

Installing the Control Cards

Note Starting with Release 11.1.4, ONS 15454 M12 chassis and TCC3 card are not supported on the ONS 15454 DWDM and WSON software packages. You must not attempt to upgrade ONS 15454 M12 nodes from a previous release to Release 11.1.4.

This chapter describes the common control cards needed for the Cisco ONS 15454, Cisco ONS 15454 M2, and Cisco ONS 15454 M6 platforms and provides installation and card turn up procedures.

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Card Compatibility



Note The DB-9 console port of the node controller works only on the active control card of the GNE or ENE and not on the standby control card. The DB-9 console port also does not work in control cards installed in the sub-tending shelves. The console port is available on all control cards except the TNCS-2 and TNCS-2O cards.

Table 1: Platform and Software Release Compatibility for Control Cards

Card Name	R4.5 - R4.6	R4.7 - R6.0	R7.0, R7.2	R8.0 - R8.5
TCC2/TCC2P/ AIC-I/MS-ISC-100T	15454-DWDM	15454-DWDM	15454-DWDM	15454-DW
TCC3 [1]	No	No	No	No
TNC/TSC [2]	No	No	No	No
TNCE/TSCE [2]	No	No	No	No
TNCS	No	No	No	No
TNCS-2	No	No	No	No
TNCS-2O	No	No	No	No

[1] The TCC3 card is backward compatible with software Release 9.1 and earlier releases. In the Release 9.1 and earlier releases, the TCC3 card boots up as the TCC2P card in the Cisco ONS 15454 DWDM systems.

[2] From releases 9.2.3 and later, the TNC and TNCE cards can be interchanged on an ONS 15454 M6 shelf without any alarms. However, if you combine both the cards in a single chassis and configure the OC3 OSC, it raises an EOC alarm.

Table 2: Platform and Software Release Compatibility for Control Cards

Card Name	R9.2	R9.2.x	R9.3, R9.4, R9.6.x, R9.8.x	R10.0, R10.1, R10.3
TCC2/TCC2P/ AIC-I/MS-ISC-100T	15454-DWDM	15454-DWDM	15454-DWDM	15454-DWDM t d m 2 D e
TCC3 [3]	15454-DWDM	15454-DWDM	15454-DWDM	15454-DWDM D
TNC/TSC [2]	ONS-15454-M2 and ONS-15454-M6	ONS-15454-M2 and ONS-15454-M6	ONS-15454-M2 and ONS-15454-M6	ONS-15454-M2 and ONS-15454-M6 M M
TNCE/TSCE [2]	No	ONS-15454-M2 and ONS-15454-M6 TNCE/TSCE cards are supported from R9.2.3	ONS-15454-M2 and ONS-15454-M6	ONS-15454-M2 and ONS-15454-M6 M M
TNCS	No	No	No	No , , S 5 2 6
TNCS-O	No	No	No	No , , S 5 2 6
TNCS-2	No	No	No	No , , S 5 2 6
TNCS-2O	No	No	No	No , , S 5 2 6

[3] The TCC3 card is backward compatible with software Release 9.1 and earlier releases. In the Release 9.1 and earlier releases, the TCC3 card boots up as the TCC2P card in the Cisco ONS 15454 DWDM systems.

Safety Labels

For information about safety labels, see the "Safety Labels" section.

TCC2 and TCC2P Cards

(Cisco ONS 15454 only)

The Advanced Timing, Communications, and Control (TCC2) card performs system initialization, provisioning, alarm reporting, maintenance, diagnostics, IP address detection/resolution, SONET section overhead (SOH) data communications channel/generic communications channel (DCC/GCC) termination, optical service channel (OSC) DWDM data communications network (DCN) termination, and system fault detection for the ONS 15454. It monitors the supply voltage of the system. Install TCC2 cards in Slots 7 and 11 for redundancy. If the active TCC2 fails, traffic switches to the protect TCC2.

The Advanced Timing, Communications, and Control Plus (TCC2P) card is an enhanced version of the TCC2 card. The primary enhancements are Ethernet security features and 64K composite clock BITS timing. The TCC2P card supports multi-shelf management.

(For Releases up to R10.3) The TCC2P card acts as a shelf controller and node controller for the ONS 15454. The TCC2P card supports up to four subtended shelves through the MS-ISC-100T card or external switch. In a multi-shelf configuration, the TCC2P card allows the ONS 15454 node to be a node controller and does not support subtending of ONS 15454 M6 shelves.

(From R10.5.2.6) The TCC2P card can be used as a control card in a subtended shelf where the node controller is TCC3 card on ONS 15454 chassis or TNC/TNCE/TNCS/TNCS-O cards on ONS 15454 M6 or NCS 2015 chassis. The TCC2P card can also be used as a node controller in a stand-alone configuration.

Limitations of TCC2 and TCC2P Cards

- (From R10.3) Due to memory limitations, TCC2/TCC2P cards are not supported as the node controller in multi-shelf configuration from R10.5.2.6. Hence, it is recommended to use TCC3 card as the node controller in multi-shelf configuration.
- (From R10.3) When ONS 15454 with TCC3 card, ONS 15454 M6 or NCS 2015 chassis is the node controller and ONS 15454 chassis with TCC2P card is the subtended shelf controller, the conversion from subtended shelf controller to node controller or to stand-alone controller is not supported.
- (From R10.6.1) The MS-ISC-100T card is not supported to save flash memory.
- In R10.5.2.6 or later, when a new TCC2P card is inserted into the standby slot of the ONS 15454 SSC shelf that is connected to ONS 15454 M6 or NCS 2015 or ONS 15454 node controller with TCC3 controller, the TCC2P card goes for roll reboot and never comes up. Hence, the user cannot replace the TCC2P card in SSC shelf with a new TCC2P card. The workaround is as follows:

  1. Configure the standalone node to SSC.
  2. Remove the card from the shelf and insert in the actual SSC shelf.

TCC2 and TCC2P Card Support from R10.6.2

The nodes with the TCC2/TCC2P cards in releases prior to R10.6.2 cannot be upgraded to R10.6.2 as the size of the software package exceeds the size of the TCC2/TCC2P flash drive. Hence, R10.6.2 does not have the TCC2/TCC2P software package.

If the user wants to continue with the ONS 15454 chassis, it is recommended to use the TCC3 control card. If the user wants to upgrade to a ONS 15454 M6 or NCS 2015 chassis, it is recommended to use the TNCS or TNCS-O control cards. There is sufficient space in the flash drive of the proposed alternative control cards.

Related Procedures for TCC2 and TCC2P Cards

- NTP-G15 Installing the Common Control Cards on ONS 15454 Shelf, on page 30
- NTP-G22 Verifying Common Card Installation
- NTP-G51 Verify DWDM Node Turn Up
- NTP-G103 Backing Up the Database
- NTP-G104 Restoring the Database
- NTP-G106 Resetting Cards Using CTC
- NTP-G105 Restoring the Node to Factory Configuration

TCC3 Card

(Cisco ONS 15454 only)

The Timing Communications Control Three (TCC3) card is an enhanced version of the TCC2P card. The primary enhancements include the increase in memory size and compact flash space. The TCC3 card boots up as TCC2P card in older releases and as TCC3 card from Release 9.2 onwards.

The TCC3 card supports multi-shelf management. The TCC3 card acts as a shelf controller and node controller for the ONS 15454. The TCC3 card supports up to 50 subtended shelves through the MSM-ISC card or external switch. In a multi-shelf configuration, the TCC3 card allows the ONS 15454 node to be a node controller if an M6 shelf is subtended to it. From R10.0, we strongly recommend the use of TCC3 card as a node controller on an ONS 15454 multi-shelf node.

For more information on TCC3 Card, see http://www.cisco.com/en/US/prod/collateral/optical/ps5724/ps2006/datasheet_c78-598518.html.

Related Procedures for TCC3 Card

- NTP-G15 Installing the Common Control Cards on ONS 15454 Shelf, on page 30
- NTP-G22 Verifying Common Card Installation
- NTP-G51 Verify DWDM Node Turn Up
- NTP-G103 Backing Up the Database
- NTP-G104 Restoring the Database

- NTP-G106 Resetting Cards Using CTC
- NTP-G105 Restoring the Node to Factory Configuration

TNC and TNCE Card

(Cisco ONS 15454 M2 and ONS 15454 M6)

The TNC or TNCE cards combine the functions of multiple cards such as TCC2P, OSCM, ISC, and AIC-I cards. The TNC or TNCE cards are provisioned as active and standby in the ONS-15454-M6 shelf, and as a stand-alone card in the ONS-15454-M2 shelf. The TNC or TNCE cards serve as the processor card for the node.

On the ONS-15454-M6 shelf, install redundant TNC or TNCE cards in slots 1 and 8. If the active TNC or TNCE card fails, the system traffic switches to the redundant TNC or TNCE card.

On the ONS-15454-M2 shelf, install the stand-alone TNC or TNCE cards in slot 1. The TNC or TNCE cards support line cards in slots 2 and 3.

The ONS-15454-M6 shelf has dual power supply. The TNC or the TNCE card monitors both supply voltage inputs on the ONS-15454-M6 shelf. The TNC or TNCE card raises an alarm if one of the supply voltage inputs has a voltage out of the specified range.

You can insert and remove the TNC or TNCE card without impacting the system traffic, even when the system is online.

For more information about the TNC and TNCE cards, see http://www.cisco.com/en/US/prod/collateral/optical/ps5724/ps2006/data_sheet_c78-602903.html.

Control Card Workflow Diagram

Workflow Diagram

The following figure shows the workflow diagram of the TNC/TSC/TNCE/TSCE card on the ONS 15454 M6 shelf. The diagram provides information on the tasks required to install and configure the TNC/TSC/TNCE/TSCE card.

Figure 1: Control Card Workflow Diagram

Related Procedures for TNC and TNCE Cards

- NTP-G313 Installing and Configuring the TNC, TNCE, TSC, TSCE, TNCS, TNCS-O, TNCS-2, and TNCS-2O Card, on page 35
- NTP-G22 Verifying Common Card Installation
- NTP-G51 Verify DWDM Node Turn Up
- NTP-G103 Backing Up the Database
- NTP-G104 Restoring the Database
- NTP-G106 Resetting Cards Using CTC
- NTP-G280 Modifying Threshold Settings for the TNC and TNCE Cards
- NTP-G277 Provision Alarms and Controls on the TNC, TNCE, TSC, or TSCE Card
- NTP-G279 Monitor TNC and TNCE Card Performance
- NTP-G250 Verifying Digital Image Signing (DIS) Information

TSC and TSCE Cards

(Cisco ONS 15454 M2 and ONS 15454 M6)

The TSC and TSCE card combines the functions of multiple cards such as TCC2P, ISC, and AIC-I cards. The TSC or TSCE card is provisioned as active and standby in the ONS-15454-M6 shelf, and as a stand-alone card in the ONS-15454-M2 shelf. The TSC and TSCE card serves as the processor card for the shelf.

On the ONS-15454-M6 shelf, install redundant TSC and TSCE cards in slots 1 and 8. If the active TSC or TSCE card fails, system traffic switches to the redundant TSC or TSCE card.

On the ONS-15454-M2 shelf, install the stand-alone TSC and TSCE cards in slot 1. The TSC and TSCE card support line cards in slots 2 and 3.

The ONS-15454-M6 shelf has dual power supply. The TSC and TSCE card monitors both supply voltage inputs on the ONS-15454-M6 shelf. The TSC and TSCE card raises an alarm if one of the supply voltage inputs has a voltage out of the specified range.

You can insert and remove the TSC and TSCE card without impacting the system traffic, even when the system is online.

The TSC and TSCE card does not support optical service channel (OSC) and SFP ports.

Note The TNC, TNCE, TSC, and TSCE cards cannot be inserted in the same shelf.

For more information about the TSC and TSCE card, see http://www.cisco.com/en/US/prod/collateral/optical/ps5724/ps2006/data_sheet_c78-602903.html.

Related Procedures for TSC and TSCE Cards

- NTP-G313 Installing and Configuring the TNC, TNCE, TSC, TSCE, TNCS, TNCS-O, TNCS-2, and TNCS-2O Card, on page 35
- NTP-G22 Verifying Common Card Installation
- NTP-G51 Verify DWDM Node Turn Up
- NTP-G103 Backing Up the Database
- NTP-G104 Restoring the Database
- NTP-G106 Resetting Cards Using CTC
- NTP-G280 Modifying Threshold Settings for the TNC and TNCE Cards
- NTP-G277 Provision Alarms and Controls on the TNC, TNCE, TSC, or TSCE Card
- NTP-G279 Monitor TNC and TNCE Card Performance
- NTP-G250 Verifying Digital Image Signing (DIS) Information

TNCS Card

(ONS 15454 M2, ONS 15454 M6, NCS 2015)

The TNCS cards are provisioned as active and standby in the Cisco ONS 15454 M2, ONS 15454 M6, or NCS 2015 shelves. The TNCS cards serve as the processor card for the node.

On the NCS 2015 shelf, the TNCS cards can be installed in slots 1 and 17. On the ONS 15454 M6 shelf, the cards can be installed in slots 1 and 8. On the ONS 15454 M2 shelf, the card can be installed in slot 1. If the active TNCS card fails, system traffic switches to the redundant TNCS card.

The NCS 2015 shelf is powered by DC power modules with 3+1, 2+2, 2+1, or 1+1 redundancy. A minimum of one power module is required to turn up the chassis. The number of power modules to be connected is dependent on the chassis load. The TNCS cards raise an alarm if one of the supply voltage inputs has a voltage out of the specified range.

You can insert and remove the TNCS cards even when the system is online, without impacting the system traffic.



Note When a TNCS card provisioned with OC3/STM-1 or GIGE payloads is replaced with a TNCS-O card, the PROV-MISMATCH, RS-EOC, EOC-E and SIGLOSS alarms are raised due to incompatibility of the payloads provisioned on the TNCS card. FE is the only payload supported on the TNCS-O card.

Perform the following steps on the TNCS card before you replace a TNCS card with a TNCS-O card:

- Delete incompatible payloads (OC3/STM-1 or GIGE) on the TNCS card.
- Delete any synchronization service related to the OSC port.

For more information about the TNCS cards, see http://www.cisco.com/en/US/prod/collateral/optical/ps5724/ps2006/data_sheet_c78-602903.html.

