



Cisco ONS SONET TL1 for Beginners

Cisco ONS 15454, ONS 15327, ONS 15310-CL, ONS 15600

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**Note**

The terms "Unidirectional Path Switched Ring" and "UPSR" may appear in Cisco literature. These terms do not refer to using Cisco ONS 15xxx products in a unidirectional path switched ring configuration. Rather, these terms, as well as "Path Protected Mesh Network" and "PPMN," refer generally to Cisco's path protection feature, which may be used in any topological network configuration. Cisco does not recommend using its path protection feature in any particular topological network configuration.

1 What is TL1?

Transaction Language 1 (TL1) is a set of ASCII (American Standard Code for Information Interchange)-based instructions, or messages, that an operations support system (OSS) uses to manage a network element (NE) and its resources. TL1 provides a standard set of messages that can be used for communicating between operating systems and NEs, and personnel and NEs.

2 TL1 Message Types and Examples

There are two main types of standards-defined TL1 messages: command/responses and autonomous messages.

1. **Command/Responses**—These are initiated by a user and provide two parts: a request to the NE to set or get information, and a response from the NE containing completion or status codes and requested information. Request, or input messages are used to issue the request portions of command messages to the NE. Command messages are often referred to as command/response messages, where the request portion is an input message (OSS to NE) and the response portion is an output message (NE to OSS).

- a. **Set information**—The simplest type of messages are those that set information or instruct the NE to perform an action and return only a result with no data in the response:

Example: ENT-CRS-<STS_PATH> to create an STS cross-connection

- b. **Get information**—Some TL1 commands get information or request information be returned from the NE.

Example: RTRV-ALM-ALL to show the current status of all active alarm conditions

- c. **Response message**—The response portion of a command message correlates to a particular request message. If a command is successful, the NE sends a response message containing the COMPLD code.

Example:

```
SV192-DATA-461 2003-08-05 10:35:17
```

```
M 123 COMPLD
```

;

If a command fails, the NE sends an error response which includes the DENY code and may or may not contain an error message.

Example:

SV192-DATA-461 2003-08-05 10:35:17

M 123 DENY

;

The following list shows standard responses:

COMPLD—Completed

DENY—TL1 command failed

PRTL—Partially successful response. The requested action can be completed for some of the specified AIDs but not for all of them.

RTRV—The response is successful but is lengthy and is being returned in multiple parts. Each part has a RTRV response code, but the final response has a COMPLD response code.

- d. Response acknowledgment—Responses may also include intermediate acknowledgment messages. Brief messages that update the user as to the status of a given command are called acknowledgments. When a command has been sent to the NE and the NE will take longer than two seconds to respond, the NE sends an acknowledgment message to be followed later by the full response. The Cisco ONS 15454, 15327 and 15310-CL support only the IP response.

Example: IP 123

>

The following list shows standard acknowledgment codes:

IP—In progress

2. Autonomous messages—These messages are used to report alarms, configuration changes or condition changes. Many of these messages, such as those relating to alarm conditions, are spontaneously triggered by the NE itself without intervention. Other messages, such as those relating to the reporting of periodic condition states or performance data values are scheduled by the NE user via other commands. Because you do not issue autonomous messages to the NE, they do not include input formats or input examples.


Example: REPT ALM

For information on specific command and autonomous message syntax, refer to the *Cisco ONS SONET TL1 Command Guide*.

3 Connect to TL1

The first step in using TL1 is to connect to TL1. You only have to connect to TL1 one time per session. A session is a related set of communication transactions between two or more network devices. There are three ways to connect to TL1: via CTC, telnet, or craft interface. Perform one of the following procedures to connect to TL1.

Launch CTC and Open a TL1 Session

- Step 1** From the PC connected to the ONS node, start Netscape or Internet Explorer.
- Step 2** Enter the IP address of the node you want to communicate with in the Netscape or Internet Explorer Web address (URL) field.
- Step 3** Log into the CTC. The IP address at the title bar should match the IP address of the node you entered in Step 2.
- Step 4** Once logged into the CTC, there are two ways to open a TL1 session:
- Click Tools > Open TL1 Connection, or
 - Click on the Open TL1 Connection button  on the toolbar.
- Step 5** From the Select Node dialog box choose the node you want to communicate with.
- Step 6** Click OK.
- A TL1 interface window opens. There are three sub-windows in the TL1 interface window: Request History, Message Log/Summary Log, and TL1 request. Type commands in the TL1 request window. You will see responses in the Message log window. The Request History window allows you to recall previous commands by double-clicking on them.
- Step 7** Verify that the Connect button is selected (grayed out).
- Step 8** You are ready to log into TL1. Follow the steps in the “Log Into TL1” section on page 8.
-

Telnet to Open a TL1 Session

To communicate with the ONS NE using TL1 commands using a telnet session over a craft interface or a LAN connection, you can choose from several ports.

- Port number 3083 is a telnet port that uses the telnet protocol and associated telnet escape sequences.
- Port number 2361 is an alternative telnet port.
- Port number 3082 is a raw TCP/IP port; it will not echo and it will not prompt the user.

Step 1 At the DOS prompt, type cmd and press Enter. (The same steps can also be done from a Unix prompt).

Step 2 At the DOS command prompt type:

TELNET <NODE IP ADDRESS OR NODE NAME> <PORT NUMBER> and press Enter.

