Ping 테스트를 사용하여 NCS6K 저속 포워딩 패킷 경로 확인

목차

소개

Ping 패킷 테스트는 일반적으로 연결 문제를 해결하는 데 사용됩니다. 이 문서에서는 NCS6K(Network Convergence System 6000) 저속 포워딩 패킷을 확인하기 위해 ping 테스트를 사용하는 체계적인 방법을 설명합니다.

사전 요구 사항

요구 사항

이 문서의 독자는 다음 주제에 대해 알고 있어야 합니다.

- 기본 IP 라우팅.
- XR 운영 체제.

사용되는 구성 요소

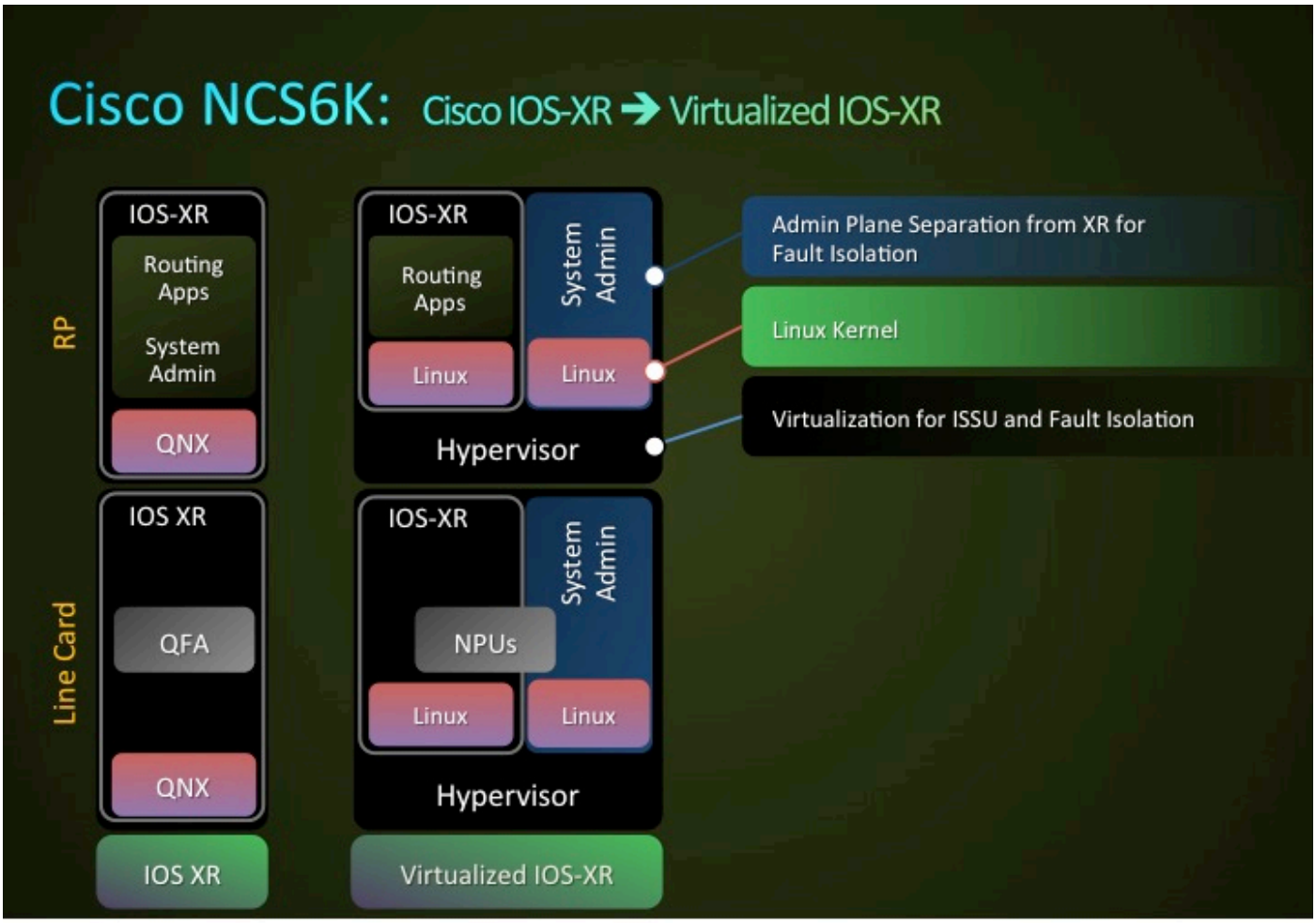
이 문서는 NCS6K 플랫폼을 위해 작성되었습니다.

이 문서의 정보는 특정 랩 환경의 디바이스를 토대로 작성되었습니다.이 문서에 사용된 모든 디바이스는 초기화된(기본) 컨피그레이션으로 시작되었습니다.현재 네트워크가 작동 중인 경우, 모든 명령어의 잠재적인 영향을 미리 숙지하시기 바랍니다.

배경 정보

NCS6K와 기존 IOS-XR 플랫폼 간에는 다음과 같은 주요 차이점이 있습니다.NCS6K는 가상화 기술을 활용하여 시스템을 구축합니다.각 노드인 RP(Routing Processor) 또는 LC(Line Card)는 시스템 관리 VM, IOS-XR VM1, IOS-XR VM2 등과 같은 여러 가상 머신(VM)을 실행할 수 있으며, 이를 결합하여 완전한 기능을 갖춘 XR 노드를 생성할 수 있습니다.다음 그림은 RP 및 LC가 하나의 IOS-XR VM을 실행하는 예를 보여줍니다.

