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FLASHWAVE® 7500

Metro/Regional Multiservice ROADM

Release 9.1
Issue 2, October 2013

Compatible with:

NETSMART® 1500 Version 8
NETSMART® 500 Version 5.2
NETSMART® 2000 Version 6

FNC-7500-0091-270A

System Turn-Up

Core Configuration

Compliance

FCC

This equipment has been tested and found to comply with the limits for Class A digital devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interferences when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio energy and if not installed in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, which the user will be required to correct at his/her expense.

Industry Canada

This digital apparatus does not exceed the Class A limits for noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications to ICES-003.

Cet appareil numérique ne dépasse pas les limites d'émission de bruit pour les appareils numériques de Classe A tel que définit dans le document NMB-003 publié par le Département Canadien de Communications.

Important

Observe all warnings in the text or on equipment labels regarding high-voltage or high-temperature conditions. The following warnings and figures apply to most Fujitsu products.

Plug-In Unit Cautions

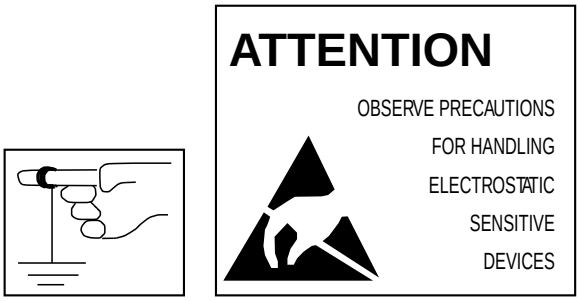
Observe the following precautions when handling plug-in units:

- Hold the plug-in unit only by its edges.
- Slowly and firmly push a plug-in unit into its slot to avoid damaging the unit. Do not force the unit. A slow insertion method minimizes power surges during installation. The longer ground connector pins ensure the ground circuit is connected first.

ESD Cautions

Units are stamped with anti-electrostatic markings (shown at right). Observe the following precautions to avoid damage from ESD:

- Always transport and store the unit in an ESD approved shipping bag.
- Always wear an ESD wrist strap, with a minimum 1-megohm resistance, that is connected to safety ground. Do not use a damaged wrist strap.

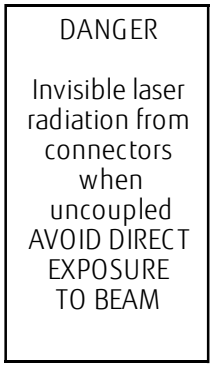


Anti-Electrostatic Markings

Fiber Warnings

Danger: Invisible laser radiation. Avoid direct exposure to the beam. Never look into the end of a fiber, fiber cord, or fiber pigtail. Permanent eye damage or blindness can occur quickly when laser radiation is present. The label on the right is attached to laser-emitting and receiving units as a reminder. Use of controls, adjustments, or procedures other than those specified may result in hazardous laser radiation exposure.

Danger: Never handle exposed fiber with your bare hands or touch it to your body. Fiber fragments can enter the skin and are difficult to detect and remove.



Laser Radiation Label

Avertissements de Fibre

La Danger: Le rayonnement laser Invisible. Eviter l'exposition directe au rayon. Jamais le regard dans la fin d'une fibre, une corde de fibre, ou la natte de fibre. Les dommages permanent d'oeil ou la cécité peut arriver rapidement quand le rayonnement laser est actuel.

La Prudence: L'Usage de contrôles ou d'ajustements ou l'exécution ou les procédures autrement que ces spécifié en ceci ont pour résultat l'exposition de rayonnement hasardeuse.

La Danger: Jamais la poignée a exposé la fibre avec vos mains nues ou le touche à votre corps. Les fragments de fibre peut entrer la peau et sont difficiles de détecter et enlever.

Installation Restrictions

The following guidelines apply when installing this equipment:

- Systems shall be installed only in restricted access areas (for example, dedicated equipment rooms or equipment closets) in accordance with the National Electrical Code, ANSI/NFPA 70.
- Equipment suitable for mounting over non-combustible surface ONLY.
- ***Caution:*** To de-energize the equipment, all input power circuits (-48Vdc battery) must be removed prior to maintenance/servicing or upgrading.
- Care should be taken not to compromise the stability of the rack by the installation of this equipment
- This equipment has a maximum operating ambient of 50 Deg C. The ambient temperature where the equipment is installed shall not exceed 50 Deg C.
- A minimum air clearance of 1.75" (1U) below the equipment must be maintained after the installation into the rack. the equipment can be installed at the very top location if desired.
- Care should be taken not to overload the supply circuit
- For the input power harness; Use only UL-Listed, dual closed loop, connectors.
- Suggested Vendor: Thomas and Betts - P/N:54205.
- Use Crimp Tool: Thomas and Betts P/N TBM25S for 6-AWG copper conductors.

Reliable earthing of the equipment must be maintained when installed in the rack. Use only UL-Listed, dual closed loop, connectors. Suggested Vendor and Part Number:

- Thomas and Betts - P/N: 256-30695-1070
- Use Crimp Tool: Thomas and Betts P/N TBM25S for 6-AWG copper connectors.

For the output distribution harness; Use only UL-Listed dual closed loop connectors. Suggested Vendor and Part Number:

- Thomas and Betts - P/N:256-30695-1298PH
- Use Crimp Tool: Thomas and Betts P/N TBM25S for 10-AWG copper connectors.

Restrictions d'Installation

Les indications suivantes s'appliquent en installant cet équipement:

- Les systémes seront seulement installés dans les secteurs d'accËs limités (par exemple, les piËces d'équipement dédié ou les placards d'Équipement) conformément au Code Electrique National, ANSI/NFPA 70.
- L'équipement convenable pour monter par-dessus la surface incombustible seulement
- ***La prudence:*** A de-stimule l'équipement, toute pile de (-48Vdc de circuits de pouvoir d'entrée) doit être enlevé avant entretien/entretenir ou avant améliorer.
- Le soin devrait être pris pour ne pas compromettre la stabilité de l'étagère par l'installation de cet équipement.
- Cet équipement a un maximum fonctionnant ambiant de 50 Deg C. La température ambiante où l'équipement est n'installé dépassera pas 50 Deg C.
- Un dégagement minimum d'air de 1.75" (1U) au dessous de l'équipement doit être maintenu après l'installation dans l'étagère. l'équipement peut être installé tout en haut l'emplacement si désiré.
- Le soin devrait être pris pour ne pas surcharger le circuit de provision
- Pour l'harnais d'entrée de pouvoir; seulement UL-LISTED les connecteurs de boucle fermés doubles seront utilisés.
- Le Vendeur suggéré: Thomas et Betts - P/N:54205.
- L'outil: Thomas et Betts - P/N:TBM25S pour les conducteurs de cuivre 6-AWG.

Earthing fiable de l'équipement doit être maintenu quand installé dans l'étagère. Utiliser la boucle fermée, double et seulement UL-ENUMERE, les connecteurs. Le Vendeur suggérés et Nombre de Partie:

- Thomas et Betts - P/N:256-30695-1070
- et utilise l'outil: Thomas et Betts - numéro de partie TBM25S pour 6-AWG connecteurs de cuivre.

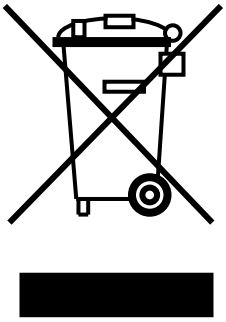
Pour l'harnais de distribution de production; seulement UL-LISTED les connecteurs de boucle fermés doubles seront utilisés. Le Vendeur et numéro de partie suggérés:

- Thomas et Betts - P/N: 256-30695-1298PH
- L'outil: Thomas et Betts P/N: TBM25S pour 10-AWG connecteurs de cuivre

Flammable Liquids Warning

Danger: Do not use flammable liquids or sprays, such as those used for cleaning optical connectors, around telecommunications equipment. Electrical fan motors and other potential ignition sources within the equipment might ignite the flammable material and cause personal injury or damage to the equipment. If uncertain about whether a liquid or spray is flammable, contact the manufacturer

Proper Disposal Procedures for Information Technology Equipment within the EU



All electrical and electronic equipment or units must be disposed of in accordance with European Directive 2001/96/EC for Waste Electrical and Electronic Equipment (WEEE).

Network communications or commercial equipment customers can dispose of Fujitsu equipment by contacting the Fujitsu regional office in their country. Customers can locate regional offices at http://www.fujitsu.com/global/.

Fujitsu will ensure the proper recycling, reuse, and other forms of recovery of WEEE. Potential hazardous substances in WEEE can harm the environment. You can contribute to the elimination of these effects through your cooperation.

Additional WEEE disposal information may be found at: http://www.fujitsu.com/global/about/environment/apporach/policy/

Document Change Notice

This notice lists the reasons for, location of, and a description of document changes. When the changes are extensive, a general statement giving the nature of the revisions is provided.

Reason for Document Change:	Not updated for Release 9.1, Issue 2

Location of Change	**Description of Change**

Contents

1

Introduction to System Turn-Up Core Configuration

This practice contains turn-up and acceptance testing procedures for the FLASHWAVE® 7500 Core Configuration system.

This practice contains the following chapters:

- Introduction to System Turn-Up Core Configuration–Provides an overview to the practice and configuration guidelines for the core configuration
- System Turn-Up–Describes how to turn up a network of FLASHWAVE 7500 nodes without service
- Acceptance Testing–Describes how to verify correct operation of the network after turn-up
- ILA Node Turn-Up–Describes how to turn up an ILA node
- Nodal Test Tool–Describes how to use the Nodal Test Tool for fiber testing
- Data Record Forms–Provides data record forms

This practice does not cover:

- Shelf installation
- Service addition after turn-up

  Note: *For FLASHWAVE 7500 shelf installation, refer to* Core Configuration*. To add service to a working system, refer to* Service Addition*.*

The flowchart in the following figure shows the turn-up procedure. The procedure assumes that the FLASHWAVE 7500 Core Configuration shelves have been installed at each site (refer to Core Configuration) and that fiber has been installed between the sites.

After each node in the ring is turned up (refer to System Turn-Up), correct operation of the ring is verified by acceptance testing (refer to Acceptance Testing). The system is then turned up and ready for services to be added (refer to Service Addition).

Note: *Procedures for ILA node turn-up are provided in* About System Turn-up Core Configuration ILA Node .

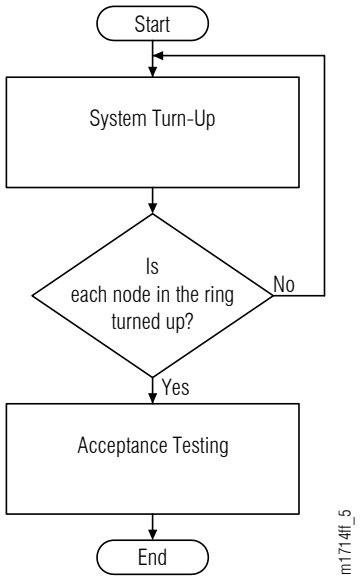


Figure 1: Turning Up FLASHWAVE 7500 Core Configuration System (Overall Flowchart)

2
System Turn-Up

In this chapter:

2.1 About System Turn-up Core Configuration

This chapter describes how to turn up a FLASHWAVE® 7500 Core Configuration network without service. After completing this process, you should perform acceptance testing (Acceptance Testing).

System Turn-Up Flowchart provides a flowchart of the turn-up process described in this chapter. Slot Labels and AIDs and Slot Labels and AIDs describe the shelves and plug-in units, including slot labels and AIDs.

The FLASHWAVE 7500 NE can be configured in several ways. Example equipment configurations are described in Example Equipment Configurations. The work order should specify the configuration of shelves at each node and the configuration of plug-in units within each shelf.

System Turn-Up Flowchart

The flowchart shown in the following figure illustrates the sequence to turn up nodes without service. After all nodes are turned up, verifying that the network-level fiber connections are correct is important.

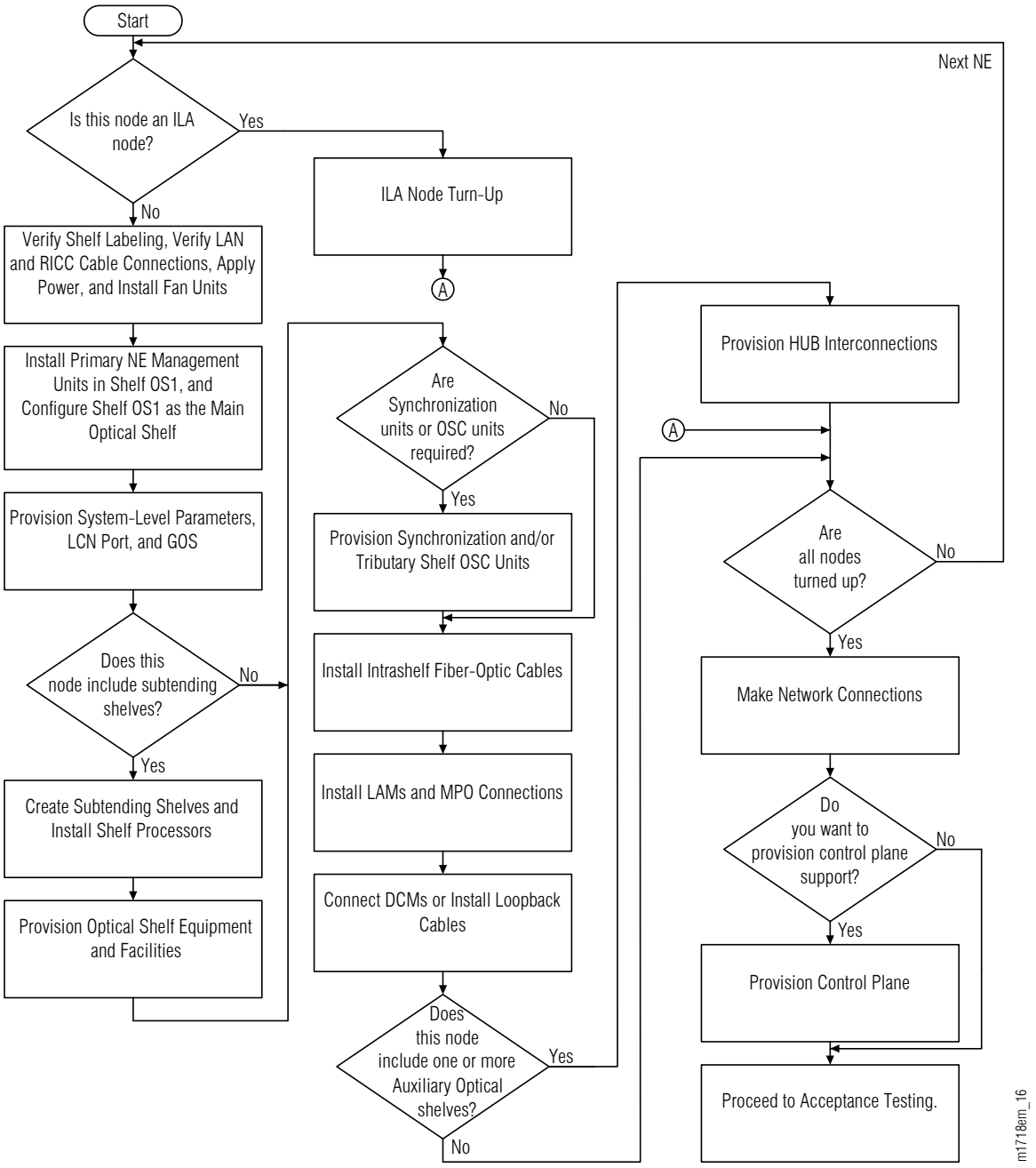


Figure 2: System Turn-Up (Procedure Flowchart)

Prerequisites

Before proceeding with node turn-up procedures, perform or verify the following:

- Obtain the work order, or equivalent, specifying:
  - The shelves and plug-in units required for the turn-up.
  - Network design requirements, including, but not limited to, expected span loss, attenuation requirements and DCM requirements.
  - Housekeeping alarm provisioning and cabling requirements. OSS considerations, including, but not limited to, data networking, IP addresses, default gateway, OSPF, SNMP, and control plane requirements.

  Note: *The form of the work order depends on local practice.*

- Become familiar with the node requirements, including the following:
  - The equipment configuration needed at the site: whether or not the node is a HUB node (includes the Auxiliary Optical shelves) and the number and arrangement of Tributary shelves (if any) within the shelf hierarchy (Figure 22). Refer to Example Equipment Configurations.
  - Which shelves, if any, require Synchronization plug-in units.

    Note: *Synchronization units support timing and synchronization for Flexponder™ optical line cards. They are generally required in every shelf that include a Flexponder unit. However, the Synchronization unit is optional for shelves that include only single-unit applications of the IFMA-BXC1 Flexponder. If all STS cross-connects are within individual IFMA-BXC1 units (never between units) , the Synchronization unit can be omitted from the shelf and timing accuracy will be ±20 ppm for the IFMA-BXC1 units.*

- Acquire all plug-in units and cables required for the turn-up.
- Verify that the FLASHWAVE 7500 shelves are installed and that the acceptance procedures listed in Introduction to Equipment Installation, have been completed.
- Ensure that fiber has been placed between the sites.
- Review the node turn-up procedure shown in the preceding figure.
- Familiarize yourself with the provisioning hierarchy for the FLASHWAVE 7500 Core Configuration system (Turn-Up Provisioning Hierarchy FLASHWAVE 7500–Core Configuration).
- Familiarize yourself with the FLASHWAVE 7500 system as described in Introduction to the FLASHWAVE 7500 All-Optical Transport Platform.
- Familiarize yourself with the NETSMART® 500 Element Manager for provisioning the FLASHWAVE 7500 system. Refer to *FNC-0500-0311-010, NETSMART 500 User Guide*.
- Ensure that a terminal emulator (such as a HyperTerminal® emulator) is available, and familiarize yourself with its operation.

- Familiarize yourself with the FLASHWAVE 7500 access identifiers (AIDs) described in Access Identifiers.
- Ensure that the craft interface device is connected, activated, and set up in the required interface modes as described in Craft Interface Operations .
- Refer to Introduction to Maintenance and Trouble Clearing, for general procedures and information on replacing plug-in units and handling optical units and optical fibers.
- Refer to Introduction to TL1 Commands for additional command and parameter information and typical response messages.
- Perform initial turn-up procedures locally through the craft interface (connectors TERM1 or TERM2) provided on the front of the Main Optical shelf (OS1).

Danger: *Never look into the end of a fiber-optic cable. Permanent eye damage or blindness can occur very quickly if the laser light is present. Follow local safety precautions regarding fiber.*

Danger: *Never handle exposed fiber with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove. Follow local safety precautions regarding fiber.*

Warning: *When handling FLASHWAVE 7500 plug-in units, wear an ESD wrist strap with a minimum resistance of 1000 kilohms to prevent possible damage to the units. Before using the strap, check it for opens, shorts, and minimum resistance value. If the strap does not pass these checks, do not use it.*

Caution: *Verify that you have received a completed (COMPLD) response to each command before going to the next step. If you are unable to complete a command after several tries, call Fujitsu Network Communications Inc. (FNC) at 1-800-USE-FTAC for technical assistance.*

Caution: *Before installing fiber-optic cables, always verify that the fiber connectors are free of contamination by visually inspecting with a fiber scope and cleaning the connectors at both ends of the fiber, if necessary. Refer to* Fiber Cable Handling.

Note: *Until it is fully provisioned, the FLASHWAVE 7500 generates false alarms. These alarms clear as the system is provisioned. Any remaining alarms are cleared (other than LOS, if applicable) at the end of the turn-up procedure.*

Example Equipment Configurations

The FLASHWAVE 7500 NE can be configured in several ways. The equipment required at each NE (shelves and plug-in units) depends on the role that the NE serves in the network. This subsection provides a few examples of the equipment required for some representative configurations.

For more information on network applications, refer to Applications.

Terminal Node

At a terminal node, only one degree (WDM facility) of the NE is provisioned. The following figure shows the equipment required to support adds and drops to WDM facility OS1-1-PE1. The node includes the Main Optical shelf OS1 and up to 10 Tributary shelves.

Note: *The following figure applies to the WSS Core Configuration. The 2D-ROADM Configuration is identical, except that the 2D-ROADM unit (SFMA-RDC1) is used in place of SFMA-CMC1 and filler panels are used in place of MDMA-RMC1.*

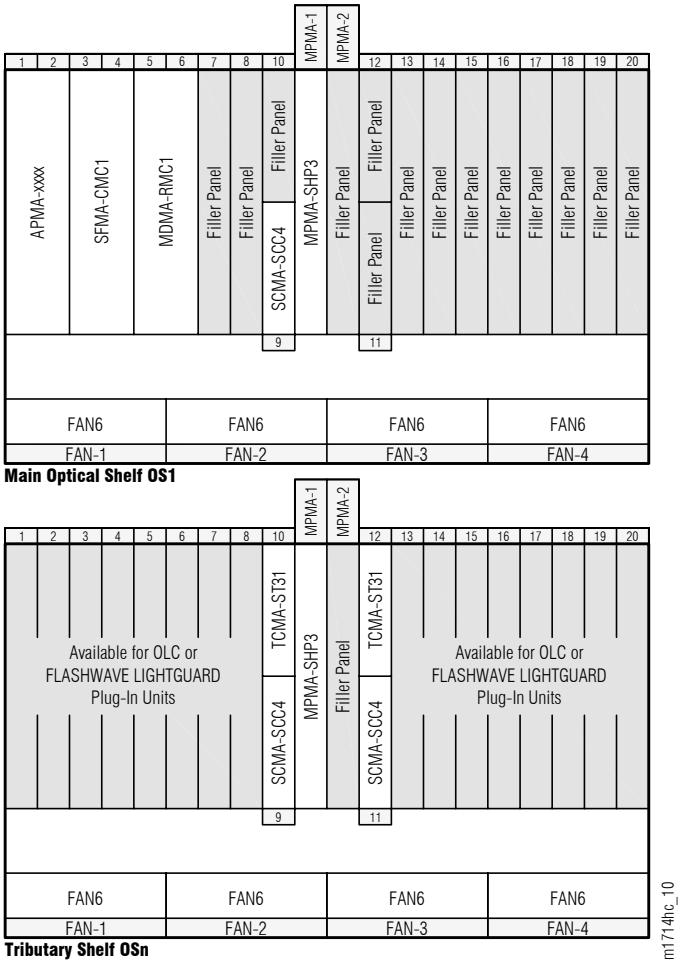


Figure 3: Equipment for Terminal Node Supporting OS1-1-PE1 (WDM) Adds and Drops

The following figure shows the equipment required in a terminal node to support adds and drops to WDM facility OS1-19-PE1. The node includes the Main Optical shelf OS1 and up to 10 Tributary shelves.

Note: *The following figure applies to the WSS Core Configuration. The 2D-ROADM Configuration is identical, except that the 2D-ROADM unit (SFMA-RDC1) is used in place of SFMA-CMC1 and filler panels are used in place of MDMA-RMC1.*

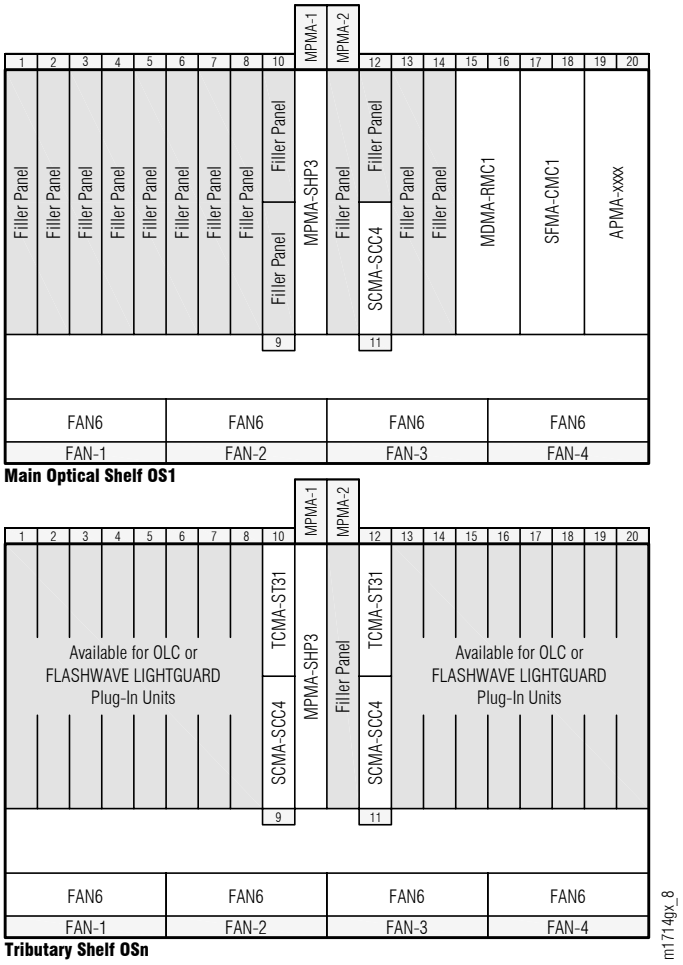


Figure 4: Equipment for Terminal Node Supporting OS1-19-PE1 (WDM) Adds and Drops

Add/Drop Node

At nodes in ring networks, two degrees (WDM facilities) of the NE are provisioned. Likewise, at intermediate nodes (not a terminal node) in linear networks, two degrees of the NE are provisioned. The following figure shows the equipment required to support adds and drops to both WDM facilities: OS1-1-PE1 and OS1-19-PE1. The node includes the Main Optical shelf OS1 and up to 10 Tributary shelves.

Note: *The following figure applies to the WSS Core Configuration. The 2D-ROADM Configuration is identical, except that 2D-ROADM units (SFMA-RDC1) are used in place of the SFMA-CMC1 units and filler panels are used in place of the MDMA-RMC1 units.*

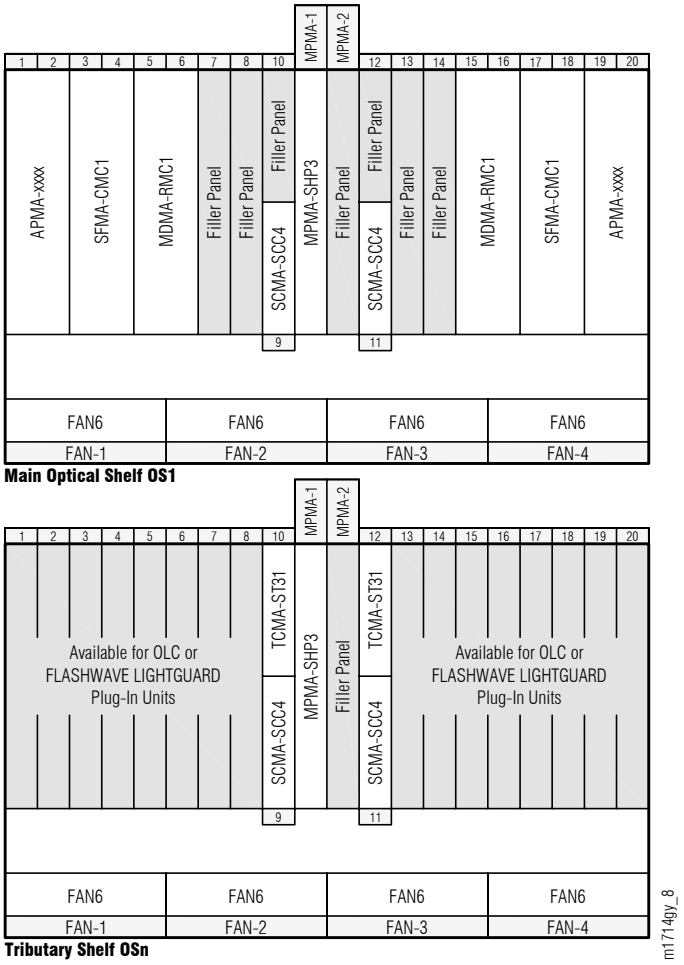


Figure 5: Equipment for 2-Degree Add/Drop Node

Express Node

If add/drop support is not currently needed at the site, the node configuration shown in the following figure can be used in place of the preceding figure. This Express node configuration allows only pass-through traffic but can be upgraded in the future to support adds and drops. The node includes only one shelf, the Main Optical shelf OS1.

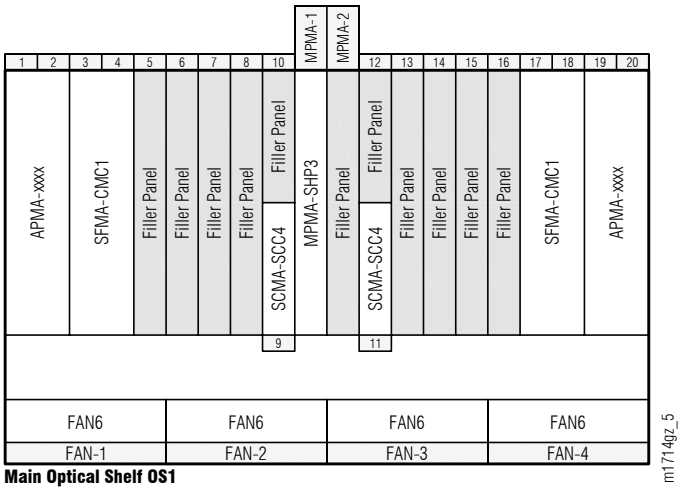


Figure 6: Equipment for 2-Degree Express Node

ILA Node

The In-Line Amplifier (ILA) node configuration is used to increase the span length between add/drop NEs. The node includes only one shelf, the Main Optical shelf OS1. The following figure shows the equipment required.

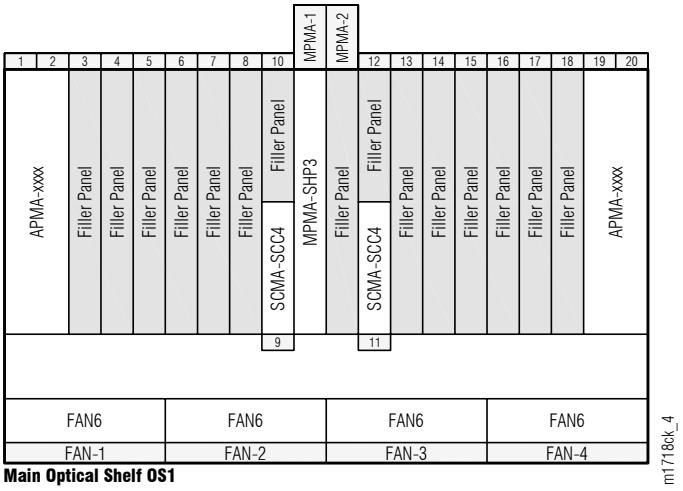


Figure 7: Equipment for ILA Node

The ILA node configuration is functionally similar to the Express node configuration (Express Node). Both configurations support only pass-through traffic. There main differences are:

- The Express node provides channel equalization and the ILA node does not.
- After turn-up, the ILA node passes traffic for all channels in both directions without additional provisioning. The Express node re quires provisioning of WCH cross-connects for each channel that carries traffic.

HUB Node

A HUB node has more than one Optical shelf and at least one interconnect between network degrees residing on separate shelves.

Note: *The two network degrees on the same Optical shelf are automatically interconnected.*

The following figure shows the required equipment for a 4-degree add/drop HUB node. The node supports adds and drops to all four WDM facilities: OS1-1-PE1, OS1-19-PE1, OS2-1-PE1, and OS2-19-PE1. The node includes the Main Optical shelf OS1, the Auxiliary Optical shelf OS2, and up to 20 Tributary shelves.

Note: *This configuration supports Tributary shelves OSn (n=10...13, 20...23,100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230). Synchronization units (TCMA-ST31) are needed only when Flexponder units are installed in the shelf. OSC units (SCMA-SCC4) are only installed in the Tributary shelf to support interoperability with Extension Configuration NEs.*

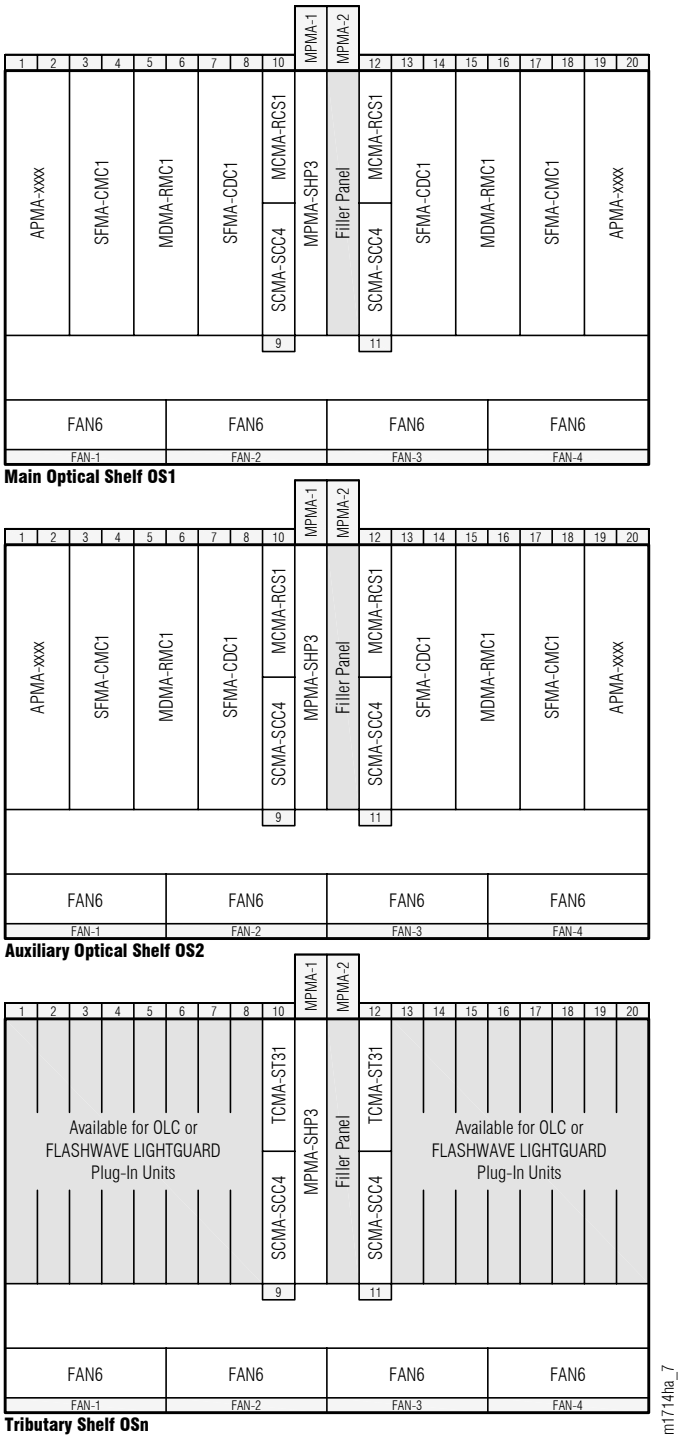


Figure 8: Equipment for 4-Degree Add/Drop HUB Node

The following figure shows the required equipment for a 6-degree add/drop HUB node. The node supports adds and drops to six WDM facilities: OS1-1-PE1, OS1-19-PE1, OS2-1-PE1, OS2-19-PE1, OS3-1-PE1, and OS3-19-PE1. The

node includes the Main Optical shelf OS1, the Auxiliary Optical shelf OS2, and the Auxiliary Optical shelf OS3, and up to 20 Tributary shelves.

