

WS-X6608-T1/E1 Digital Gateway Card on Catalyst 6000 Platform Problem Resolution

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Introduction

The Lennon card (WS-X6608-T1/E1) is an 8-port Digital Gateway and/or digital signal processor (DSP) Farm which uses Skinny Client Control Protocol (SCCP) to interact with Cisco CallManager 3.0.

This document gives an in-depth overview of the **debug** and engineering level commands that are available for troubleshooting problems with Lennon gateways. The document covers everything from how to troubleshoot registration problems to how to obtain information directly from the 860 processor and DSPs solve.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

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

- WS-X6608-T1/E1 Digital Gateway Card
- Cisco Catalyst 6000 Series Switches

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.

Troubleshoot over the Catalyst 6000 CLI

First you must ensure that the module is recognized in the chassis, is powered up, and is in an operational state.

Make sure that the module is recognized and has power with the **show env power** command.

```
voice-cat6k-6a (enable) show env power 7
Module 7:
Slot power Requirement/Usage :

Slot Card Type          PowerRequested PowerAllocated CardStatus
Watts   A @42V Watts   A @42V
-----
3      WS-X6608-T1      83.16    1.98    83.16    1.98    ok
```

If the card type shows up correctly, then the module is recognized. The CardStatus field shows other while the card powers up. Eventually shows ok. If the card shows deny then there is not enough power in the system to power up the module.

Next check the APP load and DSP load versions with the help of the **show version** command:

```
dtl17-1-cat6000-a (enable) show version 3
Mod Port Model          Serial #   Versions
-----
3   8   WS-X6608-T1          SAD04380DAW Hw : 1.1
                                     Fw : 5.4(2)
                                     Sw : 6.1(1a)
                                     HP1: D004G300; DSP1: D005B300 (3.3.18)
                                     HP2: D004G300; DSP2: D005B300 (3.3.18)
                                     HP3: D004G300; DSP3: D005B300 (3.3.18)
                                     HP4: D004G300; DSP4: D005B300 (3.3.18)
                                     HP5: C001H300; DSP5: C002F300 (3.1.2)
                                     HP6: C001H300; DSP6: C002F300 (3.1.2)
                                     HP7: M001H300; DSP7: M002F300 (3.1.2)
                                     HP8: M001H300; DSP8: M002F300 (3.1.2)
```

HP stands for Host Processor which are the eight separate 860 processors on the Lennon. The load ID that follows is referred to as the App load. The DSP field indicates the version number of the DSP code loaded on the eight DSPs for that particular Lennon port (this gives a total of 64 DSPs). These fields can be empty if the DSPs are currently being updated.

The App load version also tells you what function the port is currently configured for. The three valid settings are Digital PRI Gateway, Conference Bridge, or Transcoder/Message Transfer Part (MTP). The first four characters of the load file tell you what kind of file it is:

- **D004** = Digital Gateway App Load
- **D005** = Digital Gateway DSP Load
- **C001** = Conference Bridge App Load
- **C002** = Conference Bridge DSP Load
- **M001** = Transcoder/MTP App Load
- **M002** = Transcoder/MTP DSP Load

The DSP load file name is never configured by the user. It is directly tied to a particular App load file. Multiple App load files usually point to the same DSP load file since less changes are made to DSP loads. For example, D0040300, D004A300, D004B300 App load files can all use DSP load file D0050300.

