

Troubleshooting Packet Flow Issues

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Packet Flow Issues

Packets could be dropped for the following reasons:

- Software-switched packets could be dropped because of Control Plane Policing (CoPP).
- Hardware-switched packets could be dropped by the hardware because of a bandwidth limitation.

Beginning with Cisco NX-OS Release 10.3.(1)F, the following CLIs are supported on Cisco Nexus 9300 and 9500 Cloud Scale switches.

- **show hardware internal statistics module-all all**: Displays the statistics of active modules.
- **show hardware internal statistics module <module-no> all**: Displays the statistics of a particular active module from supervisor.

Packets Dropped Because of Rate Limits

Use the **show hardware rate-limit** command to determine if packets are being dropped because of a rate limit.

```
switch(config)# show hardware rate-limit module 1

Units for Config: packets per second
Allowed, Dropped & Total: aggregated since last clear counters

Rate Limiter Class                      Parameters
------------------------------------------------------------
access-list-log                         Config    : 100
                                        Allowed   : 0
                                        Dropped   : 0
                                        Total     : 0
```

Packets Dropped Because of CoPP

Use the **show policy-map interface control-plane** command to determine if packets are being dropped because of CoPP.

```
switch# show policy-map interface control-plane
   class-map copp-system-p-class-exception (match-any)
      match exception ip option
      match exception ip icmp unreachable
      match exception ttl-failure
      match exception ipv6 option
      match exception ipv6 icmp unreachable
      match exception mtu-failure
      set cos 1
      police cir 200 pps , bc 32 packets

      module 27 :
        transmitted 0 packets;
        dropped 0 packets;

      module 28 :
        transmitted 0 packets;
        dropped 0 packets;
```

Monitoring Inband Packet Statistics

Use the **show hardware internal cpu-mac inband counters** command to display inband packet statistics for supervisor modules, fabric modules, and line cards.

```
switch# show hardware internal cpu-mac inband counters
eth2 counters:
eth2      Link encap:Ethernet  HWaddr 00:00:00:01:1b:01
          BROADCAST MULTICAST  MTU:9400  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

eth3 counters:
eth3      Link encap:Ethernet  HWaddr 00:00:00:01:1b:01
          inet6 addr: fe80::200:ff:fe01:1b01/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:9400  Metric:1
          RX packets:425432 errors:0 dropped:0 overruns:0 frame:0
          TX packets:352432 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:253284953 (241.5 MiB)  TX bytes:249647978 (238.0 MiB)

ps-inb counters:
ps-inb    Link encap:Ethernet  HWaddr 00:00:00:01:1b:01
          inet6 addr: fe80::200:ff:fe01:1b01/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:9400  Metric:1
          RX packets:128986 errors:0 dropped:0 overruns:0 frame:0
          TX packets:129761 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:221538103 (211.2 MiB)  TX bytes:227158091 (216.6 MiB)


switch# slot 22 show hardware internal cpu-mac inband  counters
inband0 counters:
inband0   Link encap:Ethernet  HWaddr 00:00:00:01:16:03
```

```
          inet addr:127.2.2.22  Bcast:127.2.255.255  Mask:255.255.0.0
          inet6 addr: fe80::200:ff:fe01:1603/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:9676  Metric:1
          RX packets:147425 errors:0 dropped:0 overruns:0 frame:0
          TX packets:147470 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:532
          RX bytes:15479625 (14.7 MiB)  TX bytes:14898335 (14.2 MiB)
          Interrupt:10

knet0_0 counters:
knet0_0   Link encap:Ethernet  HWaddr 02:10:18:e1:6f:50
          inet6 addr: fe80::10:18ff:fee1:6f50/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:9400  Metric:1
          RX packets:36 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:6 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:3816 (3.7 KiB)  TX bytes:0 (0.0 B)

knet0_1 counters:
knet0_1   Link encap:Ethernet  HWaddr 02:10:18:e1:6f:51
          inet6 addr: fe80::10:18ff:fee1:6f51/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:9400  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:6 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
```

Fabric Connectivity Commands

Cisco NX-OS provides the following commands to display information and statistics related to fabric connectivity:

- **show system internal fabric connectivity** [**module** *module-number*]—Displays connectivity information for all fabric modules or a single module.

```
switch# show system internal fabric connectivity
HiGIG Link-info Linecard slot:4
------------------------------------------------------------------
 LC-Slot  LC-Unit   LC-HGLink   FM-Slot   FM-Unit   FM-HGLink
------------------------------------------------------------------
    4        0       HG02         22        0        HG09
    4        0       HG03         22        1        HG09
    4        0       HG06         24        0        HG09
    4        0       HG07         24        1        HG09
    4        1       HG02         22        0        HG10
    4        1       HG03         22        1        HG10
    4        1       HG06         24        0        HG10
    4        1       HG07         24        1        HG10
    4        2       HG02         22        0        HG11
    4        2       HG03         22        1        HG11
    4        2       HG06         24        0        HG11
    4        2       HG07         24        1        HG11

HiGIG Link-info Fabriccard slot:22
------------------------------------------------------------------
 FM-Slot  FM-Unit   FM-HGLink   LC-Slot   LC-Unit   LC-HGLink
------------------------------------------------------------------
   22        0       HG09         4        0        HG02
   22        0       HG10         4        1        HG02
   22        0       HG11         4        2        HG02
```

```
   22        1       HG09          4        0        HG03
   22        1       HG10          4        1        HG03
   22        1       HG11          4        2        HG03

HiGIG Link-info Fabriccard slot:24
------------------------------------------------------------
 FM-Slot  FM-Unit   FM-HGLink   LC-Slot   LC-Unit   LC-HGLink
------------------------------------------------------------
   24        0       HG09          4        0        HG06
   24        0       HG10          4        1        HG06
   24        0       HG11          4        2        HG06
   24        1       HG09          4        0        HG07
   24        1       HG10          4        1        HG07
   24        1       HG11          4        2        HG07
```