Note: *This configuration supports Tributary shelves OSn (n=10...13, 20...23, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330). Synchronization units (TCMA-ST31) are only needed when Flexponder units are installed in the shelf. OSC units (SCMA-SCC4) are only installed in the Tributary shelf to support interoperability with Extension Configuration NEs.*

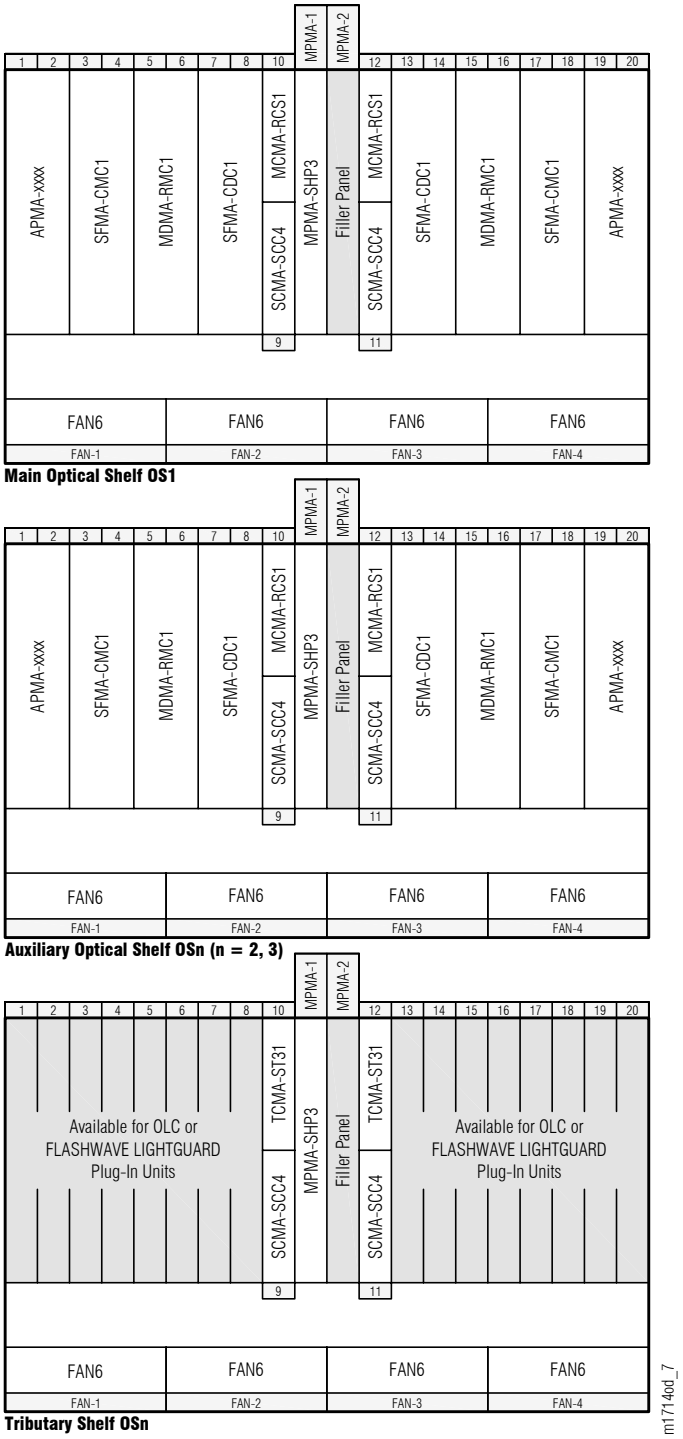


Figure 9: Equipment for 6-Degree Add/Drop HUB Node

The following figure shows the required equipment for an 8-degree add/drop HUB node. The node supports adds and drops to eight WDM facilities: OS1-1-PE1, OS1-19-PE1, OS2-1-PE1, OS2-19-PE1, OS3-1-PE1, OS3-19-PE1,

OS4-1-PE1, and OS4-19-PE1. The node includes the Main Optical shelf OS1, the Auxiliary Optical shelf OS2, the Auxiliary Optical shelf OS3, the Auxiliary Optical shelf OS4, and up to 20 Tributary shelves.

Note: *This configuration supports Tributary shelves OSn (n=10...13, 20...23, 30...33, 40...43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430). Synchronization units (TCMA-ST31) are only needed when Flexponder units are installed in the shelf. OSC units (SCMA-SCC4) are only installed in the Tributary shelf to support interoperability with Extension Configuration NEs.*

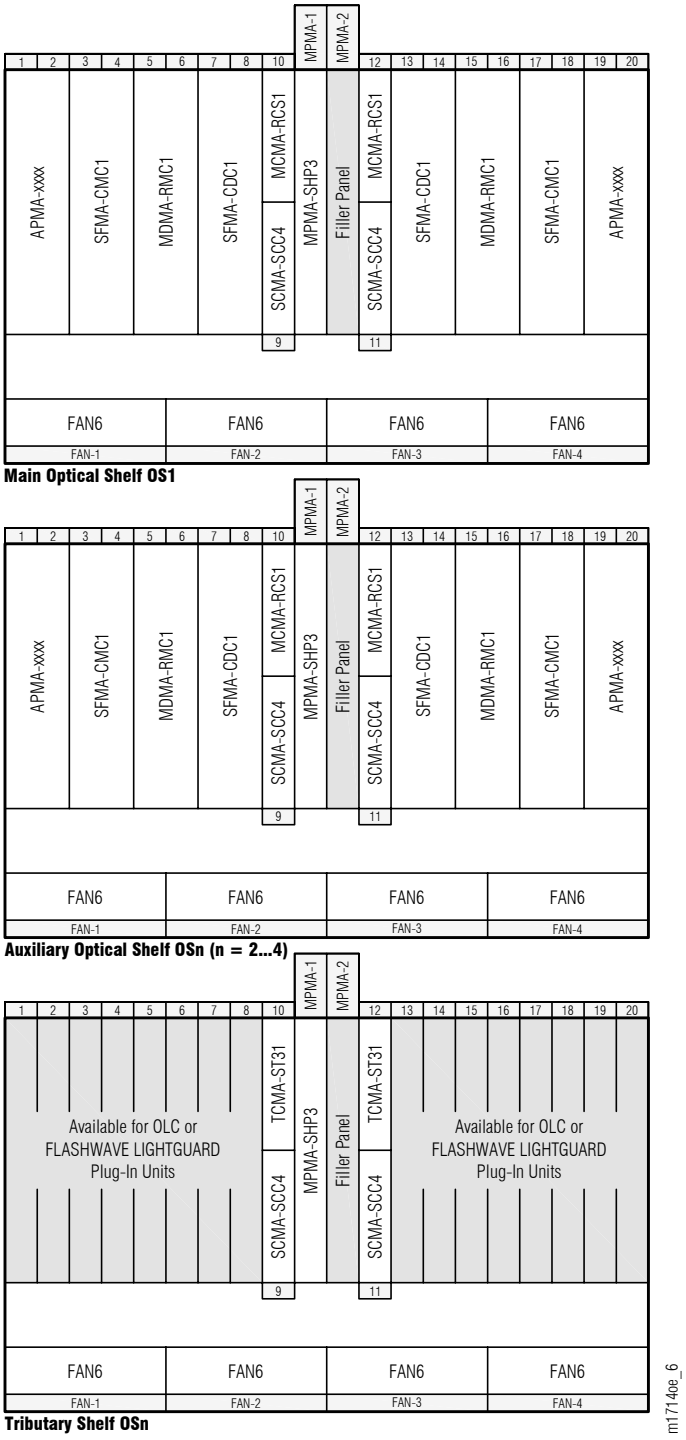


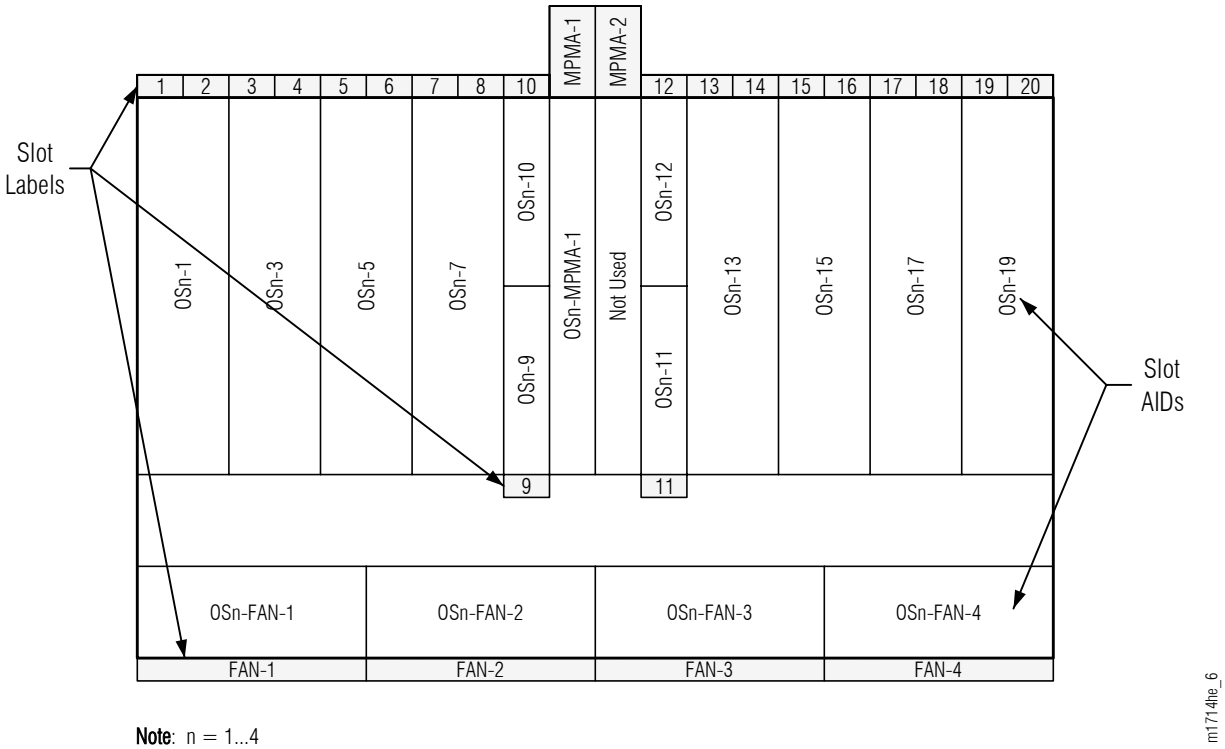
Figure 10: Equipment for 8-Degree Add/Drop HUB Node

2.2
Slot Labels and AIDs

Optical Shelf Slot Labels and AIDs

WSS Core Configuration

The following figures and table show and describe plug-in unit slot labels, AIDs, locations, and equipment type and AID mapping on the Main Optical shelf OS1 and an Auxiliary Optical shelf OSn (n = 2...4, 25, 26).



Note: n = 1...4

Figure 11: Optical Shelf Plug-In Unit Slot Labels and Slot AIDs (WSS Core Configuration)

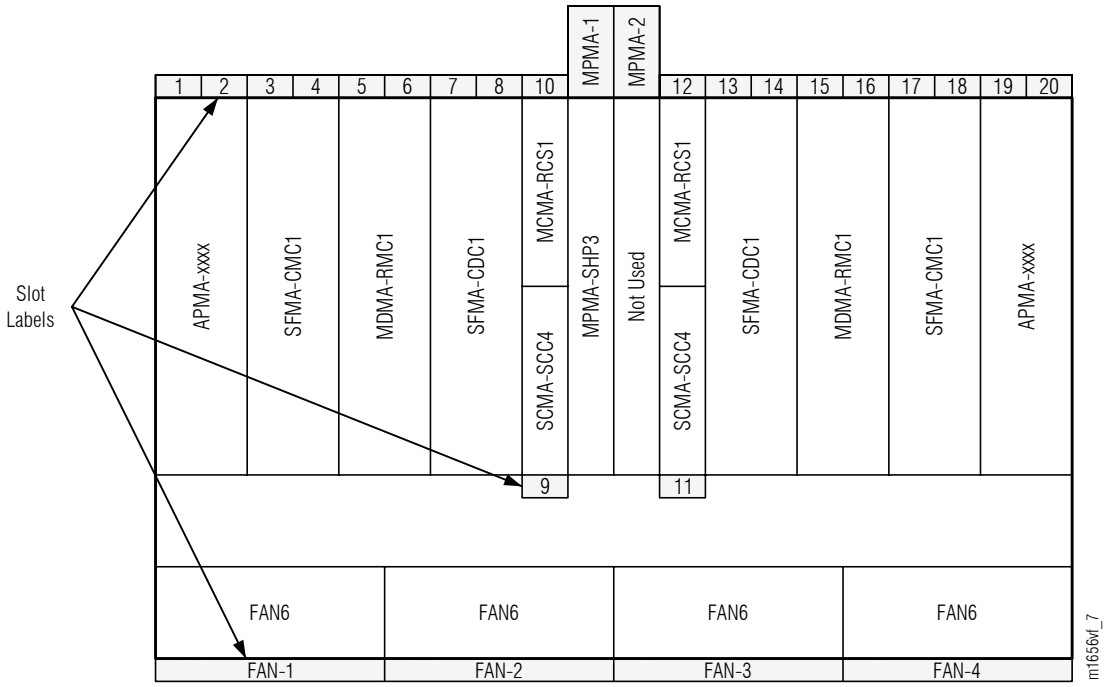


Figure 12: Optical Shelf Plug-In Unit Slot Locations (WSS Core Configuration)

Table 1: Optical Shelf Equipment Type and Slot AID Mapping (WSS Core Configuration)

Slot Label	Slot AID[1]	Equipment	Type (Default in Bold)
n/a	OSn	Shelf	**SHU3**
1	OSn-1	Amplifier	APMA-L2C1 **APMA-M2C1** APMA-ULC1 APMA-M2U1 APMA-ULU1 APMA-MHU1
2	OSn-2 (AID not used)		
3	OSn-3	WSS Core Switch unit	**SFMA-CMC1**
4	OSn-4 (AID not used)		
5	OSn-5	Mux/Demux unit	**MDMA-RMC1**
6	OSn-6 (AID not used)		
7	OSn-7	WSS HUB Switch unit	**SFMA-CDC1**
8	OSn-8		

[1] **n = 1...4, 25, 26**

Table 1: Optical Shelf Equipment Type and Slot AID Mapping (WSS Core Configuration) (Cont.)

Slot Label	Slot AID[1]	Equipment	Type (Default in Bold)
9	OSn-9	OSC Processing unit	**SCMA-SCC4**
10	OSn-10	OSC HUB Interconnect unit	**MCMA-RCS1**
MPMA-1	OSn-MPMA-1	Shelf Processor unit	**MPMA-SHP3** MPMA-SHP4
MPMA-2	Slot not used		n/a
11	OSn-11	OSC Processing unit	**SCMA-SCC4**
12	OSn-12	OSC HUB Interconnect unit	**MCMA-RCS1**
13	OSn-13	WSS HUB Switch unit	**SFMA-CDC1**
14	OSn-14		
15	OSn-15	Mux/Demux unit	**MDMA-RMC1**
16	OSn-16 (AID not used)		
17	OSn-17	WSS Core Switch unit	**SFMA-CMC1**
18	OSn-18 (AID not used)		
19	OSn-19	Amplifier	APMA-L2C1 **APMA-M2C1** APMA-ULC1 APMA-M2U1 APMA-ULU1 APMA-MHU1
20	OSn-20 (AID not used)		
FAN-1	OSn-FAN-1	Fan unit	**FAN6**
FAN-2	OSn-FAN-2		
FAN-3	OSn-FAN-3		
FAN-4	OSn-FAN-4		

2D-ROADM Core Configuration

The following figures and table show and describe plug-in unit slot labels, AIDs, locations, and equipment type and AID mapping on the Optical shelf OS1.

[1] **n = 1...4, 25, 26**

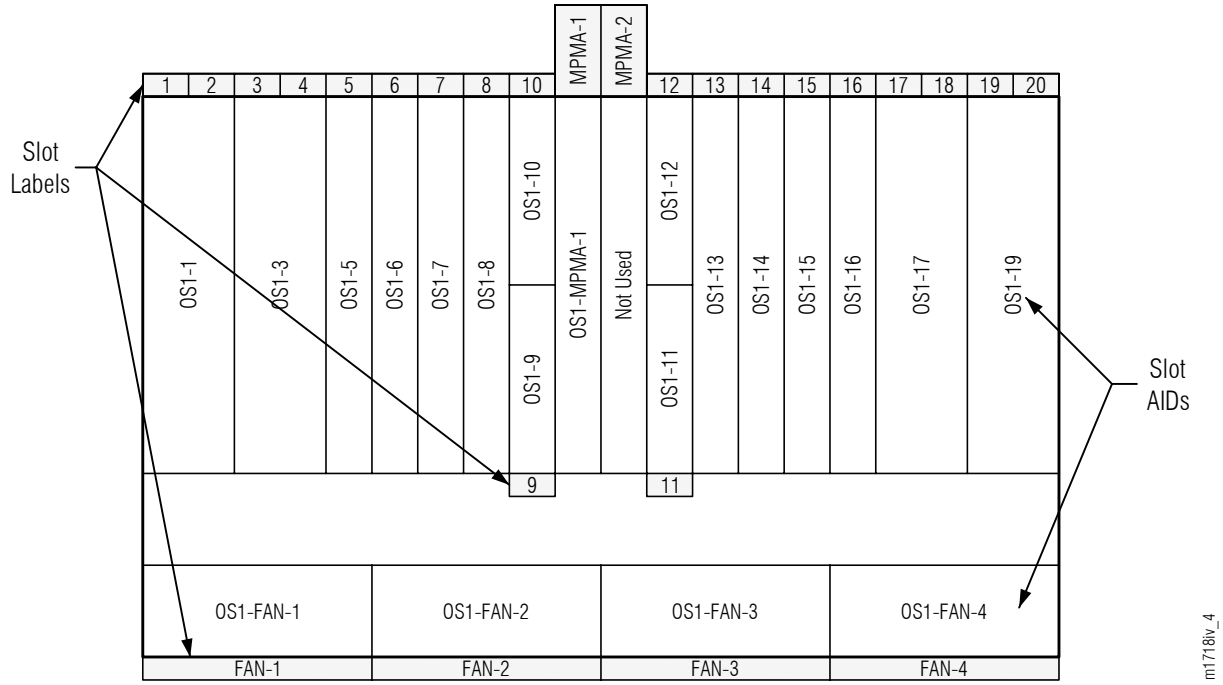


Figure 13: Optical Shelf Plug-In Unit Slot Labels and Slot AIDs (2D-ROADM Core Configuration)

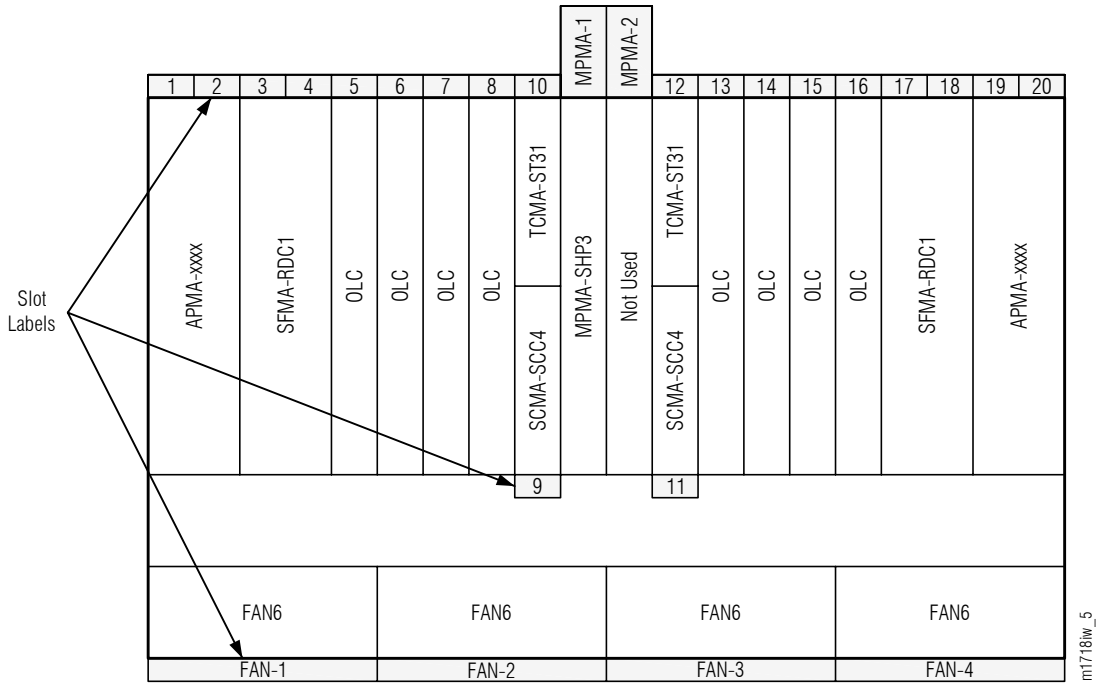


Figure 14: Optical Shelf Plug-In Unit Slot Locations (2D-ROADM Core Configuration)

Table 2: Optical Shelf Equipment Type and Slot AID Mapping (2D-ROADM Core Configuration)

Slot Label	Slot AID	Equipment	Type (Default in Bold)	
n/a	OS1	Shelf	**SHU3**[2]	
1	OS1-1	Amplifier	APMA-L2C1 **APMA-M2C1** APMA-ULC1 APMA-M2U1 APMA-ULU1 APMA-MHU1	
2	OS1-2 (AID not used)			
3	OS1-3	2D-ROADM unit	SFMA-RDC1	
4	OS1-4 (AID not used)		The default equipment type for this slot (SFMA-CMC1) is not applicable to the 2D-ROADM configuration.	
5	OS1-5	OLC or Regenerator unit	Single-wide OLCs(any slot): IFMA-SB **IFMA-U1**/U2/U3/U4 IFMA-U52 IFMA-RG	Double-wide OLCs (odd-numbered slots only): IFMA-8T/8T2 IFMA-GU IFMA-U12/U22/U32 IFMA-BX IFMA-SM IFMA-RG3 IFMA-QU/QU2 IFMA-QM/QM2 IFMA-QR/QR2
6	OS1-6			
7	OS1-7			
8	OS1-8			
9	OS1-9	OSC Processing unit	**SCMA-SCC4**	
10	OSn-10	Synchronization unit	**TCMA-ST31**	
MPMA-1	OS1-MPMA-1	Shelf Processor unit	**MPMA-SHP3** MPMA-SHP4	
MPMA-2	Slot not used	n/a	n/a	
11	OS1-11	OSC Processing unit	**SCMA-SCC4**	
12	OSn-12	Synchronization unit	**TCMA-ST31**	
13	OS1-13	OLC or Regenerator unit	Same as slots 5...8	
14	OS1-14			
15	OS1-15			
16	OS1-16			

[2] Non-issue shelf SHU3 does not fully support IFMA-BXC1. Cross-shelf STS grooming requires shelf SHU3 issue 2 or later.

Table 2: Optical Shelf Equipment Type and Slot AID Mapping (2D-ROADM Core Configuration) (Cont.)

Slot Label	Slot AID	Equipment	Type (Default in Bold)
17	OS1-17	2D-ROADM unit	SFMA-RDC1 The default equipment type for this slot (SFMA-CMC1) is not applicable to the 2D-ROADM configuration.
18	OS1-18 (AID not used)		
19	OS1-19	Amplifier	Same as slot 1.
20	OS1-20 (AID not used)		
FAN-1	OS1-FAN-1	Fan unit	**FAN6**
FAN-2	OS1-FAN-2		
FAN-3	OS1-FAN-3		
FAN-4	OS1-FAN-4		

Tributary Shelf Slot Labels and AIDs

The following figures and tables show and describe plug-in unit slot labels, AIDs, locations, and equipment type and AID mapping on the Tributary shelf OSn (n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430).

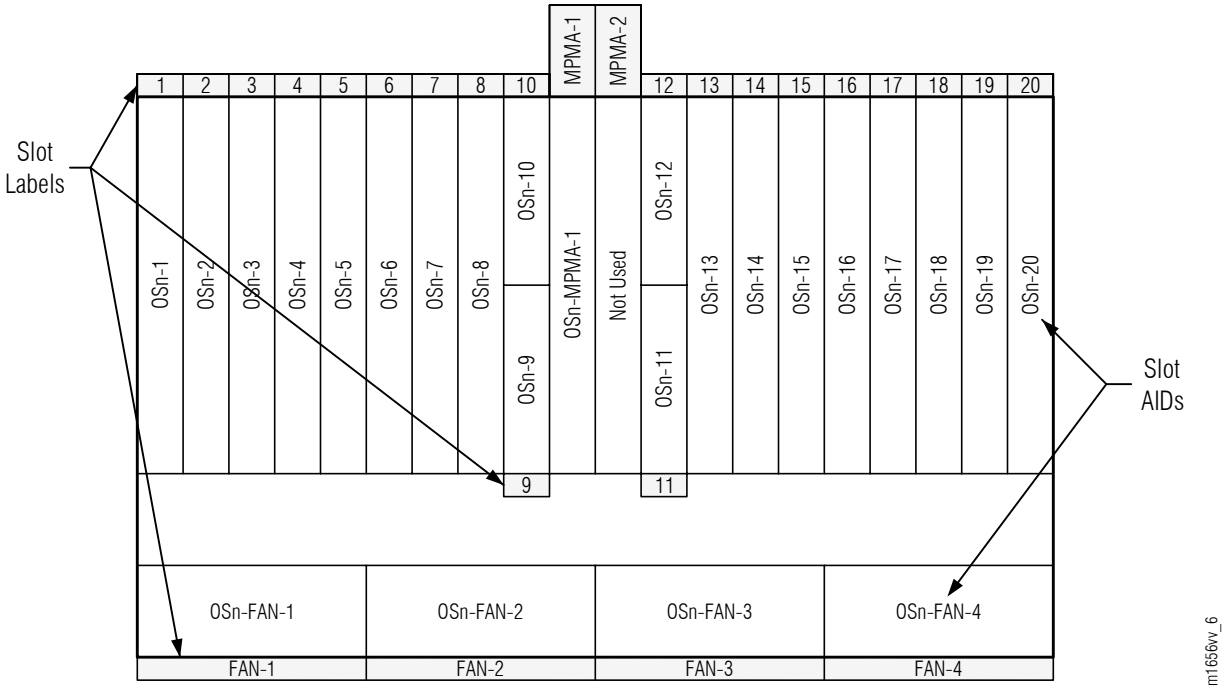


Figure 15: Tributary Shelf Plug-In Unit Slot Labels and Slot AIDs

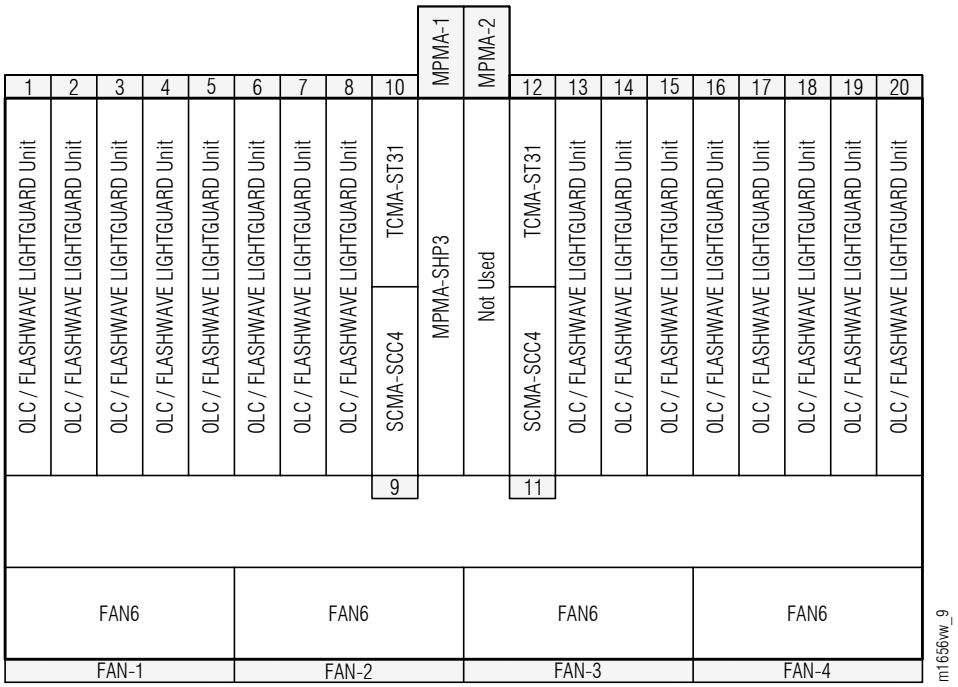


Figure 16: Tributary Shelf Plug-In Unit Slot Locations

Table 3: Tributary Shelf Equipment Type and Slot AID Mapping (WSS Core Configuration)

Slot Label	Slot AID[3]	Equipment	Type (Default in Bold)	
n/a	OSn	Shelf	**SHU3**[4]	
1	OSn-1	OLC, Regenerator unit, FLASHWAVE LIGHTGUARD unit, or 1-Channel Amplifier	Single-wide (any slot): IFMA-SB IFMA-HG IFMA-LL **IFMA-U1** IFMA-U2 IFMA-U3 IFMA-U4 IFMA-U52 IFMA-LGB1 IFMA-RG APMA-ASC1	Double-wide (odd slots only): IFMA-HL IFMA-8T IFMA-8T2 IFMA-BX IFMA-SM IFMA-GU IFMA-LE IFMA-U12 IFMA-U22 IFMA-U32 IFMA-RG3 IFMA-QU/QU2 IFMA-QM/QM2 IFMA-QR/QR2
2	OSn-2			
3	OSn-3			
4	OSn-4			
5	OSn-5			
6	OSn-6			
7	OSn-7			
8	OSn-8			
9	OSn-9	OSC Processing unit	**SCMA-SCC4**	
10	OSn-10	Synchronization unit	**TCMA-ST31**	
MPMA-1	OSn-MPMA-1	Shelf Processor unit	**MPMA-SHP3** MPMA-SHP4	
MPMA-2	Slot not used	n/a	n/a	
11	OSn-11	OSC Processing unit	**SCMA-SCC4**	
12	OSn-12	Synchronization unit	**TCMA-ST31**	
13	OSn-13	OLC, Regenerator unit, FLASHWAVE LIGHTGUARD unit, or 1-Channel Amplifier	Same as slots 1...8	
14	OSn-14			
15	OSn-15			
16	OSn-16			
17	OSn-17			
18	OSn-18			
19	OSn-19			
20	OSn-20			
FAN-1	OSn-FAN-1	Fan unit	**FAN6**	

[3] **n = 10...13, 20...23, 30...33, 40...43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430**

[4] Non-issue shelf SHU3 does not fully support IFMA-BXC1. Cross-shelf STS grooming requires shelf SHU3 issue 2 or later.

Table 3: Tributary Shelf Equipment Type and Slot AID Mapping (WSS Core Configuration) (Cont.)

Slot Label	Slot AID[3]	Equipment	Type (Default in Bold)
FAN-2	OSn-FAN-2		
FAN-3	OSn-FAN-3		
FAN-4	OSn-FAN-4		

Table 4: Tributary Shelf Equipment Type and Slot AID Mapping (2D-ROADM Core Configuration)

Slot Label	Slot AID[5]	Equipment	Type (Default in Bold)	
n/a	OSn	Shelf	**SHU3**[6]	
1	OSn-1	OLC, Regenerator unit, FLASHWAVE LIGHTGUARD unit, or 1-Channel Amplifier	Single-wide (any slot): IFMA-SB IFMA-HG IFMA-LL **IFMA-U1** IFMA-U2 IFMA-U3 IFMA-U4 IFMA-U52 IFMA-LGB1 IFMA-RG APMA-ASC1	Double-wide (odd slots only): IFMA-HL IFMA-8T IFMA-8T2 IFMA-BX IFMA-SM IFMA-GU IFMA-LE IFMA-U12 IFMA-U22 IFMA-U32 IFMA-RG3 IFMA-QU/QU2 IFMA-QM/QM2 IFMA-QR/QR2
2	OSn-2			
3	OSn-3			
4	OSn-4			
5	OSn-5			
6	OSn-6			
7	OSn-7			
8	OSn-8			
9	OSn-9	OSC Processing unit	**SCMA-SCC4**	
10	OSn-10	Synchronization unit	**TCMA-ST31**	
MPMA-1	OSn-MPMA-1	Shelf Processor unit	**MPMA-SHP3** MPMA-SHP4	
MPMA-2	Slot not used	n/a	n/a	
11	OSn-11	OSC Processing unit	**SCMA-SCC4**	
12	OSn-12	Synchronization unit	**TCMA-ST31**	

[3] **n = 10...13, 20...23, 30...33, 40...43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430**
[5] **n = 10...13, 100, 101, 110, 111, 120, 130**
[6] Non-issue shelf SHU3 does not fully support IFMA-BXC1. Cross-shelf STS grooming requires shelf SHU3 issue 2 or later.

Table 4: Tributary Shelf Equipment Type and Slot AID Mapping (2D-ROADM Core Configuration) (Cont.)

Slot Label	Slot AID[5]	Equipment	Type (Default in Bold)
13	OSn-13	OLC, Regenerator unit, FLASHWAVE LIGHTGUARD unit, or 1-Channel Amplifier	Same as slots 1...8
14	OSn-14		
15	OSn-15		
16	OSn-16		
17	OSn-17		
18	OSn-18		
19	OSn-19		
20	OSn-20		
FAN-1	OSn-FAN-1	Fan unit	**FAN6**
FAN-2	OSn-FAN-2		
FAN-3	OSn-FAN-3		
FAN-4	OSn-FAN-4		

ILA Shelf Slot Labels and AIDs

Procedures for the in-line amplifier (ILA) shelf turn-up are presented in ILA Node Turn-Up. For ILA Shelf slot labels and AIDs, refer to About System Turn-up Core Configuration ILA Node .

[5] **n = 10...13, 100, 101, 110, 111, 120, 130**

2.3 Turn-Up Provisioning Hierarchy FLASHWAVE 7500 Core Configuration

The various entities (equipment, facilities, cross-connects, and so on) within the FLASHWAVE 7500 Core Configuration must be provisioned in a certain order. This section contains provisioning hierarchy tables that indicates the order in which the entities can be added to or deleted from the system, along with the applicable TL1 root commands.

Shelf Entities, WSS Core Configuration

The following figure presents the provisioning hierarchy for shelves of the FLASHWAVE 7500 WSS Core Configuration system. Auxiliary Optical shelves OS2...OS4, OS25, and OS26 apply to HUB configurations only. Auxiliary Optical shelves OS25 and OS26 apply to asymmetric HUB configurations only. The WSS Core Configuration supports a maximum of 20 tributary shelves per node.