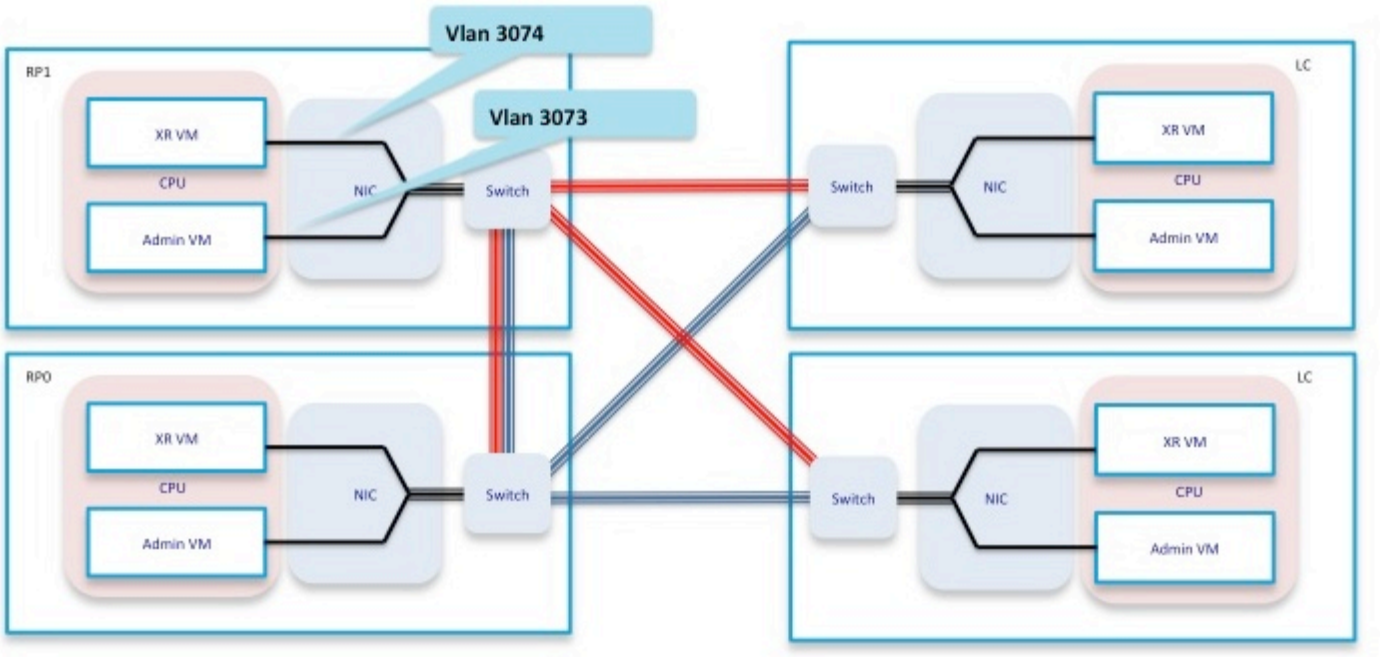
그림 1



RP 및 LC를 연결하기 위한 제어 이더넷 네트워크가 있습니다.RP와 LC 간의 컨트롤 플레인 트래픽은 이 제어 이더넷 네트워크를 통과합니다.가상화 환경이므로 이러한 패킷이 특정 VM에 어떻게 전달되고 RP 또는 LC의 Nicktic(NIC)이 패킷의 목적지를 어떻게 알고 있는지 등의 질문이 있습니까?

간단히 말해, VLAN은 서로 다른 VM의 트래픽을 구별하는 데 사용되며 이 프로세스는 NIC에서 수행됩니다.그림 2는 NIC가 IOS-XR VM에 VLAN 3074 트래픽을 전달하고 관리 VM에 VLAN 3073 트래픽을 전달하는 방법을 보여줍니다.

그림 2

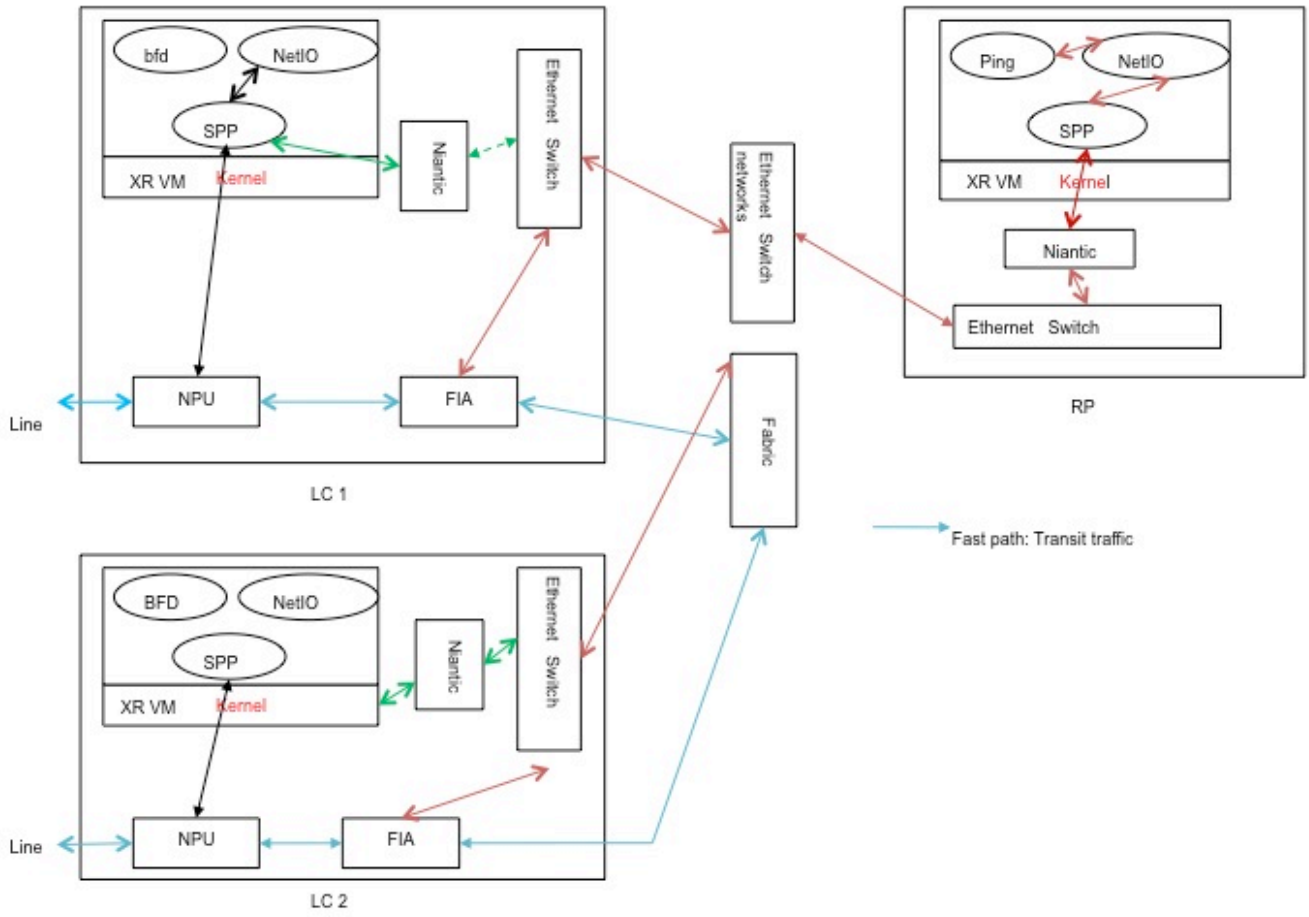


이러한 포워딩 구성 요소를 결합하면 그림 3과 같이 ping 테스트 시나리오를 위한 단순화된 포워딩 경로를 얻을 수 있습니다.

RP에서 ping 테스트를 수행할 때 패킷은 상자 내에서 다음 포워딩 경로를 사용합니다.

RP_PING <—> RP_NETIO <—> RP_SPP <—> RP_Linux_Kernel_Socket <—> 스위치 <—> LC_FIA <—> LC_NPU(PSE, PLIM_ASIC 포함) <—> 라인

그림 3



다음을 확인합니다.

