

使用Ping测试，验证NCS6K缓慢的转发信息包路径

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简介

Ping信息包测验是排除故障连通性问题的常用的测验。本文将说明一系统化的方法为使用ping测试检查网络收敛系统6000 (NCS6K)缓慢的转发数据包。

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

本文为NCS6K平台创建。

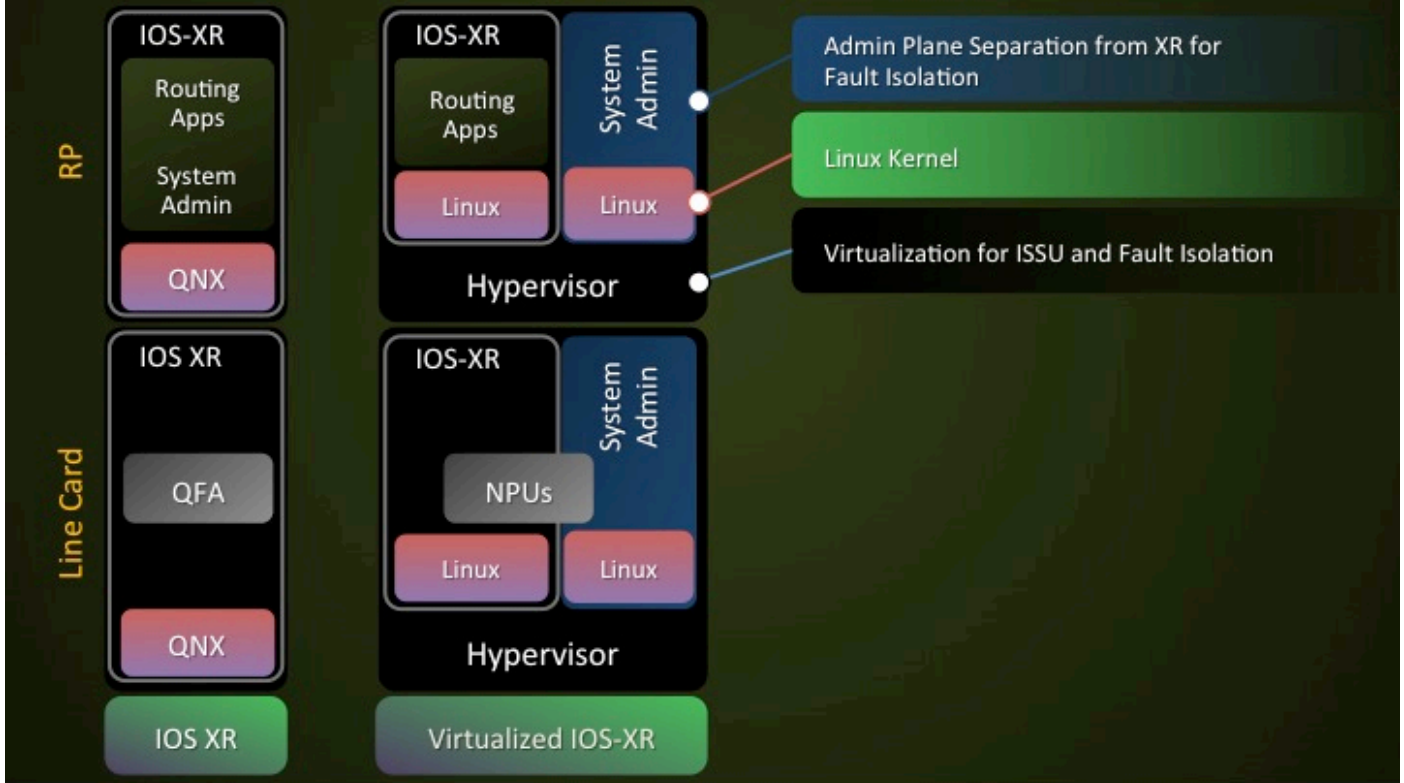
本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

背景信息

有NCS6K和传统IOS-XR平台之间的一关键区别：NCS6K使用虚拟化技术加强系统。每节点、路由处理器(RP)或线卡(LC)，可能运行几台Virtual机器(VM)类似系统管理员VM、IOS-XR VM1，IOS-XR VM2等，结合在一起创建一个功能完备的XR节点。跟随的图显示示例RP和LC运行一个IOS-XR VM的地方：