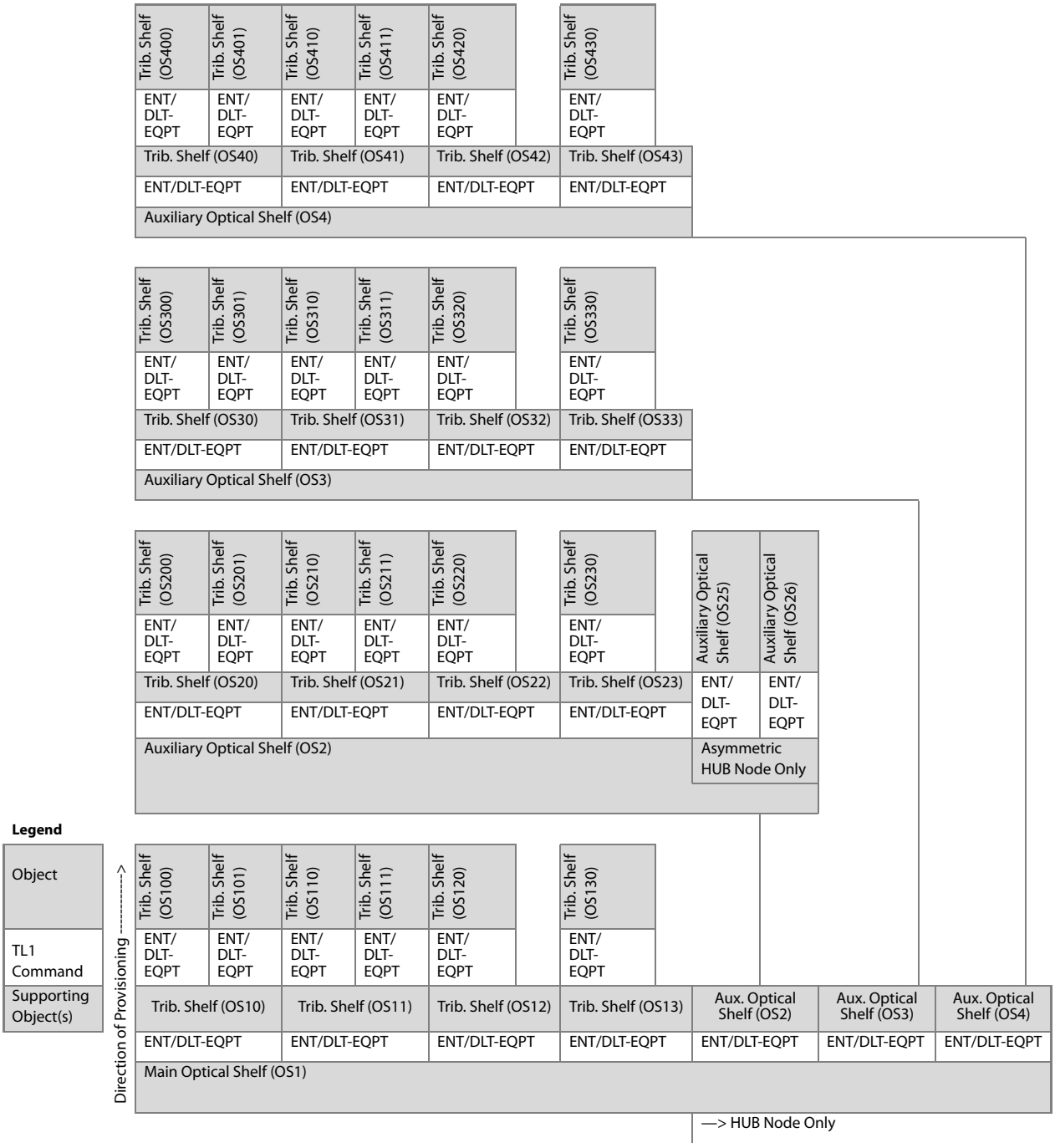


Figure 17: Turn-Up Provisioning Hierarchy–Shelves (WSS Core Configuration)

Optical Shelf Equipment, WSS Core Configuration

The following figure presents the hierarchy for provisioning equipment within optical shelves of the WSS Core Configuration system. It applies to the Main Optical shelf (OS1) and to the Auxiliary Optical shelves (OS2...OS4, OS25, OS26) if the node is a HUB node.

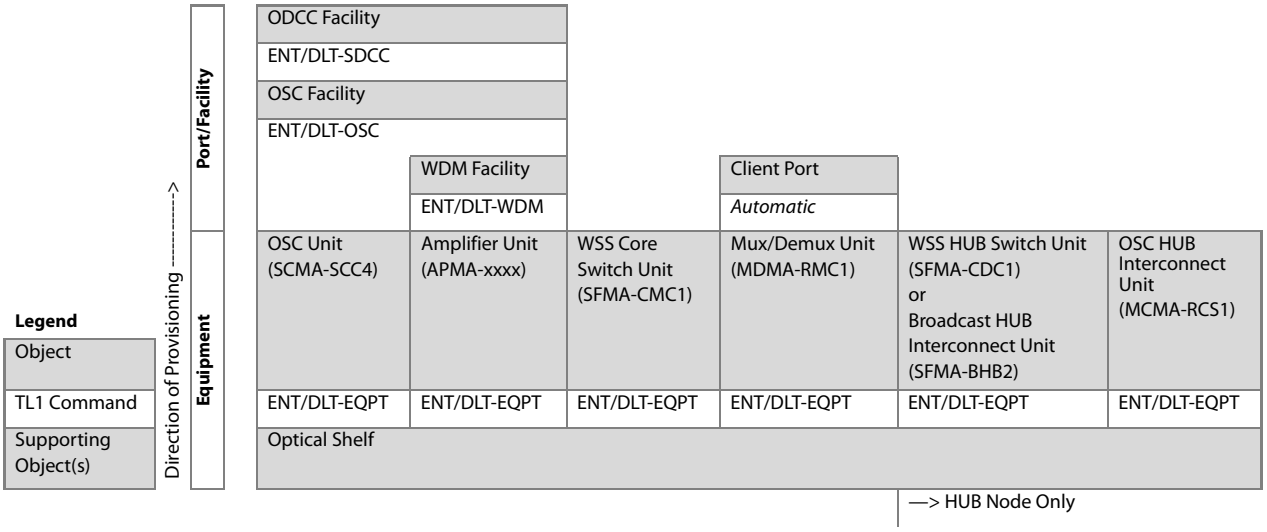


Figure 18: Turn-Up Provisioning Hierarchy–Optical Shelf (WSS Core Configuration)

Shelf Entities, 2D-ROADM Core Configuration

The following figure presents the provisioning hierarchy for shelves of the FLASHWAVE 7500 2D-ROADM Core Configuration system.

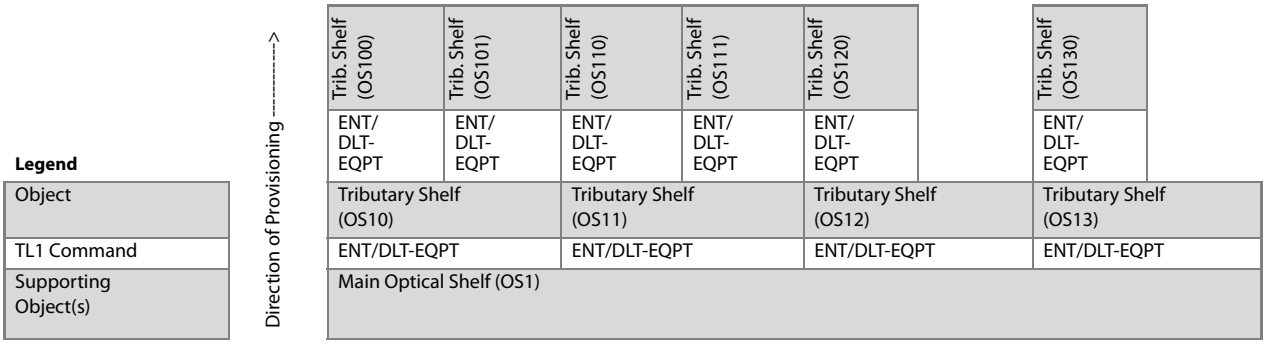


Figure 19: Turn-Up Provisioning Hierarchy–Shelves (2D-ROADM Configuration)

Optical Shelf Equipment, 2D-ROADM Core Configuration

The following figure presents the hierarchy for provisioning equipment within the Optical shelf of the 2D-ROADM Core Configuration system.

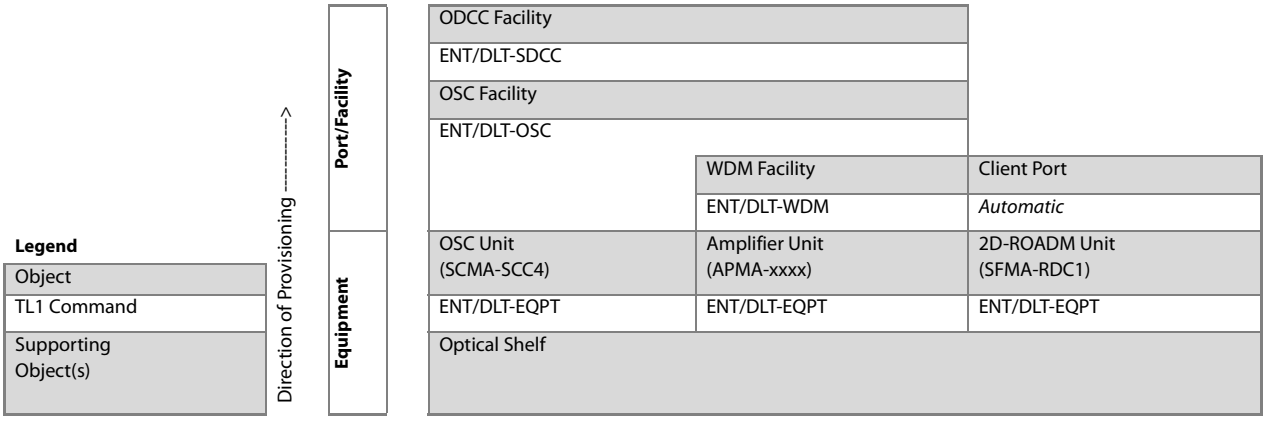


Figure 20: Turn-Up Provisioning Hierarchy–Optical Shelf (2D-ROADM Core Configuration)

2.4 Verify Shelf Labeling, Verify LAN and RICC Cable Connections, Apply Power, and Install Fan Units

In this section:

This is the starting point for turning up all types of Core Configuration nodes, except ILA nodes. If you are provisioning an ILA node, proceed to ILA Node Turn-Up.

The following figure shows a flowchart identifying the subprocedures used to begin the node turn-up.

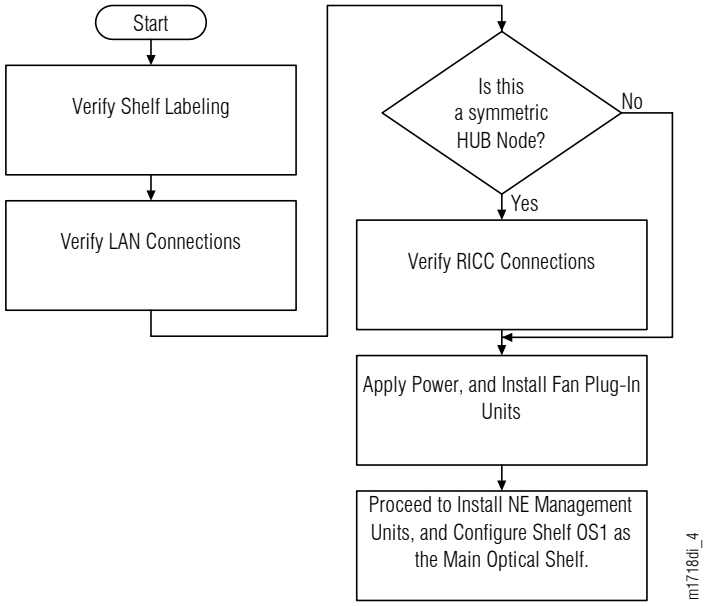


Figure 21: Begin Node Turn-Up (Procedure Flowchart)

The following figure shows the shelves that can be included in a WSS Core Configuration node and how they are related in the hierarchy of LAN connections.

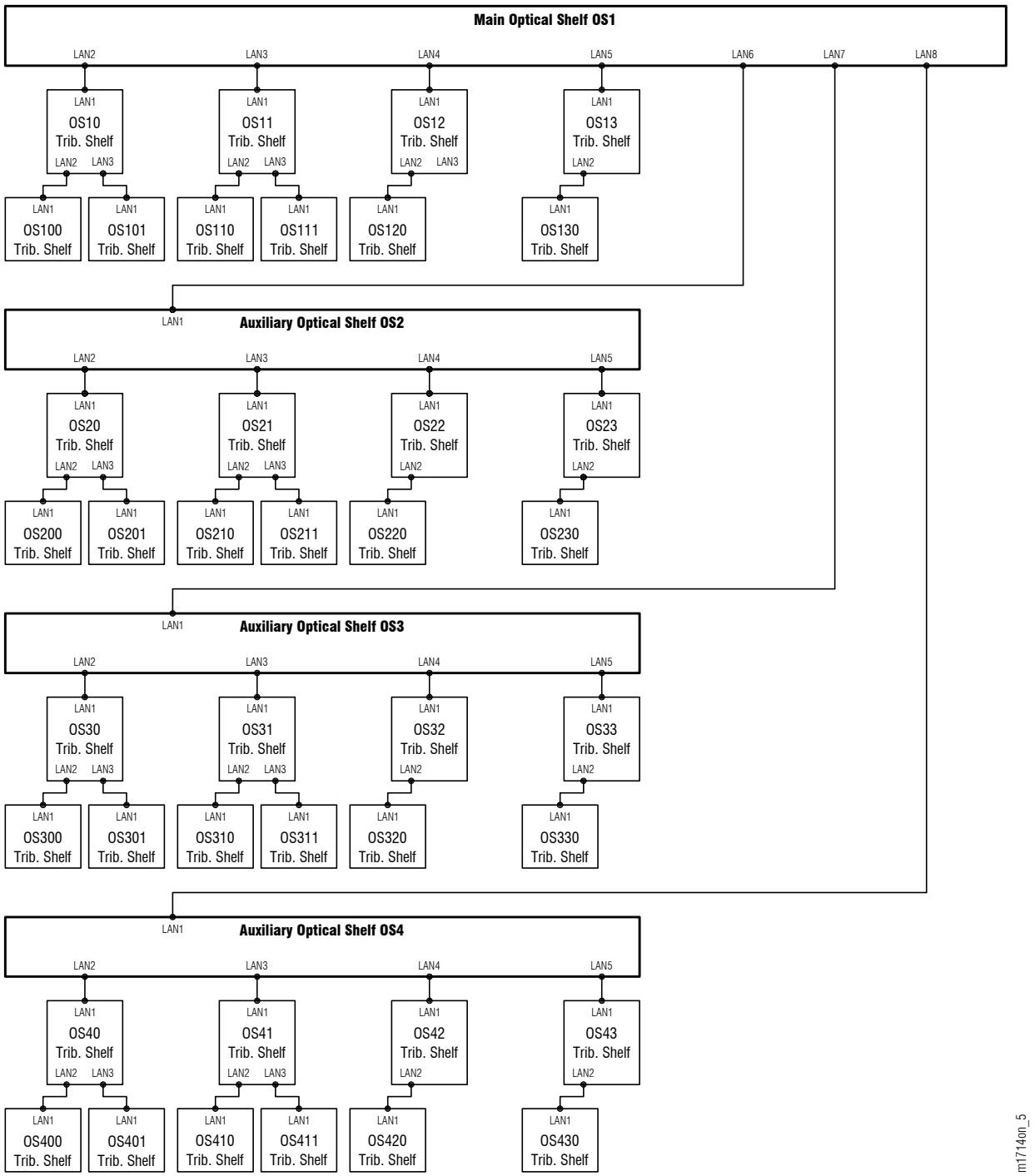


Figure 22: Shelf AIDs and Hierarchy of LAN Connections at HUB Node

The preceding figure shows each optical shelf that can support a maximum of 10 Tributary shelves. An additional constraint, not presented in the preceding figure, is the node as a whole can support no more than 20 Tributary shelves.

The following figure shows the shelves that can be included in a 2D-ROADM node. The AID structure and hierarchy of LAN connections matches the following figure, but only the Main Optical shelf (OS1) and associated Tributary shelves are included.

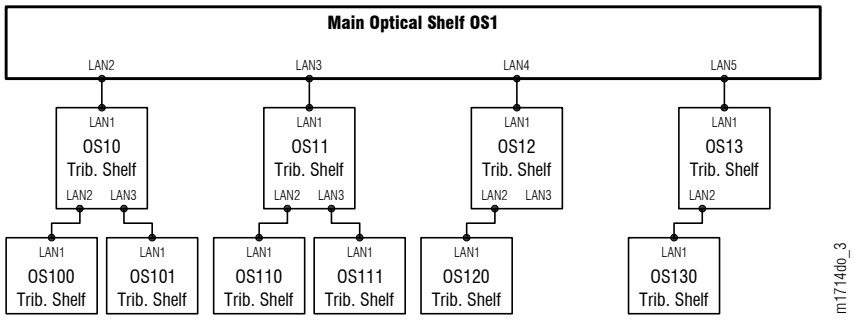


Figure 23: Shelf AIDs and Hierarchy of LAN Connections at Two-Degree ROADM Node

The following figure shows another special case. If the node is an asymmetric HUB node (Keyword HUBMODE=MANUAL in the ED-SYS command), the system can include two shelves in addition to those shown in Figure 22. The additional shelves are Optical shelves OS25 and OS26. Both shelves connect to shelf OS2 in the hierarchy of LAN connections. Shelves OS25 and OS26 does not support subtending Tributary shelves.

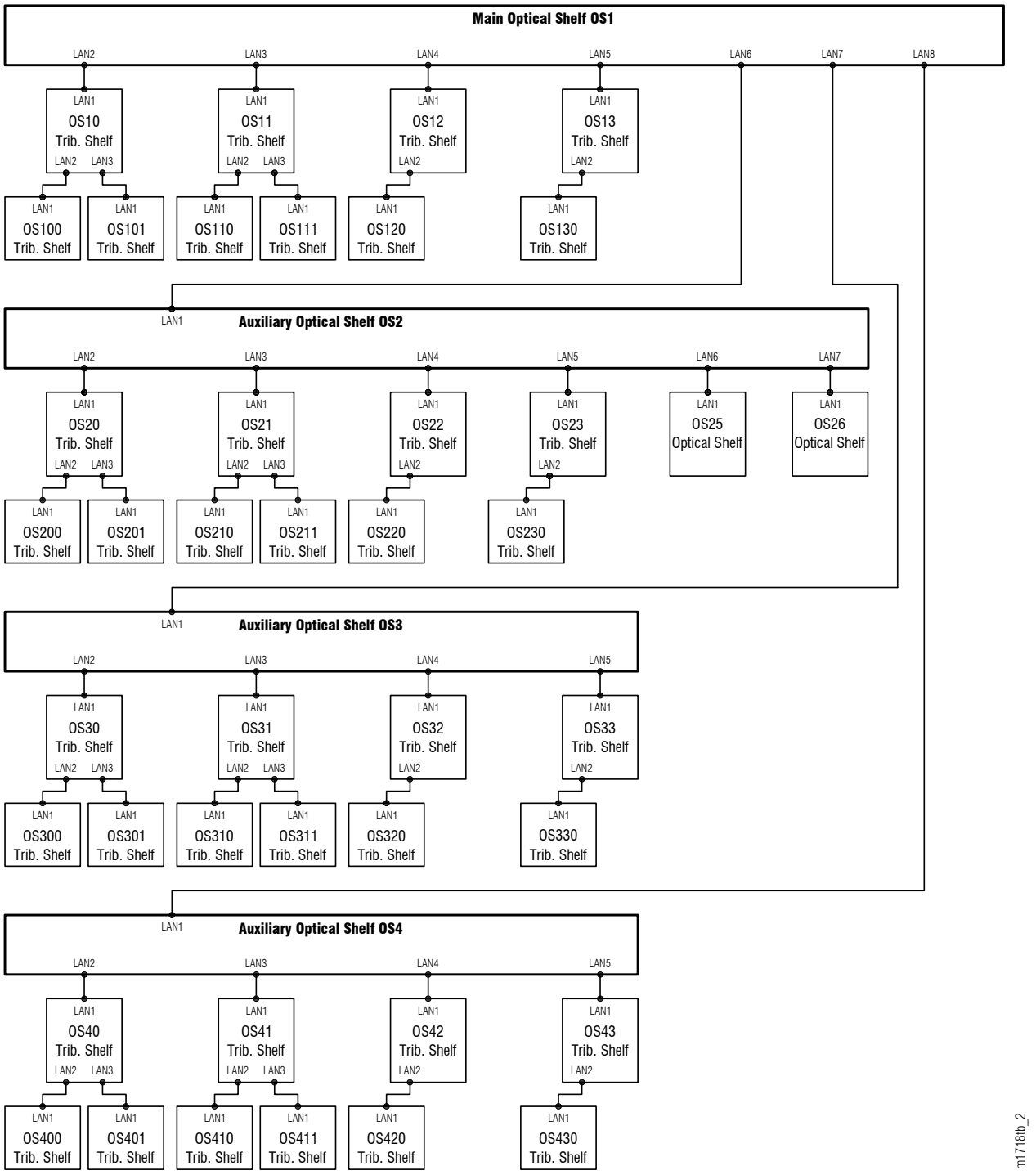


Figure 24: Shelf AIDs and Hierarchy of LAN Connections at Asymmetric HUB Node

The following figure shows the Optical/Tributary shelf backplane.

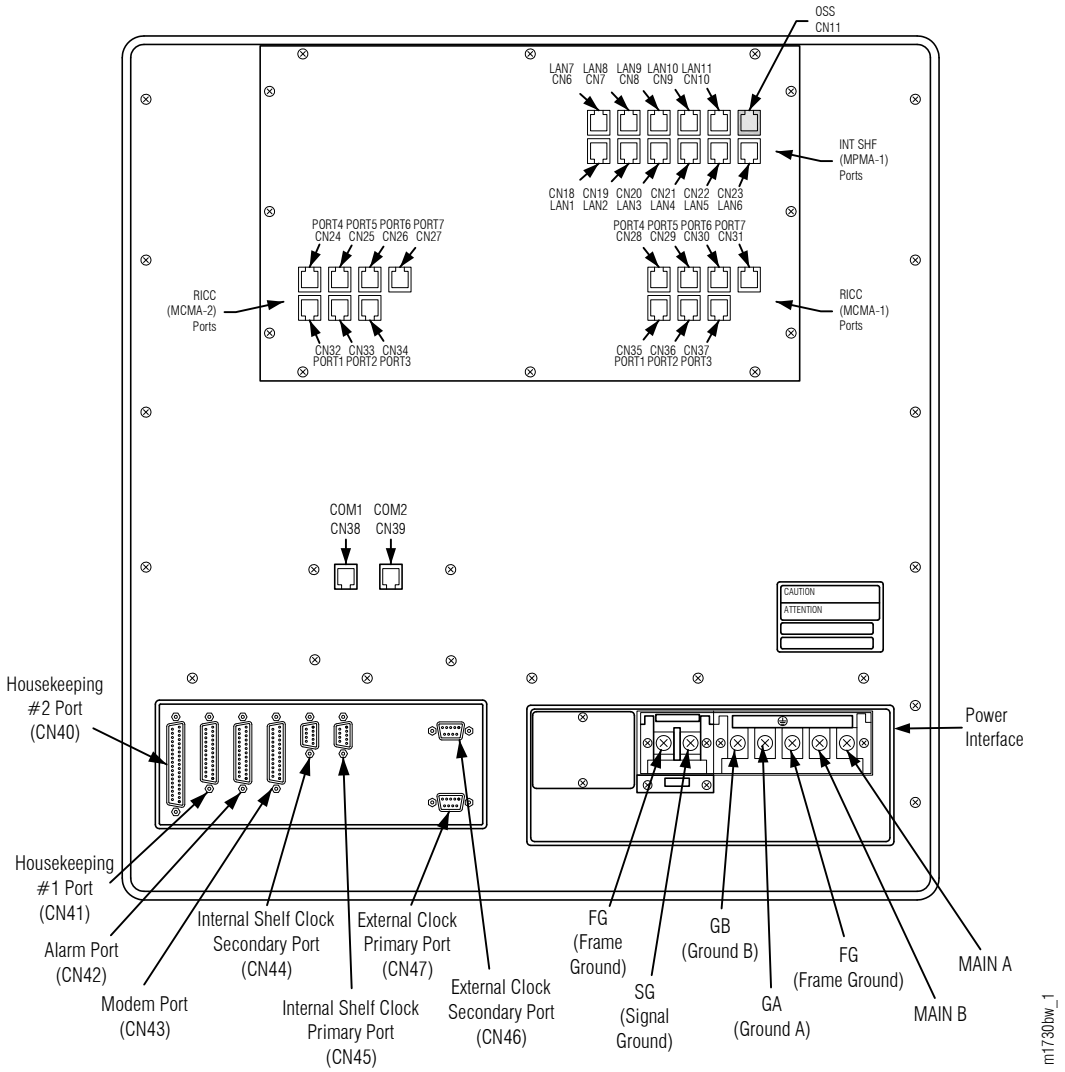


Figure 25: Optical/Tributary Shelf Backplane

Note: *The backplane shown above is an Issue 6 SHU3 shelf. The SHU3 Issue 6 shelf does not have the MPMA-2 port cluster (CN1…CN5 and CN12…CN17).*

2.4.1 Verify Shelf Labeling

Note: *This is the starting point for turning up all types of Core Configuration nodes, except ILA nodes. If you are turning up an ILA node, proceed to* ILA Node Turn-Up.

Verify shelf labeling as follows:

Step 1
Locate each shelf that is part of the node.

Step 2
Verify that each shelf is clearly marked or labeled according to local practice.

Note: *Optical and Tributary shelves are physically identical.*

Note: *The Fujitsu recommended labeling scheme is shown in Figures 22 through 24. In this scheme, each shelf is labeled with its shelf AID (for example, OS1 for the Main Optical shelf). The shelf AID is determined by shelf position within the hierarchy of LAN connections. Throughout this documentation, shelves are identified by its shelf AID.*

Step 3
Proceed to Verify LAN Connections.

2.4.2 Verify LAN Connections

LAN connections are needed for all nodes that include more than one shelf.

Note: *If LAN cables are required at the node, they should already be installed as part of shelf equipment installation. Refer to Installing LAN Cable (Optical/Tributary Shelf).*

Step 1
Familiarize yourself with the backplane LAN connectors shown in Figure 25.

Note: *The backplane contains two sets of LAN connectors. LAN connectors in the **INT SHF (MPMA-1) ports** area are used for LAN connections. LAN connectors in the **INT SHF (MPMA-2) ports** area are not used.*

Step 2
Verify that all LAN cables have been installed. Refer to Figure 24 and the following table for a lists of all possible LAN cable connections.

Table 5: LAN Connections (Core Configuration)

From			To		
Shelf	Connector	Label	Shelf	Connector	Label
OS1 (Main Optical)	CN19	LAN2	OS10 (Tributary)	CN18	LAN1
	CN20	LAN3	OS11 (Tributary)	CN18	LAN1
	CN21	LAN4	OS12 (Tributary)	CN18	LAN1

Table 5: LAN Connections (Core Configuration) (Cont.)

From			To		
Shelf	**Connector**	**Label**	**Shelf**	**Connector**	**Label**
	CN22	LAN5	OS13 (Tributary)	CN18	LAN1
	CN23	LAN6	OS2 (Auxiliary Optical)	CN18	LAN1
	CN6	LAN7	OS3 (Auxiliary Optical)	CN18	LAN1
	CN7	LAN8	OS4 (Auxiliary Optical)	CN18	LAN1
OS10 (Tributary)	CN19	LAN2	OS100 (Tributary)	CN18	LAN1
	CN20	LAN3	OS101 (Tributary)	CN18	LAN1
OS11 (Tributary)	CN19	LAN2	OS110 (Tributary)	CN18	LAN1
	CN20	LAN3	OS111 (Tributary)	CN18	LAN1
OS12 (Tributary)	CN19	LAN2	OS120 (Tributary)	CN18	LAN1
OS13 (Tributary)	CN19	LAN2	OS130 (Tributary)	CN18	LAN1
OS2 (Auxiliary Optical)	CN19	LAN2	OS20 (Tributary)	CN18	LAN1
	CN20	LAN3	OS21 (Tributary)	CN18	LAN1
	CN21	LAN4	OS22 (Tributary)	CN18	LAN1
	CN22	LAN5	OS23 (Tributary)	CN18	LAN1
	CN23	LAN6	OS25 (Auxiliary Optical)	CN18	LAN1
	CN6	LAN7	OS26 (Auxiliary Optical)	CN18	LAN1
OS20 (Tributary)	CN19	LAN2	OS200 (Tributary)	CN18	LAN1
	CN20	LAN3	OS201 (Tributary)	CN18	LAN1
OS21 (Tributary)	CN19	LAN2	OS210 (Tributary)	CN18	LAN1
	CN20	LAN3	OS211 (Tributary)	CN18	LAN1
OS22 (Tributary)	CN19	LAN2	OS220 (Tributary)	CN18	LAN1
OS23 (Tributary)	CN19	LAN2	OS230 (Tributary)	CN18	LAN1
OS3 (Auxiliary Optical)	CN19	LAN2	OS30 (Tributary)	CN18	LAN1
	CN20	LAN3	OS31 (Tributary)	CN18	LAN1
	CN21	LAN4	OS32 (Tributary)	CN18	LAN1
	CN22	LAN5	OS33 (Tributary)	CN18	LAN1
OS30 (Tributary)	CN19	LAN2	OS300 (Tributary)	CN18	LAN1
	CN20	LAN3	OS301 (Tributary)	CN18	LAN1
OS31 (Tributary)	CN19	LAN2	OS310 (Tributary)	CN18	LAN1

Table 5: LAN Connections (Core Configuration) (Cont.)

From			To		
Shelf	**Connector**	**Label**	**Shelf**	**Connector**	**Label**
	CN20	LAN3	OS311 (Tributary)	CN18	LAN1
OS32 (Tributary)	CN19	LAN2	OS320 (Tributary)	CN18	LAN1
OS33 (Tributary)	CN19	LAN2	OS330 (Tributary)	CN18	LAN1
OS4 (Auxiliary Optical)	CN19	LAN2	OS40 (Tributary)	CN18	LAN1
	CN20	LAN3	OS41 (Tributary)	CN18	LAN1
	CN21	LAN4	OS42 (Tributary)	CN18	LAN1
	CN22	LAN5	OS43 (Tributary)	CN18	LAN1
OS40 (Tributary)	CN19	LAN2	OS400 (Tributary)	CN18	LAN1
	CN20	LAN3	OS401 (Tributary)	CN18	LAN1
OS41 (Tributary)	CN19	LAN2	OS410 (Tributary)	CN18	LAN1
	CN20	LAN3	OS411 (Tributary)	CN18	LAN1
OS42 (Tributary)	CN19	LAN2	OS420 (Tributary)	CN18	LAN1
OS43 (Tributary)	CN19	LAN2	OS430 (Tributary)	CN18	LAN1

Install the cables, if they are not already installed, as described in Installing LAN Cable (Optical/Tributary Shelf).

Step 3
Is this a symmetric HUB node?

Note: *For an asymmetric HUB node, RICC cables are installed as needed, not as part of shelf equipment installation. For more information on symmetric and asymmetric HUB nodes, refer to* Core Configuration *in* Core Configuration.

If YES:
Proceed to Verify RICC Connections.

If NO:
Proceed to Apply Power, and Install Fan Plug-In Units.

2.4.3 Verify RICC Connections

This procedure applies to symmetric HUB nodes only. For more information on symmetric and asymmetric HUB nodes, refer to Core Configuration in Core Configuration.

If this is a symmetric HUB node, RICC cables should already be installed as part of shelf equipment installation. Refer to Installing RICC Cable (Optical Shelf).

Step 1
Verify that all four RICC cables have been installed between Main Optical shelf OS1 and Auxiliary Optical shelf OS2. The connections are listed in the following table and shown in the following figure.

Install the cables, if they are not already installed, as described in Installing RICC Cable (Optical Shelf).

Table 6: RICC Connections between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS2

From Backplane Connector			To Backplane Connector		
Shelf	**Connector Group**	**Connector**	**Shelf**	**Connector Group**	**Connector**
OS1	RICC (MCMA-2)	CN32 (PORT1)	OS2	RICC (MCMA-2)	CN32 (PORT1)
		CN33 (PORT2)		RICC (MCMA-1)	CN35 (PORT1)
	RICC (MCMA-1)	CN35 (PORT1)		RICC (MCMA-2)	CN33 (PORT2)
		CN36 (PORT2)		RICC (MCMA-1)	CN36 (PORT2)

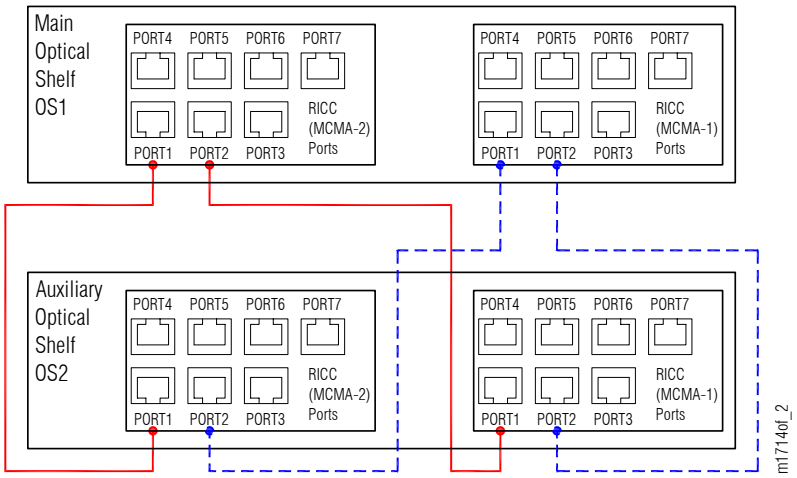


Figure 26: RICC Connections between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS2 Backplanes

Step 2
Does the node include Auxiliary Optical shelf OS3?

If YES:
Proceed to Step 3.

If NO:
Proceed to Apply Power, and Install Fan Plug-In Units.

Step 3
Verify that all four RICC cables are installed between Main Optical shelf OS1 and Auxiliary Optical shelf OS3. The connections are listed in the following table and shown in the following figure.

Install the cables, if they are not already installed, as described in Installing RICC Cable (Optical Shelf).

