在Cisco ASR 1000系列服务路由器的丢包

目录

简介

本文提供信息关于怎样排除故障在Cisco® ASR 1000系列聚合服务路由器的丢包问题。

先决条件

要求

本文档没有任何特定的要求。

使用的组件

本文档中的信息基于以下软件和硬件版本：

- 所有Cisco ASR 1000系列汇聚服务路由器，包括1002， 1004和1006

- 支持Cisco ASR 1000系列汇聚服务路由器的Cisco IOS XE软件软件版本2.3.0

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。

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

ASR 1000系列路由器数据包流

高层次数据包流

Cisco ASR 1000系列路由器包括在system:的这些功能元件

- Cisco ASR 1000系列路由处理器1 (RP1)
- Cisco ASR 1000系列嵌入式服务处理器(ESP)
- Cisco ASR 1000系列SPA接口处理器(SIP)

Cisco ASR 1000系列路由器介绍Cisco QuantumFlow处理器(QFP)作为他们的硬件体系结构。在根据的QFP中体系结构，所有信息包通过ESP转发，如此，如果问题在ESP发生，转发终止。

图1有双重路由处理器、双重ESP和三个饮者的思科ASR 1006系统

参考的Cisco ASR 1000系列汇聚服务路由器欲知更多信息。

排除故障的步骤为在Cisco ASR 1000系列服务路由器的丢包

丢包点

在路由处理器(RP)、嵌入式服务处理器(ESP)， SPA接口处理器(SIP)和共享端口适配器是构件的Cisco ASR 1000系列路由器(SPA)。所有信息包通过在每个模块的ASIC转发。

图2 Cisco ASR 1000系列系统数据路径图表

有显示的丢包几个点在Cisco ASR 1000系列路由器的表1。

表丢包1点

模块	功能组件
SPA	从属于接口类型
SIP	IO控制处理器(IOCP) SPA聚合ASIC互连ASIC
ESP	思科QuantumFlow处理器(QFP)转发控制处理器(FECP)互连ASIC QFP子系统。QFP子系统包括这些组件： • 数据包处理器引擎(PPE) • 缓冲、队列和日程安排(BQS) • 输入信息包模块(IPM)

	• 输出数据包模块(OPM) • 全局数据包内存(GPM)
RP	Linux共享内存平底船接口(LSMPI)互连ASIC

获得关于丢包的信息

如果遇到一意外的丢包，您必须确保，信息包计数器的控制台输出、差异和再生产步骤为排除故障是可用的。为了确定原因，第一步是尽可能多的获取该问题的大量信息。此信息是必要的以确定问题的原因：

- 控制台日志 - 有关详细信息，请参阅为控制台连接应用正确的终端仿真器设置。
- **系统日志信息**—如果设置路由器发送日志到系统日志服务器，您能得到关于发生什么的信息。参考如何配置Syslog的Cisco设备欲知更多信息。
- **显示平台**— **show platform命令**显示RP、ESP、温泉和电源的状态。
- **show tech-support** — **show tech-support命令**是包括**show version**和**show running-config**许多不同的命令的编译。当路由器遇到问题时， Cisco技术支持中心(TAC)工程师通常请求此信息排除故障硬件问题。您必须收集**show tech-support**，在您执行重新加载或关机并重新开机前，因为这些操作能造成关于问题的信息丢失。**注意： show tech-support命令不**包括**显示平台**或**show logging**命令。
- **再生产步骤**(若有) —再次产生问题的步骤。如果不能繁殖，请在丢包时检查条件。
- **SPA计数器信息**—请参阅SPA计数器部分。
- **SIP计数器信息**—请参阅SIP计数器部分。
- **ESP计数器信息**—请参阅ESP计数器部分。
- **RP计数器信息**—请参阅RP计数器部分。

List命令收集计数器信息

有排除故障信息包转发的许多平台特定的可以使用的命令。收集这些命令是否打开TAC服务请求。为了识别计数器的差异，请收集这些命令几次。粗体字符命令是特别有用的开始故障排除。**排除_0_**选项有效导致与相反排除0。

SPA

```
show interfaces <interface-name> show interfaces <interface-name> accounting show interfaces
<interface-name> stats
```

SIP

```
show platform hardware port <slot/card/port> plim statistics
show platform hardware subslot {slot/card} plim statistics
show platform hardware slot {slot} plim statistics
show platform hardware slot {0|1|2} plim status internal
show platform hardware slot {0|1|2} serdes statistics
```