- **show system internal interface counters module** *module-number* [**nz**]—Displays the rates for HG or fabric links on a module. The **nz** option displays only non-zero counters.

```
switch# show system internal interface counters module 22 nz
Internal Port Counters (150 secs rate) for Slot: 22
===================================================

Interface ASIC ASIC  BCM  TxBitRate(BwUtil) TxPktRate RxBitRate(BwUtil) RxPktRate
          Port Inst Port     (bps)            (pps)       (bps)          (pps)
-------------------------------------------------------------------------------
ii22/1/10  HG9    0   10     0(  0.00)         0       33064(  0.00)      17


switch# show system internal interface counters module 22
Internal Port Counters (150 secs rate) for Slot: 22
===================================================

Interface ASIC ASIC  BCM  TxBitRate(BwUtil) TxPktRate RxBitRate(BwUtil) RxPktRate
          Port Inst Port      (bps)            (pps)       (bps)          (pps)
-------------------------------------------------------------------------------
ii22/1/1  HG0    0    1       0(  0.00)         0          0(  0.00)         0
ii22/1/2  HG1    0    2       0(  0.00)         0          0(  0.00)         0
ii22/1/3  HG2    0    3       0(  0.00)         0          0(  0.00)         0
ii22/1/4  HG3    0    4       0(  0.00)         0          0(  0.00)         0
ii22/1/5  HG4    0    5       0(  0.00)         0          0(  0.00)         0
ii22/1/6  HG5    0    6       0(  0.00)         0          0(  0.00)         0
ii22/1/7  HG6    0    7       0(  0.00)         0          0(  0.00)         0
ii22/1/8  HG7    0    8       0(  0.00)         0          0(  0.00)         0
ii22/1/9  HG8    0    9       0(  0.00)         0          0(  0.00)         0
ii22/1/10  HG9    0   10      0(  0.00)         0      30888(  0.00)        12
ii22/1/11 HG10    0   11      0(  0.00)         0          0(  0.00)         0
ii22/1/12 HG11    0   12      0(  0.00)         0          0(  0.00)         0
ii22/1/13 HG12    0   13      0(  0.00)         0          0(  0.00)         0
ii22/1/14 HG13    0   14      0(  0.00)         0          0(  0.00)         0
ii22/1/15 HG14    0   15      0(  0.00)         0          0(  0.00)         0
ii22/1/16 HG15    0   16      0(  0.00)         0          0(  0.00)         0
ii22/1/17 HG16    0   17      0(  0.00)         0          0(  0.00)         0
ii22/1/18 HG17    0   18      0(  0.00)         0          0(  0.00)         0
ii22/1/19 HG18    0   19      0(  0.00)         0          0(  0.00)         0
ii22/1/20 HG19    0   20      0(  0.00)         0          0(  0.00)         0
ii22/1/21 HG20    0   21      0(  0.00)         0          0(  0.00)         0
ii22/1/22 HG21    0   22      0(  0.00)         0          0(  0.00)         0
ii22/1/23 HG22    0   23      0(  0.00)         0          0(  0.00)         0
ii22/1/24 HG23    0   24      0(  0.00)         0          0(  0.00)         0
ii22/1/33  HG0    1    1      0(  0.00)         0          0(  0.00)         0
ii22/1/34  HG1    1    2      0(  0.00)         0          0(  0.00)         0
ii22/1/35  HG2    1    3      0(  0.00)         0          0(  0.00)         0
ii22/1/36  HG3    1    4      0(  0.00)         0          0(  0.00)         0
ii22/1/37  HG4    1    5      0(  0.00)         0          0(  0.00)         0
```

```
ii22/1/38  HG5    1    6      0(  0.00)        0         0(  0.00)         0
ii22/1/39  HG6    1    7      0(  0.00)        0         0(  0.00)         0
ii22/1/40  HG7    1    8      0(  0.00)        0         0(  0.00)         0
ii22/1/41  HG8    1    9      0(  0.00)        0         0(  0.00)         0
ii22/1/42  HG9    1   10      0(  0.00)        0         0(  0.00)         0
ii22/1/43 HG10    1   11      0(  0.00)        0         0(  0.00)         0
ii22/1/44 HG11    1   12      0(  0.00)        0         0(  0.00)         0
ii22/1/45 HG12    1   13      0(  0.00)        0         0(  0.00)         0
ii22/1/46 HG13    1   14      0(  0.00)        0         0(  0.00)         0
ii22/1/47 HG14    1   15      0(  0.00)        0         0(  0.00)         0
ii22/1/48 HG15    1   16      0(  0.00)        0         0(  0.00)         0
ii22/1/49 HG16    1   17      0(  0.00)        0         0(  0.00)         0
ii22/1/50 HG17    1   18      0(  0.00)        0         0(  0.00)         0
ii22/1/51 HG18    1   19      0(  0.00)        0         0(  0.00)         0
ii22/1/52 HG19    1   20      0(  0.00)        0         0(  0.00)         0
ii22/1/53 HG20    1   21      0(  0.00)        0         0(  0.00)         0
ii22/1/54 HG21    1   22      0(  0.00)        0         0(  0.00)         0
ii22/1/55 HG22    1   23      0(  0.00)        0         0(  0.00)         0
ii22/1/56 HG23    1   24      0(  0.00)        0         0(  0.00)         0
```

- **show system internal interface counters detail module** *module-number*—Displays detailed statistics for all HG or fabric links on a single module.

```
show system internal interface counters detail module 4
.................
.............
Interface: ii4/1/3  ASIC Inst# 0/Port# 3/Name HG2
------------------------------------------------------
Last Cleared @ Thu Jan  1 00:00:00 2013
 (0)
Tx/Rx Rates (per second):
          secs     tx bytes    tx packets  rx bytes    rx packets
    [0] - 10       0           0           0           0
    [1] - 150      9448        60          0           0
    [2] - 300      9448        60          0           0
Mac Pktflow:
  Rx Counters:
    Ingress Packets  :       0x0000000000000000/0
    Unicast Packets  :       0x0000000000000000/0
    Multicast Packets:       0x0000000000000000/0
    Broadcast Packets:       0x0000000000000000/0
    Jumbo Packets    :       0x0000000000000000/0
    Total Bytes      :       0x0000000000000000/0

    Rx Bytes by Packet Size:
    64:             0x0000000000000000/0
    65   - 127:     0x0000000000000000/0
    128  - 255:     0x0000000000000000/0
    256  - 511:     0x0000000000000000/0
    512  - 1023:    0x0000000000000000/0
    1024 - 1518:    0x0000000000000000/0
    1519 - 1548:    0x0000000000000000/0

  Tx Counters:
    Egress Packets   :       0x0000000000001351/4945
    Unicast qackets:         0x0000000000001351/4945
    Multicast qackets:       0x0000000000000000/0
    Broadcast Packets:       0x0000000000000000/0
    Jumbo Packets    :       0x0000000000000000/0
    Undersize Packets:       0x0000000000000000/0
    Total Bytes      :       0x0000000000008e756/583510

    Tx Bytes by Packet Size
```

```
    64:             0x0000000000000000/0
    65   - 127:     0x0000000000001351/4945
    128  - 255:     0x0000000000000000/0
    256  - 511:     0x0000000000000000/0
    512  - 1023:    0x0000000000000000/0
    1024 - 1518:    0x0000000000000000/0
    1519 - 1548:    0x0000000000000000/0
    trunk:          0x0000000000000000/0

Mac Control:
    Rx Pause:       0x0000000000000000/0
    Tx Pause:       0x0000000000000000/0
    Reset:          0x0000000000000000/0
Mac Errors:
    Undersize:      0x0000000000000000/0
    Runt:           0x0000000000000000/0
    Crc:            0x0000000000000000/0
    Input Errors:   0x0000000000000000/0
    In Discard:     0x0000000000000000/0
    Giants:         0x0000000000000000/0
    Output Errors:  0x0000000000000000/0
    Output Discard: 0x0000000000000000/0
    Bad Proto:      0x0000000000000000/0
    Collision:      0x0000000000000000/0
    Late Collision: 0x0000000000000000/0
    No Carrier:     0x0000000000000000/0
```

