Nokia Service Router Linux

Release 23.3

Troubleshooting Toolkit

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Nokia is committed to diversity and inclusion. We are continuously reviewing our customer documentation and consulting with standards bodies to ensure that terminology is inclusive and aligned with the industry. Our future customer documentation will be updated accordingly.

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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 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

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.
- An open right angle bracket indicates a progression of menu choices or simple command sequence (often selected from a user interface).

  Example: **start** > **connect to**

- A vertical bar (|) indicates a mutually exclusive argument.
- Square brackets ([ ]) indicate optional elements.
- 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.

Generic IP addresses are used in examples. Replace these with the appropriate IP addresses used in the system.

2 What's new

Topic	Location
Update for 7220 IXR-D4 inclusion	Mirroring

3 sFlow

sFlow is used to monitor data traffic flows traversing different points in a network. The sFlow functionality uses an sFlow agent and an sFlow collector. The agent is software that runs on a network element and samples and reports flow headers and statistics. The collector is software that typically runs on a remote server and receives the flow headers and statistics from one or more sFlow agents.

Sampling and reporting is accomplished as the sFlow agent running on a network element takes periodic samples of ingress traffic and reports the data to one or more collectors. The network element does not need to maintain a local flow cache. Instead, the sampled header information is immediately sent to the collector without additional processing.

The SR Linux supports sFlow version 5 behavior and formats. On 7250 IXR chassis-based systems, sFlow is implemented in hardware. On 7220 IXR-D2, D3, and IXR-H systems, sFlow functionality is implemented in software. sFlow behavior is identical on both platforms.

Note: sFlow is not supported on 7220 IXR-D4/D5 systems.

3.1 sFlow sampling

sFlow works by sampling flow data and reporting the samples to the configured sFlow collectors. Based on the configured system sampling rate, the forwarding plane samples ingress packet flows and sends the sampled headers to the sFlow agent in the control plane.

All ingress packets are subject to sampling. Each sample includes the top 256 bytes of the sampled packet, starting at the outer Ethernet header. The sampled packets are sent to the configured sFlow collectors with the sampled data in sFlow raw packet data format.

For sampled IPv4 packets, the IPv4 header data fields are sent with the raw data. For sampled IPv6 packets, the IPv6 header data fields are sent with the raw data.

3.2 sFlow collector reporting

sFlow reports sampled headers and statistics to the configured collectors using IP/UDP datagrams. UDP port 6343 is the default destination port, but you can optionally configure a different port. Sampled packets are sent as soon as the samples are taken, and interface statistics are sent based on the configured poll-interval (default 20 seconds). SR Linux supports up to 8 remote sFlow collectors. Each collector can only have one IPv4 address. The flow and counter samples are aggregated in a sflow datagram packet in software implementation.

3.3 sFlow counter samples

Another aspect of the sFlow agent is streaming of interface statistics to configured sFlow collectors. Statistics are only sent to a collector if sFlow has been enabled on an interface. Interface statistics are sent based on a default poll-interval of 20 seconds with a separate timer for each interface. When the interval expires. the current value of each associated statistics are sent to the configured collectors.

The interface counter sample contains:

- Interface index
- Interface type
- Interface speed
- Oper and admin status
- Input octets
- Input packets
- Input broadcast packets
- Input discards packets
- Output errors
- Output octets
- Output packets
- Output broadcast packets
- Output discards packets

3.4 Configuring the sFlow agent

Procedure

To configure the sFlow agent on the system, you enable sFlow, and optionally configure the sampling rate (by default, 1 out of every 10,000 packets) and sample size (by default, 256 bytes are sampled from each packet).

Example: Configuring the sFlow agent

The following example enables sFlow on the system and configures the system sampling rate and sample size. Note that the sample size and polling interval are not configurable. The following default sample size applies:

- 7220 IXR-D2, D3, and 7220 IXR-H systems: 256 bytes
- 7250 IXR 6/10: 220 bytes

```
--{ * candidate shared }--[  ]--
    system {
        sflow {
            admin-state enable
            }
        }
    }
```

3.5 Configuring sFlow collectors

Procedure

The sFlow agent sends sampled packets to sFlow collectors. You can configure up to 8 sFlow collectors to receive the data. To configure an sFlow collector, you specify its IP address, associated network instance, and IP address to be used as the source IP address in sFlow packets sent from the SR Linux to the collector. You can optionally specify a destination port (by default, this is UDP port 6343).

Note:
Configuring a network-instance is mandatory. Also, a collector cannot be reached using the **mgmt** network-instance.

Example: Configuring sFlow collectors

The following example configures two sFlow collectors. The IP address for each collector is configured, as well as its network instance and source IP address. Each collector receives all samples.

```
--{ * candidate shared }--[  ]--
    system {
        sflow {
            collector 1 {
                collector-address 1.3.4.4
                source-address 2.2.2.2
                network-instance default
            collector 2 {
                collector-address 2.3.4.4
                source-address 2.3.2.2
                network-instance default
                port 4310
                }
            }
        }
    }
```

3.6 Configuring sFlow for an interface

Procedure

When sFlow is configured for an interface, the ingress packets are taken for sampling according to the sample-rate.

