

使用Ping测试检验NCS6K慢速转发数据包路径

目录

[简介](#)

[先决条件](#)

[要求](#)

[使用的组件](#)

[背景信息](#)

[验证](#)

[相关的思科支持社区讨论](#)

简介

Ping数据包测试通常用于排除连接问题。 本文档将说明使用ping测试来检查网络融合系统6000(NCS6K)慢速转发数据包的系统方法。

先决条件

要求

本文档的读者应掌握以下这些主题的相关知识：

- 基本IP路由。
- XR操作系统。

使用的组件

本文档针对NCS6K平台创建。

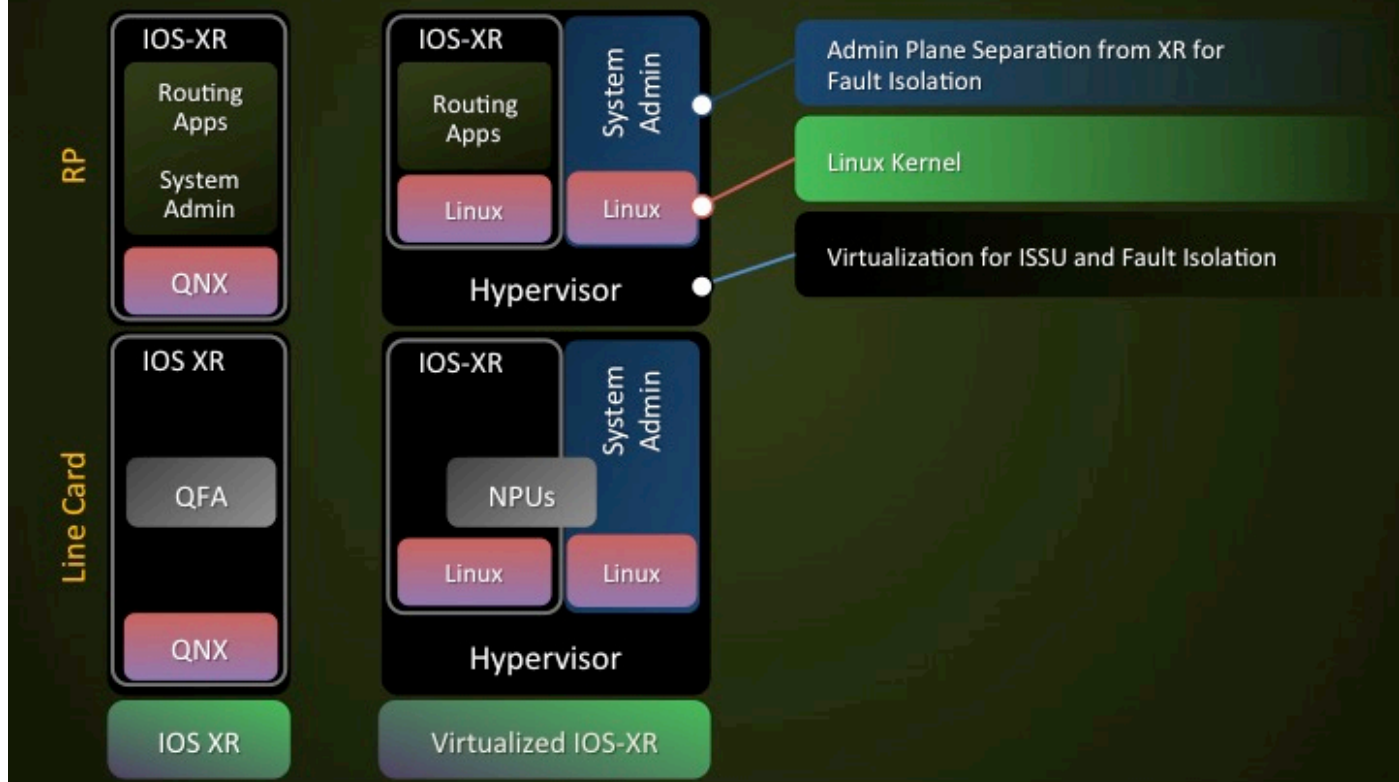
本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