TNCS-O Card

(ONS 15454 M2, ONS 15454 M6, NCS 2015)

The TNCS-O card is provisioned as active and standby in the Cisco ONS 15454 M6 or NCS 2015 shelves. On the NCS 2015 shelf, the TNCS-O card can be installed in slots 1 and 17. On the ONS 15454 M6 shelf, the card can be installed in slots 1 and 8. If the active TNCS-O card fails, the system switches to the redundant TNCS-O card.

Note The TNCS-O control card is not supported on a node that has ONS 15454 as node controller and ONS 15454 M6 or NCS 2015 as subtending shelf controllers.

A TNCS-O card has an optical module that provides Optical Time Domain Reflectometer (OTDR) measurement, ORL measurement, and standard Optical Service Channel (OSC) capability on two ports. These capabilities are available on up to four ports for each shelf; a shelf can have two TNCS-O cards. OTDR scan and OSC transmission can run in parallel on different ports.

The TNCS-O cards support only Fast Ethernet (FE) and wavelength of 1518 nm in OSC transmissions.

Note OC-3 and ONE-GE payloads are not supported by the TNCS-O card.

The OTDR feature in the TNCS-O card lets you do the following:

- Inspect the transmission fiber.
- Identify discontinuities or defect on the fiber.
- Measure the distance and magnitude of defects like insertion loss, reflection loss, and so on.
- Monitor variations in scan values and configured threshold values periodically.

The OTDR measurement ranges are:

- Zone #1
- Zone #2
- Zone #3
- Zone #4
- Expert Mode
- Auto mode

The following table shows the OTDR performance in different operating ranges:

Operating Range	Distance Range [Km]	Distance Accuracy [m]	Loss Accuracy [dB]		Reflection Accuracy [dB]		Measurement Time [s]
			Typ.	W.C.	Typ.	W.C.	
Zone #1	0.001 - 1	+/- 1	+/- 0.2	+/- 2	3	4	180
Zone #2	0.001 - 25	+/- 2	+/- 0.2	+/- 2	2	4	180
Zone #3	0.001 - 80	+/- 10	+/- 0.5	+/- 2	1	4	180
Zone #4	0.001 - 100	+/- 20	+/- 0.5	+/- 2	1	4	180

The following table shows the maximum dynamic range of the TNCS-O OTDR in the different zones. The maximum dynamic range of the TNCS-O OTDR includes the total insertion loss, including the optical attenuation at the faceplate connector, not shown in the OTDR trace.

Operating Range	Max [dB]
Zone #1	2.5
Zone #2	8
Zone #3	17
Zone #4	21

The OSC transmission ranges are:

- Standard range: 12 - 43 dB
- Reduced range: 5 - 30 dB



Note The TNCS-O cards are not interoperable with TNC or TNCE cards. TNCS-O cards are interoperable only with a TNCS or another TNCS-O card over a fiber span. However, the OTDR functionality is available only if a TNCS-O card is connected to another TNCS-O card over a fiber span.



Note The OTDR feature of TNCS-O and TNCS-2O cards is not supported over DWDM network configuration having PSM card at the line side of booster amplifier. In this configuration, the PSM Working (W) and Protect (P) ports are connected to the fiber. The OTDR signal is split into both W and P fibers and back reflected light from both the fibers leads to inconsistent OTDR results.

For more information about the TNCS-O cards, see http://www.cisco.com/c/en/us/products/collateral/optical-networking/ons-15454-series-multiservice-transport-platforms/data_sheet_c78-602903.html.

Operating Modes for TNC, TNCE, TNCS, or TNCS-O cards

The control cards can be configured either in TNC or TNCO operating mode. The TNC mode is the default operating mode for the cards. A card is configured in TNCO mode if the actual card that is to be inserted into a shelf is a TNCS-O card.

Note The creation of OC-3 or ONE-GE payloads is rejected in the TNCO mode.

The PROV_MISMATCH alarm is raised in case of a provisioning mismatch. For more information on the PROV_MISMATCH alarm, see *Cisco ONS 15454 DWDM Troubleshooting Guide, Release 10.x.x*.

TNCS-2 and TNCS-2O Cards

(ONS 15454 M2, ONS 15454 M6, NCS 2015)

Note The TNCS-2O control card is not supported on a node that has ONS 15454 as node controller and NCS 2006 or NCS 2015 as subtending shelf controllers.

The TNCS-2 and TNCS-2O cards are provisioned as active in the ONS 15454 M2 chassis, and as active and standby ONS 15454 M6 or NCS 2015 chassis.

Note When the TNCS-2 or TNCS-2O control card is removed and re-inserted from the ONS 15454 M2 chassis, the detection of fan-tray assembly (FTA) takes 5 to 7 minutes.

The TNCS-2O control card is not supported on a node that has ONS 15454 as node controller and NCS 2006 or NCS 2015 as subtending shelf controllers.

On the NCS 2015 shelf, the TNCS-2 and TNCS-2O cards can be installed in slots 1 and 17.

On the ONS 15454 M6 shelf, the cards can be installed in slots 1 and 8.

On the ONS 15454 M2 shelf, the cards can be installed in slot 1.

You can insert and remove the TNCS-2 and TNCS-2O cards without affecting the system traffic, even when the system is online.

The card has the following features:

- The TNCS-2 and the TNCS-2O cards work in redundant mode with another TNCS-2, TNCS-2O, TNCS, TNCSO, or TNCE cards.
- The TNCS-2 and the TNCS-2O cards can replace each other and the TNCS/TNCSO/TNC-E cards in any ONS 15454 M2, ONS 15454 M6, or NCS 2015 chassis. When the TNCS/TNCSO/TNCE cards are provisioned with the OC-3 payload and are being replaced by the TNCS-2/TNCS-2O card, the provisioning has to be removed on the TNC-E/TNCS/TNCS-O card before replacing the card with the TNCS-2/TNCS-2O card..

Note When the TNCS-2/TNCS-2O card is replacing a pre-provisioned card with OC-3 payload on a chassis, the PROV-MISMATCH/MEA alarm is raised.

- The TNCS-2O has an optical module that performs Optical Time Domain Reflectometry (OTDR) functions with the internal module on two OSC ports 3, 4.
- Synchronous Ethernet is supported on all GE and FE ports of the TNCS-2 and the TNCS-2O cards.
- The TNCS-2 control card has OSC ports 1 and 2 available and the TNCS-2O has a total of four OSC ports available with FE and GE support. OC-3 support is not available on either of the cards.
- The TNCS-2 and TNCS-2O cards address CPU EOL and SDRAM supply issues on the existing controller cards.
- The TNCS-2 and the TNCS-2O cards supports a secure boot.
- The TNCS-2 and TNCS-2O cards exhibit chassis control functions including the control of power supplies, fans, ECU, optical modules, clock synchronization, and line card configuration. It can also configure the field programmable devices present in the TNCS-2 or TNCS-2O card.
- The TNCS-2 and TNCS-2O cards support environment monitoring and alarm reporting features.
- The TNCS-2 and TNCS-2O cards support multishelf management (MSM) as other control cards.
- The TNCS-2 or TNCS-2O cards can be inserted based on SSC into an existing MSM node with the node controller (NC) having one of TNCS, TNCS-O, TNCE, or TSCE control cards. The TNCS-2 card is supported on SSC to a NC having a TCC3 control card.

Note The TNCS-2O card is not supported on SSC to a NC having a TCC3 control card.

Note The TNCS-2 and TNCS-2O cards are not supported on the ONS 15454 chassis.

Note The TNCS-2 and TNCS-2O cards cannot be installed in the chassis that runs software earlier than R11.0.

- All packages are supported on the TNCS-2 and TNCS-2O cards.

The **Lamp Test** button is not available on the TNCS-2 and TNCS-2O cards.

Note When the EMS port is configured with 10 Mbps speed for TNCS-2 and TNCS-2O cards, it causes unicast storm control over the EMS peer port connected to the switch. However, when the storm controller is enabled on the EMS port for unicast packets on the switch, the EMS link goes down.

Table 3: The TNCS-2 and TNCS-2O cards support the following shelf control options:

Standby Slot	Active Slot	Support
TSC	TNCS-2O	Not Supported
TSC-E	TNCS-2O	Not Supported
TNC	TNCS-2O	Not Supported
TNC-E	TNCS-2O	Yes
TNCS	TNCS-2O	Yes
TNCS-O	TNCS-2O	Yes
TNCS-2	TNCS-2O	Yes
TSC	TNCS-2	Not Supported
TSC-E	TNCS-2	Not Supported
TNC	TNCS-2	Not Supported
TNC-E	TNCS-2	Yes
TNCS	TNCS-2	Yes
TNCS-O	TNCS-2	Yes
TNCS-2O	TNCS-2	Yes

Power Settings of TNCS-O and TNCS-2O OTDR Ports

OTDR ports of TNCS-O and TNCS-2O operate in two modes:

- High Power
- Low Power

These power changes occur based on the settings of the **Max Expected Span Loss** parameter. If the **Max Expected Span Loss** parameter is set to 28 dB or less, OTDR ports operate in low power and if the **Max Expected Span Loss** parameter is set to more then 28 dB, OTDR ports operate in high power.

After changing the value of **Max Expected Span Loss** parameter, you must perform **Launch ANS** from CTC as it is an ANS parameter.

Support for OTDR

Optical Time Domain Reflectometer (OTDR) is used to detect faults in an optical fiber link of a communication network. OTDR functionality is supported on TNCS-O and TNCS-2O control cards.

From Release 11.0, the OTDR functionality support is extended to NCS 2002.

The OTDR feature on the TNCS-O and TNCS-2O cards lets you do the following:

- Inspect the transmission fiber.
- Identify discontinuities or defect on the fiber.
- Measure the distance and magnitude of defects like insertion loss, reflection loss, and so on.
- Monitor variations in scan values and configured threshold values periodically.

The OTDR measurement ranges are:

- Zone #1
- Zone #2
- Zone #3
- Zone #4
- Expert Mode
- Auto mode

The following table shows the OTDR performance in different operating ranges:

Operating Range	Distance Range [Km]	Distance Accuracy [m]	Loss Accuracy [dB]		Reflection Accuracy [dB]		Measurement Time [s]
			Typ.	W.C.	Typ.	W.C.	
Zone #1	0.001 - 1	+/- 1	+/- 0.2	+/- 2	3	4	180
Zone #2	0.001 - 25	+/- 2	+/- 0.2	+/- 2	2	4	180
Zone #3	0.001 - 80	+/- 10	+/- 0.5	+/- 2	1	4	180
Zone #4	0.001 - 100	+/- 20	+/- 0.5	+/- 2	1	4	180

The following table shows the maximum dynamic range of OTDR in the different zones. The maximum dynamic range of OTDR includes the total insertion loss, including the optical attenuation at the faceplate connector, not shown in the OTDR trace.

Operating Range	Max [dB]
Zone #1	2.5
Zone #2	8
Zone #3	17
Zone #4	21

You can start a scan in auto mode requesting for the new reflection loss report or for both (legacy and new reflection loss reports). You can select, either the new loss reflection scan or normal scan. The TL1 command used for this operation is available here TL1 Command Guide.

Note The OTDR feature of TNCS-O and TNCS-2O cards is not supported over DWDM network configuration having PSM card at the line side of booster amplifier. In this configuration, the PSM Working (W) and Protect (P) ports are connected to the fiber. The OTDR signal is split into both W and P fibers and back reflected light from both the fibers leads to inconsistent OTDR results.

Note When an OTDR hybrid scan is initiated on the TNCS-2O card, UDC partial packet loss occurs while the scan is in progress. The UDC packet loss stops once the OTDR hybrid scan is completed.

OTDR Training

In R10.8, OTDR scan performances are improved using specific parameters of fiber plant such as span length, span loss, equipment insertion loss, reflection contributions, and major events on the fiber. This calibration operation is called OTDR training.

OTDR training is executed with the following rules.

- OTDR training is executed on both the Tx fiber and Rx fiber.
- OTDR training results are used to execute the composite scan.
- OTDR training is embedded in the scan operation.
- OTDR training takes up to 2 minutes in fast mode and up to 10 minutes in hybrid mode.
- OTDR training results in calibration file, fast span trace, and identification of fiber end.

Note High reflection location is not available if detected during ORL training.

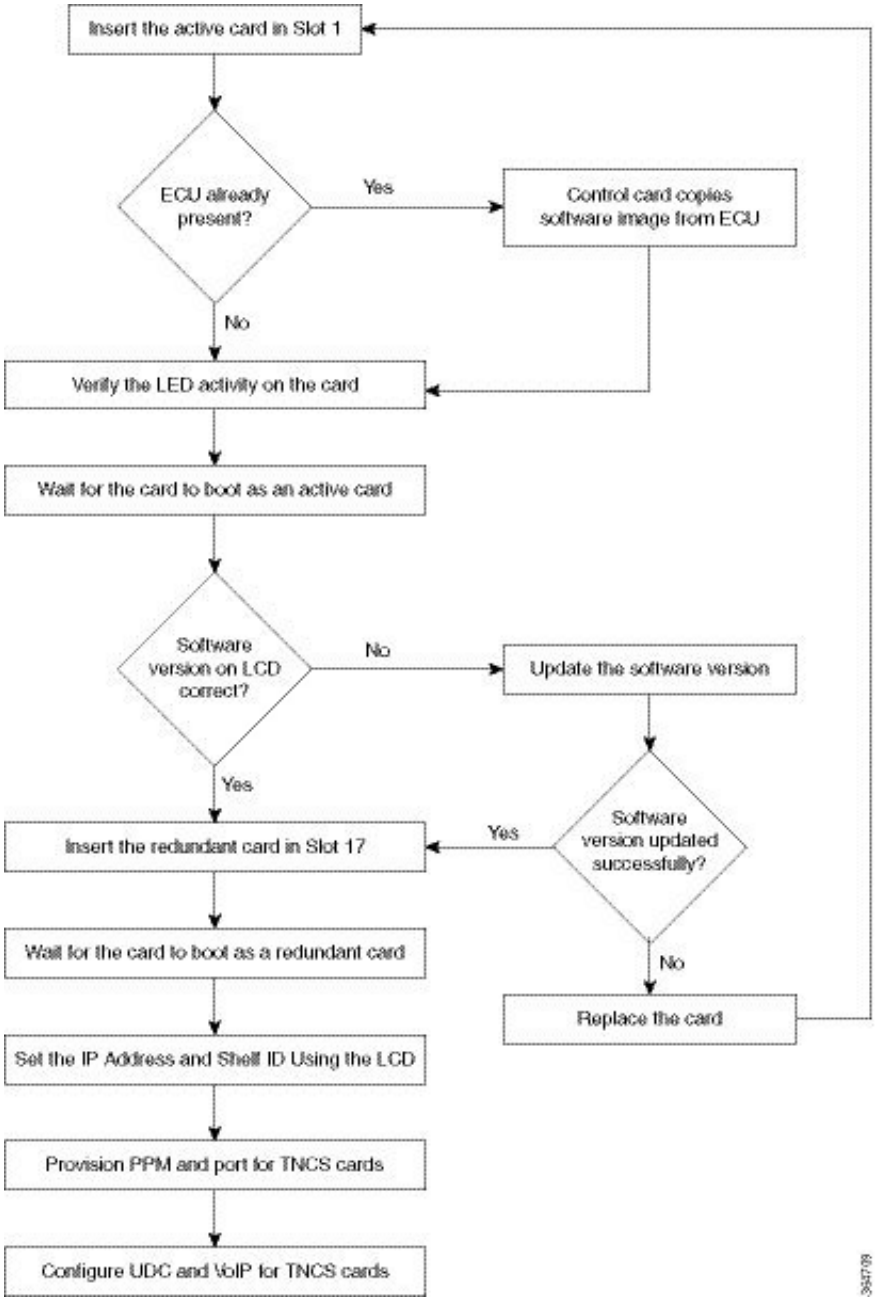
You can configure a periodic ORL training in the Rx direction, even for a single PPM. The TL1 command used for this operation is available here TL1 Command Guide.

