

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 <b>Dropped : 228295</b> <-- 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 <b>Dropped : 88790262</b> <---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 \*\*\*