



# Cisco Transport Controller Operation

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This chapter describes Cisco Transport Controller (CTC), the Cisco software interface for the ONS 15454 SDH. For CTC set up and login information, refer to the *Cisco ONS 15454 SDH Procedure Guide*.

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## 8.1 CTC Software Delivery Methods

ONS 15454 SDH provisioning and administration is performed using the CTC software. CTC is a Java application that is installed in two locations. CTC is stored on the TCC2 card and downloaded to your workstation each time you log into the ONS 15454 SDH.

### 8.1.1 CTC Software Installed on the TCC2 Card

CTC software is preloaded on the ONS 15454 SDH TCC2 card; therefore, you do not need to install software on the TCC2 cards. When a new CTC software version is released, follow procedures in the *Cisco ONS 15454 SDH Software Upgrade Guide* to upgrade the ONS 15454 SDH software on the TCC2 cards.

When you upgrade CTC software, the TCC2 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 SDH by selecting the Maintenance > Software tabs in node view ([Figure 8-1 on page 8-2](#)).

Figure 8-1 CTC Software Versions, Node View

The screenshot shows the CTC Node View for RIO-SDH-231. The left panel displays node details:

- 0 CR
- 0 MJ
- 0 MN
- IP Addr : 10.92.17.231
- Booted : 1/17/03 11:27 AM
- User : CISC015
- Authority : Superuser
- SW Version: 04.00-002L-29.00
- Defaults : Factory Defaults

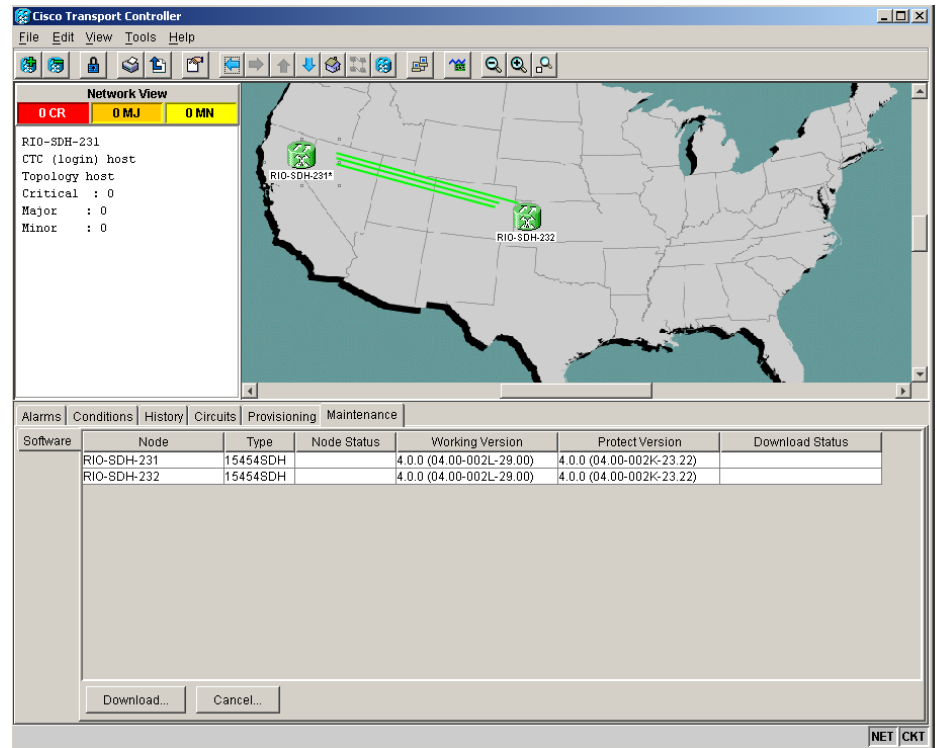
The main area shows a network diagram with cards 18 through 29. The bottom table shows software versions for different nodes:

Database	Node	Type	Node Status	Working Version	Protect Version	Download Status
Ether Bridge	RIO-SDH-231	15454SDH		4.0.0 (04.00-002L-29.00)	4.0.0 (04.00-002K-23.22)	

Buttons at the bottom include Download..., Cancel..., Activate..., and Revert... The status bar shows NET CKT 900391.