Control Card Workflow Diagram

Note From Release 10.62 onwards, the new node must be connected to the laptop before node turn up.

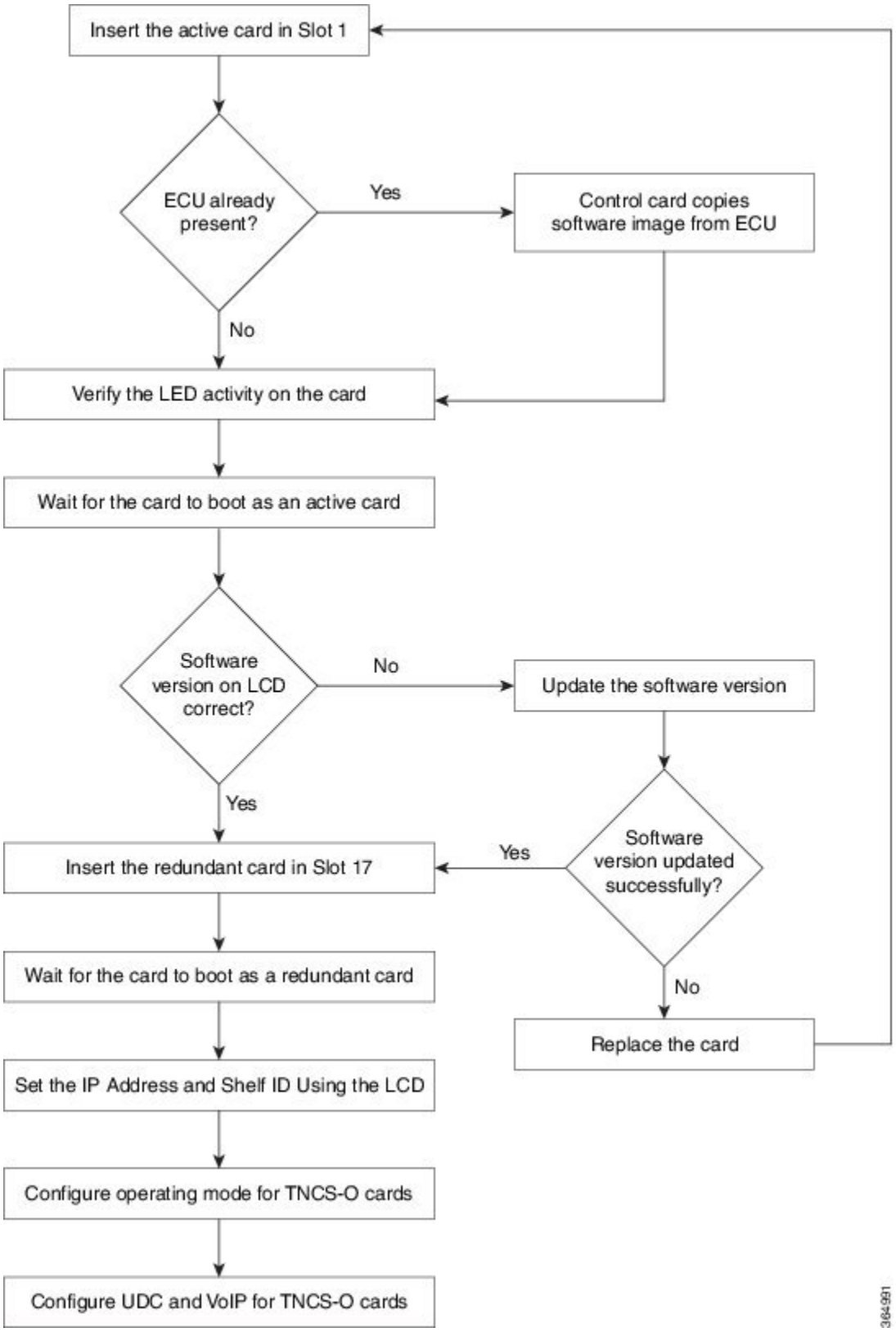
The following figure shows a workflow that describes the tasks required to install and configure the TNCS card.

Figure 2: TNCS Card Workflow



The following figure shows a workflow that describes the tasks required to install and configure the TNCS-O card.

Figure 3: TNCS-O Card Workflow


Insert the active card in Slot 1
ECU already present?
Yes
Control card copies software image from ECU
No
Verify the LED activity on the card
Wait for the card to boot as an active card
Software version on LCD correct?
No
Update the software version
Yes
Software version updated successfully?
Yes
Insert the redundant card in Slot 17
No
Replace the card
Wait for the card to boot as a redundant card
Set the IP Address and Shelf ID Using the LCD
Configure operating mode for TNCS-O cards
Configure UDC and VoIP for TNCS-O cards
384991

Related Procedures for TNCS and TNCS-O Cards

- NTP-G313 Installing and Configuring the TNC, TNCE, TSC, TSCE, TNCS, TNCS-O, TNCS-2, and TNCS-2O Card, on page 35
- NTP-G277 Provision Alarms and Controls on the TNC, TNCE, TNCS, TSC, or TSCE Card

Digital Image Signing

(Cisco ONS 15454 DWDM)

The DIS feature complies with the new U.S. Government Federal Information Processing Standard (FIPS) 140-3 to provide security for all software provided on the Cisco ONS 15454 DWDM platforms. This standard requires software to be digitally signed and verified for authenticity and integrity prior to load and execution.

DIS focuses on software security and provides increased protection from attacks and threats to Cisco ONS 15454 DWDM products. DIS verifies software integrity and provides assurance that the software has not been tampered with or modified. Digitally signed Cisco software provides counterfeit protection.

New controller cards, such as TNC/TNCE/TSC/TSCE/TNCS/TNCS-O, provide services that authenticate the origin of the software running on the Cisco ONS 15454 DWDM platforms.

DIS Identification

Digitally signed software can be identified by the last three characters appended to the working version and protected version field in CTC. The DIS conventions can be viewed under the working version displayed in the **Maintenance** > **Software** tab in CTC. For example, 9.2.0 (09.20-X10C-29.09-SDA) and 9.2.0 (09.20-010C-18.18-SPA).

The significance of the three characters appended to the software version is explained in the following table:

Character	Meaning
S (first character)	Indicates that the package is signed.
P or D (second character)	Production (P) or Development (D) image. • Production image—Software approved for general release. • Development image—development software provided under special conditions for limited use.
A (third character)	This third character indicates the version of the key used for signature generation. The version changes when a key is revoked and a new key is used. The values of the version key varies from A to Z.

Related Procedures for DIS

To verify DIS, see NTP-G250 Verifying Digital Image Signing (DIS) Information

AIC-I Card

(Cisco ONS 15454 only)

- The optional Alarm Interface Controller—International (AIC-I) card provides customer-defined (environmental) alarms and controls and supports local and express orderwire.
- It provides 12 customer-defined input and 4 customer-defined input/output contacts. The physical connections are via the backplane wire-wrap pin terminals. If you use the additional alarm expansion panel (AEP), the AIC-I card can support up to 32 inputs and 16 outputs, which are connected on the AEP connectors. The AEP is compatible with ANSI shelves only. A power monitoring function monitors the supply voltage (–48 VDC).



Note For ANSI shelves, the number of inputs and outputs can be increased using the AEP. The AEP is connected to the shelf backplane and requires an external wire-wrap panel.

AIC-I Card-Level Indicators

For "AIC-I Card-Level Indicators", see Card-Level Indicators on the AIC-I Card.

External Alarms and Controls

The AIC-I card provides input/output alarm contact closures. You can define up to 12 external alarm inputs and 4 external alarm inputs/outputs (user configurable). The physical connections are made using the backplane wire-wrap pins or FMEC connections. For information about increasing the number of input/output contacts, see the “ONS 15454 ANSI Alarm Expansion Panel” section in the Cisco ONS 15454 Hardware Installation Guide.

LEDs on the front panel of the AIC-I indicate the status of the alarm lines, one LED representing all of the inputs and one LED representing all of the outputs. External alarms (input contacts) are typically used for external sensors such as open doors, temperature sensors, flood sensors, and other environmental conditions. External controls (output contacts) are typically used to drive visual or audible devices such as bells and lights, but they can control other devices such as generators, heaters, and fans.

You can program each of the twelve input alarm contacts separately and each of the sixteen input alarm contacts separately. Choices include:

- Alarm on Closure or Alarm on Open
- Alarm severity of any level (Critical, Major, Minor, Not Alarmed, Not Reported)
- Service Affecting or Non-Service Affecting alarm-service level
- 63-character alarm description for CTC display in the alarm log

You cannot assign the fan-tray abbreviation for the alarm; the abbreviation reflects the generic name of the input contacts. The alarm condition remains raised until the external input stops driving the contact or you provision the alarm input.

The output contacts can be provisioned to close on a trigger or to close manually. The trigger can be a local alarm severity threshold, a remote alarm severity, or a virtual wire:

- Local NE alarm severity: A hierarchy of Not Reported, Not Alarmed, Minor, Major, or Critical alarm severities that you set to cause output closure. For example, if the trigger is set to Minor, a Minor alarm or above is the trigger.
- Remote NE alarm severity: Same as the local NE alarm severity but applies to remote alarms only.
- Virtual wire entities: You can provision any environmental alarm input to raise a signal on any virtual wire on external outputs 1 through 4 when the alarm input is an event. You can provision a signal on any virtual wire as a trigger for an external control output.

You can also program the output alarm contacts (external controls) separately. In addition to provisionable triggers, you can manually force each external output contact to open or close. Manual operation takes precedence over any provisioned triggers that might be present.

For information on how to configure and view the external alarms and external controls, refer the Alarm and TCA Monitoring and Management document.

Orderwire

Orderwire allows a crafts person to plug a phone set into an ONS 15454 and communicate with crafts people working at other ONS 15454s or other facility equipment. The orderwire is a pulse code modulation (PCM) encoded voice channel that uses E1 or E2 bytes in section/line overhead.

The AIC-I allows simultaneous use of both local (section overhead signal) and express (line overhead channel) orderwire channels on a SONET/SDH ring or particular optics facility. Express orderwire also allows communication via regeneration sites when the regenerator is not a Cisco device.

You can provision orderwire functions with CTC similar to the current provisioning model for DCC/GCC channels. In CTC, you provision the orderwire communications network during ring turn-up so that all NEs on the ring can reach one another. Orderwire terminations (that is, the optics facilities that receive and process the orderwire channels) are provisionable. Both express and local orderwire can be configured as on or off on a particular SONET/SDH facility. The ONS 15454 supports up to four orderwire channel terminations per shelf. This allows linear, single ring, dual ring, and small hub-and-spoke configurations. Orderwire is not protected in ring topologies such as bidirectional line switched ring (BLSR), multiplex section-shared protection ring (MS-SPRing), path protection, or subnetwork connection protection (SNCP) ring.



Caution Do not configure orderwire loops. Orderwire loops cause feedback that disables the orderwire channel.

The ONS 15454 implementation of both local and express orderwire is broadcast in nature. The line acts as a party line. Anyone who picks up the orderwire channel can communicate with all other participants on the connected orderwire subnetwork. The local orderwire party line is separate from the express orderwire party line. Up to four OC-N/STM-N facilities for each local and express orderwire are provisionable as orderwire paths.

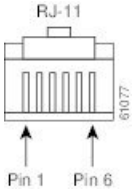
The AIC-I supports selective dual tone multi-frequency (DTMF) dialing for telephony connectivity, which causes one AIC-I card or all ONS 15454 AIC-I cards on the orderwire subnetwork to “ring.” The ringer/buzzer resides on the AIC-I. There is also a “ring” LED that mimics the AIC-I ringer. It flashes when a call is received on the orderwire subnetwork. A party line call is initiated by pressing *0000 on the DTMF pad. Individual dialing is initiated by pressing * and the individual four-digit number on the DTMF pad.

Table 4: Orderwire Pin Assignments

RJ-11 Pin Number	Description
1	Four-wire receive ring
2	Four-wire transmit tip
3	Two-wire ring
4	Two-wire tip
5	Four-wire transmit ring
6	Four-wire receive tip

When provisioning the orderwire subnetwork, make sure that an orderwire loop does not exist. Loops cause oscillation and an unusable orderwire channel.

