TL1 Overview

1.1 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.

1.2 TL1 Message Types and Examples

There are two main types of standard-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). Command/Responses can be further classified as follows:
   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-<VC_PATH> to create an VC 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 takes longer than two seconds to respond, the NE sends an acknowledgment message to be followed later by the full response.

2. **Autonomous events**—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 through other commands. Autonomous messages are not issued to the NE and hence they do not include input formats or input examples.

   Example: REPT-ALM

1.3 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.

1.3.1 Launch CTC and Open a TL1 Session

Step 1 From the PC connected to the Cisco NCS 2002 or Cisco NCS 2006 start Netscape Navigator 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 "1.3.4 Log Into TL1" section on page 1-4.

1.3.2 Telnet to Open a TL1 Session

To communicate with the NCS network element (NE) using TL1 commands through a Telnet session over a craft interface or a LAN connection, you can choose either of the following two ports:

- Port number 3083 is a Telnet port that uses the Telnet protocol and associated Telnet escape sequences.
- Port number 2361 is supported for backward compatibility with earlier releases and has the same behavior as Port 3083 (Telnet port). Use the following procedure with PCs running Windows operating systems.

Note Port number 3082 is a raw TCP/IP port; it is not an interactive port and is not recommended for use as an alternate telnet port.

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 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 "1.3.4 Log Into TL1" section on page 1-4.

1.3.3 Use a Craft Interface to Open a TL1 Session (Cisco NCS 2002 or Cisco NCS 2006)

The TCC2/TCC2P card has two built-in interface ports for accessing the Cisco NCS 2002 or Cisco NCS 2006. 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 EIA/TIA-232 port. The EIA/TIA-232 port supports VT100 emulation which allows TL1 commands to be entered directly without a browser.

Step 1 Connect the serial cable to the EIA/TIA-232 port on the active TCC2/TCC2P card.

Step 2 Configure the terminal emulation software (Hyperterminal):

a. Terminal emulation = vt100

a. Bits per second = 9600

a. Parity = None

a. Stop BITS = 1

a. 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 "1.3.4 Log Into TL1" section on page 1-4.