ESP

```
show platform hardware slot {f0|f1} serdes statistics
show platform hardware slot {f0|f1} serdes statistics internal
show platform hardware qfp active bqs 0 ipm mapping
show platform hardware qfp active bqs 0 ipm statistics channel all
show platform hardware qfp active bqs 0 opm mapping
show platform hardware qfp active bqs 0 opm statistics channel allshow platform hardware qfp
active statistics drop | exclude _0_ show platform hardware qfp active interface if-name
```

```
<Interface-name> statistics show platform hardware qfp active infrastructure punt statistics
type per-cause | exclude _0_ show platform hardware qfp active infrastructure punt statistics
type punt-drop | exclude _0_ show platform hardware qfp active infrastructure punt statistics
type inject-drop | exclude _0_ show platform hardware qfp active infrastructure punt statistics
type global-drop | exclude _0_ show platform hardware qfp active infrastructure bqs queue output
default all show platform hardware qfp active infrastructure bqs queue output recycle all !---
The if-name option requires full interface-name
```

RP

```
show platform hardware slot {r0|r1} serdes statistics
show platform software infrastructure lsmpi
```

SPA计数器

请使用一通用的丢包故障排除SPA以及其他平台。**clear counters命令**是有用的查找计数器的差异。

为了显示在路由器配置的所有接口的统计信息，请使用此命令：

```
Router#show interfaces TenGigabitEthernet 1/0/0 TenGigabitEthernet1/0/0 is up, line protocol is
up Hardware is SPA-1X10GE-L-V2, address is 0022.5516.2040 (bia 0022.5516.2040) Internet address
is 192.168.1.1/24 MTU 1500 bytes, BW 10000000 Kbit, DLY 10 usec, reliability 255/255, txload
1/255, rxload 1/255 Encapsulation ARPA, loopback not set Keepalive not supported Full Duplex,
10000Mbps, link type is force-up, media type is 10GBase-LR output flow-control is on, input
flow-control is on ARP type: ARPA, ARP Timeout 04:00:00 Last input 00:00:59, output 00:00:46,
output hang never Last clearing of "show interface" counters never Input queue: 0/375/415441/0
(size/max/drops/flushes); Total output drops: 0 Queueing strategy: fifo Output queue: 0/40
(size/max) 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0
packets/sec 510252 packets input, 763315452 bytes, 0 no buffer Received 3 broadcasts (0 IP
multicasts) 0 runts, 0 giants, 0 throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 watchdog, 0 multicast, 0 pause input 55055 packets output, 62118229 bytes, 0 underruns 0
output errors, 0 collisions, 2 interface resets 0 babbles, 0 late collision, 0 deferred 0 lost
carrier, 0 no carrier, 0 pause output 0 output buffer failures, 0 output buffers swapped out
```

为了显示是根据协议数据包的统计信息，请使用此命令：

```
Router#show interfaces TenGigabitEthernet 1/0/0 accounting TenGigabitEthernet1/0/0 Protocol Pkts
In Chars In Pkts Out Chars Out Other 15 900 17979 6652533 IP 510237 763314552 37076 55465696 DEC
MOP 0 0 1633 125741 ARP 15 900 20 1200 CDP 0 0 16326 6525592
```

为了显示是交换的进程数据包的统计信息，快速交换式或者分布式交换式，使用此命令：

```
Router#show interfaces TenGigabitEthernet 1/0/0 stats TenGigabitEthernet1/0/0 Switching path
Pkts In Chars In Pkts Out Chars Out Processor 15 900 17979 6652533 Route cache 0 0 0 0
Distributed cache 510252 763315452 55055 62118229 Total 510267 763316352 73034 68770762
```

SIP计数器

Cisco ASR 1000系列SIP不参加信息包转发。它在系统安置温泉。入口数据包的SIP提供信息包优先级划分从温泉和一个大入口破裂了等候转移到将处理的ESP的入口数据包的吸收缓冲区。出口缓冲在流量管理器集中并且提供以出口队列的形式在SIP。Cisco ASR 1000系列路由器能通过配置入口和出口分类指定优先级流量，不仅在ESP级别，而且在系统中。缓冲(入口和出口)加上背压到/从ESP在系统提供处理超额预订。

图3 Cisco ASR 1000系列路由器入口队列。 SIP的图4结构图。

为了每在SPA聚合ASIC的端口队列丢弃计数器显示，请使用此命令：

```
Router#show platform hardware port 1/0/0 plim statistics Interface 1/0/0 RX Low Priority RX Drop
Pkts 0 Bytes 0 RX Err Pkts 0 Bytes 0 TX Low Priority TX Drop Pkts 0 Bytes 0 RX High Priority RX
Drop Pkts 0 Bytes 0 RX Err Pkts 0 Bytes 0 TX High Priority TX Drop Pkts 0 Bytes 0
```