Table 7: RICC Connections between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS3

From Backplane Connector			To Backplane Connector		
Shelf	**Connector Group**	**Connector**	**Shelf**	**Connector Group**	**Connector**
OS1	RICC (MCMA-2)	CN34 (PORT3)	OS3	RICC (MCMA-2)	CN32 (PORT1)
		CN24 (PORT4)		RICC (MCMA-1)	CN35 (PORT1)
	RICC (MCMA-1)	CN37 (PORT3)		RICC (MCMA-2)	CN33 (PORT2)
		CN28 (PORT4)		RICC (MCMA-1)	CN36 (PORT2)

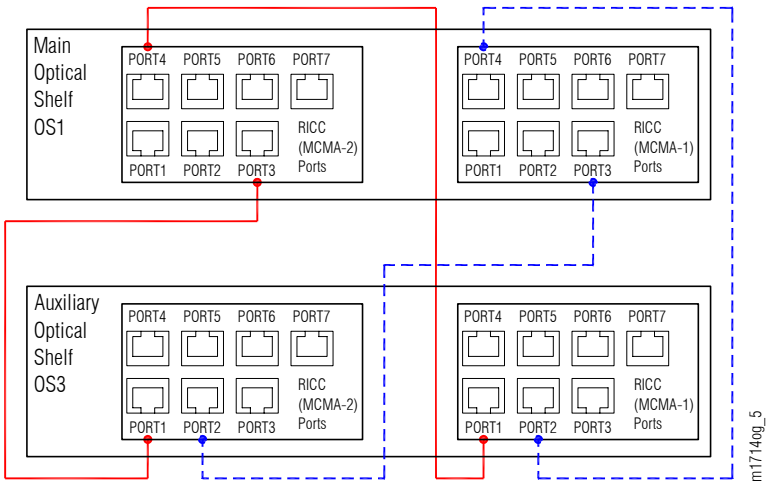


Figure 27: RICC Connections between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS3 Backplanes

Step 4

Verify that all four RICC cables have been installed between Auxiliary Optical shelf OS2 and Auxiliary Optical shelf OS3. The connections are listed in the following table and shown in the following figure.

Install the cables, if they are not already installed, as described in Installing RICC Cable (Optical Shelf).

Table 8: RICC Connections between Auxiliary Optical Shelf OS2 and Auxiliary Optical Shelf OS3

From Backplane Connector			To Backplane Connector		
Shelf	**Connector Group**	**Connector**	**Shelf**	**Connector Group**	**Connector**
OS2	RICC (MCMA-2)	CN34 (PORT3)	OS3	RICC (MCMA-2)	CN34 (PORT3)
		CN24 (PORT4)		RICC (MCMA-1)	CN37 (PORT3)
	RICC (MCMA-1)	CN37 (PORT3)		RICC (MCMA-2)	CN24 (PORT4)
		CN28 (PORT4)		RICC (MCMA-1)	CN28 (PORT4)

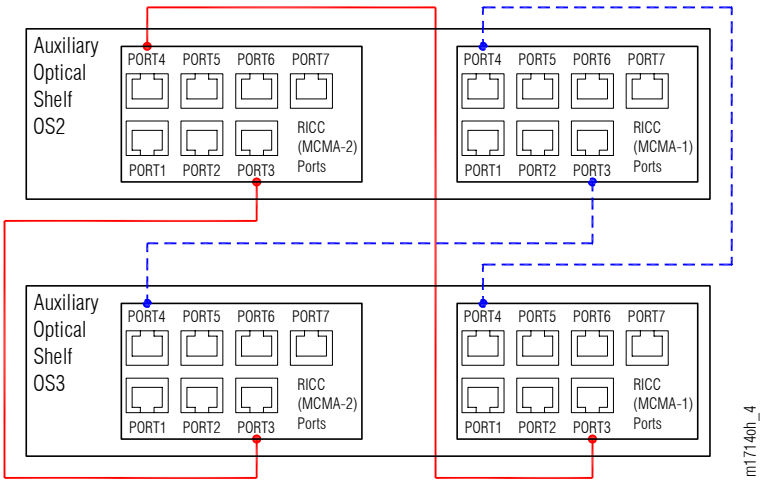


Figure 28: RICC Connections between Auxiliary Optical Shelf OS2 and Auxiliary Optical Shelf OS3 Backplanes

Step 5

Does the node include Auxiliary Optical shelf OS4?

If YES:
Proceed to Step 6.

If NO:
Proceed to Apply Power, and Install Fan Plug-In Units.

Step 6

Verify that all four RICC cables have been installed between Main Optical shelf OS1 and Auxiliary Optical shelf OS4. The connections are listed in the following table and shown in the following figure.

Install the cables, if they are not already installed, as described in Installing RICC Cable (Optical Shelf).

Table 9: RICC Connections between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS4

From Backplane Connector			To Backplane Connector		
Shelf	**Connector Group**	**Connector**	**Shelf**	**Connector Group**	**Connector**
OS1	RICC (MCMA-2)	CN25 (PORT5)	OS4	RICC (MCMA-2)	CN32 (PORT1)
		CN26 (PORT6)		RICC (MCMA-1)	CN35 (PORT1)
	RICC (MCMA-1)	CN29 (PORT5)		RICC (MCMA-2)	CN33 (PORT2)
		CN30 (PORT6)		RICC (MCMA-1)	CN36 (PORT2)

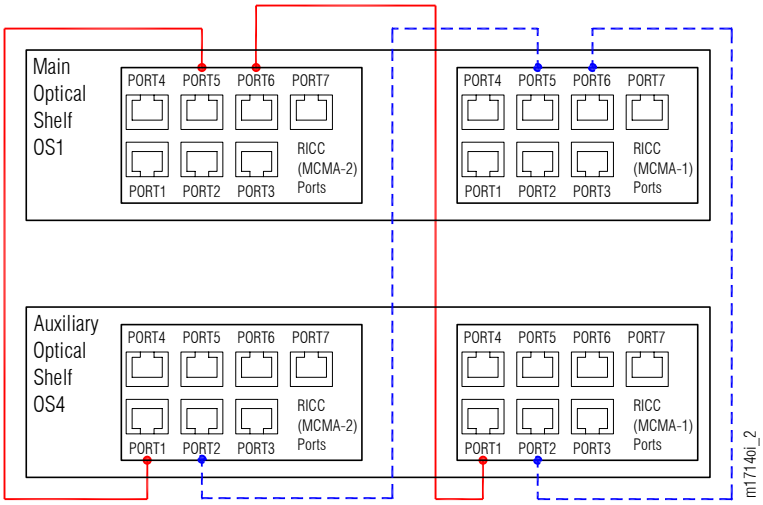


Figure 29: RICC Connections between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS4 Backplanes

Step 7

Verify that all four RICC cables have been installed between Auxiliary Optical shelf OS2 and Auxiliary Optical shelf OS4. The connections are listed in the following table and shown in the following figure.

If the cables are not installed, install as described in Installing RICC Cable (Optical Shelf).

Table 10: RICC Connections between Auxiliary Optical Shelf OS2 and Auxiliary Optical Shelf OS4

From Backplane Connector			To Backplane Connector		
Shelf	Connector Group	Connector	Shelf	Connector Group	Connector
OS2	RICC (MCMA-2)	CN25 (PORT5)	OS4	RICC (MCMA-2)	CN34 (PORT3)
	RICC (MCMA-1)	CN30 (PORT6)		RICC (MCMA-1)	CN28 (PORT4)
	RICC (MCMA-1)	CN29 (PORT5)		RICC (MCMA-2)	CN24 (PORT4)
	RICC (MCMA-2)	CN26 (PORT6)		RICC (MCMA-1)	CN37 (PORT3)

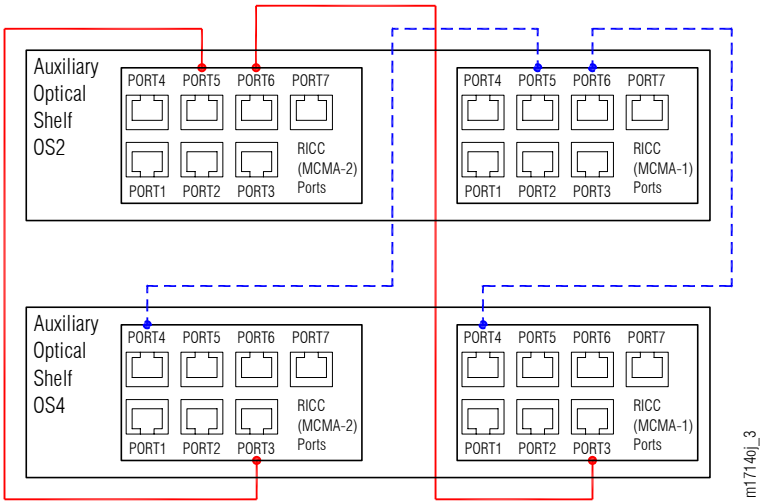


Figure 30: RICC Connections between Auxiliary Optical Shelf OS2 and Auxiliary Optical Shelf OS4 Backplanes

Step 8

Verify that all four RICC cables have been installed between Auxiliary Optical shelf OS3 and Auxiliary Optical shelf OS4. The connections are listed in the following table and shown in the following figure.

Install the cables, if they are not already installed, as described in Installing RICC Cable (Optical Shelf).

Table 11: RICC Connections between Auxiliary Optical Shelf OS3 and Auxiliary Optical Shelf OS4

From Backplane Connector			To Backplane Connector		
Shelf	Connector Group	Connector	Shelf	Connector Group	Connector
OS3	RICC (MCMA-2)	CN25 (PORT5)	OS4	RICC (MCMA-2)	CN25 (PORT5)
		CN26 (PORT6)		RICC (MCMA-1)	CN29 (PORT5)

Table 11: RICC Connections between Auxiliary Optical Shelf OS3 and Auxiliary Optical Shelf OS4 (Cont.)

From Backplane Connector			To Backplane Connector		
Shelf	**Connector Group**	**Connector**	**Shelf**	**Connector Group**	**Connector**
	RICC (MCMA-1)	CN29 (PORT5)		RICC (MCMA-2)	CN26 (PORT6)
		CN30 (PORT6)		RICC (MCMA-1)	CN30 (PORT6)

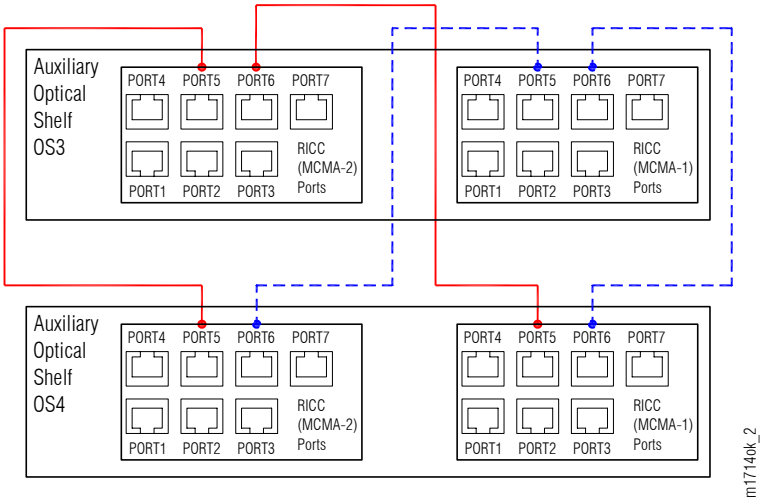


Figure 31: RICC Connections between Auxiliary Optical Shelf OS3 and Auxiliary Optical Shelf OS4 Backplanes

Step 9
Proceed to Apply Power, and Install Fan Plug-In Units.

2.4.4 Apply Power, and Install Fan Plug-In Units

Note: *The fan plug-in units are equipped with preinstalled fan filters.*

Step 1
Apply power to each shelf as follows:

a) Ensure that power is available at the rack as indicated by illumination of the green PWR indicators on the power distribution panel at the top of the rack.

b) Set the appropriate circuit breaker at the distribution panel to the ON position to apply power to the shelf.

Step 2
Install fan plug-in units in each shelf as follows:

a) Inspect the fan plug-in unit for possible damage or debris.

b) Verify that a fan filter is installed in the fan plug-in unit. See the following figure for the fan filter location.

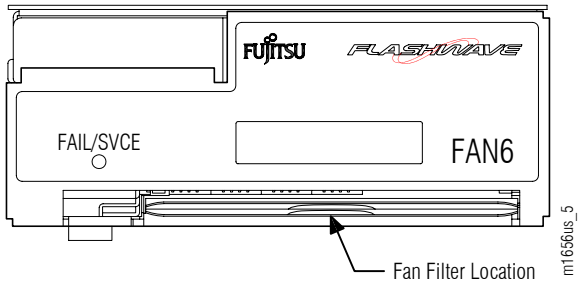


Figure 32: Fan Filter Location

c) Slide the fan plug-in unit into one of the fan slots located at the bottom of the shelf.

d) Ensure that the FAIL/SVCE indicator is lit green.

e) Repeat until four fan plug-in units are installed in each shelf.

Step 3
Proceed to Install Primary NE Management Units in Shelf OS1, and Configure Shelf OS1 as the Main Optical Shelf.

2.5 Install Primary NE Management Units in Shelf OS1, and Configure Shelf OS1 as the Main Optical Shelf

In this section:

Prerequisites:

If not already done, complete the procedures in Verify Shelf Labeling, Verify LAN and RICC Cable Connections, Apply Power, and Install Fan Units.

If you are using the NETSMART 500 Element Manager for provisioning, be sure the computer meets or exceeds the following system requirements (refer to *FNC-0500-0311-010, NETSMART 500 User Guide)*:

- Microsoft® Windows® operating system:
  - Windows 2000 (Service Pack 4)
  - Windows XP Professional (Service Packs 1 and 2)
- 450 MHz Pentium® processor (1.2 GHz or faster recommended)
- 128 MB RAM (512 MB RAM recommended), approximately 30 MB of memory (random access or virtual) per NETSMART 500 session
- 400 MB disk space (minimum)
- CD drive
- LAN card and/or serial craft interface port and connection cable
- 8-bit color (256 colors) minimum (16-bit color recommended)

- 800×600 resolution (optimized for 1024×768 or larger resolution)
- Web browser:
  - Internet Explorer version 5.5 or later
  - Netscape® version 4.7 (complete installation) or later
  - Mozilla® Firefox® version 1.0 or later

Initially, due to factory default settings, shelf OS1 does not behave as the Main Optical shelf. Shelf OS1 becomes the Main Optical shelf after the system keyword TYPE has been changed from the default value (FW7500TRIB) to FW7500U_OADM (refer to Step 7).

The steps in Verify Software Version ensure the NEM Shelf Processor unit (MPMA-SHPx), installed in slot MPMA-1, is running the correct software version. When additional NEM Shelf Processors or OSC plug-in units are installed, the system will automatically update the software on these units, if necessary, to match the software running on this first NEM, installed the unit in slot MPMA-1.

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

Note: *For plug-in unit slot locations, refer to Slot Labels and AIDs.*

Note: *Default values are shown in bold.*

This procedure shows how to install the primary NE management units, and configure shelf OS1 as the Main Optical shelf.

2.5.1 Install MPMA-SHPx Plug-In Unit

Step 1
Install the MPMA-SHPx plug-in unit in shelf OS1 as follows:

a) Inspect the unit for possible damage or debris.

b) Install the unit into slot MPMA-1 of shelf OS1.

The NOT READY and FAIL/SVCE indicators should immediately light amber.

Note: *If the NOT READY and FAIL/SVCE indicators do not light amber, verify that wiring to the PWR terminal located in the back of the shelf is correct. Remove the plug-in unit and then repeat Step 1.*

After 5 to 20 minutes, the amber NOT READY and FAIL/SVCE indicators should go out, and the FAIL/SVCE indicator should light green.

Step 2
After waiting up to 20 minutes, did the FAIL/SVCE indicator on the MPMA-SHPx plug-in unit light green?

If YES:
Proceed to Step 3.

If NO:
The NEM Shelf Processor unit may be defective. Remove the unit and set it aside for repair paperwork processing. Obtain another NEM Shelf Processor plug-in unit. Return to Step 1 and repeat this procedure on that NEM Shelf Processor unit.

Step 3
Establish a craft interface connection through connector TERM1 or TERM2 on the front of the Main Optical shelf (OS1). Refer to the following table for a listing of set-up procedures.

Table 12: Craft Interface Set-Up Procedures

Type of User Interface	Craft Interface Connector	Set-Up Procedure
TL1 user interface	TERM1 (Serial)	Setting Up Craft Interface (TL1 Session through TERM1)
	TERM 2 (LAN, TCP/IP)	Setting Up Craft Interface (TL1 Session through TERM2)
NETSMART 500 user interface	TERM1 (Serial)	Setting Up Craft Interface (NETSMART 500 Session through TERM1)
	TERM 2 (LAN, TCP/IP)	Setting Up Craft Interface (NETSMART 500 Session through TERM2)

Note: *A TERM1 (serial) connection allows continuous connectivity between the craft interface and the NE. With a TERM2 (TCP/IP) connection, the communication link between the craft interface and the NE is severed when the INIT-SYS and INIT-OIF commands are processed. The severing of the communication link requires you to reestablish your logon session with the NE.*

Step 4
Log on the NE.

Note: *At this stage, you can only log on the NE using the factory default values for the target identifier (TID), user identifier (UID), and private identifier (PID). TID, UID, and PID values are not case-sensitive.*

Note: *The following table includes brief instructions for setting up the craft interface connection, which should have been completed in the previous step.*

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen appears. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft Windows platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard appears. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

`ACT-USER:TID:UID:CTAG::PID;`
 	
TID: FUJITSU (factory default value)
 	
UID: ROOT (factory default value)
 	
PID: ROOT (factory default value)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[7]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

2.5.2 Verify Software Version

Step 5
Retrieve the software version information.

[7] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`RTRV-VERSION:TID::CTAG;`
 	
Example:
`RTRV-VERSION:FUJITSU::CTAG;`
	The Shelf Provisioning Mode dialog box opens.[8]
	Click OK.
	
	In the Current Values area of the Operations[9] dialog box, determine the value of the Active GISSUE.
	
	Do not close the Operations dialog box.

Step 6
Is the active GISSUE correct?

The correct GISSUE value for FLASHWAVE 7500 Release 9.1 software is 09-01-1.

If YES:
Proceed to Step 7.

If NO:
Upgrade the system software as described in Upgrading System Software Using TL1 Commands or Upgrading System Software Using NETSMART 500 Software Download Wizard, then repeat this subprocedure.

2.5.3 Change System Type

Step 7
Change system type from FW7500TRIB to FW7500U_OADM.

Note: *This command terminates the communication session and restarts the NE.*

TL1	NETSMART 500

`ED-SYS:TID::CTAG:::`
`TYPE=FW7500U_OADM;`
 	
Example:
`ED-SYS:FUJITSU::CTAG:::`
`TYPE=FW7500U_OADM;`
	In the Operations dialog box:
	• Select the NE Type tab
	• From the Type drop-down list, select FW7500U_OADM.
	• Click Modify.
	
	The Confirmation dialog box opens.
	Click OK.

The NOT READY indicator on the NEM Shelf Processor plug-in unit lights amber and then goes out after 5 to 20 minutes. After the NOT READY indicator goes out, the FAIL/SVCE indicator lights green on the NEM Shelf Processor unit.

[8] The Shelf Provisioning Mode dialog only appears when logging on to a factory default shelf.
[9] Upon logging on a factory default shelf, the Operations dialog is automatically opened with the NE Type tab selected. However, if the Operations dialog box does not open automatically, select System Operations from the NE menu and, after the Operations dialog box appears, click the Attributes tab, then the NE Type tab.

Step 8
After the NOT READY indicator goes out and the FAIL/SVCE indicator lights green and stays green, proceed to Step 9.

Step 9
Log on the NE.

Note: *At this stage, you can only log on the NE using factory default values of the target identifier (TID), user identifier (UID), and private identifier (PID). TID, UID, and PID values are not case-sensitive.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Craft Interface Operations .

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen appears. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft Windows platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard appears. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

`ACT-USER:TID:UID:CTAG::PID;`
 	
TID: FUJITSU (factory default value)
 	
UID: ROOT (factory default value)
 	
PID: ROOT (factory default value)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[10]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

[10] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

Step 10
Reinitialize the system software.

Note: *This command automatically logs the user off the NE.*

TL1	NETSMART 500

`INIT-SYS:TID:AID:CTAG:::LEVEL=WARM;`
AID:
• ALL (null)
Example:
`INIT-SYS:FUJITSU::CTAG:::LEVEL=WARM;`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click the Initialize tab.
	Click the NE tab.
	Select Level: WARM.
	Click Initialize.
	Click Yes in the pop-up window to continue.
	If a second pop-up window opens, the connection is lost, and you must log on the NETSMART 500 user interface again to continue by clicking Logon.

The NOT READY indicator on the NEM Shelf Processor plug-in unit lights amber and then goes out after 5 to 20 minutes. After the NOT READY indicator goes out, the FAIL/SVCE indicator lights green on the NEM Shelf Processor unit.

Step 11
After the NOT READY indicator goes out and the FAIL/SVCE indicator lights green and stays green, proceed to Step 12.

Step 12
Log on the NE.

Note: *At this stage, you can only log on the NE using factory default values of the target identifier (TID), user identifier (UID), and private identifier (PID). TID, UID, and PID values are not case-sensitive.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Craft Interface Operations .

<table>
<tr><th>TL1</th><th>NETSMART 500</th></tr>
<tr><td>Start a terminal or terminal emulator program (for example, HyperTerminal).

For TERM1 (Serial):
Press CTRL+X.

For TERM2 (TCP/IP):
Establish a Telnet session using IP address 192.168.1.1 and default port 23.

The Welcome screen appears.
Press 3 for TL1.</td><td>To launch the NETSMART 500 user interface from a Microsoft Windows platform, select the following from the Windows taskbar:

Start ▸ All Programs ▸ Fujitsu ▸ NETSMART 500

The NETSMART 500 Dashboard appears.

Click the Logon icon, or select :

NE ▸ Logon

Note: If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.

The NE Logon dialog box opens.
Make the following selections:</td></tr>
<tr><td>ACT-USER:TID:UID:CTAG::PID;

TID: FUJITSU (factory default value)

UID: ROOT (factory default value)

PID: ROOT (factory default value)

Example:
ACT-USER:FUJITSU:ROOT:CTAG::ROOT;</td><td>For TERM1 (Serial):
TID: FUJITSU
User ID: ROOT
Password: ROOT
Conn. Mode: Serial

Comm. Port: COMx (for example, COM2)

Configure: use default[11]

For TERM2 (TCP/IP):
TID: FUJITSU
User ID: ROOT
Password: ROOT
Conn. Mode: TCP/IP
IP Address: 192.168.1.1
Port: 2024

Click Logon.

The NETSMART 500 NE View opens.

The Security Message dialog box opens.
Click OK.

Note: Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.</td></tr>
</table>

Step 13
Is this node to be provisioned as an asymmetric HUB node?

Note: *For an asymmetric HUB node, keyword HUBMODE must be changed from AUTO (default) to MANUAL. For more information on symmetric and asymmetric HUB nodes, refer to* Core Configuration *in* Core Configuration.

If YES:
Proceed to Step 14.

If NO:
Proceed to Step 16.

[11] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

2.5.4 Change HUBMODE to MANUAL

Step 14
Change keyword HUBMODE from AUTO to MANUAL.

TL1	NETSMART 500

`ED-SYS:TID::CTAG:::HUBMODE=MANUAL;`
 	
Example:
`ED-SYS:FUJITSU::CTAG::: HUBMODE=MANUAL;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click the Attributes tab.
	Click the Modify tab.
	Set HUBMODE to MANUAL.
	Click Modify.
	
	The Confirmation dialog box opens.
	Click OK.
	
	Do not close the Operations dialog box.

Step 15
Verify that keyword HUBMODE is set to MANUAL.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
 	
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the value of HUBMODE is MANUAL.
	
	Close the Operations dialog box.

Step 16
Following local practice, do you want to provision shelf location identifiers?

Note: *Shelf location identifiers, SHELFLBL and USERLBL, are optional parameters that precisely identify the location of equipment. If provisioned, the values appear in equipment retrieval and alarm messages. The SHELFLBL value indicates the physical location of the bay and shelf. The USERLBL value indicates the frame identification code (FIC). Telcordia® NMA® OSMINE™ users should keep the SHELFLBL and USERLBL parameters values as NULL (default). For more information, refer to* Shelf Location Identifiers.

If YES:
Proceed to Step 17.

If NO:
Proceed to Step 19.

2.5.5 Provision Shelf Location Identifiers

Step 17
Edit the values of shelf location identifiers (SHELFLBL and/or USERLBL).

TL1	NETSMART 500

`ED-EQPT:TID:AID:CTAG:::`
`KEYWORD=DOMAIN;`
AID:
• OS1
KEYWORD=DOMAIN:
• SHELFLBL = *Up to 13 characters with each character an uppercase letter (A...Z) or number (0...9)* (**null** is default)
• USERLBL = *Up to 20 characters with each character an uppercase letter (A...Z), number (0...9), or hyphen (-)* (**null** is default)
Example:
`ED-EQPT:FUJITSU:OS1:CTAG:::`
`SHELFLBL=MAINSHELF,USERLBL=PLANO;`
	In the tree view, click the Equipment tab.
	Expand the appropriate shelf components.
	Select the equipment component.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	In the Command Parameters area type values into the SHELFLBL and/or USERLBL fields, if required.
	Click Modify.
	Do not close the Operations dialog box.

Step 18
Verify the values of the shelf location identifiers.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS1:CTAG;`
	In the Current Values area of the Operations dialog box, verify equipment provisioning.
	Close the Operations dialog box.

2.5.6 Provision OSC Units

Step 19
Depending on your work order, install one or two OSC (SCMA-SCC4) plug-in units in the appropriate slots (9 and 11) of shelf OS1. For each OSC plug-in unit to be installed, do the following:

The NOT READY indicators light amber and then go out after 5 to 20 minutes. Independently, the FAIL/SVCE indicators light green.

Note: *The NOT READY indicator remains amber until the backup database is completely copied to the OSC unit. During this time, CPY-MEM and CPY-FILE functions are unavailable and the OSC unit should not be removed.*

a) Inspect the OSC plug-in unit for possible damage or debris.

b) Slide the OSC plug-in unit into the Optical shelf slot.

Note: *Because autoprovisioning is on (by default), the OSC units will begin provisioning when they are inserted into the shelf.*

Step 20
Wait until both of the following conditions are met, then proceed to Step 21.

- NOT READY indicators on the OSC plug-in units go out.
- FAIL/SVCE indicators on the OSC plug-in units light green.

Step 21
Ensure that OSC plug-in units are properly provisioned and that the equipment state is IS, Normal (STATE=IS-NR).

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• OS1-9 (slot 9)
• OS1-11 (slot 11)
Example:
`RTRV-EQPT:FUJITSU:OS1-9&OS1-11:CTAG;`
	In the Optical shelf OS1 graphic view or tree view area, select the equipment slot.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify the PRIMARY_STATE is IS.
	Verify the PRIMARY_STATE_QUALIFIER is NR.
	Close the Properties dialog box.

Step 22
Retrieve and verify software version information.

TL1

`RTRV-VERSION:TID:AID:CTAG;`
AID:
- ACT, STBY, **ALL**

Example:
`RTRV-VERSION:FUJITSU::CTAG;`

Step 23
Is the system running Release 8.1 or Release 8.1.2 system software?

Note: *Release 8.1 introduces the Expansion Pack that addresses plug-in unit firmware storage limitations. The Expansion Pack should be loaded to the processor prior to installing the remaining plug-in units (optical line cards). The Expansion Pack should be downloaded on all Release 8.1 and later systems.*

If YES:
Go to Download Firmware Expansion Pack Files Using TL1Commands or Download Firmware Expansion Pack Files Using NETSMART 500 Expansion Pack Firmware Download Wizard document to download the Expansion Pack firmware files. Then proceed to Step 25.

If NO:
Proceed to the next step.

Step 24
Does the system need to be upgraded to Release 9.1 system software?

Note: *FLASHWAVE 7500 NEs loaded with Release 4.x software must be upgraded to Release 5.1 before being upgraded to Release 5.2, 5.2.2, or 6.x. After upgrading to Release 5.2 or 5.2.2, the FLASHWAVE 7500 NE can be upgraded to Release 6.x or 7.x. After upgrading to Release 6.x, the FLASHWAVE 7500 NE can be upgraded to 7.x, 8.x, or 9.x.*

If YES:
Upgrade the system software as described in Upgrading System Software Using TL1 Commands or Upgrading System Software Using NETSMART 500 Software Download Wizard, then proceed to the next step.

If NO:
Proceed to the next step.

Step 25
Go to Provision System-Level Parameters, LCN Port, and GOS.

✔ This procedure is complete.

2.6 Provision System-Level Parameters, LCN Port, and GOS

In this section:

2.6.1 Provision System-Level Parameters

This subprocedure includes steps to set the NE target identifier (TID), change the date and time, and enter new users.

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to* Introduction to TL1 Commands *for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
If not already done, complete the procedures in Install Primary NE Management Units in Shelf OS1, and Configure Shelf OS1 as the Main Optical Shelf.

Step 2
If not already done, log on the NE.

Note: *At this stage, you can only log on the NE using factory default values of the target identifier (TID), user identifier (UID), and private identifier (PID). TID, UID, and PID values are not case-sensitive.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Craft Interface Operations .

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen appears. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft Windows platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard appears. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

`ACT-USER:TID:UID:CTAG::PID;`
 	
TID: FUJITSU (factory default value)
 	
UID: ROOT (factory default value)
 	
PID: ROOT (factory default value)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[12]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Step 3
Inhibit the autonomous messages.

Note: *This step does not apply if you are using the NETSMART 500 user interface.*

Caution: *Ensure that the autonomous messages are allowed after these procedures have been completed. Failure to allow the autonomous messages could cause loss of traffic or the ability to detect remote troubles.*

[12] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`INH-MSG-ALL:TID::CTAG;`
 	
Example:
`INH-MSG-ALL:FUJITSU::CTAG;`
	n/a

Note: *Autonomous messages are inhibited until Step 3 of Provision GOS, when the command is entered to allow autonomous messages.*

Step 4

Change the system identifier (SID) from the default value, *FUJITSU*, to a unique identifier. This identifier acts as the shelf address in the network. The new SID must be from 7 to 20 alphanumeric characters. Hyphens are allowed.

Note: *Allow approximately 20 seconds after completion of the command before verifying the new SID.*

TL1	NETSMART 500

`SET-SID:TID::CTAG::SID;`
TID:
• Existing system ID
SID:
• New system ID
 	
Example:
`SET-SID:FUJITSU::CTAG::FUJITSU1;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click the Attributes tab.
	Click the System ID tab.
	
	In the Command Parameters area, enter the new system identifier (SID).
	Click Modify.
	
	Click Yes in the pop-up window to continue.
	
	A second pop-up window will indicate that the connection has been lost. You will have to log on the NETSMART 500 user interface again to continue.
	
	Note: *If using TERM1 (serial connection), the second pop-up window will not appear, you will not be logged off, and you will not need to log on again. In the tree view, verify the new SID. Proceed to Step 6.*
	Click Logon.

Step 5

Verify the new SID.

Note: *NETSMART 500 users should wait approximately 20 seconds before attempting to log on the NE using the new SID.*

TL1	NETSMART 500

`RTRV-HDR:TID::CTAG;`
TID:
 	
New system ID
 	
Note: *The TID is the same as the SID set in the previous step.*
 	
Example:
`RTRV-HDR:FUJITSU1::CTAG;`
	To launch the NETSMART 500 user interface from a Microsoft Windows platform, select the following from the Windows task bar:
	
	Start ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500*
	
	The NETSMART 500 Dashboard appears.
	
	Click the Logon icon, or select :
	
	NE ▸ *Logon*
	
	Note: *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.*
	
	The NE Logon dialog box opens.
	Make the following selections:
	
	For **TERM1** (Serial):
	TID: Use new SID
	User ID: ROOT
	Password: ROOT
	Conn. Mode: Serial
	Comm. Port: COMx
	(for example, COM2)
	
	For **TERM2** (TCP/IP):
	TID: Use new SID
	User ID: ROOT
	Password: ROOT
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Configure: use default[13]
	
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 graphical user interface.*
	
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click the System ID tab.
	Verify the value of SID.
	
	Close the Operations dialog box.

Step 6

Set the system date, time, and time zone.

Note: *If TZONE is set to a value with DT (that is, xxxxxDT), the time is adjusted automatically for Daylight Saving Time, and a REPT EVT COM message is generated when the adjustment occurs.*

[13] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

Note: *Enter the date in the format YYMMDD (year/month/day) and the time in the 24-hour format HHMMSS (hour/minute/second).*

TL1	NETSMART 500

`SET-DAT:TID::CTAG::DATE,TIME:KEYWORD=DOMAIN;`
DATE:
• YYMMDD
TIME:
• HHMMSS
KEYWORD=DOMAIN:
• Refer to the following table.
Example:
`SET-DAT:FUJITSU::CTAG::990727,050958:TZONE=CST6CDT;`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click the Attributes tab.
	Click the Time tab.
	In the Command Parameters area:
	• Enter the date (YYYYMMDD).
	• Enter the time (HHMMSS).
	• Select a time zone (Refer to the following table).
	Click Modify.
	Do not close the Operations dialog box.

Table 13: SET-DAT Keyword and Domain Input Parameters

Keyword	Domain[14] (Default in Bold)		Description
TZONE	**NODST**		Disables the daylight savings time feature
	NSTNDT		Newfoundland time zone
	AST4	AST4ADT	Atlantic time zone
	EST5	EST5EDT	Eastern time zone
	CST6	CST6CDT	Central time zone
	MST7	MST7MDT	Mountain time zone
	PST8	PST8PDT	Pacific time zone
	AKST9	AKST9AKDT	Alaska time zone
	HST10		Hawaii time zone
	GMT		Greenwich mean time

Step 7

Verify the system date, time, and time zone.

[14] **Values to the right enable automatic daylight savings time adjustment**

TL1	NETSMART 500

`RTRV-DAT:TID::CTAG;`
 	
Example:
`RTRV-DAT:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the updated information is correct.
	
	Close the Operations dialog box.

Step 8
Do you want to change from the default basic security mode to the enhanced security mode?

Note: *For more information about the basic and enhanced security modes, refer to* Security.

Note: *Changing the security level is allowed only by Level 4 users.*

If YES:
Continue with Step 9.

If NO:
Proceed to Step 14.

Step 9
Change the basic security mode to the enhanced security mode.

TL1	NETSMART 500

`ED-DFLT-SECU:TID::CTAG:::`
`SECULVL=ENHANCED;`
 	
Example:
`ED-DFLT-SECU:FUJITSU::CTAG:::`
`SECULVL=ENHANCED;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click the Security tab.
	Click the Settings tab.
	
	Select Enhanced from the SECULVL drop-down list.
	Click Modify.
	
	Do not close the Operations dialog box.

Step 10
Verify that the security mode has changed to the enhanced security mode.

TL1	NETSMART 500

`RTRV-DFLT-SECU:TID::CTAG;`
 	
Example:
`RTRV-DFLT-SECU:FUJITSU::CTAG:`
	In the Current Values area of the Operations dialog box, verify that the updated information is correct.

Step 11
Do you want to change the default Fujitsu security warning message banner to a customized warning message banner?