Next check to see if the module has valid IP configuration information and if it is registered with Cisco CallManager. Use the **show port** command.

```
dtl17-1-cat6000-a (enable) show port 3
Port Name Status Vlan Duplex Speed Type
-----
3/1 connected 17 full 1.544 T1
3/2 connected 17 full 1.544 T1
3/3 connected 17 full 1.544 T1
3/4 connected 17 full 1.544 T1
3/5 enabled 17 full - Conf Bridge
3/6 enabled 17 full - Conf Bridge
3/7 enabled 17 full - MTP
3/8 enabled 17 full - MTP
```

```
Port DHCP MAC-Address IP-Address Subnet-Mask
-----
3/1 enable 00-01-c9-d8-55-74 10.192.17.98 255.255.255.0
3/2 enable 00-01-c9-d8-55-75 10.192.17.107 255.255.255.0
3/3 enable 00-01-c9-d8-55-76 10.192.17.108 255.255.255.0
3/4 enable 00-01-c9-d8-55-77 10.192.17.109 255.255.255.0
3/5 enable 00-01-c9-d8-55-78 10.192.17.110 255.255.255.0
3/6 enable 00-01-c9-d8-55-79 10.192.17.93 255.255.255.0
3/7 enable 00-01-c9-d8-55-7a 10.192.17.95 255.255.255.0
3/8 enable 00-01-c9-d8-55-7b 10.192.17.96 255.255.255.0
```

```
Port Call-Manager(s) DHCP-Server TFTP-Server Gateway
-----
3/1 172.18.112.17* 172.18.112.11 172.18.112.17 10.192.17.254
172.18.112.18
3/2 172.18.112.17* 172.18.112.11 172.18.112.17 10.192.17.254
172.18.112.18
3/3 172.18.112.17* 172.18.112.11 172.18.112.17 10.192.17.254
172.18.112.18
3/4 172.18.112.17* 172.18.112.11 172.18.112.17 10.192.17.254
172.18.112.18
3/5 172.18.112.17* 172.18.112.11 172.18.112.17 10.192.17.254
172.18.112.18
3/6 172.18.112.17* 172.18.112.11 172.18.112.17 10.192.17.254
172.18.112.18
3/7 172.18.112.17* 172.18.112.11 172.18.112.17 10.192.17.254
172.18.112.18
3/8 172.18.112.17* 172.18.112.11 172.18.112.17 10.192.17.254
172.18.112.18
```

(*): Primary

```
Port DNS-Server(s) Domain
-----
3/1 161.44.15.250* cisco.com
161.44.21.250
3/2 161.44.15.250* cisco.com
161.44.21.250
3/3 161.44.15.250* cisco.com
161.44.21.250
3/4 161.44.15.250* cisco.com
161.44.21.250
3/5 161.44.15.250* cisco.com
161.44.21.250
3/6 161.44.15.250* cisco.com
```

```

        161.44.21.250
3/7    161.44.15.250*   cisco.com
        161.44.21.250
3/8    161.44.15.250*   cisco.com
        161.44.21.250

```

(*): Primary

Port	CallManagerState	DSP-Type
3/1	registered	C549
3/2	registered	C549
3/3	registered	C549
3/4	registered	C549
3/5	registered	C549
3/6	registered	C549
3/7	registered	C549
3/8	registered	C549

Port	NoiseRegen	NonLinearProcessing
3/1	enabled	enabled
3/2	enabled	enabled
3/3	enabled	enabled
3/4	enabled	enabled
3/5	disabled	disabled
3/6	disabled	disabled
3/7	disabled	disabled
3/8	disabled	disabled

Port	Trap	IfIndex
3/1	disabled	1262
3/2	disabled	1263
3/3	disabled	1264
3/4	disabled	1265
3/5	disabled	1266
3/6	disabled	1267
3/7	disabled	1268
3/8	disabled	1269

In this **show port** command output, ensure that the IP address, subnet mask, gateway, DNS server(s), domain, and TFTP server addresses are correct. Also make sure that the ports are in the correct VLAN. Each Lennon port can be put on a different subnet and act independently of the other ports on the same module.

Check whether or not the card has registered with the Cisco CallManager. If the card is not registered and has been configured on the Cisco CallManager, see the Troubleshoot Registration Problems section of this document.

The **show port** command can also be used to check the status of each of the individual ports on the card. The status field varies based on what type of port it is (Gateway/Conf/MTP).

For any port that is not registered with Cisco CallManager, the port is either in an enabled or disabled state based on the configured status on that port. MTP and Conference Bridge ports also show either enabled or disabled.

Registered Digital Gateway ports show either connected or notconnected based on the status of the D-channel. Remember that the D-channel terminates on the Cisco CallManager, not the Lennon card.