1.3.4 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;
```

1.4 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 1-1.

Table 1-1 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-MSSPR
ED-	Edit/Change	ED-BITS
ENT-	Enter/Create	ENT-MSSPR
EX-	Exercise	EX-SW-<OCN_MSSPR>
INH-	Inhibit	INH-MSG-ALL
INIT-	Initialize	INIT-SYS
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
TST-	Test	TST-INSERRBITS-<MOD2>

Table 1-2 shows some examples of actions, categories, and commands that apply to the *Cisco NCS 2002 or Cisco NCS 2006*.

Table 1-2 Some TL1 Category Examples

If You Want to	Look in this Category	Applicable Command or Autonomous Message
Create a 2-fiber or 4-fiber MS-SPRing	MS-SPRing	ENT-<MOD_RING>
Delete a cross-connection on a VC 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

Table 1-2 Some TL1 Category Examples (continued)

If You Want to	Look in this Category	Applicable Command or Autonomous Message
Perform an SNCP protection switch on an VC path	Protection	OPR-PROTNSW-<PATH>
Release an SNCP protection switch on an VC 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 "1.5 Basic Commands" section on page 1-6, there are various commands listed in detail to help get you started on using the TL1 commands.

1.5 Basic Commands

This section lists the basic commands to help you get started. You must be connected and logged into aTL1 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.

- To perform an in-service card upgrade or downgrade on a system, see 7.2 CHG-EQPT, page 7-3.
- To delete a card from the NE, see 12.13 DLT-EQPT, page 12-11.
- To change configuration information on an E1 port, see 13.26 ED-E1, page 13-85.
- To enter the card type and attributes for a given slot on an NE, see 14.12 ENT-EQPT, page 14-18.
- To initialize the specified card and its associated subsystem(s), see17.2 INIT-SYS, page 17-7.
- To remove an equipment from the In Serv.ice state and place it into Maintenance, see 21.2 RMV-EQPT, page 21-2.
- To provision an equipment into the In Service state from the Maintenance state, see 22.2 RST-EQPT, page 22-2.
- To retrieve configuration information about an E1 port, see 23.10 RTRV-<STM_TYPE>, page 23-54.
- To retrieve all alarms on a specific E1 port, see 23.12 RTRV-ALM-<MOD2ALM>, page 23-74.
- To retrieve all conditions on a specific E1 port, see 23.37 RTRV-COND-<MOD2ALM>, page 23-140.
- To retrieve all alarms on a system, see 23.14 RTRV-ALM-ALL, page 23-79.
- To retrieve all conditions on a system, see 23.38 RTRV-COND-ALL, page 23-144.
- To retrieve all data, state, and shelf parameters on an associated equipment unit, see 23.56 RTRV-EQPT, page 23-200.
- To retrieve all general attributes on a system, see 23.98 RTRV-NE-GEN, page 23-307.
- To retrieve actual PM values on an E1 port, see 23.120 RTRV-PM-<MOD2>, page 23-372.
- To retrieve the thresholds in place for an E1 port, see 23.152 RTRV-TH-<MOD2>, page 23-462.

- To create a loopback, see 18.6 OPR-LPBK-<MOD2>, page 18-5.
- To release a loopback, see 20.3 RLS-LPBK-<MOD2NCSPAYLOAD>, page 20-2.

Note When you are finished using TL1 remember to log out. Follow the steps in the "1.14 Log Out of TL1" section on page 1-18 to log out.

1.6 Command Syntax

TL1 commands conform to the following syntax:

a:b:c:d:e: ... z;

where:

"a" is the command code.

"b" is the target identifier (TID).

"c" is the access identifier (AID) or the user identifier (UID).

"d" is the correlation tag (CTAG).

"e: ... z;" are other positions required for various commands.