Select the tabs in network view to display the software versions installed on all the network nodes (Figure 8-2 on page 8-3).

Figure 8-2 CTC Software Versions, Network View



## 8.1.2 CTC Software Installed on the PC or UNIX Workstation

CTC software is downloaded from the TCC2 cards and installed on your computer automatically after you connect to the ONS 15454 SDH. Downloading the CTC software files automatically ensures your computer is running the same CTC software version as the TCC2 cards you are accessing. The computer CTC software files are stored in the temporary directory designated by your computer's operating system. You can use 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 an ONS 15454 SDH. Downloading the jar files for CTC takes several minutes depending on the bandwidth of the connection between your workstation and the ONS 15454 SDH. For example, jar files downloaded from a modem or an Regenerator SDCC network link require more time than jar files downloaded over a LAN connection.

## 8.2 CTC Installation Overview

To connect to an ONS 15454 SDH using CTC, you enter the ONS 15454 SDH IP address in the URL field of a web browser, such as Netscape Communicator or Microsoft Internet Explorer. After connecting to an ONS 15454 SDH, the following occurs automatically:

1. A CTC launcher applet is downloaded from the TCC2 card to your computer.
2. The launcher determines whether your computer has a CTC release matching the release on the ONS 15454 SDH TCC2 card.
3. If the computer does not have CTC installed, or if the installed release is older than the TCC2 card's version, the launcher downloads the CTC program files from the TCC2 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 SDH that is connected to ONS 15454 SDHs with older versions of CTC, CTC “element” files are downloaded automatically to enable you to interact with those nodes. 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 SDH can handle up to four network-level CTC sessions (the login node and its DCC-connected nodes) and one node-level session (login node only) at one time. CTC performance may vary, depending upon the volume of activity in each session.

## 8.3 PC and UNIX Workstation Requirements

To use CTC in ONS 15454 SDH Release 3.3 or later, your computer must have a web browser with the correct Java Runtime Environment (JRE) installed.



### Note

Do not use Software R3.3 or R3.4 if you have TCC2 cards installed. The TCC2 card requires Software R4.0 or later. Do not use Software R4.0 or later with TCC-I cards. The TCC-I card requires Software R3.3 or R3.4.

The correct JRE for each CTC software release is included on the Cisco ONS 15454 SDH 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. [Table 8-1](#) shows JRE compatibility with ONS software releases.

**Table 8-1 JRE Compatibility**

ONS Software Release	JRE 1.2.2 Compatible	JRE 1.3 Compatible
ONS 15454 SDH Release 3.3	Yes	Yes
ONS 15454 SDH Release 3.4	No	Yes
ONS 15454 SDH Release 4.0	No	Yes
ONS 15454 SDH Release 4.1	No	Yes
ONS 15454 SDH Release 4.5	No	Yes



### Note

Software R4.0 or later notifies you if an older version JRE is running on your PC or UNIX workstation.

Requirements for PCs and UNIX workstations are provided in [Table 8-2 on page 8-5](#). In addition to Netscape Communicator and the JRE, also included on the ONS 15454 SDH software CD and the ONS 15454 SDH documentation CD are the Java plug-in and modified java.policy file.

