

# 了解并且排除故障连结的5600/6000输入丢弃

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## 简介

本文描述如何排除故障在Cisco连结5600/6000系列交换机的输入丢弃。

## 先决条件

### 要求

Cisco建议您有Cisco连结6000系列配置基础知识。

### 使用的组件

本文档中的信息基于以下软件和硬件版本：

- 思科连结6001
- 7.1(3)N1(1)

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。如果您的网络实际，请保证您了解所有命令潜在影响。

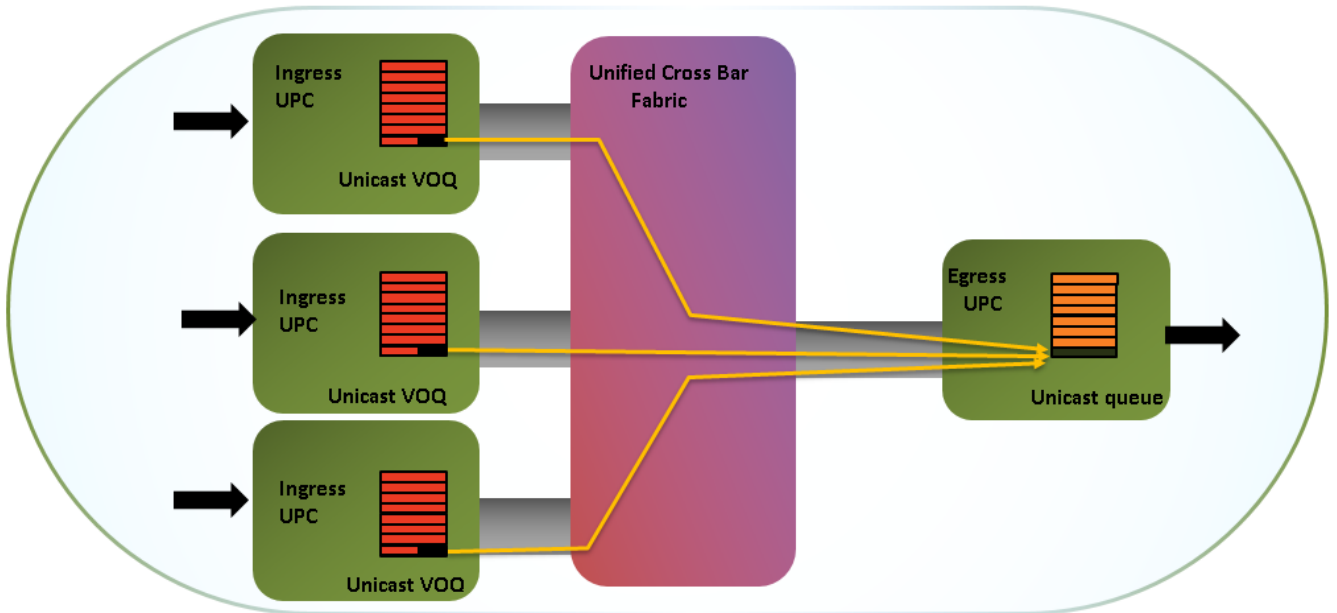
