

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

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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.

```

dct1-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

```

dct1-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 ***