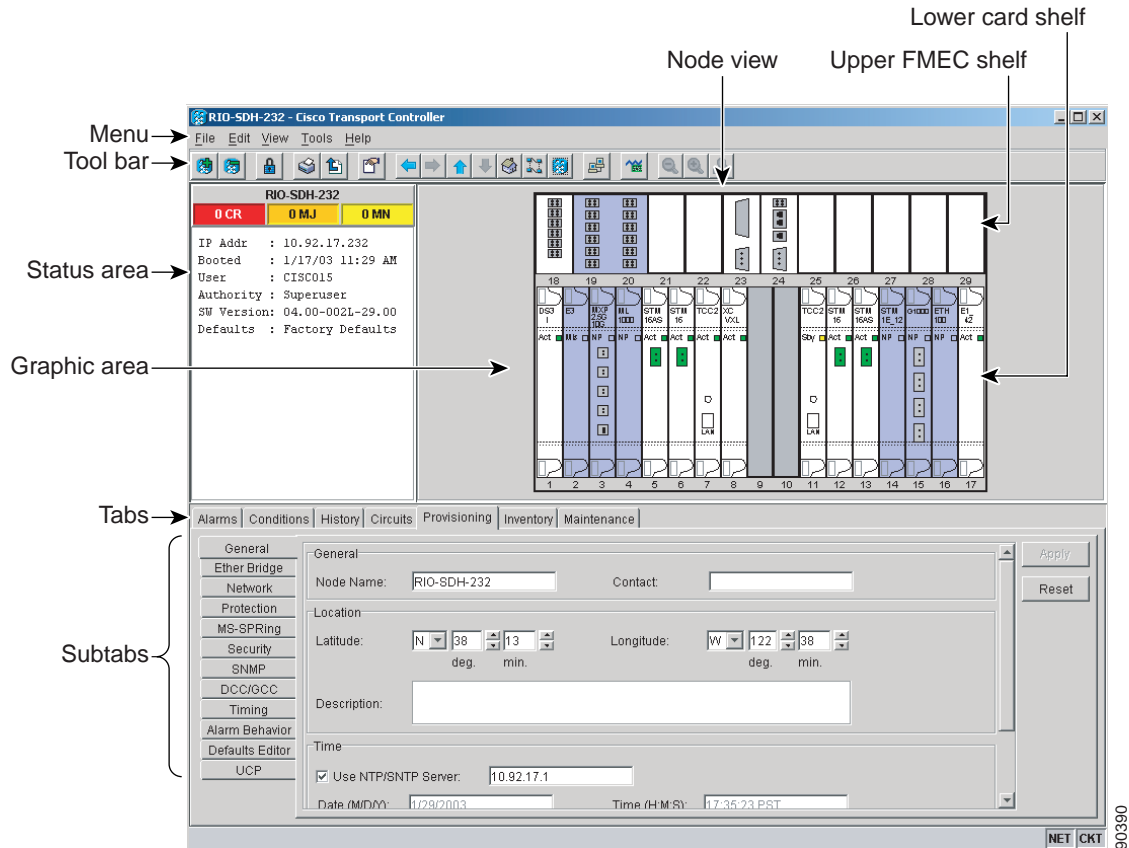
**Table 8-2** CTC Computer Requirements

Area	Requirements	Notes
Processor	Pentium II 300 MHz, UltraSPARC, or equivalent	300 MHz is the recommended processor speed. You can use computers with lower processor speed; however, you may experience longer response times and slower performance.
RAM	128 MB	—
Hard drive	2 GB recommended; 50 MB space required	—
Operating System	<ul style="list-style-type: none"> <li>PC: Windows 95, Windows 98, Windows NT 4.0 with Service Pack 6, Windows 2000, or Windows XP</li> <li>Workstation: Any Solaris release</li> </ul>	—
Web browser	<ul style="list-style-type: none"> <li>PC: Netscape Navigator 4.73 or higher, Internet Explorer 5.0 (Service Pack 2) or higher</li> <li>Workstation: Netscape Navigator 4.73 or higher</li> </ul>	Netscape Communicator 4.73 (Windows) and 4.76 (UNIX) are installed by the CTC Installation Wizard included on the Cisco ONS 15454 SDH software and documentation CDs.
Java Runtime Environment	JRE 1.3.1_02	JRE 1.3.1_02 is installed by the CTC Installation Wizard included on the Cisco ONS 15454 SDH software and documentation CDs. JRE 1.4 is not supported.
Java.policy file	A java.policy file modified for CTC	The java.policy file is modified by the CTC Installation Wizard included on the Cisco ONS 15454 SDH software and documentation CDs.
Cable	User-supplied Category 5 straight-through cable with RJ-45 connectors on each end to connect the computer directly to the ONS 15454 SDH or through a LAN	—

## 8.4 CTC Window

The CTC window appears after you log into an ONS 15454 SDH ([Figure 8-3 on page 8-6](#)). The window includes a menu bar, toolbar, and a top and bottom pane. The top pane displays status information about the selected objects and a graphic of the current view. The bottom pane displays tabs and subtabs, which you use to view ONS 15454 SDH information and perform ONS 15454 SDH provisioning and maintenance. From this window you can display three ONS 15454 SDH views: network, node, and card.