## 背景信息

输入丢弃是一个订购过量输出端口的征兆。也意味着您是可能的降低在该特定端口的单播流量。此

条款帮助您知道单播和组播数据流如何在此平台缓冲，并且输入丢弃如何可能与缓解步骤一起出现。

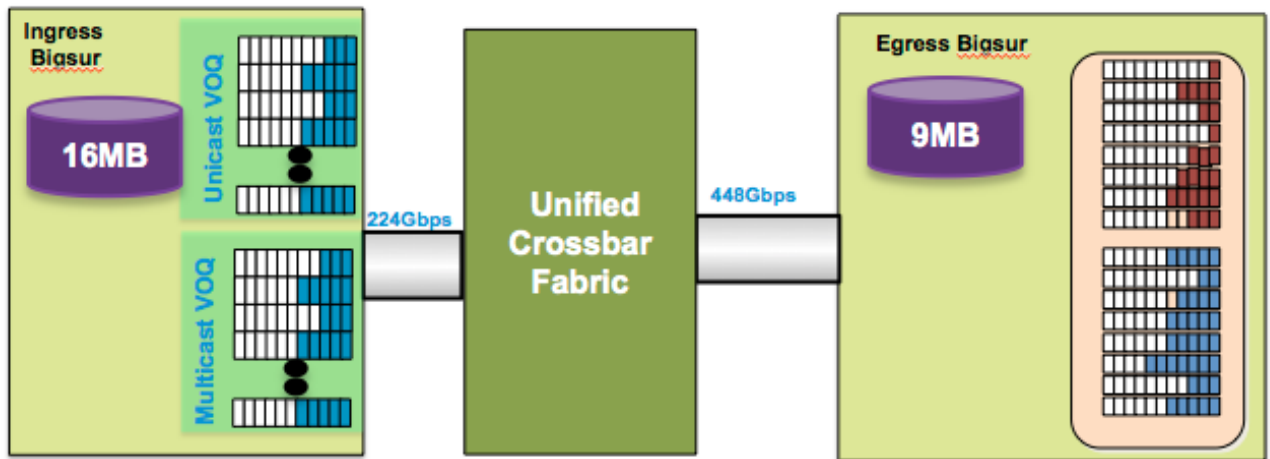
## 单播流量运输流量和缓冲

在出口队列满如镜像所显示后，单播流量首先然后排队在输出缓冲区缓冲池入口缓冲区。



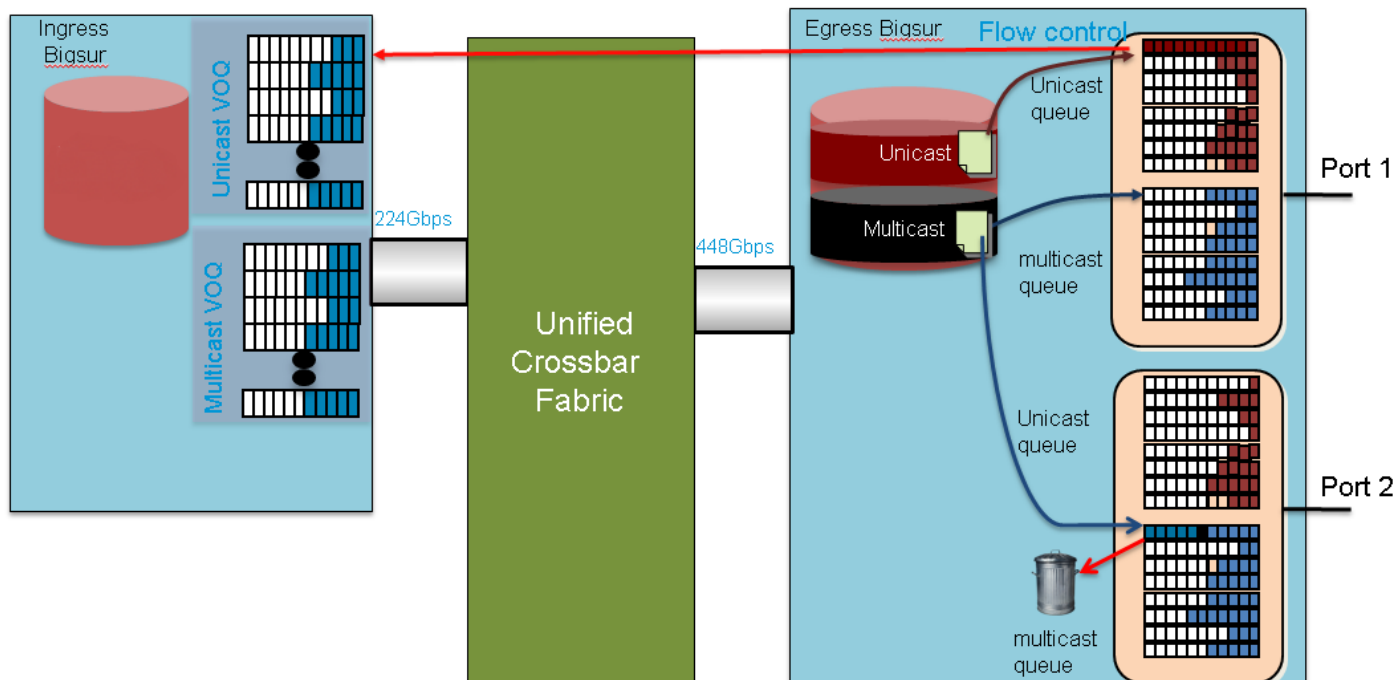
有16MB入口共享的缓冲区和9MB出口共享的缓冲区。缓冲区共享在12个x 10个gig端口或3个x 40个gig端口之间。共享缓冲区是有效对于突发流量吸收。