Troubleshooting Packet Flow with Packet Tracer

Packet Tracer

The Packet Tracer is a new troubleshooting tool that allows a packet to be captured from the Network Processor. Similar to the ELAM tool available on Cisco Nexus 9000 Cloud Scale switches, this tool provides information to understand how the ASIC forwarded the captured packet. This information is useful to troubleshoot packet flow.

While various tools like SPAN, ERSPAN, Ethanalyzer exist to debug packet flow issues, Packet Tracer allows troubleshooting within the forwarding pipeline of an ASIC without any performance penalty or disruption to the environment.

Packet tracer has the following capabilities:



Important To effectively use Packet Tracer, users should have a comprehensive understanding of the ASIC forwarding pipeline. This knowledge is crucial for setting precise filters and accurately interpreting the results of packet captures.

- Allows filters for capturing packets based on various protocol parameters like IPv4/IPv6 addresses, TCP/UDP ports, and so on.
- Provides flexible filtering functionality at the ASIC level due to matching incoming packets using a 128-byte filter and 128-byte mask. This allows the filters to be designed using packet protocol parameters or specific byte sequences in the payload portion of the packet.

- Captures 128 bytes of packet along with the state of the forwarding pipeline because the packet passes through various stages of the pipeline.
- Allows creation of filters using non-protocol information like packet size, traffic class, and so on.

Packet Tracer Workflow

You must perform the following steps to capture packets using Packet Tracer.

- Determine whether the packet must be captured in the receive packet path (RxPP) or transmit packet path (TxPP).
- Determine whether a packet must be captured using protocol parameters or specific byte sequences as filters.
  - To capture packets using protocol parameters as filters: Identify the frame or packet format of the packet to be captured which will guide you to know whether the packet to be captured is an Ethernet packet followed by IPv4 or IPv6 or other well-known protocols or a VLAN tagged Ethernet packet followed by well-known protocols and so on. For more information, see Packet Format, on page 7.



Note The packet format serves as a template for forming the 128-byte filter and mask based on various protocol parameters that you may select as filters.

  - To capture packets using specific byte sequences as filters: Identify the specific contiguous byte sequences and start offset.

- Start the Packet Tracer.
- Wait for the Packet Tracer to trigger and display the result.

Packet Format

The Packet Tracer on ASIC uses a 128-byte packet filter and a corresponding 128-byte filter mask to capture specific packets. You use the packet filter as a byte string representing the first 128 bytes of the packet of interest, with specific values at certain offsets. The ASIC matches ingress/egress packets against this byte pattern using the filter mask. This setup allows you to capture packets of any protocol type or pattern, providing flexibility in specifying the match pattern.

To build the packet filter and mask, you must typically identify protocol fields of interest, like dot1q header, IPv4 source IP, destination IP, or UDP source port, and incorporate these values at the correct offsets in the packet filter. The matching mask is then applied at the same offsets in the filter mask. Because packets are matched against the 128-byte filter and mask, you must be aware of the specific packet format to create a representative pattern including ethernet headers.

This image represents the packet format tree that can help create specific packet format.

Figure 1: Packet Format Tree

```
eth
+-- arp
+-- ipv4
¦ +-- tcp
¦ +-- udp
¦ ¦ +-- vxlan
¦ ¦ +-- eth
¦ ¦ ¦ +-- arp
¦ ¦ ¦ +-- llcu
¦ ¦ ¦ ¦ +-- snap
¦ ¦ ¦ +-- llci
¦ ¦ ¦ ¦ +-- snap
¦ ¦ ¦ +-- llcs
¦ ¦ ¦ ¦ +-- snap
¦ ¦ ¦ +-- ipv4
¦ ¦ ¦ ¦ +-- tcp
¦ ¦ ¦ ¦ +-- udp
¦ ¦ ¦ ¦ +-- icmp
¦ ¦ ¦ +-- ipv6
¦ ¦ ¦ ¦ +-- tcp
¦ ¦ ¦ ¦ +-- udp
¦ ¦ ¦ ¦ +-- icmpv6
¦ ¦ ¦ +-- qinq
¦ ¦ ¦ ¦ +-- ipv4
¦ ¦ ¦ ¦ ¦ +-- tcp
¦ ¦ ¦ ¦ ¦ +-- udp
¦ ¦ ¦ ¦ ¦ +-- icmp
¦ ¦ ¦ ¦ +-- ipv6
¦ ¦ ¦ ¦ ¦ +-- tcp
¦ ¦ ¦ ¦ ¦ +-- udp
¦ ¦ ¦ ¦ ¦ +-- icmpv6
¦ ¦ ¦ +-- vntag
¦ ¦ ¦ ¦ +-- ipv4
¦ ¦ ¦ ¦ ¦ +-- tcp
¦ ¦ ¦ ¦ ¦ +-- udp
¦ ¦ ¦ ¦ ¦ +-- icmp
¦ ¦ ¦ ¦ +-- ipv6
¦ ¦ ¦ ¦ ¦ +-- tcp
¦ ¦ ¦ ¦ ¦ +-- udp
¦ ¦ ¦ ¦ ¦ +-- icmpv6
¦ ¦ +-- mpls
¦ ¦ ¦ +-- mpls
¦ ¦ ¦ ¦ +-- ipv4
¦ ¦ ¦ ¦ +-- ipv6
¦ ¦ +-- arp
¦ +-- icmp
¦ +-- gre
¦ ¦ +-- ipv4
¦ ¦ +-- ipv6
¦ +-- dot1q
```

This table lists a few examples of supported packet format usage of packet tracer.