Figure 8-3 Node View (Default Login View)



## 8.4.1 Node View

The CTC node view, shown in [Figure 8-3](#), is the first view displayed after you log into an ONS 15454 SDH. The login node is the first node displayed, and it is the “home view” for the session. Node view allows you to view and manage one ONS 15454 SDH 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; the name of the current logged-in user; and the security level of the user.

### 8.4.1.1 CTC Card Colors

The graphic area of the CTC window depicts the ONS 15454 SDH shelf assembly. The colors of the cards in the graphic reflect the real-time status of the physical card and slot ([Table 8-3](#)).

**Table 8-3 Node View Card Colors**

Card Color	Status
Grey	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

**Table 8-3 Node View Card Colors (continued)**

Card Color	Status
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

The colors of the FMEC cards reflect the real-time status of the physical FMEC cards. [Table 8-4](#) shows the state of the FMEC cards.

**Note**

FMECs cannot be preprovisioned and the FMEC ports displayed in CTC do not change color.

**Table 8-4 Node View 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

Ports can be assigned one of four states, OOS, IS, OOS\_AINS, or OOS\_MT. The color of the port in both card and node view indicates the port state. [Table 8-5](#) shows the port colors and their states.

**Table 8-5 Node View Card Port Colors**

Port Color	State	Description
Grey	OOS	Port is out of service; no signal is transmitted.
Violet	OOS_AINS	Port is in an auto-in-service state; alarm reporting is suppressed, but traffic is carried and loopbacks are allowed. Raised fault conditions, whether their alarms are reported or not, can be retrieved on the CTC Conditions tab.
Cyan	OOS_MT	Port is in a maintenance state. The maintenance state does not interrupt traffic flow, alarm reporting is suppressed, but traffic is carried and loopbacks are allowed. Raised fault conditions, whether their alarms are reported or not, can be retrieved on the CTC Conditions tab. Use OOS_MT for testing or to suppress alarms temporarily. Change the state to IS, OOS, or OOS_AINS when testing is complete.
Green	IS	Port is in service. The port transmits a signal and displays alarms; loopbacks are not allowed.

The color and wording on a card in node view shows the state of a card (Active, Standby, Loading, or Not Provisioned). [Table 8-6 on page 8-8](#) shows the port colors and their states.

**Table 8-6 Node View Card State**

Lower Shelf Act/Sty/NP/Ldg Color	Status
Yellow with Sty Graphic	Card is in standby
Green with Act Graphic	Card is active
Purple with NP Graphic	Card is not present
White with Ldg Graphic	Card is resetting

The graphics on a port in node view shows the state of a port (diagonal lines or loop graphics). [Table 8-7](#) lists the port graphic and their description.

**Table 8-7 Node View Port Graphics**

Lower Shelf Port Graphics	Description
Multiple diagonal lines on port	Port is in service and card was reset
Loop graphic on port	Port is in service and has a loopback provisioned in Card View > Maintenance > Loopback tabs

### 8.4.1.2 Node View Card Shortcuts

If you move your mouse over cards in the 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, and minor (if any); and the alarm profile used by the card. Right-click a card to reveal a shortcut menu, which you can use to open, reset, or delete a card. Right-click a slot to preprovision a card (that is, provision a slot before installing the card).

### 8.4.1.3 Node View Tabs

[Table 8-8](#) lists the tabs and subtabs available in the node view.