这是存储器分配的一个视觉描述供您的参考(Bigsur是ASIC/Unified波尔特控制器的名称)如镜像所显示。



## 组播数据流运输流量和缓冲

- 组播信息包缓冲并且丢弃在出口
- 丢弃接近拥塞点的组播信息包为了避免Head of Line封闭(HOLB)
- 如镜像所显示，保存单播的无损的结构。



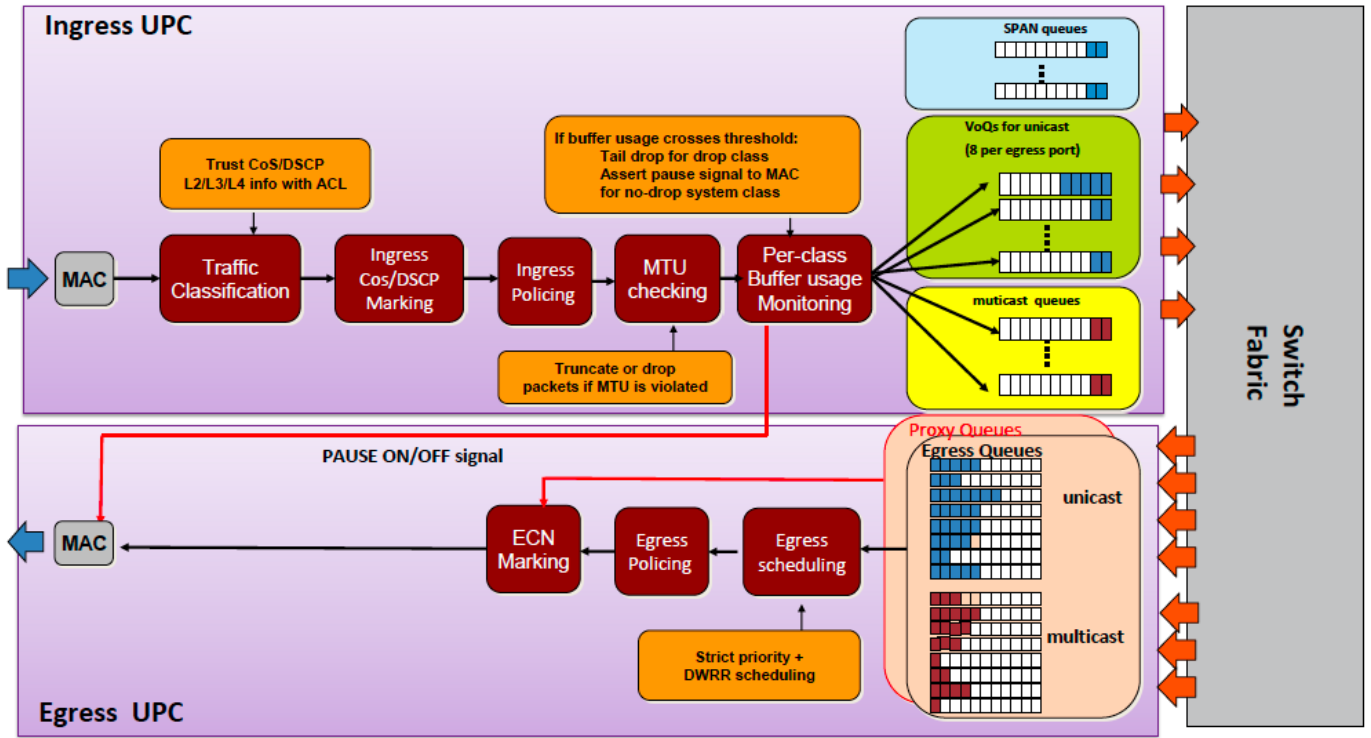
在案件的多数，出口丢包总是/广播的由于组播/未知单播流量。

## 什么导致输入丢弃？

一个拥塞输出端口造成输出缓冲区为了首先填满然后导致在入口的背压。这仅是为单播流量。一旦入口缓冲区全双工然后您可能潜在降低在导致输入丢弃的入口的流量。

此说明在高级和容易消化，但是有有点更多对它，特别是当您查看另外流量等级时，队列等。有的虚拟输出输出队列(VOQ)的概念在连结平台频繁地使用。VOQ是入口缓冲区的分配每IEEE 802.1p业务类别(CoS)的每个输出端口。因此有每个输出端口8个VOQ。

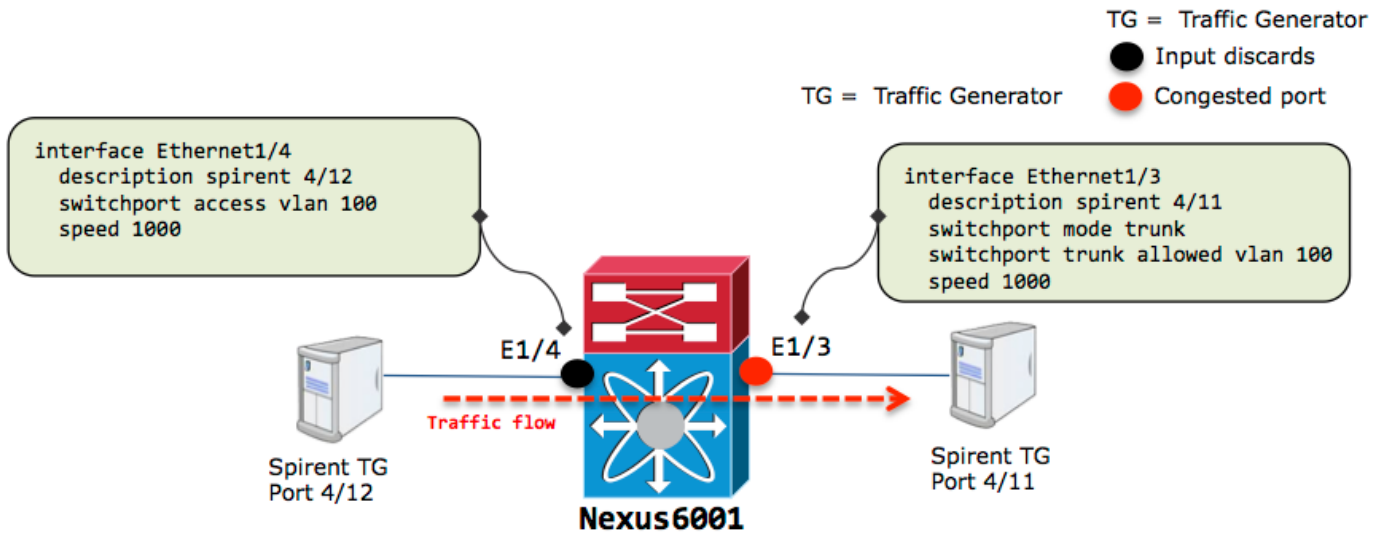
在一个输出端口的拥塞—Cos的最终流血到其在入站端口的对应的VOQ的拥塞。一旦限制然后达到流量被撤销。然而它，不影响为其他CoSs或其他出口接口注定的流量，因而避免HOLB，将否则造成拥塞传播。如镜像所显示，从入口到输出端口和多种块的通信流在作用是。