为了每在SPA聚合ASIC的SPA计数器显示，请使用此命令：

```
Router#show platform hardware subslot 1/0 plim statistics 1/0, SPA-1XTENGE-XFP-V2, Online RX
Pkts 510252 Bytes 763315452 TX Pkts 55078 Bytes 62126783 RX IPC Pkts 0 Bytes 0 TX IPC Pkts 0
Bytes 0
```

为了显示在SPA聚合ASIC的所有SPA计数器，请使用此命令：

```
Router#show platform hardware slot 1 plim statistics 1/0, SPA-1XTENGE-XFP-V2, Online RX Pkts
510252 Bytes 763315452 TX Pkts 55078 Bytes 62126783 RX IPC Pkts 0 Bytes 0 TX IPC Pkts 0 Bytes 0
1/1, SPA-5X1GE-V2, Online RX Pkts 42 Bytes 2520 TX Pkts 65352 Bytes 31454689 RX IPC Pkts 0 Bytes
0 TX IPC Pkts 0 Bytes 0 1/2, Empty 1/3, Empty
```

为了显示聚集了到/从互连ASIC的rx/tx计数器在SPA聚合ASIC，使用此命令。Rx计数器含义从SPA的输入信息包;Tx计数器含义输出数据包对SPA。

```
Router#show platform hardware slot 1 plim status internal FCM Status XON/XOFF 0x0000000F00000000
ECC Status Data Path Config MaxBurst1 256, MaxBurst2 128, DataMaxT 32768 Cal Length RX 0x0002,
TX 0x0002 Repetitions RX 0x0010, TX 0x0010 Data Path Status RX in sync, TX in sync Spi4 Channel
0, Rx Channel Status Starving, Tx Channel Status Starving Spi4 Channel 1, Rx Channel Status
Starving, Tx Channel Status Starving RX Pkts 510294 Bytes 765359148 TX Pkts 120430 Bytes
94063192 Hypertransport Status RX Pkts 0 Bytes 0 TX Pkts 0 Bytes 0
```

为了显示从ESP互连ASIC的rx计数器在SIP请互联ASIC，使用此命令：

```
Router#show platform hardware slot 1 serdes statistics From Slot F0 Pkts High: 0 Low: 120435
Bad: 0 Dropped: 0 Bytes High: 0 Low: 94065235 Bad: 0 Dropped: 0 Pkts Looped: 0 Error: 0 Bytes
Looped 0 Qstat count: 0 Flow ctrl count: 196099
```

ESP计数器

ESP提供集中化转发引擎负责对处理任务的大多数数据平面。所有网络流量通过Cisco ASR 1000系列路由器流经ESP。

ESP的图5结构图。 图6思科QuantumFlow处理器基本体系结构

参考思科QuantumFlow处理器：思科的下一代网络处理器欲知更多信息。

为了显示从RP的rx计数器，在ESP互连ASIC的SIP互连ASIC，使用此命令：

```
Router#show platform hardware slot F0 serdes statistics From Slot R0 Pkts High: 70328 Low: 13223
Bad: 0 Dropped: 0 Bytes High: 31049950 Low: 10062155 Bad: 0 Dropped: 0 Pkts Looped: 0 Error: 0
Bytes Looped 0 Qstat count: 0 Flow ctrl count: 311097 From Slot 2 <snip>
```

为了显示内部链路信息包计数器和错误计数器，请使用此命令：

```
Router#show platform hardware slot F0 serdes statistics internal Network-Processor Link: Local
TX in sync, Local RX in sync From Network-Processor Packets: 421655 Bytes: 645807536 To Network-
Processor Packets: 83551 Bytes: 41112105 RP/ESP Link: Local TX in sync, Local RX in sync Remote
TX in sync, Remote RX in sync To RP/ESP Packets: 421650 Bytes: 645807296 Drops Packets: 0 Bytes:
0 From RP/ESP Packets: 83551 Bytes: 41112105 Drops Packets: 0 Bytes: 0 <snip>
```

为了检查映射输入信息包模块(IPM)信道和其他组件，请使用此命令：

```
Router#show platform hardware qfp active bqs 0 ipm mapping BQS IPM Channel Mapping Chan Name
Interface Port CFIFO 1 CC3 Low SPI1 0 1 2 CC3 Hi SPI1 1 0 3 CC2 Low SPI1 2 1 <snip>
```

为了显示每个信道的统计信息在输入信息包模块(IPM)，请使用此命令：

```
Router#show platform hardware qfp active bqs 0 ipm statistics channel all BQS IPM Channel
Statistics Chan GoodPkts GoodBytes BadPkts BadBytes 1 - 0000000000 0000000000 0000000000
0000000000 2 - 0000000000 0000000000 0000000000 0000000000 3 - 0000000000 0000000000 0000000000
0000000000 <snip>
```