문서의 나머지 부분에서는 RP에서 ping을 시작하는 시나리오를 예로 들 수 있습니다.Te0/0/0/2/0에서 직접 연결된 호스트로 ping이 시작됩니다. 다음 단계에서는 이 ping 패킷의 경로를 확인하기 위한 단계별 접근 방식을 보여줍니다.

```
RP/0/RP0/CPU0:NCS6k-Deploy#show ip interface brief

Interface                      IP-Address      Status              Protocol
Bundle-Ether671                10.67.2.2       Up                  Up
Bundle-Ether672                10.67.3.2       Down                Down
Loopback0                      10.17.17.17     Up                  Up
MgmtEth0/RP0/CPU0/0            10.7.54.11      Up                  Up
TenGigE0/0/0/2/0               10.67.1.2       Up                  Up
TenGigE0/0/0/2/1               unassigned      Up                  Up
TenGigE0/0/0/2/2               unassigned      Up                  Up
TenGigE0/0/0/2/3               unassigned      Up                  Up
TenGigE0/0/0/2/4               unassigned      Up                  Up
TenGigE0/0/0/2/5               unassigned      Down                Down
[snip]

RP/0/RP0/CPU0:NCS6k-Deploy#show run interface Ten 0/0/0/2/0
interface TenGigE0/0/0/2/0
 ipv4 address 10.67.1.2 255.255.255.252
 load-interval 30
```

```
RP/0/RP0/CPU0:NCS6k-Deploy#ping 10.67.1.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.67.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 5/6/7 ms
```

1. **RP 노드의 "show IPv4 traffic" 카운터는 얼마나 많은 ICMP(Internet Control Message Protocol) 초본이 전송되었는지, 얼마나 많은 ICMP 회신이 반환되었는지 보여줍니다.**

```
RP/0/RP0/CPU0:NCS6k-Deploy#show ipv4 traffic

IP statistics:
  Rcvd:  1495334 total, 80112 local destination
         0 format errors, 0 bad hop count
         23 unknown protocol, 0 not a gateway
         0 security failures, 0 bad source, 0 bad header
         133207 with options, 0 bad, 0 unknown
  Opts:  0 end, 0 nop, 0 basic security, 0 extended security
         0 strict source rt, 0 loose source rt, 0 record rt
         0 stream ID, 0 timestamp, 133207 alert, 0 cipso
  Frags: 0 reassembled, 0 timeouts, 0 couldn't reassemble, 0 fragments received
         0 fragmented, 0 fragment count, 0 fragment max drop
  Bcast: 0 sent, 0 received
  Mcast: 1361652 sent, 1376283 received
   Drop: 0 encapsulation failed, 237 no route, 0 too big
   Sent: 1437435 total

ICMP statistics:
  Sent: 0 admin unreachable, 63 network unreachable
        8 host unreachable, 0 protocol unreachable
        16 port unreachable, 0 fragment unreachable
        0 time to live exceeded, 0 reassembly ttl exceeded
        24 echo request, 30024 echo reply
        0 mask request, 0 mask reply
        0 parameter error, 0 redirects
        30131 total
  Rcvd: 0 admin unreachable, 21 network unreachable
        0 host unreachable, 0 protocol unreachable
        0 port unreachable, 0 fragment unreachable
        0 time to live exceeded, 0 reassembly ttl exceeded
        30024 echo request, 15 echo reply
        0 mask request, 0 mask reply
        0 redirect, 0 parameter error
        0 source quench, 0 timestamp, 0 timestamp reply
        0 router advertisement, 0 router solicitation
        30063 total, 0 checksum errors, 0 unknown
```

2. **NETIO(Network Input Output) 구성 요소를 확인합니다.**다음 단계는 RP FINT NETIO 체인 카운터를 확인하는 것입니다.네트워크 체인에 있는 IPv4 노드의 "OUT" 카운터를 확인해야 합니다.패킷이 증가하면 패킷이 NETIO 구성 요소에 도달하여 NETIO 구성 요소에서 전송되고 있음을 의미합니다.

Check initial NETIO counter value.

```
RP/0/RP0/CPU0:NCS6k-Deploy#sh netio chains FINT loc 0/rp0/cpu0 | in Stats
<Protocol number> (name)  Stats
<6> (fint_n2n)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
<10> (clns)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
<12> (ipv4)   Stats IN: 2788 pkts, 115373 bytes; OUT: 2816 pkts, 117933 bytes
<13> (mpls)   Stats IN: 16482 pkts, 2467508 bytes; OUT: 0 pkts, 0 bytes
<18> (lpts)   Stats IN: 47234 pkts, 10381065 bytes; OUT: 0 pkts, 0 bytes
```

```
<19> (ipv6)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
<30> (ipv4_preroute)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
<32> (ipv6_preroute)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
<34> (fint_proto_tp)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
<36> (l2transport)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
```

Initiate 10 ping packets.

```
RP/0/RP0/CPU0:NCS6k-Deploy#ping  10.67.1.1 coun 10
Type escape sequence to abort.
Sending 10, 100-byte ICMP Echos to 10.67.1.1, timeout is 2 seconds:
!!!!!!!!!!
Success rate is 100 percent (10/10), round-trip min/avg/max = 4/7/8 ms
```

Check NETIO counter again. You would see increment of 10 packets.

```
RP/0/RP0/CPU0:NCS6k-Deploy#sh netio chains FINT  loc 0/rp0/cpu0 | in Stats
<Protocol number> (name)  Stats
<6> (fint_n2n)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
<10> (clns)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
<12> (ipv4)   Stats IN: 2788 pkts, 115373 bytes; OUT: 2826 pkts, 118933 bytes
<13> (mpls)   Stats IN: 16482 pkts, 2467508 bytes; OUT: 0 pkts, 0 bytes
<18> (lpts)   Stats IN: 47234 pkts, 10381065 bytes; OUT: 0 pkts, 0 bytes
<19> (ipv6)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
<30> (ipv4_preroute)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
<32> (ipv6_preroute)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
<34> (fint_proto_tp)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
<36> (l2transport)   Stats IN: 0 pkts, 0 bytes; OUT: 0 pkts, 0 bytes
```

또한 KornShell(ksh) 명령 "show_netio_fwder_stats -g"를 사용하여 삽입/펀트 카운터 증분 여부를 확인할 수 있습니다. **참고:**프로덕션 환경에서는 ping 패킷이 이 이 구성 요소에 도달했는지 여부를 확인하기 어렵게 하는 다른 백그라운드 트래픽이 있을 수 있습니다.이를 해결하려면 timeout 0을 사용하여 많은 수의 패킷을 사용할 수 있습니다."ping x.x.x.x count 10000 time 0"을 입력하고 카운터가 갑자기 증가하는지 또는 급증이 발생하는지 확인합니다.

