



CHAPTER 14

Cisco Transport Controller Operation

This chapter describes operations of the Cisco Transport Controller (CTC), the software interface for Cisco ONS 15454, Cisco ONS 15454 M2, and Cisco ONS 15454 M6 shelf assemblies. For CTC setup and login information, refer to the *Cisco ONS 15454 DWDM Procedure Guide*.



Note

Unless otherwise specified, ONS 15454, ONS 15454 M2, and ONS 15454 M6 refers to both ANSI and ETSI shelf assemblies.

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14.1 CTC Software Delivery Methods

ONS 15454, ONS 15454 M2, and ONS 15454 M6 provisioning and administration is performed using the CTC software. CTC is a Java application that resides on the control cards: TCC2/TCC2P/TCC3/TNC/TSC. CTC is downloaded to your workstation the first time you log into 15454-DWDM, 15454-M2, or 15454-M6 shelf assemblies with a new software release using the web interface. You can also log into CTC using the CTC launcher application (StartCTC.exe). Refer to the [“14.6 Using the CTC Launcher Application to Manage Multiple ONS Nodes”](#) section on page 14-19 for more information.

14.1.1 CTC Software Installed on the TCC2/TCC2P/TCC3/TNC/TSC Card

The CTC software is preloaded on the TCC2/TCC2P/TCC3/TNC/TSC cards; therefore, you do not need to install software on these cards. When a new CTC software version is released, use the release-specific software upgrade document to upgrade the ONS 15454, 15454-M2, or 15454-M6 software on the TCC2/TCC2P/TCC3/TNC/TSC cards.

When you upgrade the CTC software, the control cards store the new CTC version as the protect CTC version. When you activate the new CTC software, the control cards store the older CTC version as the protect CTC version, and the newer CTC release becomes the working version. You can view the software versions that are installed on an ONS 15454, 15454-M2, or 15454-M6 shelf assemblies by selecting the Maintenance > Software tabs in node view (single-shelf mode) or multisshelf view (multishelf mode).

Select the Maintenance > Software tabs in network view to display the software versions installed on all the network nodes.

14.1.2 CTC Software Installed on the PC or UNIX Workstation

CTC software is downloaded from the TCC2/TCC2P/TCC3/TNC/TSC cards and installed on your computer automatically after you connect to the ONS 15454, 15454-M2, or 15454-M6 with a new software release for the first time. Downloading the CTC software files automatically ensures that your computer is running the same CTC software version as the TCC2/TCC2P/TCC3/TNC/TSC cards you are accessing. The CTC files are stored in the temporary directory designated by your computer operating system. Click the **Delete CTC Cache** button to remove files stored in the temporary directory. If the files are deleted, they download the next time you connect to ONS 15454, 15454-M2, or 15454-M6.

Downloading the Java archive (JAR) files for CTC takes several minutes depending on the bandwidth of the connection between your workstation and ONS 15454, 15454-M2, or 15454-M6. For example, JAR files downloaded from a modem or a data communications channel (DCC) network link require more time than JAR files downloaded over a LAN connection.

During network topology discovery, CTC polls each node in the network to determine which one contains the most recent version of the CTC software. If CTC discovers a node in the network that has a more recent version of the CTC software than the version you are currently running, CTC generates a message stating that a later version of the CTC has been found in the network and offers to install the CTC software upgrade. After the node view appears, you can upgrade CTC by using the **Tools > Update CTC** menu option. If you have network discovery disabled, CTC will not seek more recent versions of the software. Unreachable nodes are not included in the upgrade discovery.



Note

Upgrading the CTC software will overwrite your existing software. You must restart CTC after the upgrade is complete.

14.2 CTC Installation Overview

To connect to ONS 15454, 15454-M2, or 15454-M6 using CTC, you enter the IP address in the URL field of Microsoft Internet Explorer. After connecting to ONS 15454, 15454-M2, or 15454-M6, the following occurs automatically:

1. A CTC launcher applet is downloaded from the TCC2/TCC2P/TCC3/TNC/TSC card to your computer.

2. The launcher determines whether your computer has a CTC release matching the release on the TCC2/TCC2P/TCC3/TNC/TSC card.
3. If the computer does not have CTC installed, or if the installed release is older than the TCC2/TCC2P/TCC3/TNC/TSC card's version, the launcher downloads the CTC program files from the TCC2/TCC2P/TCC3/TNC/TSC card.
4. The launcher starts CTC. The CTC session is separate from the web browser session, so the web browser is no longer needed. Always log into nodes having the latest software release. If you log into an ONS 15454, 15454-M2, or 15454-M6 that is connected with older versions of CTC, or to Cisco ONS 15327s or Cisco ONS 15600s, CTC files are downloaded automatically to enable you to interact with those nodes. The CTC file download occurs only when necessary, such as during your first login. You cannot interact with nodes on the network that have a software version later than the node that you used to launch CTC.

Each ONS 15454, 15454-M2, or 15454-M6 can handle up to five concurrent CTC sessions. CTC performance can vary, depending upon the volume of activity in each session, network bandwidth, and TCC2/TCC2P/TCC3/TNC/TSC card load.

**Note**

You can also use TL1 commands to communicate with ONS 15454, 15454-M2, or 15454-M6 through VT100 terminals and VT100 emulation software, or you can telnet to ONS 15454, 15454-M2, or 15454-M6 using TL1 ports 2361 and 3083. Refer to the *Cisco ONS SONET TLI Command Guide* or *Cisco ONS 15454 SDH and Cisco ONS 15600 SDH TLI Command Guide* for a comprehensive list of TL1 commands.

14.3 PC and UNIX Workstation Requirements

To use CTC for ONS 15454, 15454-M2, or 15454-M6, your computer must have a web browser with the correct Java Runtime Environment (JRE) installed. The correct JRE for each CTC software release is included on the ONS 15454, 15454-M2, or 15454-M6 software CD. If you are running multiple CTC software releases on a network, the JRE installed on the computer must be compatible with the different software releases.

When you change the JRE version on the JRE tab, you must exit and restart CTC for the new JRE version to take effect. [Table 14-1](#) shows JRE compatibility with ONS 15454 software releases.