## 故障排除情况

### 案例1.被输入的丢弃

实验室设置：



线路egressing e1/3和可能的超量预订的速率流量：

```
nexus6001# sh int e1/3
Ethernet1/3 is up
Dedicated Interface
Hardware: 1000/10000 Ethernet, address: 002a.6a56.7a8a (bia 002a.6a56.7a8a)
Description: spirent 4/11
MTU 1500 bytes, BW 1000000 Kbit,, BW 1000000 Kbit, DLY 10 usec
reliability 255/255, txload 251/255, rxload 25/255
```

```
Encapsulation ARPA, medium is broadcast
Port mode is trunk
full-duplex, 1000 Mb/s
Beacon is turned off
Input flow-control is off, output flow-control is off
Switchport monitor is off
EtherType is 0x8100
Last link flapped 11:39:20
Last clearing of "show interface" counters 00:00:15
0 interface resets
30 seconds input rate 98683696 bits/sec, 8223 packets/sec
30 seconds output rate 986853640 bits/sec, 82019 packets/sec
Load-Interval #2: 5 minute (300 seconds)
  input rate 98.68 Mbps, 8.22 Kpps; output rate 986.85 Mbps, 82.01 Kpps
RX
```

```
124003 unicast packets  0 multicast packets  0 broadcast packets
124003 input packets  186004500 bytes
0 jumbo packets  0 storm suppression bytes
0 runts  0 giants  0 CRC  0 no buffer
0 input error  0 short frame  0 overrun  0 underrun  0 ignored
0 watchdog  0 bad etype drop  0 bad proto drop  0 if down drop
0 input with dribble  0 input discard
0 Rx pause
```

TX

```
1236745 unicast packets  9 multicast packets  0 broadcast packets
1236754 output packets  1860065401 bytes
0 jumbo packets
0 output error  0 collision  0 deferred  0 late collision
0 lost carrier  0 no carrier  0 babble  0 output discard
0 Tx pause
```

```
nexus6001# sh int e1/4
```

```
Ethernet1/4 is up
Dedicated Interface
```

```
Hardware: 1000/10000 Ethernet, address: 002a.6a56.7a8b (bia 002a.6a56.7a8b)
Description: spirent 4/12
MTU 1500 bytes, BW 1000000 Kbit,, BW 1000000 Kbit, DLY 10 usec
reliability 255/255, txload 25/255, rxload 251/255
Encapsulation ARPA, medium is broadcast
Port mode is access
full-duplex, 1000 Mb/s
Beacon is turned off
Input flow-control is off, output flow-control is off
Switchport monitor is off
EtherType is 0x8100
Last link flapped 10:53:31
Last clearing of "show interface" counters 00:00:04
0 interface resets
30 seconds input rate 986840376 bits/sec, 82236 packets/sec
30 seconds output rate 98421072 bits/sec, 8223 packets/sec
Load-Interval #2: 5 minute (300 seconds)
  input rate 986.84 Mbps, 82.23 Kpps; output rate 98.42 Mbps, 8.22 Kpps
RX
```

```
326332 unicast packets  0 multicast packets  0 broadcast packets
326332 input packets  489496500 bytes
0 jumbo packets  0 storm suppression bytes
0 runts  0 giants  0 CRC  0 no buffer
0 input error  0 short frame  0 overrun  0 underrun  0 ignored
0 watchdog  0 bad etype drop  0 bad proto drop  0 if down drop
0 input with dribble  863 input discard >>>>>
```

```

0 Rx pause
TX
32633 unicast packets 2 multicast packets 0 broadcast packets
32635 output packets 48819096 bytes
0 jumbo packets
0 output error 0 collision 0 deferred 0 late collision
0 lost carrier 0 no carrier 0 babble 0 output discard
0 Tx pause

```

在一个被模拟的设置作为此处，您认识超额预订的原因，但是在制作请设置数据流配置文件突发流量和它可以是虽则察觉拥塞输出端口的挑战这些命令的地方。

步骤列出了此处帮助您识别拥塞输出端口。

## 步骤1.识别有输入丢弃的端口

输入在端口看到的丢弃e1/4：

```

nexus6001# sh int e1/4 | in i disc
 0 input with dribble 3024 input discard
 0 lost carrier 0 no carrier 0 babble 0 output discard

```

```

nexus6001# sh queuing int e1/4
Ethernet1/4 queuing information:

```

```

TX Queuing
  qos-group  sched-type  oper-bandwidth
    0          WRR          100

```

```

RX Queuing

```

```

qos-group 0 >>>> Drops in QOS 0

```

```

q-size: 100160, q-size-40g: 100160, HW MTU: 1500 (1500 configured)

```

```

drop-type: drop, xon: 0, xoff: 0

```

```

Statistics:

```

```

Pkts received over the port           : 9612480
Ucast pkts sent to the cross-bar      : 9587016
Mcast pkts sent to the cross-bar      : 0
Ucast pkts received from the cross-bar : 961249
Pkts sent to the port                 : 961261
Pkts discarded on ingress             : 3024 >>>>>>
Per-priority-pause status             : Rx (Inactive), Tx (Inactive)

```

## 步骤2. ASIC识别

- 映射接口到从此输出的内部ASIC (UPC)编号。
- 发现从您注意丢包的入站端口ID的入口ASIC ID。

```

nexus6001# sh hard internal bigsur all-ports

```

```

Bigsur Port Info:

```

Port name	asic idx	inst slot	inst asic	eport logi	flag adm	opr if_index	diag ucVer
sup1	0 0	0 0	0 - 48	b3 en	dn 15010000	pass 0.00	
sup0	0 0	0 0	1 - 49	b3 en	dn 15020000	pass 0.00	
1gb1/1	1 0	1 1	2 - 0	b3 en	up 1a000000	pass 0.00	
1gb1/2	1 0	1 1	3 - 1	b3 en	up 1a001000	pass 0.00	
1gb1/3	1 0	1 1	0 - 2	b3 en	up 1a002000	pass 0.00	

```

1gb1/4 |1**|0|1|1-3|b3|en|up|1a003000|pass|0.00 >>>** is the asic number
1gb1/5 |1|0|1|6-4|b3|en|up|1a004000|pass|0.00
1gb1/6 |1|0|1|7-5|b3|en|up|1a005000|pass|0.00
1gb1/7 |1|0|1|4-6|b3|en|up|1a006000|pass|0.00
1gb1/8 |1|0|1|5-7|b3|en|up|1a007000|pass|0.00
1gb1/9 |1|0|1|10-8|b3|en|up|1a008000|pass|0.00
1gb1/10|1|0|1|11-9|b3|en|up|1a009000|pass|0.00
1gb1/11|1|0|1|8-10|b3|en|up|1a00a000|pass|0.00
xgb1/12|1|0|1|9-11|b3|en|dn|1a00b000|pass|0.00
xgb1/13|2|0|2|2-12|b3|en|dn|1a00c000|pass|0.00
xgb1/14|2|0|2|3-13|b3|en|dn|1a00d000|pass|0.00
xgb1/15|2|0|2|0-14|b3|en|dn|1a00e000|pass|0.00
xgb1/16|2|0|2|1-15|b3|en|dn|1a00f000|pass|0.00
xgb1/17|2|0|2|6-16|b3|en|dn|1a010000|pass|0.00
xgb1/18|2|0|2|7-17|b3|en|dn|1a011000|pass|0.00
xgb1/19|2|0|2|4-18|b3|en|dn|1a012000|pass|0.00
xgb1/20|2|0|2|5-19|b3|en|dn|1a013000|pass|0.00
xgb1/21|2|0|2|10-20|b3|en|dn|1a014000|pass|0.00
xgb1/22|2|0|2|11-21|b3|en|dn|1a015000|pass|0.00
xgb1/23|2|0|2|8-22|b3|en|dn|1a016000|pass|0.00
xgb1/24|2|0|2|9-23|b3|en|dn|1a017000|pass|0.00
xgb1/25|3|0|3|2-24|b3|en|dn|1a018000|pass|0.00
xgb1/26|3|0|3|3-25|b3|en|dn|1a019000|pass|0.00
xgb1/27|3|0|3|0-26|b3|en|dn|1a01a000|pass|0.00
xgb1/28|3|0|3|1-27|b3|en|dn|1a01b000|pass|0.00
xgb1/29|3|0|3|6-28|b3|en|dn|1a01c000|pass|0.00
xgb1/30|3|0|3|7-29|b3|en|dn|1a01d000|pass|0.00
xgb1/31|3|0|3|4-30|b3|en|dn|1a01e000|pass|0.00
xgb1/32|3|0|3|5-31|b3|en|dn|1a01f000|pass|0.00
xgb1/33|3|0|3|10-32|b3|en|dn|1a020000|pass|0.00
xgb1/34|3|0|3|11-33|b3|en|dn|1a021000|pass|0.00
xgb1/35|3|0|3|8-34|b3|en|dn|1a022000|pass|0.00
xgb1/36|3|0|3|9-35|b3|en|dn|1a023000|pass|0.00
xgb1/37|4|0|4|2-36|b3|en|dn|1a024000|pass|0.00
xgb1/38|4|0|4|3-37|b3|en|dn|1a025000|pass|0.00
xgb1/39|4|0|4|0-38|b3|en|dn|1a026000|pass|0.00
xgb1/40|4|0|4|1-39|b3|en|dn|1a027000|pass|0.00
xgb1/41|4|0|4|6-40|b3|en|dn|1a028000|pass|0.00
xgb1/42|4|0|4|7-41|b3|en|dn|1a029000|pass|0.00
xgb1/43|4|0|4|4-42|b3|en|dn|1a02a000|pass|0.00
xgb1/44|4|0|4|5-43|b3|en|dn|1a02b000|pass|0.00
xgb1/45|4|0|4|10-44|b3|en|dn|1a02c000|pass|0.00
xgb1/46|4|0|4|11-45|b3|en|dn|1a02d000|pass|0.00
xgb1/47|4|0|4|8-46|b3|en|dn|1a02e000|pass|0.00
xgb1/48|4|0|4|9-47|b3|en|dn|1a02f000|pass|0.00
40gb2/1|5|1|0|2-0|b3|dis|dn|1a0f0000|pass|0.00
40gb2/2|5|1|0|1-1|b3|dis|dn|1a0f1000|pass|0.00
40gb2/3|6|1|1|2-2|b3|dis|dn|1a0f2000|pass|0.00
40gb2/4|6|1|1|1-3|b3|dis|dn|1a0f3000|pass|0.00
Done.