背景信息

NCS6K与传统IOS-XR平台有一个关键区别：NCS6K利用虚拟化技术构建系统。每个节点(路由处理器(RP)或线卡(LC))可以运行多个虚拟机(VM)，如系统管理VM、IOS-XR VM1、IOS-XR VM2等，这些节点结合在一起可创建一个功能齐全的XR节点。下图显示RP和LC运行一个IOS-XR VM的示例：

图 1

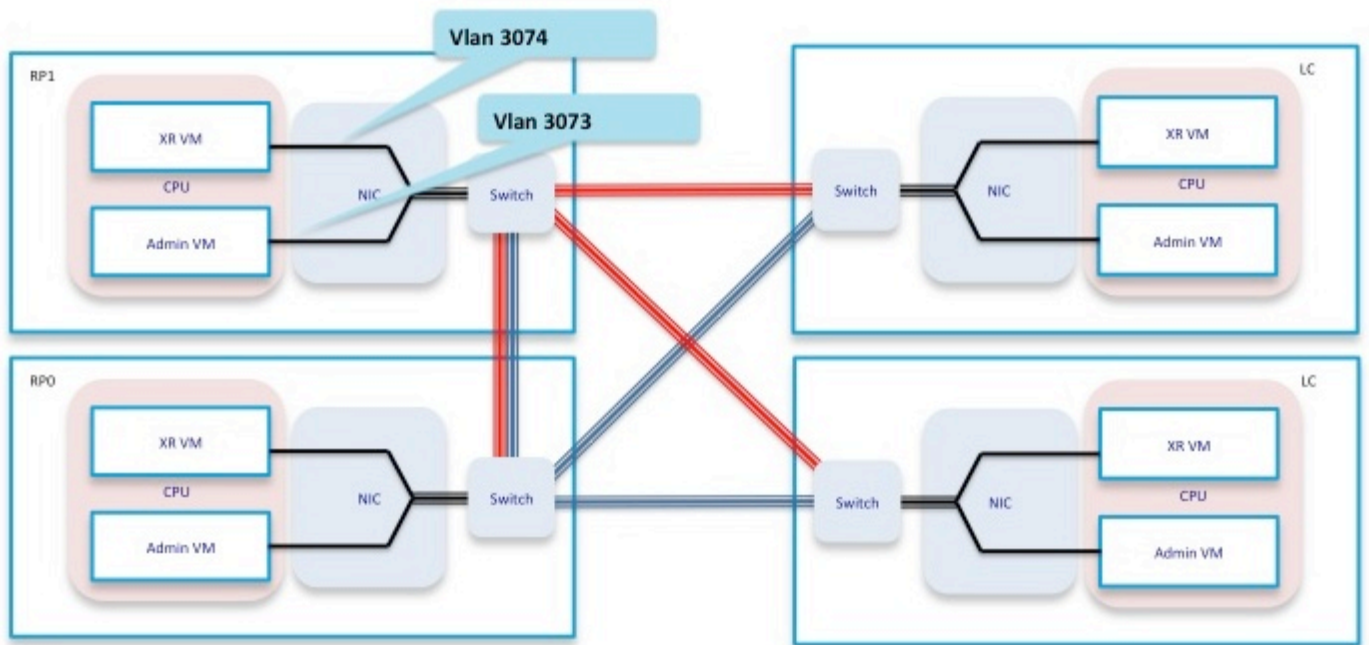
Cisco NCS6K: Cisco IOS-XR → Virtualized IOS-XR



有一个控制以太网网络来连接RP和LC。RP和LC之间的控制平面流量将通过此控制以太网网络。由于这是虚拟化环境，因此会出现以下问题：如何将这些数据包传送到特定虚拟机，以及RP或LC中的NIC如何知道发往它们的数据包？

简而言之，VLAN用于区分不同虚拟机的流量，此过程由NIC完成。图2显示NIC如何将VLAN 3074流量传送到IOS-XR虚拟机，将VLAN 3073流量传送到管理VM。