Check initial counter value.

```
RP/0/RP0/CPU0:NCS6k-Deploy#run show_netio_fwder_stats -g
RECEIVE STATISTICS SUMMARY:
rx_pkts: 2224455
punt_pkts: 2224447
ingress_total_drops: 8
TRANSMIT STATISTICS SUMMARY:
inject_pkts: 2077319
tx_pkts: 2058041
egress_total_drops: 2
RECEIVE STATISTICS DETAILS:
Rx Pkt type stats:
  lpts_pkts: 2220753
Rx Listener tag stats:
  ipv4: 1116092
  ipv6: 658627
  clns: 112549
  ipv4_l: 286252
  raw4: 23
  raw6: 43984
  ospf_mc4: 45
  ospf_mc6: 2
  udp4: 7
  tcp4: 405
  isis: 2767
Rx Punt reason stats:
  IFIB: 2220753
Rx Drop stats:
```

```
  null_fint_ifh_drops: 8
  ingress_total_drops: 8
TRANSMIT STATISTICS DETAILS:
Tx Pkt type stats:
  ipv4: 2852
  mpls: 42647
  osi: 78760
  ipv4_preroute: 1339401
  ipv6_preroute: 613659
Tx Protocol Id stats:
  clns: 78760
  ipv4: 2852
  mpls: 42647
  ipv4_preroute: 1339401
  ipv6_preroute: 613659
Tx Drop stats:
  invalid_queue_drops: 2
  hdr_init_drops: 2
  egress_total_drops: 2
```

Initiate 10 ping packets.

```
RP/0/RP0/CPU0:NCS6k-Deploy#ping  10.67.1.1 coun 10
Type escape sequence to abort.
Sending 10, 100-byte ICMP Echos to 10.67.1.1, timeout is 2 seconds:
!!!!!!!!!!
Success rate is 100 percent (10/10), round-trip min/avg/max = 3/4/7 ms
```

Check counter again to check to se increment of 10 packets.

```
RP/0/RP0/CPU0:NCS6k-Deploy#run show_netio_fwder_stats -g
RECEIVE STATISTICS SUMMARY:
rx_pkts: 2224465
punt_pkts: 2224457
ingress_total_drops: 8
TRANSMIT STATISTICS SUMMARY:
inject_pkts: 2077332
tx_pkts: 2058051
egress_total_drops: 2
RECEIVE STATISTICS DETAILS:
Rx Pkt type stats:
  lpts_pkts: 2220763
Rx Listener tag stats:
  ipv4: 1116102
  ipv6: 658627
  clns: 112549
  ipv4_l: 286252
  raw4: 23
  raw6: 43984
  ospf_mc4: 45
  ospf_mc6: 2
  udp4: 7
  tcp4: 405
  isis: 2767
Rx Punt reason stats:
  IFIB: 2220763
Rx Drop stats:
  null_fint_ifh_drops: 8
  ingress_total_drops: 8
TRANSMIT STATISTICS DETAILS:
Tx Pkt type stats:
  ipv4: 2865
  mpls: 42647
  osi: 78760
  ipv4_preroute: 1339401
```

```
  ipv6_preroute: 613659
Tx Protocol Id stats:
  clns: 78760
  ipv4: 2865
  mpls: 42647
  ipv4_preroute: 1339401
  ipv6_preroute: 613659
Tx Drop stats:
  invalid_queue_drops: 2
  hdr_init_drops: 2
  egress_total_drops: 2
RP/0/RP0/CPU0:NCS6k-Deploy#
```

3. **SPP 구성 요소를 확인합니다.**SPP CLI를 사용하여 패킷이 SPP에 도달했는지 확인합니다.

Check initial counter value.

```
RP/0/RP0/CPU0:NCS6k-Deploy#sh spp node-counters
0/0/CPU0:
pdma/rx
              slice1 high pkts:              10
--------------------------------
pdma/tx
               slice1 low pkts:              10
--------------------------------
panini/classify
      forwarded to spp clients:              10
--------------------------------
client/inject
        pkts injected into spp:              10
--------------------------------
client/punt
              punted to client:              10
--------------------------------

0/RP0/CPU0:
panini/classify
      forwarded to spp clients:           22070
--------------------------------
client/inject  pkts injected into spp: 4640
--------------------------------
socket/rx
                  ce low pkts:              45
           mgmt interface pkts:           22025
--------------------------------
socket/tx
                      ce pkts:              45
           mgmt interface pkts:            4595
--------------------------------
client/punt punted to client: 22070
--------------------------------
```

Initiate 100 ping packets.

```
RP/0/RP0/CPU0:NCS6k-Deploy#ping  10.67.1.1 count 100
Type escape sequence to abort.
Sending 100, 100-byte ICMP Echos to 10.67.1.1, timeout is 2 seconds:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!! Success rate is 100 percent (100/100), round-trip
min/avg/max = 3/3/8 ms
```

Check counter again to see increment of 100 packets.

```
RP/0/RP0/CPU0:NCS6k-Deploy#sh spp node-counters
0/0/CPU0:
pdma/rx
```

```
              slice1 high pkts:              10
------------------------------
pdma/tx
               slice1 low pkts:              10
------------------------------
panini/classify
      forwarded to spp clients:              10
------------------------------
client/inject
        pkts injected into spp:              10
------------------------------
client/punt
              punted to client:              10
------------------------------

0/RP0/CPU0:
panini/classify
      forwarded to spp clients:           22172
------------------------------
client/inject  pkts injected into spp: 4740
------------------------------
socket/rx
                   ce low pkts:             145
           mgmt interface pkts:           22027
------------------------------
socket/tx
                       ce pkts:             145
           mgmt interface pkts:            4595
------------------------------
client/punt punted to client:    22172
------------------------------
```

4. **tcpdump 도구를 사용하여 Linux 커널 구성 요소에서 패킷을 덤프합니다.** 아래 출력의 NCS6K XR VM ksh에서 몇 가지 하위 인터페이스를 볼 수 있습니다.

```
RP/0/RP0/CPU0:NCS6008-SJ#
RP/0/RP0/CPU0:NCS6008-SJ#run
Tue Jun 24 10:51:51.972 UTC
[xr-vm_node0_RP0_CPU0:/]$
[xr-vm_node0_RP0_CPU0:/]$ ifconfig -a
eth-vf1   Link encap:Ethernet  HWaddr 46:91:EE:A5:48:A8
          inet6 addr: fe80::4491:eeff:fea5:48a8/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:9700  Metric:1
          RX packets:518403076C3 errors:0 dropped:0 overruns:0 frame:0 TX packets:969599306
errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:138405352234
(128.9 GiB) TX bytes:242828863250 (226.1 GiB) eth-vf1.514 Link encap:Ethernet HWaddr
4C:4E:35:B6:63:68 inet6 addr: fe80::4e4e:35ff:feb6:6368/64 Scope:Link UP BROADCAST RUNNING
MULTICAST MTU:9700 Metric:1 RX packets:13547000 errors:0 dropped:0 overruns:0 frame:0 TX
packets:116957 errors:0 dropped:10 overruns:0 carrier:0 collisions:0 txqueuelen:0 RX
bytes:623478135C3 (594.5 MiB) TX bytes:26876899 (25.6 MiB) eth-vf1.3073 Link encap:Ethernet
HWaddr 4C:4E:35:B6:63:69 inet addr:192.0.0.4 Bcast:192.255.255.255 Mask:255.0.0.0 inet6
addr: fe80::4e4e:35ff:feb6:6369/64 Scope:Link UP BROADCAST RUNNING MULTICAST MTU:9700
Metric:1 RX packets:102364757 errors:0 dropped:0 overruns:0 frame:0 TX packets:100689507
errors:0 dropped:3 overruns:0 carrier:0 collisions:0 txqueuelen:0 RX bytes:29925046692
(27.8 GiB) TX bytes:7562528012 (7.0 GiB) eth-vf1.3074 Link encap:Ethernet HWaddr
4E:41:50:00:10:01 inet addr:172.0.16.1 Bcast:172.255.255.255 Mask:255.0.0.0 inet6 addr:
fe80::4c41:50ff:fe00:1001/64 Scope:Link UP BROADCAST RUNNING MULTICAST MTU:9700 Metric:1 RX
packets:402491385 errors:0 dropped:0 overruns:0 frame:0 TX packets:350389778 errors:0
dropped:6 overruns:0 carrier:0 collisions:0 txqueuelen:0 RX bytes:100599198478 (93.6 GiB)
TX bytes:96834116492 (90.1 GiB) lo Link encap:Local Loopback inet addr:127.0.0.1
Mask:255.0.0.0 inet6 addr: ::1/128 Scope:Host UP LOOPBACK RUNNING MTU:16436 Metric:1 RX
packets:1029861486 errors:0 dropped:0 overruns:0 frame:0 TX packets:1029861486 errors:0
dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:0 RX bytes:201624257033 (187.7 GiB)
TX bytes:201624257033 (187.7 GiB)
```