Figure 4: RJ-11 Connector



User Data Channel

The user data channel (UDC) features a dedicated data channel of 64 kbps (F1 byte) between two nodes in an ONS 15454 network. Each AIC-I card provides two user data channels, UDC-A and UDC-B, through separate RJ-11 connectors on the front of the AIC-I card. Each UDC can be routed to an individual optical interface in the ONS 15454. The UDC ports are standard RJ-11 receptacles.

Table 5: UDC Pin Assignments

RJ-11 Pin Number	Description
1	For future use
2	TXN
3	RXN
4	RXP
5	TXP
6	For future use

Data Communications Channel

The DCC features a dedicated data channel of 576 kbps (D4 to D12 bytes) between two nodes in an ONS 15454 network. Each AIC-I card provides two data communications channels, DCC-A and DCC-B, through separate RJ-45 connectors on the front of the AIC-I card. Each DCC can be routed to an individual optical interface in the ONS 15454.

The DCC ports are synchronous serial interfaces. The DCC ports are standard RJ-45 receptacles.

Table 6: DCC Pin Assignments

RJ-45 Pin Number	Description
1	TCLKP
2	TCLKN
3	TXP
4	TXN
5	RCLKP
6	RCLKN
7	RXP
8	RXN

For more information on AIC-I card, see http://www.cisco.com/en/US/products/hw/optical/ps2006/products_data_sheet09186a00800dd662.html.

Related Procedures for AIC-I Card

- NTP-G15 Installing the Common Control Cards on ONS 15454 Shelf, on page 30
- NTP-G22 Verifying Common Card Installation
- NTP-G60 Creating and Deleting Overhead Circuits
- NTP-G72 Provision External Alarms and Controls on the Alarm Interface Controller-International Card
- NTP-G101 Modifying Alarm Interface Controller-International Settings

MS-ISC-100T Card

(Cisco ONS 15454 only)

Note For hardware specifications, see the "MS-ISC-100T Card Specifications" section in the Hardware Specifications document.

The Multishelf Internal Switch Card (MS-ISC-100T) is an Ethernet switch used to implement the multishelf LAN. It connects the node controller shelf to the network and to subtending shelves. The MS-ISC-100T must always be equipped on the node controller shelf; it cannot be provisioned on a subtending controller shelf.

The recommended configuration is to implement LAN redundancy using two MS-ISC-100T cards: one switch is connected to the Ethernet front panel port of the TCC2/TCC2P card in Slot 7, and the other switch is connected to the Ethernet front panel port of the TCC2/TCC2P card in Slot 11. The Ethernet configuration of the MS-ISC-100T card is part of the software package and is automatically loaded. The MS-ISC-100T card operates in Slots 1 to 6 and 12 to 17 on the node controller shelf; the recommended slots are Slot 6 and Slot 12.

Caution Shielded twisted-pair cabling should be used for inter-building applications.

Table 7: MS-ISC-100T Card Port Assignments

Port	Description
DCN 1and DCN 2	Connection to the network
SSC1 to SSC7	Connection to subtending shelves
NC	Connection to TCC2/TCC2P using a cross-over cable
PRT	Connection to the PRT port of the redundant MS-ISC-100T

MS-ISC-100T Card-Level Indicators

For "MS-ISC-100T Card-Level Indicators", see Card-Level Indicators on the MS-ISC-100T Card.

Related Procedures for MS-ISC-100T Card

- NTP-G15 Installing the Common Control Cards on ONS 15454 Shelf, on page 30
- NTP-G22 Verifying Common Card Installation
- NTP-G144 Provisioning a Multishelf Node
- NTP-G163 Upgrading Nodes in Single-Shelf Mode to Multishelf Mode

Front Mount Electrical Connections

This section describes the MIC-A/P and MIC-C/T/P FMECs, which provide power, external alarm, and timing connections for the ONS 15454 ETSI shelf. The FMECs are needed to support the functions of the DWDM, transponder, and muxponder cards.

MIC-A/P FMEC

Note For hardware specifications, see the "MIC-A/P FMEC Specifications (ETSI only)" section in the Hardware Specifications document.

The MIC-A/P FMEC has the following features:

- Connection for one of the two possible redundant power supply inputs
- Connection for eight alarm outputs (coming from the TCC2/TCC2P card)
- Connection for four configurable alarm inputs/outputs
- Connection for sixteen alarm inputs
- Storage of manufacturing and inventory data

For proper system operation, both the MIC-A/P and MIC-C/T/P FMECs must be installed in the ONS 15454 ETSI shelf.

Table 8: Alarm Interface Pinouts on the MIC-A/P DB-62 Connector

Pin No.	Signal Name	Signal Description
1	ALMCUTOFF N	Alarm cutoff, normally open ACO pair
2	ALMCUTOFF P	Alarm cutoff, normally open ACO pair
3	ALMINP0 N	Alarm input pair 1, reports closure on connected wires
4	ALMINP0 P	Alarm input pair 1, reports closure on connected wires
5	ALMINP1 N	Alarm input pair 2, reports closure on connected wires
6	ALMINP1 P	Alarm input pair 2, reports closure on connected wires
7	ALMINP2 N	Alarm input pair 3, reports closure on connected wires
8	ALMINP2 P	Alarm input pair 3, reports closure on connected wires
9	ALMINP3 N	Alarm input pair 4, reports closure on connected wires
10	ALMINP3 P	Alarm input pair 4, reports closure on connected wires
11	EXALM0 N	External customer alarm 1
12	EXALM0 P	External customer alarm 1
13	GND	Ground
14	EXALM1 N	External customer alarm 2
15	EXALM1 P	External customer alarm 2

Pin No.	Signal Name	Signal Description
16	EXALM2 N	External customer alarm 3
17	EXALM2 P	External customer alarm 3
18	EXALM3 N	External customer alarm 4
19	EXALM3 P	External customer alarm 4
20	EXALM4 N	External customer alarm 5
21	EXALM4 P	External customer alarm 5
22	EXALM5 N	External customer alarm 6
23	EXALM5 P	External customer alarm 6
24	EXALM6 N	External customer alarm 7
25	EXALM6 P	External customer alarm 7
26	GND	Ground
27	EXALM7 N	External customer alarm 8
28	EXALM7 P	External customer alarm 8
29	EXALM8 N	External customer alarm 9
30	EXALM8 P	External customer alarm 9
31	EXALM9 N	External customer alarm 10
32	EXALM9 P	External customer alarm 10
33	EXALM10 N	External customer alarm 11
34	EXALM10 P	External customer alarm 11
35	EXALM11 N	External customer alarm 12
36	EXALM11 P	External customer alarm 12
37	ALMOUP0 N	Normally open output pair 1
38	ALMOUP0 P	Normally open output pair 1
39	GND	Ground
40	ALMOUP1 N	Normally open output pair 2
41	ALMOUP1 P	Normally open output pair 2
42	ALMOUP2 N	Normally open output pair 3
43	ALMOUP2 P	Normally open output pair 3

Pin No.	Signal Name	Signal Description
44	ALMOUP3 N	Normally open output pair 4
45	ALMOUP3 P	Normally open output pair 4
46	AUDALM0 N	Normally open Minor audible alarm
47	AUDALM0 P	Normally open Minor audible alarm
48	AUDALM1 N	Normally open Major audible alarm
49	AUDALM1 P	Normally open Major audible alarm
50	AUDALM2 N	Normally open Critical audible alarm
51	AUDALM2 P	Normally open Critical audible alarm
52	GND	Ground
53	AUDALM3 N	Normally open Remote audible alarm
54	AUDALM3 P	Normally open Remote audible alarm
55	VISALM0 N	Normally open Minor visual alarm
56	VISALM0 P	Normally open Minor visual alarm
57	VISALM1 N	Normally open Major visual alarm
58	VISALM1 P	Normally open Major visual alarm
59	VISALM2 N	Normally open Critical visual alarm
60	VISALM2 P	Normally open Critical visual alarm
61	VISALM3 N	Normally open Remote visual alarm
62	VISALM3 P	Normally open Remote visual alarm

MIC-C/T/P FMEC

Note For hardware specifications, see the "MIC-C/T/P FMEC Specifications (ETSI only)" section in the Hardware Specifications document.

The MIC-C/T/P FMEC has the following features:

- Connection for one of the two possible redundant power supply inputs
- Connection for two serial ports for local craft/modem (for future use)
- Connection for one LAN port

- Connection for two system timing inputs
- Connection for two system timing outputs
- Storage of manufacturing and inventory data

For proper system operation, both the MIC-A/P and MIC-C/T/P FMECs must be installed in the shelf.

The MIC-C/T/P FMEC has one pair of LEDs located on the RJ45 LAN connector. The green LED is on when a link is present, and the amber LED is on when data is being transferred.

Control Card Reset

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

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



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

When you reset the standby control card, the system traffic is not affected. When you reset the active control 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/TNCE/TSC/TSCE card on the ONS-15454-M2 or ONS-15454-M6 shelf or the TNCS/TNCS-O card on the ONS-15454-M6 or NCS 2015 shelf in simplex control mode (when the standby control card is not present), 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.

Control Card Database

When dual control cards are installed in the ONS 15454 DWDM shelf each control card hosts a separate database; therefore, the protect card database is available if the database on the working control 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 maintenance program at approximately weekly intervals, and should also be completed when preparing ONS 15454 DWDM for a pending natural disaster, such as a flood or fire. The configuration details are stored in the database of the control card. The database restore from a TNC and TNCE cards to a TSC and TSCE cards 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.

NTP-G15 Installing the Common Control Cards on ONS 15454 Shelf

Purpose	This procedure describes how to install the control cards needed for the ONS 15454 platform.
Tools/Equipment	Two TCC2/TCC2P/TCC3 cards (required) AIC-I card (optional) MS-ISC-100T (optional; for multishelf node configurations)
Prerequisite Procedures	• • NTP-G7 Install the Power and Ground • NTP-G14 Install DWDM Equipment
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Warning During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself. Statement 94.

Caution Always use the supplied ESD wristband when working with a powered ONS 15454. For detailed instructions on how to wear the ESD wristband, refer to the Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms.

Note If protective clips are installed on the backplane connectors of the cards, remove the clips before installing the cards.

Note If you install a card incorrectly, the FAIL LED flashes continuously.

Procedure

Step 1 Complete the DLP-G33 Installing the TCC2, TCC2P, or TCC3 Card.

Note
If you install the wrong card in a slot, see the NTP-G107 Remove Permanently or Remove and Replace DWDM Cards.

Step 2 Complete the DLP-G34 Installing the AIC-I Card, on page 31, if necessary.

Step 3 Complete the "DLP-G309 Install the MS-ISC-100T Card", if necessary.

Stop. You have completed this procedure.

DLP-G34 Installing the AIC-I Card

Purpose	This task installs the AIC-I card. The AIC-I card provides connections for external alarms and controls (environmental alarms).
Tools/Equipment	AIC-I card
Prerequisite Procedures	DLP-G33 Installing the TCC2, TCC2P, or TCC3 Card
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Procedure

Step 1 Open the latches/ejectors on the card.

Step 2 Use the latches/ejectors to firmly slide the card along the guide rails in Slot 9 until the card plugs into the receptacle at the back of the slot.

Step 3 Verify that the card is inserted correctly and close the latches/ejectors on the card.

Note

It is possible to close the latches/ejectors when the card is not completely plugged into the backplane. Ensure that you cannot insert the card any further.

Note
When installing cards, allow each card to boot completely before installing the next card.

Step 4 Verify the following:

- The red FAIL LED blinks for up to 10 seconds.

  Note
  If the red FAIL LED does not turn on, check the power.

- The PWR A and PWR B LEDs become red, the two INPUT/OUTPUT LEDs become amber, and the ACT LED turns green for approximately 5 seconds.
- The PWR A and PWR B LEDs turn green, the INPUT/OUTPUT LEDs turn off, and the green ACT LED remains on.

  Note
  It might take up to 3 minutes for the PWR A and PWR B LEDs to update.

  Note
  If you insert a card into a slot provisioned for a different card, no LEDs turn on.

  Note
  If the red FAIL LED is on continuously or the LEDs act erratically, the card is not installed properly. Remove the card and repeat Steps 1 to 4.

Step 5 Return to your originating procedure (NTP).

DLP-G309 Installing the MS-ISC-100T Card

Purpose	This task installs redundant MS-ISC-100T cards. The MS-ISC-100T card is required for a multishelf node configuration. It provides LAN redundancy on the node controller shelf. An alternative to using the MS-ISC-100T card is the Cisco Catalyst 2950, although Cisco recommends using the MS-ISC-100T. For more information on the Catalyst 2950 installation, refer to the Catalyst 2950 product documentation.
Tools/Equipment	MS-ISC-100T card (2)
Prerequisite Procedures	DLP-G33 Installing the TCC2, TCC2P, or TCC3 Card
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Note The MS-ISC-100T is not supported in a subtended shelf.

Note When installing cards, allow each card to boot completely before installing the next card.

Procedure

Step 1 Open the latches/ejectors on the card.

Step 2 Use the latches/ejectors to firmly slide the card along the guide rails into the appropriate slot in the node controller shelf until the card plugs into the receptacle at the back of the slot. The card can be installed in any slot from Slot 1 to 6 or 12 to 17. Cisco recommends that you install the MS-ISC-100T cards in Slot 6 and Slot 12.

Step 3 Verify that the card is inserted correctly and close the latches/ejectors on the card.

Note
It is possible to close the latches/ejectors when the card is not completely plugged into the backplane. Ensure that you cannot insert the card any further.

Step 4 Verify the LED activity:

- The red FAIL LED blinks for 35 to 45 seconds.
- The red FAIL LED turns on for 15 to 20 seconds.
- The red FAIL LED blinks for approximately 3 minutes.
- The red FAIL LED turns on for approximately 6 minutes.
- The green ACT or ACT/STBY LED turns on. The SF LED can persist until all card ports connect to their far end counterparts and a signal is present.

Note
If the red FAIL LED does not turn on, check the power.

Note
If you insert a card into a slot provisioned for a different card, all LEDs turn off.

Step 5 Repeat Steps 1 through 4 for the redundant MS-ISC-100T card.

Step 6 Return to your originating procedure (NTP).