Table 14-1 JRE Compatibility

| ONS Software Release | JRE 1.2.2 Compatible | JRE 1.3 Compatible | JRE 1.4 Compatible | JRE 5.0 Compatible | JRE 1.6 Compatible | JRE 1.7 Compatible |
|-----------------------|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| ONS 15454 Release 4.5 | No | Yes | No | No | No | No |
| ONS 15454 Release 4.6 | No | Yes | Yes | No | No | No |
| ONS 15454 Release 4.7 | No | No | Yes | No | No | No |
| ONS 15454 Release 5.0 | No | No | Yes | No | No | No |
| ONS 15454 Release 6.0 | No | No | Yes | No | No | No |
| ONS 15454 Release 7.0 | No | No | Yes | Yes | No | No |
| ONS 15454 Release 7.2 | No | No | Yes | Yes | No | No |
| ONS 15454 Release 8.0 | No | No | No | Yes | No | No |
| ONS 15454 Release 8.5 | No | No | No | Yes | No | No |

Table 14-1 JRE Compatibility (continued)

| ONS Software Release | JRE 1.2.2 Compatible | JRE 1.3 Compatible | JRE 1.4 Compatible | JRE 5.0 Compatible | JRE 1.6 Compatible | JRE 1.7 Compatible |
|-------------------------|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| ONS 15454 Release 9.0 | No | No | No | Yes | No | No |
| ONS 15454 Release 9.1 | No | No | No | Yes | No | No |
| ONS 15454 Release 9.2 | No | No | No | No | Yes | Yes |
| ONS 15454 Release 9.2.1 | No | No | No | No | Yes | Yes |

**Note**

To avoid network performance issues, Cisco recommends managing a maximum of 50 nodes concurrently with CTC. The 50 nodes can be on a single DCC or split across multiple DCCs. Cisco does not recommend running multiple CTC sessions when managing two or more large networks. To manage more than 50 nodes, Cisco recommends using Cisco Transport Manager (CTM). If you do use CTC to manage more than 50 nodes, you can improve performance by adjusting the heap size; see the “General Troubleshooting” chapter of the *Cisco ONS 15454 DWDM Troubleshooting Guide*. You can also create login node groups; see the “Connect the PC and Log Into the GUI” chapter of the *Cisco ONS 15454 DWDM Procedure Guide*.

Table 14-2 lists the requirements for PCs and UNIX workstations. In addition to the JRE, the Java plug-in is also included on the ONS 15454 software CD.

Table 14-2 Computer Requirements for CTC

| Area | Requirements | Notes |
|---------------------|---|---|
| Processor (PC only) | Pentium 4 processor or equivalent | A faster CPU is recommended if your workstation runs multiple applications or if CTC manages a network with a large number of nodes and circuits. |
| RAM | 1 GB RAM or more | A minimum of 1 GB is recommended if your workstation runs multiple applications or if CTC manages a network with a large number of nodes and circuits. |
| Hard drive | 20 GB hard drive with 250 MB of free space required | CTC application files are downloaded from the TCC2/TCC2P/TCC3/TNC/TSC to your computer. These files occupy around 100MB (250MB to be safer) or more space depending on the number of versions in the network. |

Table 14-2 Computer Requirements for CTC (continued)

| Area | Requirements | Notes |
|--------------------------|---|--|
| Operating System | <ul style="list-style-type: none"> PC: Windows 2000, Windows XP, Windows Vista, Windows 7, Windows Server 2003, Windows Server 2008 Workstation: Solaris Version 9 or 10 on an UltraSPARC-III or faster processor, with a minimum of 1 GB RAM and 250 MB of available hard drive space Apple Mac OS X. CTC needs to be installed using the CacheInstaller available on the CCO or the ONS CD | Use the latest Patch/Service Pack released by the OS vendor. Check with the vendor for the information about the latest Patch/Service Pack. |
| Java Runtime Environment | JRE 1.6 | <p>JRE 1.6 is installed by the CTC Installation Wizard included on the ONS 15454, 15454-M2, or 15454-M6 software CD. JRE 1.6 provides enhancements to the CTC's performance, especially for large networks with numerous circuits.</p> <p>We recommend that you use JRE 1.6 for networks with Software R9.2 and later nodes. If CTC must be launched directly from nodes running software R7.0 or R7.2, we recommend JRE 1.4.2 or JRE 5.0. If CTC must be launched directly from nodes running software R5.0 or R6.0, we recommend JRE 1.4.2. If CTC must be launched directly from nodes running software earlier than R5.0, we recommend JRE 1.3.1_02.</p> |
| Web browser | <ul style="list-style-type: none"> PC: Internet Explorer 6.x, 7.x, 8.x UNIX Workstation: Mozilla 1.7 Mac OS-X PC: Safari | <p>For the PC, use JRE 1.6 with any supported web browser.</p> <p>The supported browser can be downloaded from the Web.</p> |
| Cable | <p>User-supplied CAT-5 straight-through cable with RJ-45 connectors on each end to connect the computer to ONS 15454, 15454-M2, or 15454-M6 directly or through a LAN.</p> <p>User-supplied cross-over CAT-5 cable to the DCN port on the ONS 15454 patch panel or to the Catalyst 2950 (multishelf mode).</p> | — |

14.4 ONS 15454 Connections

You can connect to the ONS 15454, 15454-M2, or 15454-M6 shelf assemblies in multiple ways.

(ONS 15454) You can connect your PC directly to the ONS 15454 shelf using the RJ-45(LAN) port on the faceplate of TCC2/TCC2P/TCC3 card or using the backplane RJ-45 LAN port.

(ONS 15454 M6) You can connect your PC directly to the ONS 15454 M6 shelf using the RJ-45(LAN) port on the faceplate of TNC/TSC card or using the EMS RJ-45 port or using the RJ-45 Craft port. The EMS RJ-45 port and RJ-45 Craft port are present on the external connection unit (ECU).

(ONS 15454 M2) You can connect your PC directly to the ONS 15454 M2 shelf using the RJ-45(LAN) port on the faceplate of TNC/TSC card or using the EMS RJ-45 port on the power module.

For the ANSI shelf, you can connect using the LAN pins on the backplane (the ETSI shelf provides a LAN connection through the RJ-45 jack on the MIC-T/C/P Front Mount Electrical Connection [FMEC]). Alternatively, you can connect your PC to a hub or switch that is connected to the ONS 15454, connect to the ONS 15454 through a LAN or modem, or establish TL1 connections from a PC or TL1 terminal. [Table 14-3](#) lists the connection methods and requirements for ONS 15454, 15454-M2, or 15454-M6 shelves.

**Note**

The TNC/TSC card supports multi-shelf connections through three FE RJ45 connections on the ECU. The TNC card supports one GE connection for CRS-1 router through the SFP port on the card. This SFP port can act as a secondary OSC supporting only FE and GE interfaces. The TNC/TSC card in ONS 15454 M6 shelf can connect to CTC through the EMS RJ-45 port or Craft port on the ECU. The TNC/TSC card in ONS 15454 M2 shelf can connect to CTC through the EMS RJ-45 port on the power module.