The Node IP address or Node Name refers to the IP address or Node Name of the node you want to communicate with. Port number is the port (2361, 3082, or 3083) where TL1 commands are understood. If the connection is successful, a screen opens with a prompt.

Step 3 You are ready to log into TL1. Follow the steps in the “Log Into TL1” section on page 8.

Use a Craft Interface to Open a TL1 Session

ONS 15454, ONS 15327, and ONS 15310-CL

The TCC2/TCC2P, XTC and 15310-CL-CTX cards have two built-in interface ports for accessing the ONS 15454, ONS 15327 and ONS 15310-CL respectively. With one RJ-45 LAN connection you can access the system using a standard browser interface. In the browser interface, you can perform local and remote Operations, Administration, Maintenance, and Provisioning (OAM&P) functions and open a VT100 emulation window to enter TL1 commands. If a browser is not available, you can access the system using a nine-pin RS-232 port. The RS-232 port supports VT100 emulation such that TL1 commands may be entered directly without a browser.

Step 1 Connect the serial cable to the RS-232 port on the active TCC2/TCC2P, XTC or 15310-CL-CTX card.

Step 2 Configure the terminal emulation software (Hyperterminal):

- a. Terminal emulation = vt100
- b. Bits per second = 9600
- c. Parity = None
- d. Stop BITS = 1
- e. Flow control = None

Step 3 Press Enter. An angle bracket prompt (>) appears.

Step 4 You are ready to log into TL1. Follow the steps in the “Log Into TL1” section on page 8.

ONS 15600

The TSC card has one RJ-45 port of the faceplate. The RJ-45 port allows you to access the system using a standard web browser. You must use the RJ-45 port on the active TSC. While using the web browser, you can perform local and remote Operations, Administration, Maintenance and Provisioning (OAM&P) functions.

If a browser is not available, you can access the system using one of two RS-232 ports on the Customer Access Panel (CAP). Each RS-232 port supports VT100 emulation so that you can enter TL1 commands directly without using a web browser. Each RS-232 supports its own TL1 session. Because the CAP RS-232 port is set up as a DTE interface, you must use a 3-pair swapping null modem adapter so that the TXD/RXC, DSR/DTR, and CTS/RTS pins are swapped when connecting to the serial ports. The null modem adapter connects the CAP RS-232 port (male configuration) and the serial cable (female configuration). Refer to the *Cisco ONS 15600 Reference Manual* for null modem adapter pin assignments.

Step 1 Attach a 3-pair swapping null modem adapter to the RS-232 port on the CAP.

Step 2 Connect a serial cable to the null modem adapter, and to the serial port on your PC or workstation.

Step 3 Complete one of the following:

- If you are using a PC, configure the terminal emulation software (Hyperterminal):
 - Terminal emulation = vt100
 - Bits per second = 9600
 - Parity = None
 - Stop BITS = 1
 - Flow control = None

- If you are using a UNIX workstation, connect from X-windows or the terminal using the tip command:
tip -9600 /dev/ttyb (or ttya depending on where serial cable is connected)

Step 4 Press Enter. A > prompt appears.

Step 5 You are ready to log into TL1. Follow the steps in the “Log Into TL1” section on page 8.

4 Log Into TL1

Once you have connected to TL1, you must log into TL1 in order to issue commands. Logging into TL1 only has to be done once per session.

Step 1 Issue the ACT-USER command:

Input Format:

ACT-USER:[<TID>]:<UID>:<CTAG>[::<PID>];

- TID is the name of the node you want to access. If you only want to query the node you connected to leave the TID blank.
- UID is your user ID. UID can be up to 10 characters.
- CTAG is any non-blank character series that does not have to be unique.
- PID is your password. PID can be up to 10 characters. PIDs are encrypted and are displayed as asterisks (*).

Input Example:

ACT-USER:PETALUMA:DXT:100::MYPASSWD;

Step 2 Confirm you receive a COMPLD response to indicate the command was completed successfully.

Response Example:

TID-000 1998-06-20 14:30:00

M 001 COMPLD

DXT:2003-01-02 14-04-49,0

;

5 Command Actions and Categories

When you have connected and logged into a TL1 session, you are ready to begin issuing TL1 commands and autonomous messages. TL1 commands and autonomous messages can be used to accomplish a variety of actions. Determining the correct command or autonomous message you need begins with identifying what action you want to perform. The first part of every command and autonomous message helps identify the action that command or autonomous message performs as shown in Table 1.

Table 1 TL1 Command and Autonomous Message Actions

Commands or Autonomous Messages That Begin With	Generally Do This	Command Example
ACT-	Activate	ACT-USER
ALW-	Allow	ALW-MSG-ALL
APPLY	Apply	APPLY
CANC (autonomous message)	Report	CANC (reports a cancelled session)
CANC-	Cancel	CANC-USER
CHG-	Change	CHG-ACCMD-<MOD_TACC>
CLR-	Clear	CLR-COND-SECU
CONN-	Connect	CONN-TACC-<MOD_TACC>
COPY-	Copy	COPY-IOSCFG
DISC-	Disconnect	DISC-TACC
DLT-	Delete	DLT-BLSR
ED-	Edit/Change	ED-BITS
ENT-	Enter/Create	ENT-BLSR
EX-	Exercise	EX-SW-<OCN_BLSR>
INH-	Inhibit	INH-MSG-ALL
INIT-	Initialize	INIT-SYS
OPR-	Operate/Create	OPR-LNK
REPT (autonomous message)	Report	REPT ALM ENV
RLS-	Release	RLS-EXT-CONT
RMV-	Remove	RMV-<MOD2>
RST-	Restore	RST-<MOD2>
RTRV-	Retrieve	RTRV-COND-RING
SCHED-	Schedule	SCHED-PMREPT-<MOD2>
SET-	Set	SET-ATTR-ENV
SW-	Switch	SW-DX-EQPT