Example: Configuring sFlow for an interface

The following example enables sFlow on an interface.

```
--{ * candidate shared }--[  ]--
    interface ethernet-1/1 {
        sflow {
            admin-state enable
        }
    }
```

3.7 Displaying the state of the sFlow agent

Procedure

To display the system-wide state of the sFlow agent, including any sFlow parameters, collector configuration, and general statistics, use the **info from state** command in candidate or running mode, or the **info** command in state mode.

Example: Info from state command

```
# info from state system sflow
    system {
        sflow {
            admin-state enable
            sample-rate 1000
            sample-size 256
            collector 1 {
                collector-address 10.1.1.24
                network-instance default
                source-address 5.5.5.5
                port 6343
                next-hop 172.24.71.65
            }
            statistics {
                total-samples-taken 5457
                total-sent-packets 26800
            }
        }
    }
```

3.8 Displaying the status of the sFlow agent

Procedure

Use the **show system sflow status** command in show mode to display the general status of the sFlow agent:

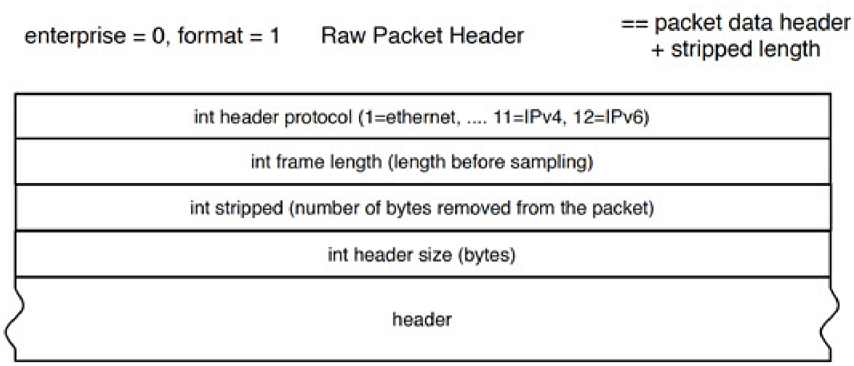
Example: Show system sflow status command

```
--{ running }--[  ]--
# enter show
# show system sflow status
-------------------------------------
Admin State            : enable
Sample Rate            : 10000
Sample Size            : 256
Total Samples          : 0
Total Collector Packets: 3269158
-------------------------------------
  collector-id     : 8
  collector-address: 172.10.10.10
  network-instance : default
  source-address   : 10.0.0.1
  port             : 6343
  next-hop         : 18.7.8.1
-------------------------------------
```

3.9 sFlow formats

Figure 1: Raw packet header shows an example of a raw packet header for an sFlow format.

Figure 1: Raw packet header



3.10 Sampled data and counter examples

The following is an example of sample data:

Example: Flow sample data

```
InMon sFlow
    Datagram version: 5
    Agent address type: IPv4 (1)
    Agent address: 0.0.0.0
    Sub-agent ID: 2
    Sequence number: 0
    SysUptime: 0
    NumSamples: 1
    Flow sample, seq 0
        0000 0000 0000 0000 0000 .... .... .... = Enterprise: standard sFlow (0)
        .... .... .... .... .... 0000 0000 0001 = sFlow sample type: Flow sample (1)
        Sample length (byte): 141
        Sequence number: 0
        0000 0000 .... .... .... .... .... .... = Source ID class: 0
        .... .... 0000 0000 0000 0000 0011 0110 = Index: 54
        Sampling rate: 1 out of 5 packets
        Sample pool: 0 total packets
        Dropped packets: 0
        Input interface (ifIndex): 54
        .000 0000 0000 0000 0000 0000 0011 0110 = Output interface (ifIndex): 54
        Flow record: 1
        Raw packet header
            0000 0000 0000 0000 0000 .... .... .... = Enterprise: standard sFlow (0)
            Format: Raw packet header (1)
            Flow data length (byte): 101
            Header protocol: Ethernet (1)
            Frame Length: 98
```

```
                Payload removed: 0
                Original packet length: 85
                Header of sampled packet:
                  000c0002000000000011111108004500005200000000004006...
                    Ethernet II, Src: 00:00:00_11:11:11 (00:00:00:11:11:11),
                        Dst: BebIndus_02:00:00 (00:0c:00:02:00:00)
                        Destination: BebIndus_02:00:00 (00:0c:00:02:00:00)
                        Source: 00:00:00_11:11:11 (00:00:00:11:11:11)
                        Type: IPv4 (0x0800)
                    Internet Protocol Version 4, Src: 10.100.1.2, Dst: 10.1.1.2
                        0100 .... = Version: 4
                        .... 0101 = Header Length: 20 bytes (5)
                        Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
                        Total Length: 82
                        Identification: 0x0000 (0)
                        Flags: 0x00
                        Fragment offset: 0
                        Time to live: 64
                        Protocol: TCP (6)
                        Header checksum: 0x35a1 [validation disabled]
                        [Header checksum status: Unverified]
                        Source: 10.100.1.2
                        Destination: 10.1.1.2767689
                        [Source GeoIP: Unknown]
                        [Destination GeoIP: Unknown]
                    Transmission Control Protocol, Src Port: 0, Dst Port: 0, Seq: 0
                    LBT-TCP Protocol
                    LBMC Protocol
                    [Unreassembled Packet: LBT-TCP]
```

