *<interface name>*	The name of the configured interface to inject the probe packet

Example: Scapy input file

```
# bash cat /tmp/p1.txt
Ether(dst="00:00:5E:00:53:D2",src="00:00:5E:00:53:41")/Dot1Q(vlan=100)/
IP(dst="10.1.5.1",src="192.0.2.1")/UDP(sport=6722,dport=6789)/"Hi"/
Raw(RandString(size=512))
```

Example: command

```
# tools system packet-trace file /tmp/p1.txt interface ethernet-1/1
```

Example: output (bridged)

```
Ether(dst="00:00:5E:00:53:D2",src="00:00:5E:00:53:41")/Dot1Q(vlan=100)/IP(dst=
"10.1.5.1",src="192.35.1.1")/UDP(sport=6722,dport=6789)/"Hi"/Raw(RandString(size=512))
Generated packet:
###[ Ethernet ]###
    dst       = 00:00:5e:00:53:d2
    src       = 00:00:5e:00:53:41
    type      = VLAN
###[ 802.1Q ]###
    prio      = 0
    id        = 0
    vlan      = 100
    type      = IPv4
###[ IP ]###
    version   = 4
    ihl       = 5
    tos       = 0x0
    len       = 542
    id        = 1
    flags     =
    frag      = 0
    ttl       = 64
    proto     = udp
    chksum    = 0x4ea8
    src       = 192.0.2.1
    dst       = 10.1.5.1
    \options   \
###[ UDP ]###
    sport     = 6722
    dport     = smc_https
    len       = 522
```


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```
    chksum    = 0x251e
###[ Raw ]###
    load      = 'Hi9cmfMxg4lBV6iXRKbe3t2dUJyiGZb7s2GcTQ8YQ0A2PYnF8ntm45l
GqCezZ6ncYF4ijsc7hqjxSUjIJdq4YhhRrNSnyUsHkhehhSif
TpT1EEiQNOzNLWgF6DPdcQ078REyyjnI9hqzTNAk0XhgOmLtg55rkufD8nyOotgBgnz2mpQ0igLSEtYe84VDfdi
Cs5lWTvhGTYCClxsCYmXEozmSsWqBagdwHe1Ia0voCZ3deUUL6B7paAOb8ua5bZa44G7Z7LneJZ0YxH2Vjb
SqmeukaxyMrkg7NUIxs3aVIwD2jPqra3CBaxokvarX5TyIzNuK2qYeAwnjdzBZo2iZTonXom
JjoDWB2cqG61iEGPLNg5juC7PTa9fglirYgEI2T9rTm8gpTjG6ZgN90g3w0xOxBgwYsNfuXMqp7u9wR8fvfNa4Mm
ZseCC6UUKneSKK0zDyxyHgtSEKwHQgQA0HOh6wZttNQRFzST4YB0cFM1tTeo6mCgwAplYX8THGImjvis'
/system/packet-trace-base64:
================================================================================
Ingress information for Packet 3 Ingress Interface ethernet-1/1
================================================================================
Type                : Bridged
Interface           : ethernet-1/1 (4401020001)
Net Instance        : macvrf1
================================================================================
================================================================================
Egress information for Packet 3
================================================================================
Interface           : Flooded in macvrf1
Egress Net Instance : macvrf1
================= (routed)======================================================
```

Example: output (routed)

```
smac='00:00:5E:00:53:D2'
dmac= '00:00:5E:00:53:41'
Ether(src=smac,dst=dmac)/IP(src='192.0.2.1',dst='10.1.5.1')/ICMP()

Generated packet:
###[ Ethernet ]###
dst = 00:00:5e:00:53:41
src = 00:00:5e:00:53:d2
type = IPv4
###[ IP ]###
    version = 4
    ihl = 5
    tos = 0x0
    len = 28
    id = 1
    flags =
    frag = 0
    ttl = 64
    proto = icmp
    chksum = 0x7edc
    src = 192.0.2.1
    dst = 10.1.5.1
    \options \
###[ ICMP ]###
    type = echo-request
    code = 0
    chksum = 0xf7ff
    id = 0x0
    seq = 0x0
/system/packet-trace-base64:

================================================================================
Ingress information for Packet 1 Ingress Interface ethernet-4/29
================================================================================
Type                : Routed
Interface           : lag5 (14000000005)
Sub interface       : lag5.1
```


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```
Net Instance        : red
Out Interface       : ethernet-4/22
Nexthop ip          : 192.0.52.1
===============================================================================
===============================================================================
Egress information for Packet 1 Egress Interface ethernet-4/22
===============================================================================
Interface           : ethernet-4/22 (4404020016)
Sub interface       : ethernet-4/22.1
Mac Address         : 00:01:03:FF:00:08
===============================================================================
```

5.1.2 Configuring the packet-trace tool (using base64 format)

Procedure

Use this command to report the forwarding behavior for a specified test packet using packets specified in base64 format:

 # tools system packet-trace-base64 interface *<interface name>* **packet** *<value>*

Packet trace command parameters for specifying base64 format are described in Table 5: Packet trace command parameters using base64 string format.