If YES:
Continue with the next step.

If NO:
Proceed to Step 14.

Step 12
Enter the customized warning message banner information.

TL1	NETSMART 500

`ED-DFLT-SECU:TID::CTAG:::WARN=;`
 	
Example:
`ED-DFLT-SECU:FUJITSU::CTAG:::`
`WARN=\"THIS COMPUTER IS FOR SECURITY`
`PERSONAL ONLY, AUTHORIZED USE REQUIRED\";`
	NE ▸ *Security Administration*
	
	The Security Administration dialog box opens.
	Click the Settings tab.
	
	Click the WARN box and then enter required banner warning message in text box.
	Click Modify.
	
	Do not close the Operations dialog box.

Step 13
Verify the warning message banner has changed.

TL1	NETSMART 500

`RTRV-DFLT-SECU:TID::CTAG;`
 	
Example:
`RTRV-DFLT-SECU:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the updated information is correct.
	
	Close the Operations dialog box.

Step 14
If required, enter additional security information (new users and privilege levels, updated security levels).

Note: *The maximum number of UIDs in the system is 100. This command will be denied if the number of UIDs exceeds 100.*

TL1	NETSMART 500

`ENT-SECU-USER:TID:UID:CTAG::PID,,UPC:KEYWORD=DOMAIN;`
UID:
• User identifier for new user (4 to 10 alphanumeric characters)
PID:
• Private identifier:
  • BASIC mode–6 to 10 characters, including at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -.
  • ENHANCED mode–10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.
UPC:
• User privilege code (1, 2, 3, or 4, with Level 4 allowing greatest access to commands)
KEYWORD=DOMAIN:
• TMOUTA = **Y**, N (Y enables automatic logoff after the specified number of minutes of user inactivity. N disables automatic logoff.)
• TIMEOUT = 5…**10**…**30**…60 (time-out period in minutes when TMOUTA=Y; defaults are 30 minutes for BASIC mode and 10 minutes for ENHANCED mode.)
• UAGE = 1…90, **99** (The UID aging interval expressed in days. UAGE=99 disables UAGE.)
• PAGE = 25…90, **99** (The PID aging interval expressed in days. PAGE=99 disables PAGE.)
Example:
`ENT-SECU-USER:FUJITSU:ROOT:CTAG::NEWPID9,,2:TMOUTA=N;`
	NE ▸ *Security Administration* ▸ *User tab* ▸ *Create*
	Enter the new user ID in the UID field.
	Enter the password in the PID field.
	Select the user privilege code (1…4) in the UPC field.
	In the TMOUTA field, select True to enable automatic time-out or False to disable automatic time-out.
	If automatic time-out is enabled, enter the time-out period (5…60 minutes) in the TIMEOUT field.
	Select the UID aging interval (1…90, 99) from the UAGE pull-down menu.
	Select the PID aging interval (25…90, 99) from the PAGE pull-down menu.
	Click Create.

Step 15

If security information was added or changed in the previous step, verify the new users and privilege levels.

TL1	NETSMART 500

`RTRV-SECU-USER:TID:UID:CTAG;`
UID:
• User identifier; 4 to 10 non-case sensitive alphanumeric characters
Example:
`RTRV-SECU-USER:FUJITSU:BILL:CTAG;`
	In the tree view, click the Users tab.
	If necessary, expand the tree view to show the new users added.
	Select the new user.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify the properties for the given user.
	Close the Properties dialog box.

Step 16
Set the system contact and location information, if required.

TL1	NETSMART 500

`ED-SYS:TID::CTAG:::KEYWORD=DOMAIN;`
KEYWORD=DOMAIN:
• CONTACT = \"*up to 40 characters*\"
• LOCATION = \"*up to 40 characters*\"
Example:
`ED-SYS:FUJITSU::CTAG:::`
`CONTACT=\"BILLJONES\",`
`LOCATION=\"HINSDALE\";`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click the Attributes tab.
	Click the Modify tab.
	In the Command Parameters area, enter required information in CONTACT and LOCATION fields.
	Click Modify.
	Do not close the Operations dialog box.

Step 17
Verify the system contact and location information.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the updated information is correct.
	Close the Operations dialog box.

Step 18
Do you wish to provision the LCN port to allow remote provisioning over the data network?

If YES:
Proceed to Provision LCN Port.

If NO:
Proceed to Provision GOS.

2.6.2 Provision LCN Port

Provisioning the local communications network (LCN) port involves setting the IP address of the operations support system (OSS) port, placing the LCN port in service (using the ED-LAN command), and finally issuing the INIT-OIF command to enable pending provisioning changes by the system.

The following LCN provisioning restrictions apply:

- The MASK cannot take the following values: 0.0.0.0 or 255.255.255.255.
- The following IP addresses cannot be assigned as the NE IP address:
  - 0.0.0.0 (use of this IP address is allowed but will delete the IP interface)
  - 255.255.255.255
  - 127.xxx.xxx.xxx
  - 224.xxx.xxx.xxx through 239.xxx.xxx.xxx (Class D—not for normal use)
- The NE IP address cannot be the same as the one provisioned by the ENT-CIDR-ROUTE command.
- When the LCN port is used as part of the default gateway (via the ENT-CIDR-ROUTE command), its IP address cannot be changed.

Step 1
If not already done, complete the system parameter provisioning procedures in Provision System-Level Parameters.

Step 2
Set the IP address and mask of the LCN port.

Note: *See your System Administrator for valid IP addresses that can be used on your network.*

TL1	NETSMART 500

`ED-IP-ADDR:TID:LCN:CTAG::: KEYWORD=DOMAIN;`
KEYWORD=DOMAIN:
• MASK = xxx.xxx.xxx.xxx (xxx = 0…255), **255.255.255.0**
• IP = xxx.xxx.xxx.xxx (xxx = 0…255), **0.0.0.0**
• PORT = 1024…**2024**…65535
Example:
`ED-IP-ADDR:FUJITSU:LCN:CTAG::: MASK=255.255.255.128, IP=123.255.255.121,PORT=2024;`
	In the tree view, click the Communications tab.
	Select *LCN (IP)*.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	In the Command Parameters area:
	• Enter the IP address (IP) for the NE.
	• Enter the IP subnet mask (MASK).
	• Enter the Transmission Control Protocol (TCP) port number (PORT).
	Click Modify.
	A confirmation dialog box opens.
	Click Yes to close the confirmation dialog box and continue.
	Close the Operations dialog box.

Step 3
Place LCN port in service (IS state).

TL1	NETSMART 500

`ED-LAN:TID:LCN:CTAG::: KEYWORD=DOMAIN:IS;`
KEYWORD=DOMAIN:
• TARP = **Y**, N
• SIZE = 86…**1518**
• LSAP = **FE**
• OSI = Y, **N**
• IPFWD = **Y**, N
• NETID = User-defined network identifier. Character string of up to 20 alphanumeric delineated by escape quotes (\").
Example:
`ED-LAN:FUJITSU:LCN:CTAG:::SIZE=150:IS;`
	In the tree view, click the Communications tab.
	Expand the parent LCN component by clicking the plus sign (+) to the left of *LCN (IP)*.
	Select the LCN (LAN) component.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	In the Command Parameters area:
	• Select IS from the STATE drop-down list.
	• Make additional parameter modifications as required.
	Click Modify.
	A confirmation dialog box opens.
	Click Yes to close the confirmation dialog box and continue.
	Close the Operations dialog box.

Step 4
Enter default gateway if required.

Note: *There are preconditions associated with the ENT-CIDR-ROUTE command. Refer to* Enter CIDR Route (ENT-CIDR-ROUTE)*, for a list of preconditions, restrictions and keywords associated with the ENT-CIDR-ROUTE command.*

TL1	NETSMART 500
ENT-CIDR-ROUTE:TID::CTAG::LCN: KEYWORD=DOMAIN; KEYWORD=DOMAIN: • DESTIP = 0.0.0.0 • DESTMASK = 0.0.0.0 • NEXTHOP = xxx.xxx.xxx.xxx (xxx = 0…255) • METRIC = 0…**100**…65535 ***Example:*** **ENT-CIDR-ROUTE:FUJITSU::CTAG:: LCN:DESTIP=0.0.0.0, DESTMASK=0.0.0.0, NEXTHOP=128.167.154.170;** ***Note:*** *The NEXTHOP IP address is the same as the gateway IP address.*	*NE* ▸ *Create* Select the IP Routes tab. Select the Enter tab. In the Command Parameters area: • Enter the destination IP address (DESTIP). • Enter the destination IP address mask (DESTMASK). • Enter the IP address of the next system on the route (NEXTHOP). • Enter the cost metric of the route (METRIC). • Select LCN from the PORT drop-down list. Click Enter. A confirmation dialog box opens. Click Yes to close the confirmation dialog box and continue.

Step 5
How are you connected to the NE?

TERM1 (serial)— Go to Step 6.

TERM2 (TCP/IP)— Go to Step 8.

Step 6
Initialize the operation interface (OIF) through a TERM1 (serial) connection.

Note: *The INIT-OIF command must be executed before the ED-IP-ADDR, ED-LAN, and ENT-CIDR-ROUTE commands become effective.*

TL1	NETSMART 500

`INIT-OIF:TID::CTAG;`
 	
Example:
`INIT-OIF:FUJITSU::CTAG;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click Initialize tab.
	Select the Stack tab.
	
	In the Command Parameters area:
	
	Select OIF from the STACK INIT TYPE drop-down list.
	Click Initialize.
	
	A confirmation dialog box opens.
	
	Note: *The confirmation message refers to an Initialize Stack operation. The Initialize Stack operation is the initialization of the OSI stack that results from the processing of the INIT-OIF command.*
	Click Yes.

Step 7
Wait 2 minutes, then go to Step 11.

Step 8
Initialize the operation interface (OIF) through a TERM2 connection.

Note: *The INIT-OIF command must be executed before the ED-IP-ADDR, ED-LAN, and ENT-CIDR-ROUTE commands become effective.*

TL1	NETSMART 500

`INIT-OIF:TID::CTAG;`
 	
Example:
`INIT-OIF:FUJITSU::CTAG;`
	NE ▸ *System Operations*
	
	Click Initialize tab.
	
	In the Command Parameters area:
	
	Select OIF from the STACK INIT TYPE drop-down list.
	Click Initialize.
	
	A confirmation dialog box opens.
	
	Note: *The confirmation message refers to an Initialize Stack operation. The Initialize Stack operation is the initialization of the OSI stack that results from the processing of the INIT-OIF command.*
	Click Yes.
	
	A connection warning dialog box opens, indicating that the connection has been lost. You will have to log on the NETSMART 500 user interface again when it is time to continue.
	
	Click Logon in the pop-up window to continue.

Note: *The NETSMART 500 connection to the NE will be lost. After waiting 2 minutes, NETSMART 500 users should log back on the NE.*

Step 9
Wait 2 minutes before continuing.

Step 10
Log on the NE.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft Windows platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

TL1	NETSMART 500

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	Comm. Port: COMx (for example, COM2)
	Configure: use default[15]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	The NETSMART 500 NE View opens.
	The Security Message dialog box opens.
	Click OK.
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 graphical user interface.*

Step 11
Verify the IP address and mask of the LCN port.

TL1	NETSMART 500

`RTRV-IP-ADDR:TID:LCN:CTAG;`
Example:
`RTRV-IP-ADDR:FUJITSU:LCN:CTAG;`
	In the tree view, click the Communications tab.
	Select the *LCN (IP)* component.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify the IP address (IP), mask (MASK), and port (PORT) of the LCN port.
	Close the Properties dialog box.

Step 12
Verify that the LAN is in service.

[15] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`RTRV-LAN:TID:LCN:CTAG;`
Example:
`RTRV-LAN:FUJITSU:LCN:CTAG;`
	In the tree view, click the Communications tab.
	Expand the parent LCN component by clicking the plus sign (+) to the left of *LCN (IP)*.
	Select the *LCN (LAN)* component.
	Entity ▸ ***Properties View***
	The Properties dialog box opens.
	Verify that the LCN port is in service (STATE: IS).
	Close the Properties dialog box.

Step 13
Verify the default gateway.

TL1	NETSMART 500

`RTRV-CIDR-ROUTE:TID::CTAG::PORT:`
`KEYWORD=DOMAIN;`
PORT:
• LCN (local communication network port)
• **ALL** (default)
KEYWORD=DOMAIN:
• NEXTHOP = xxx.xxx.xxx.xxx (xxx = 0…255)
• **ALL**
Example:
`RTRV-CIDR-ROUTE:FUJITSU::CTAG;`
	In the tree view, click the Communications tab.
	Select the <TID> (SYSTEM) component.
	Entity ▸ ***Properties View***
	Select the IP Routes tab.
	Verify current values.
	Close the Properties dialog box.

Step 14
Proceed to Provision GOS.

2.6.3 Provision GOS

The grade of service (GOS) table stores system-level default values for newly created entities, including equipment, facility, and ports entities. It can be used to modify default provisioning in the following areas:

- Default PM threshold levels (PMs)
- Default threshold crossing alerts (TCAs)

- Default alarm severity for standing conditions (ALMs)
- Default values for certain entity attributes (keyword parameter values) of managed objects (MOs)

Attention: *GOS provisioning does not change the provisioning of existing entities (equipment, facilities, or ports). Changes are only applicable to new entities, created after the GOS table is changed. To promote uniformity, Fujitsu recommends that GOS provisioning be performed at turn-up.*

Step 1
If not already done, complete the system parameter provisioning procedures provided in Provision System-Level Parameters.

Step 2
Do you wish to provision GOS?

Note: *If GOS provisioning is part of your local practice, Fujitsu recommends that GOS provisioning be performed at this time.*

If YES:
Perform GOS provisioning as described in Provisioning GOS, then proceed to Step 3.

If NO:
Proceed to Step 3.

Step 3
Allow autonomous messages, which were inhibited in Step 3 of Provision System-Level Parameters.

Note: *This step does not apply if you are using the NETSMART 500 user interface.*

TL1	NETSMART 500

`ALW-MSG-ALL:TID::CTAG;`
Example:
`ALW-MSG-ALL:FUJITSU::CTAG;`
	The NETSMART 500 graphical user interface does not support this TL1 command.
	NE ▸ *TL1 Command Builder*
	The Command Builder dialog opens.
	Select the ALW-MSG-ALL command in the Command Name field.
	Click Send.
	Close the TL1 Command Builder dialog box.

Step 4
Does the node include subtending shelves (Auxiliary Optical shelves and/or Tributary shelves)?

If YES:
Proceed to Create Subtending Shelves and Install Shelf Processors .

If NO:
Proceed to Provision Optical Shelf Equipment and Facilities.

2.7 Create Subtending Shelves and Install Shelf Processors

In this section:

2.7.1 Install Shelf Processors

The purpose of this subprocedure is to install NE Management (NEM) Shelf Processor (MPMA-SHPx) plug-in units in the Auxiliary Optical shelves OSn (n = 2...4, 25, 26) and Tributary shelves OSn (n = 10...13, 20...23, 30...33, 40...43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430), as required. For plug-in unit slot locations, refer to Slot Labels and AIDs, and Slot Labels and AIDs.

Step 1
If not already done, complete the procedures provided in Provision System-Level Parameters, LCN Port, and GOS.

Step 2
Install an MPMA-SHPx plug-in unit in each subtending shelf as follows:

a) Inspect the unit for possible damage or debris.

b) Install the unit into the MPMA-1 slot of the shelf.

The NOT READY and FAIL/SVCE indicators should immediately light amber.

Note: *If the NOT READY and FAIL/SVCE indicators do not light amber, verify that wiring to the PWR terminal in the rear of the shelf is correct, remove the plug-in unit, and then repeat Step 2.*

After approximately 5 minutes, the amber NOT READY and FAIL/SVCE indicators should go out.

Note: *After the indicators go out, they remain unlit until the shelf entity is created (*Create Auxiliary Optical Shelf Equipment Entities *or* Create Tributary Shelf Entities*). After the shelf entity is created, the FAIL/SVCE indicator will light green.*

Step 3
Does the node include one or more Auxiliary Optical shelves?

If YES:
Proceed to Create Auxiliary Optical Shelf Equipment Entities.

If NO:
Proceed to Create Tributary Shelf Entities.

2.7.2 Create Auxiliary Optical Shelf Equipment Entities

Create Auxiliary Optical shelves as follows:

Step 1
If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[16]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024

	Click Logon. The NETSMART 500 NE View opens. The Security Message dialog box opens. Click OK. ***Note:*** *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Step 2

For each Auxiliary Optical shelf OS2...OS4, as required, create the Auxiliary Optical shelf equipment entity, and place it in service.

Note: *Do not create Auxiliary Optical shelves OS25 or OS26 at this time.*

Note: *Shelf location identifiers, SHELFLBL and USERLBL, are optional parameters that precisely identify the location of equipment. If provisioned, the values appear in equipment retrieval and alarm messages. The SHELFLBL value indicates the physical location of the bay and shelf. The USERLBL value indicates the frame identification code (FIC). Telcordia NMA OSMINE users should keep the SHELFLBL and USERLBL parameters values as NULL (default). For more information, refer to* Shelf Location Identifiers.

[16] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::TYPE:KEYWORD=DOMAIN:IS;`
AID:
• OS2…OS4
TYPE:
• **SHU3**
KEYWORD=DOMAIN:
• SHELFLBL = *Up to 13 characters with each character an uppercase letter (A…Z) or number (0…9)* (**null** is default)
• USERLBL = *Up to 20 characters with each character an uppercase letter (A…Z), number (0…9), or hyphen (-)* (**null** is default)
Example:
`ENT-EQPT:FUJITSU:OS2:CTAG::SHU3::IS;`
	NE ▸ *Create*
	The Operations dialog box opens.
	Click the Shelf tab.
	In the Command Parameters area:
	• Select the appropriate AIDs.
	• Select the Type.
	• Select the State (IS).
	Type values into the SHELFLBL and/or USERLBL fields, if required.
	Click Create.
	Close the Operations dialog box.

Step 3
Verify that the Auxiliary Optical shelf equipment entity is in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As specified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS2:CTAG;`
	In the tree view, select the Equipment tab.
	Select the appropriate shelf.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify that the equipment Primary state is IS and that other properties are correct.
	Close the Properties dialog box.

Note: *The FAIL/SVCE indicator on (MPMA-SHPx) plug-in unit in slot MPMA-1 of this shelf should now be lit green.*

Step 4
Repeat Steps 2 through 3 for each Auxiliary Optical shelf OS2…OS4, as required.

Step 5
Does the node include Auxiliary Optical shelf OS25 or OS26?

If YES:
Proceed to Step 6.

If NO:
Proceed to Step 9.

Step 6
For each Auxiliary Optical shelf OS25 and OS26, as required, create the Auxiliary Optical shelf equipment entity, and place it in service.

Note: *Shelf location identifiers, SHELFLBL and USERLBL, are optional parameters that precisely identify the location of equipment. If provisioned, the values appear in equipment retrieval and alarm messages. The SHELFLBL value indicates the physical location of the bay and shelf. The USERLBL value indicates the frame identification code (FIC). Telcordia NMA OSMINE users should keep the SHELFLBL and USERLBL parameters values as NULL (default). For more information, refer to* Shelf Location Identifiers.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::TYPE: KEYWORD=DOMAIN:IS;`
AID:
• OS25, OS26
TYPE:
• **SHU3**
KEYWORD=DOMAIN:
• SHELFLBL = *Up to 13 characters with each character an uppercase letter (A...Z) or number (0...9)* (**null** is default)
• USERLBL = *Up to 20 characters with each character an uppercase letter (A...Z), number (0...9), or hyphen (-)* (**null** is default)
Example:
`ENT-EQPT:FUJITSU:OS25:CTAG::SHU3: :IS;`
	NE ▸ *Create*
	The Operations dialog box opens.
	Click the Shelf tab.
	In the Command Parameters area:
	• Select the appropriate AIDs.
	• Select the Type.
	• Select the State (IS).
	Type values into the SHELFLBL and/or USERLBL fields, if required.
	Click Create.
	Close the Operations dialog box.

Step 7
Verify that the Auxiliary Optical shelf equipment entity is in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As specified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS25:CTAG;`
	In the tree view, select the Equipment tab.
	Select the appropriate shelf.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify that the equipment Primary state is IS and that other properties are correct.
	Close the Properties dialog box.

Step 8
Repeat Steps 6 through 7 for each Auxiliary Optical shelf OS25 and OS26, as required.

Step 9
Is the FAIL/SVCE indicator on the MPMA-SHPx plug-in unit within each of the Auxiliary Optical shelves lit green?

If YES:
Proceed to Step 12.

If NO:
Proceed to Step 10.

Step 10
Reinitialize the system software with LEVEL=WARM and ADOPT=SHELF.

Note: *This command automatically logs the user off the NE.*

TL1	NETSMART 500

`INIT-SYS:TID:AID:CTAG:::LEVEL=WARM, ADOPT=SHELF;`
AID:
• ALL (null)
Example:
`INIT-SYS:FUJITSU::CTAG:::LEVEL=WARM, ADOPT=SHELF;`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click the Initialize tab.
	Click the NE tab.
	Select Level: WARM.
	Select Adopt: SHELF.
	Click Initialize.
	Click Yes in the pop-up window to continue.
	If a second pop-up window opens, the connection is lost, and you must log on the NETSMART 500 user interface again to continue by clicking Logon.

The NOT READY indicator on the NEM Shelf Processor plug-in unit lights amber and then goes out after 5 to 20 minutes. After the NOT READY indicator goes out, the FAIL/SVCE indicator lights green on the NEM Shelf Processor unit.

Step 11
Is the FAIL/SVCE indicator on the MPMA-SHPx plug-in unit within each of the Auxiliary Optical shelves lit green?

If YES:
Proceed to Step 12.

If NO:
The MPMA-SHPx plug-in unit may be defective.

1. Remove the MPMA-SHPx plug-in unit from slot MPMA-1, and set it aside for repair paperwork processing.
2. Obtain another MPMA-SHPx plug-in unit, and install it in slot MPMA-1.
   After 5 to 20 minutes, the amber NOT READY and FAIL/SVCE indicators should go out, and the FAIL/SVCE indicator should light green.
3. If the FAIL/SVCE indicator lights green, proceed to Step 12. If it does not, call Fujitsu at 1-800-USE-FTAC for technical assistance.

Step 12
Does the node include one or more Tributary shelves?

If YES:
Proceed to Create Tributary Shelf Entities.

If NO:
Proceed to Provision Optical Shelf Equipment and Facilities.

2.7.3 Create Tributary Shelf Entities

These steps create the Tributary shelf equipment entities and place them in service.

A shelf equipment entity cannot be created until supporting entities in the hierarchy (see the following figures) are created. For example, shelf OS100 cannot be created until shelf OS10 has been created.

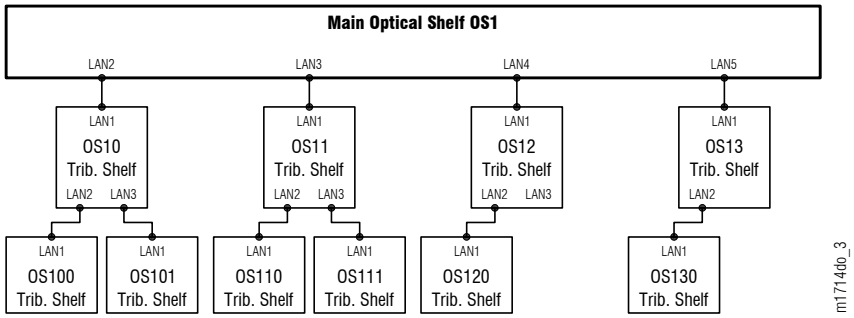


Figure 33: Shelf Hierarchy at ROADM Node

Note: *A single node cannot support all of the Tributary shelves shown in the following figure. A node can support no more than 20 Tributary shelves.*

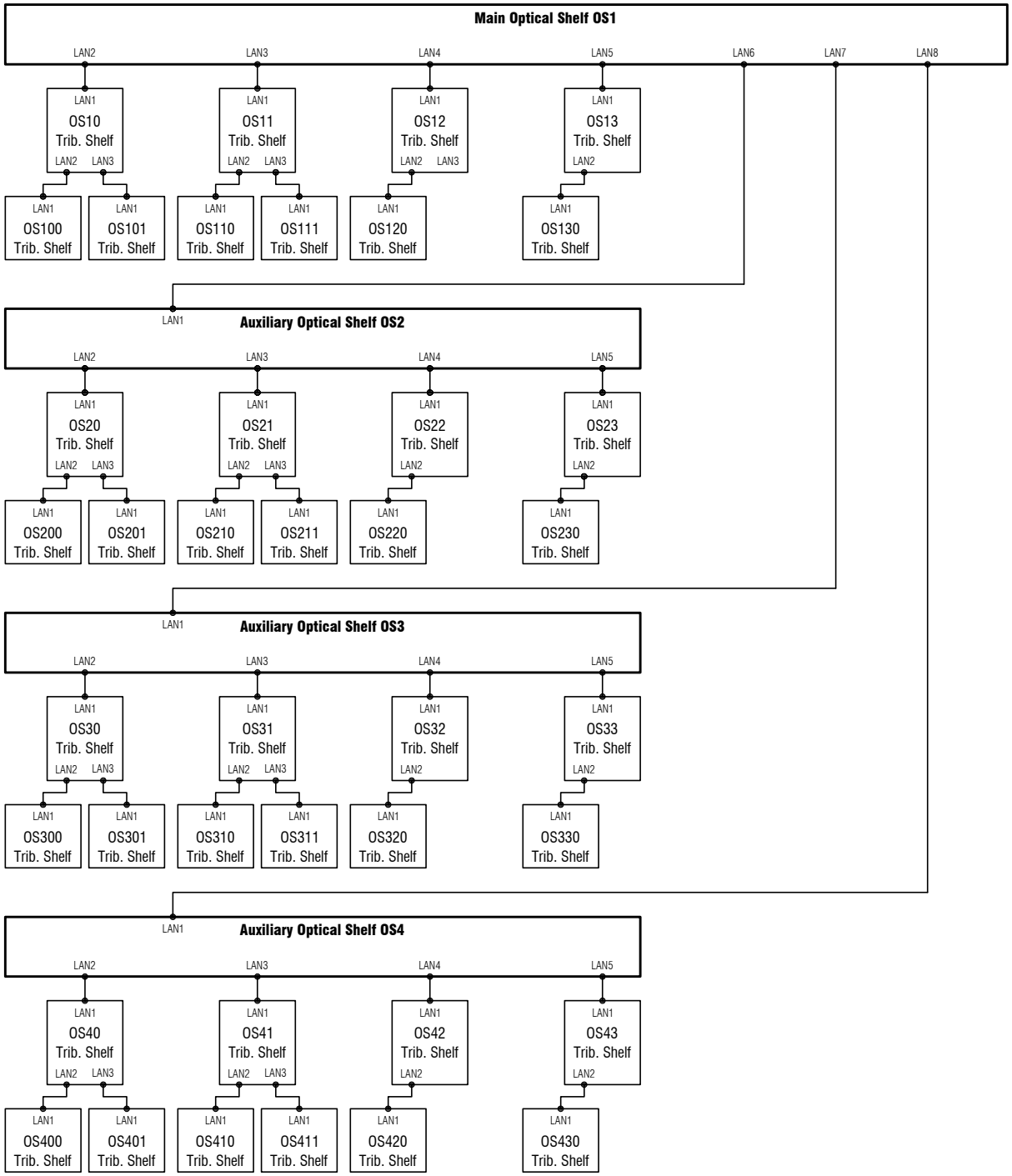


Figure 34: Shelf Hierarchy at HUB Node

This subprocedure includes steps to create all Tributary shelves that can be supported. Omit steps for Tributary shelves that are not included in the work order.

This procedure assumes the following:

- LAN cables and fan units (FAN6) have already been installed in each Tributary shelf (Verify Shelf Labeling, Verify LAN and RICC Cable Connections, Apply Power, and Install Fan Units).
- NE Management (NEM) Shelf Processor units (MPMA-SHPx) have already been installed in each Tributary shelf (Install Shelf Processors).
- The Auxiliary Optical shelves OSn (n = 2...4), if used, have already been created (Create Auxiliary Optical Shelf Equipment Entities).

Step 1
If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

<table>
<tr><th>TL1</th><th colspan="2">NETSMART 500</th></tr>
<tr><td rowspan="2">ACT-USER:TID:UID:CTAG::PID;
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
Example:
ACT-USER:FUJITSU:ROOT:CTAG::ROOT;</td><td>For TERM1 (Serial):
TID: FUJITSU
User ID: ROOT
Password: ROOT/(Route66K)
Conn. Mode: Serial
Comm. Port: COMx (for example, COM2)
Configure: use default[17]</td><td>For TERM2 (TCP/IP):
TID: FUJITSU
User ID: ROOT
Password: ROOT/(Route66K)
Conn. Mode: TCP/IP
IP Address: 192.168.1.1
Port: 2024</td></tr>
<tr><td colspan="2">Click Logon.
The NETSMART 500 NE View opens.
The Security Message dialog box opens.
Click OK.
Note: Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.</td></tr>
</table>

Step 2

For each Tributary shelf OS10…OS13, OS20…OS23, OS30…OS33, and OS40…OS43, as required, create the equipment entity and place it in service.

Note: *Do not create Tributary shelves OS100, OS101, OS110, OS111, OS120, OS130, OS200, OS201, OS210, OS211, OS220, OS230, OS300, OS301, OS310, OS311, OS320, OS330, OS400, OS401, OS410, OS411, OS420, or OS430 at this time.*

Note: *Shelf location identifiers SHELFLBL and USERLBL are optional parameters that precisely identify the location of equipment. If provisioned, the values appear in equipment retrieval and alarm messages. The SHELFLBL value indicates the physical location of the bay and shelf. The USERLBL value indicates the frame identification code (FIC). Telcordia NMA OSMINE users should keep the SHELFLBL and USERLBL parameters values as NULL (default). For more information, refer to* Shelf Location Identifiers.

[17] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::TYPE:KEYWORD=DOMAIN:IS;`
AID:
• OS10…OS13
• OS20…OS23
• OS30…OS33
• OS40…OS43
Note: *See Figure 34 for Tributary shelf hierarchy and AIDs.*
TYPE:
• **SHU3**
KEYWORD=DOMAIN:
• SHELFLBL = Up to 13 characters with each character an uppercase letter (A…Z) or number (0…9) (**null** is default)
• USERLBL = Up to 20 characters with each character an uppercase letter (A…Z), number (0…9), or hyphen (-) (**null** is default)
Example:
`ENT-EQPT:FUJITSU:OS10:CTAG::SHU3::IS;`
	NE ▸ *Create*
	The Operations dialog box opens.
	Click the Shelf tab.
	In the Command Parameters area:
	• Select the appropriate AIDs.
	• Select the Type.
	• Select the State (IS).
	Type values into the SHELFLBL and/or USERLBL fields, if required.
	Click Create.
	Close the Operations dialog box.

Step 3
Verify that the shelf equipment entity is in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS10:CTAG;`
	In the tree view, select the Equipment tab.
	Select the appropriate shelf.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify that the equipment Primary state is IS and that other properties are correct.
	Close the Properties dialog box.

Step 4
Repeat Steps 2 through 3 for each Tributary shelf OS10…OS13, OS20…OS23, OS30…OS33, and OS40…OS43, as required.

Step 5
Does the node include Tributary shelves OS100, OS101, OS110, OS111, OS120, OS130, OS200, OS201, OS210, OS211, OS220, OS230, OS300, OS301, OS310, OS311, OS320, OS330, OS400, OS401, OS410, OS411, OS420, or OS430?

If YES:
Proceed to Step 6.

If NO:
Proceed to Step 9.

Step 6
For each Tributary shelf OS100, OS200, OS300, OS400, as required, create the equipment entity and place it in service.

Note: *Shelf location identifiers SHELFLBL and USERLBL are optional parameters that precisely identify the location of equipment. If provisioned, the values appear in equipment retrieval and alarm messages. The SHELFLBL value indicates the physical location of the bay and shelf. The USERLBL value indicates the frame identification code (FIC). Telcordia NMA OSMINE users should keep the SHELFLBL and USERLBL parameters values as NULL (default). For more information, refer to* Shelf Location Identifiers.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::TYPE:KEYWORD=DOMAIN:IS;`
AID:
• OS100, OS101, OS110, OS111, OS120, OS130,
• OS200, OS201, OS210, OS211, OS220, OS230,
• OS300, OS301, OS310, OS311, OS320, OS330,
• OS400, OS401, OS410, OS411, OS420, OS430
• ***Note:*** *See Figure 34 for Tributary shelf hierarchy and AIDs.*
TYPE:
• **SHU3**
KEYWORD=DOMAIN:
• SHELFLBL = *Up to 13 characters with each character an uppercase letter (A...Z) or number (0...9)* (**null** is default)
• USERLBL = *Up to 20 characters with each character an uppercase letter (A...Z), number (0...9), or hyphen (-)* (**null** is default)
Example:
`ENT-EQPT:FUJITSU:OS100:CTAG::SHU3::IS;`
	NE ▸ *Create*
	The Operations dialog box opens.
	Click the Shelf tab.
	In the Command Parameters area:
	• Select the appropriate AIDs.
	• Select the Type.
	• Select the State (IS).
	Type values into the SHELFLBL and/or USERLBL fields, if required.
	Click Create.
	Close the Operations dialog box.

Step 7
Verify that the shelf equipment entity is in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS100:CTAG;`
	In the tree view, select the Equipment tab.
	Select the appropriate shelf.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify that the equipment Primary state is IS.
	Close the Properties dialog box.

Step 8
Repeat Steps 6 through 7 for each Tributary shelf OS100, OS101, OS110, OS111, OS120, OS130, OS200, OS201, OS210, OS211, OS220, OS230, OS300, OS301, OS310, OS311, OS320, OS330, OS400, OS401, OS410, OS411, OS420, and OS430, as required.

Step 9
For each Tributary shelf in the node, verify that the FAIL/SVCE indicator is lit green on each NEM Shelf Processor (MPMA-SHPx) plug-in unit.

Step 10
Are the FAIL/SVCE indicators lit green on all Tributary shelf MPMA-SHPx plug-in units?

If YES:
Proceed to Step 15.

If NO:
Proceed to Step 11.

Step 11
Reinitialize the system software with LEVEL=WARM and ADOPT=SHELF.

Note: *This command automatically logs the user off the NE.*

TL1	NETSMART 500

`INIT-SYS:TID:AID:CTAG:::LEVEL=WARM, ADOPT=SHELF;`
AID:
• ALL (null)
Example:
`INIT-SYS:FUJITSU::CTAG:::LEVEL=WARM, ADOPT=SHELF;`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click the Initialize tab.
	Click the NE tab.
	Select Level: WARM.
	Select Adopt: SHELF.
	Click Initialize.
	Click Yes in the pop-up window to continue.
	If a second pop-up window opens, the connection is lost, and you must log on the NETSMART 500 user interface again to continue by clicking Logon.

The NOT READY indicator on the NEM Shelf Processor plug-in unit lights amber and then goes out after 5 to 20 minutes. After the NOT READY indicator goes out, the FAIL/SVCE indicator lights green on the NEM Shelf Processor unit.