Table 14-3 Connection Methods for ONS 15454, ONS 15454 M2, and ONS 15454 M6

| Method | Description | Requirements |
|---------------|---|---|
| Local craft | <p>Refers to onsite network connections between the CTC computer and the ONS 15454, 15454-M2, or 15454-M6 using one of the following:</p> <ul style="list-style-type: none"> • The RJ-45 (LAN) port on the TCC2/TCC2P/TCC3/TNC/TSC card • The RJ-45 (LAN) port on the patch panel (multishelf mode) • Port 23 or 24 of the Catalyst 3560-V2-24TS-SD and 2950 (multishelf mode) • The LAN pins on the 15454-DWDM backplane (ANSI) • The RJ-45 jack on the MIC-T/C/P FMEC (ETSI) • (ONS 15454 M6) EMS RJ-45 port on the ECU • (ONS 15454 M6) RJ-45 Craft port on the ECU • (ONS 15454 M2) EMS RJ-45 port on the power module • A hub or switch to which the ONS 15454 is connected | <p>If you do not use Dynamic Host Configuration Protocol (DHCP), you must change the computer IP address, subnet mask, and default router, or use automatic host detection.</p> |
| Corporate LAN | <p>Refers to a connection to the ONS 15454, 15454-M2, or 15454-M6 through a corporate or network operations center (NOC) LAN.</p> | <ul style="list-style-type: none"> • The ONS 15454, 15454-M2, or 15454-M6 must be provisioned for LAN connectivity, including IP address, subnet mask, and default gateway. • The ONS 15454, 15454-M2, or 15454-M6 must be physically connected to the corporate LAN. • The CTC computer must be connected to the corporate LAN that has connectivity to ONS 15454, 15454-M2, or 15454-M6. |

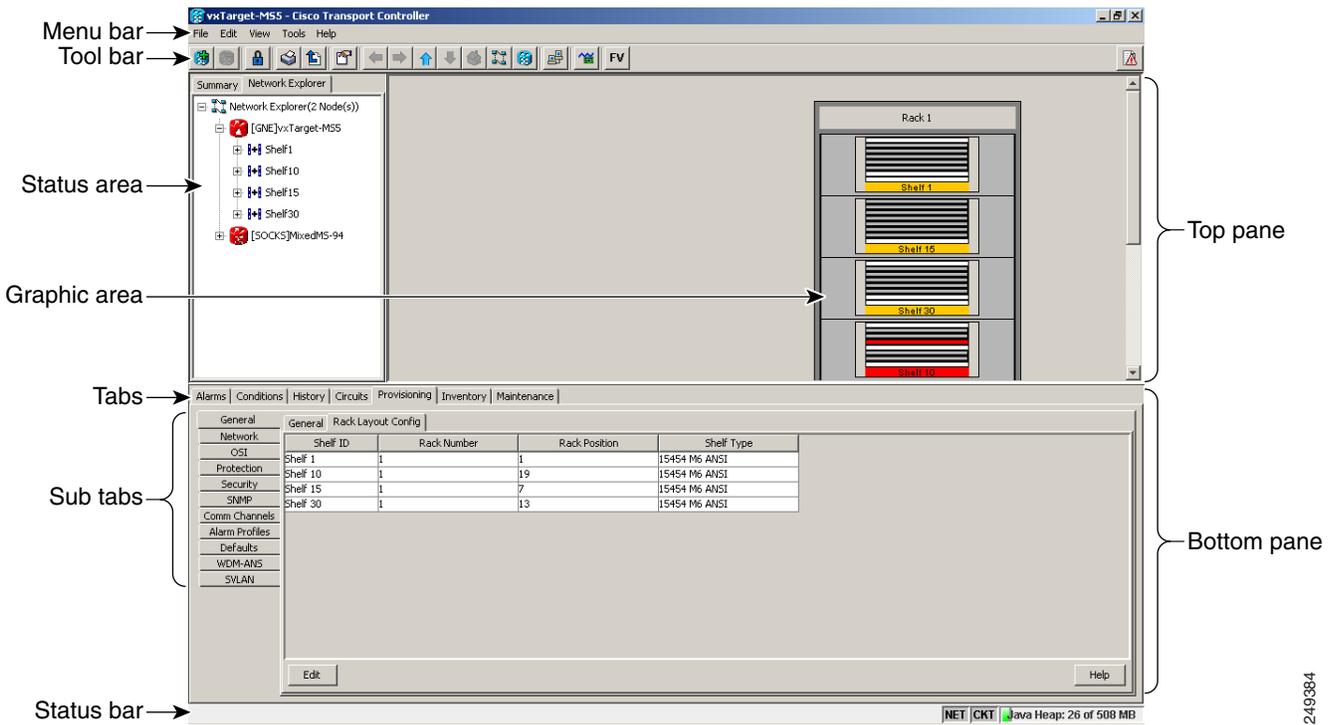
Table 14-3 Connection Methods for ONS 15454, ONS 15454 M2, and ONS 15454 M6

| Method | Description | Requirements |
|--------|---|--|
| TL1 | Refers to a connection to the ONS 15454, 15454-M2, or 15454-M6 using TL1 rather than CTC. TL1 sessions can be started from CTC, or you can use a TL1 terminal. The physical connection can be a craft connection, corporate LAN, or a TL1 terminal. | Refer to the <i>Cisco ONS SONET TL1 Reference Guide</i> or the <i>Cisco ONS 15454 SDH and Cisco ONS 15600 SDH TL1 Reference Guide</i> . |
| Remote | Refers to a connection made to the ONS 15454, 15454-M2, or 15454-M6 using a modem. | <ul style="list-style-type: none"> • A modem must be connected to the ONS 15454, 15454-M2, or 15454-M6. • The modem must be provisioned for the ONS 15454, 15454-M2, or 15454-M6. To run CTC, the modem must be provisioned for Ethernet access. |

14.5 CTC Window

When you log into a single-shelf ONS 15454, 15454-M2, or 15454-M6, the CTC window appears in node view (Figure 14-1). When you log into a multishelf ONS 15454 or 15454-M6, meaning that two or more ONS 15454 or 15454-M6 shelves are configured to operate as one node, the multishelf view (Figure 14-2) appears in the CTC window. The window includes a menu bar, a toolbar, and a top and bottom pane. The top pane provides status information about the selected objects and a graphic of the current view. The bottom pane provides tabs and subtabs to view ONS 15454 information and perform ONS 15454 provisioning and maintenance tasks. From the CTC window, you can display the other ONS 15454 views. In single-shelf mode, these are the network, node, and card views. In multishelf mode, these are the network, multishelf, shelf, and card views.

Figure 14-1 Node View (Default Login View for Single-Shelf Mode)



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Figure 14-2 Multishelf View (Default Login View for Multishelf Mode)

| Shelf ID | Rack Number | Rack Position | Shelf Type |
|----------|-------------|---------------|---------------|
| Shelf 1 | 1 | 1 | 15454 M6 ANSI |
| Shelf 20 | 1 | 13 | CHASSIS_454 |
| Shelf 29 | 1 | 7 | 15454 M6 ANSI |
| Shelf 30 | 2 | 1 | CHASSIS_454 |

14.5.1 Summary Pane

The Summary pane on the left has the following fields:

- Node Addr—IP address of the node.
- Booted—The Booted field indicates one of the following:
 - Date and time of the node reboot. The node reboot is caused by complete power cycle, software upgrade, or software downgrade.
 - Date and time of reset of the control cards one after the other.
- User—Login user name.
- Authority—Security level of users. The possible security levels are Retrieve, Maintenance, Provisioning, and Superuser.
- SW Version—CTC software version.
- Defaults—Name provided to identify the defaults list.

