Verifique o caminho de pacote de informação do encaminhamento lento NCS6K usando o teste de ping

Índice

Introdução

O teste do pacote de ping é teste de uso geral para pesquisar defeitos problemas de conectividade. Este documento ilustrará uma aproximação sistemática para usar o teste de ping para verificar o pacote do encaminhamento lento do sistema 6000 da convergência de rede (NCS6K).

Pré-requisitos

Requisitos

Os leitores deste documento devem estar cientes destes tópicos:

- Roteamento IP básico.
- Sistema operacional XR.

Componentes Utilizados

Este documento é criado para a plataforma NCS6K.

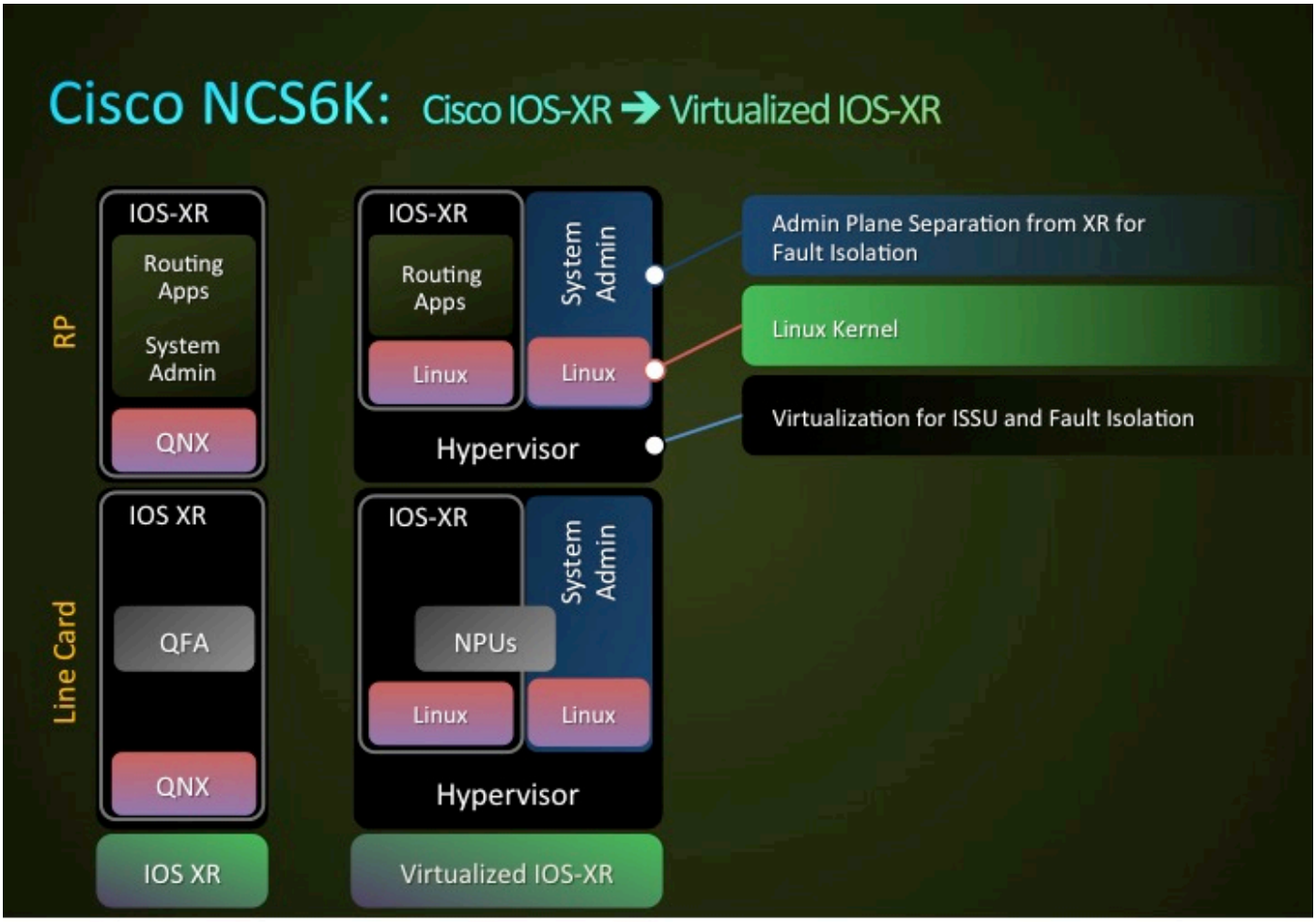
As informações neste documento foram criadas a partir de dispositivos em um ambiente de laboratório específico. Todos os dispositivos utilizados neste documento foram iniciados com uma configuração (padrão) inicial. Se a sua rede estiver ativa, certifique-se de que entende o impacto potencial de qualquer comando.