Step 12
Are the FAIL/SVCE indicators lit green on all Tributary shelf MPMA-SHPx plug-in units?

If YES:
Proceed to Step 15.

If NO:
Choose any Tributary shelf that does not have green FAIL/SVCE indicators on the MPMA-SHPx plug-in units, and proceed to Step 13.

Step 13
Remove the MPMA-SHPx plug-in unit from slot MPMA-1, and set it aside for repair paperwork processing. Obtain another MPMA-SHPx plug-in unit, and install it in slot MPMA-1.

After 5 to 20 minutes, the amber NOT READY and FAIL/SVCE indicators should go out, and the FAIL/SVCE indicator should light green.

Step 14
If the FAIL/SVCE indicator lights green, return to Step 9. If it does not, call Fujitsu at 1-800-USE-FTAC for technical assistance.

Step 15
Proceed to Provision Optical Shelf Equipment and Facilities.

2.8
Provision Optical Shelf Equipment and Facilities

In this section:

The following figure shows a flowchart of how these subprocedures are used to turn-up an Optical shelf.

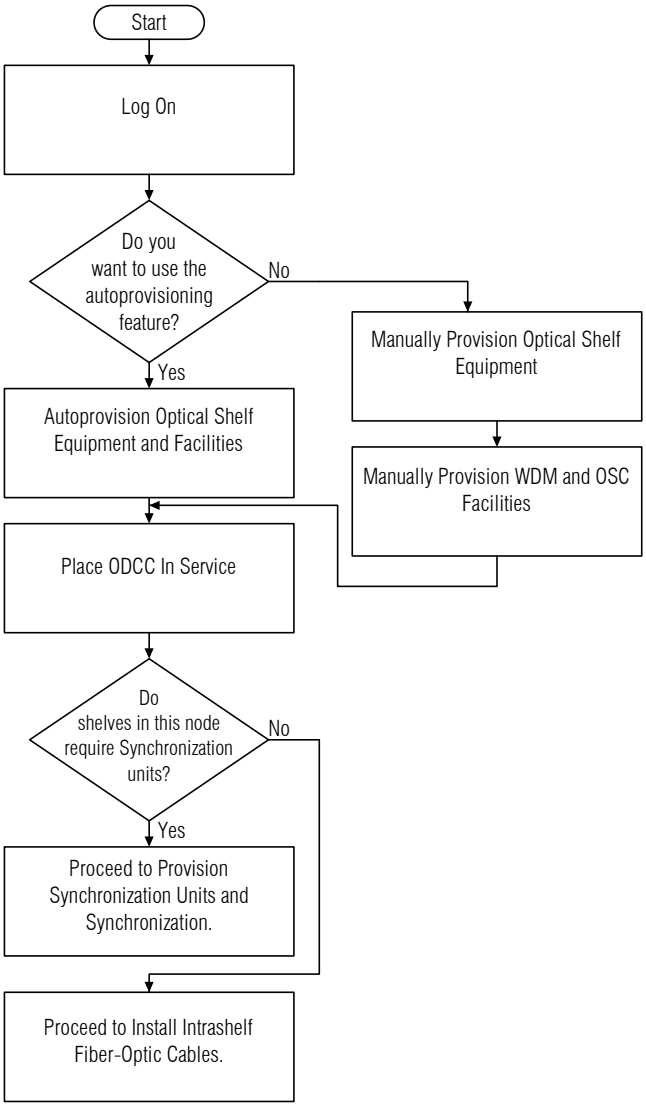


Figure 35: Provision Optical Shelf Equipment and Facilities (Procedure Flowchart)

2.8.1 Log On

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to* Introduction to TL1 Commands *for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections: For **TERM1** (Serial): TID: FUJITSU User ID: ROOT Password: ROOT/(Route66K) Conn. Mode: Serial Comm. Port: COMx (for example, COM2) Configure: use default[18] For **TERM2** (TCP/IP): TID: FUJITSU User ID: ROOT Password: ROOT/(Route66K) Conn. Mode: TCP/IP IP Address: 192.168.1.1 Port: 2024

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

[18] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

Step 2
In provisioning the Optical shelf equipment and facilities, do you want to use the autoprovisioning feature?

If YES:
Proceed to Autoprovision Optical Shelf Equipment and Facilities.

If NO:
Proceed to Manually Provision Optical Shelf Equipment.

2.8.2 Autoprovision Optical Shelf Equipment and Facilities

The following figure shows a flowchart of how these subtasks are used to autoprovision the Optical shelf equipment and facilities.

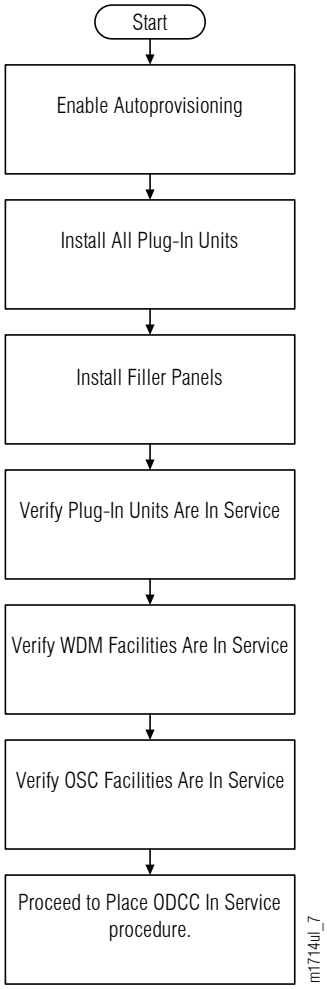


Figure 36: Autoprovision Optical Shelf Equipment and Facilities (Subprocedure Flowchart)

This subprocedure describes one method for installing and provisioning plug-in units in the Optical shelf OSn (n = 1...4, 25, 26). Another option is to use the procedures in Manually Provision Optical Shelf Equipment, and Manually Provision WDM and OSC Facilities.

Note: *For plug-in unit slot locations, refer to* Slot Labels and AIDs.

The FLASHWAVE 7500 system provides automatic provisioning of the equipment and facilities and also provides the automatic in-service provisioning (AISP) capability for all facility types. Autoprovisioning and AISP are the default software settings.

After the plug-in unit is seated, the equipment entity is created and placed in service. Facilities are also created and placed in an Out-of-Service (OOS), Auto In-Service (AINS) state. While in the AINS state, alarms such as LOS are not generated, and the system waits for the application of a valid signal. Upon receiving a valid signal, the system begins a time-out period and then automatically transitions to the

In-Service (IS) state. The default time-out period is 8 hours and can be modified using the ED-SYS command.

Note: *All equipment except shelves can be autoprovisioned. Shelves require manual provisioning to be placed in service.*

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

If the facility is lost during the time-out period because of LOF or LOS, the time-out period is reset. Normal alarm reporting begins when the time-out period has completed and the transition to the IS state has occurred.

Install and autoprovision Optical shelf equipment as follows:

Enable Autoprovisioning

Note: *You should already be logged on the NE (refer to Step 1).*

Note: *Default values are shown in bold.*

Step 1
Retrieve the state of the autoprovisioning feature.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
 	
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the tree view, select the NE (the top-level system entity).
	
	Entity ▸ *Properties View*
	
	In the Current Values area of the Properties dialog box, determine the value of AUTOP (Yes or No).
	
	Close the Properties dialog box.

Step 2
Is autoprovisioning already enabled? (Is the current value of AUTOP set to Yes?)

If YES:
Proceed to Step 5.

If NO:
Proceed to Step 3.

Step 3
Enable autoprovisioning, and provision the AISP feature and the AISP timer if necessary.

TL1	NETSMART 500

`ED-SYS:TID::CTAG:::KEYWORD=DOMAIN;`
KEYWORD=DOMAIN:
• CONTACT = Contact information; 40-character string delineated by escape quotes (\"string\")
• LOCATION = Location information; 40-character string delineated by escape quotes (\"string\")
• AUTOP = **Y**, N (autoprovisioning)
• AISPDEFTM = 00-00…**08-00**…48-00 (default valid signal timer in 1-minute increments)
Example:
`ED-SYS:FUJITSU::CTAG:::AUTOP=Y, AISPDEFTM=08-00;`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click the Attributes tab.
	Click the Modify tab.
	Set AUTOP to Yes.
	Click Modify.
	Do not close the Operations dialog box.

Step 4
Verify that autoprovisioning is enabled.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the updated information is correct.
	Close the Operations dialog box.

Install All Plug-In Units

Step 5
Refer to your work order to identify the plug-in units to be installed in the Optical shelf OSn (n = 1…4, 25, 26).

Note: Slot Labels and AIDs, *describes the plug-in units that are supported by each slot of the Optical shelf. However, in most applications, the Optical shelf is not fully populated with plug-in units. The work order should specify which slots should be equipped.*

Note: *Examples that show the plug-in units required in typical applications are given in* About System Turn-up Core Configuration .

Step 6
Install the plug-in units, identified in the previous step, in their appropriate slots. Refer to Slot Labels and AIDs for slot locations. For each plug-in unit to be installed, do the following:

a) Inspect the plug-in unit for possible damage or debris.

b) Slide the unit into the appropriate shelf slot.

Install Filler Panels

Step 7
Install filler panels in any unused slots.

Verify Plug-In Units Are In Service

Step 8
Ensure that each of the plug-in units installed in the previous step is properly provisioned and that the equipment state is IS, Normal (STATE=IS-NR). Refer to Slot Labels and AIDs, for plug-in unit listing.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• Equipment slot AID (refer to Slot Labels and AIDs)
• **ALL**
Example:
`RTRV-EQPT:FUJITSU::CTAG;`
	In the shelf OS1 graphic view or tree view, select the equipment slot.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify the PRIMARY_STATE is IS.
	Verify the PRIMARY_STATE_QUALIFIER is NR.
	Close the Properties dialog box.

Verify WDM Facilities Are In Service

Note: *Depending on your work order, you installed one or two amplifier (APMA-xxxx) plug-in units in Step 6. Amplifier plug-in units are located in slots 1 and 19 of the Optical shelf.*

Step 9
Verify that the WDM facility associated with each installed amplifier plug-in unit is in service and provisioned correctly.

TL1	NETSMART 500

`RTRV-WDM:TID:AID:CTAG;`
AID:
• OSn-1-PE1 (WDM facility for slot-1 amplifier)
• OSn-19-PE1 (WDM facility for slot-19 amplifier)
  • n = 1…4, 25, 26
Example:
`RTRV-WDM:FUJITSU:OS1-1-PE1:CTAG;`
	In the tree view, click the Facilities tab. Select the facility.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify that In-Service state and provisioning parameters are correct.
	Close the Properties dialog box.

Step 10
Are the WDM facilities in service and provisioned correctly?

If YES:
Proceed to Step 11.

If NO:
Correct WDM facility provisioning using procedures described in Editing Facility State, or Editing Facility Parameters. Then proceed to Step 11.

Verify OSC Facilities Are In Service

Step 11
Verify that the OSC facility associated with each installed OSC plug-in unit is in service and provisioned correctly.

TL1	NETSMART 500

`RTRV-OSC:TID:AID:CTAG;`
AID:
• OSn-9-PE1 (OSC facility for slot-9 plug-in unit)
• OSn-11-PE1 (OSC facility for slot-11 plug-in unit)
  • n = 1...4, 25, 26
Example:
`RTRV-OSC:FUJITSU:OS1-9-PE1:CTAG;`
	In the tree view, click the Facilities tab.
	Select the facility.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify that In-Service state and provisioning parameters are correct.
	Close the Properties dialog box.

Step 12
Are the OSC facilities in service and provisioned correctly?

If YES:
Proceed to Step 13.

If NO:
Correct OSC facility provisioning using procedures described in Editing Facility State, or Editing Facility Parameters. Then proceed to Place ODCC In Service.

Step 13
Repeat Steps 5 through 12 for each Optical shelf OSn (n = 1...4, 25, 26), as required.

Step 14
Proceed to Place ODCC In Service.

✔ This procedure is complete.

2.8.3 Manually Provision Optical Shelf Equipment

The flowchart in the following figure shows how these subtasks are used to manually provision the Optical shelf equipment.

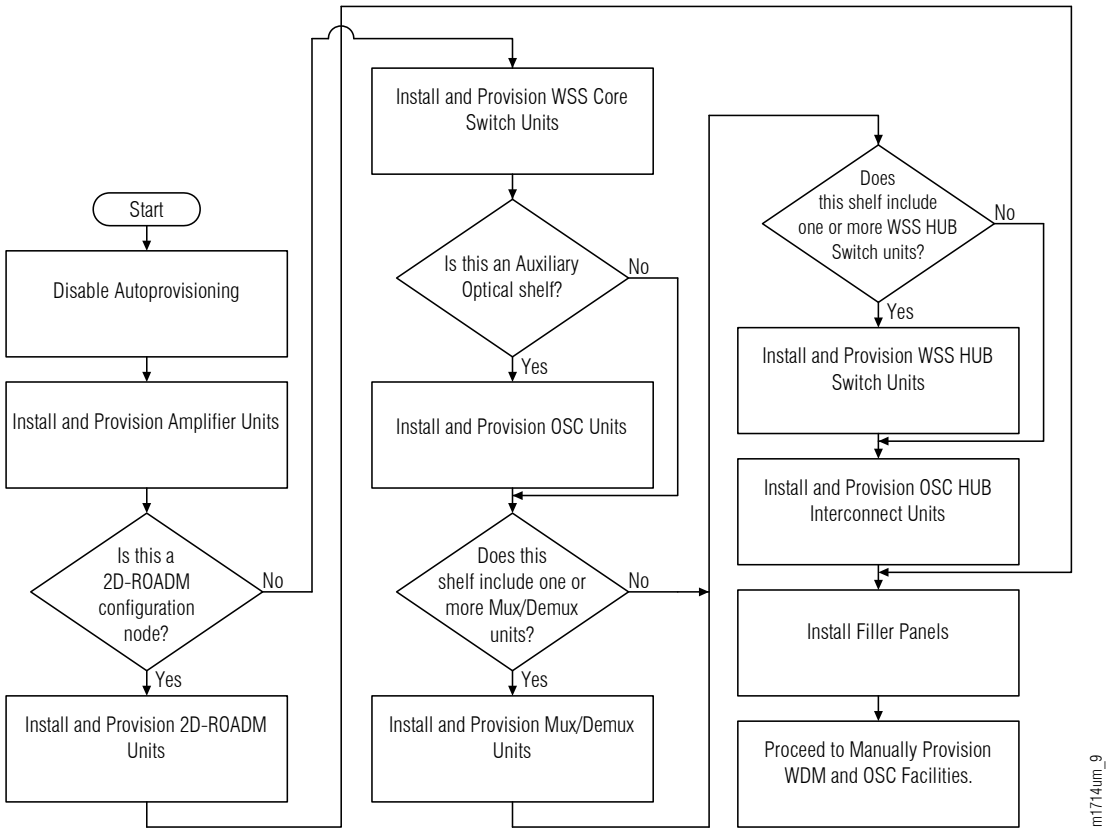


Figure 37: Manually Provision Optical Shelf Equipment (Subprocedure Flowchart)

This subprocedure describes one method for installing and provisioning plug-in units in the Optical shelf OSn (n = 1...4, 25, 26). For an alternative method, refer to Autoprovision Optical Shelf Equipment and Facilities.

Note: *For plug-in unit slot locations, refer to* Slot Labels and AIDs.

This subprocedure includes steps to equip and manually provision each slot of the Optical shelf that can support a plug-in unit. However, in most applications, the Optical shelf is not fully populated with plug-in units. The work order should specify which slots should be equipped. Within this subprocedure, omit all steps associated with slots that are not equipped in the work order.

Note: *Examples that show the plug-in units required in typical applications are given in* About System Turn-up Core Configuration .

Note: *This procedure includes steps to install plug-in units in the appropriate slots in the Optical shelf. However, if certain plug-in units are not available, you can complete the procedure without installing them. This is called preprovisioning the slot. In this case, the unit will assume the specified provisioning when the unit is eventually installed in the slot. Note that an unequipped alarm will be raised until the unit is installed.*

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

Install and manually provision equipment in the Optical shelf OSn (n = 1...4, 25, 26) as follows:

Disable Autoprovisioning

Note: *You should already be logged on the NE (refer to Log On).*

Note: *Default values are shown in bold.*

Step 1
Retrieve the state of the autoprovisioning feature.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the tree view, select the NE (the top-level system entity).
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	In the Current Values area of the Properties dialog box, determine the value of AUTOP (Yes or No).
	Close the Properties dialog box.

Step 2
Is autoprovisioning already disabled? (Is the current value of AUTOP set to No?)

If YES:
Proceed to Step 5.

If NO:
Proceed to Step 3.

Step 3
Disable the autoprovisioning feature.

Note: *If autoprovisioning is already disabled, this command will fail.*

TL1	NETSMART 500

`ED-SYS:TID::CTAG:::AUTOP=N;`
 	
Example:
`ED-SYS:FUJITSU::CTAG:::AUTOP=N;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click the Attributes tab.
	Click the Modify tab.
	Set AUTOP to No.
	Click Modify.
	
	Do not close the Operations dialog box.

Step 4
Verify that the autoprovisioning feature is disabled.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
 	
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the value of AUTOP is No.
	
	Close the Operations dialog box.

Install and Provision Amplifier Unit(s)

Step 5
Depending on your work order, install one or two amplifier (APMA-xxxx) plug-in units in the appropriate slots (1 and 19) of the Optical shelf. For each amplifier plug-in unit to be installed, do the following:

a) Inspect the amplifier plug-in unit for possible damage or debris.

b) Slide the amplifier plug-in unit into the Optical shelf slot.

Step 6
For each plug-in unit installed in the previous step, create the amplifier equipment entity, and place it in service.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::TYPE::IS;`
AID:
• OSn-1 (slot 1)
• OSn-19 (slot 19)
  • n = 1…4, 25, 26
TYPE:
• APMA-L2C1
• **APMA-M2C1**
• APMA-ULC1
• APMA-M2U1
• APMA-ULU1
• APMA-MHU1
Example:
`ENT-EQPT:FUJITSU:OS1-1:CTAG::`
`APMA-L2C1::IS;`
	In the tree view, select the Equipment tab.
	Expand the appropriate Optical shelf OSn (n = 1…4, 25, 26).
	Select slot 1 or 19.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	In the Command Parameters area:
	• At New Prov. State, select In Service (ENT-IS).
	• Click the Type tab.
	• Select the appropriate equipment type.
	• Click Modify.
	Do not close the Operations dialog box.

Step 7
For each equipment entity created in the previous step, verify that it is in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS1-1&OS1-19:CTAG;`
	In the Current Values of the Operations dialog box, verify that the Provisioned State is In Service and that the Type is the appropriate equipment type.
	Close the Operations dialog box.

Step 8
Is this a 2D-ROADM configuration node?

If YES:
Proceed to Step 9.

If NO:
Proceed to Step 13.

Install and Provision 2D-ROADM Unit(s)

Step 9
Depending on your work order, install one or two 2D-ROADM (SFMA-RDC1) plug-in units in the appropriate slots (3 and 17) of the shelf OS1. For each 2D-ROADM plug-in unit to be installed, do the following:

a) Inspect the 2D-ROADM plug-in unit for possible damage or debris.

b) Slide the 2D-ROADM plug-in unit into the Optical shelf slot.

Step 10
For each plug-in unit installed in the previous step, create the 2D-ROADM equipment entity, and place it in service.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::SFMA-RDC1::IS;`
AID:
• OS1-3 (slot 3)
• OS1-17 (slot 17)
Example:
`ENT-EQPT:FUJITSU:OS1-3:CTAG::`
`SFMA-RDC1::IS;`
	In the tree view, select the Equipment tab.
	Expand the Main Optical shelf.
	Select slot 3 or 17.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	In the Command Parameters area:
	• At New Prov. State, select In Service (ENT-IS).
	• Click Modify.
	Do not close the Operations dialog box.

Step 11
For each equipment entity created in the previous step, verify that it is in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• OS1-3 (slot 3)
• OS1-17 (slot 17)
Example:
`RTRV-EQPT:FUJITSU:OS1-3&OS1-17:CTAG;`
	In the Current Values area of the Operations dialog box, verify that the Provisioned State is In Service and that the Type is the appropriate equipment type.
	Close the Operations dialog box.

Step 12
Proceed to Step 33.

Install and Provision WSS Core Switch Unit(s)

Step 13
Depending on your work order, install one or two WSS Core Switch (SFMA-CMC1) plug-in units in the appropriate slots (3 and 17) of the Optical shelf. For each WSS Core Switch plug-in unit to be installed, do the following:

a) Inspect the WSS Core Switch plug-in unit for possible damage or debris.

b) Slide the WSS Core Switch plug-in unit into the Optical shelf slot.

Step 14
For each plug-in unit installed in the previous step, create the WSS Core Switch equipment entity, and place it in service.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::SFMA-CMC1::IS;`
AID:
• OSn-3 (slot 3)
• OSn-17 (slot 17)
  • n = 1…4, 25, 26
Example:
`ENT-EQPT:FUJITSU:OS1-3:CTAG::`
`SFMA-CMC1::IS;`
	In the tree view, select the Equipment tab.
	Expand the appropriate Optical shelf.
	Select slot 3 or 17.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	In the Command Parameters area:
	• At New Prov. State, select In Service (ENT-IS).
	• Click Modify.
	Do not close the Operations dialog box.

Step 15
For each equipment entity created in the previous step, verify it is in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS1-3&OS1-17:CTAG;`
	In the Current Values area of the Operations dialog box, verify that the Provisioned State is In Service and that the Type is the appropriate equipment type.
	Close the Operations dialog box.

Step 16
Are you provisioning equipment in an Auxiliary Optical shelf OSn (n = 2...4, 25, 26)?

If YES:
Proceed to Step 17.

If NO:
Proceed to Step 20.

Note: *OSC plug-in units have already been installed in shelf OS1 (*Step 19 *of* Install Primary NE Management Units in Shelf OS1, and Configure Shelf OS1 as the Main Optical Shelf*).*

Install and Provision OSC Unit(s)

Step 17
Depending on your work order, install one or two OSC (SCMA-SCC4) plug-in units in the appropriate slots (9 and 11) of the Auxiliary Optical shelf. For each OSC plug-in unit to be installed, do the following:

a) Inspect the OSC plug-in unit for possible damage or debris.

b) Slide the OSC plug-in unit into the Optical shelf slot.

Step 18
For each plug-in unit installed in the previous step, create the OSC equipment entity, and place it in service.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::SCMA-SCC4::IS;`
AID:
• OSn-9 (slot 9)
• OSn-11 (slot 11)
  • n = 2...4, 25, 26
Example:
`ENT-EQPT:FUJITSU:OS2-9:CTAG::`
`SCMA-SCC4::IS;`
	In the tree view, select the Equipment tab.
	Expand the appropriate Auxiliary Optical shelf OSn (n = 2...4, 25, 26).
	Select slot 9 or 11.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	In the Command Parameters area:
	• At New Prov. State, select In Service (ENT-IS).
	• Click Modify.
	Do not close the Operations dialog box.

Step 19
For each equipment entity created in the previous step, verify it is in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS2-9&OS2-11:CTAG;`
	In the Current Values area of the Operations dialog box, verify that the Provisioned State is In Service and that the Type is the appropriate equipment type.
	Close the Operations dialog box.

Install and Provision Mux/Demux Unit(s)

Step 20
Does your work order include installation of Mux/Demux (MDMA-RMC1) plug-in units (in slots 5 and 15 of the Optical shelf)?

If YES:
Proceed to Step 21.

If NO:
Proceed to Step 24.

Step 21
Depending on your work order, install one or two Mux/Demux plug-in units in the appropriate slots (5 and 15) of the Optical shelf. For each Mux/Demux plug-in unit to be installed, do the following:

a) Inspect the Mux/Demux plug-in unit for possible damage or debris.

b) Slide the Mux/Demux plug-in unit into the Optical shelf slot.

Step 22
For each plug-in unit installed in the previous step, create the Mux/Demux equipment entity, and place it in service.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::MDMA-RMC1::IS;`
AID:
• OSn-5 (slot 5)
• OSn-15 (slot 15)
  • n = 1…4, 25, 26
Example:
`ENT-EQPT:FUJITSU:OS1-5:CTAG::`
`MDMA-RMC1::IS;`
	In the tree view, select the Equipment Tab.
	Expand the appropriate Optical shelf.
	Select slot 5 or 15.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	In the Command Parameters area:
	• At New Prov. State, select In Service (ENT-IS).
	• Click Modify.
	Do not close the Operations dialog box.

Step 23
For each equipment entity created in the previous step, verify it is in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS1-5&OS1-15:CTAG;`
	In the Current Values area of the Operations dialog box, verify that the Provisioned State is In Service and that the Type is the appropriate equipment type.
	Close the Operations dialog box.

Install and Provision WSS HUB Switch Unit(s)

Step 24
Does your work order include installation of WSS HUB Switch (SFMA-CDC1) plug-in units (in slots 7 and 13 of the Optical shelf)?

If YES:
Proceed to Step 25.

If NO:
Proceed to Step 29.

Step 25
Depending on your work order, install one or two WSS HUB Switch plug-in units in the appropriate slots (7 and 13) of the Optical shelf. For each WSS HUB Switch plug-in unit to be installed, do the following:

a) Inspect the WSS HUB Switch plug-in unit for possible damage or debris.

b) Slide the WSS HUB Switch plug-in unit into the Optical shelf slot.

Step 26
For each plug-in unit installed in the previous step, create the WSS HUB Switch equipment entity, and place it in service.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::SFMA-CDC1::IS;`
AID:
• OSn-7 (slot 7)
• OSn-13 (slot 13)
  • n = 1…4, 25, 26
Example:
`ENT-EQPT:FUJITSU:OS1-7:CTAG::`
`SFMA-CDC1::IS;`
	In the tree view, select the Equipment tab.
	Expand the appropriate Optical shelf.
	Select slot 7 or 13.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	In the Command Parameters area:
	• At New Prov. State, select In Service (ENT-IS).
	• Click Modify.
	Do not close the Operations dialog box.

Step 27
For each equipment entity created in the previous step, verify that it is in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS1-7&OS1-13:CTAG;`
	In the Current Values area of the Operations dialog box, verify that the Provisioned State is In Service and that the Type is the appropriate equipment type.
	Close the Operations dialog box.

Step 28
Proceed to Step 29.

Install and Provision OSC HUB Interconnect Unit(s)

Step 29
Does your work order include installation of OSC HUB Interconnect (MCMA-RCS1) plug-in units (in slots 10 and 12 of the Optical shelf)?

If YES:
Proceed to Step 30.

If NO:
Proceed to Step 33.

Step 30
Depending on your work order, install one or two OSC HUB Interconnect plug-in units in the appropriate slots (10 and 12) of the Optical shelf. For each OSC HUB Interconnect plug-in unit to be installed, do the following:

a) Inspect the OSC HUB Interconnect plug-in unit for possible damage or debris.

b) Slide the OSC HUB Interconnect plug-in unit into the Optical shelf slot.

Step 31
For each plug-in unit installed in the previous step, create the OSC HUB Interconnect equipment entity, and place it in service.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::MCMA-RCS1::IS;`
AID:
• OSn-10 (slot 10)
• OSn-12 (slot 12)
  • n = 1…4, 25, 26
Example:
`ENT-EQPT:FUJITSU:OS1-10:CTAG::`
`MCMA-RCS1::IS;`
	In the tree view, select the Equipment tab.
	Expand the appropriate Optical shelf.
	Select slot 10 or 12.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	In the Command Parameters area:
	• At New Prov. State, select In Service (ENT-IS).
	• Click Modify.
	Do not close the Operations dialog box.

Step 32
For each equipment entity created in the previous step, verify that it is in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS1-10&OS1-12:CTAG;`
	In the Current Values area of the Operations dialog box, verify that the Provisioned State is In Service and that the Type is the appropriate equipment type.
	Close the Operations dialog box.

Install Filler Panels

Step 33
Install filler panels in any unused slots of the Optical shelf.

Step 34
Repeat Steps 5 through 33 for each Optical shelf OSn (n = 1…4, 25, 26), as required.

Step 35
Proceed to Manually Provision WDM and OSC Facilities.

✔ This procedure is complete.

2.8.4
Manually Provision WDM and OSC Facilities

The following steps are used to manually create the WDM and OSC facilities and place them in service.

Note: *If you autoprovisioned the Optical shelf (refer to Autoprovision Optical Shelf Equipment and Facilities), WDM and OSC facilities have already been created. Skip this procedure and continue to Place ODCC In Service.*

Note: *Default values are shown in bold.*

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

Manually provision WDM and OSC facilities as follows:

Manually Provision WDM Facilities

Note: *You should already be logged on the NE (Step 1).*

Step 1
Depending on the work order, one or two amplifier (APMA-xxxx) plug-in units were installed in Step 5. Amplifier plug-in units are located in slots 1 and 19 of the Optical shelf. For each installed amplifier plug-in unit, create the associated WDM facility, and place it in service.

TL1	NETSMART 500

`ENT-WDM:TID:AID:CTAG:::KEYWORD=DOMAIN:IS;`
AID:
• OSn-1-PE1 (WDM facility associated with slot-1 amplifier)
• OSn-19-PE1 (WDM facility associated with slot-1 amplifier)
  • n = 1...4, 25, 26
KEYWORD=DOMAIN:
• VSTIMER = hh-mm
Example:
`ENT-WDM:FUJITSU:OS1-1-PE1:CTAG::::IS;`
	NE ▸ *Create*
	Click the Facility tab.
	In the Command Parameters area:
	• Select type WDM.
	• Select the appropriate facility AIDs.
	• Select In Service (IS).
	• Select the desired VSTIMER value.
	Click Create.
	Close the Operations dialog box.

Step 2
Verify that the WDM facility associated with each installed amplifier plug-in unit is in service and provisioned correctly.

TL1	NETSMART 500

`RTRV-WDM:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-WDM:FUJITSU:OS1-1-PE1:CTAG;`
	Click the Facilities tab in the tree area.
	Expand the appropriate shelf component.
	Select the appropriate facility AIDs.
	Note: *Select more than one component using CTRL+click (multiple) or SHIFT+click (range).*
	Entity ▸ *Properties View*
	Verify the new facility.
	Close the Properties dialog box.

Step 3
Are the WDM facilities in service and provisioned correctly?

If YES:
Proceed to Step 4.

If NO:
Correct WDM facility provisioning using procedures described in Editing Facility State, or Editing Facility Parameters. Then proceed to Step 4.

Manually Provision OSC Facilities

Note: *Depending on the work order, one or two OSC plug-in units (SCMA-SCC4) were installed in the Optical shelf. OSC plug-in units are located in slots 9 and 11.*

Step 4
For each installed OSC plug-in unit, create the OSC facility, and place it in service.

TL1	NETSMART 500

`ENT-OSC:TID:AID:CTAG:::KEYWORD=DOMAIN:IS;`
AID:
• OSn-9-PE1 (OSC facility for slot-9 plug-in unit)
• OSn-11-PE1 (OSC facility for slot-11 plug-in unit)
  • n = 1...4, 25, 26
KEYWORD=DOMAIN:
• VSTIMER = hh-mm
• JOSECTRC = **Y**, N
• TRC = \"*up to 62 ASCII characters*\"
• EXPTRC = \"*up to 62 ASCII characters*\"
• MISCON = **Y**, N
• REMOTE = SAME, **DIFF**
Example:
`ENT-OSC:FUJITSU:OS1-9-PE1:CTAG:::`
`VSTIMER=04-00:IS;`
	NE ▸ *Create*
	Click the Facility tab.
	In the Command Parameters area:
	• Select type OSC.
	• Select the appropriate facility AIDs.
	• Select In Service (IS).
	• Select the appropriate provisioning options.
	Click Create.
	Close the Operations dialog box.

Step 5
Verify that the OSC facility associated with each installed OSC plug-in unit is in service and provisioned correctly.

TL1	NETSMART 500

`RTRV-OSC:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-OSC:FUJITSU:OS1-9-PE1:CTAG;`
	Click the Facilities tab in the tree area.
	Expand the appropriate shelf component.
	Select the appropriate facility AIDs.
	Note: *Select more than one component using CTRL+click (multiple) or SHIFT+click (range).*
	Entity ▸ *Properties View*
	Verify the new facility.
	Close the Properties dialog box.

Step 6
Are the OSC facilities in service and provisioned correctly?

If YES:
Proceed to Step 7.

If NO:
Correct OSC facility provisioning using procedures described in Editing Facility State, or Editing Facility Parameters. Then proceed to Place ODCC In Service.

Step 7
Repeat Steps 1 through 6 for each Auxiliary Optical shelf OSn (n = 2...4, 25, 26), as required.

Step 8
Proceed to Place ODCC In Service.

✔ This procedure is complete.

2.8.5 Place ODCC In Service

An optical data communications channel (ODCC) can be assigned to every OSC facility up to a maximum of two channels per Optical shelf. The ODCC is used for communication with network-side NEs.

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
Depending on your work order, you have installed one or two OSC plug-in units (SCMA-SCC4), and the OSC facility associated with each installed OSC plug-in unit has been created and is in service. OSC plug-in units are located in slots 9 and 11 of the Optical shelf. For each installed OSC plug-in unit, create the associated ODCC and place it in service.

TL1	NETSMART 500

`ENT-SDCC:TID:AID:CTAG:::`
`KEYWORD=DOMAIN:IS;`
 	
AID (matching OSC facility AID):
• OSn-9-PE1 (ODCC facility for slot-9 plug-in unit)
• OSn-11-PE1 (ODCC facility for slot-11 plug-in unit)
  • n = 1...4, 25, 26
KEYWORD=DOMAIN:
• K = 1...**7**, 8
• L2CR = **PLUS-R**, NTWK, USER, PLUS-C
• T200 = 50...**200**...5000
• T203 = 2...**10**...300
• N200 = 2, **3**...16
• N201 = 260...**1024**
• SRV = **AITS**, UITS
• NETID = User-defined network identifier. Character string of up to 20 alphanumeric delineated by escape quotes (\").
• INSTID = Identifies the NLP (ISIS) management-port instance. Refer to command ENT-SDCC for more information about keyword INSTID.
 	
Example:
`ENT-SDCC:FUJITSU:OS1-9-PE1:CTAG:::`
`K=8,SRV=UITS:IS;`
	NE ▸ *Create*
	
	The Operations dialog box opens.
	Click the DCC tab.
	
	Select ODCC from the TYPE drop-down list in the Command Parameters area.
	
	Additional parameter choices appear:
	• From the AID drop-down list, select the ODCC facility AIDs.
	• From the STATE drop-down list, select IS.
	• If required, use the additional fields to set KEYWORD=DOMAIN values.
	
	Click Create.
	
	A confirmation dialog box opens.
	Click Yes.
	
	Close the Operations dialog box.

Step 2
Initialize the operation interface (OIF).

Note: *The INIT-OIF command must be executed before the ENT-SDCC command becomes effective.*

TL1	NETSMART 500

`INIT-OIF:TID::CTAG;`
 	
Example:
`INIT-OIF:FUJITSU::CTAG;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click Initialize tab.
	