The following is a counter sample example:

Example: Counters sample

```
InMon sFlow
    Datagram version: 5
    Agent address: 10.0.0.1 (10.0.0.1)
    Sub-agent ID: 0
    Sequence number: 8
    SysUptime: 6548000
    NumSamples: 1
    Counters sample, seq 1
        Enterprise: standard sFlow (0)
        sFlow sample type: Counters sample (2)
        Sample length (byte): 108
        Sequence number: 1
        Source ID type: 64
        Source ID index: 49150
        Counters records: 1
        Generic interface counters
            Enterprise: standard sFlow (0)
            Format: Generic interface counters (1)
            Flow data length (byte): 88
            Interface index: 1073790974
            Interface Type: 6
            Interface Speed: 25600
            IfDirection: Full-Duplex
            IfAdminStatus: Up
            IfOperStatus: Up
            Input Octets: 0
            Input Packets: 0
            Input Multicast Packets: 0
            Input Broadcast Packets: 0
```

```
            Input Discarded Packets: 0
            Input Errors: 0
            Input Unknown Protocol
Packets: 0
            Output Octets: 0
            Output Packets: 0
            Output Multicast Packets: 0
            Output Broadcast Packets: 0
            Output Discarded Packets: 0
            Output Errors: 0
            Promiscuous Mode: 0
```

4 Interactive traffic-monitoring tool

SR Linux features an interactive traffic-monitoring tool that allows you to capture and monitor traffic based on 5-tuple match criteria. The match criteria is injected into a capture-filter ACL entry that is applied to all subinterfaces; information from matching packets can be displayed on screen or directed to a file.

4.1 Using the interactive traffic-monitoring tool

Procedure

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

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 1: Traffic monitoring command parameters.

Table 1: 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)
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

Command/parameter	Description
verbose	Displays detailed output
output-file *<file-name>*	Directs output to a file
hex-output	Displays output in hex format

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.

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

Example: Capture filter ACL entry

```
acl {
        capture-filter {
            ipv4-filter {
                entry 1 {
                    action {
                        copy {
                        }
                    }
                    match {
                        destination-address 1.1.1.1/32
                        protocol icmp
                        source-address 2.2.2.2/32
                    }
                }
            }
        }
    }
```

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.

4.1.1 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 1.1.1.1/32 and destination address 2.2.2.2/32 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 1.1.1.1/32 source-address 2.2.2.2/32 protocol icmp
```

```
Capturing on 'monit'
1 0.000   ethernet-1/20.1 2.2.2.2 1.1.1.1  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=63
2 1.803   ethernet-1/20.1 2.2.2.2 1.1.1.1  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=63
3 2.895   ethernet-1/20.1 2.2.2.2 1.1.1.1  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=63
4 3.749   ethernet-1/20.1 2.2.2.2 1.1.1.1  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=63
5 4.250   ethernet-1/20.1 2.2.2.2 1.1.1.1  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=63
6 5.759   ethernet-1/20.1 2.2.2.2 1.1.1.1  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=63
7 6.644   ethernet-1/20.1 2.2.2.2 1.1.1.1  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 1.1.1.1/32 source-
address 2.2.2.2/32 protocol icmp'
```

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

```
acl {
        capture-filter {
            ipv4-filter {
                entry 1 {
                    action {
                        copy {
                        }
                    }
                    match {
                        destination-address 1.1.1.1/32
                        protocol icmp
                        source-address 2.2.2.2/32
                    }
                }
            }
        }
    }
```

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

4.1.2 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:

```
# tools system traffic-monitor destination-address 1.1.1.1/32 source-address 2.2.2.2/32 protocol icmp
 verbose
Frame 1: 146 bytes on wire (1168 bits), 146 bytes captured (1168 bits) on interface 0
    Interface id: 0 (monit)
        Interface name: monit
    Encapsulation type: Ethernet (1)
    Arrival Time: Jan  4, 2098 19:53:01.144789891 UTC
    [Time shift for this packet: 0.000000000 seconds]
    Epoch Time: -255263715.144789891 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-1/20.1
    Padding: 000000
Ethernet II, Src: b0:70:0d:d2:a0:bf, Dst: b0:70:0d:d2:78:bf
    Destination: b0:70:0d:d2:78:bf
        Address: b0:70:0d:d2:78:bf
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Source: b0:70:0d:d2:a0:bf
        Address: b0:70:0d:d2:a0:bf
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Type: IPv4 (0x0800)
Internet Protocol Version 4, Src: 20.20.20.20, Dst: 10.10.10.10
    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: 0xa166 (41318)
    Flags: 0x0000
        0... .... .... .... = Reserved bit: Not set
        .0.. .... .... .... = Don't fragment: Not set
        ..0. .... .... .... = More fragments: Not set
    ...0 0000 0000 0000 = Fragment offset: 0
    Time to live: 63
    Protocol: ICMP (1)
    Header checksum: 0x9e07 [validation disabled]
    [Header checksum status: Unverified]
    Source: 2.2.2.2
    Destination: 1.1.1.1
Internet Control Message Protocol
    Type: 0 (Echo (ping) reply)
    Code: 0
    Checksum: 0xd01f [correct]
    [Checksum Status: Good]
    Identifier (BE): 10408 (0x28a8)
    Identifier (LE): 43048 (0xa828)
    Sequence number (BE): 1352 (0x0548)
    Sequence number (LE): 18437 (0x4805)
    Timestamp from icmp data: Jan  4, 2098 19:53:01.000000000 UTC
    [Timestamp from icmp data (relative): 0.144789891 seconds]
    Data (48 bytes)
0000  5a 30 02 00 00 00 00 00 10 11 12 13 14 15 16 17   Z0..............
0010  18 19 1a 1b 1c 1d 1e 1f 20 21 22 23 24 25 26 27   ........ !"#$%&'
0020  28 29 2a 2b 2c 2d 2e 2f 30 31 32 33 34 35 36 37   ()*+,-./01234567
        Data: 5a300200000000001011121314151617181191a1b1c1d1e1f…
        [Length: 48]
```

4.1.3 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 1.1.1.1/32 and destination address 2.2.2.2/32 to a `.pcap` file.

```
# tools system traffic-monitor destination-address 10.10.10.10/32 source-address
 20.20.20.20/32 protocol icmp output-file /home/linuxadmin/ICMP.pcap
Capturing on 'monit'
6 packets captured
Command execution aborted : 'tools system traffic-monitor destination-address 10.10.10.10/
32 source-address 20.20.20.20/32 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
```

4.1.4 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 two capture filter entries: one that matches traffic with source address 1.1.1.1/32 and one that matches traffic with destination address 1.1.1.1/32.

```
acl {
        capture-filter {
            ipv4-filter {
                entry 10 {
                    action {
                        accept {
                        }
                        copy {
                        }
                    }
                    match {
                        source-address 1.1.1.1/32
                    }
                }
                entry 20 {
                    action {
                        accept {
                        }
                        copy {
                        }
                    }
                    match {
```

```
                        destination-address 1.1.1.1/32
                    }
                }
            }
        }
    }
```

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

```
# tools system traffic-monitor
Capturing on 'monit'
1 0.000  ethernet-1/20.1 1.1.1.1 2.2.2.2  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=63
2 1.803  ethernet-1/21.1 2.2.2.2 1.1.1.1  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=63
3 2.895  ethernet-1/20.1 1.1.1.1 2.2.2.2  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=63
4 3.749  ethernet-1/21.1 2.2.2.2 1.1.1.1  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=63
5 4.250  ethernet-1/20.1 1.1.1.1 2.2.2.2  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=63
6 5.759  ethernet-1/21.1 2.2.2.2 1.1.1.1  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=63
7 6.644  ethernet-1/20.1 1.1.1.1 2.2.2.2  ICMP 146 Echo (ping) reply id=0x28a8, seq=119/30464, ttl=63
```

5 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* for details on all switch fabric statistic related commands and descriptions of all parameters.

5.1 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
```

6 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

See the *SR Linux Data Model Reference* for more information about all packet-trace related commands and descriptions of all parameters.

6.1 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.

6.1.1 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 2: Packet trace command parameters using an input file.

Table 2: 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="50:E0:EF:3A:EA:D2",src="00:01:03:FF:00:41")/Dot1Q(vlan=100)/
IP(dst="100.1.5.1",src="192.35.1.1")/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="50:E0:EF:3A:EA:D2",src="00:01:03:FF:00:41")/Dot1Q(vlan=100)/IP(dst=
"100.1.5.1",src="192.35.1.1")/UDP(sport=6722,dport=6789)/"Hi"/Raw(RandString(size=512))
Generated packet:
###[ Ethernet ]###
  dst       = 50:e0:ef:3a:ea:d2
  src       = 00:01:03:ff:00:41
  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       = 192.35.1.1
        dst       = 100.1.5.1
        \options   \
###[ UDP ]###
           sport     = 6722
           dport     = smc_https
           len       = 522
```

```
           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:AA:33:44:55:66'
dmac= '20:E0:9C:7A:DA:E2'
Ether(src=smac,dst=dmac)/IP(src='120.1.7.1',dst='120.1.5.1')/ICMP()

Generated packet:
 ###[ Ethernet ]###
dst = 20:e0:9c:7a:da:e2
src = 00:aa:33:44:55:66
type = IPv4
###[ IP ]###
     version = 4
     ihl = 5
     tos = 0x0
     len = 28
     id = 1
    flags =
    frag = 0
    ttl = 64
    proto = icmp
    chksum = 0x7edc
     src = 120.1.7.1
     dst = 120.1.5.1
     \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
```