eth-vf1.514는 Mgmter 인터페이스와의 통신에 사용되지만 IPv4 주소는 볼 수 없습니다.XR VM의 멀티캐스트 인터페이스는 Linux의 IP 스택 대신 IOS-XR의 IP 스택을 사용합니다.**ether-vf1.3073**은 관리 VM과의 통신에 사용됩니다.**eher-vf1.3074**는 XR VM 관련 컨트롤 플레인 트래픽에 사용됩니다.Ping 테스트 패킷은 이 하위 인터페이스를 통과합니다(Linux 네트워크 프로토콜 스택 사용). Linux와 연결된 Tcpdump에는 흥미로운 트래픽을 덤프하는 방법에 대한 다양한 옵션이 있습니다.또한 tcpdump 툴을 사용하여 SDR(Secure Domain Router) 컨트롤 플레인 트래픽(vlan 3074)을 스니핑하거나 vlan 3073에서 IPC(Inter Process Communication) 통신과 같은 다른 트래픽을 스니핑할 수 있습니다.

```
xr-vm_node0_RP0_CPU0:/]$ tcpdump -i eth-vf1.3074 -XX -vv
tcpdump: listening on eth-vf1.3074, link-type EN10MB (Ethernet), capture size 65535 bytes
01:49:21.798386 IP (tos 0x6,ECT(0), ttl 1, id 0, offset 0, flags [DF], proto UDP (17),
length 340)
    172.0.16.1.10150 > 239.255.0.4.10150: [bad udp cksum ab2a!] UDP, length 312
        0x0000:  0100 5e7f 0004 4e41 5000 1001 0800 4506  ..^...NAP.....E.
        0x0010:  0154 0000 4000 0111 cc8e ac00 1001 efff  .T..@...........
        0x0020:  0004 27a6 27a6 0140 ad56 abcd abcd 0000  ..'.'..@.V......
        0x0030:  0000 0280 f502 0000 0000 0000 0000 0000  ................
        0x0040:  0000 0000 0000 7856 3412 0128 0204 0000  ......xV4..(....
        0x0050:  0000 5508 0100 0100 0000 3c25 2600 0000  ..U.......<%&...
        0x0060:  0000 d007 0000 0000 0000 ffff 0000 0000  ................
        0x0070:  0000 0000 0000 0000 0000 0000 0000 0000  ................
        0x0080:  0000 0000 0000 4800 0000 0200 0000 0000  ......H.........
        0x0090:  0000 8800 0000 0000 0000 0000 0000 0000  ................
        0x00a0:  0000 0100 0000 0000 0000 0000 0000 0000  ................
        0x00b0:  0000 0000 0000 c2ca 0031 0000 0000 0000  .........1......
        0x00c0:  0000 0000 0000 0000 0000 5508 0000 6510  ..........U...e.
        0x00d0:  0000 ed53 4c00 0000 0000 0000 0000 0000  ...SL...........
        0x00e0:  0000 0000 0000 0000 0000 0000 0000 6264  ..............bd
        0x00f0:  7863 0000 0000 0000 0000 0000 0000 0000  xc..............
        0x0100:  0000 0000 0000 0000 0000 0000 0000 0000  ................
        0x0110:  0000 0100 0000 0000 0000 0000 0000 30ff  ..............0.
        0x0120:  0002 0000 0000 0000 0000 0000 0000 0000  ................
        0x0130:  0000 0000 0000 0000 0000 0000 0000 0000  ................
        0x0140:  0000 0000 0000 0000 0000 0c00 0000 0000  ................
        0x0150:  0000 0000 0000 0000 0000 0000 0000 0000  ................
        0x0160:  0000                                     ..
01:49:21.799167 IP (tos 0x6,ECT(0), ttl 64, id 0, offset 0, flags [DF], proto UDP (17),
length 380)
    172.0.0.1.8197 > 172.0.16.1.8197: [udp sum ok] UDP, length 352
        0x0000:  4e41 5000 1001 4e41 5000 0001 0800 4506  NAP...NAP.....E.
        0x0010:  017c 0000 4000 4011 d168 ac00 0001 ac00  .|..@.
        0x0040:  0000 0000 0000 7856 3412 0128 0204 0000  ......xV4..(....
        0x0050:  0000 5508 0100 0100 0000 3d25 2600 0000  ..U.......=%&...
        0x0060:  0000 d007 0000 0000 0000 ffff 0000 0000  ................
        0x0070:  0000 0000 0000 0000 0000 0000 0000 0000  ................
        0x0080:  0000 0000 0000 4800 0000 0200 0000 0000  ......H.........
        0x0090:  0000 8800 0000 0000 0000 0000 0000 0000  ................
        0x00a0:  0000 0100 0000 0000 0000 0000 0000 0000  ................
        0x00b0:  0000 0000 0000 c2ca 0031 0000 0000 0000  .........1......
        0x00c0:  0000 0000 0000 0000 0000 5508 0000 6510  ..........U...e.
        0x00d0:  0000 ee53 4c00 0000 0000 0000 0000 0000  ...SL...........
        0x00e0:  0000 0000 0000 0000 0000 0000 0000 6264  ..............bd
        0x00f0:  7863 0000 0000 0000 0000 0000 0000 0000  xc..............
        0x0100:  0000 0000 0000 0000 0000 0000 0000 0000  ................
        0x0110:  0000 0100 0000 0000 0000 0000 0000 30ff  ..............0.
        0x0120:  0002 0000 0000 0000 0000 0000 0000 0000  ................
        0x0130:  0000 0000 0000 0000 0000 0000 0000 0000  ................
        0x0140:  0000 0000 0000 0000 0000 0c04 0000 0000  ................
        0x0150:  0000 0000 0000 0000 0000 0000 0000 0000  ................
        0x0160:  0000                                     ..
01:49:21.802982 IP (tos 0x6,ECT(0), ttl 64, id 0, offset 0, flags [DF], proto UDP (17),
```

```
length 380)
    172.0.0.1.8197 > 172.0.16.1.8197: [udp sum ok] UDP, length 352
        0x0000:  4e41 5000 1001 4e41 5000 0001 0800 4506  NAP...NAP.....E.
        0x0010:  017c 0000 4000 4011 d168 ac00 0001 ac00  .|..@.@..h......
        0x0020:  1001 2005 2005 0168 672f abcd abcd 0000  .......hg/......
        0x0030:  0000 3c80 f502 0000 0000 0000 0000 0000  ..<.............
        0x0040:  0000 0000 0000 7856 3412 0411 0008 0000  ......xV4.......
        0x0050:  0000 5508 0000 0100 0000 3d25 2600 0000  ..U.......=%&...
        0x0060:  0000 d007 0100 0000 0000 ffff 0000 0000
[snip]
```