Informações de Apoio

Há uma diferença chave entre NCS6K e a plataforma tradicional IOS-XR: NCS6K utiliza a tecnologia da virtualização para acumular o sistema. Cada nó, o processador de roteamento (RP)

ou o line card (LC), pode executar diversas máquinas de Vitual (VM) como o System Admin VM, IOS-XR VM1, IOS-XR VM2 etc., que combinou para criar junto inteiramente a - nó funcional XR. A figura de seguimento mostra a um exemplo aonde o RP e o LC executam um IOS-XR VM:

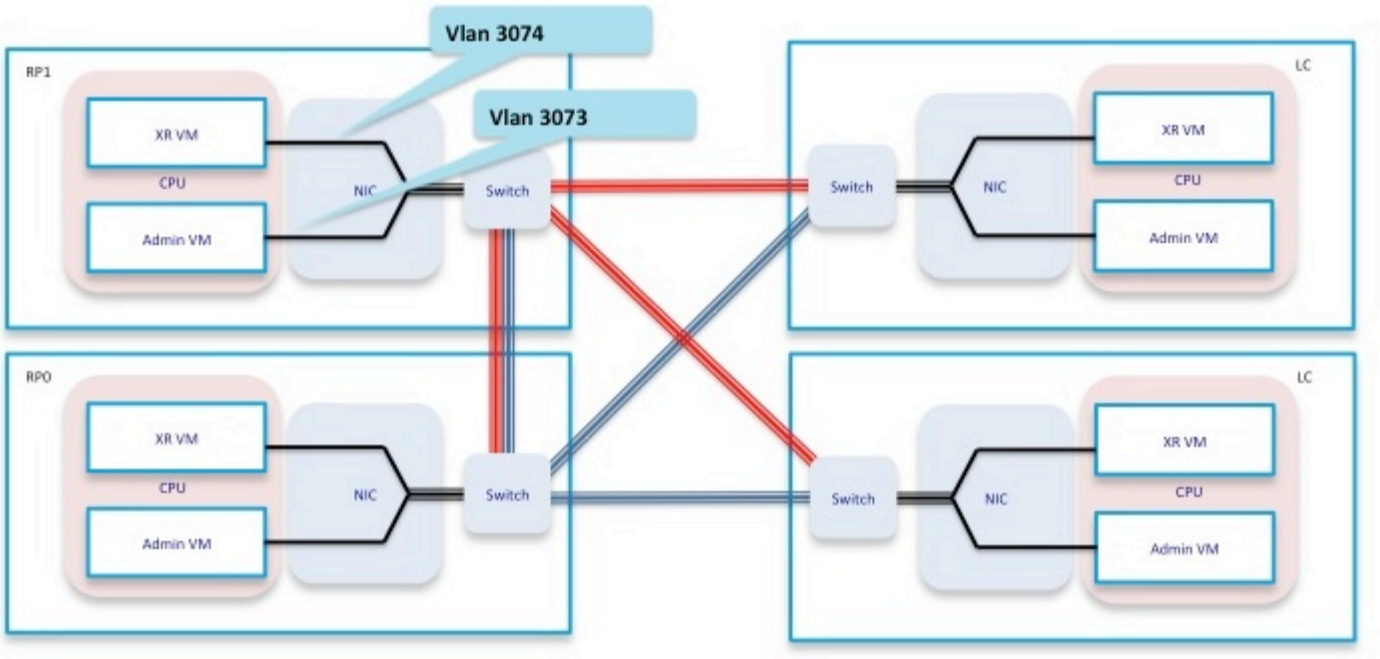
Figura 1



Há uma rede Ethernet do controle para conectar RP e LC. O tráfego plano do controle entre RP e LC passará através desta rede Ethernet do controle. Desde que este é um ambiente do virtulization, as perguntas como como este o pacote é entregado ao VM específico e como o Nicantic (NIC) no RP ou no LC sabe um pacote são-lhes destinadas?