NTP-G249 Upgrade the TCC2/TCC2P Card to the TCC3 Card

Purpose	This procedure upgrades the TCC2/TCC2P card to the TCC3 card.
Tools/Equipment	Two TCC3 cards
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Maintenance or higher



Note Downgrade procedures from TCC3 cards to TCC2P/TCC2 cards are not supported. Log into the Technical Support Website at http://www.cisco.com/cisco/web/support/index.html for more information or call Cisco TAC (1 800 553-2447).

Procedure

Step 1 Log into CTC.

Step 2 Verify that the LAN wires on the backplane are installed properly. The TCC3 card does not autodetect miswired LAN connections. If a LAN connection is miswired, a LAN Connection Polarity Reversed condition appears.

Step 3 Verify that the node you are upgrading has 10.x.x installed. The software version is displayed in the upper left corner of the window.

Step 4 Back up the database before beginning the upgrade.

Step 5 Physically replace the standby TCC2/TCC2P card with a TCC3 card.

a) Check the LED on the faceplate. The ACT/STBY LED on the faceplate of the TCC2/TCC2P/TCC3 card indicates whether the card is in active or standby mode. A green ACT/STBY LED indicates an active card and an amber light indicates a standby card.
b) Open the standby TCC2/TCC2P card ejectors.
c) Slide the card out of the slot. This raises the IMPROPRMVL alarm, which clears when the upgrade is complete.
d) Open the ejectors on the TCC3 card to be installed.
e) Slide the TCC3 card into the slot along the guide rails.
f) Close the ejectors.
g) In CTC node view, Ldg (loading) appears on the newly installed TCC3.

Note
It takes approximately 10 minutes for the active TCC2/TCC2P card to copy the system software and database to the newly installed TCC3 card. During this operation, the LEDs on the TCC3 card flash Fail and then the active/standby LED flashes. When the transfer completes, the TCC3 card reboots and goes

into standby mode after approximately three minutes. Do not remove the card from the shelf during a database transfer.

Caution
If your active TCC2/TCC2P card resets during the upgrade before the new TCC3 card is in full standby mode, remove the new TCC3 card immediately.

Step 6 When the newly installed TCC3 card is in standby, right-click active TCC2/TCC2P card in CTC.

Step 7 From the pull-down menu, click **Reset Card**.

Wait for the TCC2/TCC2P card to reboot. The software switches the standby TCC3 card to the active mode. The TCC2/TCC2P card verifies that it has the same database as the TCC3 card and then switches to standby.

Step 8 Verify that the remaining TCC2/TCC2P card is now in standby mode (the ACT/STBY LED changes to amber).

Step 9 Physically replace the remaining TCC2/TCC2P card with the second TCC3 card.

a) Open the TCC2/TCC2P card ejectors.
b) Slide the card out of the slot. This raises the IMPROPRMVL alarm, which clears when the upgrade is complete.
c) Open the ejectors on the TCC3 card.
d) Slide the TCC3 card into the slot along the guide rails.
e) Close the ejectors.

Tip
When a newly installed TCC3 card has a different version of the software installed from the version running on the active TCC3 card, the newly installed TCC3 card automatically copies the software version running on the active TCC3 card. You do not need to do anything in this situation. However, loading the TCC3 card does not boot up in the normal manner. When the card is first inserted, the red FAIL LED stays on for a short period. The FAIL LED then blinks normally and all LEDs go dark. After loading the new software for approximately 10 minutes, the TCC3 card becomes the standby card and the amber LED is illuminated.

Step 10 If power-related alarms occur after the second TCC3 card is installed, check the voltage on the backplane.

Step 11 When both the active and standby TCC3 cards are operational, download the full version of the same release package. For example, if the node is in the R9.8.1.3 release before upgrading to the TCC3 card, download the R9.8.1.3 DWDM pkg (non-DWDM-LITE pkg) after upgrading to the TCC3 card.

Step 12 Upgrade the node to Cisco ONS 15454 DWDM full package. For example, upgrade the node to R9.8.1.3 DWDM pkg.

Stop. You have completed this procedure.

NTP-G313 Installing and Configuring the TNC, TNCE, TSC, TSCE, TNCS, TNCS-O, TNCS-2, and TNCS-2O Card

Purpose	This procedure describes how to install and configure the TNC, TNCE, TSC, TSCE, or TNCS/TNCS-O/TNCS-2/TNCS-2O card.

Tools/Equipment	Redundant TNC/TNCE/TSC/TSCE/TNCS/TNCS-O/TNCS-2/TNCS-2O cards on ONS-15454-M6 shelf (required) Stand-alone TNC/TNCE/TSC/TSCE/TNCS-2/TNCS-2O/TNCS-O card on ONS-15454-M2 shelf (required) Redundant TNCS/TNCS-O/TNCS-2/TNCS-2O cards on the NCS 2015 shelf.
Prerequisite Procedures	Install Power and Ground. See the Hardware Installation Guide.
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	Provisioning or higher

Warning During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself. Statement 94

Caution Always use the supplied ESD wristband when working with a powered ONS 15454 DWDM shelf assemblies. For detailed instructions on how to wear the ESD wristband, refer to the Electrostatic Discharge and Grounding Guide for Cisco CPT and Cisco ONS Platforms.

Note If you install a card incorrectly, the FAIL LED flashes continuously.

Procedure

Step 1 Complete the DLP-G604 Installing the TNC, TNCE, TSC, TSCE, TNCS-2, TNCS-2O, TNCS-O, or TNCS Card, on page 37.

Step 2 Complete theDLP-G788 Configuring Operating Mode for the TNC, TNCE, TNCS, TNCS-O, TNCS-2, and TNCS-2O Cards, on page 43.

Step 3 Complete the DLP-G605 Provisioning PPM and Port for the TNC, TNCE, TNCS-2, TNCS-2O, and TNCS Cards, on page 41.

Step 4 Complete the DLP-G606 Configuring UDC and VoIP for the TNC, TNCE, TNCS-2, TNCS-2O, and TNCS/TNCS-O Cards, on page 42.

Step 5 Complete the DLP-G605 Provisioning PPM and Port for the TNC, TNCE, TNCS-2, TNCS-2O, and TNCS Cards, on page 41.

Note
Step 3, on page 36 and Step 5, on page 36 do not apply to TNCS-O cards.

Stop. You have completed this procedure.

DLP-G604 Installing the TNC, TNCE, TSC, TSCE, TNCS-2, TNCS-2O, TNCS-O, or TNCS Card

This task installs active and standby cards on the Cisco ONS 15454 M6 or Cisco NCS 2015 shelf.

Purpose	(Cisco ONS 15454 M2, Cisco ONS 15454 M6, and Cisco NCS 2015) This task installs two TNC/TNCE/TSC/TSCE/TNCS-2O/TNCS-2 cards on the ONS 15454 M6 shelf, two TNCS/TNCS-O/TNCS-2/TNCS-2O cards on the ONS 15454 M6 or NCS 2015 shelf, and a stand-alone TNC/TNCE/TSC/TSCE/TNCS-2/TNCS-2O card on the ONS 15454 M2 shelf. Install and initialize the TNC/TNCE/TSC/TSCE/TNCS/TNCS-2/TNCS-2O/TNCS-O card before installing any other line cards into the shelf assemblies. On the ONS-15454-M6 shelf, install the TNC/TNCE/TSC/TSCE/TNCS-2/TNCS-2O/TNCS/TNCS-O cards in slots 1 and 8 for redundancy. On the Cisco NCS 2015 shelf, install the TNCS/TNCS-O cards in slots 1 and 17 for redundancy. On the ONS-15454-M2 shelf, install the stand-alone TNC/TNCE/TSC/TSCE/TNCS-2 card in slot 1.
Tools/Equipment	Two TNC/TNCE/TSC/TSCE/TNCS-2/TNCS-2O/TNCS/TNCS-O cards for the ONS-15454-M6 shelf, two TNCS/TNCS-2/TNCS-2O/TNCS-O cards for the Cisco NCS 2015 shelf, and one TNC/TNCE/TSC/TSCE/TNCS-2 card for the ONS-15454-M2 shelf.
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Note The ONS-15454-M2 shelf supports stand-alone control cards such as TNC, TSC, TNCE, TNCS, TNCS-O, TNCS-2, TNCS-2O, or TSCE. During replacement or removal of the control card, ensure that the optical fibers are not disturbed. The fibers must be correctly routed in the retention feature mounted on the front side of the shelf.

Note Node discovery fails when the control card of a ONS-15454-M2 node is replaced with a control card running a later software version because the ONS-15454-M2 node loses it node IP and node name. However, there is no loss of traffic and the provisioning database.

Caution Do not remove the control cards during the software installation process, which is indicated by the alternate flashing of the FAIL and ACT/STBY LEDs. Removing the control cards during the software installation process corrupts the system memory.

Note Allow each control card to boot completely before installing the redundant control card.

Note You cannot insert the control cards in other slots due to mechanical constraints. To identify the card slot, match the symbol placed on the lower side of the card front panel with the symbol on the shelf.

Note The firmware upgrade of the OTDR functionality of the TNCS-O card might take up to 1 hour and 15 minutes, depending on the node configuration. An automatic retry mechanism is available in case of any issue during the upgrade. During the firmware upgrade, the TNCS-O card is fully functional except for the OTDR feature, which is not available until the completion of the firmware upgrade.

From Release 11.0, the firrmware upgrade of the OTDR functionality of the TNCS-2 and TNCS-2O cards might take 30 mins.

Procedure

Step 1 Open the latches or ejectors of the first control card that you will install.

Step 2 Use the latches or ejectors to firmly slide the card horizontally along the guide rails until the card plugs into the receptacle at the back of the slot (slot 1 or 8 in the ONS-15454-M6 shelf, slot 1 or 17 in the NCS 2015 shelf, and slot 1 in the ONS-15454-M2 shelf).

Note
The cards slide vertically in the NCS 2015 shelf.

Step 3 Verify that the card is inserted correctly, and close the latches or ejectors on the card.

If you insert a card into a slot assigned for a different card, all LEDs turn off.

Step 4 If needed, verify the LED activity on the control card.

- The red FAIL LED, PWR LED turn on briefly.
- The red FAIL LED turns on for about 10 seconds.
- The red FAIL LED and the amber ACT/STBY LED turn on for about 30 seconds.
- The red FAIL LED blinks for about 10 seconds.
- The red FAIL LED turns on for about 15 seconds.
- All the LEDs including the CRIT, MAJ, MIN, REM, SYNC, and ACO LEDs blink once and turn off for about 10 seconds.
- ACT/STBY LED blinks for about 1 second.
- All the LEDs including the CRIT, MAJ, MIN, REM, SYNC, and ACO LEDs turn off for about 10 seconds.

- The ACT/STBY, ACO, and PWR LEDs turn on.
- The boot process is complete when the PWR LEDs turn green and the amber ACT/STBY LED remains on. The ACT/STBY LED turns green if this is the first control card installed, but turns amber if this is the second control card installed.

Note
It might take up to four minutes for the power alarms to clear.

Note
Alarm LEDs might be on. After completing the control card installation, log in to CTC and click the Alarms tab to display the alarms raised on the card. For procedure to clear the alarm, see the Troubleshooting Guide.

Note
During the control card initialization, the SFTWDOWN alarm appears twice. The alarm clears after the control card boots completely.

Note
If the FAIL LED is on continuously, see the note in Step 8 about the control card automatic upload.

Figure 5: Installing TNC and TNCE Cards on the ONS-15454-M6 Shelf

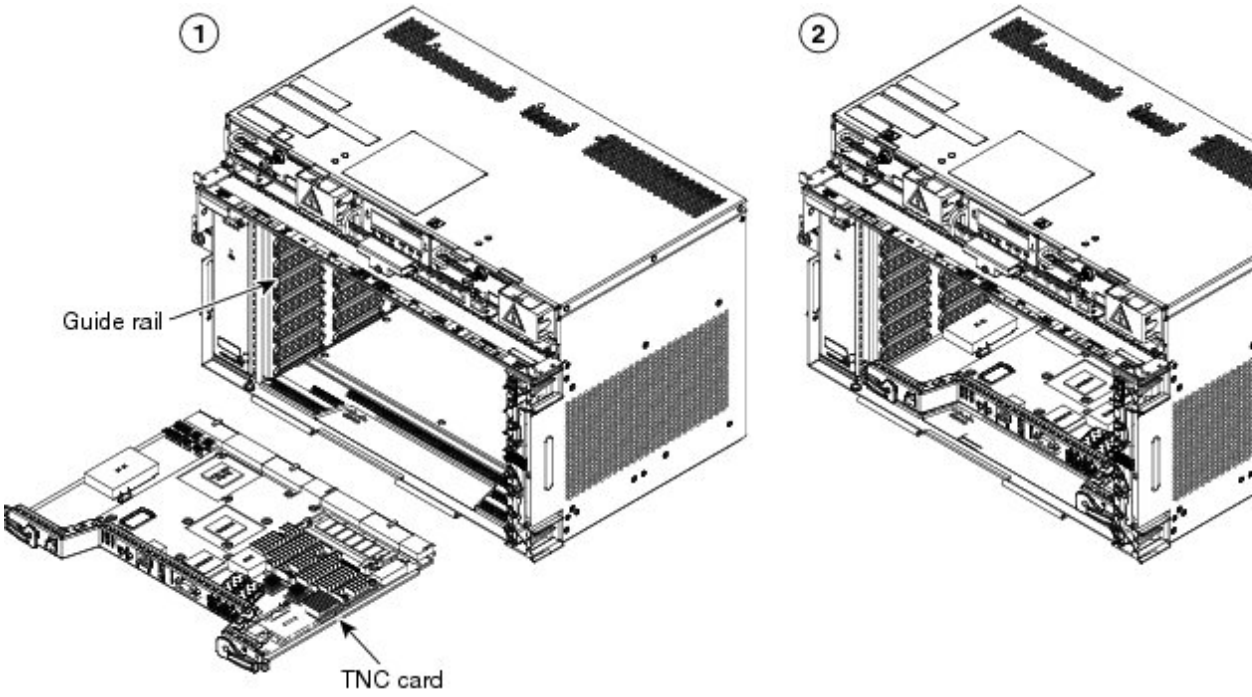
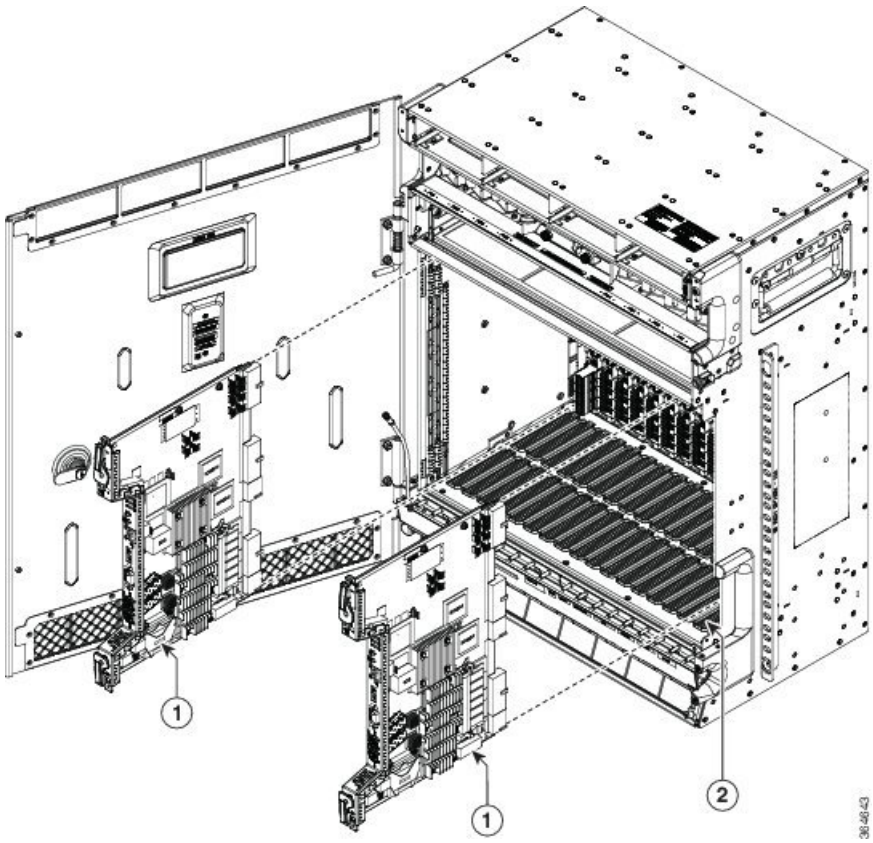