**Table 8-8 Node View Tabs and Subtabs**

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

**Table 8-8 Node View Tabs and Subtabs (continued)**

Tab	Description	Subtabs
Provisioning	Provisions the ONS 15454 SDH node.	General, EtherBridge, Network, Protection, MS-SPRing, Security, SNMP, SDH DCC/GCC, Timing, Alarm Behavior, Defaults Editor, UCP
Inventory	Provides inventory information (part number, serial number, CLEI codes) for cards installed in the node. Allows you to delete and reset cards.	—
Maintenance	Performs maintenance tasks for the node.	Database, EtherBridge, Protection, MS-SPRing, Software, Cross-Connect, Overhead XConnect, Diagnostic, Timing, Audit, Routing Table, RIP Routing Table, Test Access

## 8.4.2 Network View

Network view ([Figure 8-4 on page 8-10](#)) allows you to view and manage ONS 15454 SDHs that have DCC connections to the node that you logged into and any login node groups you may have selected.



### Note

Nodes with DCC connections to the login node do not display if you select Disable Network Discovery on the Login dialog box.

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

The lines show DCC connections between the nodes. DCC connections can be green (active) or grey (fail). The lines can also be solid (circuits can be routed through this link) or dashed (circuits cannot be routed through this link).

There are four possibilities total for the appearance of DCCs: green/solid, green/dashed, gray/solid, or gray/dashed. DCC appearance corresponds to the following states: active/routable, active/nonroutable, failed/routable, or failed/nonroutable. 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.

Figure 8-4 Four-Node Network Displayed in CTC Network View

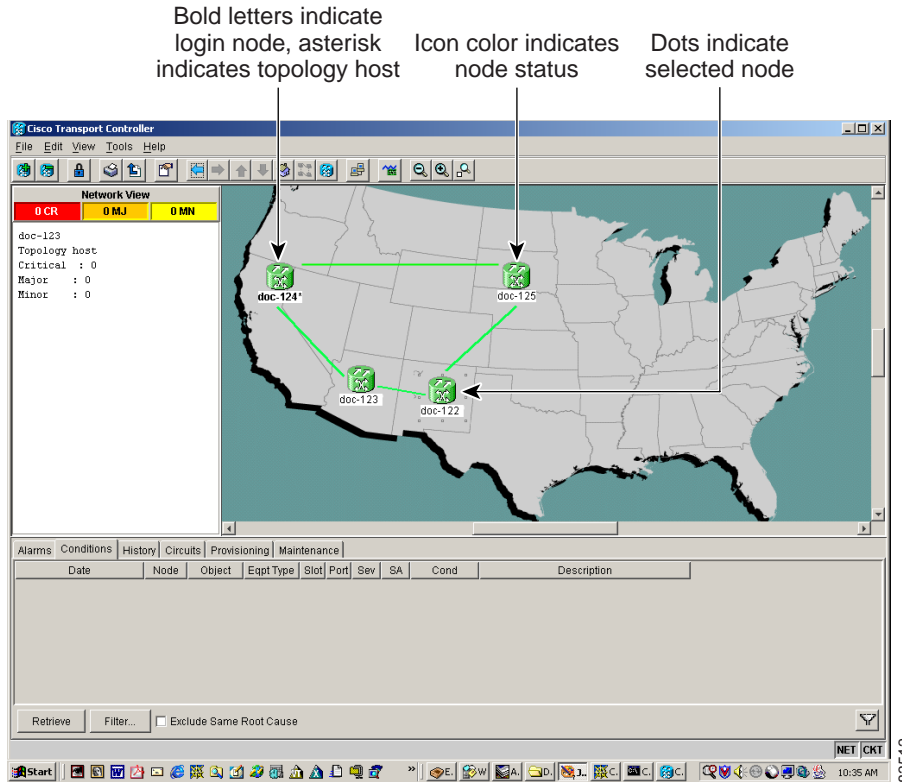


Table 8-9 lists the node colors shown in network view.

Table 8-9 Node Status Shown in Network View

Color	Alarm Status
Green	No alarms
Yellow	Minor alarms
Orange	Major alarms
Red	Critical alarms
Grey with Unknown#	Node is initializing for the first time. CTC displays Unknown# because CTC has not discovered the name of the node yet.

Table 8-10 lists the tabs and subtabs available in the network view.