Once a call is up, the **show port voice active** command can be used to gather information about all active

calls on the system and detailed information on individual calls. The type shows call for a gateway port, conferencing for a conference port and transcoding for both transcoding and MTP.

```
dtl17-1-cat6000-a (debug-eng) show port voice active
Port Type          Total Conference-ID/ Party-ID IP-Address
Transcoding-ID
-----
3/1 call           2 - - 10.192.17.115
                  10.192.17.93
3/6 conferencing  1 1 6 10.192.17.98
                  7 10.192.17.112
                  5 10.192.17.114
3/8 transcoding   1 2 9 172.18.112.109
                  11 10.192.17.113
```

Issue the **show port voice active** command for a single port in order to obtain additional details. A gateway call looks like this output and the fields are self-explanatory.

```
dtl17-1-cat6000-a (debug-eng) show port voice active 3/1
Port 3/1 :
Channel #22:
Remote IP address      : 10.192.17.115
Remote UDP Port       : 20972
ACOM Level Current    : 200
Call State            : voice
Codec Type            : G711 ULAW PCM
Coder Type Rate       : 20
ERL Level             : 200
Voice Activity Detection : disabled
Echo Cancellation     : enabled
Fax Transmit Duration (ms) : 0
Hi Water Playout Delay : 65
Low Water Playout Delay : 65
Receive Bytes         : 0
Receive Delay         : 65
Receive Packets       : 0
Transmit Bytes        : 7813280
Transmit Packets      : 48833
Tx Duration (ms)     : 3597580
Voice Tx Duration (ms) : 3597580
```

This is the same command output for a conferencing port. Each conference shows the participants of the conference as well as the codec that is used and the packet size.

```
dtl17-1-cat6000-a (debug-eng) show port voice active 3/6
Port 3/6 :
Conference ID: 1
Party ID: 6
Remote IP address      : 10.192.17.98
UDP Port               : 26522
Codec Type             : G711 ULAW PCM
Packet Size (ms)      : 20
Party ID: 7
Remote IP address      : 10.192.17.112
UDP Port               : 17164
Codec Type             : G711 ULAW PCM
Packet Size (ms)      : 20
Party ID: 5
Remote IP address      : 10.192.17.114
UDP Port               : 19224
Codec Type             : G711 ULAW PCM
Packet Size (ms)      : 20
```



```

00:00:00.020 (NMP) Open TCP Connection ip:7f010101
00:00:00.030 NMPTask:Send Module Slot Info
00:00:00.030 NMPTask:get DIAGCMD
00:00:00.030 NMPTask:send DIAGCMD TCP ack
00:00:00.030 SPAN: Transmit clock slaved to span 3
00:00:00.030 SPAN: Transmit clock set to internal osc.
00:00:00.580 (DSP) Test Begin -> Mask<0x00FFFFFF>
00:00:01.570 SPAN: Transmit clock slaved to span 3
00:00:01.570 SPAN: Transmit clock set to internal osc.
00:00:01.570 (DSP) Test Complete -> Results<0x00FFFFFF/0x00FFFFFF>
00:00:01.810 NMPTask:get VLANCONFIG
00:00:02.870 (CFG) Starting DHCP
00:00:02.870 (CFG) Booting DHCP for dynamic configuration.
00:00:03.170 (CFG) DHCP Request or Discovery Sent, DHCPState = INIT
00:00:03.170 (CFG) DHCP Server Response Processed, DHCPState = REQUESTING
00:00:03.170 (CFG) DHCP Server Response Processed, DHCPState = BOUND
00:00:03.170 (CFG) Requesting DNS Resolution of CiscoCm1
00:00:16.170 (CFG) DNS Server Timeout on Resolving TFTP Server Name.
00:00:16.170 (CFG) TFTP Server IP Set by DHCP Option 150 = 172.18.112.17
00:00:16.170 (CFG) Requesting SDA0001C9D85577.cnf File From TFTP Server
00:00:16.170 (CFG) TFTP Error: .cnf File Not Found!
00:00:16.170 (CFG) Requesting SDAdefault.cnf File From TFTP Server
00:00:16.170 (CFG) .cnf File Received and Parsed Successfully.
00:00:16.170 (CFG) Updating Configuration ROM...
00:00:16.620 GMSG: GWEvent = CFG_DONE --> GWState = SrchActive
00:00:16.620 GMSG: CCM#0 CPEvent = CONNECT_REQ --> CPState = AttemptingSocket
00:00:16.620 GMSG: Attempting TCP socket with CCM 172.18.112.17
00:00:16.620 GMSG: CCM#0 CPEvent = SOCKET_ACK --> CPState = BackupCCM
00:00:16.620 GMSG: GWEvent = SOCKET_ACK --> GWState = RegActive
00:00:16.620 GMSG: CCM#0 CPEvent = REGISTER_REQ --> CPState = SentRegister
00:00:16.770 GMSG: CCM#0 CPEvent = CLOSED --> CPState = NoTCPsocket
00:00:16.770 GMSG: GWEvent = DISCONNECT --> GWState = SrchActive
00:00:16.770 GMSG: CCM#1 CPEvent = CONNECT_REQ --> CPState = AttemptingSocket
00:00:16.770 GMSG: Attempting TCP socket with CCM 172.18.112.18
00:00:16.770 GMSG: CCM#1 CPEvent = SOCKET_NACK --> CPState = NoTCPsocket
00:00:16.770 GMSG: GWEvent = DISCONNECT --> GWState = Rollover
00:00:31.700 GMSG: GWEvent = TIMEOUT --> GWState = SrchActive
00:00:31.700 GMSG: CCM#0 CPEvent = CONNECT_REQ --> CPState = AttemptingSocket
00:00:31.700 GMSG: Attempting TCP socket with CCM 172.18.112.17
00:00:31.700 GMSG: CCM#0 CPEvent = SOCKET_ACK --> CPState = BackupCCM
00:00:31.700 GMSG: GWEvent = SOCKET_ACK --> GWState = RegActive
00:00:31.700 GMSG: CCM#0 CPEvent = REGISTER_REQ --> CPState = SentRegister
00:00:31.850 GMSG: CCM#0 CPEvent = CLOSED --> CPState = NoTCPsocket
00:00:31.850 GMSG: GWEvent = DISCONNECT --> GWState = SrchActive
00:00:31.850 GMSG: CCM#1 CPEvent = CONNECT_REQ --> CPState = AttemptingSocket
00:00:31.850 GMSG: Attempting TCP socket with CCM 172.18.112.18
00:00:31.850 GMSG: CCM#1 CPEvent = SOCKET_NACK --> CPState = NoTCPsocket
00:00:31.850 GMSG: GWEvent = DISCONNECT --> GWState = Rollover

