

# MDS交换机优先级传输B2B信用额技术说明

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## 简介

本文档介绍不同接口中的接收和传输缓冲区到缓冲区(B2B)信用，这些信用来排除光纤通道交换矩阵中的性能问题。

## 先决条件

### 要求

Cisco 建议您了解以下主题：

- 思科多层数据交换机(MDS)
- 光纤通道协议

### 使用的组件

本文档中的信息基于Cisco MDS 9000系列多层交换机。

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。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

## 了解MDS交换机中的优先级传输B2B信用

当您对光纤通道交换矩阵网络的瓶颈问题进行故障排除时，MDS交换机中的**show interface**命令是确认接口可用积分的一种简单方法。

以下说明在MDS接口中传输B2B信用点。

### 对于交换机间链路协议(ISL)中继接口

低优先级信用用于数据流量，高优先级信用用于交换机间链路控制流量。这只是发送方逻辑上的划分，用于限制其自身，使其不会消耗接收方的所有可用接收(Rx)信用。

例如，交换机MDS Tempest (接收方)告知交换机MDS Maestro (发送方)它有64个Rx信用点。

交换机MDS Maestro将56个信用标记为低优先级传输(Tx)信用和8个标记为高优先级Tx信用点。

出现拥塞时，MDS Maestro在56个低优先级信用点均不可用时停止发送数据流量。

但是，它仍然可以使用可用的8个高优先级信用点向MDS Tempest发送控制流量。

MDS Tempest无需区分低优先级信用或高优先级信用额度。

**注意：**高优先级TX传输信用的数量取决于不同的硬件平台。

这是一般的概念：八分之一的TX传输信用为高优先级信用，最大值为15 — 足以处理ELP或其他ISL控制消息。

这种高/低优先级差异仅适用于E端口或TE端口之间的ISL链路，不用于F端口。

### MDS 9148S平台示例：

对于E端口接口：

```
Tempest# show int fc1/26 fc1/26 is trunking Hardware is Fibre Channel, SFP is short wave laser
w/o OFC (SN) Port WWN is 20:1a:00:2a:6a:b9:d2:30 Peer port WWN is 20:1a:00:2a:6a:56:f0:00 Admin
port mode is auto, trunk mode is on snmp link state traps are enabled Port mode is TE Port vsan
is 2 Admin Speed is auto Operating Speed is 4 Gbps Rate mode is dedicated Port flow-control is
R_RDY Transmit B2B Credit is 32 Receive B2B Credit is 64 B2B State Change Number is 14 Receive
data field Size is 2112 Beacon is turned off Logical type is core Trunk vsans (admin allowed and
active) (2) Trunk vsans (up) (2) Trunk vsans (isolated) () Trunk vsans (initializing) () 5
minutes input rate 160 bits/sec,20 bytes/sec, 0 frames/sec 5 minutes output rate 96 bits/sec,12
bytes/sec, 0 frames/sec 22464 frames input,1801536 bytes 0 discards,0 errors 0 invalid CRC/FCS,0
unknown class 0 too long,0 too short 22977 frames output,1318564 bytes 0 discards,0 errors 0
input OLS,0 LRR,0 NOS,2 loop inits 1 output OLS,2 LRR, 0 NOS, 1 loop inits 64 receive B2B credit
remaining 32 transmit B2B credit remaining
28 low priority transmit B2B credit remaining
Interface last changed at Thu Jul 20 15:40:32 2017

Last clearing of "show interface" counters : never
```

Tempest#

链路的另一端显示总传输信用为64，低优先级为56:

```
Maestro# show int fc1/26
fc1/26 is trunking
Hardware is Fibre Channel, SFP is short wave laser w/o OFC (SN)
Port WWN is 20:1a:00:2a:6a:56:f0:00
Peer port WWN is 20:1a:00:2a:6a:b9:d2:30
Admin port mode is auto, trunk mode is on
snmp link state traps are enabled
Port mode is TE
Port vsan is 2
Speed is 4 Gbps
Rate mode is dedicated
Transmit B2B Credit is 64
Receive B2B Credit is 32
B2B State Change Number is 14
```

```
Receive data field Size is 2112
Beacon is turned off
admin fec state is down
oper fec state is down
Trunk vsans (admin allowed and active) (2)
Trunk vsans (up) (2)
Trunk vsans (isolated) ()
Trunk vsans (initializing) ()
5 minutes input rate 160 bits/sec,20 bytes/sec, 0 frames/sec
5 minutes output rate 216 bits/sec,27 bytes/sec, 0 frames/sec
 23189 frames input,1330368 bytes
   0 discards,0 errors
   0 invalid CRC/FCS,0 unknown class
   0 too long,0 too short
22677 frames output,1818076 bytes
   0 discards,0 errors
1 input OLS,2 LRR,0 NOS,3 loop inits
1 output OLS,0 LRR, 0 NOS, 1 loop inits
32 receive B2B credit remaining
64 transmit B2B credit remaining
56 low priority transmit B2B credit remaining
Interface last changed at Wed Jul 19 16:39:58 2017

Last clearing of "show interface" counters 1w 5d
```