The TID, AID, and CTAG route and control the TL1 command. Other parameters provide additional information required to complete the action requested by the command. TL1 command codes, parameter names, and parameter values can be either uppercase or lowercase exclusively or any combination of the two, unless specifically noted in the command description.

The TID is a unique name given to each system when it is installed. The name identifies the particular NE, to which each command is directed. The value of TID can be any TL1 identifier or text string, but it is limited to 20 characters. An identifier contains any number of letters or digits, but must start with a letter. A text string is any alphanumeric or punctuation characters enclosed in double quotes. The presence of the TID is required in all input commands, but its value can be null (represented by two successive colons). The TID can be null when the operating system directly communicates with the target NE. The recommended value for the TID, when it is used, is the target's common language location identifier (CLLI) code. To establish the TID for a node, use the Provisioning > General tab in Cisco Transport Controller (CTC).

The AID is an access code used to identify and address specific objects within the NE. These objects include individual pieces of equipment, transport spans, access tributaries, and other objects.

The CTAG is a unique identifier given to each input command by the user. When the NE responds to a specific command, it includes the command's CTAG in the reply. Including the CTAG eliminates discrepancies about which response corresponds to which command. Valid CTAG values include strings of up to six characters composed of identifiers (alphanumeric, beginning with a letter) or decimal numerals (a string of decimal digits with an optional nontrailing period).

The following specification characters are used throughout this document as vehicles for defining the syntax:

- Anglebrackets (< >) enclose a symbol specifier, for example <CTAG>.
- Square brackets ([ ]) enclose an optional symbol, for example [<TID>].
- Quotation marks (" ") enclose a literal character, as shown in the following output example:

  SLOT-7:PLUGIN,TC,,,,,,,:\"EQUIPMENT PLUG-IN\",TCC

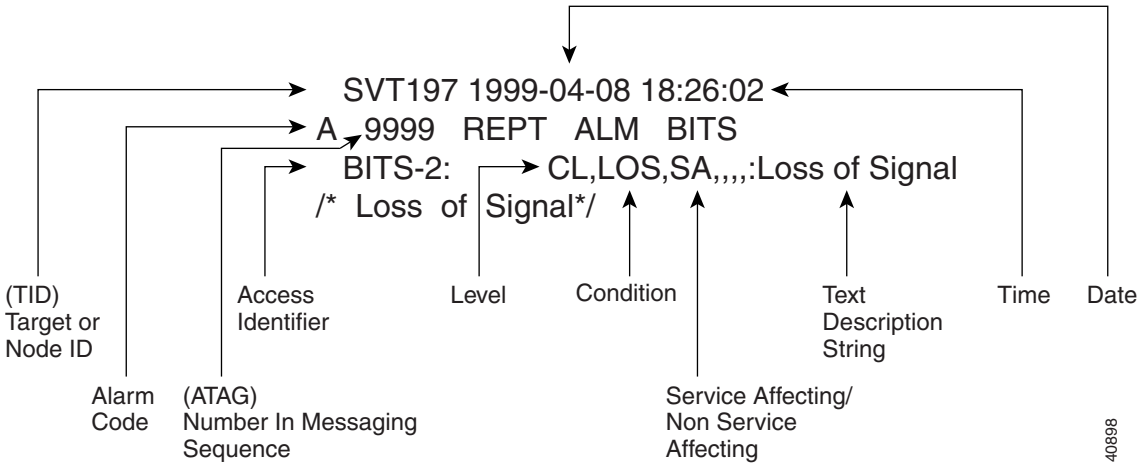
1.7 Autonomous Message Syntax

Autonomous messages are used to report alarms, configuration changes, and 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 through other commands. Because you do not issue autonomous messages to the NE, they do not include input formats or input examples.

Figure 1-1 shows the autonomous message format. The autonomous message tag (ATAG) is used for message sequencing. The number is incremented by one for each autonomous message sent by the NE. Cisco NEs use whole numbers 0000 to 9999.

Note Some autonomous messages (REPT DBCHG and REPT EVT SESSION, for example) differ slightly from the format shown in the third line of Figure 1-1.

Figure 1-1 Autonomous Message Format



The alarm code indicates the severity of the autonomous message. Valid values for alarm codes in decreasing order of severity are as follows:

- *C—Critical alarm
- **—Major alarm
- *^—Minor alarm
- A^—Nonalarmed message

Critical, Major, and Minor correspond to the reporting of alarmed events. The Nonalarmed message designation is used when the NE is reporting nonalarmed events, periodic measurements, or results of previously scheduled diagnostics or audits. If multiple alarms are reported in the same message, the alarm code represents the highest severity of those being reported.

The following is an example of an output message that includes the Critical alarm code:

```
  AB7-56 1970-01-01 16:02:10
*C 100.100 REPT ALM EQPT
  “SYSTEM:CR,HITEMP,NSA,,,,:\“High Temperature\”,TCC”
```

1.8 Command Completion Behavior

When you enter a TL1 command, one of three completion codes will be returned. The completion codes are: completed (COMPLD), partial (PRTL), and deny (DENY). You can specify an explicit, implicit, or explicit with implicit list as explained in the following sections.

1.8.1 General Rules

Note The command completion behavior does not apply to RTRV-CRS, RTRV-ALM, and RTVR-COND commands.

1.8.1.1 Explicit List of AIDs—No Wildcards

If a set of AIDs is explicitly listed, including a set of just one AID, then each AID must complete successfully to return a COMPLD message. If more than one AID is in the set and at least one AID succeeds but all do not, then a PRTL with errors for each failed AID is returned. If all AIDs in the set fail, a DENY with errors for each failed AID is returned.

1.8.1.2 Implicit List of AIDs—Single AID With Wildcard

If a set of AIDs is implied by the use of the ALL modifier on a single AID, then follow the same rules as in Section 1.8.1.1 Explicit List of AIDs—No Wildcards, page 1-9. The caveat is that the implicit list only includes AIDs that apply to the command. For example, assume SLOT-3 contains an STM-4 card and only VC-4-4 and VC-4-7 are of path-width VC4 while the rest are VC3. An ED-VC3 command with VC-4-ALL AID applies only on the VC3 implicit AID set VC4-{1,2,3,10,11,12} (with the ED-VC3 command).

Apply the following rules to the set:

1. If all valid AIDs match, COMPLD is returned with a matching list of cross-connections.
2. If some valid AIDs match but not all, COMPLD is returned with a matching list of cross-connections.

If all valid AIDs fail to match, DENY is returned.

1.8.1.3 Explicit List Grouped With Implicit List

If the set of AIDs is composed of two subsets, one set including explicitly stated AIDs and the other set implied by one or more AID(s) with the ALL modifier, then follow the rules in the 1.8.1.1 Explicit List of AIDs—No Wildcards, page 1-9 and the 1.8.1.2 Implicit List of AIDs—Single AID With Wildcard, page 1-9 respectively. Apply the logic in Table 1-3 to the results from the two subsets:

Table 1-3 Explicit List, Implicit List, and Combined List Logic

Explicit List Returns	Implicit List Returns	Combined List Returns
COMPLD	COMPLD	COMPLD plus matching list
COMPLD	DENY	PRTL with errors plus matching list
PRTL	COMPLD	PRTL with errors plus matching list

Table 1-3 Explicit List, Implicit List, and Combined List Logic

Explicit List Returns	Implicit List Returns	Combined List Returns
PRTL	DENY	PRTL with errors plus matching list
COMPLD	PRTL	PRTL with errors plus matching list
DENY	PRTL	PRTL with errors plus matching list
DENY	COMPLD	PRTL with errors plus matching list
PRTL	PRTL	PRTL with errors plus matching list
DENY	DENY	DENY with errors

1.8.2 Command Completion Behavior for Retrieval of Cross-Connections

When you enter a RTRV-CRS command, one of three completion codes will be returned. The completion codes are: COMPLD, PRTL, and DENY. You can specify an explicit, implicit, or explicit with implicit list as explained in the following sections.

1.8.2.1 Explicit List of AIDs—No Wildcards

For an explicit list of AIDs on a RTRV-CRS command, an error code will be returned for each AID that fails validation (for example, the user specifies VC-N-13 when SLOT-N only contains an STM-4) or for each AID where no matching cross-connection is found. To determine the completion code, follow the rules from the "1.8.1.1 Explicit List of AIDs—No Wildcards" section on page 1-9. If the result is either PRTL or COMPLD, then a list of matching cross-connections will accompany the response.

1.8.2.2 Implicit List of AIDs—Single AID With Wildcard

If a set of AIDs is implied by the use of the ALL modifier on a single AID, then follow the same AID expansion rule as defined in the example from the "1.8.1.2 Implicit List of AIDs—Single AID With Wildcard" section on page 1-9. Apply the following rules to the set:

- If all valid AIDs match, COMPLD is returned with a matching list of cross-connections.
- If some valid AIDs match but not all, COMPLD is returned with a matching list of cross-connections.
- If all valid AIDs fail to match, DENY is returned.