14.5.2 Node View (Multishelf Mode), Node View (Single-Shelf Mode), and Shelf View (Multishelf Mode)

Node view, shown in [Figure 14-1](#), is the first view that appears after you log into a single-shelf ONS 15454. Multishelf view, shown in [Figure 14-2](#), is the first view that appears after you log into a multishelf ONS 15454. The login node is the first node shown, and it is the “home view” for the session. Multishelf view and node view allow you to manage one ONS 15454 node. The status area shows the node name; IP address; session boot date and time; number of Critical (CR), Major (MJ), and Minor (MN) alarms; name and security level of the current logged-in user; software version; and network element default setup.

(On ONS 15454 and 15454-M6) In a multishelf mode, up to 30 shelves operate as a single node.



Note

The reason for extending the number of subtending shelves to 30 is to accommodate and manage the new optical and DWDM cards that operate in the even band frequency grid.

When you open a shelf from multishelf view, shelf view appears, which looks similar to node view but does not contain the tabs and subtabs that are used for node-level operations.

14.5.2.1 CTC Card Colors

The graphic area of the CTC window depicts the ONS 15454 shelf assembly. The colors of the cards in the graphic reflect the real-time status of the physical card and slot ([Table 14-4](#)).

Table 14-4 *Multishelf View (Multishelf Mode), Node View (Single-Shelf Mode), and Shelf View (Multishelf Mode) Card Colors*

| Card Color | Status |
|------------|---|
| Gray | Slot is not provisioned; no card is installed. |
| Violet | Slot is provisioned; no card is installed. |
| White | Slot is provisioned; a functioning card is installed. |
| Yellow | Slot is provisioned; a Minor alarm condition exists. |
| Orange | Slot is provisioned; a Major alarm condition exists. |
| Red | Slot is provisioned; a Critical alarm exists. |

On the ONS 15454 ETSI, the colors of the FMEC cards reflect the real-time status of the physical FMEC cards. [Table 14-5](#) lists the FMEC card colors. The FMEC ports shown in CTC do not change color.



Note

You cannot preprovision FMECs.

Table 14-5 Multishelf View (Multishelf Mode) and Node View (Single-Shelf Mode) FMEC Color

| Upper Shelf FMEC Color | Status |
|------------------------|--------------------------------|
| White | Functioning card is installed. |
| Yellow | Minor alarm condition exists. |
| Orange (Amber) | Major alarm condition exists. |
| Red | Critical alarm exists. |

The wording on a card in node view (single-shelf mode) or shelf view (multishelf mode) shows the status of a card (Active, Standby, Loading, or Not Provisioned). [Table 14-6](#) lists the card statuses.

Table 14-6 Node View (Single-Shelf Mode) or Shelf View (Multishelf Mode) Card Statuses

| Card Status | Description |
|-------------|--------------------------|
| Act | Card is active. |
| Sty | Card is in standby mode. |
| Ldg | Card is resetting. |
| NP | Card is not present. |

Port color in card view, node view (single-shelf mode), and shelf view (multishelf mode) indicates the port service state. [Table 14-7](#) lists the port colors and their service states. For more information about port service states, see [Appendix 21, “Administrative and Service States.”](#)

Table 14-7 Node View (Single-Shelf Mode) or Shelf View (Multishelf Mode) Card Port Colors and Service States

| Port Color | Service State | Description |
|-------------|--|---|
| Cyan (blue) | Out-of-Service and Management, Loopback (OOS-MA,LPBK) (ANSI) Locked-enabled,loopback (ETSI) | Port is in a loopback state. On the card in node or shelf view, a line between ports indicates that the port is in terminal or facility loopback (see Figure 14-3 and Figure 14-4). Traffic is carried and alarm reporting is suppressed. Raised fault conditions, whether or not their alarms are reported, can be retrieved on the CTC Conditions tab or by using the TL1 RTRV-COND command. |
| Cyan (blue) | Out-of-Service and Management, Maintenance (OOS-MA,MT) (ANSI) Locked-enabled,maintenance (ETSI) | Port is out-of-service for maintenance. Traffic is carried and loopbacks are allowed. Alarm reporting is suppressed. Raised fault conditions, whether or not their alarms are reported, can be retrieved on the CTC Conditions tab or by using the TL1 RTRV-COND command. Use this service state for testing or to suppress alarms temporarily. Change the state to IS-NR/Unlocked-enabled; OOS-MA,DSBLD/Locked-enabled,disabled; or OOS-AU,AINS/Unlocked-disabled,automaticInService when testing is complete. |

Table 14-7 Node View (Single-Shelf Mode) or Shelf View (Multishelf Mode) Card Port Colors and Service States

| Port Color | Service State | Description |
|------------|---|--|
| Gray | Out-of-Service and Management, Disabled (OOS-MA,DSBLD) (ANSI) Locked-enabled,disabled (ETSI) | The port is out-of-service and unable to carry traffic. Loopbacks are not allowed in this service state. |
| Green | In-Service and Normal (IS-NR) (ANSI) Unlocked-enabled (ETSI) | The port is fully operational and performing as provisioned. The port transmits a signal and displays alarms; loopbacks are not allowed. |
| Violet | Out-of-Service and Autonomous, Automatic In-Service (OOS-AU,AINS) (ANSI) Unlocked-disabled,automaticInService (ETSI) | The port is out-of-service, but traffic is carried. Alarm reporting is suppressed. The node monitors the ports for an error-free signal. After an error-free signal is detected, the port stays in this service state for the duration of the soak period. After the soak period ends, the port service state changes to IS-NR/Unlocked-enabled. Raised fault conditions, whether or not their alarms are reported, can be retrieved on the CTC Conditions tab or by using the TL1 RTRV-COND command. The AINS port will automatically transition to IS-NR/Unlocked-enabled when a signal is received for the length of time provisioned in the soak field. |

Figure 14-3 Terminal Loopback Indicator**Figure 14-4 Facility Loopback Indicator**

14.5.2.2 Multishelf View Card Shortcuts

If you move your mouse over cards in the multishelf view graphic, popups display additional information about the card including the card type; the card status (active or standby); the type of alarm, such as Critical, Major, or Minor (if any); the alarm profile used by the card; and for transponder (TXP) or muxponder (MXP) cards, the wavelength of the dense wavelength division multiplexing (DWDM) port.

14.5.2.3 Node View (Single-Shelf Mode) or Shelf View (Multishelf Mode) Card Shortcuts

If you move your mouse over cards in the node view (single-shelf mode) or shelf view (multishelf mode) graphic, popups display additional information about the card including the card type; the card status (active or standby); the type of alarm, such as Critical, Major, or Minor (if any); the alarm profile used by the card; and for TXP or MXP cards, the wavelength of the DWDM port. Right-click a card to reveal a shortcut menu, which you can use to open, reset, delete, or change a card. Right-click a slot to preprovision a card (that is, provision a slot before installing the card).