Maestro#

对于F端口接口：

对于F端口，此计算不适用，因为MDS交换机和启动器/目标设备之间没有控制流量。

但是，您可以看到F端口中的所有传输信用点被标记为数据流量优先级较低。

例如，以下输出中的总传输信用为3，低优先级为3:

```
switch# show int fc1/47
fc1/47 is up
Hardware is Fibre Channel, SFP is short wave laser w/o OFC (SN)
Port WWN is 20:2f:00:2a:6a:56:f0:00
Admin port mode is F, trunk mode is on
snmp link state traps are enabled
Port mode is F, FCID is 0x570f00
Port vsan is 2
Speed is 4 Gbps
Rate mode is dedicated
Transmit B2B Credit is 3
Receive B2B Credit is 32
Receive data field Size is 2112
Beacon is turned off
admin fec state is down
oper fec state is down
5 minutes input rate 0 bits/sec,0 bytes/sec, 0 frames/sec
5 minutes output rate 16 bits/sec,2 bytes/sec, 0 frames/sec
 1220 frames input,74256 bytes
   0 discards,0 errors
   0 invalid CRC/FCS,0 unknown class
   0 too long,0 too short
2231 frames output,220056 bytes
   0 discards,0 errors
1 input OLS,1 LRR,0 NOS,0 loop inits
```

```
1 output OLS,0 LRR, 1 NOS, 0 loop inits
32 receive B2B credit remaining
3 transmit B2B credit remaining
3 low priority transmit B2B credit remaining
Interface last changed at Wed Jul 19 15:56:15 2017
```

Last clearing of "show interface" counters 1w 5d

switch#

## MDS 9710交换机示例：

MDS97xx交换机中没有高优先级Tx传输信用。但是，可以通过命令**system default tx-credit double-queue**更改此值。

从所连接的交换机的接口也可看到最大Tx传输信用。

拓扑： MDS 9710 Leonard fc3/14通过E端口背对背连接到MDS 9148S Tempest fc1/13。

## 默认设置:

默认情况下，MDS 9710 DS-X9448-768K9线卡没有高优先级信用点，所有64个传输信用点都被视为低优先级。

```
Leonard(config-if)# show int fc3/14 counter
fc3/14
5 minutes input rate 320 bits/sec, 40 bytes/sec, 3 frames/sec
5 minutes output rate 2688 bits/sec, 336 bytes/sec, 3 frames/sec
1416819 frames input, 77233324 bytes
0 discards, 0 errors, 0 CRC/FCS
0 unknown class, 0 too long, 0 too short
1416813 frames output, 138598368 bytes
0 discards, 0 errors
0 timeout discards, 0 credit loss
53 input OLS, 85 LRR, 119 NOS, 0 loop inits
77 output OLS, 7 LRR, 93 NOS, 0 loop inits
14 link failures, 37 sync losses, 2 signal losses
140 Transmit B2B credit transitions to zero
92 Receive B2B credit transitions to zero
0 2.5us TxWait due to lack of transmit credits
Percentage Tx credits not available for last 1s/1m/1h/72h: 0%/0%/0%/0%
500 receive B2B credit remaining
64 transmit B2B credit remaining
64 low priority transmit B2B credit remaining
Last clearing of "show interface" counters : never
Leonard(config-if)#
```

## 使用tx-credit双队列：

在交换机Leonard上发出命令后，系统**default tx-credit double-queue**

( 需要通过shut/no shut重置接口 )

```
Leonard(config)# show system default switchport
System default port state is down
System default trunk mode is on
```

```
System default link failure syslog logging level is 5
System default tx credit queue type is 0
Leonard(config)# system default tx-credit double-queue
Leonard(config)# show system default switchport
System default port state is down
System default trunk mode is on
System default link failure syslog logging level is 5
System default tx credit queue type is 1
Leonard(config)# int fc3/14
Leonard(config-if)# shut
Leonard(config-if)# no shut
```