To further determine which command or autonomous message you need, identify what category the action applies to (i.e. BLSR, Cross Connections). In the *Cisco ONS SONET TL1 Command Guide*, commands and autonomous messages are categorized based on the area of the NE that they effect. For example, if you want to create, edit, or delete a cross-connection, you will find the available commands in the Cross Connections category. Table 2 shows some examples of actions, categories, and commands that apply to the Cisco ONS 15454, ONS 15327, ONS 15310-CL and ONS 15600. For a complete list of categories, commands and autonomous messages, refer to the *Cisco ONS SONET TL1 Command Guide*.

Table 2 Some TL1 Category Examples

If You Want to	Look in this Category	Applicable Command or Autonomous Message
Create a 2-fiber or 4-fiber BLSR	BLSR	ENT-BLSR
Delete a cross-connection on a VT path	Cross Connections	DLT-CRS-<PATH>
Set the attributes of the air conditioner	Environment Alarms and Controls	SET-ATTR-CONT
Delete a card from the NE	Equipment	DLT-EQPT
Lockout a user from the NE	Security	INH-USER-SECU
See the alarms on a BITS	Synchronization	REPT ALM BITS ¹
Change the date on the NE	System	ED-DAT
Disconnect a test access path/point	Troubleshooting and Test Access	DISC-TACC
Perform a path protection switch on an STS path	Protection	OPR-PROTNSW-<PATH>
Release a path protection switch on an STS path	Protection	RLS-PROTNSW-<PATH>

1. REPT ALM BITS is an autonomous message. Autonomous messages are either spontaneously triggered by the NE or scheduled by the NE user via other commands.

In the “Ten Basic Commands” section on page 11, there are ten commands listed in detail to help get you started entering TL1 commands.

6 Ten Basic Commands

This section lists ten basic commands to help you get started. You must be connected and logged into a TL1 session. After you issue a command, confirm you receive a COMPLD response to indicate the command was completed successfully.



Note If you receive a DENY response, first check the syntax you entered for accuracy. If you entered the command correctly, refer to the *Cisco ONS SONET TL1 Command Guide* for more information about that particular command and its components.

- To change configuration information on a DS1 port see ED-T1, page 12.
- To retrieve configuration information about a DS1 port see RTRV-T1, page 13.
- To retrieve all alarms on a specific DS1 port see RTRV-ALM-T1, page 15.
- To retrieve all conditions on a specific DS1 port see RTRV-COND-T1, page 17.
- To retrieve all alarms on a system see RTRV-ALM-ALL, page 18.
- To retrieve all conditions on a system see RTRV-COND-ALL, page 19.
- To retrieve actual PM values on a DS1 port see RTRV-PM-T1, page 20.
- To retrieve the thresholds in place for a DS1 port see RTRV-TH-T1, page 21.
- To create a loopback see OPR-LPBK-T1, page 22.
- To release a loopback see RLS-LPBK-T1, page 23.



Note When you are finished using TL1 remember to log out. Follow the steps in the “Log Out of TL1” section on page 23 to log out.

For complete TL1 documentation, refer to the *Cisco ONS SONET TL1 Command Guide* and the *Cisco ONS SONET TL1 Reference Guide*. For a command quick reference guide, refer to the *Cisco ONS SONET TL1 Command Quick Reference Guide*.

ED-T1

Use the ED-T1 command edits the attributes related to a DS1/T1 port. ED-T1 is from the Ports category.

Input Format:

```
ED-T1:[<TID>]:<AID>:<CTAG>:::[LINECDE=<LINECDE>],[FMT=<FMT>],[LBO=<LBO>],  
[TACC=<TACC>],[TAPTYPE=<TAPTYPE>],[SOAK=<SOAK>],[SFBER=<SFBER>],  
[SDBER=<SDBER>],[SYNCSMSG=<SYNCSMSG>],[SENDDUS=<SENDDUS>],  
[RETIME=<RETIME>],[NAME=<NAME>],[MODE=<MODE>],[SYNCSMAP=<SYNCSMAP>],  
[ADMSSM=<ADMSSM>],[VTMAP=<VTMAP>],[INHFELPBK=<INHFELPBK>],  
[AISONLPBK=<AISONLPBK>],[CMDMDE=<CMDMDE>],[AISVONAIIS=<AISVONAIIS>],  
[AISONLOF=<AISONLOF>]:[<PST>[,<SST>]];
```

