

在连结5000系列交换机的生成树协议故障排除

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简介

本文描述多种方法排除故障与生成树协议涉及的常见问题。

[先决条件](#)

[要求](#)

Cisco 建议您了解以下主题：

- 连结操作系统CLI
- STP

[使用的组件](#)

本文档不限于特定的软件和硬件版本。

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。

[故障排除](#)

此部分包括一些方法排除故障与STP的常见问题。

STP根

为了排除故障STP问题，知道是关键是哪交换机当前是根。命令显示在连结5000系列交换机的STP根是：

```
Nexus-5000# show spanning-tree vlan 1

VLAN0001
Spanning tree enabled protocol rstp
Root ID Priority 32769
Address c84c.75fa.6000
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
Address c84c.75fa.6000
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

这是一些其他相关命令：

```
Nexus-5000# show spanning-tree vlan 1 detail
Nexus-5000# show spanning-tree vlan 1 summary
```

一旦确定了谁当前根是，您能检查事件历史记录发现是否更改，并且拓扑变化通知起源于的地方。

```
Nexus-5000# show spanning-tree internal event-history tree 1 brief
2012:11:06 13h:44m:20s:528204us T_EV_UP
VLAN0001 [0000.0000.0000.0000 C 0 A 0 R none P none]
2012:11:06 13h:44m:21s:510394us T_UT_SBPDU
VLAN0001 [8001.547f.ee18.e441 C 0 A 0 R none P Po1]
2012:11:06 13h:44m:21s:515129us T_EV_M_FLUSH_L
VLAN0001 [1001.001b.54c2.5a42 C 6 A 5 R Po1 P none]
2012:11:06 13h:44m:23s:544632us T_EV_M_FLUSH_R
VLAN0001 [1001.001b.54c2.5a42 C 6 A 5 R Po1 P Po1]
2012:11:06 13h:44m:24s:510352us T_EV_M_FLUSH_R
VLAN0001 [1001.001b.54c2.5a42 C 6 A 5 R Po1 P Po1]
```

提示：这是在命令的输出中出现的缩略语的一些定义。**SBPDU**：接收的优越网桥协议数据单元;**FLUSH_L**：本地冲洗;**FLUSH_R**：从远程交换机的冲洗。

注意：在版本5.1(3)N1(1)之前的NX-OS版本不记录超过149个事件，并且日志不滚动。

STP接口

此命令用于为了显示接口的事件。

```
Nexus-5000# show spanning-tree internal event-history tree 1 interface
ethernet 1/3 brief
2012:11:05 13h:42m:20s:508027us P_EV_UP Eth1/3 [S DIS R Unkw A 0 Inc no]
2012:11:05 13h:42m:20s:508077us P_STATE Eth1/3 [S BLK R Desg A 0 Inc no]
2012:11:05 13h:42m:20s:508294us P_STATE Eth1/3 [S LRN R Desg A 0 Inc no]
2012:11:05 13h:42m:20s:508326us P_STATE Eth1/3 [S FWD R Desg A 0 Inc no]
```

此命令用于为了调查在接口的STP更改。此输出提供许多详细信息：

```

Nexus-5000# show spanning-tree internal info tree 1 interface port-channel 11
----- STP Port Info (vdc 1, tree 1, port Po11) -----
dot1d info: port_num=4106, ifi=0x1600000a (port-channell1)
ISSU FALSE non-disr, prop 0, ag 0, flush 0 peer_not_disputed_count 0
if_index          0x1600000a
namestring port-channell1
..... cut to save space .....

stats
fwd_transition_count 1          bpdus_in      40861   bpdus_out    40861
config_bpdu_in      0          rstp_bpdu_in 40861   tcn_bpdu_in  0
config_bpdu_out     0          rstp_bpdu_out 40861   tcn_bpdu_out 0
bpdufilter_drop_in  0
bpduguard_drop_in   0
err_dropped_in      0
sw_flood_in         0
..... cut to save space .....

```

与Ethanalyzer的BPDU调查

此部分描述如何使用Ethanalyzer为了捕获BPDU :

```
Ethanalyzer local interface inbound-hi display-filter "vlan.id == 1 && stp"
```

Example:

```
Nexus-5000# ethanalyzer local interface inbound-hi display-filter "vlan.id
== 1 && stp"
```

Capturing on eth4

```

2013-05-11 13:55:39.280951 00:05:73:f5:d6:27 -> 01:00:0c:cc:cc:cd STP RST.
Root = 33768/00:05:73:ce:a9:7c Cost = 1 Port = 0x900a
2013-05-11 13:55:40.372434 00:05:73:ce:a9:46 -> 01:00:0c:cc:cc:cd STP RST.
Root = 33768/00:05:73:ce:a9:7c Cost = 0 Port = 0x900a
2013-05-11 13:55:41.359803 00:05:73:f5:d6:27 -> 01:00:0c:cc:cc:cd STP RST.
Root = 33768/00:05:73:ce:a9:7c Cost = 1 Port = 0x900a
2013-05-11 13:55:42.372405 00:05:73:ce:a9:46 -> 01:00:0c:cc:cc:cd STP RST.
Root = 33768/00:05:73:ce:a9:7c Cost = 0 Port = 0x900a

```

为了看到详细的数据包，请使用detail命令：