为了检查映射输出数据包模块(OPM)信道和其他组件，请使用此命令：

```
Router#show platform hardware qfp active bqs 0 opm mapping BQS OPM Channel Mapping Chan Name
Interface LogicalChannel 0 CC3 Low SPI1 0 1 CC3 Hi SPI1 1 2 CC2 Low SPI1 2 <snip>
```

为了显示每个信道的统计信息在输出数据包模块(OPM)，请使用此命令：

```
Router#show platform hardware qfp active bqs 0 opm statistics channel all BQS OPM Channel
Statistics Chan GoodPkts GoodBytes BadPkts BadBytes 0 - 0000000000 0000000000 0000000000
0000000000 1 - 0000000000 0000000000 0000000000 0000000000 2 - 0000000000 0000000000 0000000000
0000000000 <snip>
```

为了显示丢包统计信息所有接口的在数据包处理器引擎(PPE)方面，请使用此命令。**此命令是有用的开始故障排除。**

```
Router#show platform hardware qfp active statistics drop ------------------------------------
------------------------ Global Drop Stats Octets Packets ------------------------------------
------------------------- AttnInvalidSpid 0 0 BadDistFifo 0 0 BadIpChecksum 0 0 <snip>
```

为了清除统计信息所有接口的丢包在数据包处理器引擎(PPE)方面，请使用此命令。此命令，在显示计数器后，清除。

```
Router#show platform hardware qfp active statistics drop clear --------------------------------
------------------------------ Global Drop Stats Octets Packets ------------------------------
------------------------------- AttnInvalidSpid 0 0 BadDistFifo 0 0 BadIpChecksum 0 0 <snip>
```

为了显示丢包统计信息每个接口的在数据包处理器引擎(PPE)里，请使用此命令。清除此计数器每10秒。

```
Router#show platform hardware qfp active interface if-name TenGigabitEthernet1/0/0 statistics
Platform Handle 6 ------------------------------------------------------------------ Receive Stats
Octets Packets ---------------------------------------------------------------- Ipv4 0 0 Ipv6 0
0 <snip> !--- The if-name option requires full interface-name
```

为了检查数据包的原因踢了对RP，使用此命令：

```
Router#show platform hardware qfp active infrastructure punt statistics type per-cause Global
Per Cause Statistics Number of punt causes = 46 Per Punt Cause Statistics Packets Packets
Counter ID Punt Cause Name Received Transmitted ------------------------------------------------
----------------------- 00 RESERVED 0 0 01 MPLS_FRAG_REQUIRE 0 0 02 IPV4_OPTIONS 0 0 <snip>
```

为了显示丢包统计信息平底船数据包的(对RP的ESP)，请使用此命令：

```
Router#show platform hardware qfp active infrastructure punt statistics type punt-drop Punt Drop
Statistics Drop Counter ID 0 Drop Counter Name PUNT_NOT_ENABLED_BY_DATA_PLANE Counter ID Punt
Cause Name Packets ------------------------------------------------------- 00 RESERVED 0 01
MPLS_FRAG_REQUIRE 0 02 IPV4_OPTIONS 0 <snip>
```

为了显示丢包统计信息为请注入数据包(对ESP的RP)，使用此命令。注入数据包从RP发送到大多数由IOSD生成的ESP。他们是L2保活、路由协议、管理协议类似SNMP等等。

```
Router#show platform hardware qfp active infrastructure punt statistics type inject-drop Inject
Drop Statistics Drop Counter ID 0 Drop Counter Name INJECT_NOT_ENABLED_BY_DATA_PLANE Counter ID
Inject Cause Name Packets ------------------------------------------------------------ 00
RESERVED 0 01 L2 control/legacy 0 02 CPP destination lookup 0 <snip>
```

为了显示全局丢包数据包统计信息，请使用此命令：

```
Router#show platform hardware qfp active infrastructure punt statistics type global-drop Global
Drop Statistics Counter ID Drop Counter Name Packets ----------------------------------------
---------------------- 00 INVALID_COUNTER_SELECTED 0 01 INIT_PUNT_INVALID_PUNT_MODE 0 02
INIT_PUNT_INVALID_PUNT_CAUSE 0 <snip>
```

为了显示缓冲默认队列/日程统计信息，队列和日程安排(BQS)每个接口的，使用此命令：

```
Router#show platform hardware qfp active infrastructure bqs queue output default all Interface:
internal0/0/rp:0, QFP if_h: 1, Num Queues/Schedules: 2 Queue specifics: Index 0 (Queue ID:0x2f,
Name: ) Software Control Info: (cache) queue id: 0x0000002f, wred: 0x88b002d2, qlimit (bytes):
6250048 parent_sid: 0x232, debug_name: sw_flags: 0x00000011, sw_state: 0x00000001 orig_min : 0 ,
min: 0 orig_max : 0 , max: 0 share : 1 Statistics: tail drops (bytes): 77225016 , (packets):
51621 total enqs (bytes): 630623840 , (packets): 421540 queue_depth (bytes): 0 <snip>
```

