

Troubleshooting PVC Problems

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Introduction

This document describes how to troubleshoot permanent virtual circuit (PVC) problems in a Cisco IGX 8400 or BPX 8600 series switch running 9.1 Switch Software or later.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on this software and hardware:

- Switch Software 9.1 and later
- IGX 8400 Universal Switching Module (UXM)
- BPX 8600 Broadband Switch Module (BXM)

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

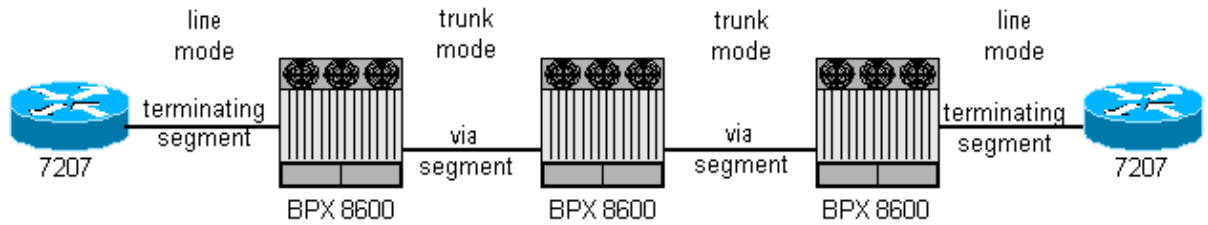
Conventions

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

UXM and BXM Functionality

UXM and BXM modules support ATM Forum compliant traffic between user and network equipment and within Cisco networks. Both modules display statistics for connections whether they are operating in line mode or trunk mode. Based on this functionality, the UXM and BXM can display statistics at each point in a connection path.

Connections are referred to as channels for statistics collection using the **dspchstats** command. Channel statistics provide information to help troubleshoot network connectivity problems such as excessive delay or one-way traffic on customer premise equipment (CPE). Connections that traverse an IGX or BPX are known as via connections. The diagram below provides an oversimplified example of the terminating and via segments of a connection traversing BPX BXMs.



The **dspchstats** command identifies discards on a connection and requires the connection number or trunk identifier to display useful information. The **dspchstats** command syntax depends upon the connection type as described here:

Segment	Command Syntax
terminating	dspchstats <i>module_slot.line.vpi.vci</i> , where vpi = virtual path identifier; vci = virtual channel identifier.
via	dspchstats <i>module_slot.trunk.lcn</i> , where lcn = logical channel number.

Examine PVC Via Segments

This section assumes that the **dspchstats** *module_slot.line.vpi.vci* command does not display discards or congestion at either terminating segment. It also assumes that end-to-end connectivity is slow or successful in only one direction. The connection could be experiencing discards or a stuck-module queue at the via segments.

Complete these steps to isolate the source of the problem:

1. Identify all connections via segment logical channel numbers.

The service-level **dect** *slot.port.vpi.vci* command contains multiple screens of information about a specific connection, including six screens for local connections and seven screens for connections routed across a network. The command output depends upon the switch type. The table below provides the equivalent fields for the IGX 8400 and BPX 8600 series switches.

IGX 8400	BPX 8600
<i>Master Lcon Index</i>	<i>Mstr LCon Idx</i>
<i>Master Node Number</i>	<i>Master Node#</i>
<i>Slot.port</i>	<i>Trunk</i>
<i>LCN</i>	<i>This Chan</i>

- a. Use the **dect** *slot.port.vpi.vci* command and record the following information to evaluate the via segments of the ATM connection used in this example:

- ◇ Logical connection (LCON) number . The LCON is unique per node. A connection only has one pair of LCONs representing the master and slave ends.
- ◇ *Master Node Number*. Indicated by a 1 in the *Master* field on the first screen or in the *Master Node Number* field on the last screen of the **dcct slot.port.vpi.vci** command. A connection only has one master end representing the node on which the connection was built.
- ◇ Trunk information (*slot.port*). The trunk information is specific to each end of the trunk.
- ◇ Logical channel number (*LCN*). The logical number assigned to the connection on the card. A connection has one LCN per card and two LCNs per trunk.

```
g4static      TN      StrataCom      IGX 8420  9.2.23   May  18 2000 1131 GMT
```

```
Slot 11 Port 1 VPI.VCI 100.1 LCON# 16 &31875AC4 VC# 16 &3193FA88
Alloc      1 Bundled  0 MS Cmax,SM 10,10 mir 384000,384000
Exists     1 Never rtd 0 COS      0 peak 768000,768000
Master     1 No DC fnd 0 Hops     2 Cmax 200,200
Local      0 Failed  0 Src dc   10 %Utl 100,100
Pref only  0 Down,pend 0,0 Snk dc   10 FSTsts 1
No rt fnd  0 Cur route  PREF Frst Pt,oe 3,3 Route wait 329493477
Path fail  0 BW needed No Bndl Sz,OE 0,0 Cdt reason None
Derouted   0 baddr type 1 Group num 0 MS PLU,SM 2400,2400
RrtReq L,G 0,0 acc dev vx 0 VC count 1 MS CLU,SM 1000,1000
Route CDT  0 Max cost 100 VC index 16 Line rstr NONE
                                         RR Group # 10
Path 63/5 66/4 64 Prev LCON 17
Pref 63/5 66/4 64 Next LCON 65535
```

```
Slot 11 Port 1 VPI.VCI 100.1 LCON# 16 &31875AC4 VC# 16 &3193FA88
```