- TID is the name of the node you want to access. If you only want to query the node you connected to leave the TID blank.
- AID is the access identifier to indicate slot and port.
- CTAG is any non-blank character series that does not have to be unique.
- LINECDE is a line code. Values are AMI or B8ZS.
- FMT is a frame format. Values are D4, ESF, or unframed.
- LBO is a line build out. Values are 0-131, 132-262, 263-393, 394-524, or 525-655.
- TACC defines the STS as a test access port with a selected unique TAP number. The TAP number is in the range of 0, 1-999. When TACC is 0 (zero), the TAP is deleted.
- TAPTYPE is the test access point type. Values are DUAL or SINGLE.
- SOAK is IS-AINS to IS transition soak time as measured in 15 minute intervals, so a value of 4 translates to a soak time of 1 hour. The allowable range is 0-192 intervals (maximum of 48 hours).
- SFBER identifies port SFBER; valid values are 1E-3, 1E-4 or 1E-5.
- SDBER identifies port SDBER; valid values are 1E-5, 1E-6,...1E-9.
- SYNCSMSG is the synchronization status message. Values are NO or YES.
- SENDDUS is the synchronization status message Don't use for Synchronization (DUS). Optional for ONS 15454 and 15310-CL. Not supported on ONS 15327.
- RETIME indicates if retiming is needed. Values are NO or YES. Optional for ONS 15454 and 15310-CL. Not supported on ONS 15327.
- NAME is the name. Maximum length is 32 characters.
- MODE type of DS1MODE.
- SYNCSMAP is the synchronization mapping for the DS1 facility. Only supported on ONS 15454.
- ADMSSM is the administration synchronization status message. Only supported on ONS 15454.

- VTMAP is the port to VT mapping type for that particular STS. Only supported on ONS 15454.
- INHFELPBK indicates whether far end loopbacks are inhibited on the facility. Only supported on ONS 15454.
- AISONLPBK is the AIS to be sent on what type of loopback.
- CMDMDE is the command mode. Values are FRCD or NORM.
- AISVONAI is enabled or disabled.
- AISONLOF is enabled or disabled.
- PST is primary state. Values are IS or OOS.
- SST is secondary state. Values are MT or AINS.

Input Example:

```
ED-T1:CISCO:FAC-2-1:1223::LINECDE=AMI,FMT=ESF,LBO=0-131,TACC=8,
TAPTYPE=SINGLE,SOAK=10,SFBER=1E-4,SDBER=1E-6,SYNCMSG=Y,SENDDUS=Y,
RETIME=Y,NAME="T1PORT",MODE=FDL,SYNCPMAP=ASYNC,ADMSSM=STU,
VTMAP=GR253,INHFELPBK=N,AISONLPBK=AIS_ON_LPBK_ALL,CMDMDE=CMDMDE,
AISVONAI=Y,AISONLOF=Y:IS,AINS;
```

RTRV-T1

Use the RTRV-T1 command to retrieve configuration information on a DS1 port. RTRV-T1 is from the Ports category.

Input Format:

```
RTRV-T1:[<TID>]:<AID>:<CTAG>[:::];
```

- TID is the name of the node you want to access. If you only want to query the node you connected to leave the TID blank.
- AID is the access identifier to indicate slot and port.
- CTAG is any non-blank character series that does not have to be unique.

Input Example:

```
RTRV-T1:TID:FAC-2-1:1223;
```

Response Format:

SID DATE TIME
M CTAG COMPLD

```
"<AID>:,[LINECDE=<LINECDE>],[FMT=<FMT>],[LBO=<LBO>],[TACC=<TAP>],  
[TAPTYPE=<TAPTYPE>],[SOAK=<SOAK>],[SOAKLEFT=<SOAKLEFT>],[SFBER=<SFBER>],  
[SDBER=<SDBER>],[NAME=<NAME>],[SYNCMSG=<SYNCMSG>],[SENDDUS=<SENDDUS>],  
[RETIME=<RETIME>],[AISONLPBK=<AISONLPBK>],[AISVONAI=<AISVONAI>],  
[AISONLOF=<AISONLOF>],[MODE=<MODE>],[SYNCMAP=<SYNCMAP>],  
[ADMSSM=<ADMSSM>],[PROVIDESYNC=<PROVIDESYNC>],[VTMAP=<VTMAP>],  
[INHFELPBK=<INHFELPBK>]:<PST_PSTQ>,[<SSTQ>]"
```

;

- AID is the access identifier to indicate slot and port.
- LINECDE is a line code. Values are AMI or B8ZS.
- FMT is a frame format. Values are D4, ESF, or unframed.
- LBO is a line build out. Values are 0-131, 132-262, 263-393, 394-524, or 525-655.
- TAP defines the STS as a test access port with a selected unique TAP number. The TAP number is in the range of 0, 1–999. When TACC is 0 (zero), the TAP is deleted.
- TAPTYPE is the test access point type. Values are DUAL or SINGLE.
- SOAK - IS-AINS to IS transition soak time as measured in 15 minute intervals, so a value of 4 translates to a soak time of 1 hour. The allowable range is 0–192 intervals (maximum of 48 hours).
- SOAKLEFT is the time remaining for the transition from OOS-AINS to IS measured in 1 minute intervals.
- SFBER identifies port SFBER; valid values are 1E-3, 1E-4 or 1E-5.
- SDBER identifies port SDBER; valid values are 1E-5, 1E-6,...1E-9.
- SYNCMSG is the synchronization status message. Values are NO or YES.
- NAME is the name.
- SYNCMSG is the synchronization status message enabled or disabled on the T1 facility. Optional for ONS 15454 and 15310-CL. Not supported on the ONS 15327.
- SENDDUS is the synchronization status message Don't use for Synchronization (DUS). Optional for ONS 15454 and 15310-CL. Not supported on ONS 15327.
- RETIME indicates if retiming is needed. Values are NO or YES. Optional for ONS 15454 and 15310-CL. Not supported on ONS 15327.
- AISONLPBK is the AIS to be sent on what type of loopback.
- AISVONAI is enabled or disabled.
- AISONLOF is enabled or disabled.
- MODE type of DS1MODE.