可以看到有8个高优先级Tx传输B2B信用点和56个低优先级信用点：

```
Leonard(config-if)# show int fc3/14 counter
fc3/14
 5 minutes input rate 320 bits/sec, 40 bytes/sec, 2 frames/sec
 5 minutes output rate 256 bits/sec, 32 bytes/sec, 2 frames/sec
1420613 frames input, 77459300 bytes
 0 discards, 0 errors, 0 CRC/FCS
 0 unknown class, 0 too long, 0 too short
1420607 frames output, 138968464 bytes
 0 discards, 0 errors
 0 timeout discards, 0 credit loss
 54 input OLS, 87 LRR, 122 NOS, 0 loop inits
 79 output OLS, 7 LRR, 95 NOS, 0 loop inits
 14 link failures, 38 sync losses, 2 signal losses
 143 Transmit B2B credit transitions to zero
 94 Receive B2B credit transitions to zero
 0 2.5us TxWait due to lack of transmit credits
Percentage Tx credits not available for last 1s/1m/1h/72h: 0%/0%/0%/0%
 500 receive B2B credit remaining
 64 transmit B2B credit remaining
 56 low priority transmit B2B credit remaining
Last clearing of "show interface" counters : never
Leonard(config-if)#
```

来自交换机MDS 9148S Tempest的最大RX传输信用为15:

从所连接的MDS 9148S，Tempest可以看到Tx传输B2B积分的最大值为15。

默认情况下，MDS9710交换机Leonard有500个接收信用点，因此MDS9148S交换机Tempest还将有500个Tx传输B2B信用点剩余，但15个信用点（最大值）被分配为高优先级(500 - 485 = 15)。

```
Tempest# show int fc1/13 counter
fc1/13
 5 minutes input rate 2624 bits/sec, 328 bytes/sec, 3 frames/sec
 5 minutes output rate 1504 bits/sec, 188 bytes/sec, 3 frames/sec
1343331 frames input, 131489464 bytes
 0 discards, 0 errors, 0 CRC/FCS
 0 unknown class, 0 too long, 0 too short
1343332 frames output, 72878124 bytes
 0 discards, 0 errors
 0 timeout discards, 0 credit loss
 9 input OLS, 2 LRR, 0 NOS, 0 loop inits
 12 output OLS, 20 LRR, 9 NOS, 0 loop inits
 9 link failures, 0 sync losses, 0 signal losses
 66 Transmit B2B credit transitions to zero
 24 Receive B2B credit transitions to zero
```

```
0 2.5us TxWait due to lack of transmit credits
Percentage Tx credits not available for last 1s/1m/1h/72h: 0%/0%/0%/0%
64 receive B2B credit remaining
500 transmit B2B credit remaining
485 low priority transmit B2B credit remaining
Last clearing of "show interface" counters :never
Tempest#
```

当从MDS 9710 Leonard接收的积分更改为低于120时，八分之一的发射积分将被标记为高优先级：

```
Leonard(config)# int fc3/14
Leonard(config-if)# switchport fcrxbbcredit 112

Tempest# show int fc1/13 count
fc1/13
5 minutes input rate 1024 bits/sec, 128 bytes/sec, 3 frames/sec
5 minutes output rate 1536 bits/sec, 192 bytes/sec, 3 frames/sec
1360026 frames input, 133105756 bytes
0 discards, 0 errors, 0 CRC/FCS
0 unknown class, 0 too long, 0 too short
1360027 frames output, 73885304 bytes
0 discards, 0 errors
0 timeout discards, 0 credit loss
14 input OLS, 2 LRR, 0 NOS, 0 loop inits
17 output OLS, 30 LRR, 14 NOS, 0 loop inits
14 link failures, 0 sync losses, 0 signal losses
91 Transmit B2B credit transitions to zero
34 Receive B2B credit transitions to zero
0 2.5us TxWait due to lack of transmit credits
Percentage Tx credits not available for last 1s/1m/1h/72h: 0%/0%/0%/0%
64 receive B2B credit remaining
112 transmit B2B credit remaining
98 low priority transmit B2B credit remaining
Last clearing of "show interface" counters :never
Tempest#
```

## 关于此翻译

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