참고:VM 시나리오이므로 VM으로 전송된 트래픽은 외부 헤더의 VM 인터페이스 주소로 캡슐화되어 이 트래픽이 VM 인터페이스에 도달할 수 있습니다.
위의 패킷 덤프는 실제로 IOS-XR VM의 eth-vf1.3074 ip 주소인 source/destination 172.0.16.1을 사용하여 UDP 패킷 헤더로 캡슐화됩니다. **참고:**캡처는 접근 방식을 보여주며 ICMP(Internet Control Message Protocol) 트래픽이 없습니다.

5. **라인 카드에서 FIA 구성 요소를 확인하는 중입니다.**

Check initial counter value.

```
RP/0/RP0/CPU0:NCS6k-Deploy#sh controllers fia statistics instance 1 loc 0/0/cpu0

FIA Statistics Rack: 0, Slot: 0, Asic instance: 1

FIA Rx (To Fabric) Statistics.
------------------------------------------------------------------------ Input Pkt counters
Pkts Bytes Rx pkts from pse : 250 53000 Rx pkts from switch : 993528 349564509 bcast pkts
from switch : 0 mcast pkts from switch : 993278 ucast pkts from switch       :
250
    Rx pkts enqueued(IQM)            :              500             86500
    Rx pkts dequeued(IQM)            :              500             86500
    Rx pkts sent to fabric           :              500

Cell counters:
    Data cells sent to fabric        :              500             86500
    Control cells sent to fabric     :     183039783411

Drop counters:
    Rx burst error drops(NBI)        :                0
    Rx error drops(Switch)           :                0
    Rx error drops(pse)              :                0
    Rx pkt discard drops(IQM)        :           993277         334570329
    Pkt crc error drops(FDT)         :                0
    Unreachable dest cell drops      :                0
    Internal Error Count             :         41984110
    Internal Drop Count              :                0

FIA Tx (From Fabric) Statistics
------------------------------------------------------------------------ Cell counters:
Pkts Bytes Data cells : 500 Control cells : 179368087015 Reassembled packet counters: Pkts
received from fabric : 500 Tx Ucast pkts : 500 86500 Tx Mcast pkts : 0 0 Tx pkts (EPNI) :
500 81000 Tx pkts sent to switch : 250 53000 Bcast pkts sent to switch : 0 Mcast pkts sent
to switch : 0 Ucast pkts sent to switch : 250 Tx segments sent to pse          :
250             29000
    Tx pkts sent to pse (NBI)        :              500             49000

Drop counters:
    Tx pkts dropped EPNI             :                0
    Tx Ucast pkts dropped            :                0
    Tx Mcast pkts dropped            :                0
    Tx pkts dropped in EGQ(RQP + EHP):                0
    Control cell Drops               :                0
    Data cell Drops                  :                0
    Tx pkts dropped switch           :                0
```

```
    Tx pkts dropped pse            :                 0
    Internal Error Count           :                 0
    Internal Drop Count            :                 0
```

Initiate ping of 1000 packets.

```
RP/0/RP0/CPU0:NCS6k-Deploy#ping 10.67.1.1 count 1000 Type escape sequence to abort. Sending
1000, 100-byte ICMP Echos to 10.67.1.1, timeout is 2 seconds:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! !!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (1000/1000), round-trip min/avg/max = 2/3/8 ms
```

Check counters again to see increment of 1000 packets.

RP/0/RP0/CPU0:NCS6k-Deploy#**sh controllers fia statistics instance 1 loc 0/0/cpu0**

```
FIA Statistics Rack: 0, Slot: 0, Asic instance: 1

FIA Rx (To Fabric) Statistics.
------------------------------------------------------------------------ Input Pkt counters
Pkts Bytes Rx pkts from pse : 1250 265000 Rx pkts from switch : 994927 349849612 bcast pkts
from switch : 0 mcast pkts from switch : 993677  ucast pkts from switch : 1250
    Rx pkts enqueued(IQM)          :              2500            432500
    Rx pkts dequeued(IQM)          :              2500            432500
    Rx pkts sent to fabric         :              2500

Cell counters:
    Data cells sent to fabric      :              2500            432500
    Control cells sent to fabric   :      183111332632

Drop counters:
    Rx burst error drops(NBI)      :                 0
    Rx error drops(Switch)         :                 0
    Rx error drops(pse)            :                 0
    Rx pkt discard drops(IQM)      :            993676         334707420
    Pkt crc error drops(FDT)       :                 0
    Unreachable dest cell drops    :                 0
    Internal Error Count           :          42004879
    Internal Drop Count            :                 0

FIA Tx (From Fabric) Statistics
------------------------------------------------------------------------ Cell counters:
Pkts Bytes Data cells : 2500 Control cells : 179438200981 Reassembled packet counters: Pkts
received from fabric : 2500 Tx Ucast pkts : 2500 432500 Tx Mcast pkts : 0 0 Tx pkts (EPNI)
: 2500 405000 Tx pkts sent to switch : 1250 265000 Bcast pkts sent to switch : 0 Mcast pkts
sent to switch : 0 Ucast pkts sent to switch : 1250  Tx segments sent to pse : 1250 145000
    Tx pkts sent to pse (NBI)      :              2500            245000

Drop counters:
    Tx pkts dropped EPNI           :                 0
    Tx Ucast pkts dropped          :                 0
    Tx Mcast pkts dropped          :                 0
    Tx pkts dropped in EGQ(RQP + EHP):               0
    Control cell Drops             :                 0
    Data cell Drops                :                 0
```

```
    Tx pkts dropped switch          :               0
    Tx pkts dropped pse             :               0
    Internal Error Count            :               0
    Internal Drop Count             :               0
```