Table 1: Examples of Supported Packet Format

Interested traffic	Packet-format to use
TCP traffic with VLAN tagging	• For IPv4: eth-dot1q-ipv4-tcp • For IPv6: eth-dot1q-ipv6-tcp

Interested traffic	Packet-format to use
VXLAN traffic with VLAN tagging	• For IPv4: eth-dot1q-ipv4-udp-vxlan-eth-ipv4 • For IPv6: eth-dot1q-ipv6-udp-vxlan-eth-ipv4
VXLAN traffic with inner VLAN tagging	• ForIPv4:eth-ipv4-udp-vxlan-eth-dot1q-ipv4 • For IPv6:eth-ipv6-udp-vxlan-eth-dot1q-ipv4
VXLAN traffic with inner VLAN tagging and ARP	• For IPv4: eth-ipv4-udp-vxlan-eth-dot1q-arp • For IPv6: eth-ipv6-udp-vxlan-eth-dot1q-arp
ARP traffic	eth-arp
ICMP traffic	• For IPv4: eth-ipv4-icmp • For IPv6: eth-ipv6-icmp
MPLS traffic	• eth-mpls-mpls-ipv4 (MPLS can be added up to 6 times for 6 labels)

Guidelines and Limitations for Packet Tracer

The Packet Tracer has the following configuration guidelines and limitations:

- The Packet Tracer feature is not supported on the Nexus 9800 Series (N9808) platform.
- In the packet offset command, a maximum of 10 conditions can be set for RxPP or TxPP.
- Packet filter matches only on the first 128 Bytes of the packet.
- Packet tracer can be done in either RxPP or TxPP path.
- Capture mode ‘continuous’ is not supported.
- If slices are not specified, the output is displayed for all the slices where the packet-trace is tracked.

Supported Release and Platform for Packet Tracer

Release	Platform
10.5(3)F and later	Cisco N9364E-SG2-Q and N9364E-SG2-O switches
10.6(1)F and later	Cisco N9336C-SE1 switches
10.6(2)F and later	Cisco N9324C-SE1U and Cisco N9348Y2C6D-SE1U switches.

Deploy Packet Tracer

You can use the following commands to trigger packet tracer functionality on the switch.

Procedure

Step 1 Run the **packet-trace** command to enable the packet trace mode.

Example:

```
switch# packet-trace
switch(S1HAL-pt)#
```

Step 2 Run the **trigger init** {**rxpp** | **txpp**} command to capture the packet on Rx path (Rxpp) or Tx Path (TxPP).

Example:

```
switch(S1HAL-pt)# trigger init rxpp
switch(S1HAL-pt-rxpp)#
```

Step 3 Run the **packet-format** *packet-format* command to specify the packet format to trace the packets.

Example:

```
switch(S1HAL-pt-txpp)# packet-format eth-ipv4-tcp
switch(S1HAL-pt-txpp-pkt-fmt)#
```

In this example, the frame format of packet to be captured is Ethernet with IPv4 and TCP protocol filter.

Note
This command provides a User Guide option under help (?) to guide on the usage of this command.

Step 4 Run the **set outer** {**l2** | **ipv4** | **ipv6** | **arp** | **l4** | **mpls** } | **set inner** { **l2** | **ipv4** | **ipv6** | **arp** | **l4** | **mpls** } command to set various protocol filters for nonencapsulated packets (set outer) or encapsulated packet (set inner).

Example:

```
switch(S1HAL-pt-txpp-pkt-fmt)# set outer ipv4
```

To set filters for packet, an appropriate packet-format must be selected, see Packet Format, on page 7 section.

Note
For encapsulated packet, the term "outer" is used for underlay protocols like IP/UDP and the term "inner" is used for overlay protocols like VXLAN, GRE, and so on.

Step 5 (Optional) Run the **show filters** command to set various nonpacket filters.

Example:

```
switch(S1HAL-pt-txpp-pkt-fmt)# show filters
```

These filters can be set in addition to packet header filters.

Note
Packet capture is based on both packet header filters and nonpacket filters, if set.

Step 6 Run the **start** command to set the filters on the ASIC and begins the capture operation.

Example:

```
switch(S1HAL-pt-txpp-pkt-fmt)# start
```

Step 7 (Optional) Run the **status** command to provide information on whether capture has occurred or not.

Example:

```
switch(S1HAL-pt-txpp-pkt-fmt)# status
```

This command can be run multiple times to know whether a packet has been captured or not.

Step 8 (Optional) Run the **stop** command to cancel the capture that has been started.

Example:

```
switch(S1HAL-pt-txpp-pkt-fmt)# stop
```

Note
Issuing a **stop** command after a successful capture does not alter the capture's outcome.

Step 9 (Optional) Run the **reset** command to clear the set filters.

Example:

```
switch(S1HAL-pt-txpp-pkt-fmt)# reset
switch(S1HAL-pt-txpp)#
```

Step 10 Run the **report** [**brief**] [**slice** *slice-ids*] command to provide details of the captured packet and dump of NPPD decode information for each stage of the capture.

Example:

```
switch(S1HAL-pt-txpp)# report detail
```

For **brief** option, NPPD decoded information will not be dumped.

If a **slice** option is specified, packet capture details of the specified slice will be displayed.

For more details of the report detail, see Configuration Example for Packet Tracer, on page 13.

Step 11 Run the **set npi** {**err-flag** *value* | **initial-TC** *value* | **processing-code** *value* | **reassembly-ctxt** *value* | **single-frag-pkt** *value* | **src-pif** *value* | **tx-to-rx-rec-data** *value* | **unsch-rec-code** *value*} command to set various nonpackets in RxPP capture mode.

Example:

```
switch(S1HAL-pt-rxpp)# set npi src-pif 15
```

These filters can be set in addition to packet header filters.

Packet capture is based on both packet header filters and nonpacket filters, if set.

- **Error Flag (err-flag)**: Use this option to check if any hardware errors are observed. Size: 1 bit. Range: 0–1.
- **Initial TC (initial-TC)**: Use this option to set the packets initial traffic class as calculated by IFG. Size: 3 bits. Range: 0–7.
- **Processing Code (processing-code)**: Use this option to indicate abnormal events. Size: 7 bits. Range: 0–127.
- **Reassembly Context (reassembly-ctxt)**: Use this option to uniquely identify the packet fragments for reassembly. Size: 11 bits. Range: 0–2047.
- **Single Fragment Packet (single-frag-pkt)**: Use this option to set a flag for single fragment packet. Size: 1 bit. Range: 0–1.
- **Source Port interface (src-pif)**: Use this option to set the source physical interface. Size: 7 bits. Range: 0–127.