- SYNCMAP is the synchronization mapping for the DS1 facility. Only supported on ONS 15454.
- ADMSSM is the administration synchronization status message. Only supported on ONS 15454.
- PROVIDESYNC indicates whether the facility provides synchronization. Only supported on ONS 15454.
- VTMAP is the port to VT mapping type for that particular STS. Only supported on ONS 15454.
- INHFELPBK indicates whether far end loopbacks are inhibited on the facility. Only supported on the ONS 15454.
- PST_PSTQ is primary state.
- SSTQ is secondary state.

Response Example:

```
TID-000 1998-06-20 14:30:00
M 001 COMPLD
" FAC-2-1::LINECDE=AMI,FMT=ESF,LBO=0-131,TACC=8,TAPTYPE=DUAL,SOAK=52,
SOAKLEFT=12-25,SFBER=1E-4,SDBER=1E-7,NAME=\ "T1 PORT",SYNCMSG=Y,
SENDDUS=Y,RETIME=Y,AISONLPBK=AIS_ON_LPBK_ALL,AISVONAIIS=Y,AISONLOF=Y,
MODE=FDL,SYNCMAP=ASYNC,ADMSSM=STU,PROVIDESYNC=N,VTMAP=GR253,
INHFELPBK=N:OOS-AU,AINS"
;
```

RTRV-ALM-T1

Use the RTRV-ALM-T1 command to retrieve all alarms on a specific E1 port. The RTRV-ALM-T1 command is listed as RTRV-ALM-<MOD2ALM> in the *Cisco ONS SONET TL1 Command Guide*. T1 is just one of the options you can enter. RTRV-ALM-T1 is from the Fault category.

Input Format:

```
RTRV-ALM-<MOD2ALM>:[<TID>]:<AID>:<CTAG>:: [<NTFCNCDE>],[<CONDTYPE>],
[<SRVEFF>][,.,,];
```

- TID is the name of the node you want to access. If you only want to query the node you connected to leave the TID blank.
- AID is the access identifier to indicate slot and port.
- CTAG is any non-blank character series that does not have to be unique.
- NTFCNCDE is the 2-letter notification code. Values are CL (cleared), CR (critical), MJ (major), MN (minor), NA (not alarmed), and NR (not reported).
- CONDTYPE is the alarm condition.
- SRVEFF is the effect on service caused by the alarm condition. Values are NSA (not service affecting) or SA (service affecting).

Input Example:

RTRV-ALM-OC12:ELDRIDGE:FAC-5-1:225::MN,SD,SA;

Response Format:

```
SID DATE TIME
M CTAG COMPLD
"<AID>,[<AIDTYPE>];<NTFCNCDE>,<CONDTYPE>,<SRVEFF>,[<OCRDAT>],
[<OCRTM>],,:[<DESC>]"
;
```

- AID shows the port in question.
- AIDTYPE shows the type of the port.
- NTFCNCDE is the 2-letter notification code. Values are CL (cleared), CR (critical), MJ (major), MN (minor), NA (not alarmed), and NR (not reported).
- CONDTYPE is the type of alarm condition.
- SRVEFF is the effect on service caused by the alarm condition. Values are NSA (not service affecting) or SA (service affecting).
- OCRDAT is the date when the specific event or violation occurred.
- OCRTM is the time when the specific event or violation occurred.
- DESC is a condition description.

Response Example:

```
TID-000 1998-06-20 14:30:00
M 001 COMPLD
"FAC-5-1,OC12:MJ,SD,SA,09-05,12-30-20,,:\\"BER AT SIGNAL DEGRADE LEVEL\","
;
```


RTRV-COND-T1

Use the RTRV-COND-T1 command to retrieve all conditions on a specific DS1 port. The RTRV-COND-T1 command is listed as RTRV-COND-<MOD2ALM> in the *Cisco ONS SONET TL1 Command Guide*. T1 is just one of the options you can enter. RTRV-COND-T1 is from the Fault category.

Input Format:

```
RTRV-COND-<MOD2ALM>:[<TID>]:<AID>:<CTAG>::[<TYPEREQ>][,.,.];
```

- TID is the name of the node you want to access. If you only want to query the node you connected to leave the TID blank.
- AID is the access identifier to indicate slot and port.
- CTAG is any non-blank character series that does not have to be unique.
- TYPEREQ is the type of condition to be retrieved. A null value is equivalent to ALL.

Input Example:

```
RTRV-COND-T1:TID:FAC-2-1:229::LOS;
```

Response Format:

```
SID DATE TIME  
M CTAG COMPLD  
" <AID>,[<AIDTYPE>]:[<NTFCNCDE>],<TYPEREP>,[<SRVEFF>],[<OCRDAT>],  
[<OCRTM>],,,[<DESC>]"
```

- AID shows the port in question.
- AIDTYPE shows the type of the port.
- NTFCNCDE is the 2-letter notification code. Values are CL (cleared), CR (critical), MJ (major), MN (minor), NA (not alarmed), and NR (not reported).
- TYPEREP is the condition itself.
- SRVEFF is the effect on service caused by the alarm condition. Values are NSA (not service affecting) or SA (service affecting).
- OCRDAT is a date and is optional.
- OCRTM is a time and is optional.
- DESC is a condition description.