6. PSE(Packet Switching Engine) 카운터를 확인합니다.

Check initial counter value.

```
RP/0/RP0/CPU0:NCS6k-Deploy#sh control pse statistics summ instance 1 loc 0/0/cpu0
STATISTICS SUMMARY:

INGRESS
-------
From L2 [LSIM]:
Packets: 1261
  Bytes:   163336
To Fabric:
  Packets: 1250
  Bytes:   265000

EGRESS
------
From Fabric:
  Packets: 1250
  Bytes:   145000
To TM:
  Packets: 1272
To L2 [LSIM]:
  Packets: 1261
  Bytes:   142962

TO/FROM CPU
-----------
To CPU:
  Packets: 11
From CPU:
  Packets: 11
```

Generate 1000 ping packets.

```
RP/0/RP0/CPU0:NCS6k-Deploy#ping  10.67.1.1 count 1000
Type escape sequence to abort.
Sending 1000, 100-byte ICMP Echos to 10.67.1.1, timeout is 2 seconds:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! !!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (1000/1000), round-trip min/avg/max = 3/4/9 ms
```

Check counter again to see increment of 1000 packets.

```
RP/0/RP0/CPU0:NCS6k-Deploy#sh control pse statistics summ instance 1 loc 0/0/cpu0
STATISTICS SUMMARY:

INGRESS
-------
```

```
From L2 [LSIM]:
  Packets: 2261
  Bytes:   293336
To Fabric:
  Packets: 2250
  Bytes:   477000

EGRESS
------
From Fabric:
  Packets: 2250
  Bytes:   261000
To TM:
  Packets: 2272
To L2 [LSIM]:
  Packets: 2261
  Bytes:   256962

TO/FROM CPU
-----------
To CPU:
  Packets: 11
From CPU:
  Packets: 11
```

7. PLIM(Physical Layer Interface Module) ASIC 카운터를 확인하는 중입니다.

Check initial counter value.

```
RP/0/RP0/CPU0:NCS6k-Deploy#sh controllers  plim  asic statistics interface  Te0/0/0/2/0
                              Node: 0/0/CPU0
------------------------------------------------------------------------------
TenGigE0/0/0/2/0 Tx Statistics ---------------------------------------------- Total Packets
: 2256 Total Bytes : 265884 Total Good Packets : 2256 Total Good Bytes : 265884 Unicast
Packets          : 2256              Multicast Packets        : 0
Broadcast Packets        : 0                 64 Byte Packets          : 6
65to127  Byte Packets    : 2250              128to255 Byte Packets    : 0
256to511 Byte Packets    : 0                 512to1023 Byte Packets   : 0
1024to1518 Byte Packets  : 0                 1519to1522 Byte Packets  : 0
1523to1548 Byte Packets  : 0                 1549to2000 Byte Packets  : 0
2001to_MRU Byte Packets  : 0                 Non Pause BPDU Packets   : 0
Classic Pause Packets    : 0
Class Based Pause Pkts 0 : 0                 Class Based Pause Pkts 1 : 0
Class Based Pause Pkts 2 : 0                 Class Based Pause Pkts 3 : 0
Class Based Pause Pkts 4 : 0                 Class Based Pause Pkts 5 : 0
Class Based Pause Pkts 6 : 0                 Class Based Pause Pkts 7 : 0

Dropped Packets
===============
Drained Packets          : 0                 Abort                    : 0
Length Error             : 0                 Giant                    : 0
Tail Drop: HP Queue      : 0                 Tail Drop: LP Queue      : 0

TenGigE0/0/0/2/0 Rx Statistics
------------------------------------------------
Total Packets : 2256 Total Bytes : 265884 Total Good Packets : 2256 Total Good Bytes :
265884 Unicast Packets           : 2256              Multicast Packets        : 0
Broadcast Packets        : 0                 64 Byte Packets          : 6
65to127  Byte Packets    : 2250              128to255 Byte Packets    : 0
256to511 Byte Packets    : 0                 512to1023 Byte Packets   : 0
1024to1518 Byte Packets  : 0                 1519to1522 Byte Packets  : 0
1523to1548 Byte Packets  : 0                 1549to2000 Byte Packets  : 0
2001to_MRU Byte Packets  : 0                 Non Pause BPDU Packets   : 0
Classic Pause Packets    : 0
```

```
Class Based Pause Pkts 0 : 0                Class Based Pause Pkts 1 : 0
Class Based Pause Pkts 2 : 0                Class Based Pause Pkts 3 : 0
Class Based Pause Pkts 4 : 0                Class Based Pause Pkts 5 : 0
Class Based Pause Pkts 6 : 0                Class Based Pause Pkts 7 : 0

Dropped Packets
===============
Runts                    : 0                Fragments                : 0
Jumbo                    : 0                Jabber                   : 0
CRC                      : 0                Code Error               : 0
Code Violation           : 0                Bad Preamble             : 0
IPG Violation            : 0
Packet HPQ QoS Ctl Drop  : 0                Bytes HPQ QoS Ctl Drop   : 0
Packet HPQ QoS HP Drop   : 0                Bytes HPQ QoS HP Drop    : 0
Packet HPQ Ctl Tail Drop : 0                Bytes HPQ Ctl Tail Drop  : 0
Packet HPQ HP Tail Drop  : 0                Bytes HPQ HP Tail Drop   : 0
Packet LPQ LP1 Tail Drop : 0                Bytes LPQ LP1 Tail Drop  : 0
Packet LPQ LP2 Tail Drop : 0                Bytes LPQ LP2 Tail Drop  : 0
Packet TCAM Miss         : 0                Bytes TCAM Miss          : 0
Packet EOP Abort Drop    : 0                Bytes EOP Abort Drop     : 0
Packet Policy Deny       : 0                Bytes Policy Deny        : 0

Rx Packet Drop Details
======================
Unknown Dest MAC Pkts    : 0
Unknown E-Type Pkts      : 0
Unknown Encap Pkts       : 0                Unknown Encap Bytes      : 0
Unknown VLAN Pkts        : 0                Unknown VLAN Bytes       : 0
L2 Subif VLAN Deny Pkts  : 0                L2 Subif VLAN Deny Bytes : 0


Rx Accepted Packet Details
============================
Packet HPQ CTL Sent      : 6                Bytes HPQ CTL Sent       : 384
Packet HPQ HP  Sent      : 0                Bytes HPQ HP  Sent       : 0
Packet LPQ LP1 Sent      : 0                Bytes LPQ LP1 Sent       : 0
Packet LPQ LP2 Sent      : 0                Bytes LPQ LP2 Sent       : 0
```

Initiate 1000 ping packets.

```
RP/0/RP0/CPU0:NCS6k-Deploy#ping  10.67.1.1 count 1000
Type escape sequence to abort.
Sending 1000, 100-byte ICMP Echos to 10.67.1.1, timeout is 2 seconds:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! !!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (1000/1000), round-trip min/avg/max = 3/5/9 ms
```