Table 5: Packet trace command parameters using base64 string format

Command/parameter	Description
tools system packet-trace-base64	Reports the forwarding behavior for a specified test packet (packet specified in base64 format)
interface *<interface name>*	The name of the configured interface to inject the probe packet
packet *<value>*	Packet format in base64 string format

Example: command (for routed)

```
# tools system packet-trace-base64 interface ethernet-1/1 packet
"RQAAOgABAABABnS4AQEBAQICAgIAFABQAAAAAAAAAABQAiAAqscAAEdFVCAvIEhUVFAvMS4wDQoNCg=="
```

Example: output (routed)

```
tools system packet-trace-base64 interface ethernet-1/3 packet
"MjBFMDlDNzlCQUUzMDAwMTA3RkYwMDAwMDgwMDQ1MDAwMDJFMDAwMDAwMDA0MDExNTA3REMwMz
kwMTA3NjQwMTA1MDExQTQyMUE4NTAwMUE1ODVGMDAwMTAyMDMwNDA1MDYwNzA4MDkwQTBCMEMwRDBFMEYxMD
ExM0VGMjA5OTM="
/system/packet-trace-base64:
===============================================================================
Ingress information for Packet 77 Ingress Interface ethernet-1/2
===============================================================================
Type          : Routed
Interface     : ethernet-1/2 (4401020002)
Sub interface : ethernet-1/2.1
Instance id   : 1
Out Interface : ethernet-1/1
```


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```
Nexthop ip    : 10.1.5.1
===============================================================================
===============================================================================
Egress information for Packet 77 Egress Interface ethernet-1/1
===============================================================================
Interface : ethernet-1/1 (4401020001)
Sub interface : ethernet-1/1.1
Mac Address : 00:00:5e:00:53:41
===============================================================================
```

Example: command (for bridged)

```
tools system packet-trace-base64 packet UODvOurSAAED/wBBgQAAZAgARQACHgAB
AABAEU6owCMBAWQBBQEaQhqFAgpUvkhpQzVDODlhcUttaDVsRHNWRnk4WDRpYXRQbW81UllWenFweE9p
NEJNeXpPQWo5UktOVTRGNkFwTENhNVljNlFVMHViRTY2UUJzUkh5TWh0SHhQUTZOaFFTRk5LeXFKNGVn
VVZINDJlOFdBSmt1NlFZeHFicFRmZjEwdHVWdENwcENNMmQ5R1RCeHpseUY3aDZrQjBLMHRXNkF1a2Y0
QllNS3Jld2M5aUVGNGRUc1pPbEs0WVFEdkpxRjFOQ1BMMktXNjlnS212bXJmbTlZT2tHWE01MG9haTdp
R2l0amNzRHdkV3VBZEJ4OHJvek5tbnVQc2FCYVdPeVBWUjJBT0hVa1BrOW1mcldwYTFDVXVOcU8xZzJk
RVExRXhBNFhaYUlnNlJLZjJvc2swMVJZektac0dKZEFUVnBaSkQzM2tnY2c4UDJnM0dYZFYzZnp4VTNH
bEtEQzhRUUlzQTJVYUJOODM4TWNiNmw3MUdZdGNuZlNDdGZFYlB0TU9OS2xSejlhYWZHb3JaQzVMNFdw
TjZXRDVzZWlKelZtYWdrWUM2VThYY2dKWGpDSXJpR01lQjlobnY4RmFjNklDZnpROHFiZE5iZ21TTG9M
N0l0Tk4xZ1NmQ2JkeUE0RVFabHBGYlFEeVFFYUFJZUUycG9lbWRPU2x4a0FWYzBQU3kzZExEYWE=int
erface ethernet-1/1
```

Example: output (bridged)