14.5.2.4 Node View (Single-Shelf Mode) or Shelf View (Multishelf Mode) Port Shortcuts

If you move your mouse over the ports in the node view (single-shelf mode) or shelf view (multishelf mode), the popup message displays information about the port type, service state, and the alarm profile used by the port. For example, the popup message displays "(EXP-RX-1-4) Service State: IS-NR, Alarm Profile: Inherited".

14.5.2.5 Card View (Single-Shelf Mode) or Shelf View (Multishelf Mode) Port Shortcuts

If you right-click the ports in the card view (single-shelf mode or multishelf mode), the popup message displays the side information along with shelf, slot, and port information. For example, the popup message displays "Shelf 1, Slot 3 (40 SMR2 C), Port EXP-TX 1-1, Side C".

14.5.2.6 Multishelf View Tabs

Table 14-8 lists the tabs and subtabs available in the multishelf view. The actions on these tabs apply to the multishelf node and its subtending shelves.

Table 14-8 Multishelf View Tabs and Subtabs

| Tab | Description | Subtabs |
|--------------|---|---|
| Alarms | Lists current alarms (CR, MJ, MN) for the multishelf node and updates them in real time. | — |
| Conditions | Displays a list of standing conditions on the multishelf node. | — |
| History | Provides a history of multishelf node alarms including the date, type, and severity of each alarm. The Session subtab displays alarms and events for the current session. The Node subtab displays alarms and events retrieved from a fixed-size log on the node. | Session, Node |
| Circuits | Creates, deletes, edits, and maps circuits. | Circuits, Rolls |
| Provisioning | Provisions the ONS 15454 multishelf node. | General, Network, OSI, Security, SNMP, Comm Channels, Alarm Profiles, Defaults, WDM-ANS |
| Inventory | Provides inventory information (part number, serial number, and Common Language Equipment Identification [CLEI] codes) for cards installed on all shelves in the multishelf node. Allows you to delete and reset cards and change the card service state. | — |
| Maintenance | Performs maintenance tasks for the multishelf node. | Database, Network, OSI, Software, Diagnostic, Audit, DWDM |

14.5.2.7 Node View (Single-Shelf Mode) or Shelf View (Multishelf Mode) Tabs

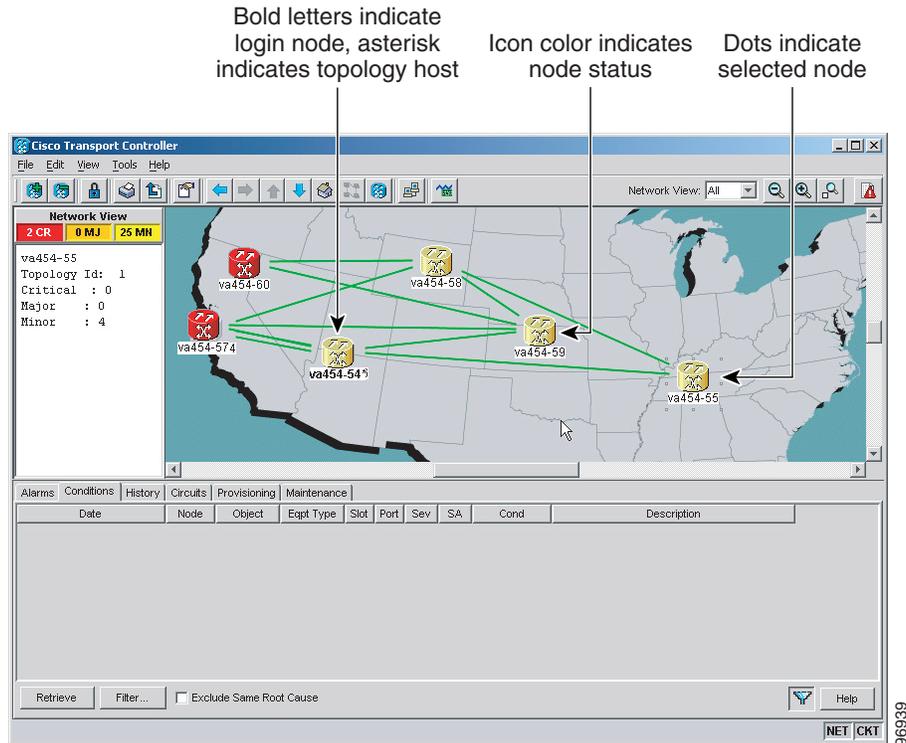
Table 14-9 lists the tabs and subtabs available in node view (single-shelf mode) or shelf view (multishelf mode).

Table 14-9 Node View (Single-Shelf Mode) or Shelf View (Multishelf Mode) Tabs and Subtabs

| Tab | Description | Subtabs |
|--------------|---|--|
| Alarms | Lists current alarms (CR, MJ, MN) for the node or shelf and updates them in real time. | — |
| Conditions | Displays a list of standing conditions on the node or shelf. | — |
| History | Provides a history of node or shelf alarms including the date, type, and severity of each alarm. The Session subtab displays alarms and events for the current session. The Node subtab displays alarms and events retrieved from a fixed-size log on the node. | Session, Node |
| Circuits | Creates, deletes, edits, and maps circuits. | Circuits, Rolls |
| Provisioning | Provisions the ONS 15454 single-shelf or multishelf node. | Single-shelf mode: General, Network, OSI, Security, SNMP, Comm Channels, Alarm Profiles, Defaults, WDM-ANS Multishelf mode: General, Protection, Timing, Alarm Profiles |
| Inventory | Provides inventory information (part number, serial number, and CLEI codes) for cards installed in the single-shelf or multishelf node. Allows you to delete and reset cards and change the card service state. Note Each card has bootstrap and boot code. After the card is upgraded using the boot code upgrade procedure, the bootstrap version is displayed in the Inventory tab in CTC; However, the boot code version is not displayed in the Inventory tab. | — |
| Maintenance | Performs maintenance tasks for the single-shelf or multishelf node. | Single-shelf mode: Database, Network, OSI, Software, Diagnostic, Audit, DWDM Multishelf mode: Protection, Overhead XConnect, Diagnostic, Timing |

14.5.3 Network View

Network view allows you to view and manage ONS 15454, 15454-M2, or 15454-M6 that have DCC connections to the node that you logged into and any login node groups you have selected (Figure 14-5).

Figure 14-5 Network in CTC Network View**Note**

Nodes with DCC connections to the login node do not appear if you checked the Disable Network Discovery check box in the Login dialog box.

The graphic area displays a background image with colored ONS 15454 icons. A Superuser can set up the logical network view feature, which enables each user to see the same network view.

14.5.3.1 Network View Tabs

Table 14-10 lists the tabs and subtabs available in network view.