Figure 6: Installing TNCS/TNCS-O Cards on the NCS 2015 Shelf



1	TNCS/TNCS-O Card	2	Guide Rail

Step 5 Verify that the ACT/STBY LED is green if this is the first powered-up control card installed or amber if this is the second powered-up control card. The IP address, temperature of the node, and time of day appear on the LCD. The default time and date is 12:00 AM, January 1, 1970.

Step 6 The LCD cycles through the IP address (the default is 192.1.0.2), node name, and software version. Verify that the correct software version is shown on the LCD. The software text string indicates the node type (SDH or SONET) and software release. (For example: SDH 09.20-05L-20.10 indicates it is an SDH software load, Release 9.2. The numbers following the release number do not have any significance.)

Step 7 If the LCD shows the correct software version, continue with Step 8. If the LCD does not show the correct software version, refer to your next level of technical support, upgrade the software, or remove the control card and install a replacement card. Refer to the release-specific software upgrade document to replace the software.

Step 8 (ONS-15454-M6 or NCS 2015 shelf only) Repeat Steps 1 through 7 for the redundant control card.

Note
If you install a standby control card that has a different software version than the active control card, the standby control card copies the software version from the one in the active control card. When the standby card is first inserted, the LEDs follow the normal boot-up sequence. However, after the red FAIL LED turns on for about 5 seconds, the FAIL LED and the ACT/STBY LED begin to flash alternately for up to 30 minutes. After loading the new software, the upgraded control cards LEDs repeat the appropriate bootup sequence, and the amber ACT/STBY LED turns on.

Step 9 Return to your originating procedure.

DLP-G605 Provisioning PPM and Port for the TNC, TNCE, TNCS-2, TNCS-2O, and TNCS Cards

Purpose	(Cisco ONS 15454 M2, ONS 15454 M6, and Cisco NCS 2015)This task provisions a PPM and port on TNC, TNCE, TNCS, TNCS-2, and TNCS-2O cards. PPMs are created to support the OSC function.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	None

Note If the card in the shelf is configured in TNCO operating mode, PPM and port is automatically provisioned on the card.

Procedure

Step 1 In node view (single-shelf mode) or shelf view (multishelf view), double-click the TNC, TNCE, TNCS, TNCS-2, TNCS-2O, or TNCS-O cards where you want to provision PPM and port settings.

Step 2 Click the **Provisioning** > **Pluggable Port Modules** tabs.

Step 3 In the Pluggable Port Modules area, click Create. The Create PPM dialog box appears.

Step 4 In the Create PPM dialog box, complete the following:

- PPM—Choose 1 or 2 from the PPM drop-down list.
- PPM Type—Displays the PPM associated with the chosen PPM in the above step.

Step 5 Click **OK**. The newly created PPM appears in the Pluggable Port Modules area. The row in the Pluggable Port Modules area becomes white when the PPM is inserted and the Actual Equipment Type column lists the name of PPM.

Step 6 In the Pluggable Ports area, click**Create** . The Create Port dialog box appears.

Step 7 In the Create Ports dialog box, complete the following:

- Port—Choose the port you want to configure from the Port drop-down list.
- Port Type—Choose the port type, such as OC-3, FE, or ONE-GE from the Port Type drop-down list.

Note

When changing the port type from OC-3 or FE, to ONE-GE is traffic affecting.

Note
The OC-3 port type is not supported on the TNCS-2 & TNCS-2O cards.

Note
OC-3 can be configured only on PPM port 1. FE and ONE-GE can be configured on both the ports. If the port type is FE, then disable ALS before provisioning OSC on that port.

Step 8 Click **OK**. The newly created port appears in the Pluggable Ports area. The port type you provisioned is listed in the Rate column.

Step 9 Repeat Steps 3 through 8 to provision another PPM and port on the TNC, TNCE, TNCS-2, TNCS-2O, or TNCS cards.

Step 10 Return to your originating procedure (NTP).

DLP-G606 Configuring UDC and VoIP for the TNC, TNCE, TNCS-2, TNCS-2O, and TNCS/TNCS-O Cards

Purpose	(Cisco ONS 15454 M2, Cisco ONS 15454 M6, and Cisco NCS 2015)This task configures UDC and VoIP traffic for the TNC, TNCE, TNCS-2, TNCS-2O, and TNCS/TNCS-O cards.
Tools/Equipment	None
Prerequisite Procedures	• DLP-G46 Log into CTC • NTP-G38 Provisioning OSC Terminations • DLP-G605 Provisioning PPM and Port for the TNC, TNCE, TNCS-2, TNCS-2O, and TNCS Cards, on page 41
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	None

Note LLDP traffic associated with specific MAC addresses is not passed across UDC.

Note Each TNC, TNCE, TNCS-2, TNCS-2O, and TNCS/TNCS-O card supports UDC/VoIP configuration. You can configure UDC or VoIP on the two SFP ports present on the TNC, TNCE, TNCS-2, TNCS-2O, and TNCS cards. The TNC, TNCE, TNCS-2, TNCS-2O, and TNCS cards support the UDC/VoIP configuration only when OSC is provisioned on the SFP ports.

Note If two nodes are connected through the fiber and if the TNC, TNCE, TNCS-2, TNCS-2O, and TNCS/TNCS-O cards in one node have UDC configuration, the TNC, TNCE, TNCS-2, TNCS-2O, and TNCS/TNCS-O cards in the other node must also have UDC configuration. The same rule applies to VoIP configuration.

Procedure

Step 1 In node view (single-shelf mode) or shelf view (multishelf view), double-click the TNC, TNCE, TNCS, TNCS-2, TNCS-2O, or TNCS-O cards where you want to configure UDC and VoIP.

Step 2 Click the **Provisioning** > **UDC / VOIP** tabs.

Step 3 From the Service Type drop-down list, choose UDC or VOIP.

Note
You can configure UDC or VoIP on only one SFP port at a time per TNC, TNCE, TNCS-2, TNCS-2O, or TNCS card. If you want to configure UDC or VoIP on the second SFP port, choose NONE from the Service Type drop-down list for the first port and then choose UDC or VoIP for the second port.

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G788 Configuring Operating Mode for the TNC, TNCE, TNCS, TNCS-O, TNCS-2, and TNCS-2O Cards

Purpose	(Cisco ONS 15454 DWDM)This task configures the operating mode for the TNC, TNCE, TNCS, and TNCS-O cards.
Tools/Equipment	None
Prerequisite Procedures	• DLP-G46 Log in to CTC
Required/As Needed	As Needed
Onsite/Remote	Onsite or Remote
Security Level	None

The TNC mode supports the TNC, TNC-E and TNCS cards, the TNCS-O mode supports only the TNCS-O card, and no card mode supports the TSC and TSC-E cards.

Procedure

Step 1 In node view (single-shelf mode) or shelf view (multishelf view), double-click the control card where you want to configure the card mode.

Step 2 Click **Provisioning** > **Card** tab.

Step 3 From the Mode drop-down list, choose TNC or TNCO.

Note
The card is configured to TNC mode by default.

Note
If the actual card to be inserted is TNCS-O card, configure the card in TNCO mode.

Step 4 Click **Apply**.

Step 5 Return to your originating procedure (NTP).

DLP-G774 Changing the Frame Type on the OSC

Purpose	This task changes the frame type on the OSC.
Tools/Equipment	None
Prerequisite Procedures	DLP-G46 Log into CTC
Required/As Needed	As needed
Onsite/Remote	Onsite or remote
Security Level	None

Note TNCS-O cards support only FE payload. Hence, OSC payload cannot be changed on TNCS-O cards.

Procedure

Step 1 Delete the OC-3, STM1, FE, or ONE_GE OSC communication channel. See DLP-G186 Delete an OSC Termination.

Step 2 Click **Provisioning** > **WDM-ANS** > **Internal Patchcords**.

Step 3 Choose the internal patchcord that is associated with OSC and click **Delete**.

Step 4 Delete the OSC payload on the TNC/TNCE/TNCS-2/TNCS-2O/TNCS card.

a) In node view (single-shelf mode) or shelf view (multishelf view), double-click the TNC/TNCE/TNCS card where you want to delete the OSC payload.

b) Click the **Provisioning** > **Pluggable Port Modules** tabs.
c) In the Pluggable Ports area, choose the OSC payload that you want to delete and click **Delete**.

Step 5 Provision the OSC payload on the TNC/TNCE/TNCS-2/TNCS-2O/TNCS card. See DLP-G605 Provisioning PPM and Port for the TNC, TNCE, and TNCS Cards.

Note
OC-3/STM1 can be configured only on port 1. FE and ONE-GE can be configured on both the ports.

Step 6 Provision the internal patchcord from the OSC on the TNC/TNCE/TNCS/TNCS-2/TNCS-2O card to the corresponding line card. See Virtual Patchcords.

Step 7 Provision the OSC communication channel. See NTP-G38 Provisioning OSC Terminations.

Step 8 Repeat the above steps for the other node.

Step 9 Return to your originating procedure (NTP).

Accessing and Configuring the Controller Cards Using Link-Local Address

Table 9: Feature History

Feature Name	Release Information	Feature Description
Accessing the Controller Cards using Link-Local Address	Cisco NCS 2000 Release 11.13	You can now use the link-local subnet address to access and configure the controller cards. This approach is helpful when you do not have admin privileges to the laptop through which the controller card is configured. Ensure that the controller card and the laptop are on the same subnet.

This topic describes how to access controller cards in factory mode with link-local subnet IP address (169.254.0.2) when you don't have administrative access to the laptop to configure the controller cards using the default IP address (192.1.0.2).

Procedure

Step 1 Disable the Wi-Fi connection on your laptop.

Step 2 Check and ensure that NCS 2000 is in default factory mode.

Step 3 Connect the laptop ethernet port to either the controller card front port, the ECU EMS port, or the ECU craft port which enables the laptop OS (Windows, Mac, or Linux) to assign the IP address (169.254.0.2) in the link-local subnet.

Note
The initial DHCP discovery phase run by the laptop will fail because the controller card does not support it.

Step 4 Ping the link-local address in the Command Prompt to verify the connectivity between NCS 2000 and the laptop.

Step 5 Use the default username and password values to log into CTC for NCS2000.

Step 6 After logging in, **Change Password** dialog box prompts you to change the password.

Step 7 Change the password for your Username:

a) Enter the old password in the **Old Password** field.
b) Enter the new password in the **New Password** and **Confirmation New Password** fields.
c) Check the **Change password in all other nodes in the background check box**.
d) Select the required Applicable Nodes from the list.
e) Click **OK**.

Step 8 In the node view (single-shelf mode) or multishelf view (multishelf mode), click the **Maintenance** > **Database** tabs.

Step 9 Click **Rebuild DB** and click **Yes** on the dialog box to exit from the factory mode.

Step 10 In the node view (single-shelf mode) or multishelf view (multishelf mode), click the **Provisioning** > **Network** > **General** tabs.

Step 11 Configure the new IP address:

a) Enter the IP address in the **Node Address** field.
b) Enter the subnet mask in the **Net/Subnet Mask Length** field.
c) Enter the gateway address in the **Default Router** field.
d) Click **Apply**.

NCS 2000 reboots to activate the new IP address.

Step 12 Disconnect the ethernet.

Step 13 Connect NCS 2000 to the site LAN using the EMS port.

Step 14 Enable the Wi-Fi connect on your laptop, and verify that the NCS 2000 chassis is correctly managed locally and remotely using the assigned IP address.

Step 15 The remote admin can now start deployment of the node.

NTP-G278 Upgrade an Older Controller Card to a Newer Controller Card

Purpose	This procedure upgrades an older controller card to a newer controller card. See the #unique_56 to upgrade the TNCS Card to TNCS-O Card.
Tools/Equipment	Two TSCE/TNC/TNCE/TNCS/TNCS-O (Two of the new controller cards to be used as active and standby cards.)
Prerequisite Procedures	"DLP-G46 Log into CTC" in the "Connect the PC and Log into the GUI" document.

Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Maintenance or higher

The table below lists the matrix of the controller cards that can be upgraded.