Check counter again to see increment of 1000 packets.

```
RP/0/RP0/CPU0:NCS6k-Deploy#sh controllers  plim  asic statistics interface  Ten0/0/0/2/0
                               Node: 0/0/CPU0
-------------------------------------------------------------------------------
TenGigE0/0/0/2/0 Tx Statistics ----------------------------------------------- Total Packets
: 3256 Total Bytes : 383884 Total Good Packets : 3256 Total Good Bytes : 383884 Unicast
```

```
Packets          : 3256              Multicast Packets        : 0
Broadcast Packets        : 0                 64 Byte Packets          : 6
65to127  Byte Packets    : 3250              128to255 Byte Packets    : 0
256to511 Byte Packets    : 0                 512to1023 Byte Packets   : 0
1024to1518 Byte Packets  : 0                 1519to1522 Byte Packets  : 0
1523to1548 Byte Packets  : 0                 1549to2000 Byte Packets  : 0
2001to_MRU Byte Packets  : 0                 Non Pause BPDU Packets   : 0
Classic Pause Packets    : 0
Class Based Pause Pkts 0 : 0                 Class Based Pause Pkts 1 : 0
Class Based Pause Pkts 2 : 0                 Class Based Pause Pkts 3 : 0
Class Based Pause Pkts 4 : 0                 Class Based Pause Pkts 5 : 0
Class Based Pause Pkts 6 : 0                 Class Based Pause Pkts 7 : 0

Dropped Packets
===============
Drained Packets          : 0                 Abort                    : 0
Length Error             : 0                 Giant                    : 0
Tail Drop: HP Queue      : 0                 Tail Drop: LP Queue      : 0

TenGigE0/0/0/2/0 Rx Statistics
-----------------------------------------------
Total Packets : 3256 Total Bytes : 383884 Total Good Packets : 3256 Total Good Bytes :
383884 Unicast Packets          : 3256              Multicast Packets        : 0
Broadcast Packets        : 0                 64 Byte Packets          : 6
65to127  Byte Packets    : 3250              128to255 Byte Packets    : 0
256to511 Byte Packets    : 0                 512to1023 Byte Packets   : 0
1024to1518 Byte Packets  : 0                 1519to1522 Byte Packets  : 0
1523to1548 Byte Packets  : 0                 1549to2000 Byte Packets  : 0
2001to_MRU Byte Packets  : 0                 Non Pause BPDU Packets   : 0
Classic Pause Packets    : 0
Class Based Pause Pkts 0 : 0                 Class Based Pause Pkts 1 : 0
Class Based Pause Pkts 2 : 0                 Class Based Pause Pkts 3 : 0
Class Based Pause Pkts 4 : 0                 Class Based Pause Pkts 5 : 0
Class Based Pause Pkts 6 : 0                 Class Based Pause Pkts 7 : 0

Dropped Packets
===============
Runts                    : 0                 Fragments                : 0
Jumbo                    : 0                 Jabber                   : 0
CRC                      : 0                 Code Error               : 0
Code Violation           : 0                 Bad Preamble             : 0
IPG Violation            : 0
Packet HPQ QoS Ctl Drop  : 0                 Bytes HPQ QoS Ctl Drop   : 0
Packet HPQ QoS HP Drop   : 0                 Bytes HPQ QoS HP Drop    : 0
Packet HPQ Ctl Tail Drop : 0                 Bytes HPQ Ctl Tail Drop  : 0
Packet HPQ HP Tail Drop  : 0                 Bytes HPQ HP Tail Drop   : 0
Packet LPQ LP1 Tail Drop : 0                 Bytes LPQ LP1 Tail Drop  : 0
Packet LPQ LP2 Tail Drop : 0                 Bytes LPQ LP2 Tail Drop  : 0
Packet TCAM Miss         : 0                 Bytes TCAM Miss          : 0
Packet EOP Abort Drop    : 0                 Bytes EOP Abort Drop     : 0
Packet Policy Deny       : 0                 Bytes Policy Deny        : 0

Rx Packet Drop Details
======================
Unknown Dest MAC Pkts    : 0
Unknown E-Type Pkts      : 0
Unknown Encap Pkts       : 0                 Unknown Encap Bytes      : 0
Unknown VLAN Pkts        : 0                 Unknown VLAN Bytes       : 0
L2 Subif VLAN Deny Pkts  : 0                 L2 Subif VLAN Deny Bytes : 0


Rx Accepted Packet Details
==========================
Packet HPQ CTL Sent      : 6                 Bytes HPQ CTL Sent       : 384
```

```
Packet HPQ HP  Sent      : 0                 Bytes HPQ HP  Sent       : 0
Packet LPQ LP1 Sent      : 0                 Bytes LPQ LP1 Sent       : 0
Packet LPQ LP2 Sent      : 0                 Bytes LPQ LP2 Sent       : 0
```

8. **"show interface" 카운터를 확인합니다.**첫 번째 단계에서 이를 확인하는 것이 좋지만 패킷 흐름의 순서대로 이 작업이 마지막이 됩니다.패킷이 회선으로 전송되었는지, 그리고 회선에서 패킷이 반환되었는지 확인하는 데 도움이 됩니다.문제가 상자 안에 있는지 아니면 이 상자 외부에 있는지를 좁힐 수 있습니다.

```
Check initial counter values.

RP/0/RP0/CPU0:NCS6k-Deploy#show inter ten 0/0/0/2/0
TenGigE0/0/0/2/0 is up, line protocol is up
  Interface state transitions: 1
  Hardware is TenGigE, address is e051.2a0f.8c29 (bia e051.2a0f.8c29)
  Description: Connected to 0/7/0/1 - CRS-F
  Internet address is 10.67.1.2/30
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 0/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 10000Mb/s, SR, link type is force-up
  output flow control is off, input flow control is off
  loopback not set,
  ARP type ARPA, ARP timeout 04:00:00
  Last input 00:14:22, output 00:14:22
  Last clearing of "show interface" counters 22:08:42
  30 second input rate 0 bits/sec, 0 packets/sec
  30 second output rate 0 bits/sec, 0 packets/sec
     3256 packets input, 370860 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     3256 packets output, 370860 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions

Initiate 1000 ping packets.

RP/0/RP0/CPU0:NCS6k-Deploy#ping  10.67.1.1 cou 1000
Type escape sequence to abort.
Sending 1000, 100-byte ICMP Echos to 10.67.1.1, timeout is 2 seconds:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! !!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (1000/1000), round-trip min/avg/max = 3/4/8 ms
Check counter again to see increment of 1000 packets.
```

```
RP/0/RP0/CPU0:NCS6k-Deploy#show inter ten 0/0/0/2/0
TenGigE0/0/0/2/0 is up, line protocol is up
  Interface state transitions: 1
  Hardware is TenGigE, address is e051.2a0f.8c29 (bia e051.2a0f.8c29)
  Description: Connected to 0/7/0/1 - CRS-F
  Internet address is 10.67.1.2/30
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 10000Mb/s, SR, link type is force-up
  output flow control is off, input flow control is off
  loopback not set,
  ARP type ARPA, ARP timeout 04:00:00
  Last input 00:00:00, output 00:00:00
  Last clearing of "show interface" counters 22:09:38
  30 second input rate 1000 bits/sec, 2 packets/sec
  30 second output rate 1000 bits/sec, 2 packets/sec
     4256 packets input, 484860 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     4256 packets output, 484860 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
```