For example, consider the command **RTRV-CRS-VC3:[<TID>]:VC-9-ALL:<CTAG>;** where VC-9-ALL maps to VC-9-{1,2,3,10,11,12} because there is a single-port STM-4 card in Slot 3 with VC-4 defined for VC-9-4 and VC-9-7. In this example, the set is traversed and returns only the VC-3 cross-connections that exist using endpoints in that set. If no cross-connections are retrieved, COMPLD is returned.

1.8.2.3 Explicit List Grouped With Implicit List

When you have determined the implicit list, apply the rules in the "1.8.2.2 Implicit List of AIDs—Single AID With Wildcard" section on page 1-10 to the implicit list and the rules from the "1.8.2.1 Explicit List of AIDs—No Wildcards" section on page 1-10 to the explicit list. Apply the logic in Table 1-3 to the results from the two subsets.

1.9 User Security Levels

User security levels limit the amount of time a user can leave the system idle before the TL1 session is locked to prevent unauthorized users from making changes. Higher security levels have shorter timeouts. Starting with Release 4.0, timeouts can be provisioned (by a Superuser) from CTC. If provisioned, it only affects users who are not currently logged in. A user that is logged in has to log out and log back in before the new timeouts will take affect. A Superuser can provision security levels through TL1 with the SET-ATTR-SECUDFLT command.

Table 1-4 shows security levels and their default timeouts.

Table 1-4 Security Default Timeouts

Security Level	Default Timeout
Retrieve	Unlimited
Maintenance	60 minutes
Provisioning	30 minutes
Superuser	15 minutes

1.10 Keyboard Shortcuts

TL1 has the ability to store previously issued commands so that they can be recalled for future use. A maximum of 20 commands are stored. All types of commands are stored, including invalid commands. If the session is a GNE session, it will store commands sent to both the gateway network element (GNE) and the end network element (ENE).

- Pressing **Ctrl-R** recalls the last command issued. Each time Ctrl-R is pressed, a previously issued command is displayed.
- Pressing **Ctrl-F** recalls commands in the forward direction.

When a command has been recalled, you can use the Backspace key to edit the command as necessary. Cursor keys (for example, left and right arrows) are not permitted for editing.

Note Command recall keys are only available when using a serial port session or an interactive Telnet session (for example, **telnet <hostname> 3083**).

1.11 Mixed Mode Timing Support

Although TL1 supports mixed mode timing, Cisco strongly advises against its implementation. Mixed mode timing is not a recommended timing mode because of the inherent risk of creating timing loops. Refer to Telcordia document GR-436-CORE, *Digital Network Synchronization Plan* for recommended synchronization planning. For further assistance, contact the Cisco Technical Assistance Center (TAC) at www.cisco.com or call (800) 553-2447 for unresolved problems.

1.12 Default Values

This section lists the default values applied by the system when they are not explicitly specified during provisioning.

1.12.1 MS-SPRing

Table 1-5 lists the default MS-SPRing values that are applied by the system when they are not explicitly specified during MS-SPRing provisioning (ENT-MSSPR).

Table 1-5 MS-SPRing Default Values

MS-SPRing Parameter	Default
RVRTV	Y
RVTM	5.0 minutes
SRVRTV	Y
SRVTM	5.0 minutes

1.12.2 Cross-Connections

Table 1-6 lists the default cross-connection values that are applied by the system when they are not explicitly specified during circuit creation (ENT-CRS).

Table 1-6 Cross-Connections Default Values

Cross-Connection Parameter	Default
CCT	2WAY for both VCp and VC11 cross-connections

1.12.3 Environment

Table 1-7 lists the default environment alarms and controls values applied by the system when they are not explicitly specified during environment alarms and controls provisioning.

Table 1-7 Environment Default Values

Commands	Parameter Default
OPR-EXT-CONT	CONTTYPE is provisioned in the respective AID. There is no default for it. It is only used as a filter if entered. DUR always defaults to CONT.
RTRV-ATTR-CONT	There is no default for CONTTYPE. It is only used as a filter if entered.
RTRV-ATTR-ENV	There is no default for either NTFCNCDE or ALMTYPE, which are only used as filters if entered.

Table 1-7 Environment Default Values (continued)

Commands	Parameter Default
RTRV-EXT-CONT	CONTTYPE defaults to the control type associated with the AID.