Card	New Card
TSC	TSC-E
	TNC
	TNC-E
	TNCS
	TNCS-O
TSC-E	TNC
	TNC-E
	TNCS
	TNCS-O
TNC	TNC-E
	TNCS
	TNCS-O
TNC-E	TNCS
	TNCS-O
TNCS	TNCS-O

Note Downgrade procedures from a newer controller card to older controller card are not supported. Log into the Technical Support Website at http://www.cisco.com/cisco/web/support/index.html for more information or call Cisco TAC (1 800 553-2447).

Note If the old controller is TNC/TNC-E/TNCS and you want to upgrade to TNCS-O, the old controller cards should be provisioned only with an FE payload on both the PPM ports. If the TNC/TNC-E/TNCS controller card has a different payload provisioned such as OC-3/1GIGE, you must delete the OSC, payload, and the PPM.

This procedure also applies to TSC/TNC/TSC-E/TNC-E upgrades to the TNCS/TNCS-O card for an M6 shelf.

Before you begin

- M2 supports only TSC, TSC-E, TNC, TNC-E, TNCS, TNCS-2, TNCS-2O, and TNCS-O controller cards.
- M6 supports only TSC, TSC-E, TNC, TNC-E, TNCS,TNCS-2, TNCS-2O, and TNCS-O controller cards.
- M15 supports only TNCS, TNCS-2, TNCS-2O, and TNCS-O controller cards.

Procedure

Step 1 Verify that the node you are upgrading has R 10.x.x/ R11.0 installed. The software version is displayed in the upper left corner of the window.

Step 2 Back up the database before beginning the upgrade.

Step 3 Physically replace the standby older controller card with the newer controller card. task

a) Check the LED on the faceplate. The ACT/STBY LED on the faceplate of the controller card indicates whether the card is in active or standby mode. A green ACT/STBY LED indicates an active card and an amber light indicates a standby card.
b) Open the ejectors on the standby old controller card.
c) Slide the card out of the slot. This raises the IMPROPRMVL alarm, which clears when the upgrade is complete.
d) Right-click the slot from which the old controller card was ejected out.
e) Click **Delete Card** to delete the old controller card from CTC.

Note
If the old controller card is not deleted from the CTC shelf view before inserting the new controller card, the MEA (card mismatch) alarm appears on that slot.

f) Open the ejectors on the new controller card to be installed.
g) Slide the new controller card into the slot along the guide rails.
h) Close the ejectors.
i) In CTC node view, Ldg (loading) appears on the newly installed controller card.

Note
It takes approximately 10 minutes for the active old controller card to copy the system software and database to the newly installed controller card. During this operation, the LEDs on the new controller card flash Fail and then the active/standby LED flashes. When the transfer completes, the new controller card reboots and goes into standby mode after approximately three minutes. Do not remove the card from the shelf during a database transfer.

Caution
If your active old controller card resets during the upgrade before the new controller card is in full standby mode, remove the new controller card immediately.

Step 4 When the newly installed controller card is in standby, right-click the active old controller card in CTC.

Step 5 From the pull-down menu, click **Reset Card**.

Wait for the old controller card to reboot. The standby new controller card is switched to active mode. The old controller card verifies that it has the same database as the new controller card and then switches to standby.

Step 6 Verify that the remaining old controller card is now in standby mode (the ACT/STBY LED changes to amber).

Step 7 Physically replace the remaining old controller card with the second new controller card.

a) Open the ejectors on the old controller card.
b) Slide the card out of the slot. This raises the IMPROPRMVL alarm, which clears when the upgrade is complete.
c) Right-click the slot from which the old controller card was ejected out.
d) Click **Delete Card** to delete the old controller card from CTC.

   If the old controller card is not deleted from the CTC shelf view before inserting the TNC card, the MEA (card mismatch) alarm appears on that slot.

e) Open the ejectors on the new controller card.
f) Slide the new controller card into the slot along the guide rails.
g) Close the ejectors.

The second new controller card boots up. The second new controller card must also copy the database. Do not remove the card from the shelf during a database transfer.

Step 8 If power-related alarms occur after the second new controller card is installed, check the voltage on the RJ-45 LAN port. Refer to the troubleshooting guide for information on clearing the alarms.

Stop. You have completed this procedure.

LCD or ECU Hot Plug-In

Purpose	This procedure upgrades or downgrades the LCD or ECU (in case of NCS 2015) inserted into a node.
Tools/Equipment	One LCD (incase of NCS 2006) or ECU (in case of NCS 2015) having a USB device with Release 11.0 and one LCD (incase of NCS 2006) or ECU (in case of NCS 2015) having a USB device with Release prior to 11.0.
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Maintenance or higher

Before you begin

The following procedure is applicable on the ONS 15454 M6 and NCS 2015 chassis. These scenarios apply to the LCD in case of the ONS 15454 M6 and the ECU in case of the NCS 2015.

Note In the case, the user is unaware of the Release version of the LCD or ECU being plugged-in into the chassis, log into the Technical Support Website at http://www.cisco.com/c/en/us/support/index.html for more information or call TAC (1 800 553-2447).

Procedure

	Command or Action	Purpose
Step 1		

Insert an LCD/ECU of Release prior to 11.0 in a Release 11.0 Chassis

Procedure

Step 1 Ensure the LCD/ECU present in the chassis is of Release 11.0.

Step 2 Eject the LCD/ECU operating with Release 11.0 from the chassis.

Step 3 Insert the new LCD/ECU with a Release prior to 11.0. The USBSYNC alarm is raised indicating the USB Sync procedure. Wait for USBSYNC alarm to clear.

Stop. You have completed this procedure.

Insert an LCD/ECU of Release 11.0 in a Release prior to 11.0 Chassis

Caution When an LCD or ECU of release 11.0 onwards is inserted into a chasis with a release prior to 11.0, the downgrade of LCD to release prior to 11.0 will not be successful and the node will reboot. The chassis will not be in a usable condition.

Note

- For NCS 2006 platform, this scenario is applicable only for LCD module.
- For NCS 2015 platform, this scenario is applicable only for ECU module. (as for NCS 2015 platform, the USB is on ECU)

In this case, follow the below steps to make the chassis usable:

Procedure

Step 1 Ensure the LCD or ECU present in the chassis is with release 11.0 onwards and the USB sync is complete.

Wait, if the USB sync is not complete.

Step 2 Download any release prior to release 11.0 into the protect partition on the node and follow the NCS 2000 downgrade process steps.

The LCD or ECU gets formatted with the dosFs1.0 file system after you complete the downgrade process. The LCD or ECU is now ready to be inserted in any chassis running prior to release 11.0.

Note
In case of any help, log into the Technical Support Website at http://www.cisco.com/c/en/us/support/index.html for more information or call TAC (1 800 553-2447).

Upgrade the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O Card to the TNCS-2 or TNCS-2O Card

Purpose	This procedure upgrades the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card to the TNCS-2 or TNCS-2O card.
Tools/Equipment	Two TNCS-2/TNCS-2O cards.

Prerequisite Procedures	"DLP-G46 Log into CTC" in the Connect the PC and Log into the GUI document. "NTP-U488 Back Up the Cisco NCS Software Database" "DLP-U548 Activate the New Cisco NCS Software" "NTP-U489 Upgrade the Cisco ONS 15454 SDH Software" "NTP-U489 Upgrade the Cisco ONS 15454 Software" "NTP-U488 Back Up the Cisco ONS 15454 SDH Software Database" "DLP-U546 Download the ONS 15454 SDH Software" "DLP-U548 Activate the New Cisco ONS 15454 SDH Software" "NTP-U488 Back Up the Cisco ONS 15454 Software Database" "DLP-U546 Download the ONS 15454 Software" "DLP-U548 Activate the New Cisco ONS 15454 Software" Acess the above procedures in the Upgrading the Cisco ONS 15454 SDH MSTP document. Acess the above procedures in the Upgrading the Cisco ONS 15454 MSTP document.
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Maintenance or higher

Caution Please make sure that the LCD/ECU are plugged-in and then proceed. The USB is located in the LCD module in ONS 15454 M6 and ECU module in NCS 2015. Do not pull-out any of the above mentioned devices while performing upgrade procedure. It is not recommended to initiate any card replacement procedure without the LCD/ECU.

Upgrade as needed:

Procedure

Dual Shelf Control - Upgrade the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O Card to the TNCS-2 or TNCS-2O Cards

A dual shelf control scenario is when a Cisco ONS 15454 M6 or Cisco ONS 15454 M15 has two operating Control Cards on the chassis. In this case, both the standby and active cards are upgraded to the TNCS-2 or TNCS-2O cards.

Procedure

Step 1 Verify that the node you are upgrading has R 11.0 installed. The software version is displayed in the upper left corner of the window.

Step 2 Back up the database before beginning the upgrade. https://www.cisco.com/c/en/us/td/docs/optical/15000r10_0/ncs/network_config/guide/b_ncs_network_configuration/b_ncs_network_configuration_chapter_010000.html#ID17_backupdatabase

Step 3 Physically replace the standby TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with the TNCS-2/TNCS-2O card

Note
It takes approximately 10 minutes for the active TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card to copy the system software and database to the TNCS-2 or TNCS-2O card. During this operation, the LEDs on the TNCS-2 or TNCS-2O card flash Fail and then the active/standby LED flashes. When the transfer completes, the new control card reboots and goes into standby mode after approximately three minutes. Do not remove the card from the shelf during a database transfer.

a) Check the LED on the faceplate. The ACT/STBY LED on the faceplate of the control card indicates whether the card is in active or standby mode. A green ACT/STBY LED indicates an active card and an amber light indicates a standby card.
b) Open the ejectors on the standby old control card.
c) Slide the card out of the slot. This raises the IMPROPRMVL alarm, which clears when the upgrade is complete.
d) Right-click the slot from which the old control card was ejected out.
e) Click **Delete Card** to delete the old control card from CTC.

Note
If the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card is not deleted from the CTC shelf view before inserting the TNCS-2/TNCS-2O card, the PROV-MISMATCH/MEA (card mismatch) alarm appears on that slot.

The following table shows the services that must be deleted on the old control card before replacement.

Table 10: Deletion of Services on the Old Control Card

Old Control Card	Services	New Control Card
TNC, TNC-E, TNCS	OC3 payload	TNCS-2
TNCSO	OTDR port provisioning	TNCS-2
TSC and TSC-E	Provisioning	TNCS-2

Old Control Card	Services	New Control Card
TSC, TSCE, TNC, TNC-E, TNCS, TNCSO	All services	TNCS-2O

f) Open the ejectors on the TNCS-2/TNCS-2O card to be installed.
g) Slide the card into the slot along the guide rails.
h) Close the ejectors.
i) In CTC node view, Ldg (loading) appears on the newly installed TNCS-2/TNCS-2O card.

Caution
If your active TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card resets during the upgrade before the TNCS-2/TNCS-2O control card is in full standby mode, remove the TNCS-2 or TNCS-2O card immediately.

Step 4 When the newly installed TNCS-2/TNCS-2O card is in standby, right-click the active TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card in CTC.

Step 5 From the pull-down menu, click **Reset Card**.

Wait for the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card to reboot. The new standby TNCS-2/TNCS-2O card is switched to active mode. The TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card verifies that it has the same database as the TNCS-2 or TNCS-2O card and then switches to standby.

Step 6 Verify that the remaining TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card is now in standby mode (the ACT/STBY LED changes to amber).

Step 7 Physically replace the remaining TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with the second TNCS-2/TNCS-2O card.

a) Open the ejectors on the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card.
b) Slide the card out of the slot. This raises the IMPROPRMVL alarm, which clears when the upgrade is complete.
c) Right-click the slot from which the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card was ejected out.
d) Click **Delete Card** to delete the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card from CTC.

   If the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card is not deleted from the CTC shelf view before inserting the TNCS-2 or TNCS-2O card, the IMPROV-MISMATCH/MEA (card mismatch) alarm appears on that slot. The MEA alarm can be cleared by resetting the configuration to factory defaults.

e) Open the ejectors on the TNCS-2/TNCS-2O card.
f) Slide the TNCS-2/TNCS-2O card into the slot along the guide rails.
g) Close the ejectors.

The TNCS-2/TNCS-2O card boots up. The TNCS-2/TNCS-2O card must also copy the database. Do not remove the card from the shelf during a database transfer.

Step 8 If power-related alarms occur after the second TNCS-2 or TNCS-2O card is installed, refer to the troubleshooting guide for information on clearing the alarms.

Stop. You have completed this procedure.

Dual Shelf Control - Upgrade Control Card to TNCS-2 or TNCS-2O Card

A dual shelf control scenario is when a Cisco ONS 15454 M6 or Cisco ONS 15454 M15 has two operating Control Cards on the chassis. In this case, only the standby control card is upgraded to the TNCS-2 or TNCS-2O card.

Procedure

Step 1 Verify that the node you are upgrading has R 11.0 installed. The software version is displayed in the upper left corner of the window.

Step 2 Back up the database before beginning the upgrade. https://www.cisco.com/c/en/us/td/docs/optical/15000r10_0/ncs/network_config/guide/b_ncs_network_configuration/b_ncs_network_configuration_chapter_010000.html#ID17_backupdatabase

Step 3 Perform steps 3 to 6 from Dual Shelf Control - Upgrade the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O Card to the TNCS-2 or TNCS-2O Cards, on page 53 to upgrade the standby TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with the TNCS-2/TNCS-2O card.

Note
On a dual shelf controller, the TNCS-2 and TNCS-2O cards are only compatible to function with the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O control cards.

Stop. You have completed this procedure.

Single Shelf Control - Upgrade Control Card to TNCS-2 or TNCS-2O Card

A single shelf control scenario is where a control card is inserted in slot 1 or 8 of the ONS 15454 M6 and slot 1 or 17 of the ONS 15454 M15, the other slot is installed with a filler card.

Procedure

Step 1 Verify that the node you are upgrading has R 11.x.x installed. The software version is displayed in the upper left corner of the window.