Table 14-10 Network View Tabs and Subtabs

| Tab | Description | Subtabs |
|------------|--|---------|
| Alarms | Lists current alarms (CR, MJ, MN) for the network and updates them in real time. | — |
| Conditions | Displays a list of standing conditions on the network. | — |
| History | Provides a history of network alarms including date, type, and severity of each alarm. | — |
| Circuits | Creates, deletes, edits, filters, and searches for network circuits. | — |

Table 14-10 Network View Tabs and Subtabs (continued)

| Tab | Description | Subtabs |
|--------------|---|--|
| Provisioning | Provisions security, alarm profiles, bidirectional line switched rings (BLSRs) (ANSI), multiplex section-shared protection rings (MS-SPRing) (ETSI), and overhead circuits. | Security, Alarm Profiles, BLSR (ANSI), MS-SPRing (ETSI), Overhead Circuits, Provisionable Patchcords |
| Maintenance | Displays the type of equipment and the status of each node in the network; displays working and protect software versions; and allows software to be downloaded. | Software |

14.5.3.2 CTC Node Colors

The color of a node in network view, shown in [Table 14-11](#), indicates the node alarm status.

Table 14-11 Node Status Shown in Network View

| Color | Alarm Status |
|--------------------|--|
| Green | No alarms |
| Yellow | Minor alarms |
| Orange | Major alarms |
| Red | Critical alarms |
| Gray with Unknown# | Node initializing for the first time (CTC displays Unknown# because CTC has not discovered the name of the node yet) |

14.5.3.3 DCC Links

The lines show DCC connections between the nodes ([Table 14-12](#)). DCC connections can be green (active) or gray (fail). The lines can also be solid (circuits can be routed through this link) or dashed (circuits cannot be routed through this link). Circuit provisioning uses active/routable links. Selecting a node or span in the graphic area displays information about the node and span in the status area.

Table 14-12 DCC Colors Indicating State in Network View

| Color and Line Style | State |
|----------------------|--------------------|
| Green and solid | Active/Routable |
| Green and dashed | Active/Nonroutable |
| Gray and solid | Failed/Routable |
| Gray and dashed | Failed/Nonroutable |

14.5.3.4 Link Consolidation

CTC provides the ability to consolidate the DCC, generic communications channel (GCC), optical transmission section (OTS), and PPC links shown in the network view into a more streamlined view. Link consolidation allows you to condense multiple inter-nodal links into a single link. The link

consolidation sorts links by class, meaning that all DCC links are consolidated together, for example. You can access individual links within consolidated links using the right-click shortcut menu. Each link has an associated icon (Table 14-13).

Table 14-13 Link Icons

| Icon | Description |
|---|-------------|
|  | DCC icon |
|  | GCC icon |
|  | OTS icon |
|  | PPC icon |



Note

Link consolidation is only available on non-detailed maps. Non-detailed maps display nodes in icon form instead of detailed form, meaning that the nodes appear as rectangles with ports on the sides. Refer to the *Cisco ONS 15454 DWDM Procedure Guide* for more information about consolidated links.

14.5.4 Card View

The card view provides information about individual ONS 15454 cards. Use this window to perform card-specific maintenance and provisioning. A graphic showing the ports on the card is shown in the graphic area. The status area displays the node name, slot, number of alarms, card type, equipment type, card status (active or standby), card service state if the card is present, and port service state (described in Table 14-7 on page 14-12). The information that appears and the actions that you can perform depend on the card. For more information about card service states, refer to Appendix 21, “Administrative and Service States.”



Note

CTC provides a card view for all cards except the TCC2/TCC2P/TCC3/TSC cards.

Use the card view tabs and subtabs shown in Table 14-14 to provision and manage the ONS 15454. The subtabs, fields, and information shown under each tab depend on the card type selected.

Table 14-14 Card View Tabs and Subtabs

| Tab | Description | Subtabs |
|------------|---|---------|
| Alarms | Lists current alarms (CR, MJ, MN) for the card and updates them in real time. | — |
| Conditions | Displays a list of standing conditions on the card. | — |

Table 14-14 Card View Tabs and Subtabs (continued)

| Tab | Description | Subtabs |
|--|---|---|
| History | Provides a history of card alarms including date, object, port, and severity of each alarm. | Session (displays alarms and events for the current session), Card (displays alarms and events retrieved from a fixed-size log on the card) |
| Circuits | Creates, deletes, edits, and search circuits. | — |
| Provisioning | Provisions an ONS 15454 card. | DS-N and OC-N cards: Line, Line Thresholds (different threshold options are available for DS-N and OC-N cards), Elect Path Thresholds, SONET Thresholds, SONET STS, Alarm Profiles TXP and MXP cards: Card, Line, Line Thresholds, Optics Thresholds, OTN, Alarm Profiles DWDM cards (subtabs depend on card type): Optical Line, Optical Chn, Optical Amplifier, Parameters, Optics Thresholds, Alarm Profiles |
| Maintenance | Performs maintenance tasks for the card. | Loopback, Info, Protection, J1 Path Trace, AINS Soak (options depend on the card type), Automatic Laser Shutdown |
| Performance (Not available for the AIC-I cards) | Performs performance monitoring for the card. | DS-N and OC-N cards: no subtabs TXP and MXP cards: Optics PM, Payload PM, OTN PM DWDM cards (subtabs depend on card type): Optical Line, Optical Chn, Optical Amplifier Line, OC3 Line, Parameters, Optics Thresholds |
| Inventory | (40-WSS, 40-WXC, OPT-PRE and OPT-BST cards) Displays an Inventory screen of the ports. | — |

14.6 Using the CTC Launcher Application to Manage Multiple ONS Nodes

The CTC Launcher application is an executable file, StartCTC.exe, that is provided on Software Release 9.2.1 CDs for Cisco ONS products. You can use CTC Launcher to log into multiple ONS nodes that are running CTC Software Release 3.3 or higher, without using a web browser. The CTC launcher application provides an advantage particularly when you have more than one NE version on the network, because it allows you to pick from all available CTC software versions. It also starts more quickly than the browser version of CTC and has a dedicated node history list.

CTC Launcher provides two connection options. The first option is used to connect to ONS NEs that have an IP connection to the CTC computer. The second option is used to connect to ONS NEs that reside behind third party, OSI-based GNEs. For this option, CTC Launcher creates a TL1 tunnel to transport the TCP traffic through the OSI-based GNE.

The TL1 tunnel transports the TCP traffic to and from ONS ENEs through the OSI-based GNE. TL1 tunnels are similar to the existing static IP-over-CLNS tunnels, GRE, and Cisco IP, that can be created at ONS NEs using CTC. (Refer to the Cisco ONS product documentation for information about static IP-over-CLNS tunnels.) However, unlike the static IP-over-CLNS tunnels, TL1 tunnels require no provisioning at the ONS ENE, the third-party GNE, or DCN routers. All provisioning occurs at the CTC computer when the CTC Launcher is started.