- **Tx to Rx recycle data (tx-to-rx-rec-data)**: Use this option to set recycle data passed from the TxNPU to the RxNPU. Size: 8 bits. Range: 0–255.
- **Unschedule Recycle code (unsch-rec-code)**: Use this option to set the type of unscheduled recycle required. Size: 4 bits. Range: 0–15.

Step 12 Run the **set npi** {**acc-LM-cache-and-Idx** *value* | **colour** *value* | **congested** *value* | **congestion-level** *value* | **cud** *value* | **dst-intf** *value* | **eop** *value* | **err-flag** *value* | **is-elephant-flow** *value* | **lm-cache-index** *value* | **omd** *value* | **pkt-size** *value* | **sop** *value* | **src-slice** *value* | **src-slice-sys-port** *value* | **start-packing** *value* | **traffic-class** *value* | **packet-offset** *offset-value*} command to set various nonpackets in TxPP capture mode.

Example:

```
switch(S1HAL-pt-txpp)# set npi dst-intf 25
```

These filters can be set in addition to packet header filters.

Packet capture is based on both packet header filters and nonpacket filters, if set.

- **Access LM cache and Index (acc-LM-cache-and-Idx)**: Use this option to check the loss measurement request cache. Size: 1 bit. Range: 0–1.
- **Color (colour)**: Use this option to check drop precedence of the packet. Size: 2 bits. Range: 0–3.
- **Congested (congested)**: Use this option to check whether a congestion event occurred on the packet. Size: 1 bit. Range: 0–1.
- **Congestion Level (congestion-level)**: Use this option to check measurement of the queues congestion as experienced by the packet. Size: 4 bits. Range: 0–15.
- **Copy unique data (cud)**: Use this option to check why the packet copy was generated. Size: 23 bits. Range: 0–8388607
- **Destination Interface (dst-intf)**: Use this option to set the destination physical interface. Size: 8 bits. Range: 0–255.
- **End Of Packet (eop)**: Use this option to set an end of a packet fragment. Size: 1 bit. Range: 0–1.
- **Error Flag (err-flag)**: Use this option to check if any hardware errors are observed. Size: 1 bit. Range: 0–1.
- **Is elephant flow (is-elephant-flow)**: Use this option to check if a packet is identified as part of a large flow. Size: 1 bit. Range: 0–1.
- **LM Cache Index (lm-cache-index)**: Use this option to check index of the loss measurement request cache. Size: 2 bits. Range: 0–255.
- **Output queue Mapped Data (omd)**: Use this option to set output queue-mapped data. Size: 9 bits. Range: 0–511.
- **Packet size (pkt-size)**: Use this option to check packet size in bytes. Size: 14 bits.
- **Start Of Packet (sop)**: Use this option to set the start of a packet fragment. Size: 1 bit. Range: 0–1.
- **Source Slice (src-slice)**: Use this option to set source slice. Size: 3 bits.
- **Source Slice System Port (src-slice-sys-port)**: Use this option to set the source slice system port. Size: 8 bits. Range: 0–255.
- **Start Packing (start-packing)**: Use this option to set the first packet of a dual packet. Size: 1 bit. Range: 0–1.
- **Traffic Class (traffic-class)**: Use this option to set the traffic class of the packet. Size: 3 bits. Range: 0–7.

- **packet-offset**: Use this option to specify the offset for retrieving packet content from the 'transaction_data' field in the Tx pipeline transmit input stage. Range: 0–255.

Step 13 Run the **set pkt-offset condition** *Value* **offset** *Value* command to set the raw filter and mask to any byte pattern according to your needs.

Example:

```
switch(S1HAL-pt-txpp)# set pkt-offset condition 1 offset 0x10 value 0xababab mask 0xffffff
```

Up to 10 such conditions can be set. This operation is mutually exclusive to set the protocol filters using the **set outer** command.

Note

- A mask of '0xf' indicates that the corresponding nibble in the filter should be considered, whereas a mask of '0x0' means it should be ignored.
- This command must be used only if you know the offset value.

Verification of the Packer Tracer Deployment

Use the following command to display Packer Tracer deployment information.

Command	Purpose
show filters	Displays the actual pkt-offset filters set. For more information, see Configuration Example for Packet Tracer, on page 13.