Step 2 Back up the database before beginning the upgrade. https://www.cisco.com/c/en/us/td/docs/optical/15000r10_0/ncs/network_config/guide/b_ncs_network_configuration/b_ncs_network_configuration_chapter_010000.html#ID17_backupdatabase

Step 3 Physically replace the active TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with the TNCS-2/TNCS-2O card.

a) Check the LED on the faceplate. The ACT/STBY LED on the faceplate of the control card indicates whether the card is in active or standby mode. A green ACT/STBY LED indicates an active card and an amber light indicates a standby card.
b) Open the ejectors on the active TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card.
c) Slide the card out of the slot. This raises the IMPROPRMVL alarm, which clears when the upgrade is complete.
d) Right-click the slot from which the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card was ejected out.

e) Click **Delete Card** to delete the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card from CTC.

Note
If the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card is not deleted from the CTC shelf view before inserting the TNCS-2/TNCS-2O card, the PROV-MISMATCH/MEA (card mismatch) alarm appears on that slot. The complete provisioning database will be lost on clearing the MEA alarm. The backed up database has to be restored after the MEA alarm clears.

Specific services must be deleted on the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O cards before upgrading to TNCS2 and TNCS2O cards. For more information, see Table 10: Deletion of Services on the Old Control Card, on page 53.

Caution
Replacing the Active Control Card on the node is service-affecting.

f) Open the ejectors on the TNCS-2/TNCS-2O card to be installed.
g) Slide the card into the slot along the guide rails.
h) Close the ejectors.
i) In CTC node view, Ldg (loading) appears on the TNCS-2 or TNCS-2O control card.

Step 4 When the installed TNCS-2/TNCS-2O card is in active mode, wait for control card to sync from the USB successfully. This indicates that the chassis is upgraded with Release 11.00 and corresponding database.

Stop. You have completed this procedure.

Single Shelf Control - Upgrade Control Card with Release 11.0

A single shelf control scenario is where a control card is inserted in slot 1 or 8 of the ONS 15454 M6 and slot 1 or 17 of the ONS 15454 M15, the other slot is installed with a filler card. In this case, the active control card of a release prior to Release 11.0 is upgraded with another control card with Release 11.0 and the other slot is installed with a filler card.

Procedure

Step 1 Verify that the node you are upgrading has a Release prior to R 11.0 installed. The software version is displayed in the upper left corner of the window.

Step 2 Back up the database before beginning the downgrade. https://www.cisco.com/c/en/us/td/docs/optical/15000r10_0/ncs/network_config/guide/b_ncs_network_configuration/b_ncs_network_configuration_chapter_010000.html#ID17_backupdatabase

Step 3 Physically remove the active TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version prior to Release 11.0 and replace the card with the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version Release 11.0.

Note
When the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with a software version prior to Release 11.0 is to be replaced with another TNC, TSC, TSC-E, TNC-E, TNCS, TNCS-2, TNCS-2O, or TNCS-O card with a software version Release 11.0, upgrade the existing node with the TNC, TSC, TSC-E, TNC-E, TNCS, TNCS-2, TNCS-2O, or TNCS-O card with a software version Release 11.0.

Note
In ONS 15454 M2 node with one control card, ONS 15454 M6 and ONS 15454 nodes with one control card and filler card, replace the existing simplex control card running prior to R11.0 with another control card running prior to R11.0. If the existing simplex control card running prior to R11.0 is replaced with a R11.0 or higher control card, the node database and traffic becomes affected. This issue does not arise when replacing a standby control card with a spare card.

Note
Replacing the Active Control Card on the node has an impact on traffic.

Step 4 Sync the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version prior to Release 11.0 to USB. The USBSYNC alarm clears.

a) Open the ejectors on the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version prior to Release 11.0.
b) Slide the card out of the slot. This raises the IMPROPRMVL alarm, which clears when the upgrade is complete.
c) Right-click the slot from which the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version prior to Release 11.0 was ejected out.
d) Click **Delete Card** to delete the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version prior to Release 11.0 from CTC.

   If the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version prior to Release 11.0 is not deleted from the CTC shelf view before inserting the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version Release 11.0, the IMPROV-MISMATCH/MEA (card mismatch) alarm appears on that slot.

   Specific services must be deleted on the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O cards before upgrading to TNCS2 and TNCS2O cards. For more information, see Table 10: Deletion of Services on the Old Control Card, on page 53.

e) Open the ejectors on the TNC, TSC, TSC-E, TNC-E, TNCS, TNCS-2, TNCS-2O, or TNCS-O card with software version Release 11.0.
f) Slide the TNC, TSC, TSC-E, TNC-E, TNCS, TNCS-2, TNCS-2O, or TNCS-O card with software version Release 11.0 into the slot along the guide rails.
g) Close the ejectors.

Step 5 The sync of the TNC, TSC, TSC-E, TNC-E, TNCS, TNCS-2, TNCS-2O, or TNCS-O card with software version Release 11.0 to USB begins automatically. The USBSYNC alarm clears.

The node is active with the database that is available in the new control card.

Stop. You have completed this procedure.

Downgrade the TNCS-2 and TNCS-2O Cards to TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O Cards

Purpose	This procedure downgrades a TNCS-2 or TNCS-2O card to the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card.
Tools/Equipment	Two TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O cards.
Prerequisite Procedures	"DLP-G46 Log into CTC" in the "Connect the PC and Log into the GUI" document. "NTP-U491 Restore the Previous Software Load and Database" "NTP-U488 Back Up the Cisco ONS 15454 SDH Software Database" "NTP-U488 Back Up the Cisco ONS 15454 Software Database" Acess the above procedures in the Upgrading the Cisco ONS 15454 SDH MSTP document. Acess the above procedures in the Upgrading the Cisco ONS 15454 MSTP document.
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	Maintenance or higher

Caution Please make sure the LCD/ECU are all plugged-in and then proceed. The USB is located in the LCD module in ONS 15454 M6 and ECU module in NCS 2015. Do not pull-out any of the mentioned devices while performing revert procedure. If the USB is inserted after the revert procedure, then it needs to be formatted manually. It is not recommended to initiate any card replacement procedure without the LCD/ECU.

Downgrade as needed:

Procedure

Dual Shelf Control - Downgrade Control Cards to TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O Card

Procedure

Step 1 Verify that the node you are downgrading has Release 11.0 installed. The software version is displayed in the upper left corner of the window.

Step 2 Back up the database before beginning the downgrade. https://www.cisco.com/c/en/us/td/docs/optical/15000r10_0/ncs/network_config/guide/b_ncs_network_configuration/b_ncs_network_configuration_chapter_010000.html#ID17_backupdatabase

Step 3 Physically replace the standby TNCS-2/TNCS-2O control card with the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with Release prior to 11.0.

Note
It takes approximately 10 minutes for the active TNCS-2/TNCS-2O card to copy the system software and database to the newly installed controller card. During this operation, the LEDs on the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card flash Fail and then the active/standby LED flashes. When the transfer completes, the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card reboots and goes into standby mode after approximately three minutes. Do not remove the card from the shelf during a database transfer.

a) Check the LED on the faceplate. The ACT/STBY LED on the faceplate of the controller card indicates whether the card is in active or standby mode. A green ACT/STBY LED indicates an active card and an amber light indicates a standby card.
b) Open the ejectors on the standby old control card.
c) Slide the card out of the slot. This raises the IMPROPRMVL alarm, which clears when the upgrade is complete.
d) Right-click the slot from which the old control card was ejected out.
e) Click **Delete Card** to delete the old control card from CTC.

Note
If the TNCS-2/TNCS-2O card is not deleted from the CTC shelf view before inserting the TNC-E/TNCS/TNCS-O card, the PROV-MISMATCH/MEA (card mismatch) alarm appears on that slot.

Specific Services must be deleted on the TNC, TSC, TSC-E, TNC-E, TNCS or TNCS-O cards before upgrading to TNCS2 and TNCS2O cards.

Table 11: Deletion of Services on the New Control Card

New Control Card	Services	Old Control Card
TNCS-2	OC3 payload	TNC, TNC-E, TNCS
TNCS-2	OTDR port provisioning	TNCSO
TNCS-2	Provisioning	TSC and TSC-E
TNCS-2O	All services	TNC, TSC, TSCE, TNC, TNC-E, TNCS, TNCSO

f) Open the ejectors on the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card to be installed.
g) Slide the card into the slot along the guide rails.
h) Close the ejectors.
i) In CTC node view, Ldg (loading) appears on the newly installed controller card.

Caution
If your active TNCS-2/TNCS-2O card resets during the upgrade before the new controller card is in full standby mode, remove the new controller card immediately.

Step 4 When the newly installed TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card is in standby, right-click the active TNCS-2/TNCS-2O card in CTC.

Step 5 From the pull-down menu, click **Reset Card**.

Wait for the TNCS-2/TNCS-2O card to reboot. The new standby TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card is switched to active mode. The old TNCS-2/TNCS-2O card verifies that it has the same database as the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card and then switches to standby.

Step 6 Verify that the remaining TNCS-2/TNCS-2O card is now in standby mode (the ACT/STBY LED changes to amber).

Step 7 Physically replace the remaining TNCS-2/TNCS-2O card with the second TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card.

a) Open the ejectors on the TNCS-2/TNCS-2O card.
b) Slide the card out of the slot. This raises the IMPROPRMVL alarm, which clears when the upgrade is complete.
c) Right-click the slot from which the TNCS-2/TNCS-2O card was ejected out.
d) Click **Delete Card** to delete the TNCS-2/TNCS-2O card from CTC.

   If the TNCS-2/TNCS-2O card is not deleted from the CTC shelf view before inserting the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card, the IMPROV-MISMATCH/MEA (card mismatch) alarm appears on that slot. The MEA alarm can be cleared by resetting the configuration to factory defaults.

e) Open the ejectors on the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card.
f) Slide the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card into the slot along the guide rails.
g) Close the ejectors.

The second TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card boots up. The TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card must also copy the database. Do not remove the card from the shelf during a database transfer.

Step 8 If power-related alarms occur after the second TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card is installed, refer to the troubleshooting guide for information on clearing the alarms.

Stop. You have completed this procedure.

Dual Shelf Control - Downgrade A Single TNCS-2 or TNCS-2O Card to the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O Card

A dual shelf control scenario is when a Cisco ONS 15454 M6 or Cisco ONS 15454 M15 has two operating Control Cards on the chassis. In this case, only the standby control card is downgraded from the TNCS-2 or TNCS-2O card to the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card.

Procedure

Step 1 Verify that the node you are downgrading has Release 11.0 installed. The software version is displayed in the upper left corner of the window.

Step 2 Back up the database before beginning the downgrade. https://www.cisco.com/c/en/us/td/docs/optical/15000r10_0/ncs/network_config/guide/b_ncs_network_configuration/b_ncs_network_configuration_chapter_010000.html#ID17_backupdatabase

Step 3 Perform step 3 from Dual Shelf Control - Downgrade Control Cards to TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O Card, on page 59 to downgrade the standby TNCS-2/TNCS-2O card to the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card.

Note
On a dual shelf controller, the TNCS-2 and TNCS-2O cards are only compatible to function with the TNC-E, TNCS, and TNCS-O control cards.

Specific services must be deleted on the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O cards before upgrading to TNCS2 and TNCS2O cards. For more information, see Table 10: Deletion of Services on the Old Control Card, on page 53.

Single Shelf Control - Downgrade Control Card with Software prior to Release 11.0



Caution When a control card with Software Release 11.0 is replaced by another control card with a Software Release prior to 11.0, the downgrade will not happen successfully. The node will not be in a usable condition. Hence, this is not recommended.

Before you begin

- These steps are common for ONS 15454 M2, ONS 15454 M6, and ONS 15454 M15 chassis in slots 1 or 8 in ONS 15454 M6 and slots 1 or 17 in ONS 15454 M15.

Procedure

Step 1 Verify that the node you are downgrading has a Release 11.0 installed. The software version is displayed in the upper left corner of the window.

Step 2 Back up the database before beginning the downgrade. https://www.cisco.com/c/en/us/td/docs/optical/15000r10_0/ncs/network_config/guide/b_ncs_network_configuration/b_ncs_network_configuration_chapter_010000.html#ID17_backupdatabase

Step 3 Revert to Release prior to 11.0.

Note
Revert to a Release prior to 11.0 is not possible on the TNCS-2/TNCS-2O cards as they do not support releases prior to Release 11.0. Hence, install a TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card in the node with Release 11.0 and then revert to Release prior to 11.0

Step 4 The sync of the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version prior to Release 11.0 to USB begins automatically. The USBSYNC alarm is raised after reverting the software from Release 11.0 to a Release prior to 11.0.

Step 5 Physically remove the active TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software Release 11.0. and replace the card with the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with a software release prior to Release 11.0.

Note
When the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with a software version of Release 11.0 is to be replaced with another TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with a software version prior to Release 11.0, revert the existing node with the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card of a software version prior to Release 11.0.

In ONS 15454 M2 node with one control card, ONS 15454 M6 and ONS 15454 nodes with one control card and filler card, replace the existing simplex control card running R11.0 with another control card running R11.0. If the existing simplex control card running R11.0 is replaced with another control card running prior to R11.0, the node database and traffic becomes affected. This issue does not arise when replacing a standby control card with a spare card.

Replacing the Active Control Card on the node is service-affecting.

a) Open the ejectors on the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version Release 11.0.
b) Slide the card out of the slot. This raises the IMPROPRMVL alarm, which clears when the upgrade is complete.
c) Right-click the slot from which the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version Release 11.0 was ejected out.
d) Click **Delete Card** to delete the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version Release 11.0 from CTC.

   If the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version Release 11.0 is not deleted from the CTC shelf view before inserting the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version prior to Release 11.0, the IMPROV-MISMATCH/MEA (card mismatch) alarm appears on that slot.

Specific services must be deleted on the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O cards before upgrading to TNCS2 and TNCS2O cards. For more information, see Table 10: Deletion of Services on the Old Control Card, on page 53.

e) Open the ejectors on the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version prior to Release 11.0.
f) Slide the TNC, TSC, TSC-E, TNC-E, TNCS, or TNCS-O card with software version prior to Release 11.0 into the slot along the guide rails.
g) Close the ejectors.

Step 6 The sync of the TNC, TSC, TSC-E, TNC-E, TNCS or TNCS-O card with software version prior to Release 11.0 to USB begins automatically. Wait for the USBSYNC alarm to clear that is raised after replacing the card in step-5. The USBSYNC alarm clears.

The node is active with the database that is available in the new control card.

Stop. You have completed this procedure.