SET-ATTR-ENV	NTFCNCDE defaults to NR. ALMTYPE defaults to NULL. ALMMSG defaults to \“Env Alarm Input 1\”.

1.12.4 Equipment

Table 1-8 lists the default equipment values that are applied by the system when they are not explicitly specified during equipment provisioning.

Table 1-8 Equipment Default Values

Commands	Parameter Default
ALW-SWTOPROTN-EQPT, INH-SWTOPROTN-EQPT, ALW-SWTOWKG-EQPT, and ING-SWTOWKG-EQPT	DIRN defaults to BTH.
ENT-EQPT	PROTID, PRTYPE, RVRTV, and RVTM default to NULL.
SW-DX-EQPT	MODE defaults to NORM.
SW-TOPROTN-EQPT and SW-TOWKG-EQPT	MODE defaults to NORM. DIRN defaults to BTH.

1.12.5 Performance

Table 1-9 lists the default performance values that are applied by the system when they are not explicitly specified during performance provisioning.

Table 1-9 Performance Default Values

Commands	Parameter Default
INIT-REG-<MOD2>	LOCN defaults to NEND (near end).
RTRV-PM-<MOD2>	LOCN defaults to NEND. TMPER defaults to 15 minutes.
RTRV-TH-<MOD2>	MONTYPE defaults to CVL for STM/OCN. MONTYPE defaults to ESP for VCp. MONTYPE defaults to UASV for VC11. LOCN defaults to NEND. TMPER defaults to 15 minutes.
SET-PMMODE-<VC_PATH>	PMSTATE defaults to ON.
SET-TH-<MOD2>	LOCN defaults to NEND. TMPER defaults to 15 minutes.

1.12.6 Ports

Table 1-10 lists the default port values that are applied by the system when they are not explicitly specified during port provisioning.

Table 1-10 Ports Default Values

Ports	Parameter Default
STM Line	DCC defaults to N. TMGREF defaults to N. SYNCMSG defaults to Y. SENDDUS defaults to N. PJMON defaults to 0. SFBER defaults to 1E-4. SDBER defaults to 1E-7. MODE defaults to SDH. PST defaults to UNLOCKED.

1.12.7 SDH Line Protection

Table 1-11 lists the default SDH line protection values that are applied by the system when they are not explicitly specified during SDH line protection provisioning.

Table 1-11 SDH Line Protection Default Values

Commands	Parameter Default
EX-SW-<STM>	ST (switch type) is optional. For MS-SPRing protection switch only, ST defaults to MS-SPRing switch type.
STM Line Protection	PROTID defaults to the protecting port of the protection group (SLOT-#(OCN)PORT-#). It is a string that can have a maximum length of 32 characters. RVRTV defaults to N (nonrevertive mode). RVTM defaults to 5.0 minutes. PSDIRN defaults to UNI.
OPR-PROTNSW-<STM>	ST (switch type) is optional. For MS-SPRing protection switch only, ST defaults to MS-SPRing switch type.

1.12.8 VC Paths

Table 1-12 lists the default VC path values that are applied by the system when they are not explicitly specified during VC path provisioning.

Table 1-12 VC Paths Default Values

VC Paths	Parameter Default
VC Path	SFBER, SDBER, RVRTV, and RVTM apply to SNCP VC paths only. SFBER defaults to 1E-4. SDBER defaults to 1E-6. RVRTV defaults to N. RVTM defaults to empty because RVRTV is N when SNCP VCp is created. EXPTRC defaults to a copy of the provisioned string or NULL when TRCMODE is OFF mode. EXPTRC defaults to the user entered string when the TRCMODE is MANUAL mode. EXPTRC defaults to a copy of the acquired received string or NULL if the string has not been acquired when the TRCMODE is AUTO mode. INCTRC defaults to the incoming string (NULL) when the TRCMODE is under OFF mode. INCTRC defaults to a copy of the received string or NULL if the string has not been received when the TRCMODE is under MANUAL or AUTO mode.

1.12.9 Synchronization

Table 1-13 lists the default synchronization values that are applied by the system when they are not explicitly specified during synchronization provisioning.

Table 1-13 Synchronization Default Values

Synchronization	Parameter Default
BITS	LINECDE defaults to HDB3. FMT defaults to E1-CRCMF. SYNCMSG defaults to Y. PST defaults to UNLOCKED.
NE-SYNCN	TMMDE defaults to EXTERNAL. RVRTV defaults to Y. RVTM defaults to 5.0 minutes.
SYNCN	PRI STATUS defaults to ACT. SEC STATUS defaults to STBY. THIRD STATUS defaults to STBY.

1.12.10 Testing

Table 1-14 lists the default testing values that are applied by the system when they are not explicitly specified during testing provisioning.

Table 1-14 Testing Default Values

Commands	Parameter Default
OPR-LPBK	LPBKTYPE defaults to FACILITY.
RLS-LPBK	LPBKTYPE defaults to the current existing loopback type.

1.13 Parameter Types

This section provides a description of all message parameter types defined for the TL1 messages used in the Cisco NCS 2002 and Cisco NCS 2006. Individual parameters are listed within each command description.