图 1

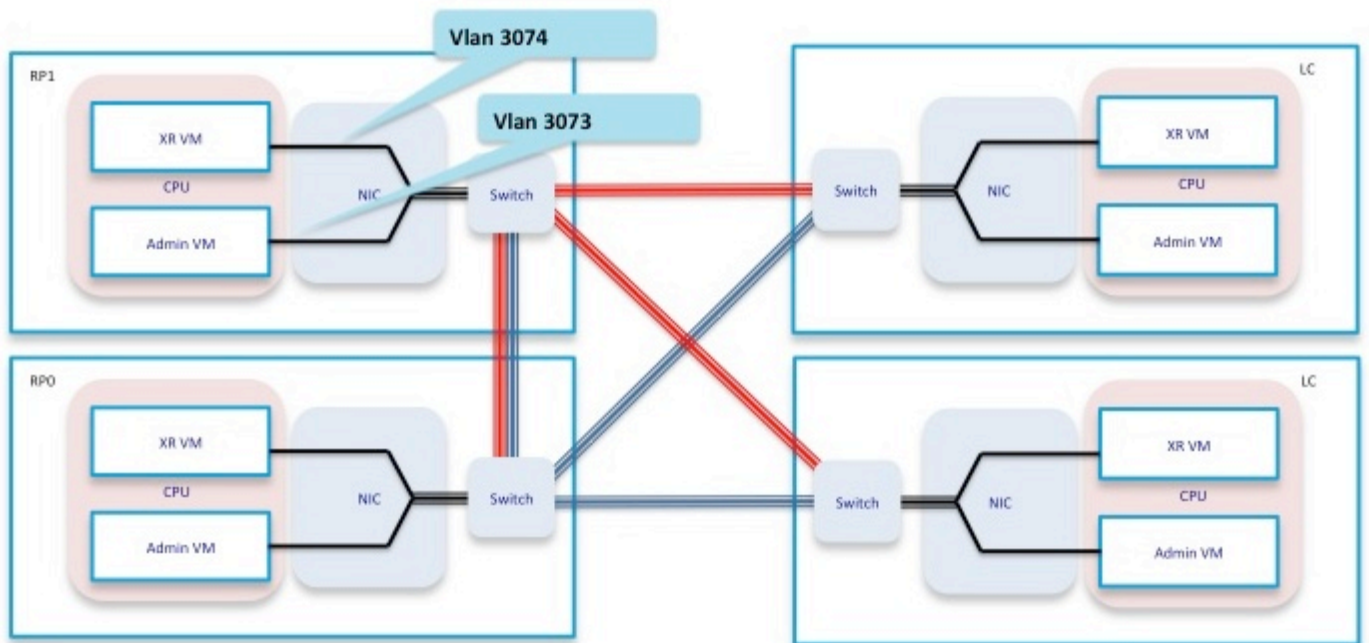
Cisco NCS6K: Cisco IOS-XR → Virtualized IOS-XR



有连接RP和LCs的控制以太网。RP和LCs之间的控制层面流量将穿过此控制以太网。因为这是 virtualization 环境，问题，如这些数据包如何传送对特定VM，并且Nicantic (NIC)在RP或LC如何知道数据包被注定对他们？

简言之，VLAN用于区分不同的VMs流量，并且此进程由NIC完成。图2显示NIC如何将提供VLAN 3074流量对IOS-XR VM和对Admin VM的VLAN 3073流量。