```
Net Instance        : red
Out Interface       : ethernet-4/22
Nexthop ip          : 192.35.1.1
================================================================================
================================================================================
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
================================================================================
```

6.1.2 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 3: Packet trace command parameters using base64 string format.

Table 3: 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
```

```
Nexthop ip    : 120.1.5.1
================================================================================
================================================================================
Egress information for Packet 77 Egress Interface ethernet-1/1
================================================================================
Interface : ethernet-1/1 (4401020001)
Sub interface : ethernet-1/1.1
Mac Address : 00:22:33:44:55:66
================================================================================
```

Example: command (for bridged)

```
tools system packet-trace-base64 packet UODvOurSAAED/wBBgQAAZAgARQACHgAB
AABAEU6owCMBAWQBBQEaQhqFAgpUvkhpQzVDODlhcUttaDVsRHNWRnk4WDRpYXRQbW81UllWenFweE9p
NEJNeXpPQWo5UktOVTRGNkFwTENhNVljNlFVMHViRTY2UUJzUkh5TWh0SHQUTZOaFFTRk5LeXFKNGVn
VVZINDJlOFdBSmt1NlFZeHFicFRmZjEwdHVWdENwcENNMmQ5R1RCeHpseUY3aDZrQjBLMHRXNkF1a2Y0
QllNS3Jld2M5aUVGNGRUc1pPbEs0WVFEdkpxRjFOQ1BMMktXNjlnS212bXJmbTlZT2tHWE01MG9haTdp
R2l0amNzRHdkV3VBZEJ4OHJvek5tbnVQc2FCYVdPeVBWUjJBT0hVa1BrOW1mcldwYTFDVXVOcU8xZzJk
RVExRXhBNFhaYUlnNlJLZjJvc2swMVJZektac0dKZEFUVnBaSkQzM2tnY2c4UDJnM0dYZFYzZnp4VTNH
bEtEQzhRUUlzQTJVYUJOODM4TWNiNmw3MUdZdGNuZlNDdGZYYlB0TU9OS2xSejlhYWZHb3JaQzVMMNFdw
TjZXRDVzZWlKelZtYWdrWUM2VThYY2dKWGpDSXpR01lQjlobnY4RmFjNklDZnpROHFiZE5iZ21TTG9M
N0l0Tk4xZ1NmQ2JkeUE0RVFabHBGYlFEeVFFYUFJZUUycG9lbWRPU2x4a0FWYzBQU3kzZExEYWE=int
erface ethernet-1/1
```

Example: output (bridged)

```
A:rifa# tools system packet-trace-base64 packet UODvOurSAAED/wBBgQAAZAgARQACHgAB
AABAEU6owCMBAWQBBQEaQhqFAgpUvkhpQzVDODlhcUttaDVsRHNWRnk4WDRpYXRQbW81UllWenFweE9p
NEJNeXpPQWo5UktOVTRGNkFwTENhNVljNlFVMHViRTY2UUJzUkh5TWh0SHQUTZOaFFTRk5LeXFKNGVn
VVZINDJlOFdBSmt1NlFZeHFicFRmZjEwdHVWdENwcENNMmQ5R1RCeHpseUY3aDZrQjBLMHRXNkF1a2Y0
QllNS3Jld2M5aUVGNGRUc1pPbEs0WVFEdkpxRjFOQ1BMMktXNjlnS212bXJmbTlZT2tHWE01MG9haTdp
R2l0amNzRHdkV3VBZEJ4OHJvek5tbnVQc2FCYVdPeVBWUjJBT0hVa1BrOW1mcldwYTFDVXVOcU8xZzJk
RVExRXhBNFhaYUlnNlJLZjJvc2swMVJZektac0dKZEFUVnBaSkQzM2tnY2c4UDJnM0dYZFYzZnp4VTNH
bEtEQzhRUUlzQTJVYUJOODM4TWNiNmw3MUdZdGNuZlNDdGZYYlB0TU9OS2xSejlhYWZHb3JaQzVMMNFdw
TjZXRDVzZWlKelZtYWdrWUM2VThYY2dKWGpDSXpR01lQjlobnY4RmFjNklDZnpROHFiZE5iZ21TTG9M
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
================================================================================
```

6.1.3 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:

\# **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 4: Packet trace command parameters using pcap format.