```

The **show port** command shows the Lennon port as not registered as seen in this output:

```

dtl17-1-cat6000-a (debug-eng) show port 3/4

```

Port	Name	Status	Vlan	Duplex	Speed	Type
3/4		enabled	17	full	-	unknown

Port	DHCP	MAC-Address	IP-Address	Subnet-Mask
3/4	enable	00-01-c9-d8-55-77	10.192.17.109	255.255.255.0

Port	Call-Manager(s)	DHCP-Server	TFTP-Server	Gateway
3/4	-	172.18.112.11	172.18.112.17	10.192.17.254

```

Port      DNS-Server(s)      Domain
-----
3/4      161.44.15.250*    cisco.com
          161.44.21.250
(*)): Primary

Port      CallManagerState  DSP-Type
-----
3/4      notregistered    C549

Port      NoiseRegen        NonLinearProcessing
-----
3/4      -                 -

Port      Trap              IfIndex
-----
3/4      disabled          1265

```

Another possible registration problem can be if the load information is incorrect or the load file is corrupt. The problem can also occur if the TFTP server does not work. In this case, tracy shows that the TFTP server reports the file is not found:

```

00:00:07.390 MSG: CCM#0 CPEvent = REGISTER_REQ --> CPState = SentRegister
00:00:08.010 MSG: TFTP Request for application load D0041300
00:00:08.010 MSG: CCM#0 CPEvent = LOADID --> CPState = AppLoadRequest
00:00:08.010 MSG: *** TFTP Error: File Not Found ***
00:00:08.010 MSG: CCM#0 CPEvent = LOAD_UPDATE --> CPState = LoadResponse

```

In this case, the Lennon requests App Load D0041300 although the correct load name is D0040300. The same problem can occur when a new App Load needs to get its corresponding DSP load as well. If the new DSP load is not found, a similar message appears.