Response Example:

```
TID-000 1998-06-20 14:30:00  
M 001 COMPLD  
"FAC-2-1,T1:CR,LOS,SA,01-01,16-00-20,,,\"LOS OF SIGNAL\""
```

RTRV-ALM-ALL

Use the RTRV-ALM-ALL command to retrieve all of the alarms on the system. RTRV-ALM-ALL is from the Fault category.

Input Format:

RTRV-ALM-ALL:[<TID>]:[<AID>]:<CTAG>::[<NTFCNCDE>],[<CONDITION>],[<SRVEFF>][,.,,];

- TID is the name of the node you want to access. If you only want to query the node you connected to leave the TID blank.
- AID is the access identifier ALL.
- CTAG is any non-blank character series that does not have to be unique.
- NTFCNCDE is the 2-letter notification code. Values are CL (cleared), CR (critical), MJ (major), MN (minor), NA (not alarmed), and NR (not reported).
- CONDITION is the type of alarm condition.
- SRVEFF is the effect on service caused by the alarm condition. Values are NSA (not service affecting) or SA (service affecting).

Input Example:

RTRV-ALM-ALL:COTATI:ALL:229::MN,PWRRESTART,NSA;

Response Format:

```
SID DATE TIME
M CTAG COMPLD
“[<AID>],[<AIDTYPE>]:<NTFCNCDE>,<CONDTYPE>,<SRVEFF>,<OCRDAT>,<OCRMT>.,.: [<DESC>],[<AIDDET>]”
;
```

- AID shows the port in question.
- AIDTYPE shows the type of the port.
- NTFCNCDE is the 2-letter notification code. Values are CL (cleared), CR (critical), MJ (major), MN (minor), NA (not alarmed), and NR (not reported).
- CONDTYPE is the type of alarm condition.
- SRVEFF is the effect on service caused by the alarm condition. Values are NSA (not service affecting) or SA (service affecting).
- OCRDAT is a date.
- OCRMT is a time.
- DESC is a condition description.
- AIDDET is the supplementary equipment identification.

Response Example:

```
TID-000 1998-06-20 14:30:00
M 001 COMPLD
" SLOT-2,EQPT:MN,PWRRESTART,NSA,08-01,14-25-59,,:\ "POWER FAIL RESTART",DS1-14"
;
```

RTRV-COND-ALL

Use the RTRV-COND-ALL command to retrieve all of the conditions on the system. RTRV-COND-ALL is from the Fault category.

Input Format:

```
RTRV-COND-ALL:[<TID>]:[<AID>]:<CTAG>::[<TYPEREQ>][,.,,];
```

- TID is the name of the node you want to access. If you only want to query the node you connected to leave the TID blank.
- AID is the access identifier ALL
- CTAG is any non-blank character series that does not have to be unique.
- TYPEREQ is the type of condition to be retrieved. A null value is equivalent to ALL.

Input Example:

```
RTRV-COND-ALL:TID:ALL:229::LOS;
```

Response Format:

```
SID DATE TIME
M CTAG COMPLD
"<AID>,[<AIDTYPE>]:[<NTFCNCDE>],<TYPEREP>,[<SRVEFF>],[<OCRDAT>],
[<OCRTM>],...[<DESC>]"
;
```

- AID shows the port in question.
- AIDTYPE shows the type of the port.
- NTFCNCDE is the 2-letter notification code. Values are CL (cleared), CR (critical), MJ (major), MN (minor), NA (not alarmed), and NR (not reported).
- TYPEREP is the condition itself.
- SRVEFF is the effect on service caused by the alarm condition. Values are NSA (not service affecting) or SA (service affecting).
- OCRDAT is a date and is optional.
- OCRTM is a time and is optional.
- DESC is a condition description.

Response Example:

```
TID-000 1998-06-20 14:30:00
M 001 COMPLD
" FAC-2-1,OC3:CR,LOS,SA,01-01,16-02-15,,,\"LOS OF SIGNAL\" "
;
```

RTRV-PM-T1

Use the RTRV-PM-T1 command to retrieve actual performance monitoring values on a DS1 port. The RTRV-PM-T1 command is listed as RTRV-PM-**<MOD2>** in the *Cisco ONS SONET TL1 Command Guide*. T1 is just one of the options you can enter. RTRV-PM-T1 is from the Performance category.