Table 4: 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    90.1.7.   2.1.1.4   UDP       2545     6722     |
|                                                                       \u2192  |
|                    t-1/2.1    1         8                             6789 Le |
|                                                                       n=2454  |
Enter packet number (default: [1]): 1
###[ Ethernet ]###
  dst       = 20:e0:9c:7a:da:e2
  src       = 00:aa:33:44:55:66
  type      = IPv4
###[ IP ]###
     version   = 4
     ihl       = 5
     tos       = 0x0
     len       = 2482
     id        = 0
     flags     =
     frag      = 0
     ttl       = 64
     proto     = udp
     chksum    = 0xd09
     src       = 90.1.7.1
     dst       = 2.1.1.48
     \options   \
```

```
###[ 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          : 117.1.5.1
    ================================================================================
    ================================================================================
    Egress information for Packet 10 Egress Interface ethernet-1/1
    ================================================================================
    Interface           : ethernet-1/1 (4401020001)
    Sub interface       : ethernet-1/1.8
    Mac Address         : 00:22:33:44:55:6D
```

7 Mirroring

Mirroring copies IPv4 and IPv6 packets seen on a specified source, such as an interface (port) or subinterface (VLAN), or matching an ACL entry, and sends the packets to a specific destination, such as a locally attached traffic analyzer or a tunnel toward a remote destination.

By default, the mirrored packets include IPv4/IPv6 headers, as well as Ethernet headers. Traffic from multiple sources can be mirrored to a single destination, although traffic from a specific source cannot be mirrored to multiple destinations.

7.1 Mirror sources

The source for mirrored traffic can be an interface or subinterface or an ACL filter.

- Interfaces / subinterfaces

  A mirror source can be an interface, including all subinterfaces within that interface. The source can be a single interface (for example, `interface ethernet-1/1`) or a LAG (for example, `interface lag1`). Either a LAG member or LAG port can be mirrored. When a LAG port is configured as a mirror source, mirroring is enabled on all ports making up the LAG.

  The source can be a specific VLAN; that is, a subinterface within an interface where VLAN tagging is enabled (for example, `interface ethernet-1/1.1` or `lag1.1`).

  You can configure mirroring for traffic in a specific direction (ingress only, egress only) or bidirectional traffic (both ingress and egress).

- ACL filters

  A mirror source can be an IPv4 or IPv6 ACL filter, applied under one or more subinterfaces. Traffic matching entries in the ingress ACL filter (regardless of whether the action is accept or drop), can be mirrored to the destination.

The following defines the hardware type supported for each source.

Table 5: Hardware applicability (source mirroring)

Source	7220 IXR-D2/ D3	7220 IXR-D2L/ D3L	7220 IXR-D4/ D5	7250 IXR-6e/ 10e
Interface (ingress)	Yes	Yes	Yes	No
Interface (egress)	Yes	Yes	Yes	No
Subinterface (ingress)	Yes	Yes	Yes	No
Subinterface (egress)	Yes	Yes	No	No
ACL filter (ingress)	Yes	Yes	Yes	Yes
ACL filter (egress)	No	No	No	No

7.2 Mirror destinations

Traffic from the mirror source can be copied to a local destination (local mirroring) or encapsulated into a tunnel to a remote destination (remote mirroring).