图 2

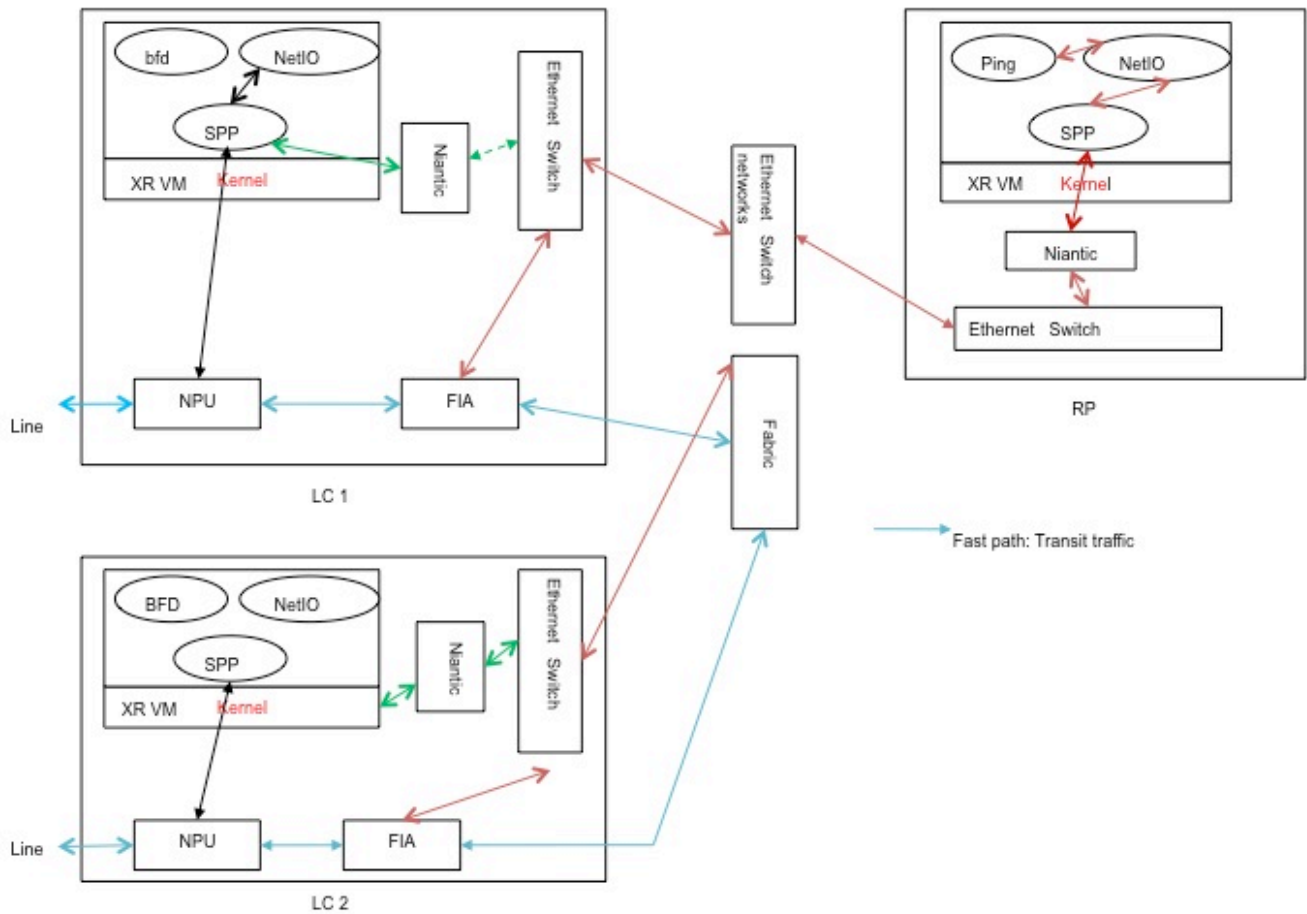


将这些转发组件组合在一起，您可以获得用于ping测试场景的简化转发路径，如图3所示。

从RP执行ping测试时，数据包在机箱内采用以下转发路径：

RP_PING \longleftrightarrow RP_NETIO \longleftrightarrow RP_SPP \longleftrightarrow RP_Linux_Kernel_Socket \longleftrightarrow 交换机 \longleftrightarrow
 LC_FIA \longleftrightarrow LC_NPU (包括PSE、PLIM_ASIC) \longleftrightarrow 线路