```
A:rifa# tools system packet-trace-base64 packet UODvOurSAAED/wBBgQAAZAgARQACHgAB
AABAEU6owCMBAWQBBQEaQhqFAgpUvkhpQzVDODlhcUttaDVsRHNWRnk4WDRpYXRQbW81UllWenFweE9p
NEJNeXpPQWo5UktOVTRGNkFwTENhNVljNlFVMHViRTY2UUJzUkh5TWh0SHhQUTZOaFFTRk5LeXFKNGVn
VVZINDJlOFdBSmt1NlFZeHFicFRmZjEwdHVWdENwcENNMmQ5R1RCeHpseUY3aDZrQjBLMHRXNkF1a2Y0
QllNS3Jld2M5aUVGNGRUc1pPbEs0WVFEdkpxRjFOQ1BMMktXNjlnS212bXJmbTlZT2tHWE01MG9haTdp
R2l0amNzRHdkV3VBZEJ4OHJvek5tbnVQc2FCYVdPeVBWUjJBT0hVa1BrOW1mcldwYTFDVXVOcU8xZzJk
RVExRXhBNFhaYUlnNlJLZjJvc2swMVJZektac0dKZEFUVnBaSkQzM2tnY2c4UDJnM0dYZFYzZnp4VTNH
bEtEQzhRUUlzQTJVYUJOODM4TWNiNmw3MUdZdGNuZlNDdGZFYlB0TU9OS2xSejlhYWZHb3JaQzVMNFdw
TjZXRDVzZWlKelZtYWdrWUM2VThYY2dKWGpDSXJpR01lQjlobnY4RmFjNklDZnpROHFiZE5iZ21TTG9M
N0l0Tk4xZ1NmQ2JkeUE0RVFabHBGYlFEeVFFYUFJZUUycG9lbWRPU2x4a0FWYzBQU3kzZExEYWE= int
erface ethernet-1/1
/system/packet-trace-base64:
===============================================================================
Ingress information for Packet 4 Ingress Interface ethernet-1/1
===============================================================================
Type                : Bridged
Interface           : ethernet-1/1 (4401020001)
Net Instance        : macvrf1
===============================================================================
===============================================================================
Egress information for Packet 4
===============================================================================
Interface           : Flooded in macvrf1
Egress Net Instance : macvrf1
===============================================================================
```

5.1.3 Configuring the packet-trace tool (using pcap format)

Procedure

Use the following command to report the forwarding behavior for a specified test packet using packets specified in pcap format:

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 # tools system packet-trace pcap-file *<file name>* **[interface** *<interface name>***] [max-packet-count** *<value>***] [packet-number** *<value>***]**

Packet trace command parameters for specifying pcap format are described in Table 6: Packet trace command parameters using pcap format.

Table 6: Packet trace command parameters using pcap format

Command/parameter	Description
tools system packet-trace	Reports the forwarding behavior for a specified test packet (file format)
pcap-file *<file name>*	Input file in pcap format
interface *<interface name>*	The name of the configured interface to inject the probe packet
max-packet-count *<value>*	Number of packets to read from the file (default: 100)
packet-number *<value>*	Use packet with the specified packet number from the pcap file

Example: packet-trace command using pcap format

```
# tools system packet-trace pcap-file data.pcap max-packet-count 1 packet-number 1
 interface ethernet-1/2
```

Example: output of packet trace in pcap format

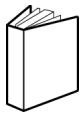
```
+-------------------------------------------------------------------------------+
| Number     Time     Ingress   Source    Destina   Protoco   Length    Info   |
|                      port               tion        l                        |
+===============================================================================+
| 1       0.046971   etherne   192.1.7.1   10.1.5.1   UDP       2545   6722    |
|                                                                      \u2192  |
|                     t-1/2.1   1         8                              6789 Le |
|                                                                      n=2454  |
Enter packet number (default: [1]): 1
###[ Ethernet ]###
    dst       = 00:00:5e:00:53:41
    src       = 00:00:5e:00:53:d2
    type      = IPv4
###[ IP ]###
    version   = 4
    ihl       = 5
    tos       = 0x0
    len       = 2482
    id        = 0
    flags     =
    frag      = 0
    ttl       = 64
    proto     = udp
    chksum    = 0xd09
    src       = 192.0.2.1
    dst       = 10.1.5.1
    \options   \
```


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```
###[ UDP ]###
    sport     = 6722
    dport     = smc_https
    len       = 2462
    chksum    = 0xcd6b
###[ Raw ]###
    load      =
'\x00\x01\x02\x03\x04\x05\x06\x07\x08\t\n\x0b\x0c\r\x0e\x0f\x10\x11\x12\x13\x14\
x15\x16\x17\x18\x19\x1a\x1b\x1c\x1d\x1e\x1f
!"#$%&\'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\\]^_
`abcdefghijklmnopqrstuvwxyz{|}~\x7f\x80\x81\x82\x83\x84\x85\x86\x8
7\x88\x89\x8a\x8b\x8c\x8d\x8e\x8f\x90\x91\x92\x93\x94\x95\x96\x97\x98\x99\
x9a\x9b\x9c\x9d\x9e\x9f\xa0\....'
/system/packet-trace-base64:
    ================================================================================
    Ingress information for Packet 10 Ingress Interface ethernet-1/2
    ================================================================================
    Type                : Routed
    Interface           : ethernet-1/2 (4401020002)
    Sub interface       : ethernet-1/2.1
    Instance id         : 1
    Out Interface       : ethernet-1/1
    Nexthop ip          : 192.0.2.54
    ================================================================================
    ================================================================================
    Egress information for Packet 10 Egress Interface ethernet-1/1
    ================================================================================
    Interface           : ethernet-1/1 (4401020001)
    Sub interface       : ethernet-1/1.8
    Mac Address         : 00:00:5e:00:53:41
```


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