```
Nexus-5000# ethanalyzer local interface inbound-hi detail display-filter
"vlan.id == 1 && stp"
```

Capturing on eth4

Frame 7 (68 bytes on wire, 68 bytes captured)

Arrival Time: May 11, 2013 13:57:02.382227000

[Time delta from previous captured frame: 0.000084000 seconds]

[Time delta from previous displayed frame: 1368280622.382227000 seconds]

[Time since reference or first frame: 1368280622.382227000 seconds]

Frame Number: 7

Frame Length: 68 bytes

Capture Length: 68 bytes

[Frame is marked: False]

[Protocols in frame: eth:vlan:llc:stp]

Ethernet II, Src: 00:05:73:ce:a9:46 (00:05:73:ce:a9:46), Dst: 01:00:0c:cc:cc:cd (01:00:0c:cc:cc:cd)

Destination: 01:00:0c:cc:cc:cd (01:00:0c:cc:cc:cd)

Address: 01:00:0c:cc:cc:cd (01:00:0c:cc:cc:cd)

.... .1 = IG bit: Group address (multicast/broadcast)

.... .0. = LG bit: Globally unique address

(factory default)

Source: 00:05:73:ce:a9:46 (00:05:73:ce:a9:46)

Address: 00:05:73:ce:a9:46 (00:05:73:ce:a9:46)

.... .0 = IG bit: Individual address (unicast)

.... .0. = LG bit: Globally unique address

```

(factory default)
  Type: 802.1Q Virtual LAN (0x8100)
802.1Q Virtual LAN
  111. .... .... = Priority: 7
  ...0 .... .... = CFI: 0
  .... 0000 0000 0001 = ID: 1
  Length: 50
Logical-Link Control
  DSAP: SNAP (0xaa)
  IG Bit: Individual
  SSAP: SNAP (0xaa)
  CR Bit: Command
  Control field: U, func=UI (0x03)
    000. 00.. = Command: Unnumbered Information (0x00)
    .... ..11 = Frame type: Unnumbered frame (0x03)
  Organization Code: Cisco (0x00000c)
  PID: PVSTP+ (0x010b)
Spanning Tree Protocol
  Protocol Identifier: Spanning Tree Protocol (0x0000)
  Protocol Version Identifier: Rapid Spanning Tree (2)
  BPDU Type: Rapid/Multiple Spanning Tree (0x02)
  BPDU flags: 0x3c (Forwarding, Learning, Port Role: Designated)
    0... .... = Topology Change Acknowledgment: No
    .0.. .... = Agreement: No
    ..1. .... = Forwarding: Yes
    ...1 .... = Learning: Yes
    .... 11.. = Port Role: Designated (3)
    .... ..0. = Proposal: No
    .... ...0 = Topology Change: No
  Root Identifier: 33768 / 00:05:73:ce:a9:7c
  Root Path Cost: 0
  Bridge Identifier: 33768 / 00:05:73:ce:a9:7c
  Port identifier: 0x900a
  Message Age: 0
  Max Age: 20
  Hello Time: 2
  Forward Delay: 15
  Version 1 Length: 0

```

为了将此信息到PCAP文件，请使用此命令：

```

Nexus-5000# ethanalyzer local interface inbound-hi display-filter
"vlan.id == 1 && stp" write bootflash:bpdu.pcap
Capturing on eth4
3 << Lists how many packets were captured.

```

在BPDU捕获，源MAC地址是远端装置的接口MAC地址。

在Ethanalyzer捕获，端口在十六进制格式出现。为了确定端口号，您需要首先转换编号到十六进制：

0x900a (从上一个trace) = 36874

这是解码该编号对端口的命令：

```

Nexus-5000# show spanning-tree internal info all |
grep -b 50 "port_id 36874" | grep "Port Info"
----- STP Port Info (vdc 1, tree 1, port Poll) -----
----- STP Port Info (vdc 1, tree 300, port Poll) -----
----- STP Port Info (vdc 1, tree 800, port Poll) -----
----- STP Port Info (vdc 1, tree 801, port Poll) -----
----- STP Port Info (vdc 1, tree 802, port Poll) -----
----- STP Port Info (vdc 1, tree 803, port Poll) -----

```

```
----- STP Port Info (vdc 1, tree 999, port Po11) -----
```

在这种情况下，它是Port-Channel 11。

STP 收敛

如果需要调查STP收敛，请使用**show spanning-tree内部交互作用**命令。此命令提供见解到什么事件触发了STP更改。收集此信息是重要的，当问题出现，因为日志大，并且他们随着时间的推移包裹。