图 3



验证

在本文档的其余部分，将以从RP发起ping的场景为例。将向Te0/0/0/2/0上的直连主机发起ping操作。以下步骤将逐步显示验证此ping数据包路径的方法。

```
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节点上的“show IPv4 traffic”计数器将显示已发送的互联网控制消息协议(ICMP)回应数和已返回的ICMP应答数。

```
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. 检查网络输入输出(NETIO)组件。下一步是检查RP FINT NETIO链计数器。您必须看到网络链中IPv4节点的“OUT”计数器。如果增加，则意味着数据包已到达NETIO组件，并正从NETIO组件发出。

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
```

您还可以使用KornShell(ksh)命令“show_netio_fwder_stats -g”检查注入/punt计数器是否增加。

注意：在生产环境中，可能存在其他后台流量，这使得很难检查ping数据包是否到达此组件。解决方法是，可以使用超时为0的大量数据包：“ping x.x.x.x count 10000 time 0”并检查计数器是突然增加还是出现峰值。

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. 检查SPP组件。使用SPP CLI查看数据包是否到达SPP。
Check initial counter value.**

```
RP/0/RP0/CPU0:NCS6k-Deploy#sh spp node-counters
0/0/CPU0:
pdma/rx
      slicel high pkts:          10
-----
pdma/tx
      slicel 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
      slicel high pkts:          10
-----
pdma/tx
      slicel 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. 使用tcpdump工具转储来自Linux内核组件的数据包。 从以下输出中，在NCS6K XR VM ksh下，您可以看到几个子接口：

```

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用于与Mgmtether接口通信，但您看不到IPv4地址。XR VM中的Mgmtether接口依赖于IOS-XR的IP堆栈，而不是Linux中的IP堆栈。**ether-vf1.3073**用于与管理VM通信。**ether-vf1.3074**用于XR VM相关控制平面流量。Ping测试数据包将通过此子接口（使用Linux网络协

议栈)。与Linux关联的Tcpcdump在如何转储相关流量方面有许多选项。此外，您可以使用tcpcdump工具嗅探安全域路由器(SDR)控制平面流量(vlan 3074)或嗅探VLAN 3073中的进程间通信(IPC)通信等其他流量。

```
xr-vm_node0_RPO_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]

注意：由于是VM方案，发送到VM的流量可以使用外部报头中的VM接口地址进行封装，以便此流量可以到达VM接口。

上述数据包转储实际上是使用源/目标地址为172.0.16.1的UDP数据包报头封装的，该地址为IOS-XR VM中的eth-vf1.3074 ip地址。 **注意：**采用的捕获是为了演示该方法，并且没有Internet控制消息协议(ICMP)流量。

5. 正在检查FIA组件在线卡。

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:
```



```

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. 正在检查物理层接口模块(PLIM)ASIC计数器。

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:

!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!
!!

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 plimasic 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
Length Error : 0
Tail Drop: HP Queue : 0
Abort : 0
Giant : 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
65to127 Byte Packets : 3250
256to511 Byte Packets : 0
1024to1518 Byte Packets : 0
1523to1548 Byte Packets : 0
2001to_MRU Byte 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
64 Byte Packets : 6
128to255 Byte Packets : 0
512to1023 Byte Packets : 0
1519to1522 Byte Packets : 0
1549to2000 Byte Packets : 0
Non Pause BPDUs : 0

Dropped Packets

=====

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

Rx Packet Drop Details

=====

Unknown Dest MAC Pkts : 0
Unknown E-Type Pkts : 0
Unknown Encap Pkts : 0
Unknown VLAN Pkts : 0
L2 Subif VLAN Deny Pkts : 0
Unknown Encap Bytes : 0
Unknown VLAN Bytes : 0
L2 Subif VLAN Deny Bytes : 0

Rx Accepted Packet Details

=====

Packet HPQ CTL Sent : 6
Packet HPQ HP Sent : 0
Packet LPQ LP1 Sent : 0
Packet LPQ LP2 Sent : 0
Bytes HPQ CTL Sent : 384
Bytes HPQ HP Sent : 0
Bytes LPQ LP1 Sent : 0
Bytes LPQ LP2 Sent : 0

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