为了显示Recycle缓冲队列/日程统计信息，队列和日程安排(BQS)每个接口的，使用此命令。回收队列由QFP不止一次处理的暂挂数据包。例如，放置得分段的信息包和组播信息包此处。

```
Router#show platform hardware qfp active infrastructure bqs queue output recycle all Recycle
Queue Object ID:0x3 Name:MulticastLeafHigh (Parent Object ID: 0x2) plevel: 1, bandwidth: 0 ,
rate_type: 0 queue_mode: 0, queue_limit: 0, num_queues: 36 Queue specifics: Index 0 (Queue
ID:0x2, Name: MulticastLeafHigh) Software Control Info: (cache) queue id: 0x00000002, wred:
0x88b00000, qlimit (packets): 2048 parent_sid: 0x208, debug_name: MulticastLeafHigh sw_flags:
0x00010001, sw_state: 0x00000001 orig_min : 0 , min: 0 orig_max : 0 , max: 0 share : 0
Statistics: tail drops (bytes): 0 , (packets): 0 total enqs (bytes): 0 , (packets): 0
queue_depth (packets): 0 <snip>
```

RP计数器

RP处理这些流量类型：

- 通过路由处理器的千兆以太网管理端口来的管理数据流。
- 在系统的平底船流量(通过ESP)，包括所有控制面板数据流在所有SPA接收。
- 更旧的协议流量、DECNet、互联网分组交换(IPX)等等。

RP的Figure7结构图。
这是平底船/注入Cisco ASR 1000系列路由器的路径：

QFP **<==>** RP内核**<==>** LSMPI **<==>** Fast-Path线索**<==>** Cisco IOS线索

Linux共享内存平底船接口(LSMPI)的图8位置。
为了显示从ESP互连ASIC的rx计数器在RP互连ASIC，请使用此命令：

```
Router#show platform hardware slot r0 serdes statistics From Slot F0 Pkts High: 57 Low: 421540
Bad: 0 Dropped: 0 Bytes High: 5472 Low: 645799280 Bad: 0 Dropped: 0 Pkts Looped: 0 Error: 0
Bytes Looped 0 Qstat count: 0 Flow ctrl count: 196207
```

为了显示Linux共享内存平底船的统计信息请建立接口(LSMPI)在路由器，使用此命令。LSMPI提供方式执行数据包零复制转移在网络和IOSd之间的高性能的。为了达到此，请共享(内存映射)Linux内核虚拟内存的一个区域在LSMPI模块和IOSd之间。

```
Router#show platform software infrastructure lsmpi LSMPI interface internal stats: enabled=0,
disabled=0, throttled=0, unthrottled=0, state is ready Input Buffers = 8772684 Output Buffers =
206519 rxdone count = 8772684 txdone count = 206515 <snip> ASR1000-RP Punt packet causes: 421540
IPV4_OPTIONS packets 7085686 L2 control/legacy packets 57 ARP packets 774 FOR_US packets Packet
histogram(500 bytes/bin), avg size in 172, out 471: Pak-Size In-Count Out-Count 0+: 7086514
95568 500+: 1 0 1000+: 2 0 1500+: 421540 6099 Lsmpi0 is up, line protocol is up Hardware is
LSMPI MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec, reliability 255/255, txload 1/255, rxload
1/255 Encapsulation ARPA, loopback not set Keepalive not set Unknown, Unknown, media type is
unknown media type <snip> 7508057 packets input, 0 bytes, 0 no buffer Received 0 broadcasts (0
IP multicasts) 0 runts, 0 giants, 0 throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0
ignored, 0 abort 0 watchdog, 0 multicast, 0 pause input 101667 packets output, 47950080 bytes, 0
underruns 0 output errors, 0 collisions, 0 interface resets 0 output buffer failures, 0 output
buffers swapped out
```