Configuration Example for Packet Tracer

The following examples shows how Packet Tracer functionality is used to capture filters and reports:

```
switch# packet-trace

switch(S1HAL-pt)# trigger init rxpp

switch(S1HAL-pt-rxpp)# packet-format eth-dot1q-ipv4

switch(S1HAL-pt-rxpp-pkt-fmt)#
switch(S1HAL-pt-rxpp-pkt-fmt)# set outer ipv4 src-ip 62.0.134.2

switch(S1HAL-pt-rxpp-pkt-fmt)# set outer ipv
ipv4   ipv6
switch(S1HAL-pt-rxpp-pkt-fmt)# set outer ipv4 next-protocol 17

switch(S1HAL-pt-rxpp-pkt-fmt)#
switch(S1HAL-pt-rxpp-pkt-fmt)# show filters

slot  1
=======

OUTER
    Ethernet
        eth_type:: value: 0x800, mask: 0xffff, offset: 16
```

```
    DOT1Q
        tpid:: value: 0x8100, mask: 0xffff, offset: 12
    IPv4
        protocol:: value: 17, mask: 0xff, offset: 27
        src_ip:: value: 62.0.134.2, mask: 0xffffffff, offset: 30

INNER

Packet filters::
0000000000000000000000008100000008000000000000000000001100003e00860200000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
Packet filters mask::
0000000000000000000000000ffff0000ffff000000000000000000ff0000ffffffff0000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000


switch(S1HAL-pt-rxpp-pkt-fmt)#
switch(S1HAL-pt-rxpp-pkt-fmt)#
switch(S1HAL-pt-rxpp-pkt-fmt)# start
Filter name: eth_type
Filter name: tpid
Filter name: protocol
Filter name: src_ip
Setting RX packet data filters (filter count 4).

switch(S1HAL-pt-rxpp-pkt-fmt)#
switch(S1HAL-pt-rxpp-pkt-fmt)#
switch(S1HAL-pt-rxpp-pkt-fmt)#
switch(S1HAL-pt-rxpp-pkt-fmt)#
switch(S1HAL-pt-rxpp-pkt-fmt)# status
Packet trace hit

switch(S1HAL-pt-rxpp-pkt-fmt)#
switch(S1HAL-pt-rxpp-pkt-fmt)#
switch(S1HAL-pt-rxpp-pkt-fmt)# report
Rx Packet traced in slot #0 slice #1:

Frame 1: 128 bytes on wire (1024 bits), 128 bytes captured (1024 bits)
    [Protocols in frame: eth:ethertype:vlan:ethertype:ip:udp:hsrp]
Ethernet II, Src: Cisco_21:e5:5b (40:14:82:21:e5:5b), Dst: IPv4mcast_66 (01:00:5e:00:00:66)

    Destination: IPv4mcast_66 (01:00:5e:00:00:66)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...1 .... .... .... .... = IG bit: Group address (multicast/broadcast)
    Source: Cisco_21:e5:5b (40:14:82:21:e5:5b)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Type: 802.1Q Virtual LAN (0x8100)
    [Stream index: 0]
802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 134
    000. .... .... .... = Priority: Best Effort (default) (0)
    ...0 .... .... .... = DEI: Ineligible
    .... 0000 1000 0110 = ID: 134
    Type: IPv4 (0x0800)
    Trailer: 00000000000000000000000000073636f000000000000000000000000000
Internet Protocol Version 4, Src: 62.0.134.2, Dst: 224.0.0.102
    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: 80
    Identification: 0x0000 (0)
    000. .... = Flags: 0x0
```

```
        0... .... = Reserved bit: Not set
        .0.. .... = Don't fragment: Not set
        ..0. .... = More fragments: Not set
    ...0 0000 0000 0000 = Fragment Offset: 0
    Protocol: UDP (17)
    Header Checksum: 0x1734 [validation disabled]
    [Header checksum status: Unverified]
    Source Address: 62.0.134.2
    Destination Address: 224.0.0.102
    [Stream index: 0]
User Datagram Protocol, Src Port: 1985, Dst Port: 1985
    Source Port: 1985
    Destination Port: 1985
    Length: 60
    Checksum: 0x5b42 [unverified]
    [Checksum Status: Unverified]
    [Stream index: 0]
    [Stream Packet Number: 1]
    UDP payload (52 bytes)
Cisco Hot Standby Router Protocol
    Group State TLV: Type=1 Len=40
        Version: 2
        Op Code: Hello (0)
        State: Standby (5)
        IP Ver.: IPv4 (4)
        Group: 134
        Identifier: Cisco_21:e5:5b (40:14:82:21:e5:5b)
        Priority: 100
        Hellotime: Default (3000)
        Holdtime: Default (10000)
        Virtual IP Address: 62.0.134.3
    Text Authentication TLV: Type=3 Len=8
        Authentication Data: Default (cisco)

Packet Summary Decode:

Packet capture Summary : (Captured at RXPP) :

Ingress port details:
Interface                       :  Eth1/22
LTL                             :  0x58
System Port                     :  0x98
PIF                             :  24
Slice                           :  1
ifg                             :  1

Packet drop summary:
Packet dropped                  : NO

Packet punt summary:
Punt Details                    :Packet is not punted

Packet Details:
===============

decode_termination_input slice_idi 1

Packet Bytes(up to 128B) :
0x01005e00006640148221e55b8100008608004500005000000000ff1117343e008602e000006607c107c1003c5b42012802000504008640148221
e55b00000064000001bb8000027103e00860300000000000000000000000000000308636973636f000000000000000000000000000000000073636f000000000000000000000000

==== FI Array ====
------------------------------------------------------------------------------------------------------------------------
FIELD_NAME                      :                               VALUE
```

```
------------------------------------------------------------------------------------------------------------------------
array[9]                        :                                  0x0
array[8]                        :                                  0x0
array[7]                        :                                  0x0
array[6]                        :                                  0x0
array[5]                        :                                  0x0
array[4]                        :                               0x2e00
array[3]                        :                               0x260f
  offset_in_bytes                                                 0x26
  protocol_type                                  PROTOCOL_TYPE_UDP
array[2]                        :                               0x1214
  offset_in_bytes                                                 0x12
  protocol_type                                PROTOCOL_TYPE_IPV4_L4
array[1]                        :                                0xe48
  offset_in_bytes                                                  0xe
  protocol_type                                 PROTOCOL_TYPE_VLAN
  flags                                                             2
array[0]                        :                                 0x11
  offset_in_bytes                                                 0x0
  protocol_type                         PROTOCOL_TYPE_ETHERNET_VLAN

==== RXPP Termination Input ====

------------------------------------------------------------------------------------------------------------------------
FIELD_NAME                      :                                VALUE
------------------------------------------------------------------------------------------------------------------------
padding_1                       :                                  0x0
pch_label                       :                                  0x0
unsch_rcy_code                  :                                  0x0
tx_to_rx_rcy_data               :                                 0xf4
mtu_violation                   :                                  0x0
initial_tc                      :                                  0x0
offset_in_fragment              :                                  0x0
slice_source_system_port        :                                 0x98
processing_code                 :                                  0x0
destination                     :                                  0x0
use_cache                       :                                  0x0
single_fragment_packet          :                                  0x1
flow_signature_on_npuh          :                                  0x0
phb                             :                                  0x0
reassembly_context              :                                0x7ff
learn_enable                    :                                  0x0
receive_time_from_nppd          :                                  0x0
rxnpu_recycle_count             :                                  0x0
rxnpu_recycle_data              :                                  0x0

==== RXPP Termination Macro Stack ====

NPE-macros-stack[0]: network_rx_mac_af_and_termination_macro
NPE-macros-stack[1]: network_rx_mac_relay_ipv4_mc_termination_macro

==== IRXPP Termination Lookup Keys/Results ====


NPE-lookup Keys/Results[0]:
no lookup hit, bucket #1 context network engine termination
no lookup hit, bucket #2 context network engine termination
+--------+-------------------------------------------------+--------------------+-----------+----------
---------------------------------------+--------------+
| Key Bucket |                                  Key Type                                  |
     Key Value          | Result Bucket |