!--- Five screens were skipped because they are not used in this document.

```
XLAT DB Ptr      30D2FC5C
XLAT Entry Ptr   30D0064C
Slot.port.index 11.5.2
Sequence Number  6
State            USED
LTrk/OE LTrk     6 / 255
LCN/OE LCN      262 / 0
xmt/rcv baddr    1 / 2 (Note add 0x1000 for CBA)
VPC              0
Conid            4102
Master Node Number 64
Master Lcon Index  16
Vc Index         16
```

Last Command **dcct 11.2.100.100**

- b. Use the **dspnds +n** command to translate from node number to node name.

```
g4static TN Service IGX 8420 9.2.31 Aug. 28 2000 13:48 GMT
NodeName J/ Num
g5static /63
g4static /64
b4static /66
Last Command: dspnds +n
```

Important information from the **dcct** command is highlighted in bold. The *Master Node Number* and the *Master Lcon Index* number are required to identify relevant LCNs on a via node. The *LCON* of a connection on the master node is the *Master Lcon Index* for the connection through the network. Each connection has many LCNs, including ones for each card it travels through, but only one master LCON.

The last screen of the **dcct slot.port.vpi.vci** command for the BPX 8600 platform presents different information:

```

b4static      VT      StrataCom      BPX 8620  9.2.23    May  18 2000 1145 GM
Slot 5   Port 0   VPI 0 VCI 99      LCON# 23  &31CD2CC2VC# 23  &3216D6DE

Base XLT ptr  31133648
Xlat ptr      310C792C
Cur,Nxt Indx 2, 0
SEQ Number    10
State         USED
Trunk        7(5.3.255)
!--- in the BPX, this is the Slot.port.

OE Trunk      255(5.3.255)
Out Trk Chan  0
This Chan   273
!--- in the BPX, this is the LCN.

VPC(N) Conid  4351
Master Node#  66
Mstr LCon Idx 23

```

Last Command **dcct 5.1.0.99**

2. Use the **dspchstats slot.port.lcn** command to view the connection status of an IGX 8400 trunk using the information collected from the **dcct** command.

```

g4static      TN      StrataCom      IGX 8420  9.2.23    May  18 2000 1135 GMT

Trunk Channel Statistics 11.5 Lcn 262
Collection Time 0 day(s) 000013
                                Clrd 05/18/00 113533
Type                            Count   Traffic      Rate (cps)
Cells Received from Port         1     From port          0
Cells Transmitted to Network     2     To network          0
Cells Received from Network      2     From network        0
Cells Transmitted to Port        2     To port              0
EOF Cells Received from Port     0
Cells Received with CLP=1        0
Cells Received with CLP=0        1
Non-Compliant Cells Received     0
Average Rx VCq Depth in Cells    0
Average Tx Vcq Depth in Cells    0
Ingress Vsvd Allowed Cell Rate   0
Egress Vsvd Allowed Cell Rate    0

Cells Rx with CLP=0 from Network  2
Cells Rx with CLP=1 from Network  0
Cells TX with CLP=0 to Port       2
Cells TX with CLP=1 to Port       0
Non-Comp Cells Rx w/CLP=0 dropped 0
Non-Comp Cells Rx w/CLP=1 dropped 0
Overflow Cells Rx w/CLP=0 dropped 0
Overflow Cells Rx w/CLP=1 dropped 0
OAM state (0OK,1FERF,2AIS)       0
Good Pdu's Received by the Sar    0
Good Pdu's Transmitted by the Sar 0
Rx pdu's discarded by the Sar     0

TX pdu's discarded by the Sar     0
Invalid CRC32 pdu rx by the sar   0
Invalid Length pdu rx by the sar  0
Shrt-Lgth Fail detected by the sar 0
Lng-Lgth Fail detected by the sar 0

```

This Command **dspchstats 11.5.262 1**
 !--- The 1 is for a one-second screen refresh rate.