Input Format:

```
RTRV-PM-<MOD2>:[<TID>]:<AID>:<CTAG>::[<MONTYPE>],[<MONLEV>],[<LOCN>],
[<DIRECTION>],[<TMPER>],[<DATE>],[<TIME>];
```

- TID is the name of the node you want to access. If you only want to query the node you connected to leave the TID blank.
- AID is the access identifier to indicate slot and port.
- CTAG is any non-blank character series that does not have to be unique.
- MONTYPE is a monitored type. A null value is equivalent to ALL.
- MONLEV specifies the discriminating level for the requested monitored parameter. MONLEV is in the format of LEVEL-DIRN where LEVEL is the measured value of the monitored parameter (MONVAL) and DIRN is the type of DIRN. A null value defaults to 1-UP which means it only shows values 1 and higher.
- LOCN indicates the location. A null value defaults to NEND.
- DIRECTION is the direction of PM relative to the entity identified by the AID. DIRN defaults to ALL which means that the command retrieves all the registers irrespective of the PM direction. Values are BTH (both), RCV (receive), and TRMT (transmit).
- TMPER is the accumulation time period for the PM information. A null value defaults to 15-MIN.
- DATE is the beginning date of the PM or storage register period specified in TMPER. DATE is MM-DD where MM (month of year) ranges from 1 to 12 and DD (day of month) ranges from 1 to 31. A null value defaults to the current date.
- TIME is the beginning time of day of the PM or storage register period specified in TMPER. TIME is HH-MM where HH (hour of day) ranges from 0 to 23 and MM (minute of hour) ranges from 0 to 59. A null value defaults to the current time (HH-MM).

Input Example:

```
RTRV-PM-T1:TID:FAC-2-1:123::CVL,10-UP,NEND,BTH,15-MIN,04-11,12-45;
```

Response Format:

```
SID DATE TIME
M CTAG COMPLD
"<AID>,[<AIDTYPE>]:<MONTYPE>,<MONVAL>,[<VLDTY>],[<LOCN>],[<DIRECTION>],
[<TMPER>],[<MONDAT>],[<MONTM>]"
;
```

- AID shows the port in question.
- AIDTYPE shows the type of the port.
- MONTYPE shows the threshold type.
- MONVAL shows the value.
- VLDTY indicates if a full and complete PM value was returned.
- LOCN indicates the location.
- DIRECTION is the direction.
- TMPER is the accumulation time period.
- MONDAT is the date.
- MONTM is the time.

Response Example:

```
TID-000 1998-06-20 14:30:00
M 001 COMPLD
"FAC-2-1,DS1-14:CVL,21,COMPL,NEND,RCV,15-MIN,04-11,12-45"
;
```

RTRV-TH-T1

Use the RTRV-TH-T1 command to retrieve the thresholds in place for a DS1 port. The RTRV-TH-T1 command is listed as RTRV-TH-<MOD2> in the *Cisco ONS SONET TL1 Command Guide*. T1 is just one of the options you can enter. RTRV-TH-T1 is from the Performance category.

Input Format:

```
RTRV-TH-<MOD2>:[<TID>]:<AID>:<CTAG>::[<MONTYPE>],[<LOCN>],<TMPER>[::];
```

- TID is the name of the node you want to access. If you only want to query the node you connected to leave the TID blank.
- AID is the access identifier to indicate slot and port.
- CTAG is any non-blank character series that does not have to be unique.
- MONTYPE is a monitored type. A null value is equivalent to ALL.

- LOCN is the location. A null value defaults to NEND. Values are NEND (near end) or FEND (far end).
- TMPER indicates the accumulation time period. A null value defaults to 15-MIN.

Input Example:

```
RTRV-TH-T3:CISCO:FAC-1-3:1234::CVL,NEND,15-MIN;
```

Response Format:

```
SID DATE TIME
M CTAG COMPLD
"<AID>,[<AIDTYPE>]:<MONTYPE>,[<LOCN>],[<THLEV>],[<TMPER>]"
;
```

- AID is the access identifier ALL.
- AIDTYPE specifies the type of AID.
- MONTYPE indicates the monitored type.
- LOCN is a location.
- THLEV is the threshold value.
- TMPER is the accumulation time period for the PM information.

Output Example:

```
TID-0001998-06-20 14:30:00
M 001 COMPLD
"FAC-1-3,DS3:CVL,NEND,,1,15-MIN"
;
```

OPR-LPBK-T1

Use the OPR-LPBK-T1 command to establish a loopback. The OPR-LPBK-T1 command is listed as OPR-LPBK-<MOD2> in the *Cisco ONS SONET TL1 Command Guide*. T1 is just one of the options you can enter. OPR-LPBK-T1 is from the Troubleshooting and Test Access category.

Input Format:

```
OPR-LPBK-<MOD2>:[<TID>]:<AID>:<CTAG>::[<LOCATION>],[<LPBKTYPE>];
```

- TID is the name of the node you want to access. If you only want to query the node you connected to leave the TID blank.
- AID is an access identifier. Valid values are facility, DS1, and STS.
- CTAG is any non-blank character series that does not have to be unique.
- LOCATION is the location where the operation is to be carried out.
- LPBKTYPE is a loopback type and is optional. LPBKTYPE can be FACILITY or TERMINAL.

Input Example:

```
OPR-LPBK-DS1:PTREYES:DS1-4-1-2-13:203::NEND,,FACILITY;
```

RLS-LPBK-T1

Use the RLS-LPBK-T1 command to release a loopback. The RLS-LPBK-T1 command is listed as RLS-LPBK-<MOD2> in the *Cisco ONS SONET TL1 Command Guide*. T1 is just one of the options you can enter. RLS-LPBK-T1 is from the Troubleshooting and Test Access category.