案例研究

在SPA的丢包

错误信息包

如果数据包有一个错误，这些数据包在SPA丢弃。这是普通的行为，不仅在Cisco ASR 1000系列路

由器，但是在所有平台。

```
Router#show interfaces TenGigabitEthernet 1/0/0 TenGigabitEthernet1/0/0 is up, line protocol is
up Hardware is SPA-1X10GE-L-V2, address is 0022.5516.2040 (bia 0022.5516.2040) Internet address
is 192.168.1.1/24 MTU 1500 bytes, BW 10000000 Kbit, DLY 10 usec, reliability 250/255, txload
1/255, rxload 1/255 Encapsulation ARPA, loopback not set Keepalive not supported Full Duplex,
10000Mbps, link type is force-up, media type is 10GBase-LR output flow-control is on, input
flow-control is on ARP type: ARPA, ARP Timeout 04:00:00 Last input 00:45:13, output 00:00:08,
output hang never Last clearing of "show interface" counters 00:00:26 Input queue: 0/375/0/0
(size/max/drops/flushes); Total output drops: 0 Queueing strategy: fifo Output queue: 0/40
(size/max) 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0
packets/sec 0 packets input, 0 bytes, 0 no buffer Received 0 broadcasts (0 IP multicasts) 0
runts, 0 giants, 0 throttles 419050 input errors, 419050 CRC, 0 frame, 0 overrun, 0 ignored 0
watchdog, 0 multicast, 0 pause input 1 packets output, 402 bytes, 0 underruns 0 output errors, 0
collisions, 0 interface resets 0 babbles, 0 late collision, 0 deferred 0 lost carrier, 0 no
carrier, 0 pause output 0 output buffer failures, 0 output buffers swapped out
```

在SIP的丢包

QFP高利用率

在QFP的情况下高利用率，数据包在SIP的每个接口队列丢弃由反压力从QFP。在这种情况下，暂停帧从接口也发送。

```
Router#show platform hardware port 1/0/0 plim statistics Interface 1/0/0 RX Low Priority RX Drop
Pkts 21344279 Bytes 1515446578 RX Err Pkts 0 Bytes 0 TX Low Priority TX Drop Pkts 0 Bytes 0 RX
High Priority RX Drop Pkts 0 Bytes 0 RX Err Pkts 0 Bytes 0 TX High Priority TX Drop Pkts 0 Bytes
0
```

在ESP的丢包

超额预订

如果发送超出接口的电线速率的数据包，数据包丢弃在出口接口。

```
Router#show interfaces GigabitEthernet 1/1/0 GigabitEthernet1/1/0 is up, line protocol is up
Hardware is SPA-5X1GE-V2, address is 0021.55dc.3f50 (bia 0021.55dc.3f50) Internet address is
192.168.2.1/24 MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec, reliability 255/255, txload 35/255,
rxload 1/255 Encapsulation ARPA, loopback not set Keepalive not supported Full Duplex, 1000Mbps,
link type is auto, media type is SX output flow-control is on, input flow-control is on ARP
type: ARPA, ARP Timeout 04:00:00 Last input 02:24:23, output 00:00:55, output hang never Last
clearing of "show interface" counters 00:01:04 Input queue: 0/375/0/0 (size/max/drops/flushes);
Total output drops: 48783 ...
```

在QFP，这些丢包可以被检查作为尾部丢弃。

```
Router#show platform hardware qfp active statistics drop | exclude _0_ ------------------------
--------------------------------------- Global Drop Stats Octets Packets ----------------------
---------------------------------------- TailDrop 72374984 483790
```

由信息包碎片的超载

如果数据包被分段的归结于MTU大小，即使入口接口比电线速率是较少，电线速率可以被超出在出口接口。在这种情况下，数据包丢弃在出口接口。

```
Router#show interfaces gigabitEthernet 1/1/0 GigabitEthernet1/1/0 is up, line protocol is up
Hardware is SPA-5X1GE-V2, address is 0022.5516.2050 (bia 0022.5516.2050) Internet address is
192.168.2.1/24 MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec, reliability 255/255, txload 25/255,
rxload 1/255 Encapsulation ARPA, loopback not set Keepalive not supported Full Duplex, 1000Mbps,
link type is auto, media type is SX output flow-control is on, input flow-control is on ARP
```

```
type: ARPA, ARP Timeout 04:00:00 Last input 00:36:52, output 00:00:12, output hang never Last
clearing of "show interface" counters 00:00:55 Input queue: 0/375/0/0 (size/max/drops/flushes);
Total output drops: 272828 Queueing strategy: fifo Output queue: 0/40 (size/max) 5 minute input
rate 0 bits/sec, 0 packets/sec 5 minute output rate 99998000 bits/sec, 14290 packets/sec 0
packets input, 0 bytes, 0 no buffer Received 0 broadcasts (0 IP multicasts) 0 runts, 0 giants, 0
throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored 0 watchdog, 0 multicast, 0 pause
input 4531543 packets output, 4009748196 bytes, 0 underruns
```

在QFP，这些丢包可以被检查作为尾部丢弃。

```
Router#show platform hardware qfp active statistics drop | exclude _0_ ------------------------
------------------------------------- Global Drop Stats Octets Packets ----------------------
---------------------------------------- TailDrop 109431162 272769
```

