



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:fe01:6f50/64 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:fe01:6f51/64 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 Port	ASIC Inst	BCM Port	TxBitRate(BwUtil) (bps)	TxPktRate (pps)	RxBitRate(BwUtil) (bps)	RxPktRate (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 Port	ASIC Inst	BCM Port	TxBitRate(BwUtil) (bps)	TxPktRate (pps)	RxBitRate(BwUtil) (bps)	RxPktRate (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 : 0x00000000000001351/4945
  Unicast packets: 0x00000000000001351/4945
  Multicast packets: 0x0000000000000000/0
  Broadcast Packets: 0x0000000000000000/0
  Jumbo Packets   : 0x0000000000000000/0
  Undersize Packets: 0x0000000000000000/0
  Total Bytes     : 0x00000000000008e756/583510

Tx Bytes by Packet Size
    
```

```

64:                0x0000000000000000/0
65 - 127:         0x00000000000001351/4945
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
    
```