      Result Type                     | Result Value |
+--------+-------------------------------------------------+--------------------+-----------+----------
---------------------------------------+--------------+
```

```
|     a      |          npl_service_mapping_ac_port_tag_compound_table_key_t         |
0x5e000066000000138184327c |       d       |
        NoneType                        |      0       |
|     d      | npl_ingress_qos_tag_encoding_pack_table_key_option_tag_type_v4_dscp_t |
        0x0             |       d       | npl_ingress_q
os_tag_encoding_pack_table_payloads_t |     0x0      |
+--------+-------------------------------------------------------+-----------------+----------+----------
-------------------------------------+--------------+

NPE-lookup Keys/Results[1]:
no lookup hit, bucket #0 context network engine termination
no lookup hit, bucket #2 context network engine termination
+--------+-------------------------------------+--------+----------+-----------------------------
-----------+------------------------------+
| Key Bucket |                          Key Type                          | Key Value |
Result Bucket |                      Result Type
           |         Result Value         |
+--------+-------------------------------------+--------+----------+-----------------------------
-----------+------------------------------+
|     b      | npl_mac_mc_em_termination_attributes_compound_table_key_t |   0x21b   |
   b       |             npl_base_l3_lp_attr_union_t
           | 0xe00010c32af008674000000000 |
|     d      |      npl_mc_macro_compressed_fileds_pack_table_key_t      |   0x388   |
   d       | npl_mc_macro_compressed_fileds_pack_table_
payloads_t |             0x0              |
+--------+-------------------------------------+--------+----------+-----------------------------
-----------+------------------------------+

==== RXPP Termination Output ====

-------------------------------------------------------------------------------------------------------------
FIELD_NAME                    :                                VALUE
-------------------------------------------------------------------------------------------------------------
learn_command                 :                                  0x0
lb_command                    :                                  0x0
offset_in_fragment            :                                  0x0
slice_source_system_port      :                                 0x98
processing_code               :                                  0x0
destination                   :                              0xe0086
use_cache                     :                                  0x0
single_fragment_packet        :                                  0x1
flow_signature_on_npuh        :                                  0x0
phb                           :                                  0x0
reassembly_context            :                                 0x7ff
learn_enable                  :                                  0x0
receive_time_from_nppd        :                                  0x0
rxnpu_recycle_count           :                                  0x0
rxnpu_recycle_data            :                                  0x0

==== RXPP Forwarding Macro Stack ====

NPE-macros-stack[0]: network_rx_ipv4_rtf_macro
NPE-macros-stack[1]: network_rx_mac_forwarding_macro
NPE-macros-stack[2]: resolution_macro

==== RXPP Forwarding Lookup Keys/Results ====


NPE-lookup Keys/Results[0]:
no lookup hit, bucket #1 context network engine forwarding
no lookup hit, bucket #3 context network engine forwarding
Error result bucket # 0 , from table ingress_rtf_ipv4_db1_240_f0_compound_table , overlapping
 previous value
Error result bucket # 1 , from table ingress_rtf_ipv4_db1_240_f0_compound_table , overlapping
```

```
 previous value
Error result bucket # 2 , from table ingress_rtf_ipv4_db1_240_f0_compound_table , overlapping
 previous value
Error result bucket # 3 , from table ingress_rtf_ipv4_db1_240_f0_compound_table , overlapping
 previous value
+--------+----------------------------------------+--------------------------+----------+-------------
-+--------------+
| Key Bucket |                       Key Type                        |                Key
Value                | Result Bucket |    Result Type
 | Result Value |
+--------+----------------------------------------+--------------------------+----------+-------------
-+--------------+
|     a      | npl_ingress_rtf_ipv6_db4_480_f0_compound_table_key_t |
0x4ff45003e008602e000006607c19c0101f056 |       b       | npl_rtf_payload_t
 |     0x0      |
|     a      | npl_ingress_rtf_ipv6_db4_480_f0_compound_table_key_t |
0x4ff45003e008602e000006607c19c0101f056 |       c       | npl_rtf_payload_t
 |     0x0      |
|     a      | npl_ingress_rtf_ipv6_db4_480_f0_compound_table_key_t |
0x4ff45003e008602e000006607c19c0101f056 |       d       | npl_rtf_payload_t
 |     0x0      |
|     a      | npl_ingress_rtf_ipv6_db4_480_f0_compound_table_key_t |
0x4ff45003e008602e000006607c19c0101f056 |       a       | npl_rtf_payload_t
 |     0x0      |
|     c      | npl_ingress_rtf_ipv4_db1_240_f0_compound_table_key_t |                0x3821a
                |       b       | npl_rtf_payload_t
 |     0x0      |
|     c      | npl_ingress_rtf_ipv4_db1_240_f0_compound_table_key_t |                0x3821a
                |       c       | npl_rtf_payload_t
 |     0x0      |
|     c      | npl_ingress_rtf_ipv4_db1_240_f0_compound_table_key_t |                0x3821a
                |       d       | npl_rtf_payload_t
 |     0x0      |
|     c      | npl_ingress_rtf_ipv4_db1_240_f0_compound_table_key_t |                0x3821a
                |       a       | npl_rtf_payload_t
 |     0x0      |
+--------+----------------------------------------+--------------------------+----------+-------------
-+--------------+

NPE-lookup Keys/Results[1]:
no lookup hit, bucket #0 context network engine forwarding
no lookup hit, bucket #1 context network engine forwarding
no lookup hit, bucket #2 context network engine forwarding
+--------+--------------------------+-------------+-----------+-----------------------------------+----
---------+
| Key Bucket |                 Key Type                |     Key Value      | Result Bucket
 |                 Result Type                  | Resu
lt Value |
+--------+--------------------------+-------------+-----------+-----------------------------------+----
---------+
|     d      | npl_mac_forwarding_table_compound_key_t | 0x8601005e00006612 |       a
  | npl_mac_forwarding_table_compound_payloads_t |
0x0      |
+--------+--------------------------+-------------+-----------+-----------------------------------+----
---------+

NPE-lookup Keys/Results[2]:
no lookup hit, bucket #3 context network engine forwarding
+--------+-------------------------------------------------+--------------------------+----------+----
-------------------------------------------------+--------------+
| Key Bucket |                                  Key Type                                  |
          Key Value                | Result Bucket |
                   Result Type                       | Result Value |
+--------+-------------------------------------------------+--------------------------+----------+----
```

```
-----------------------------------------------------+--------------+
|     a      |              npl_v4_l4_resolution_table_compound_key_t              |
       0x3300103802183             |       a       |
     npl_resolution_table_compound_payloads_t       | 0xa9100e0086 |
|     b      |              npl_v4_l4_resolution_table_compound_key_t              |
0x113e008602e00007c107c1800000000000000 |       a       |
     npl_resolution_table_compound_payloads_t       | 0xa9100e0086 |
|     c      | npl_select_fwd_q_m_counter_base_pack_table_key_option_false_value_t |
          0x4000000                  |       c       | np
l_select_fwd_q_m_counter_base_pack_table_payloads_t |     0x0      |
+------------+-----------------------------------------------------+-------------------------------+-----------+--
-----------------------------------------------------+--------------+

==== RXPP Forwarding Output ====

-------------------------------------------------------------------------------------------------------------------
FIELD_NAME                      :                                VALUE
-------------------------------------------------------------------------------------------------------------------
offset_in_fragment              :                                  0x0
slice_source_system_port        :                                 0x98