图 2

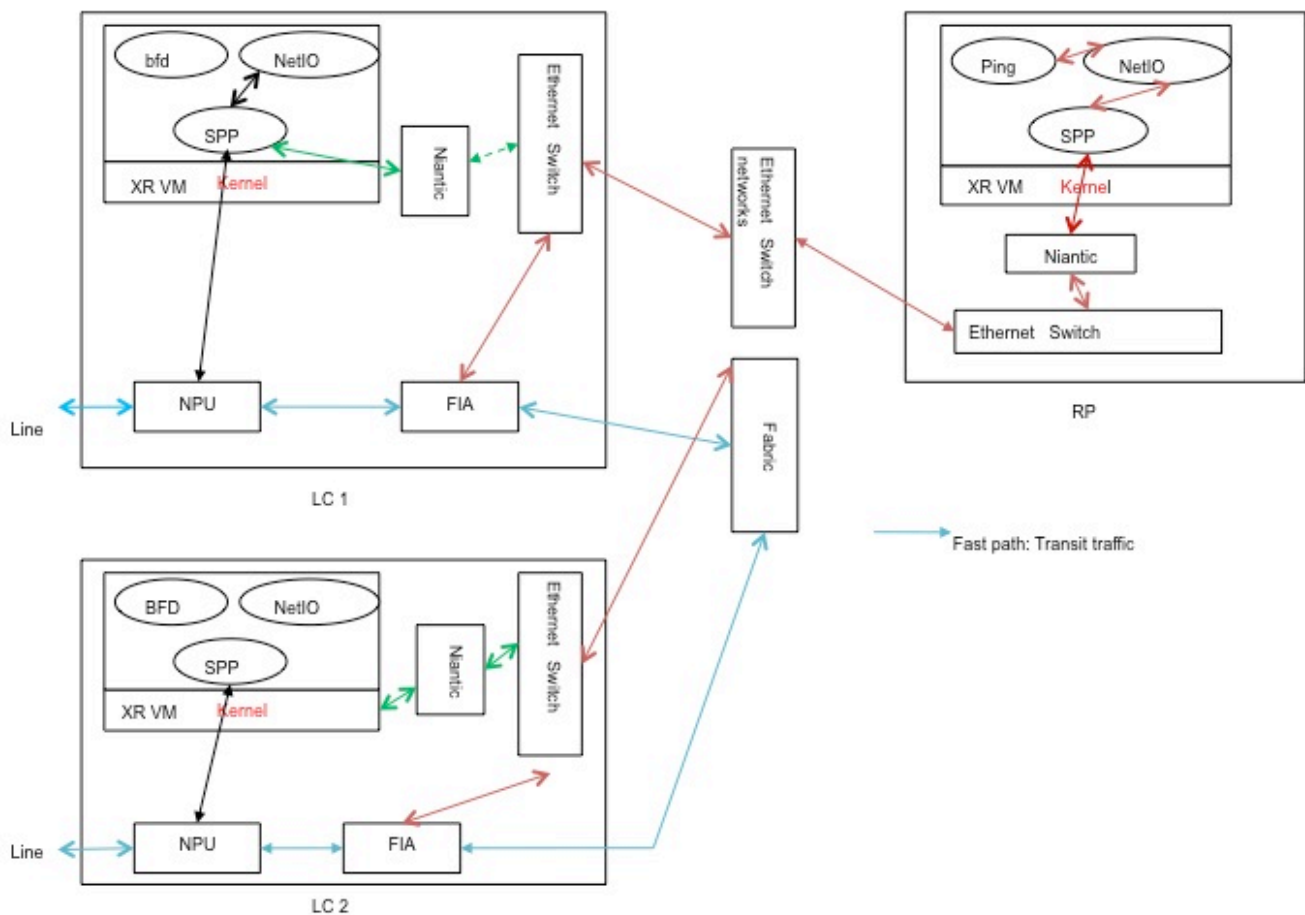


如图3.所显示，放置这些转发组件一起，您获得ping测试方案的简化的转发路径。

当进行从RP时的ping测试，数据包采取以下转发路径在方框里面：

RP_PING <—> RP_NETIO <—> RP_SPP <—> RP_Linux_Kernel_Socket <—> 交换机 <—> LC_FIA <—> LC_NPU (请包括PSE， PLIM_ASIC) <—> 线路

图 3



验证

对于本文的其余，ping从RP将启动的方案将被采取为例。ping将直接地启动到在Te0/0/0/2/0的一台连接的主机。以下步骤将显示一逐步方法验证此ping信息包路径。

```
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. “请显示IPv4在RP节点的流量”计数器，将显示多少互联网控制消息协议(ICMP)响应被派出了，并且多少ICMP回复返回。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
Frag: 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一系列计数器。您必须发现IPv4节点“OUT”计数器在netio一系列的。如果它增加，含义数据包到达了NETIO组件和从NETIO组件被派出。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
```

您能也使用KornShell (ksh)命令“show_netio_fwder_stats -g”检查是否请注入/平底船计数器增量。 **注意**：在生产环境，可能有使困难检查的其他后台流量ping信息包是否到达了此组件。作为应急方案，您能以超时0使用数据包大量：“ping x.x.x.x计数10000次0”和检查计数器是否突然增加或有尖峰。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. 检查组分的SPP。请使用SPP CLI发现数据包是否到达了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. 请使用tcpdump工具转存从Linux内核组件的数据包。 从输出下面，在NCS6K XR VM ksh下，您能看到几个子接口：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使用与Mgmtether接口的通信，但是您看不到
IPv4地址。在XR VM的Mgmtether接口依靠IOS-XR IP协议栈而不是在Linux的IP协议栈。
ether-vf1.3073使用与Admin VM的通信。ether-vf1.3074使用XR VM涉及的控制层面流量。
Ping测试数据包将穿过此sub-interface (使用Linux网络协议栈)。 Tcpdump关联与Linux有批次
关于怎样的选项转存关注数据流。另外，您能使用tcpdump工具探测安全域路由器(SDR)控制
层面流量(VLAN 3074)或探测其他流量类似在VLAN 3073的Inter Process Communication
(IPC)通信。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] **注意**：因为它是VM方案，流量发送对VM可能用VM在外面报头的接口地址封装，以便此流量能到达VM接口。

上述数据包转储是用与来源/目的地172.0.16.1的UDP数据包报头实际上封装，是eth-vf1.3074在IOS-XR VM的IP地址。 **注意**：被采取的捕获是展示方法，并且没有互联网控制消息协议(ICMP)流量。

5. 检查在线卡的FIA组件。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:

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

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. 检查信息包交换的引擎(PSE)计数器。 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:

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

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. 检查物理层接口模块(PLIM) ASIC抵抗。 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

=====


```

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. 检查“show interface”计数器。是好想法检查此在第一步，但是依顺序数据包流这最后。它帮助识别，如果数据包发送到线路，并且，如果数据包从线路返回。它可帮助缩小问题是否是在箱或外部此方框里面。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,

```