由分段的信息包的性能限制

在QFP中，全局数据包内存(GPM)使用分片数据包的重组。如果GPM在很大数量的分段数据包重组用尽，这些计数器显示丢包数量。在许多情况下，这是性能限制。

```
Router#show platform hardware qfp active statistics drop | ex _0_ ------------------------------
--------------------------------- Global Drop Stats Octets Packets ---------------------------
---------------------------------- ReassNoFragInfo 39280654854 57344096 ReassTimeout 124672
128
```

转发对Null0接口

对Null0接口的数据包在ESP丢弃和没有被踢对RP。在这种情况下，可能您不无法由传统命令(show interfaces null0)检查计数器。检查ESP计数器，为了认识丢包数量。如果“结算”和“排除_0_”同时使用选项，您能检查仅新建的丢弃数据包。

```
Router#show platform hardware qfp active statistics drop clear | ex _0_ ------------------------
---------------------------------------- Global Drop Stats Octets Packets ---------------------
----------------------------------------- Ipv4Null0 11286 99
```

与HA不履行抚养功能的RP切换

一旦RP请交换，这些数据包丢弃，直到新的激活RP重编程序QFP。

- 如果新的激活RP未同步与在交换机前的，旧有激活RP所有信息包丢弃。
- 数据包由高性能的(HA)不履行抚养功能处理。

```
Router#show platform hardware qfp active statistics drop | ex _0_ ------------------------------
--------------------------------- Global Drop Stats Octets Packets ---------------------------
---------------------------------- Ipv4NoAdj 6993660 116561 Ipv4NoRoute 338660188 5644337
```

平底船数据包

在Cisco ASR 1000系列路由器上，不可能由ESP处理的数据包被踢对RP。如果有过多的平底船数据包， QFP丢弃统计信息尾部丢弃增加。

```
Router#show platform hardware qfp active statistics drop | ex _0_ ------------------------------
--------------------------------- Global Drop Stats Octets Packets ---------------------------
---------------------------------- TailDrop 26257792 17552
```

检查缓冲、队列和日程安排(BQS)队列输出计数器为了指定已丢失接口。“internal0/0/rp:0”显示接口从ESP踢到RP。

```
Router#show platform hardware qfp active infrastructure bqs queue output default all Interface:
internal0/0/rp:0, QFP if_h: 1, Num Queues/Schedules: 2 Queue specifics: Index 0 (Queue ID:0x2f,
Name: ) Software Control Info: (cache) queue id: 0x0000002f, wred: 0x88b002d2, qlimit (bytes):
6250048 parent_sid: 0x232, debug_name: sw_flags: 0x00000011, sw_state: 0x00000001 orig_min : 0 ,
```

```
min: 0 orig_max : 0 , max: 0 share : 1 Statistics: tail drops (bytes): 26257792 , (packets):
17552 total enqs (bytes): 4433777480 , (packets): 2963755 queue_depth (bytes): 0 Queue
specifics: ...
```

在这种情况下，输入队列丢弃在入口接口被计算。

```
Router#show interfaces TenGigabitEthernet 1/0/0 TenGigabitEthernet1/0/0 is up, line protocol is
up Hardware is SPA-1X10GE-L-V2, address is 0022.5516.2040 (bia 0022.5516.2040) Internet address
is 192.168.1.1/24 MTU 1500 bytes, BW 10000000 Kbit, DLY 10 usec, reliability 255/255, txload
1/255, rxload 1/255 Encapsulation ARPA, loopback not set Keepalive not supported Full Duplex,
10000Mbps, link type is force-up, media type is 10GBase-LR output flow-control is on, input
flow-control is on ARP type: ARPA, ARP Timeout 04:00:00 Last input 00:15:10, output 00:00:30,
output hang never Last clearing of "show interface" counters 00:14:28 Input queue:
0/375/2438309/0 (size/max/drops/flushes); Total output drops: 0 Queueing strategy: fifo Output
queue: 0/40 (size/max) 5 minute input rate 70886000 bits/sec, 5915 packets/sec 5 minute output
rate 0 bits/sec, 0 packets/sec 2981307 packets input, 4460035272 bytes, 0 no buffer Received 0
broadcasts (0 IP multicasts) 0 runts, 0 giants, 0 throttles 0 input errors, 0 CRC, 0 frame, 0
overrun, 0 ignored 0 watchdog, 0 multicast, 0 pause input 15 packets output, 5705 bytes, 0
underruns 0 output errors, 0 collisions, 0 interface resets 0 babbles, 0 late collision, 0
deferred 0 lost carrier, 0 no carrier, 0 pause output 0 output buffer failures, 0 output buffers
swapped out
```