Em resumo, os VLAN são usados para diferenciar o tráfego de VM diferentes e este processo é feito pelo NIC. Figura 2 mostra como o NIC entregará o tráfego VLAN 3074 a IOS-XR VM, e tráfego VLAN 3073 a Admin VM.

Figura 2

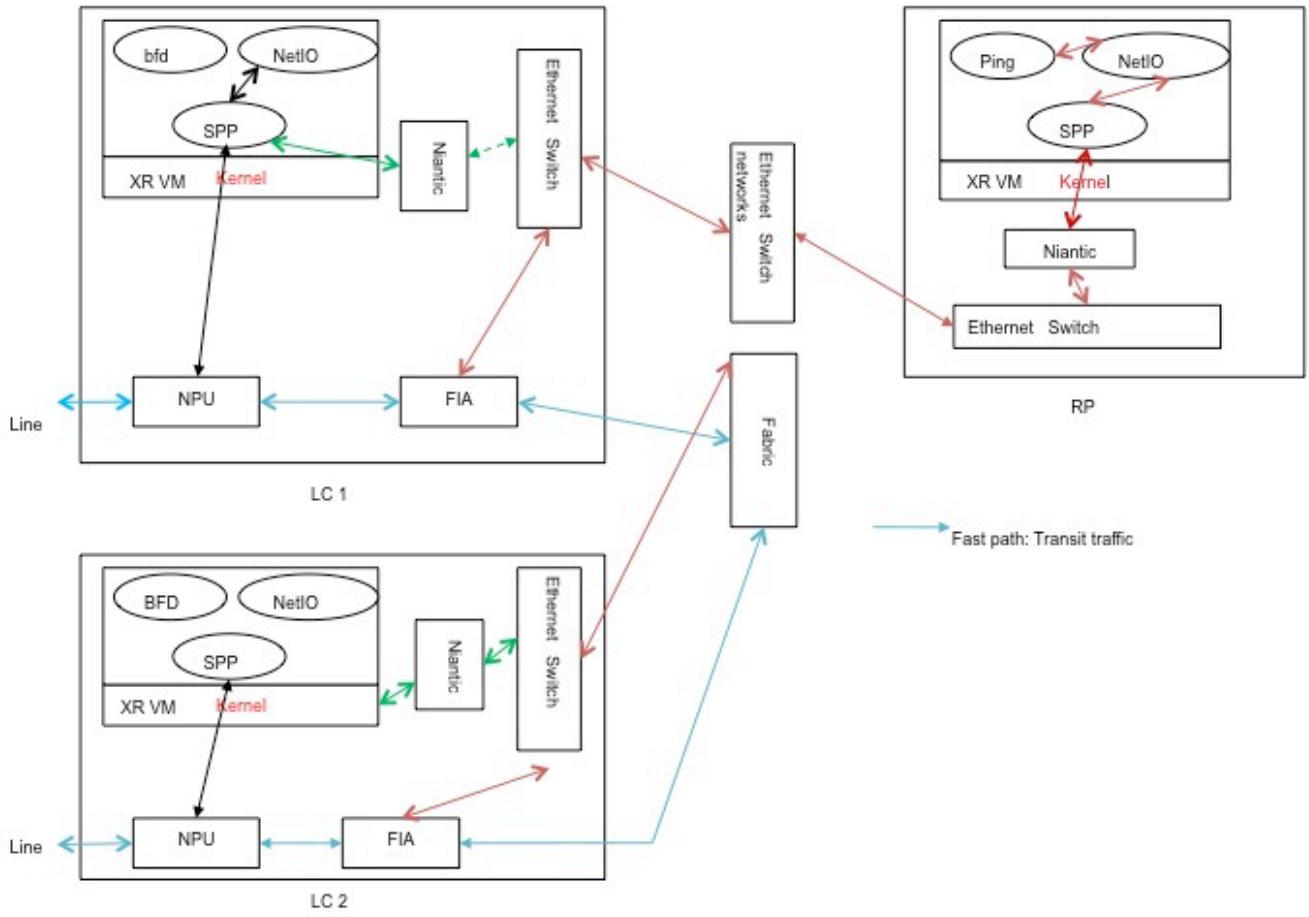


Unindo estes componente da transmissão, você obtém um trajeto de encaminhamento simplificado para a encenação do teste de ping segundo as indicações de figura 3.