Check Physical Layer Statistics on Lennon

Originally, the only Layer 1 statistics that could be obtained from the Lennon ports configured as a T1/E1 gateway were through this command. This option was only available for T1 ports since there is no provision for Facility Data Link (FDL) on E1.

```

cat6k-2 (enable) show port voice fdl 3/1

Port      ErrorEvents          ErroredSecond        SeverlyErroredSecond
          Last 15' Last 24h  Last 15' Last 24h  Last 15' Last 24h
-----
3/1      65535      65535      900      20864      900      20864
Port      FailedSignalState    FailedSignalSecond
          Last 15' Last 24h  Last 15' Last 24h
-----
3/1      1          1          900      20864
Port      LES                BES                    LCV
          Last 15' Last 24h  Last 15' Last 24h  Last 15' Last 24h
-----
3/1      0          0          0          0          0          0

```

However, as of App Load D004S030.bin, it is possible to get more detailed statistics from the Lennon ports by using the CLI debug option **tracy_send_cmd** as shown in this output:

```

cat6k-2 (debug-eng) tracy_start 3 1
cat6k-2 (debug-eng) tracy_send_cmd
Usage: tracy_send_cmd <modN> <portN> " <taskID> <enable/set/get> <cmd>[options]

```

<level>/[level] "

Tracy debugging can also be done by running the 'DickTracy' application on the PC and accessing the HP860 host processor on Lennon through an IP session. If you use the 'DickTracy' application, once the IP session is established with the 860, use the menu options to set the Framer Task ID to 16 and execute these commands.

- **show config**

```
00:00:51.660 SPAN: CLI Request --> Show Span Configuration
  Applique type is Channelized E1
  Line Encoding -----> HDB3
  Framing Format -----> CRC4
  Signaling Mode -----> ISDN
  Facility Data Link --> NONE (Disabled)
  D-channel -----> Enabled
  Timing Source -----> slaved to Span 0 Rx Clock
  Line Loopback Type --> No Loopback
  Span Description ---->
```

(or for T1 example)

```
00:01:11.020 SPAN: CLI Request --> Show Span Configuration
  Applique type is Channelized T1
  Line Encoding -----> B8ZS
  Framing Format -----> ESF
  Signaling Mode -----> ISDN
  Facility Data Link --> AT&T PUB 54016
  Yellow Alarm Mode ---> F-bit Insertion
  Line Buildout -----> 0dB
  D-channel -----> Enabled
  Timing Source -----> Internal Osc.
  Line Loopback Type --> No Loopback
  Span Description ---->
```

- **show status**

```
00:00:36.160 SPAN: CLI Request --> Show Span Summary Status
E1 6/1 is up
  No alarms detected.
Alarm MIB Statistics
  Yellow Alarms -----> 1
  Blue Alarms -----> 0
  Frame Sync Losses ---> 0
  Carrier Loss Count --> 0
  Frame Slip Count ----> 0
  D-chan Tx Frame Count ----> 5
  D-chan Tx Frames Queued --> 0
  D-chan Tx Errors -----> 0
  D-chan Rx Frame Count ----> 5
  D-chan Rx Errors -----> 0
```

(or for T1 example)

```
00:00:51.310 SPAN: CLI Request --> Show Span Summary Status
T1 6/1 is down
  Transmitter is sending Remote Alarm
  Receiver has AIS Indication
Alarm MIB Statistics
  Yellow Alarms -----> 1
  Blue Alarms -----> 2
  Frame Sync Losses ---> 2
  Carrier Loss Count --> 0
  Frame Slip Count ----> 0
  D-chan Tx Frame Count ----> 43
  D-chan Tx Frames Queued --> 0
  D-chan Tx Errors -----> 0
  D-chan Rx Frame Count ----> 0
```

D-chan Rx Errors -----> 0

- **show fdlintervals 3** The number 3 is the number of intervals to display, from most recent back.

```
00:01:21.350 SPAN: CLI Request --> Dump local FDL 15-min interval history
0 Complete intervals stored.
Data in current interval (78 seconds elapsed):
  1 Line Code Violations, 0 Path Code Violations, 0 Received E-bits
  0 Slip Secs, 3 Fr Loss Secs, 1 Line Err Secs
  3 Errored Secs, 0 Bursty Err Secs, 3 Severely Err Secs, 0 Unavail Secs
24-Hr Totals:
  0 Line Code Violations, 0 Path Code Violations, 0 Received E-bits
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
```

- **show dtefdl 3** The number 3 is the number of intervals.

This command provides far-end statistics by using FDL. Therefore, only for T1 if the FDL is functional and requests are serviced by the CO.

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