平底船的原因可以由此命令显示：

```
Router#show platform hardware qfp active infrastructure punt statistics type per-cause Global
Per Cause Statistics Number of punt causes = 46 Per Punt Cause Statistics Packets Packets
Counter ID Punt Cause Name Received Transmitted ----------------------------------------------
----------------------- 00 RESERVED 0 0 01 MPLS_FRAG_REQUIRE 0 0 02 IPV4_OPTIONS 2981307
2963755 ...
```

您能也检查show ip traffic命令。

```
Router#show ip traffic IP statistics: Rcvd: 2981307 total, 15 local destination 0 format errors,
0 checksum errors, 0 bad hop count 0 unknown protocol, 0 not a gateway 0 security failures, 0
bad options, 2981307 with options Opts: 2981307 end, 0 nop, 0 basic security, 0 loose source
route 0 timestamp, 0 extended security, 0 record route 0 stream ID, 2981307 strict source route,
0 alert, 0 cipso, 0 ump 0 other, 0 ignored Frags: 0 reassembled, 0 timeouts, 0 couldn't
reassemble 0 fragmented, 0 fragments, 0 couldn't fragment Bcast: 0 received, 0 sent Mcast: 0
received, 0 sent Sent: 23 generated, 525450 forwarded Drop: 0 encapsulation failed, 0
unresolved, 0 no adjacency 0 no route, 0 unicast RPF, 0 forced drop, 0 unsupported-addr 0
options denied, 0 source IP address zero ...
```

由平底船全局策略器的平底船限制

万一过多的平底船数据包被注定到路由器，尾部丢弃计数与PuntGlobalPolicerDrops由QFP丢弃计数器。平底船全局策略器保护从超载的RP。这些丢包看到不由转接信息包，而且由FOR_US数据包。

```
Router#show platform hardware qfp active statistics drop | ex _0_ ------------------------------
---------------------------------- Global Drop Stats Octets Packets ---------------------------
---------------------------------- PuntGlobalPolicerDrops 155856 102 TailDrop 4141792688
2768579 ...
```

平底船的原因可以由此命令知道：

```
Router#show platform hardware qfp active infrastructure punt statistics type per-cause Global
Per Cause Statistics Number of punt causes = 46 Per Punt Cause Statistics Packets Packets
Counter ID Punt Cause Name Received Transmitted ----------------------------------------------
----------------------- 00 RESERVED 0 0 01 MPLS_FRAG_REQUIRE 0 0 02 IPV4_OPTIONS 0 0 03 L2
control/legacy 0 0 04 PPP_CONTROL 0 0 05 CLNS_CONTROL 0 0 06 HDLC_KEEPALIVE 0 0 07 ARP 3 3 08
REVERSE_ARP 0 0 09 LMI_CONTROL 0 0 10 incomplete adjacency punt 0 0 11 FOR_US 5197865 2428755
```

在RP的丢包

在LSMPI的数据包错误

在Cisco ASR 1000系列路由器上，数据包从ESP被踢到RP通过Linux共享内存平底船接口(LSMPI)。LSMPI是包传输的虚拟接口在IOSd和Linux内核之间在RP通过Linux共享内存。从ESP踢的数据包到RP由RP的Linux内核接收。Linux内核发送那些数据包对IOSD进程通过LSMPI。如果看到错误计数器在LSMPI，这是软件缺陷。开TAC案例。

```
Router#show platform software infrastructure lsmpi <snip> Lsmpi0 is up, line protocol is up
Hardware is LSMPI MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec, reliability 255/255, txload
1/255, rxload 1/255 Encapsulation ARPA, loopback not set Keepalive not set Unknown, Unknown,
media type is unknown media type output flow-control is unsupported, input flow-control is
unsupported ARP type: ARPA, ARP Timeout 04:00:00 Last input never, output never, output hang
never Last clearing of "show interface" counters never Input queue: 0/1500/0/0
(size/max/drops/flushes); Total output drops: 0 Queueing strategy: fifo Output queue: 0/40
(size/max) 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0
packets/sec 15643 packets input, 0 bytes, 0 no buffer Received 0 broadcasts (0 IP multicasts) 0
runts, 0 giants, 0 throttles 1 input errors, 0 CRC, 3 frame, 0 overrun, 0 ignored, 0 abort 0
watchdog, 0 multicast, 0 pause input 295 packets output, 120491 bytes, 0 underruns 0 output
errors, 0 collisions, 0 interface resets 0 output buffer failures, 0 output buffers swapped out
```

相关信息

- 排除Cisco ASR 1000 Series Aggregation Services Routers失败故障
- Cisco ASR 1000系列汇聚服务路由器-产品支持
- 路由器产品支持
- 技术支持和文档 - Cisco Systems