Input Format:

```
RLS-LPBK-<MOD2>:[<TID>]:<SRC>:<CTAG>::[<LOCATION>],,,[<LPBKTYPE>];
```

- TID is the name of the node you want to access. If you only want to query the node you connected to leave the TID blank.
- SRC is an access identifier. Valid values are facility, DS1, and STS.
- CTAG is any non-blank character series that does not have to be unique.
- LOCATION is the location where the operation is to be carried out.
- LPBKTYPE is a loopback type and is optional. LPBKTYPE can be FACILITY or TERMINAL.

Input Example:

```
RLS-LPBK-DS1:PTREYES:DS1-4-1-2-13:203::NEND,,FACILITY;
```

7 Log Out of TL1

When you are finished using TL1, you must log out of the session. Logging out of TL1 only has to be done once per session.

Step 1 If you logged into TL1 via CTC, you must log out by pressing the Disconnect button or by issuing the CANC-USER command as shown in the following steps.

If you logged into TL1 via Telnet or craft interface, you must log out by issuing the CANC-USER command.

Input Format:

```
CANC-USER:[<TID>]:<USERID>:<CTAG>;
```

- TID is the name of the node you want to access. If you only want to query the node you connected to leave the TID blank.
- USERID is your user ID. Maximum of 10 alphanumeric characters.
- CTAG is any non-blank character series that does not have to be unique.

Input Example:

```
CANC-USER:PETALUMA:DXT:100;
```

Step 2 Confirm you receive a COMPLD response to indicate the command was completed successfully.

Response Example:

```
TID001 03-07-22 02:45:12
```

```
M 100 COMPLD
```

```
;
```

8 Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

```
http://www.cisco.com/techsupport
```

You can access the Cisco website at this URL:

```
http://www.cisco.com
```

You can access international Cisco websites at this URL:

```
http://www.cisco.com/public/countries\_languages.shtml
```

Product Documentation DVD

Cisco documentation and additional literature are available in the Product Documentation DVD package, which may have shipped with your product. The Product Documentation DVD is updated regularly and may be more current than printed documentation.

The Product Documentation DVD is a comprehensive library of technical product documentation on portable media. The DVD enables you to access multiple versions of hardware and software installation, configuration, and command guides for Cisco products and to view technical

documentation in HTML. With the DVD, you have access to the same documentation that is found on the Cisco website without being connected to the Internet. Certain products also have .pdf versions of the documentation available.

The Product Documentation DVD is available as a single unit or as a subscription. Registered Cisco.com users (Cisco direct customers) can order a Product Documentation DVD (product number DOC-DOCDVD=) from the Ordering tool or Cisco Marketplace.

Cisco Ordering tool:

<http://www.cisco.com/en/US/partner/ordering/>

Cisco Marketplace:

<http://www.cisco.com/go/marketplace/>

Ordering Documentation

Beginning June 30, 2005, registered Cisco.com users may order Cisco documentation at the Product Documentation Store in the Cisco Marketplace at this URL:

<http://www.cisco.com/go/marketplace/>

Cisco will continue to support documentation orders using the Ordering tool:

- Registered Cisco.com users (Cisco direct customers) can order documentation from the Ordering tool:
<http://www.cisco.com/en/US/partner/ordering/>
- Instructions for ordering documentation using the Ordering tool are at this URL:
http://www.cisco.com/univercd/cc/td/doc/es_inpk/pdi.htm
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 1 800 553-NETS (6387).

9 Documentation Feedback

You can rate and provide feedback about Cisco technical documents by completing the online feedback form that appears with the technical documents on Cisco.com.

You can send comments about Cisco documentation to bug-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

10 Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you can perform these tasks:

- Report security vulnerabilities in Cisco products.
- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

A current list of security advisories and notices for Cisco products is available at this URL:

<http://www.cisco.com/go/psirt>

If you prefer to see advisories and notices as they are updated in real time, you can access a Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed from this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you might have identified a vulnerability in a Cisco product, contact PSIRT:

- Emergencies—security-alert@cisco.com

An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- Nonemergencies—psirt@cisco.com

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532

**Tip**

We encourage you to use Pretty Good Privacy (PGP) or a compatible product to encrypt any sensitive information that you send to Cisco. PSIRT can work from encrypted information that is compatible with PGP versions 2.x through 8.x.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.htm

The link on this page has the current PGP key ID in use.

11 Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Technical Support & Documentation website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, at this URL:

<http://www.cisco.com/techsupport>

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

<http://tools.cisco.com/RPF/register/register.do>

**Note**

Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support & Documentation website by clicking the Tools & Resources link under Documentation & Tools. Choose Cisco Product Identification Tool from the Alphabetical Index drop-down list, or click the Cisco Product Identification Tool link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view;

or for certain products, by copying and pasting show command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:
<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/techsupport/contacts>

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

12 Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- Cisco Marketplace provides a variety of Cisco books, reference guides, documentation, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:
<http://www.cisco.com/go/marketplace/>
- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:
<http://www.ciscopress.com>
- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:
<http://www.cisco.com/packet>
- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:
<http://www.cisco.com/go/iqmagazine>
or view the digital edition at this URL:
<http://cisoiq.texterity.com/cisoiq/sample/>
- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:
<http://www.cisco.com/ipj>
- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:
<http://www.cisco.com/en/US/products/index.html>
- Networking Professionals Connection is an interactive website for networking professionals to share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:
<http://www.cisco.com/discuss/networking>

- World-class networking training is available from Cisco. You can view current offerings at this URL:

<http://www.cisco.com/en/US/learning/index.html>

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