```
Nexus-5000#show spanning-tree internal interactions
- Event:(null), length:123, at 81332 usecs after Sat May 11 12:01:47 2013
Success: pixm_send_set_mult_cbl_vlans_for_multiple_ports, num ports 1
VDC 1, state FWD, rr_token 0x21b9c3 msg_size 584
- Event:(null), length:140, at 81209 usecs after Sat May 11 12:01:47 2013
vb_vlan_shim_set_vlans_multi_port_state(2733): Req (type=12) to PIXM
vdc 1, inst 0, num ports 1, state FWD
[Po17 v 800-803,999-1000]
- Event:(null), length:123, at 779644 usecs after Sat May 11 12:01:46 2013
Success: pixm_send_set_mult_cbl_vlans_for_multiple_ports, num ports 1
VDC 1, state FWD, rr_token 0x21b99a msg_size 544<
- Event:(null), length:127, at 779511 usecs after Sat May 11 12:01:46 2013
vb_vlan_shim_set_vlans_multi_port_state(2733): Req (type=12) to PIXM
vdc 1, inst 0, num ports 1, state FWD
[Po17 v 300]
- Event:(null), length:123, at 159142 usecs after Sat May 11 12:01:32 2013
Success: pixm_send_set_mult_cbl_vlans_for_multiple_ports, num ports 1
VDC 1, state LRN, rr_token 0x21b832 msg_size 584
- Event:(null), length:140, at 159023 usecs after Sat May 11 12:01:32 2013
vb_vlan_shim_set_vlans_multi_port_state(2733): Req (type=12) to PIXM
vdc 1, inst 0, num ports 1, state LRN
[Po17 v 800-803,999-1000]
- Event:(null), length:123, at 858895 usecs after Sat May 11 12:01:31 2013
Success: pixm_send_set_mult_cbl_vlans_for_multiple_ports, num ports 1
VDC 1, state LRN, rr_token 0x21b80b msg_size 544
- Event:(null), length:127, at 858772 usecs after Sat May 11 12:01:31 2013
vb_vlan_shim_set_vlans_multi_port_state(2733): Req (type=12) to PIXM
vdc 1, inst 0, num ports 1, state LRN
[Po17 v 300]
..... cut to save space .....
```

外部VLAN映射

连结5000系列交换机使用内部VLAN为了映射到转发的外部VLAN号。有时VLAN ID是内部VLAN ID为了有映射外部VLAN，输入：

```
Nexus-5000# show platform afm info global
Gatos Hardware version 0
Hardware instance mapping
-----
Hardware instance: 0 asic id: 0 slot num: 0
----- cut to save space -----
Hardware instance: 12 asic id: 1 slot num: 3
AFM Internal Status
-----
[unknown label ]: 324
[no free statistics counter ]: 2
[number of verify ]: 70
[number of commit ]: 70
[number of request ]: 785
```

```
[tcam stats full ]: 2
```

```
Vlan mapping table
```

```
-----
```

```
Ext-vlan: 1 - Int-vlan: 65
```

STP调试

另一个方式排除故障STP问题将使用调试。然而，使用STP调试也许造成CPU使用情况阻止的一些环境导致注意事项。为了激烈地减少CPU使用情况，当运行调试时，请使用一个调试过滤器，并且记录活动到日志文件。

1. 创建日志文件，保存在目录日志下。

```
Nexus-5000#debug logfile spanning-tree.txt
Nexus-5548P-L3# dir log:
31 Nov 06 12:46:35 2012 dmesg
----- cut to save space-----
7626 Nov 08 22:41:58 2012 messages
0 Nov 08 23:05:40 2012 spanning-tree.txt
4194304 Nov 08 22:39:05 2012 startupdebug
```

2. 运行调试。

```
Nexus-5000# debug spanning-tree bpdu_rx interface e1/30
<<<setup your spanning-tree for bpdus
Nexus-5000# copy log:spanning-tree.txt bootflash:
```

示例从日志文件：

```
Nexus-5000# debug spanning-tree bpdu_rx interface e1/30
<<<setup your spanning-tree for bpdus
Nexus-5000# copy log:spanning-tree.txt bootflash:
```

连结5000没有处理BPDU

为了排除故障此问题，请检查事件历史记录确定连结5000系列交换机是否假设根。连结5000假设根，如果或者没有处理BPDU或没有接收他们。为了调查是的原因，您应该确定是否有其他交换机附加对此问题的指定的网桥。如果其他网桥没有问题，是很可能连结5000没有处理BPDU。如果其他网桥有问题，是很可能网桥没有发送BPDU。

注意：要记住的事，当排除故障STP和虚拟端口信道时(vPC)。仅vPC主要的发送BPDU。当vPC第二是STP根时，主要的仍然发送BPDU。如果根通过vPC连接，只有主要的增量Rx BPDU计数器，既使当第二接收他们。