```

### 步骤3.识别出口拥塞波尔特

- 识别有VOQ计数器的拥塞输出端口。
- 请使用ASIC编号在输出端口贡献往丢包的计数器voq asic努姆为了发现。

```

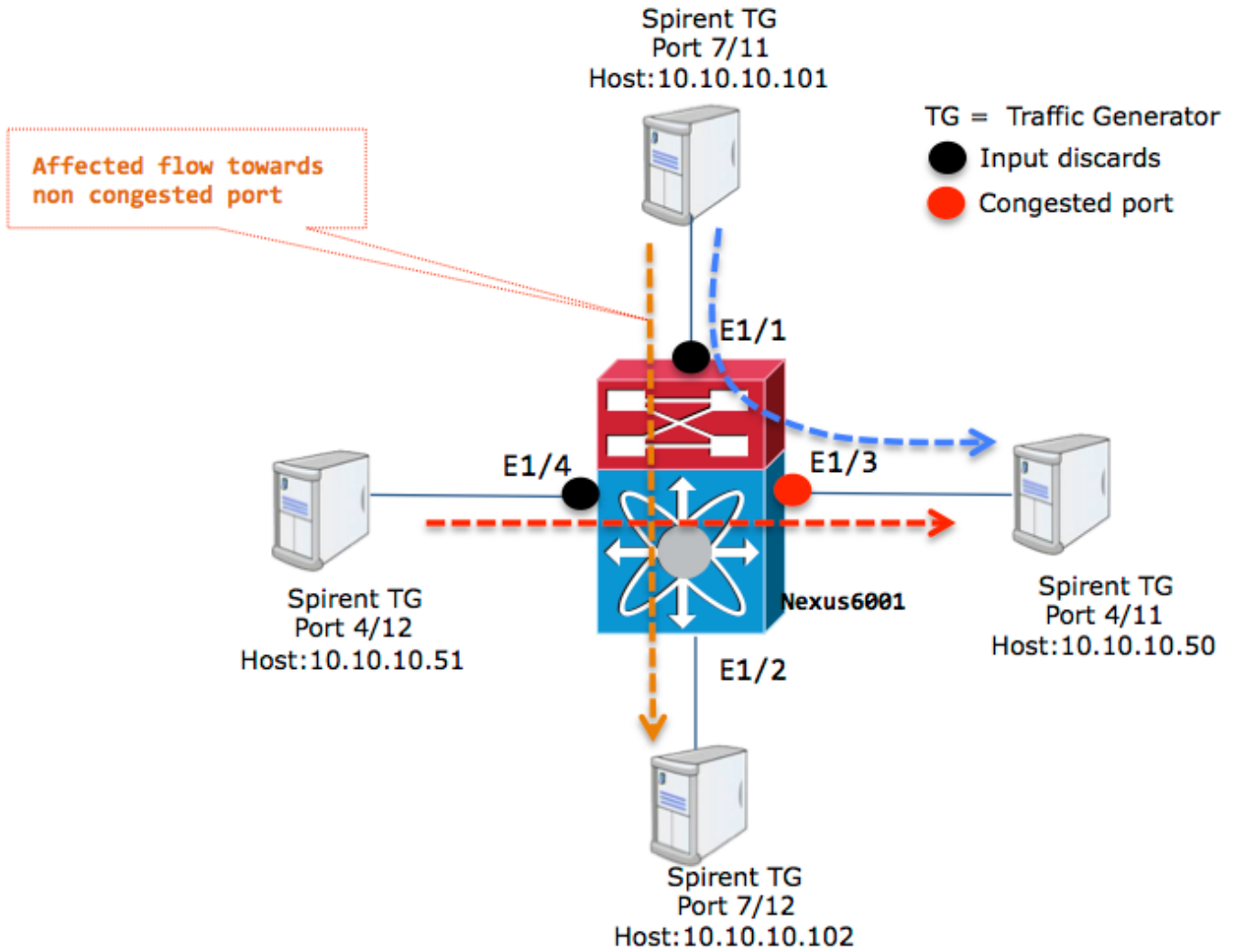
nexus6001# sh plat soft qd info counters voq asic-num 1
+-----+-----+-----+-----+
| port | TRANSMIT | TAIL DROP | HEAD DROP |
+-----+-----+-----+-----+
Eth1/3
  QUEUE-3          3222876464          8545008          0

```

Eth1/4				
QUEUE-3	323451170	0	0	
Eth1/6				
QUEUE-3	871362	0	0	
SUP_HI				
QUEUE-0	2041	0	0	

## 案例与HOLB的2.被输入的丢弃

实验室设置：



所有端口在VLAN 100。

您能看到在取决于在入口接口towardse1/3的流量速率的e1/4和e1/1的输入丢弃。

```
nexus6001# sh int e1/4 | in discard|rate
30 seconds input rate 592103840 bits/sec, 49341 packets/sec
30 seconds output rate 166412120 bits/sec, 13863 packets/sec
input rate 592.10 Mbps, 49.34 Kpps; output rate 834.82 Mbps, 69.55 Kpps
0 input with dribble 15245 input discard
0 lost carrier 0 no carrier 0 babble 0 output discard
```

```
nexus6001# sh int e1/1 | in discard|rate
```



```

30 seconds input rate 986839872 bits/sec, 82236 packets/sec
30 seconds output rate 99790992 bits/sec, 8310 packets/sec
  input rate 986.84 Mbps, 82.23 Kpps; output rate 500.88 Mbps, 41.73 Kpps
  0 input with dribble 110632 input discard
  0 lost carrier 0 no carrier 0 babble 0 output discard