Figure 14-6 shows examples of two static IP-over-CLNS tunnels. A static Cisco IP tunnel is created from ENE 1 through other vendor GNE 1 to a DCN router, and a static GRE tunnel is created from ONS ENE 2 to the other vendor, GNE 2. For both static tunnels, provisioning is required on the ONS ENEs. In addition, a Cisco IP tunnel must be provisioned on the DCN router and a GRE tunnel provisioned on GNE 2.

Figure 14-6 Static IP-Over-CLNS Tunnels

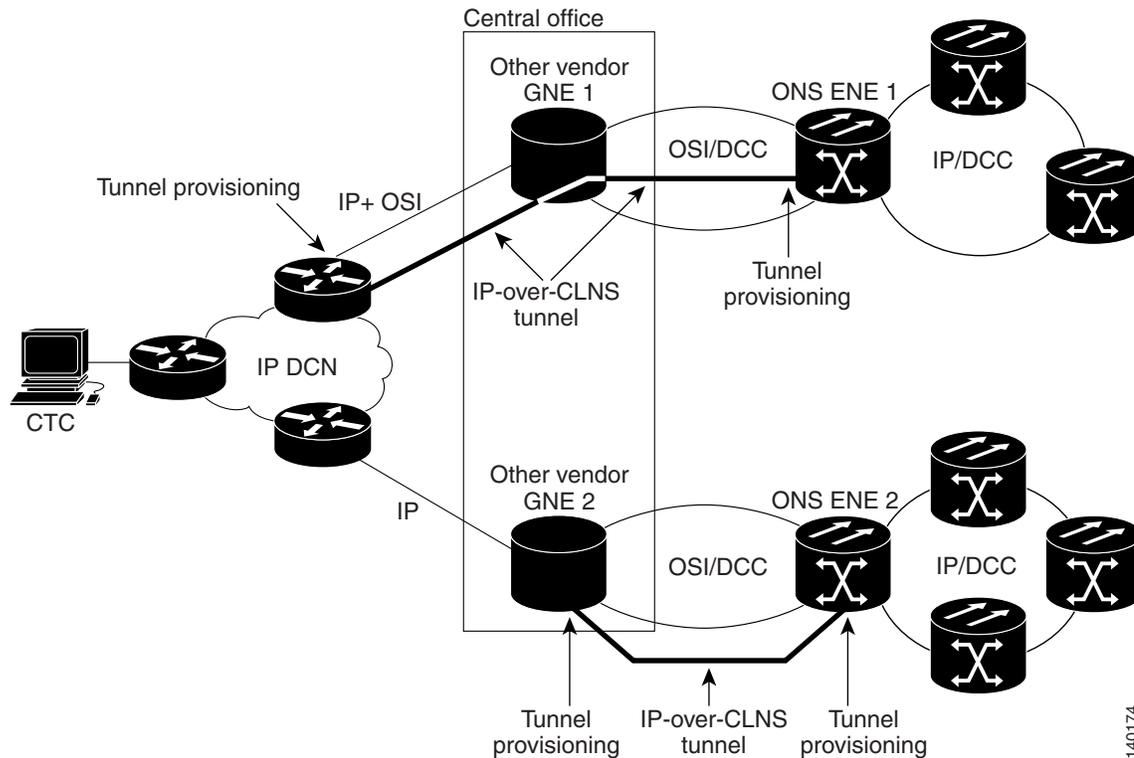
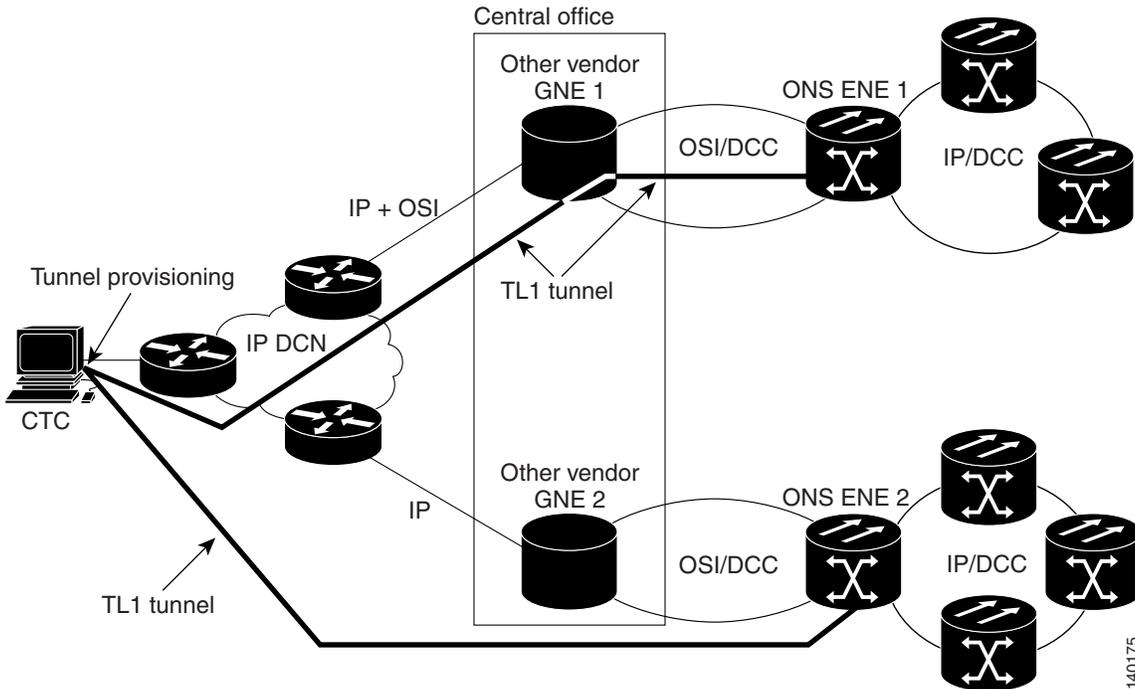


Figure 14-7 shows the same network using TL1 tunnels. Tunnel provisioning occurs at the CTC computer when the tunnel is created with the CTC Launcher. No provisioning is needed at ONS NEs, GNEs, or routers.

Figure 14-7 TL1 Tunnels



TL1 tunnels provide several advantages over static IP-over-CLNS tunnels. Because tunnel provisioning is needed only at the CTC computer, they are faster to set up. Because they use TL1 for TCP transport, they are more secure. TL1 tunnels also provide better flow control. On the other hand, IP over CLNS tunnels require less overhead and usually provide a slight performance edge over TL1 Tunnels (depending on network conditions). TL1 tunnels do not support all IP applications such as SNMP and RADIUS Authentication. Table 14-15 shows a comparison between the two types of tunnels.

