This article describes how to troubleshoot packet flow issues for Cisco NX-OS.

Guide Contents
Troubleshooting Overview
Troubleshooting Installs, Upgrades, and Reboots
Troubleshooting Licensing
Troubleshooting VDCs
Troubleshooting CFS
Troubleshooting Ports
Troubleshooting vPCs
Troubleshooting VLANs
Troubleshooting STP
Troubleshooting Routing
Troubleshooting Unicast Traffic
Troubleshooting WCCP
Troubleshooting Memory
Troubleshooting Packet Flow Issues(this section)
Troubleshooting FCoE
Before Contacting Technical Support
Troubleshooting Tools and Methodology

Contents

Packet Flow Issues

Packets could be dropped for the following reasons :

- Software switched packets could be received from the interface, but dropped by the supervisor because of rate limits.
- Packets could be dropped because of a QoS policy.
- Hardware switched packets could be dropped by the hardware because of a bandwidth limitation.

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.

```
dctl-n7010-7# show hardware rate-limit copy

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

Rate Limiter Class                          Parameters
-----------------------------------------------------------
copy                                        Config    : 30000
                                            Allowed   : 13651778
                                            Dropped   : 228295 <-- caused by ICMP redirect or OSPF He
                                            Total     : 13880073

dctl-n7010-7(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
-----------------------------------------------------------
layer-3 mtu                                  Config    : 500
                                            Allowed   : 0
                                            Dropped   : 0
                                            Total     : 0

layer-3 ttl                                  Config    : 500
                                            Allowed   : 0
                                            Dropped   : 0
                                            Total     : 0

layer-3 control                              Config    : 10000
                                            Allowed   : 17020000
                                            Dropped   : 88790262  <---HSRP, OSPF hello
                                            Total     : 105810262

layer-3 glean                                Config    : 100
                                            Allowed   : 0
                                            Dropped   : 0
                                            Total     : 0

layer-3 multicast directly-connected         Config    : 3000
                                            Allowed   : 0
                                            Dropped   : 0
                                            Total     : 0

layer-3 multicast local-groups               Config    : 3000
                                            Allowed   : 0
                                            Dropped   : 0
                                            Total     : 0

layer-3 multicast rpf-leak                   Config    : 500
                                            Allowed   : 0
                                            Dropped   : 0
                                            Total     : 0

layer-2 storm-control                        Config    : Disabled

access-list-log                              Config    : 100
```

```
                                        Allowed   : 0
                                        Dropped   : 0
                                        Total     : 0

copy                                     Config    : 30000
                                        Allowed   : 552173
                                        Dropped   : 0
                                        Total     : 552173

receive                                  Config    : 30000
                                        Allowed   : 85134
                                        Dropped   : 0
                                        Total     : 85134

layer-2 port-security                    Config    : Disabled
```

Packets Dropped Because of a QoS Policy

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

```
dctl-n7010-7# sh policy-map interface control-plane
   class-map copp-system-class-exception (match-any)
     match exception ip option
     match exception ip icmp unreachable
     police cir 360 kbps , bc 250 ms
     module 1 :
       conformed 0 bytes; action: transmit
       violated 0 bytes; action: drop

     module 2 :
       conformed 0 bytes; action: transmit
       violated 0 bytes; action: drop

     module 3 :
       conformed 0 bytes; action: transmit
       violated 0 bytes; action: drop

     module 4 :
       conformed 0 bytes; action: transmit
       violated 0 bytes; action: drop

     module 10 :
       conformed 11614462878 bytes; action: transmit
       violated 3097405384908 bytes; action: drop
```

Packets Dropped in Hardware

Use the following **show hardware** commands to determine if packets are being dropped by the hardware.

- **show hardware internal statistics rates**
- **show hardware internal statistics pktflow all**

show hardware internal statistics rates

```
dctl-n7k-dist-1# sh hardware internal statistics rates
 + ============================
 + R2D2 Instance 0
 + ============================
 |
```

```
|-- Ingress IN
|   |--- Packets/sec
|   |   |---    sum: 0
|   |
|   |--- Bytes/sec
|   |   |---    sum: 0
|
|-- Ingress OUT
|   |--- Packets/sec
|   |   |---    sum: 0
|   |
|
|-- Egress IN
|   |--- Packets/sec
|   |   |---    sum: 0
|   |
|
|-- Egress OUT
|   |--- Packets/sec
|   |   |---    sum: 0
|   |
|   |--- Bytes/sec
|   |   |---    sum: 0
|
|
|
+ ============================
+ Metropolis Instance 0
+ ============================
|
|-- Ingress IN
|   |--- Packets/sec
|   |   |---     I1: 2
|   |   |---     I1: 0
|   |   |---    sum: 0
|   |
|
|-- Ingress OUT
|   |--- Packets/sec
|   |   |---     I1: 2
|   |   |---     I1: 0
|   |   |---    sum: 0
|   |
|   |--- Bytes/sec
|   |   |---     I1: 1166
|   |   |---     I1: 0
|   |   |---    sum: 0
|
|-- Egress IN
|   |--- Packets/sec
|   |   |---     I1: 0
|   |   |---     I1: 0
|   |   |---    sum: 0
|   |
|   |--- Bytes/sec
|   |   |---     I1: 0
|   |   |---     I1: 0
|   |   |---    sum: 0
|
|-- Egress OUT
|   |--- Packets/sec
|   |   |---     I1: 0
|   |   |---    sum: 0
|   |
```

```
 |
 |
 |
```

show hardware internal statistics pktflow all

This command displays per ASIC statistics, including packets into and out of the ASIC. This command helps to identify where packet loss is occurring.

```
dctl-n7k-dist-1# show hardware internal statistics pktflow all
bhv_bitmask:0
|-------------------------------------------------------------------------|
| Device:R2D2                    Role:MAC                                 |
| Packets
|-------------------------------------------------------------------------|
 Instance: 0                     Ports:-
|----------|------------------|------------------|
|          |        IN        |       OUT        |
|----------|------------------|------------------|
|Ingress   | 00000000014a40c0 | 00000000014a40c0 |
|----------|------------------|------------------|
|Egress    | 000000000007e9dc | 000000000007e9dc |
|----------|------------------|------------------|

|-------------------------------------------------------------------------|
| Device:Metropolis              Role:REWR                                |
| Packets
|-------------------------------------------------------------------------|
 Instance: 0                     Ports:-
|----------|------------------|------------------|
|          |        IN        |       OUT        |
|----------|------------------|------------------|
|Ingress   | 00000000014a40c0 | 0000000001498ccc |
|----------|------------------|------------------|
|Egress    | 000000000007e9dc | 000000000007e9dc |
|----------|------------------|------------------|

|-------------------------------------------------------------------------|
| Device:Octopus                 Role:QUE                                 |
| Packets
|-------------------------------------------------------------------------|
 Instance: 0                     Ports:-
|----------|------------------|------------------|
|          |        IN        |       OUT        |
|----------|------------------|------------------|
|Ingress   | 0000000001498ccc | 0000000001498cc6 |
|----------|------------------|------------------|
|Egress    | 000000000007e9c5 | 000000000007e9dc |
|----------|------------------|------------------|

 *** Counters above represent packets combined into a larger one ***
```