processing_code                 :                                  0x0
destination                     :                                  0x0
use_cache                       :                                  0x0
single_fragment_packet          :                                  0x1
flow_signature_on_npuh          :                                  0x0
phb                             :                                  0x0
reassembly_context              :                                0x7ff
learn_enable                    :                                  0x0
receive_time_from_nppd          :                                  0x0
rxnpu_recycle_count             :                                  0x0
rxnpu_recycle_data              :                                  0x0
padding_2                       :                                  0x0
use_ecn                         :                                  0x0
fllb_control_code               :                                  0x0
padding_1                       :                                  0x0
ethernet_rate_limiter_type      :                                  0x7
fwd_offset_cmd                  :                                  0x0

==== RXPP TM PD IFG0 ====

-------------------------------------------------------------------------------
FIELD_NAME                           :         VALUE
-------------------------------------------------------------------------------
color                                :           0x0
counter_meter_command                :      0xfdfcf5
is_dummy_pd                          :           0x1
reorder_data                         :        0xb72a
drop                                 :           0x1
forwarding_destination               :           0x0
mirror_bitmap                        :        0x37ff
source_slice_system_port             :           0x0
traffic_class                        :           0x0
slice_mode_data                      :    0x1fb7ff4fcc9fd1ec2f4000000000000
processing_code                      :           0x0
lb_key_msbs_bits                     :           0x0
packet_size_bits                     :           0x0

==== RXPP TM PD IFG1 ====

-------------------------------------------------------------------------------
FIELD_NAME                           :         VALUE
-------------------------------------------------------------------------------
color                                :           0x0
counter_meter_command                :         0x43d
```

```
is_dummy_pd                          :           0x0
reorder_data                         :         0xba70
drop                                 :           0x0
forwarding_destination               :       0x100086
mirror_bitmap                        :          0x10
source_slice_system_port             :          0x98
traffic_class                        :           0x0
slice_mode_data                      :    0x5fffffdfffffdfffffc0217227fffd0
processing_code                      :           0x0
lb_key_msbs_bits                     :           0x0
packet_size_bits                     :           0x0

==== NPU HEADER IFG0 ====

45ca99bdfecfefd5332fbfd0000000000000000000000000000000000000000000000000000000000000000
-------------------------------------------------------------------------------------------------------------------
FIELD_NAME                           :                                VALUE
-------------------------------------------------------------------------------------------------------------------
base_type                            :                                  0x4
version                              :                                  0x0
ive_valid                            :                                  0x1
packet_edit_valid                    :                                  0x0
issu_codespace                       :                                  0x1
receive_time                         :                           0xca99bdfe
meter_color                          :                                  0x3
l2_flood_mc_pruning_or_etm           :                                  0x0
ingress_qos_remark                   :                             0xfefd5
fwd_header_type                      :                                  0x3
rx_nw_app_or_lb_key                  :                            0x32f
fwd_offset                           :                             0xbf
slp_qos_id                           :                              0xd
encap_type                           :                                  0x0
slp_dm_ptp                           :                                  0x0
is_inject_packet_capture_en          :                                  0x0
is_inject_up                         :                                  0x0
ip_first_fragment                    :                                  0x0
ttl                                  :                                  0x0
collapsed_mc                         :                                  0x0
da_bcast_or_mc_rpf                   :                                  0x0
slp_profile                          :                                  0x0
l2_slp                               :                                  0x0
l3_slp                               :                                  0x0
is_l2                                :                                  0x0
is_rpf_id                            :                                  0x0
value                                :                                  0x0
sgt                                  :                                  0x0

==== NPU HEADER IFG1 ====

040000000002000004433 0f0000000000000860000000800001000 9e0010086000000000000058
-------------------------------------------------------------------------------------------------------------------
FIELD_NAME                           :                                VALUE
-------------------------------------------------------------------------------------------------------------------
base_type                            :                                  0x0
version                              :                                  0x0
ive_valid                            :                                  0x1
packet_edit_valid                    :                                  0x0
issu_codespace                       :                                  0x0
receive_time                         :                                  0x0
meter_color                          :                                  0x0
l2_flood_mc_pruning_or_etm           :                                  0x0
ingress_qos_remark                   :                              0x20000
fwd_header_type                      :                                  0x0
rx_nw_app_or_lb_key                  :                             0x443
```

```
fwd_offset                    :                      0x30
slp_qos_id                    :                       0xf
encap_type                    :                       0x0
L2_encap                      :                       0x0
padding                       :                       0x0
l2_dlp                        :                       0x0
pif                           :                       0x0
ifg                           :                       0x0
slp_dm_ptp                    :                       0x0
is_inject_packet_capture_en   :                       0x0
is_inject_up                  :                       0x0
ip_first_fragment             :                       0x1
ttl                           :                       0x0
collapsed_mc                  :                       0x0
da_bcast_or_mc_rpf            :                       0x0
slp_profile                   :                       0x0
l2_slp                        :                  0x9e001
l3_slp                        :                   0x9e00
is_l2                         :                       0x1
is_rpf_id                     :                       0x1
value                         :                  0x9e001
sgt                           :                       0x0

switch(S1HAL-pt-rxpp-pkt-fmt)#
```

Additional References

Related Documents	Title/Link
Cisco Nexus 9364E Switches Hardware Installation Guide	Cisco Nexus 9364E-SG2-Q Switch Hardware Installation Guide Cisco Nexus 9364E-SG2-O Switch Hardware Installation Guide
ELAM Overview	https://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus7000/sw/troubleshooting/config_guide/trouble_ts_elam.html
Nexus 9000 Cloud Scale ASIC (Tahoe) NX-OS ELAM	Nexus 9000 Cloud Scale ASIC (Tahoe) NX-OS ELAM - Cisco