```

使用使用进程和描述一样为案例1。您能找到出口拥塞端口。

```

nexus6001# sh plat so qd info counters voq asic-num 1 <snip>
+-----+-----+-----+-----+
|   port   |          TRANSMIT |          TAIL DROP |  HEAD DROP |
+-----+-----+-----+-----+
Eth1/3
  QUEUE-3                3893719464                164782171                0

```

一定受影响的流是往10.10.10.50。在10.10.10.101和10.10.10.102之间的流一定是干净的。

然而这是不是实际情形。发送流量到将用尽的输出端口从而影响在这些入站端口的所有流量的一个卡住或慢排泄的输出端口能导致在一个或更多入站端口的所有缓冲区。这是经典HOLB问题。

Spirent数据流生成器显示流丢弃。如镜像所显示，端口号是Spirent端口号是。

Name/ID	Tx Port Name	Rx Port Names	Tx Count (Frames)	Rx Count (Frames)	Dropped Count (Frames)	Dropped Frame Percent	In-order Count (Frames)	Reordered Count (Frames)
StreamBloc...	Port //4/11	Port //4/12	0	0	0	0.000	0	0
StreamBloc...	Port //4/12	N/A	0	0	0	0.000	0	0
StreamBloc...	Port //4/12	Port //4/11	1,307,568	1,100,070	223,516	16.887	1,100,070	0
StreamBloc...	Port //7/11	Port //7/12	461,229	275,398	172,495	38.512	275,398	0
StreamBloc...	Port //7/11	Port //4/11	1,844,950	1,100,058	664,699	37.665	1,100,058	0

### HOLB缓解：Enable (event) VOQ限制

为了避免此方案，VOQs (仅单播流量)可以配置与集合阈值。

```

nexus6001# sh plat so qd info counters voq asic-num 1 <snip>
+-----+-----+-----+-----+
|   port   |          TRANSMIT |          TAIL DROP |  HEAD DROP |
+-----+-----+-----+-----+
Eth1/3
  QUEUE-3                3893719464                164782171                0

```

在配置以后，往非拥塞端口的流不受影响。

Spirent数据流生成器视图如镜像所显示后，在VOQ限制配置是。

Streams > Detailed Stream Results | Change Result View | 1 of 1 | Select Tx Ports: All Ports | Select Rx Ports: | There are no dropped packets

All Ports | Change Counter Mode: Basic Mode | Resample

Basic Counters		Errors		Basic Sequencing		Advanced Sequencing		Histograms	
Name/ID	Tx Port Name	Rx Port Names	Tx Count (Frames)	Rx Count (Frames)	Dropped Count (Frames)	Dropped Frame Percent	Inorder Count (Frames)	Reordered Count (Frames)	
StreamBloc...	Port //4/11	Port //4/12	0	0	0	0.000	0	0	
StreamBloc...	Port //4/12	N/A	0	0	0	0.000	0	0	
StreamBloc...	Port //4/11	Port //4/11	1,348,359	1,133,953	230,398	16.887	1,133,953	0	
StreamBloc...	Port //7/11	Port //7/12	474,821	461,488	0	0.000	461,488	0	
StreamBloc...	Port //7/11	Port //4/11	1,899,318	1,133,940	685,182	37.665	1,133,940	0	

虽然此配置显示一个清楚优点为了防止丢包由于HOLB。为什么是这不是默认设置？

一般，在生产环境的流量能破裂本质上。由VOQ阈值的不合格，您允许入口缓冲区吸收流量微突发流量，不用需要被撤销。

除非情况担保需要启用VOQ限制，推荐使用是留给它禁用的默认。

### HOLB缓解：通信分类

有缓和与使用的HOLB的另一个方法QoS配置。因为反过来是一特定QoS类别的入口丢弃仅影响一个特定VOQ，您能映射受影响的流量到非拥塞的端口到一不同的QoS类别。从此输出，入口丢弃影响QoS类别0类。

```
nexus6001# sh queuing int e1/4
Ethernet1/4 queuing information:
TX Queuing
  qos-group sched-type oper-bandwidth
    0 WRR 100

RX Queuing
qos-group 0 >>>> Drops in QOS 0
q-size: 100160, q-size-40g: 100160, HW MTU: 1500 (1500 configured)
drop-type: drop, xon: 0, xoff: 0
Statistics:
  Pkts received over the port : 9612480
  Ucast pkts sent to the cross-bar : 9587016
  Mcast pkts sent to the cross-bar : 0
  Ucast pkts received from the cross-bar : 961249
  Pkts sent to the port : 961261
Pkts discarded on ingress : 3024 >>>>>
Per-priority-pause status : Rx (Inactive), Tx (Inactive)
```

此处配置映射关键流量给QoS类别2。

1. 定义不能丢弃的流量的ACL。目标将分类此流量到一不同的QoS类别，因此不受影响。

```
nexus6001# sh queuing int e1/4
Ethernet1/4 queuing information:
TX Queuing
  qos-group sched-type oper-bandwidth
    0 WRR 100

RX Queuing
qos-group 0 >>>> Drops in QOS 0
q-size: 100160, q-size-40g: 100160, HW MTU: 1500 (1500 configured)
drop-type: drop, xon: 0, xoff: 0
Statistics:
  Pkts received over the port : 9612480
```

```
Ucast pkts sent to the cross-bar      : 9587016
Mcast pkts sent to the cross-bar      : 0
Ucast pkts received from the cross-bar : 961249
Pkts sent to the port                  : 961261
Pkts discarded on ingress           : 3024 >>>>>
Per-priority-pause status             : Rx (Inactive), Tx (Inactive)
```