	In the Command Parameters area:
	
	Select OIF from the STACK INIT TYPE menu.
	Click Initialize.
	
	A Confirmation dialog box opens.
	Click Yes.
	Click Logon.

Step 3
Wait 2 minutes before continuing.

Note: *The NETSMART 500 connection to the NE will be lost. After waiting 2 minutes, users should log back on the NE.*

Step 4
Verify the ODCC.

TL1	NETSMART 500

`RTRV-SDCC:TID:AID:CTAG;`
 	
AID (matching OSC facility AID):
• As identified in Step 1
• **ALL** (null)
 	
Example:
`RTRV-SDCC:FUJITSU:ALL:CTAG;`
	Restart the NETSMART 500 user interface, and log back on the NE.
	
	Note: *Refer to* Step 1.
	
	In the tree view, select the Communications tab.
	
	Expand the appropriate Optical shelf OS1 and OSC facility to locate the ODCC entity.
	Select the ODCC entity.
	
	Entity ▸ *Properties View*
	
	The Properties dialog box opens.
	Verify that the State is IS.
	
	Close the Properties dialog box when done.

Step 5
Repeat Steps 1 through 4 for each Optical shelf OSn (n = 1…4, 25, 26), as required.

Step 6
Do any of the Tributary shelves in this node require OSC plug-in units?

Note: *OSC units (SCMA-SCC4) are installed in Tributary shelves to support interoperability with FLASHWAVE 7500 Extension Configuration NEs.*

If YES:
Proceed to Provision Synchronization and/or Tributary Shelf OSC Units.

If NO:
Proceed to Step 7.

Step 7
Do any of the shelves in this node require Synchronization plug-in units?

Note: *Synchronization units support timing and synchronization for Flexponder™ optical line cards. They are generally required in every shelf that include a Flexponder unit. However, the Synchronization unit is optional for shelves that include only single-unit applications of the IFMA-BXC1 Flexponder. If all STS cross-connects are within*

individual IFMA-BXC1 units (never between units) , the Synchronization unit can be omitted from the shelf and timing accuracy will be ±20 ppm for the IFMA-BXC1 units.

If YES:
Proceed to Provision Synchronization and/or Tributary Shelf OSC Units.

If NO:
Proceed to Install Intrashelf Fiber-Optic Cables.

2.9
Provision Synchronization and/or Tributary Shelf OSC Units

In this section:

The following figure shows a flowchart of how these subprocedures are used.

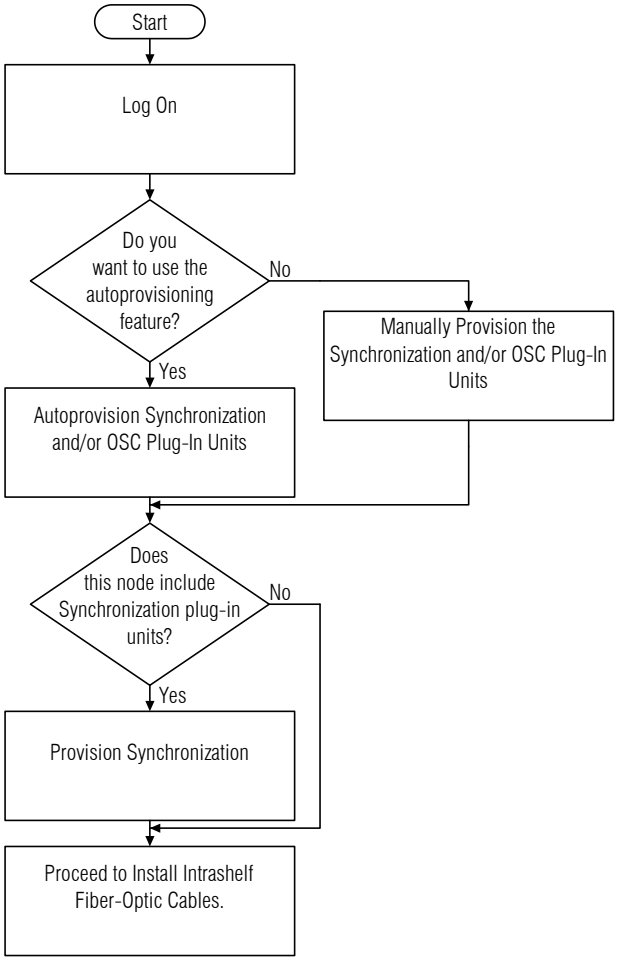


Figure 38: Provision Synchronization and/or Tributary Shelf OSC Units (Procedure Flowchart)

Note: *Synchronization units are generally required in every shelf that include a Flexponder unit. However, the Synchronization unit is optional for shelves that include only single-unit applications of the IFMA-BXC1*

Flexponder. If all STS cross-connects are within individual IFMA-BXC1 units (never between units), the Synchronization unit can be omitted from the shelf and timing accuracy will be ±20 ppm for the IFMA-BXC1 units.

When OSC units (SCMA-SCC4) are installed in a Tributary shelf they are used to support interoperability with FLASHWAVE 7500 Extension Configuration NEs. For more information, refer to Extension Configuration Applications.

These subprocedures provision OSC and/or Synchronization plug-in units and synchronization.

2.9.1 Log On

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

Step 1

If not already done, log on the node where the service is being provisioned. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to Setting Up Craft Interface (TL1 Session through TERM1) through Setting Up Craft Interface (NETSMART 500 Session through TERM2).*

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

TL1	NETSMART 500	

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	Comm. Port: COMx (for example, COM2)
	Configure: use default[19]
		For **TERM2** (TCP/IP):
		TID: FUJITSU
		User ID: ROOT
		Password: ROOT/(Route66K)
		Conn. Mode: TCP/IP
		IP Address: 192.168.1.1
		Port: 2024

	Click Logon. The NETSMART 500 NE View opens. The Security Message dialog box opens. Click OK. ***Note:*** *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*	

Step 2
Do you want to provision the OSC and/or Synchronization plug-in units using the autoprovisioning feature?

If YES:
Proceed to Autoprovision Synchronization and/or OSC Plug-In Units.

If NO:
Proceed to Manually Provision Synchronization and/or OSC Plug-In Units.

2.9.2 Autoprovision Synchronization and/or OSC Plug-In Units

Enable Autoprovisioning

Note: *You should already be logged on the NE (refer to Step 1).*

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

[19] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

Step 1
Retrieve the state of the autoprovisioning feature.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
 	
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the tree view, select the NE (the top-level system entity).
	
	Entity ▸ *Properties View*
	
	The Properties dialog box opens.
	
	In the Current Values area of the Properties dialog box, determine the value of AUTOP (Yes or No).
	
	Close the Properties dialog box.

Step 2
Is autoprovisioning already enabled? (Is the current value of AUTOP set to Yes?)

If YES:
Proceed to Step 5.

If NO:
Proceed to Step 3.

Step 3
Enable autoprovisioning, and provision the AISP feature and the AISP timer if necessary.

TL1	NETSMART 500

`ED-SYS:TID::CTAG:::KEYWORD=DOMAIN;`
KEYWORD=DOMAIN:
• CONTACT = Contact information; 40-character string delineated by escape quotes (\"string\")
• LOCATION = Location information; 40-character string delineated by escape quotes (\"string\")
• AUTOP = **Y**, N (autoprovisioning)
• AISPDEFTM = 00-00…**08-00**…48-00 (default valid signal timer in 1-minute increments)
 	
Example:
`ED-SYS:FUJITSU::CTAG:::AUTOP=Y,`
`AISPDEFTM=08-00;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click the Attributes tab.
	Click the Modify tab.
	Set AUTOP to Yes.
	Click Modify.
	
	Do not close the Operations dialog box.

Step 4
Verify that autoprovisioning is enabled.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
 	
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the updated information is correct.
	
	Close the Operations dialog box.

Step 5
Do any of the Tributary shelves in this node require OSC plug-in units?

Note: *OSC units (SCMA-SCC4) are installed in Tributary shelves to support interoperability with FLASHWAVE 7500 Extension Configuration NEs.*

If YES:
Proceed to Step 6.

If NO:
Proceed to Step 10.

Install and Autoprovision OSC Plug-In Units

Step 6
Install the OSC plug-in units in the appropriate shelf slots (9 and/or 11), as required. Refer to Slot Labels and AIDs for slot locations. For each plug-in unit to be installed, do the following:

a) Inspect the plug-in unit for possible damage or debris.

b) Slide the unit into the appropriate shelf slot (slot 9 or 11).

Step 7
Ensure that the plug-in units are properly provisioned and that the equipment state is IS, Normal (STATE=IS-NR).

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• Refer to the following table.
• **ALL** (null)
 	
Example:
`RTRV-EQPT:FUJITSU:OS100-9:CTAG;`
	In the shelf OSn graphic view or tree view, select the equipment slot.
	
	Entity ▸ *Properties View*
	
	The Properties dialog box opens.
	
	Verify the PRIMARY_STATE is IS.
	
	Verify the PRIMARY_STATE_QUALIFIER is NR.
	
	Close the Properties dialog box.

Table 14: Tributary Shelf OSC Unit Equipment AIDs (Core Configuration)

Equipment Type	AID
SCMA-SCC4	OSn-s • n = 10...13, 20...23, 30...33, 40...43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430 (shelf) • s = 9, 11 (slot)

Step 8
Repeat Steps 6 through 7 for each Tributary shelf that requires OSC plug-in units.

Step 9
Do any of the shelves in this node require Synchronization plug-in units?

Note: *Synchronization units support timing and synchronization for Flexponder™ optical line cards. They are generally required in every shelf that include a Flexponder unit. However, the Synchronization unit is optional for shelves that include only single-unit applications of the IFMA-BXC1 Flexponder. If all STS cross-connects are within individual IFMA-BXC1 units (never between units), the Synchronization unit can be omitted from the shelf and timing accuracy will be ±20 ppm for the IFMA-BXC1 units.*

If YES:
Proceed to Step 10.

If NO:
Proceed to Install Intrashelf Fiber-Optic Cables.

Install and Autoprovision Synchronization Plug-In Units

Step 10
Install the Synchronization plug-in units in the appropriate shelf slots (10 and/or 12). Refer to Slot Labels and AIDs for slot locations. For each plug-in unit to be installed, do the following:

a) Inspect the plug-in unit for possible damage or debris.

b) Slide the unit into the appropriate shelf slot (slot 10 or 12).

Step 11
Ensure that the plug-in units are properly provisioned and that the equipment state is IS, Normal (STATE=IS-NR).

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• Refer to the following table.
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS100-10:CTAG;`
	In the shelf OSn graphic view or tree view, select the equipment slot.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify the PRIMARY_STATE is IS.
	Verify the PRIMARY_STATE_QUALIFIER is NR.
	Close the Properties dialog box.

Table 15: Synchronization Unit Equipment AIDs (Core Configuration)

Equipment Type	AID[20]
TCMA-ST31	OSn-s (WSS Core or 2D-ROADM applications) • n = 10...13, 20...23, 30...33, 40...43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430 (shelf) • s = 10, 12 (slot) OS1-s (2D-ROADM applications only) • s = 10, 12 (slot)

Step 12
Repeat Steps 10 through 11 for each shelf that requires Synchronization plug-in units.

Step 13
Proceed to Provision Synchronization.

✔ This procedure is complete.

2.9.3 Manually Provision Synchronization and/or OSC Plug-In Units

Disable Autoprovisioning

Note: *You should already be logged on the NE (Step 1).*

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

[20] **Slot 10 is for the working equipment. Slot 12 is for the protect equipment.**

Step 1
Retrieve the state of the autoprovisioning feature.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
 	
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the tree view, select the NE (the top-level system entity).
	
	Entity ▸ *Properties View*
	
	The Properties dialog box opens.
	
	In the Current Values area of the Properties dialog box, determine the value of AUTOP (Yes or No).
	
	Close the Properties dialog box.

Step 2
Is autoprovisioning already disabled? (Is the current value of AUTOP set to No?)

If YES:
Proceed to Step 10.

If NO:
Proceed to Step 3.

Step 3
Disable the autoprovisioning feature.

Note: *If autoprovisioning is already disabled, this command will fail.*

TL1	NETSMART 500

`ED-SYS:TID::CTAG:::AUTOP=N;`
 	
Example:
`ED-SYS:FUJITSU::CTAG:::AUTOP=N;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click the Attributes tab.
	Click the Modify tab.
	Set AUTOP to No.
	Click Modify.
	
	Do not close the Operations dialog box.

Step 4
Verify that the autoprovisioning feature is disabled.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
 	
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the value of AUTOP is No.
	
	Close the Operations dialog box.

Step 5
Do any of the Tributary shelves in this node require OSC plug-in units?

Note: *OSC units (SCMA-SCC4) are installed in Tributary shelves to support interoperability with FLASHWAVE 7500 Extension Configuration NEs.*

If YES:
Proceed to Step 6.

If NO:
Proceed to Step 10.

Install and Manually Provision OSC Plug-In Units

Step 6
Install the OSC plug-in units in the appropriate shelf slots (9 and/or 11), as required. Refer to Slot Labels and AIDs for slot locations. For each Synchronization plug-in unit to be installed, do the following:

a) Inspect the plug-in unit for possible damage or debris.

b) Slide the unit into the appropriate shelf slot (slot 9 or 11).

Step 7
Create the OSC unit equipment entities and place in service.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::SCMA-SCC4::`
`IS;`
AID:
• Refer to the following table.
 	
Example:
`ENT-EQPT:FUJITSU:OS100-9:CTAG::`
`SCMA-SCC4::IS;`
	In the shelf OSn graphic view or tree view.
	Expand the appropriate shelf .
	Select slot 9 or 11.
	
	Entity ▸ *Operations Dialog*
	
	The Operations dialog box opens.
	Click the State tab.
	Select In Service (ENT-IS).
	Click the Type tab.
	Select SCMA-SCC4.
	Click Modify.
	
	Do not close the Operations dialog box.

Table 16: Tributary Shelf OSC Unit Equipment AIDs (Core Configuration)

Equipment Type	AID
SCMA-SCC4	OSn-s • n = 10...13, 20...23, 30...33, 40...43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430 (shelf) • s = 9, 11 (slot)

Step 8
Verify that the OSC unit equipment entities are in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS100-9:CTAG;`
	In the Current Values area of the Operations dialog box, verify the equipment state.
	Close the Operations dialog box.

Step 9
Repeat Steps 6 through 8 for each Tributary shelf that requires OSC plug-in units.

Step 10
Do any of the shelves in this node require Synchronization plug-in units?

Note: *Synchronization units support timing and synchronization for Flexponder™ optical line cards. They are generally required in every shelf that include a Flexponder unit. However, the Synchronization unit is optional for shelves that include only single-unit applications of the IFMA-BXC1 Flexponder. If all STS cross-connects are within individual IFMA-BXC1 units (never between units) , the Synchronization unit can be omitted from the shelf and timing accuracy will be ±20 ppm for the IFMA-BXC1 units.*

If YES:
Proceed to Step 11.

If NO:
Proceed to Install Intrashelf Fiber-Optic Cables.

Install and Manually Provision Synchronization Plug-In Units

Step 11
Install the Synchronization plug-in units in the appropriate shelf slots (10 and/or 12). Refer to Slot Labels and AIDs for slot locations. For each Synchronization plug-in unit to be installed, do the following:

a) Inspect the Synchronization plug-in unit for possible damage or debris.

b) Slide the Synchronization plug-in unit into the Optical shelf slot.

Step 12
Create the Synchronization unit equipment entities and place in service.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::TCMA-ST31::IS;`
AID:
• Refer to the following table.
Example:
`ENT-EQPT:FUJITSU:OS100-10:CTAG::TCMA-ST31::IS;`
	In the shelf OSn graphic view or tree view.
	Expand the appropriate shelf .
	Select slot 10 or 12.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	Select In Service (ENT-IS).
	Click the Type tab.
	Select TCMA-ST31.
	Click Modify.
	Do not close the Operations dialog box.

Table 17: Synchronization Unit Equipment AIDs (Core Configuration)

Equipment Type	AID[21]
TCMA-ST31	OSn-s (WSS Core or 2D-ROADM applications) • n = 10...13, 20...23, 30...33, 40...43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430 (shelf) • s = 10, 12 (slot) OS1-s (2D-ROADM applications only) • s = 10, 12 (slot)

Step 13
Verify that the Synchronization unit equipment entities are in service.

[21] **Slot 10 is for the working equipment. Slot 12 is for the protect equipment.**

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS100-10:CTAG;`
	In the Current Values area of the Operations dialog box, verify the equipment state.
	Close the Operations dialog box.

Step 14
Repeat Steps 11 through 13 for each shelf that requires Synchronization plug-in units.

Step 15
Proceed to Provision Synchronization.

✔ This procedure is complete.

2.9.4
Provision Synchronization

Synchronization refers to Tributary shelf timing as well as to the primary and secondary timing outputs from a Tributary shelf. Each synchronization facility/mode (OSn-TMGSYS, OSn-TMGOUTP, OSn-TMGOUTS) automatically triggers a major alarm for any OFF NORMAL condition, either FREERUN or HOLDOVER. To minimize OFF NORMAL alarmed conditions, the user must establish a valid synchronization reference priority list (using ED-SYNCLIST) or change the default values for the timing modes (using ED-SYNC).

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to Setting Up Craft Interface (TL1 Session through TERM1) through Setting Up Craft Interface (NETSMART 500 Session through TERM2).*

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[22]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Step 2

Provision synchronization at each Tributary shelf that includes Synchronization plug-in units. For more information on synchronization, refer to TCMA-ST31 (Flexponder Synchronization Unit).

[22] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`ED-SYNC:TID:AID:CTAG:::`
`KEYWORD=DOMAIN;`
AID:
• OSn-TMGSYS
• OSn-TMGOUTP
• OSn-TMGOUTS
• OSn (ALL timing reference groups on the shelf)
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
KEYWORD=DOMAIN:
• TMGMODE = **EXT**, INT[23], LINE, MIXED
• RVRTV = **N**
• RES = PRS, PRSB, STU, STUB, ST2, ST2B, ST3, ST3B, SMC, SMCB, ST4, ST4B, **DUS**
Example:
`ED-SYNC:FUJITSU:OS100-TMGSYS:CTAG:::`
`TMGMODE=INT;`
	In the tree view, click the Synchronization tab.
	Expand the appropriate Tributary shelf .
	Select TMGSYS (SYNC)
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Select the Modify tab.
	Select TMGMODE.
	Select the appropriate values from the drop-down menu.
	Click Modify.
	Select the Quality Level tab.
	Select RES.
	Select the appropriate values from the drop-down menu.
	Click modify.
	Do not close the Operations dialog box.

Step 3
Verify synchronization provisioning.

TL1	NETSMART 500

`RTRV-SYNC:TID:AID:CTAG;`
AID:
• OSn-TMGSYS
• OSn-TMGOUTP
• OSn-TMGOUTS
• OSn (ALL timing reference groups on the shelf)
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
• **ALL** (null)
Example:
`RTRV-SYNC:FUJITSU:OS100-TMGSYS:CTAG;`
	In the Current Values area of the Operations dialog box, verify the synchronization provisioning.
	Close the Operations dialog box.

Step 4
Create the required T1 clock facilities for the external timing inputs (primary and secondary) and external clock outputs (primary and secondary).

[23] INT is valid TMGNMODE for OSn-TMGSYS only.

TL1	NETSMART 500

`ED-T1CLK:TID:AID:CTAG:::`
`KEYWORD=DOMAIN:IS;`
AID:
• OSn-EXTCLKINP
• OSn-EXTCLKINS
• OSn-EXTCLKOUTP
• OSn-EXTCLKOUTS
• OSn (ALL timing reference groups on the shelf)
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
KEYWORD=DOMAIN:
• LINECDE = **AMI**, B8ZS
• LBO = **D1**, D2, D3, D4, D5
• OOF = **Y**, N
• FMT = **SF**, ESF
• SYNCMSG[27] = Y, N
• AISTHQL[28] = PRS, PRSB, STU, STUB, ST2, ST2B, **ST3**
Example:
`ENT-T1CLK:FUJITSU:OS100-EXTCLKINP:`
`CTAG:::FMT=ESF:IS;`
	NE ▸ *Create*
	The Operations dialog box opens.
	Click the T1 Clock tab.
	Select the appropriate values.
	Click Create.
	Close the Operations dialog box.

Step 5
Verify provisioning of the DS1 timing facilities.

TL1	NETSMART 500

`RTRV-T1CLK:TID:AID:CTAG;`
AID:
• OSn-EXTCLKINP
• OSn-EXTCLKINS
• OSn-EXTCLKOUTP
• OSn-EXTCLKOUTS
• OSn (ALL timing reference groups on the shelf)
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
• **ALL** (null)
Example:
`RTRV-T1CLK:FUJITSU:OS100-EXTCLKINP:CTAG;`
	In the tree view, select the Synchronization tab.
	Expand the appropriate Tributary shelf.
	Select the appropriate entity.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify the timing provisioning.
	Close the Properties dialog box.

[24] Applies only to outgoing BITS (that is, OSn-EXTCLKOUTP or OSn-EXTCLKOUTS)
[25] Applies only to incoming BITS (that is, OSn-EXTCLKINP or OSn-EXTCLKINS)
[26] When FMT=SF, the only valid value for SYNCMSG is N.
[27] Default value of SYNCMSG is Y when FMT=ESF (N when FMT=SF).
[28] Applies only to OSn-EXTCLKOUTP or OSn-EXTCLKOUTS and when SYNCMSG=N.

Step 6

If the timing mode set in Step 2 is EXT, create the required synchronization reference priority lists. A separate list can be created for system timing references (OSn-TMGSYS), the primary external clock output port (OSn-TMGOUTP), and the secondary external clock output port (OSn-TMGOUTS).

A sync list is a prioritized list from 1 to 2 valid timing sources, with the highest priority reference specified first. The list of prioritized entries identified in a single execution of this command defines the complete sync list, replacing the previous list for the specified AID.

The following restrictions apply:

- When the timing mode set with ED-SYNC is EXT, only the external clock AIDs, OSn-EXTCLKINP or OSn-EXTCLKINS, are accepted as reference sources.
- When the timing mode set with ED-SYNC is INT, the ED-SYNCLIST command is not allowed.

TL1	NETSMART 500

`ED-SYNCLIST:TID:AID:CTAG:::`
`KEYWORD=DOMAIN;`
AID:
• OSn-TMGSYS
• OSn-TMGOUTP
• OSn-TMGOUTS
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
KEYWORD=DOMAIN:
• LIST = OSn-EXTCLKINP, OSn-EXTCLKINS
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
Example:
`ED-SYNCLIST:FUJITSU:OS100-TMGSYS:`
`CTAG:::LIST=OS100-EXTCLKINP&`
`OS100-EXTCLKINS;`
	In the tree view, click the Synchronization tab.
	Expand the appropriate Tributary shelf.
	Select the appropriate entity.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Select the Sync List tab.
	Select the Set tab.
	Move the command parameters from the Available list to the Selected list in the order you wish them to appear in the list.
	Click Set.
	Do not close the Operations dialog box.

Note: *Once the sync lists are created for TMGOUTP and TMGOUTS, the associated TMGOUTP and TMGOUTS alarm conditions (SYNC and FREERUN) should clear.*

Step 7

Verify sync list provisioning.

TL1	NETSMART 500

`RTRV-SYNCLIST:TID:AID:CTAG;`
AID:
• OSn-TMGSYS
• OSn-TMGOUTP
• OSn-TMGOUTS
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
• **ALL** (null)
Example:
`RTRV-SYNCLIST:FUJITSU:`
`OS100-TMGSYS:CTAG;`
	In the Current Values area of the Operations dialog box, verify the sync list provisioning.
	Close the Operations dialog box.

Step 8
Proceed to Install Intrashelf Fiber-Optic Cables.

2.10 Install Intrashelf Fiber-Optic Cables

In this section:

Warning: *Verify the transmit and receive fibers are connected to the correct ports of the plug-in unit. An incorrect connection can result in dropped traffic or an equipment fault and may damage the laser optics.*

2.10.1 Overview Installing Intrashelf Cables Core Configuration

The following figure shows the full complement of intrashelf fiber-optic cables that can be installed in the Main Optical shelf OS1 or Auxiliary Optical shelf OSn (n = 2...4, 25, 26) in WSS Core configurations.

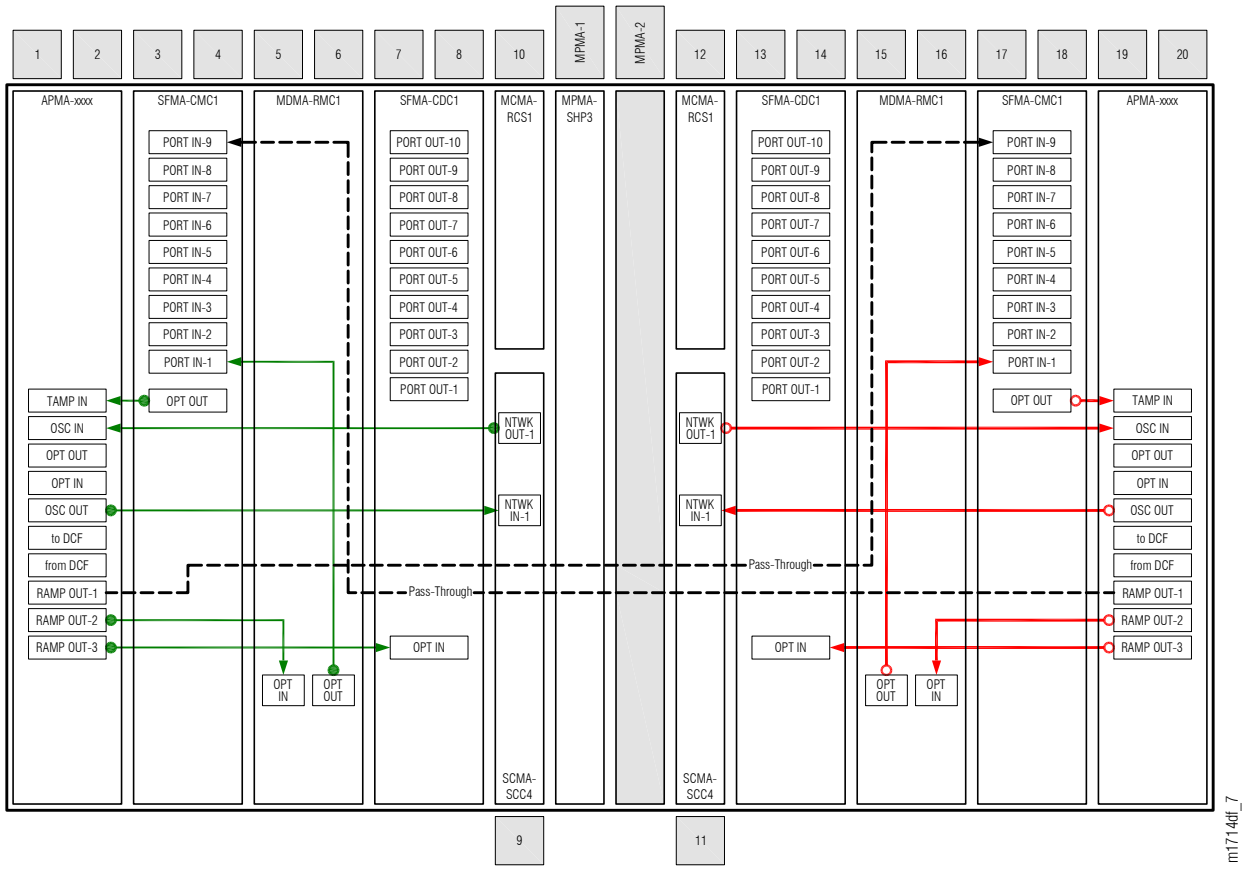


Figure 39: Full Complement of Fiber-Optic Cable Connections for WSS Core Configuration

The following figure shows the full complement of internal fiber-optic cables that can be installed between plug-in units in the 2D-ROADM configuration. Typically, only some of these cables are installed, as shown by examples in Examples of Intrashelf Cabling.

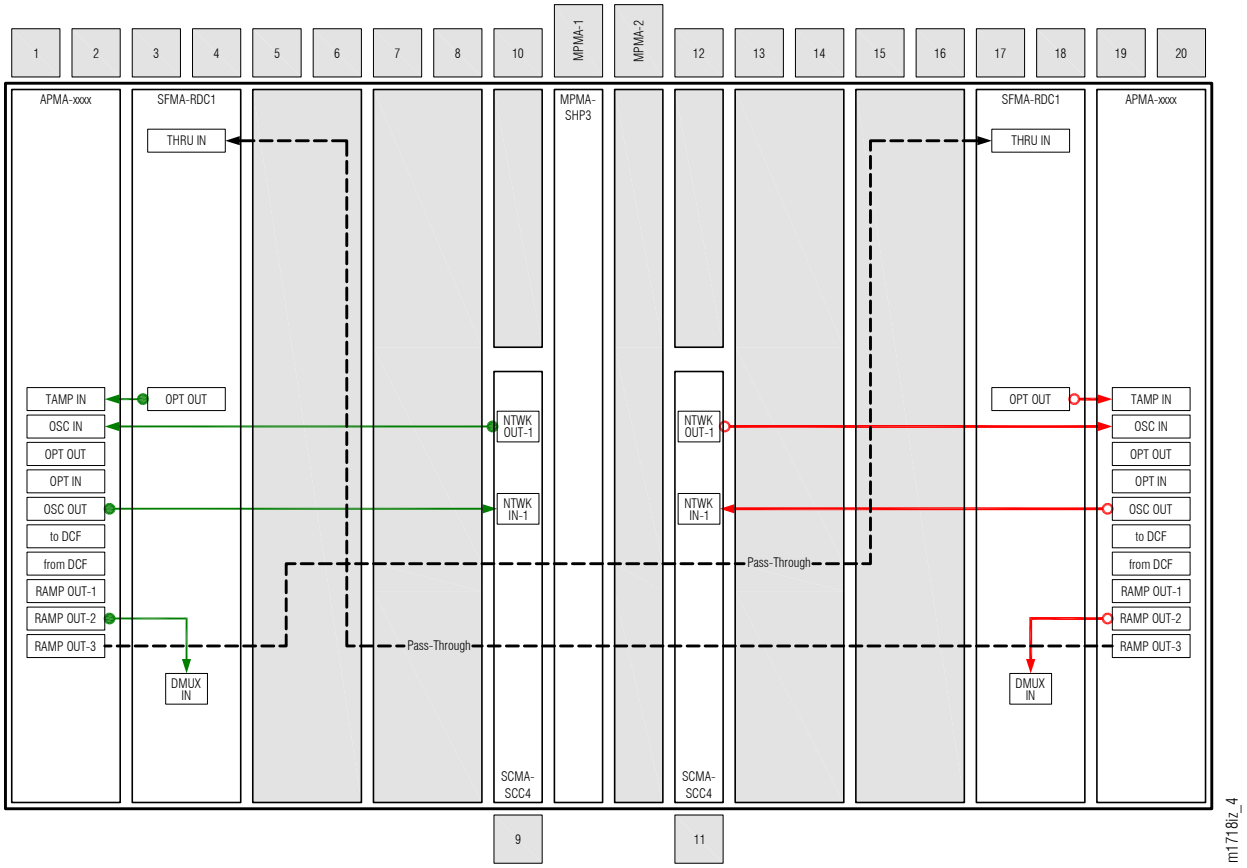


Figure 40: Full Complement of Fiber-Optic Cable Connections for 2D-ROADM Configuration

The procedure in Installing Intrashelf Cables will guide you in installing only those cables that are appropriate for the plug-in units installed in the shelf. The procedure is performed once for the Main Optical shelf OS1 and then repeated for each Auxiliary Optical shelf OSn (n = 2...4, 25, 26), as required.

2.10.2
Examples of Intrashelf Cabling

Terminal Node
WSS Core Configuration

Note: *Refer also to* About System Turn-up Core Configuration .

The following figure shows the fiber-optic cable connections for a terminal node supporting adds and drops to WDM facility OS1-1-PE1.

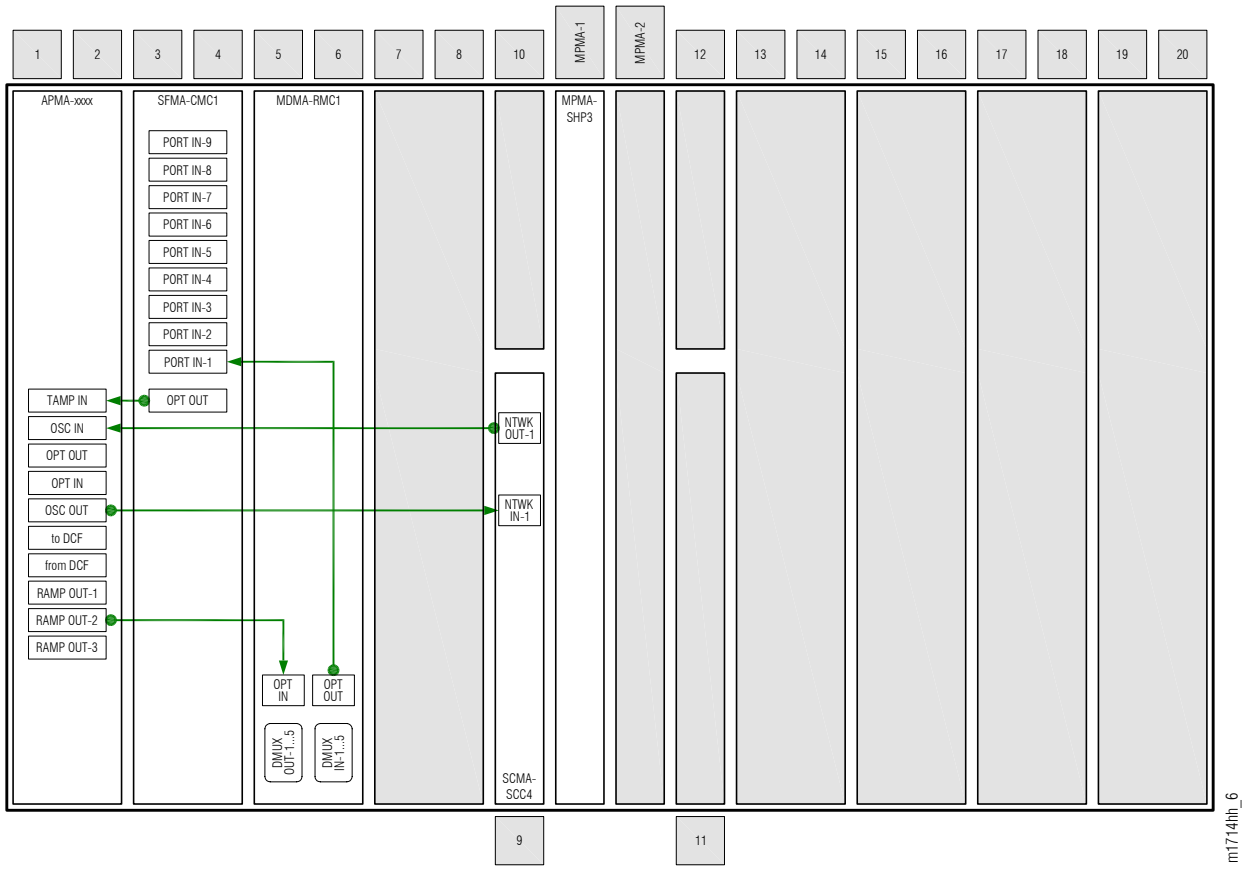


Figure 41: Cables for Terminal Node Supporting OS1-1-PE1 (WDM) Adds and Drops–Main Optical Shelf OS1, WSS Core Configuration

The following figure shows the fiber-optic cable connections for a terminal node supporting adds and drops to WDM facility OS1-19-PE1.