Ao fazer um teste de ping do RP, os pacotes tomam o seguinte trajeto de encaminhamento dentro da caixa:

RP_PING < — > RP_NETIO < — > RP_SPP < — > RP_Linux_Kernel_Socket < — > interruptor < — > LC_FIA < — > LC_NPU (inclua o PSE, o PLIM_ASIC) < — > linha

Figura 3



Verificar

Para o resto do documento, uma encenação onde um sibilo seja iniciado do RP será tomada como um exemplo. O sibilo seria iniciado diretamente a um host conectado em Te0/0/0/2/0. As seguintes etapas mostrarão uma aproximação passo a passo para verificar o trajeto deste pacote de ping.

```
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. **"mostre o tráfego do IPv4" contrário no nó RP, mostrará quantos ecos do Internet Control Message Protocol (ICMP) foram mandados e quantos a resposta de ICMP retornou.**

```
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. **Verifique o componente do entrada/saída da rede (NETIO).**A próxima etapa é verificar o contador da corrente RP FINT NETIO. Você tem que ver "PARA FORA" o contrário do nó do IPv4 na corrente do netio. Se incrementa, significa que os pacotes alcançaram o componente NETIO e estão sendo mandados do componente NETIO.

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
```

Você pode igualmente usar o comando “show_netio_fwder_stats de KornShell (KSH) - g” verificar se injete/incrementos contrários do pontapé ou não. **Note**: No ambiente de produção, pode haver o outro tráfego de background que faz duro verificar se os pacotes de ping alcançaram este componente ou não. Como uma ação alternativa, você pode usar o número grande de pacotes com intervalo 0: do “tempo 0" da contagem 10000 sibilo x.x.x.x e verificação se o contador incrementa de repente ou tem um ponto.

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. **Verifique os SPP componentes.**Use SPP CLI para ver se o pacote alcançou SPP ou não.

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. **Use ferramentas do tcpdump para despejar o pacote do componente do kernel (centro) de Linux.** Da saída abaixo, sob NCS6K XR VM KSH, você pode ver diversas relações secundárias:

```
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-vf1.514 é usado para uma comunicação com a relação de Mgmtehter mas você não pode ver o endereço do IPv4. A relação de Mgmtether em XR VM confia na pilha de IP de IOS-XR em vez da pilha de IP em Linux.**ether-vf1.3073** é usado para uma comunicação com o Admin VM.**eher-vf1.3074** é usado para o tráfego plano relativo VM do controle XR. O pacote do teste de ping passará através desta secundário-relação (que usa a pilha de protocolos da rede de Linux). O tcpdump associado com Linux tem o lote das opções em como despejar o tráfego interessante. Além, você pode usar ferramentas do tcpdump para aspirar o tráfego plano do controle do roteador do domínio seguro (SDR) (3074 vlan) ou para aspirar o outro tráfego como uma comunicação do Inter Process Communication (IPC) em 3073 vlan.

```
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]
```

Note: Desde que é encenação VM, o tráfego enviado ao VM pode ser encapsulado com endereço da relação VM no cabeçalho externo de modo que este tráfego possa alcançar a relação VM.

A descarga acima do pacote é foi encapsulada realmente com o encabeçamento de pacote de UDP com fonte/destino 172.0.16.1, que é o endereço IP de Um ou Mais Servidores Cisco ICM NT eth-vf1.3074 em IOS-XR VM. **Note**: As captações tomadas são demonstrar a aproximação e não têm o tráfego do Internet Control Message Protocol (ICMP).

5. **Verificando o componente FIA na placa de linha.**

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. **Verifique contadores do motor do packet switching (PSE).**

```
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. Verificar o módulo de interface da camada física (PLIM) ASIC opõe-se.

```
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. Verifique da “contadores da relação mostra”.Éboa ideia verificar isto na primeira etapa mas em ordem do fluxo de pacote de informação este seria durar. Ajuda a identificar se o pacote esteve enviado à linha, e se o pacote esteve retornado da linha. Pode ajudar a reduzir para baixo se o problema é dentro da caixa ou da parte externa desta caixa.

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
```