## 2. QoS分类 :

```
nexus6001# sh queuing int e1/4
Ethernet1/4 queuing information:
TX Queuing
  qos-group  sched-type  oper-bandwidth
    0         WRR        100

RX Queuing
qos-group 0 >>>> Drops in QOS 0
q-size: 100160, q-size-40g: 100160, HW MTU: 1500 (1500 configured)
drop-type: drop, xon: 0, xoff: 0
Statistics:
  Pkts received over the port          : 9612480
  Ucast pkts sent to the cross-bar     : 9587016
  Mcast pkts sent to the cross-bar     : 0
  Ucast pkts received from the cross-bar : 961249
  Pkts sent to the port                 : 961261
  Pkts discarded on ingress           : 3024 >>>>>
  Per-priority-pause status            : Rx (Inactive), Tx (Inactive)
```

## 3. 网络QoS配置 :

```
nexus6001# sh queuing int e1/4
Ethernet1/4 queuing information:
TX Queuing
  qos-group  sched-type  oper-bandwidth
    0         WRR        100

RX Queuing
qos-group 0 >>>> Drops in QOS 0
q-size: 100160, q-size-40g: 100160, HW MTU: 1500 (1500 configured)
drop-type: drop, xon: 0, xoff: 0
Statistics:
  Pkts received over the port          : 9612480
  Ucast pkts sent to the cross-bar     : 9587016
  Mcast pkts sent to the cross-bar     : 0
  Ucast pkts received from the cross-bar : 961249
  Pkts sent to the port                 : 961261
  Pkts discarded on ingress           : 3024 >>>>>
  Per-priority-pause status            : Rx (Inactive), Tx (Inactive)
```

## 4. 运用多种策略。当分类策略可以应用到单个接口时 , 网络QoS宽是系统。

```
nexus6001# sh queuing int e1/4
Ethernet1/4 queuing information:
TX Queuing
  qos-group  sched-type  oper-bandwidth
    0         WRR        100

RX Queuing
qos-group 0 >>>> Drops in QOS 0
q-size: 100160, q-size-40g: 100160, HW MTU: 1500 (1500 configured)
drop-type: drop, xon: 0, xoff: 0
```

```

Statistics:
  Pkts received over the port          : 9612480
  Ucast pkts sent to the cross-bar     : 9587016
  Mcast pkts sent to the cross-bar     : 0
  Ucast pkts received from the cross-bar : 961249
  Pkts sent to the port                 : 961261
  Pkts discarded on ingress          : 3024 >>>>>
  Per-priority-pause status           : Rx (Inactive), Tx (Inactive)

```

```

nexus6001# sh queuing int e1/4
Ethernet1/4 queuing information:

```

```

TX Queuing
  qos-group  sched-type  oper-bandwidth
  0           WRR        100

```

```

RX Queuing

```

```

qos-group 0 >>>> Drops in QOS 0
q-size: 100160, q-size-40g: 100160, HW MTU: 1500 (1500 configured)
drop-type: drop, xon: 0, xoff: 0
Statistics:
  Pkts received over the port          : 9612480
  Ucast pkts sent to the cross-bar     : 9587016
  Mcast pkts sent to the cross-bar     : 0
  Ucast pkts received from the cross-bar : 961249
  Pkts sent to the port                 : 961261
  Pkts discarded on ingress          : 3024 >>>>>
  Per-priority-pause status           : Rx (Inactive), Tx (Inactive)

```

## 5. 丢包为Qos类别2类看不到：

```

nexus6001(config-if)# sh queuing int e1/1
Ethernet1/1 queuing information:

```

```

TX Queuing
  qos-group  sched-type  oper-bandwidth
  0           WRR        100
  2           WRR         0

```

```

RX Queuing

```

```

qos-group 0
q-size: 100160, q-size-40g: 100160, HW MTU: 1500 (1500 configured)
drop-type: drop, xon: 0, xoff: 0
Statistics:
  Pkts received over the port          : 525111
  Ucast pkts sent to the cross-bar     : 327510
  Mcast pkts sent to the cross-bar     : 0
  Ucast pkts received from the cross-bar : 0
  Pkts sent to the port                 : 0
  Pkts discarded on ingress          : 197868 >>>>
  Per-priority-pause status           : Rx (Inactive), Tx (Inactive)
qos-group 2
q-size: 100160, q-size-40g: 100160, HW MTU: 1500 (1500 configured)
drop-type: drop, xon: 0, xoff: 0
Statistics:
  Pkts received over the port          : 131413
  Ucast pkts sent to the cross-bar     : 132096
  Mcast pkts sent to the cross-bar     : 0
  Ucast pkts received from the cross-bar : 0
  Pkts sent to the port                 : 0
  Pkts discarded on ingress          : 0 >>> No Drops
  Per-priority-pause status           : Rx (Inactive), Tx (Inactive)

```

## 相关信息

- [连结6000系列交换机QoS配置示例](#)
- [技术支持和文档 - Cisco Systems](#)