Table 14-15 TL1 and Static IP-Over-CLNS Tunnels Comparison

| Category | Static IP-Over-CLNS | TL1 Tunnel | Comments |
|-----------------------------|---------------------|-----------------|--|
| Setup | Complex | Simple | Requires provisioning at ONS NE, GNE, and DCN routers. For TL1 tunnels, provisioning is needed at CTC computer. |
| Performance | Best | Average to good | Static tunnels generally provide better performance than TL1 tunnels, depending on TL1 encoding used. LV+Binary provides the best performance. Other encoding will produce slightly slower TL1 tunnel performance. |
| Support all IP applications | Yes | No | TL1 tunnels do not support SNMP or RADIUS Server IP applications. |
| ITU Standard | Yes | No | Only the static IP-over-CLNS tunnels meet ITU standards. TL1 tunnels are new. |
| Tunnel traffic control | Good | Very good | Both tunnel types provide good traffic control |
| Security setup | Complex | No setup needed | Static IP-over-CLNS tunnels require careful planning. Because TL1 tunnels are carried by TL1, no security provisioning is needed. |

Table 14-15 TL1 and Static IP-Over-CLNS Tunnels Comparison (continued)

| Category | Static IP-Over-CLNS | TL1 Tunnel | Comments |
|---|---------------------|--------------|--|
| Potential to breach DCN from DCC using IP. | Possible | Not possible | A potential exists to breach a DCN from a DCC using IP. This potential does not exist for TL1 tunnels. |
| IP route management | Expensive | Automatic | For static IP-over-CLNS tunnels, route changes require manual provisioning at network routers, GNEs, and ENEs. For TL1 tunnels, route changes are automatic. |
| Flow control | Weak | Strong | TL1 tunnels provide the best flow control. |
| Bandwidth sharing among multiple applications | Weak | Best | — |
| Tunnel lifecycle | Fixed | CTC session | TL1 tunnels are terminated when the CTC session ends. Static IP-over-CLNS tunnels exist until they are deleted in CTC. |

TL1 tunnel specifications and general capabilities include:

- Each tunnel generally supports between six to eight ENEs, depending on the number of tunnels at the ENE.
- Each CTC session can support up to 32 tunnels.
- The TL1 tunnel database is stored locally in the CTC Preferences file.
- Automatic tunnel reconnection when the tunnel goes down.
- Each ONS NE can support at least 16 concurrent tunnels.

14.7 TCC2/TCC2P/TCC3/TNC/TSC Card Reset

You can soft reset the TCC2/TCC2P/TCC3/TNC/TSC card by using CTC or by physically resetting the card (a hard reset). A soft reset reboots the TCC2/TCC2P/TCC3/TNC/TSC card and reloads the operating system and the application software. Additionally, a hard reset temporarily removes power from the TCC2/TCC2P/TCC3/TNC/TSC card and clears all the buffer memory.

You can apply a soft reset from CTC to either an active or standby TCC2/TCC2P/TCC3/TNC/TSC card without affecting traffic. If you need to perform a hard reset on an active TCC2/TCC2P/TCC3/TNC/TSC card, put the TCC2/TCC2P/TCC3/TNC/TSC card into standby mode first by performing a soft reset.



Note

Hard reset can also be performed on the TNC/TSC card through CTC and TL1 interface. Before performing the hard reset, bring the TNC/TSC card to maintenance mode.

When you reset the standby TCC2/TCC2P/TCC3/TNC/TSC card, the system traffic is not affected. When you reset the active TCC2/TCC2P/TCC3/TNC/TSC card, traffic switches to the standby card if the standby card is present and in the ready standby state. If the standby card is not in the ready standby state, traffic does not switch, and results in loss of system traffic and management connectivity until the card reboots completely.

**Caution**

When you reset the TNC/TSC card on the ONS 15454 or 15454-M6 shelves in simplex control mode, loss of management connectivity happens until the card reboots. The system traffic loss may occur depending on the line card and traffic type.

**Note**

(Cisco ONS 15454 shelf) When a CTC reset is performed on an active TCC2/TCC2P/TCC3 card, the AIC-I card goes through an initialization process and also resets because it is controlled by the active TCC2/TCC2P/TCC3 card.

14.8 TCC2/TCC2P/TCC3/TNC/TSC Card Database

When dual TCC2/TCC2P/TCC3/TNC/TSC cards are installed in the ONS 15454, 15454-M2, or 15454-M6 shelves, each TCC2/TCC2P/TCC3/TNC/TSC card hosts a separate database; therefore, the protect card database is available if the database on the working TCC2/TCC2P/TCC3/TNC/TSC card fails. You can also store a backup version of the database on the workstation running CTC. This operation should be part of a regular ONS 15454, 15454-M2, or 15454-M6 maintenance program at approximately weekly intervals, and should also be completed when preparing ONS 15454, 15454-M2, or 15454-M6 for a pending natural disaster, such as a flood or fire.

The TNC card provides 4GB of nonvolatile database storage for communication, provisioning, and system control. This allows full database recovery during power failure.

The configuration details are stored in the database of the TCC2/TCC2P/TCC3/TNC/TSC card. The database restore from a TNC card to a TSC card or vice versa is not supported.

**Note**

The following parameters are not backed up and restored: node name, IP address, mask and gateway, and Internet Inter-ORB Protocol (IIOP) port. If you change the node name and then restore a backed up database with a different node name, the circuits map to the new node name. We recommend keeping a record of the old and new node names.

14.9 Software Revert

When you click the **Activate** button after a software upgrade, the TCC2/TCC2P/TCC3/TNC/TSC card copies the current working database and saves it in a reserved location in the TCC2/TCC2P/TCC3/TNC/TSC card flash memory. If later during the upgrade you need to revert to the original working software load from the protect software load, the saved database installs automatically. You do not need to restore the database manually or recreate circuits.

The revert feature is useful if the maintenance window in which you were performing an upgrade closes while you are still upgrading CTC software. You can revert to the protect software load without losing traffic. During the next maintenance window, you can complete the upgrade and activate the new software load.

Circuits created or provisioning done after you activate a new software load (upgrade to a higher release) will be lost with a revert. The database configuration at the time of activation is reinstated after a revert. (This does not apply to maintenance reverts, such as Software R5.0.1 to Software R5.0.2, because maintenance releases retain the database during activation.)

**Caution**

Cisco does not recommend reverting after changing provisioning on the node. Depending upon the particular provisioning, reverting in this case can be traffic affecting.

To perform a supported (non-service-affecting) revert from a software release that you have just activated, the release you revert to must have been working at the time you first activated the new software on that node. Because a supported revert automatically restores the node configuration at the time of the previous activation, any configuration changes made after activation will be lost when you revert the software. Downloading the software release that you are upgrading to a second time after you have activated the new load ensures that no actual revert to a previous load can take place (the TCC2/TCC2P/TCC3/TNC/TSC resets, but it does not affect the traffic and does not change your database).

**Note**

To perform a supported software upgrade or revert, you must consult the specific upgrade document and release notes for the release you are upgrading to (or reverting from).