Table 8-10 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	—

**Table 8-10 Network View Tabs and Subtabs (continued)**

Tab	Description	Subtabs
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	—
Provisioning	Provisions security, alarm profiles, MS-SPRing and overhead circuits	Security, Alarm Profiles, MS-SPRing, Overhead Circuits
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

## 8.4.3 Card View

Card view displays information about individual ONS 15454 SDH 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, and the card status (active or standby), card state (IS, OOS, OOS\_AINS, or OOS\_MT), or port state (IS, OOS, OOS\_AINS, or OOS\_MT). The information that is displayed and the actions you can perform depend on the card.



### Note

CTC displays a card view for all ONS 15454 SDH cards except the TCC2, XC10G, XC-VXL-10G, and XC-VXL-2.5G cards. Provisioning for these common control cards occurs at the node view; therefore, no card view is necessary.

Use the card view tabs and subtabs, shown in [Table 8-11](#), to provision and manage the ONS 15454 SDH. The subtabs, fields, and information displayed under each tab depend on the card type selected. The Performance tab is not displayed for the AIC-I card.

**Table 8-11 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.	—
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 searches for circuits.	Circuits

Table 8-11 Card View Tabs and Subtabs (continued)

Tab	Description	Subtabs
Provisioning	Provisions an ONS 15454 SDH card.	Line, Line Thresholds (different threshold options are available for electrical and optical cards), Elect Path Thresholds, SDH Thresholds, VC4, and Alarm Behavior.
Maintenance	Performs maintenance tasks for the card.	Loopback, Info, Protection, and J1 Path Trace (options depend on the card type).
Performance	Performs performance monitoring for the card.	—
Inventory	The MXP card displays an Inventory screen for adding pluggable ports.	—

## 8.5 TCC2 Card Reset

You can reset the ONS 15454 SDH TCC2 card by using CTC, or by physically reseating a TCC2 card. Resetting the TCC2 card reboots the TCC2 card and reloads the operating system and the application software. Additionally, a card pull reset temporarily removes power from the TCC2 card and clears all buffer memory.

You can apply a reset from CTC to either an active or standby TCC2 card without affecting traffic. If you need to perform a card pull on an active TCC2 card, put the TCC2 card into standby mode first by performing a reset using CTC.



### Note

When a software-initiated reset is performed on an active TCC2 card, the AIC-I card goes through an initialization process and also resets because the AIC-I card is controlled by the active TCC2.

## 8.6 TCC2 Card Database

When dual TCC2 cards are installed in the ONS 15454 SDH, each TCC2 card hosts a separate database; therefore, the protect card's database is available if the database on the working TCC2 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 SDH maintenance program at approximately weekly intervals, and should also be completed when preparing an ONS 15454 SDH for a pending natural disaster, such as a flood or fire.



### Note

The following parameters are not backed up and restored: node name, IP address, mask and gateway, and IOP 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. Cisco recommends keeping a record of the old and new node names.

## 8.7 Reverting to an Earlier Software Load

When you click the Activate button after a software upgrade, the TCC2 copies the current working database and saves it in a reserved location in the TCC2 flash memory. If you later 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.



**Note**

The TCC2 card does not carry any software earlier than Software R4.0. You will not be able to revert to a software release earlier than Software R4.0 with TCC2 cards installed.



**Note**

The TCC-I can be used with Software R4.0 only for TCC2 upgrade purposes. For example, during a TCC upgrade, some nodes on your network could have Software R4.0 with TCC-I cards installed, while other nodes have Software R4.0 with TCC2 cards installed. TCC-I cards running Software R4.0 are not supported beyond the TCC2 upgrade process because performance issues such as switch times cannot be guaranteed.



**Tip**

The revert feature is useful if a maintenance window closes while you are upgrading CTC software. You can revert to the protect software load without losing traffic. When the next maintenance window opens, complete the upgrade and activate the new software load.



**Note**

A revert from a matching maintenance software load uses the current active database; therefore, no provisioning is lost. All other reverts do restore the database. (A maintenance release has a three-digit release number, such as, 4.0.1).

Circuits created and provisioning performed after a software load is activated (upgraded to a higher software release) does not reinstate 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, 3.3.2 to 3.3.1), because maintenance releases use the same database.