The following destination limits apply. For each direction of mirroring, one MTP is consumed. For a session configured to mirror in both direction (ingress-egress), this means that two MTPs are consumed.

Table 6: Destination limits (hardware)

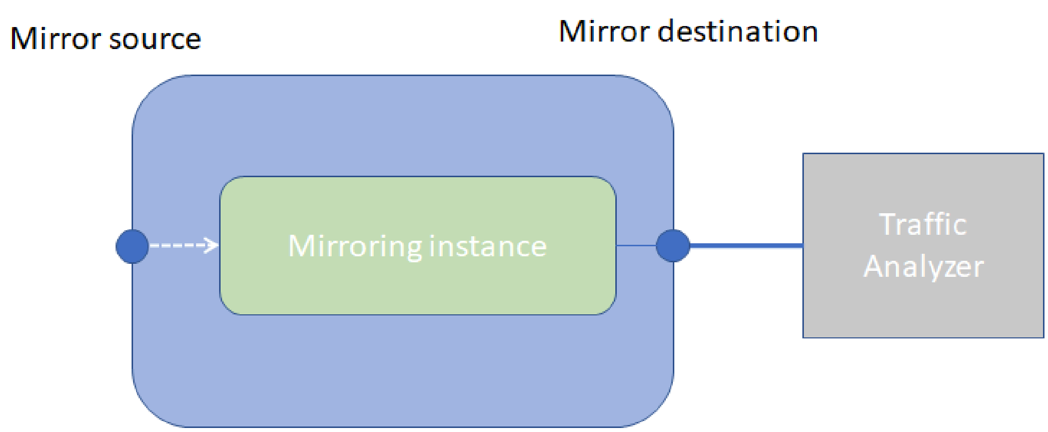
Hardware	Limit (MTP)
7220 IXR-D2/D2L/D3/D3L	4
7220 IXR-D4/D5	8 for interface sources 4 for ACL sources
7250 XR-6e/10e	8

Local mirroring

In a local mirroring configuration, both the mirror source and mirror destination reside on the same SR Linux node, as shown in Figure 2: Local mirroring.

In this configuration, the local destination is a Switched Port Analyzer (SPAN).

Figure 2: Local mirroring



For local mirroring, the following hardware types are supported: 7220 IXR-D2/D2L/D3/D3L/D4/D5.

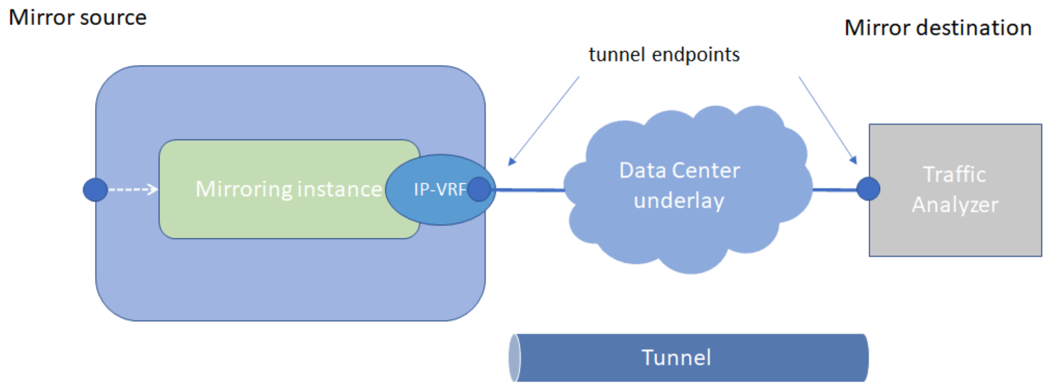
Remote mirroring

In a remote mirroring configuration, the mirror source and mirror destination are on different nodes. The mirror source resides on the SR Linux node, and the mirrored packets are encapsulated into a tunnel toward the mirror destination.

Figure 3: Remote mirroring shows a remote mirroring configuration. In this configuration, the remote destination is an Encapsulated Remote Switched Port Analyzer (ERSPAN).

Tunnel end points are defined within a specific network-instance, where the local tunnel endpoint IP address can be either a loopback subinterface address or any subinterface address within that network-instance.

Figure 3: Remote mirroring

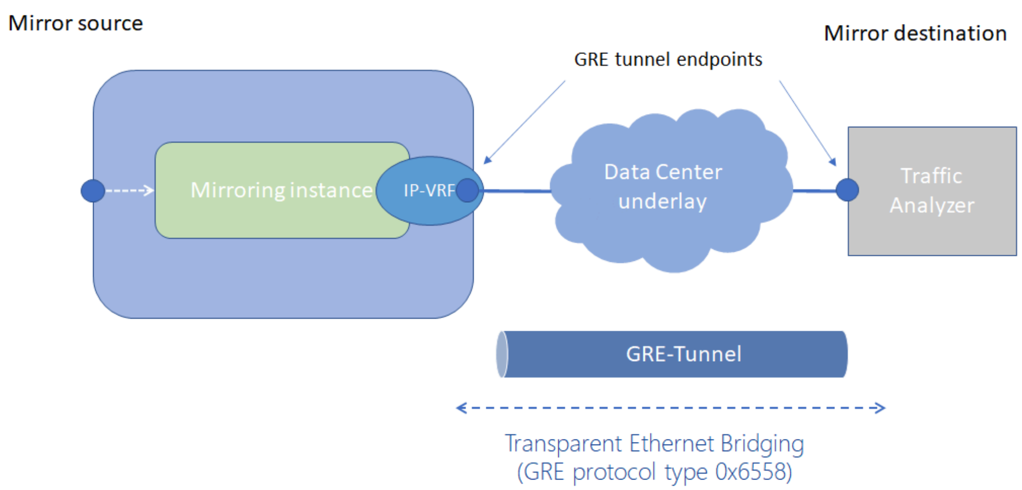


Mirroring to underlay (ERSPAN+GRE)

In a mirroring to underlay (ERSPAN+GRE) configuration, the mirrored packets, including IPv4/IPv6 header as well as Ethernet header, are tunneled using Transparent Ethernet Bridging (GRE protocol type 0x6558) or L2oGRE toward the remote destination.

Figure 4: Mirroring to underlay shows a mirroring to underlay configuration.

Figure 4: Mirroring to underlay



For remote mirroring, the following hardware types are supported.

Table 7: Hardware applicability (destination mirroring - remote)

Destination	7220 IXR-D2/ D3	7220 IXR-D2L/ D3L	7220 IXR-D4/ D5	7250 IXR-6e/ 10e
Underlay destination (GRE +ERSPAN) - IPv4 (ingress and egress	Yes	Yes	Yes	Yes
Underlay destination (GRE +ERSPAN) - IPv6 (ingress-direction mirroring)	Yes	Yes	Yes	Yes
Underlay destination (GRE +ERSPAN) - IPv6 (egress-direction mirroring)	No	No	Yes	Yes

7.3 Configuring mirroring

To configure mirroring, you configure a mirroring-instance, which specifies the source and destination for the mirrored traffic. Multiple mirror sources can have a single destination, although traffic from a specific source cannot be mirrored to multiple destinations. Only one mirror destination can be configured per mirroring-instance. A mirror destination cannot be reused in multiple mirroring instances.

Within a mirroring-instance, if an interface is configured as mirror source, a subinterface within that interface cannot be added as another mirror source. If a LAG is defined as mirror destination, only the first 8 members of the LAG carry mirrored traffic. Note that on 7220 IXR-D4 and D5 platforms, a mirror destination port cannot be a LAG.

Mirrored traffic is considered Best Effort (BE) Forwarding Class.

7.3.1 Configuring mirroring sources

Procedure

To configure mirroring, you specify the source and destination for mirrored traffic within a mirroring-instance. The source in a mirroring-instance can be traffic on a specified interface, subinterface, or LAG, or can be packets matching an ACL entry.

Example: interface source

The following example shows a mirroring-instance configuration with an interface as the source for mirrored traffic:

```
--{ * candidate shared default }--[  ]--
# info system mirroring
    system {
        mirroring {
            mirroring-instance 1 {
                admin-state enable
                mirror-source {
                    interface ethernet-1/5 {
                        direction ingress-egress
```

```
                }
            }
        }
    }
}
```

Example: ACL source

The following example configures an ACL with an entry that matches TCP packets and applies the ACL to a subinterface. A mirroring-instance is configured that uses packets matching the ACL as the source for mirrored traffic.

```
--{ +* candidate shared default }--[  ]--
# info acl ipv4-filter ip_tcp
    acl {
        ipv4-filter ip_tcp {
            entry 1000 {
                description Match_TCP_Protocol
                action {
                    accept {
                    }
                }
                match {
                    protocol tcp
                }
            }
        }
    }
```

```
--{ * candidate shared default }--[  ]--
# info interface ethernet-1/1 subinterface 1 acl
    interface ethernet-1/1 {
        subinterface 1 {
            acl {
                input {
                    ipv4-filter ip_tcp
                }
            }
        }
    }
```

```
--{ * candidate shared default }--[  ]--
# info system mirroring
    system {
        mirroring {
            mirroring-instance 1 {
                admin-state enable
                mirror-source {
                    acl ip_tcp {
                        entry 1000
                    }
                }
            }
        }
    }
```

7.3.2 Configuring mirroring destinations

Procedure

In a mirroring-instance, you specify the destination for the mirrored traffic. The mirroring destination can be a local destination residing on the same SR Linux node as the mirroring source, or a remote destination where the mirrored traffic is sent via a tunnel. The tunneled traffic can be encapsulated with GRE protocol type 0x6558 or 0x88BE (7250 IXR-6e/10e platforms only).

.

Example: Local destination

The following enables a subinterface to be a local mirror destination:

```
--{ * candidate shared default }--[  ]--
# info from running interface ethernet-1/4 subinterface 1
    interface ethernet-1/4 {
        subinterface 1 {
            type local-mirror-dest
            admin-state enable
            vlan {
                encap {
                    single-tagged {
                        vlan-id 1127
                    }
                }
            }
            local-mirror-destination {
                admin-state enable
            }
        }
    }
```

The following configures a mirroring-instance where traffic from the mirror source is mirrored to the subinterface enabled as a local mirror destination:

```
--{ * candidate shared default }--[  ]--
# info system mirroring
    system {
        mirroring {
            mirroring-instance 1 {
                admin-state enable
                mirror-source {
                    interface ethernet-2/1 {
                        direction ingress-egress
                    }
                }
                mirror-destination {
                    local ethernet-1/4.1
                }
            }
        }
    }
```

Example: Remote destination using underlay

The following example configures a mirroring-instance that specifies the mirrored traffic be encapsulated into a tunnel within a network-instance. The mirrored traffic is encapsulated into a tunnel using L2oGRE to the remote destination.

```
--{ * candidate shared default }--[  ]--
# info system mirroring
    system {
        mirroring {
            mirroring-instance 1 {
                admin-state enable
                mirror-source {
                    interface ethernet-2/1 {
                        direction ingress-egress
                    }
                }
                mirror-destination {
                    remote {
                        encap l2ogre
                        network-instance IPVRF-1 {
                            tunnel-end-points {
                                src-ipv4 192.168.1.53
                                dst-ipv4 192.168.1.153
                            }
                        }
                    }
                }
            }
        }
    }
```

7.4 Displaying mirroring information

Procedure

Use the **info from state** command to display mirroring configuration information.

Example:

```
--{ * candidate shared default }--[  ]--
# info from state system mirroring mirroring-instance 2
    system {
        mirroring {
            mirroring-instance 2 {
                admin-state enable
                oper-state down
                oper-down-reason local-mirror-subif-down
                mirror-source {
                    interface lag1 {
                        direction ingress-egress
                    }
                }
                mirror-destination {
                    local lag25.1
                }
            }
        }
```

```
    }
```

7.5 Displaying mirroring statistics

Procedure

You can use the **info from state** command to display the outgoing mirrored packets/octets per interface. Mirroring statistics are not supported on the 7220 IXR-D4, D5 and 7250 IXR-6e/10e.

Example

```
--{ * candidate shared default }--[  ]--
# info from state interface ethernet-1/1 statistics | grep mirror
    out-mirror-octets 0
    out-mirror-packets 0
```

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