1.13.1 ATAG Description

The autonomous message tag (ATAG) is used for message sequencing. There are four streams of autonomous messages and each stream corresponds to a sequence. The sequence numbers increment by one for each autonomous message within that stream. The format and range of ATAG differs for each stream. The four streams are:

1. Alarmed events: These include REPT ALM and REPT EVT (except REPT EVT SESSION) messages as well as the REPT SW autonomous message.

   The ATAG format is x.y, where:

   - x is the sequence number of this alarmed event. This is an integer in the range of 0 to 9999.
   - y is the sequence number of the previous alarmed event that is related to this alarmed event. This is an integer in the range of 0 to 9999.

   If there is no such previous related event, then y will be the same as x. For example, the first time an alarm is raised, you will receive the autonomous message:

   TID-000 1998-06-20 14:30:00
   * 1346.1346 REPT ALM T1
   “FAC-1-1:MN,LOS,NSA,,,,:\“Loss Of Signal\”,DS1-14”
   ;

   When this alarmed event/condition is cleared, you will receive the autonomous message:

   TID-000 1998-06-20 14:31:00
   A 1349.1346 REPT ALM T1
   “FAC-1-1:CL,LOS,NSA,,,,:\“Loss Of Signal\”,DS1-14”
   ;

2. Database change messages: The REPT DBCHG message falls into this category.

   The ATAG format is x, where x is the sequence number of the database change update message. This is an integer in the range of 0 to 9999. For example:

   TID-000 1998-06-20 14:30:00
   A 96 REPT DBCHG
   “TIME=18-01-05,DATE=1970-01-01,SOURCE=2,USERID=CISCO15,
   DBCHGSEQ=96:ENT-EQPT:SLOT-3”
   ;

Note The ATAG is the same as the DBCHGSEQ field in the REPT DBCHG output.

3. PM reports: The REPT PM messages fall into this category.

   The ATAG format is x, where x is the sequence number of the PM report. This is an integer in the range of 0 to 9999. For example:

   TID-000 1998-06-20 14:30:00
   A5 REPT PM DS1
   “FAC-3-1:CVL,10,PRTL,NEND,BTH,15-MIN,05-25,14-46”
   ;

   This sequence number is global across all existing PM schedules.

4. Autonomous messages specific to a TL1 session: These messages are usually related to the security aspect of the TL1 session. Only the autonomous messages REPT EVT SESSION and CANC fall under this category. This is an integer in the range 0 to 9999. For example:

   TID-000 1998-06-20 14:30:00
   A 1 CANC
   “User”
   ;

1.13.2 CTAG Description

The CTAG is included in each command by the user and is repeated by the NE in the response to allow the user to associate the command and response messages. The valid values for a CTAG are strings of up to 6 characters composed of identifiers (alphanumeric, beginning with a letter) or nonzero decimal numbers (a string of decimal digits with an optional nontrailing period).

A zero in the response field is valid when indicating an error; for example, issuing a semicolon by itself results in:

```
   TID-000 1998-06-20 14:30:00
M 0 DENY IISP
   /* Input, Garbage */
;
```

1.13.3 TID Description

The TID is the name of the NE where the command is addressed. TID is the Telcordia name for the system.

1.13.4 Parameter Notes

The following list contains general notes that apply to parameters:

- If a parameter is set to a value that is inconsistent with something already in the database and that value is not changed to a consistent value, then the command is denied.
- If a parameter is set to a value that is consistent with what is already in the database, but another parameter in the same command is incompatible, then the command is denied.
- The correct way to issue a command where parameters might be in conflict is to:

  - Issue that command and change all relevant parameters to compatible values.
  - Issue the command again to change the target values.
- The default values for command attributes can be seen using the RTRV commands, provided they are not altered by a provisioning command.
- The default for an optional field of an ED command is either the provisioned default value or the last provisioned value in the previous ED command.

1.14 Log Out of TL1

When you have 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 Cisco Transport Controller (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 the user ID. Maximum 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;
```