- Use the **dspchstats** command to view the connection status of a BPX 8600 trunk using the information collected from the **dect** command.

```

b4static      VT      StrataCom      BPX 8620  9.2.23      May  18 2000 1146 GMT

Trk Channel Statistics for 5.3.273 Cleared May  18 2000 1146 (\)
PCR 0/0 cps      Collection Time 0 day(s) 000017      Corrupted NO
  Traffic      Cells      CLP      Avg CPS      %util      Chan Stat Addr 30F69634
From Port      0          0          0          0
To Network     0          ---        0          0
From Network   0          0          0          0
To Port        0          0          0          0

Rx Frames Rcv      0 NonCmplnt Dscd      0 Rx Q Depth      0
TX Q Depth         0 Rx CLP0              0 Rx Nw CLP0      0
Igr VSVD ACR      0 Egr VSVD ACR        0 TX Clp0 Port    0
Rx Clp0+1 Port    0 NCmp CLP0 Dscd     0 NCmp CLP1 Dscd  0
Oflw CLP0 Dscd    0 Of1w CLP1 Dscd     0
  
```

This Command **dspchstats 5.3.273 1**
 !--- The 1 is for a one-second screen refresh rate.

Via Node Discards Traffic Example

This section shows an example of a via node discarding traffic.

- Use the **dspcon slot.port.vpi.vci** command at the master end to determine the connection route through the network and examine the PVC segment at a via node. Then use these commands:

- ◆ **vt node_name** To connect to the next node in the connection path.
- ◆ **dnvc master_node_name master_Lcon_number** To collect the LCN information for each trunk card the connection traverses on the via node. The **dnvc** command is a service-level command whose output depends upon which switch type is used.

```

network2      VT      StrataCom      IGX 8420  9.1.16      Dec. 13 1999 0135 G+01

NW Lcon Ptr=317EA384, Vc Offset=0, MS Indx=175, SM Indx=177, GW=1
  
```

```

TRUNK XLAT INFO (MS) 4 (15.1)      TRUNK XLAT INFO (SM) 2 (6.1)
XLAT dB ptr      30ACF070      XLAT dB ptr      30ACF170
XLAT ptr         30AB4518      XLAT ptr         30ACC188
Cur Indx(d)     175          Cur Indx(d)     177
Nxt Indx(d)     0          Nxt Indx(d)     0
SEQ Number(d)   41          SEQ Number(d)   41
State,          U          State,          U
RCV,XMT dc(H)  10,10      RCV,XMT dc(H)  10,10
RCV,XMT ch(H)  12,11      RCV,XMT ch(H)  11,12
LCN(d)         175      LCN(d)         177
Master Node#    220      Master Node#    220
Mstr LCon Indx  1          Mstr LCon Indx  1
Mstr VC Indx    1          Mstr VC Indx    1
  
```

Last Command: **dnvc network1 1**

- Use the **dspchstats** command to view the IGX connection status on a trunk using the information collected from the **dnvc** command.

Trunk Channel Statistics 15.1 Lcn 175
Collection Time 0 day(s) 000037

Type	Count	Clrd 12/14/99 Traffic	233956 Rate (cps)
Cells Received from Port	40	From port	1
Cells Transmitted to Network	0	To network	0
Cells Received from Network	16	From network	0
Cells Transmitted to Port	16	To port	0
EOF Cells Received from Port	0		
Cells Received with CLP=1	0		
Cells Received with CLP=0	40		
Non-Compliant Cells Received	0		
Average Rx Vcq Depth in Cells	4093		
Average TX Vcq Depth in Cells	3		
Cells Transmitted with EFCI=1	0		
Cells Transmitted with EFCI=0	16		

This Command: **dspchstats 15.1.175**

In this example, the **dspchstats** command isolated the problem to IGX 8400 switch network2 trunk 15.1. In this example, a UXM defect caused the transmit queue to fill and not play out cells. After the UXM transmit queue filled, subsequent traffic was discarded.

Avoid using disruptive commands such as the **resetcd slot_number h** command, unless all network traffic has been routed from the offending trunk. Use the **cnfpref connection_number** command to restore data service by routing the connection around the offending trunk.

Related Information

- [Configuring and Troubleshooting ATM Connection Configurations and Cisco BPX 8600 Series Switches](#)
- [Cisco WAN Switching Solutions – Cisco Documentation](#)
- [Guide to New Names and Colors for WAN Switching Products](#)
- [Downloads – WAN Switching Software](#)
- [Technical Support – Cisco Systems](#)