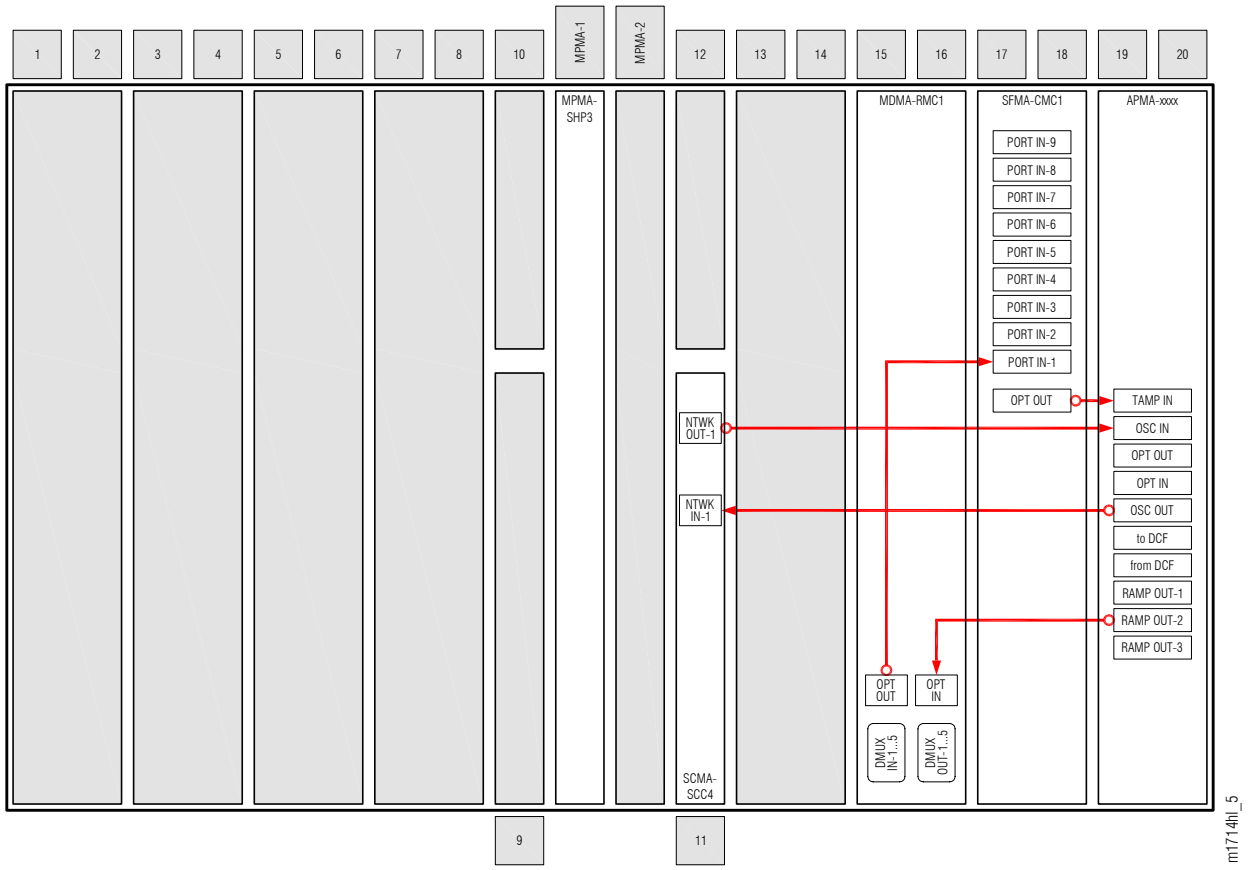


Figure 42: Cables for Terminal Node Supporting OS1-19-PE1 (WDM) Adds and Drops–Main Optical Shelf OS1, WSS Core Configuration

Terminal Node
2D-ROADM Configuration

Note: *Refer also to* About System Turn-up Core Configuration .

The following figure shows the fiber-optic cable connections for a terminal node supporting adds and drops to WDM facility OS1-1-PE1.

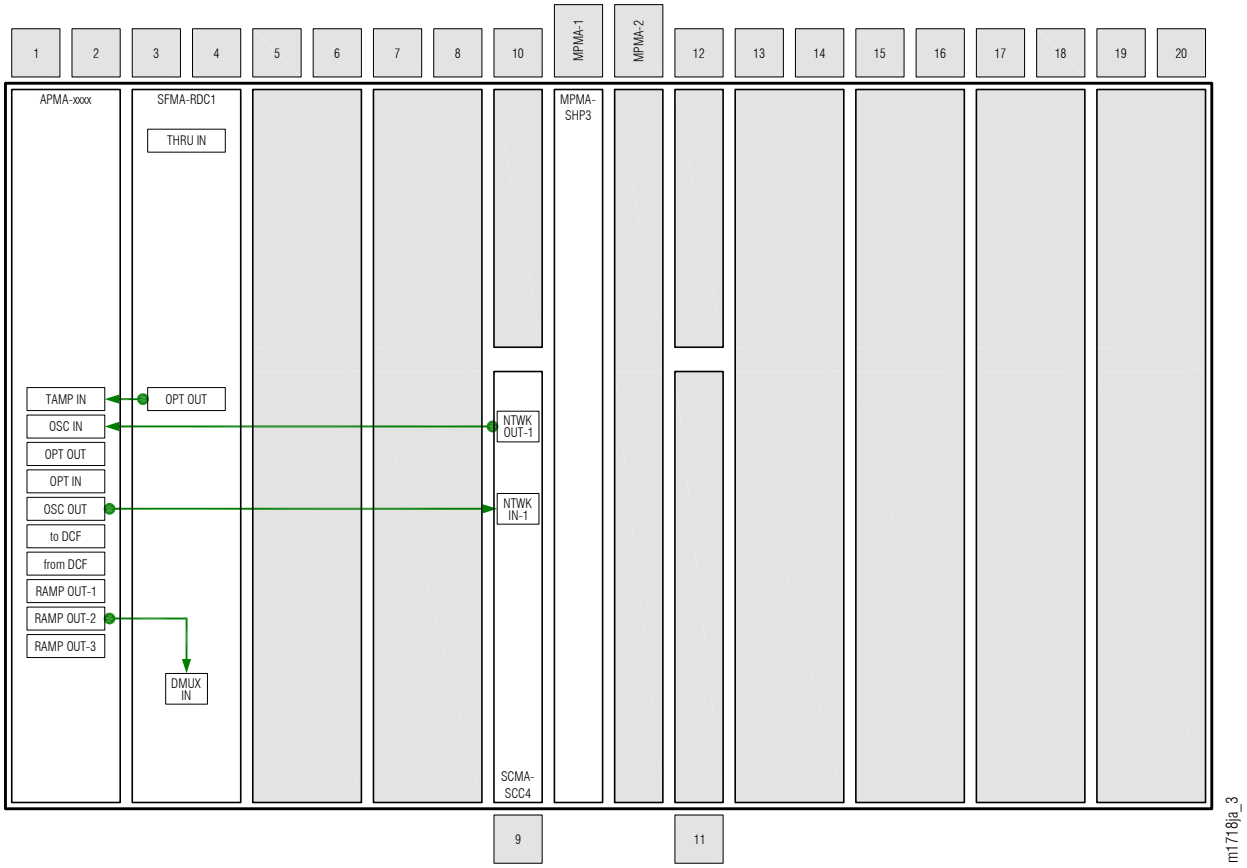


Figure 43: Cables for Terminal Node Supporting OS1-1-PE1 (WDM) Adds and Drops–Optical Shelf OS1, 2D-ROADM Configuration

The following figure shows the fiber-optic cable connections for a terminal node supporting adds and drops to WDM facility OS1-19-PE1.

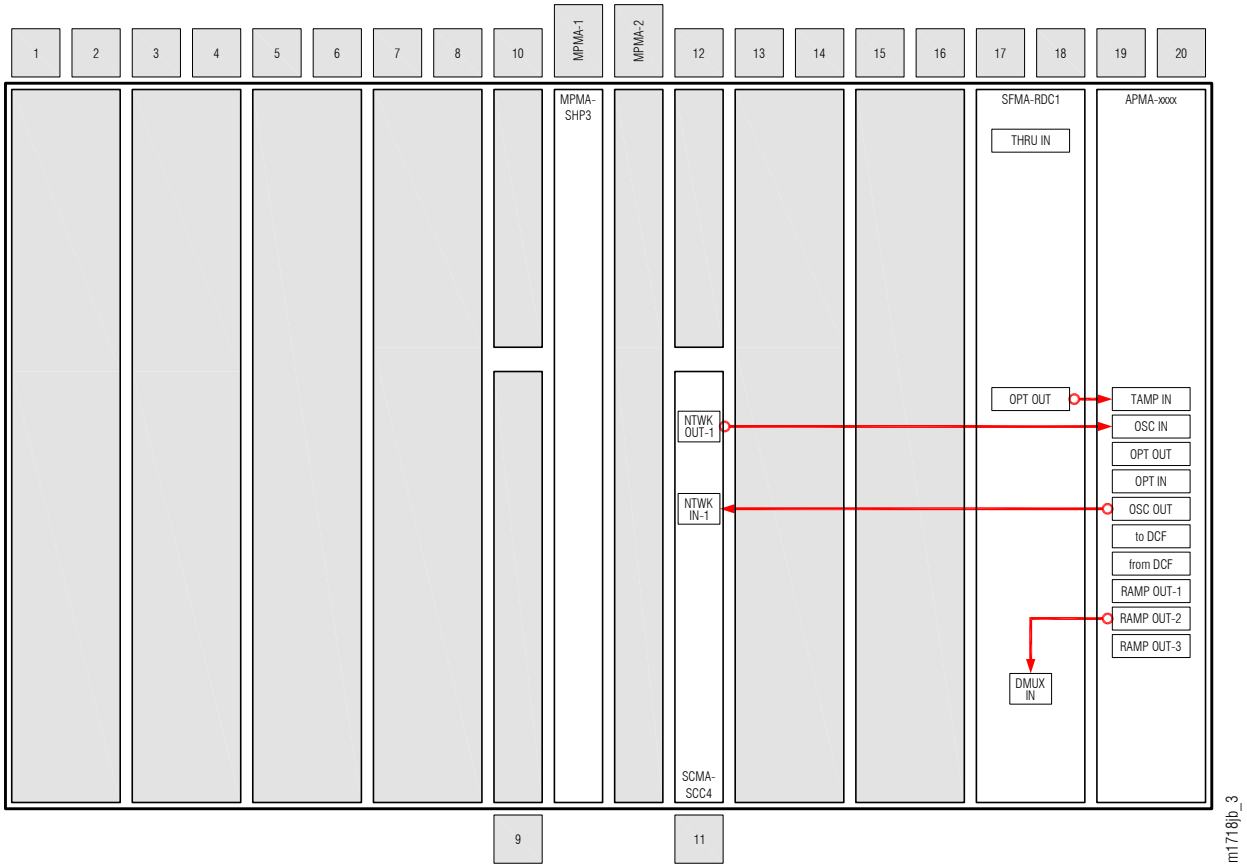


Figure 44: Cables for Terminal Node Supporting OS1-19-PE1 (WDM) Adds and Drops–Optical Shelf OS1, 2D-ROADM Configuration

2-Degree Add/Drop Node
WSS Core Configuration

The following figure shows the fiber-optic cable connections for a node supporting adds and drops to WDM facilities OS1-1-PE1 and OS1-19-PE1.

Note: *Refer also to* About System Turn-up Core Configuration .

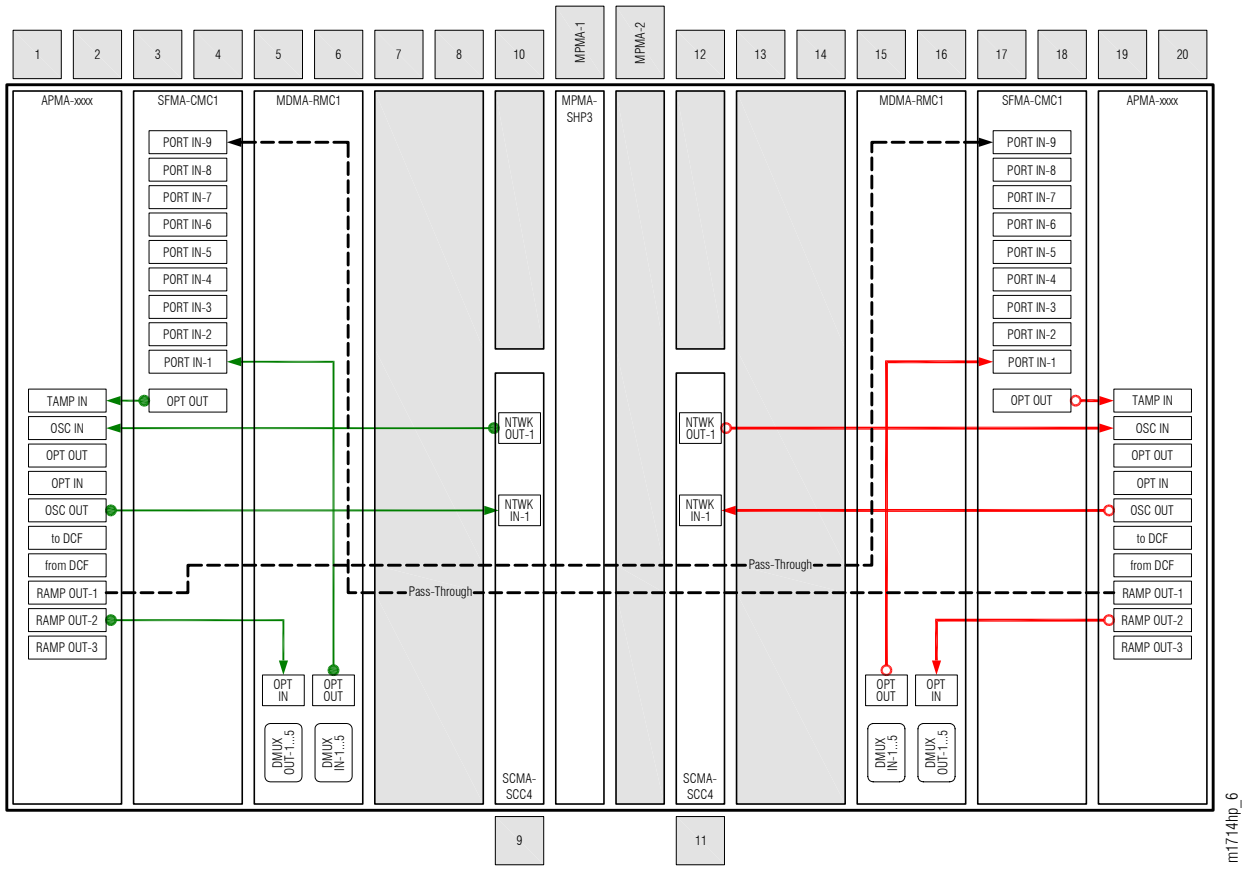


Figure 45: Cables for 2-Degree Add/Drop Node–Main Optical Shelf OS1, WSS Core Configuration

2-Degree Add/Drop Node
2D-ROADM Configuration

The following figure shows the fiber-optic cable connections for a node supporting adds and drops to WDM facilities OS1-1-PE1 and OS1-19-PE1.

Note: *Refer also to* About System Turn-up Core Configuration .

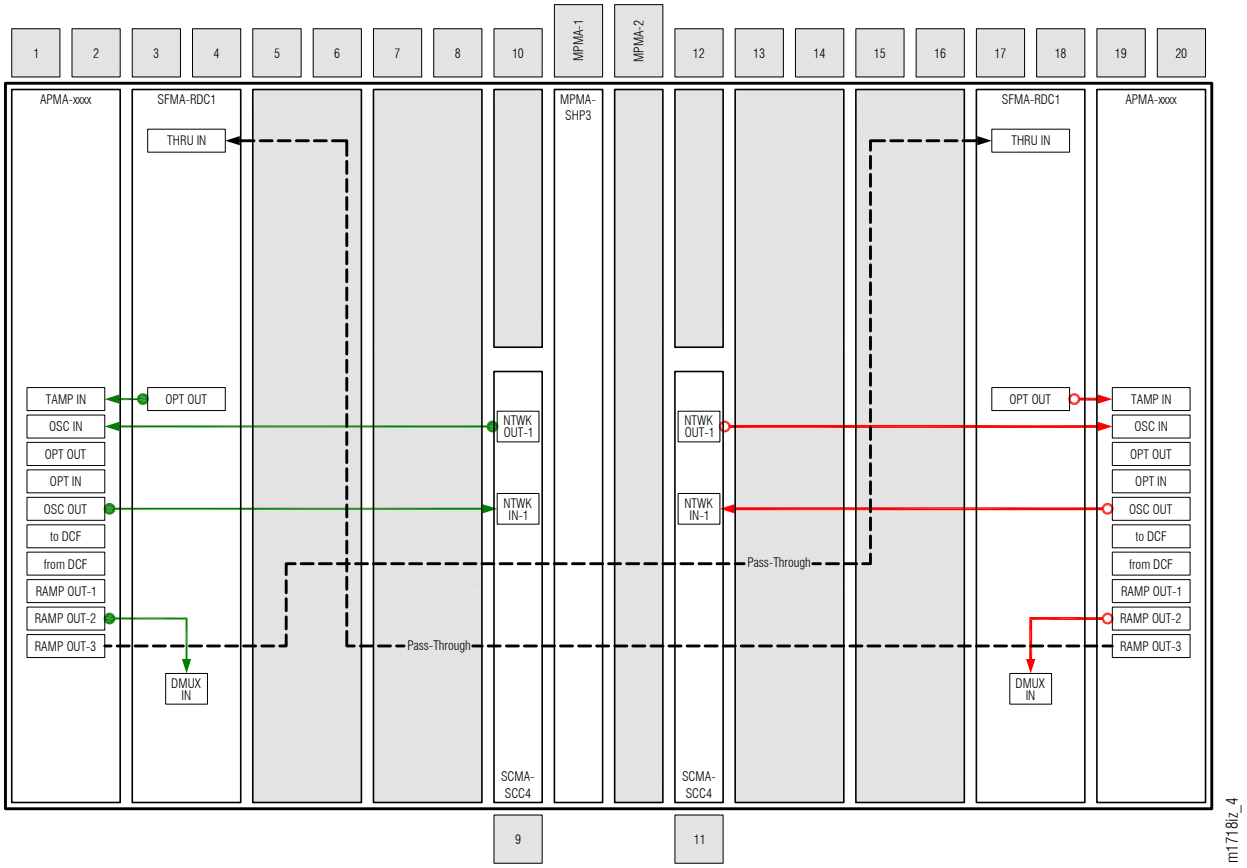


Figure 46: Cables for 2-Degree Add/Drop Node–Optical Shelf OS1, 2D-ROADM Configuration

Express Node

The following figure shows the fiber-optic cable connections for an Express node supporting pass-through traffic between WDM facilities OS1-1-PE1 and OS1-19-PE1.

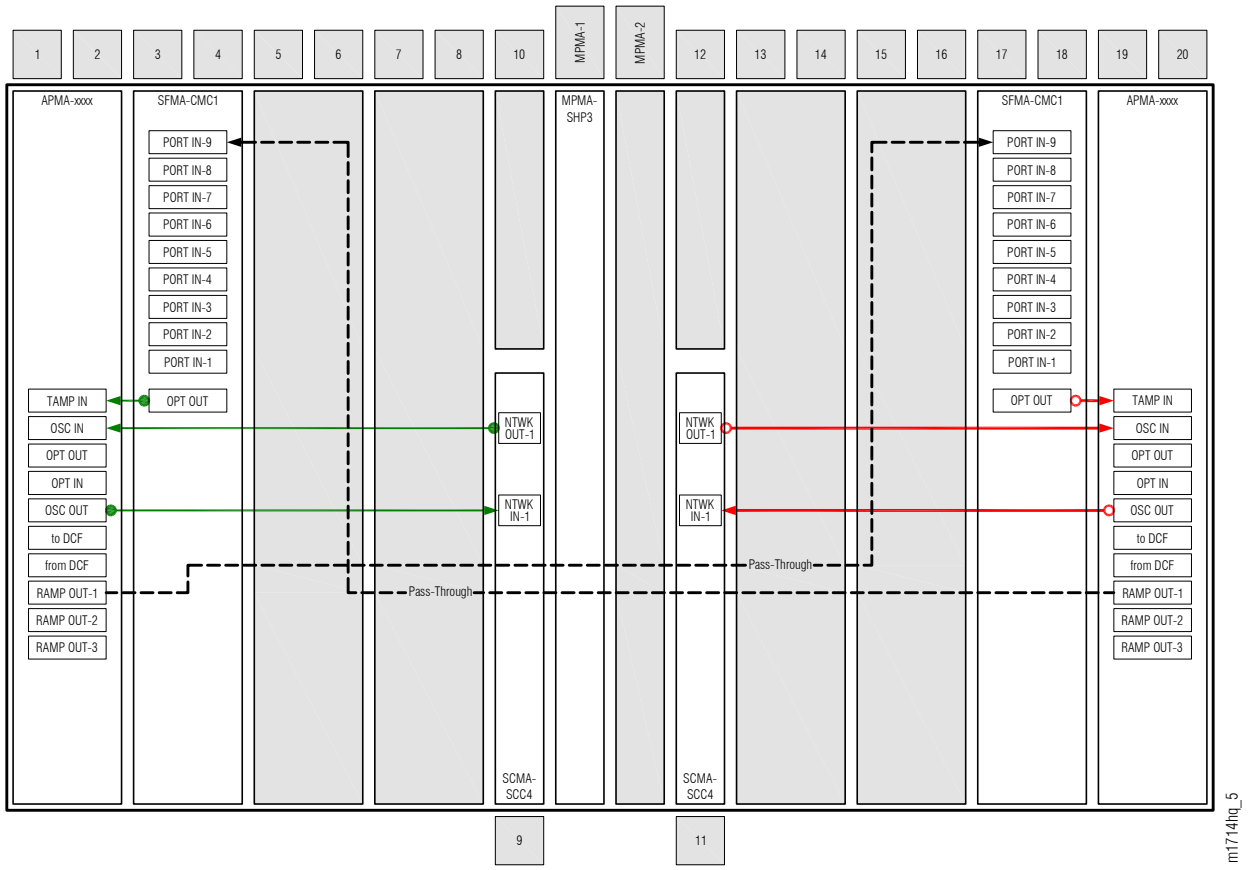


Figure 47: Cables for 2-Degree Express Node–Main Optical Shelf OS1

Note: *Refer also to* About System Turn-up Core Configuration .

HUB Node

In a HUB node, each Optical shelf can be provisioned to support one or two network degrees and each network degree can be provisioned to support add/drop and/or hubbing. The following figure shows the intrashelf fiber-optic cable connections for an Optical shelf that supports two network degrees with add/drop and hubbing for both degrees.

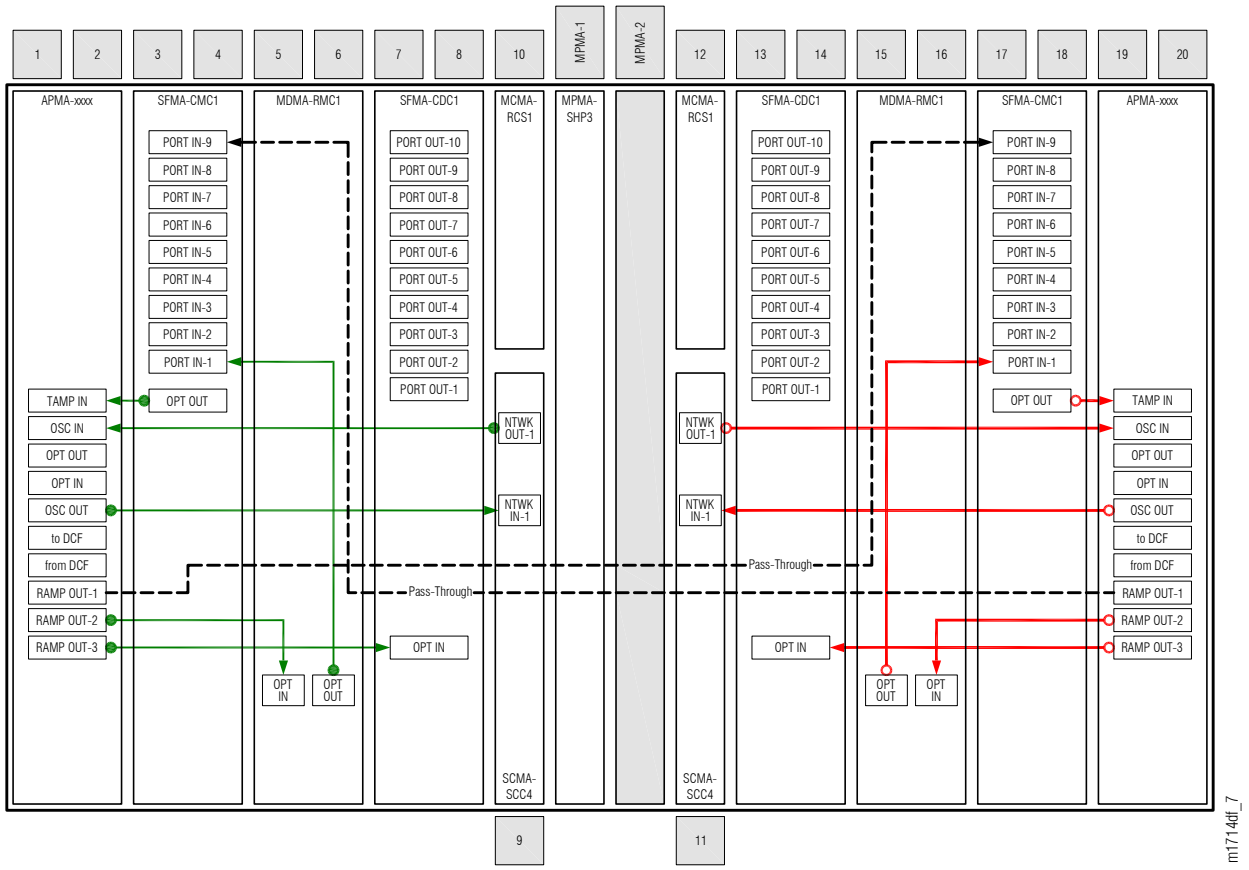


Figure 48: Cables for Add/Drop HUB Nodes–Optical Shelves

The following figures shows the intrashelf fiber-optic cable connections for Optical shelves that supports one network degrees with add/drop and hubbing.

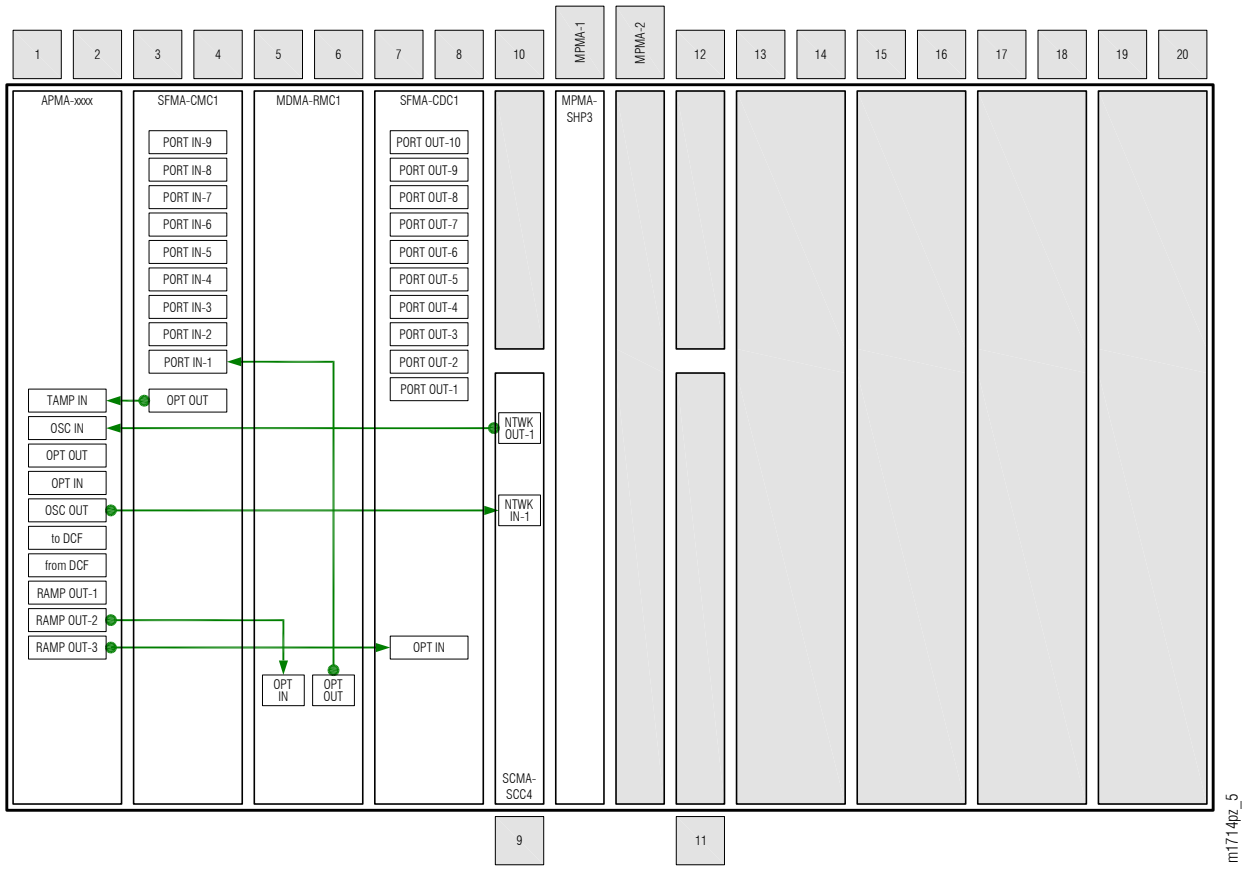


Figure 49: Cables for Add/Drop HUB Nodes–Optical Shelf with Slot-1 WDM Facility

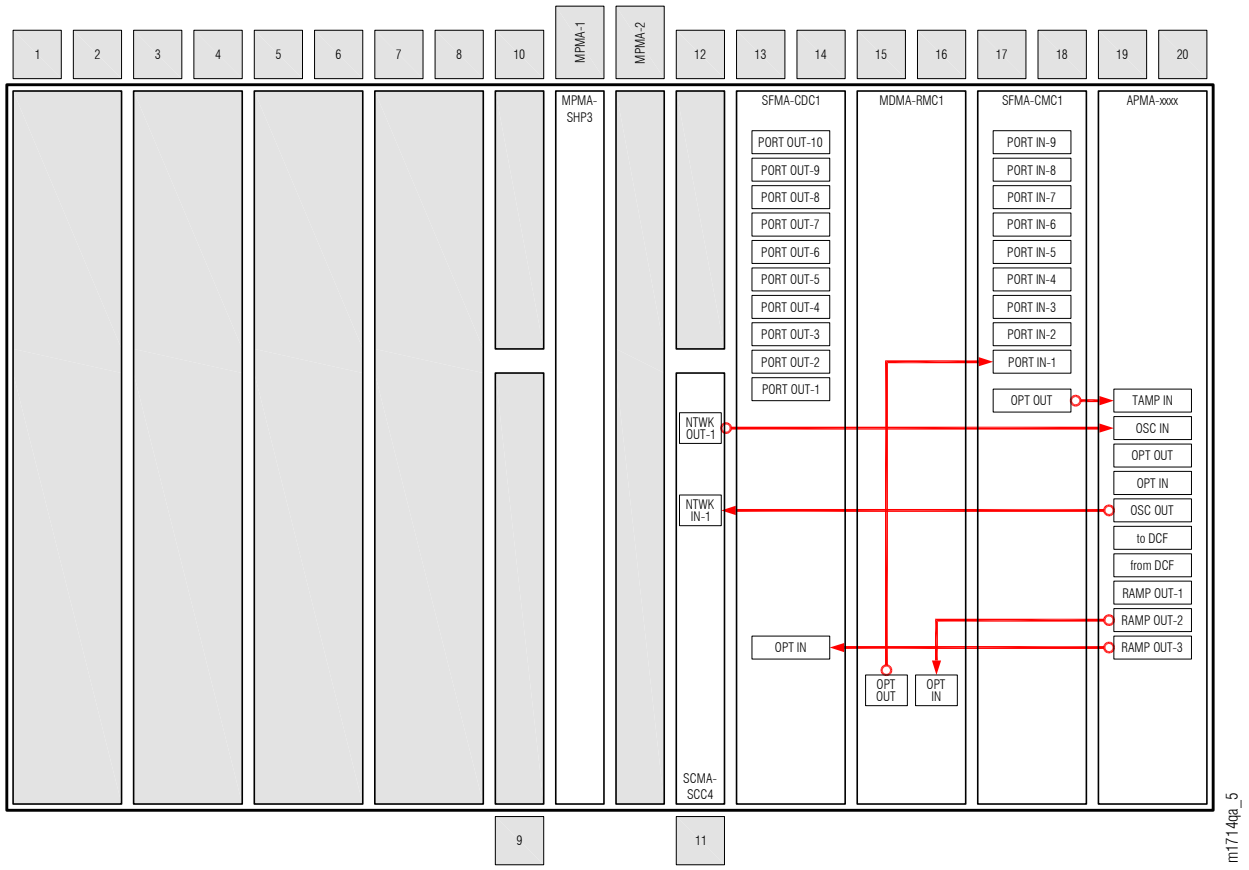


Figure 50: Cables for Add/Drop HUB Nodes–Optical Shelf Slot-19 WDM Facility

HUB nodes can include network degrees that does not support add/drop and/or hubbing. Network degrees that does not support add/drop does not include the MDMA-RMC1 (Mux/Demux unit) and associated cabling. Network degrees that does not support hubbing, do not include the SFMA-CDC1 (WSS HUB Switch unit) and associated cabling.

In addition to the cabling shown in the preceding three figures, HUB nodes require connections between WSS HUB Switch units on different Optical shelves. These cabling connections are not included in this procedure (refer to Provision HUB Interconnections).

ILA Node

Procedures for ILA shelf turn-up are presented in ILA Node Turn-Up. For ILA Shelf fiber-optic cable connections, refer to Install Intrashelf Fiber-Optic Cables.

2.10.3 Installing Intrashelf Cables

The following flowcharts (WSS Core Configuration and 2D-ROADM Configuration) show how these subtasks are used to install intrashelf cables.

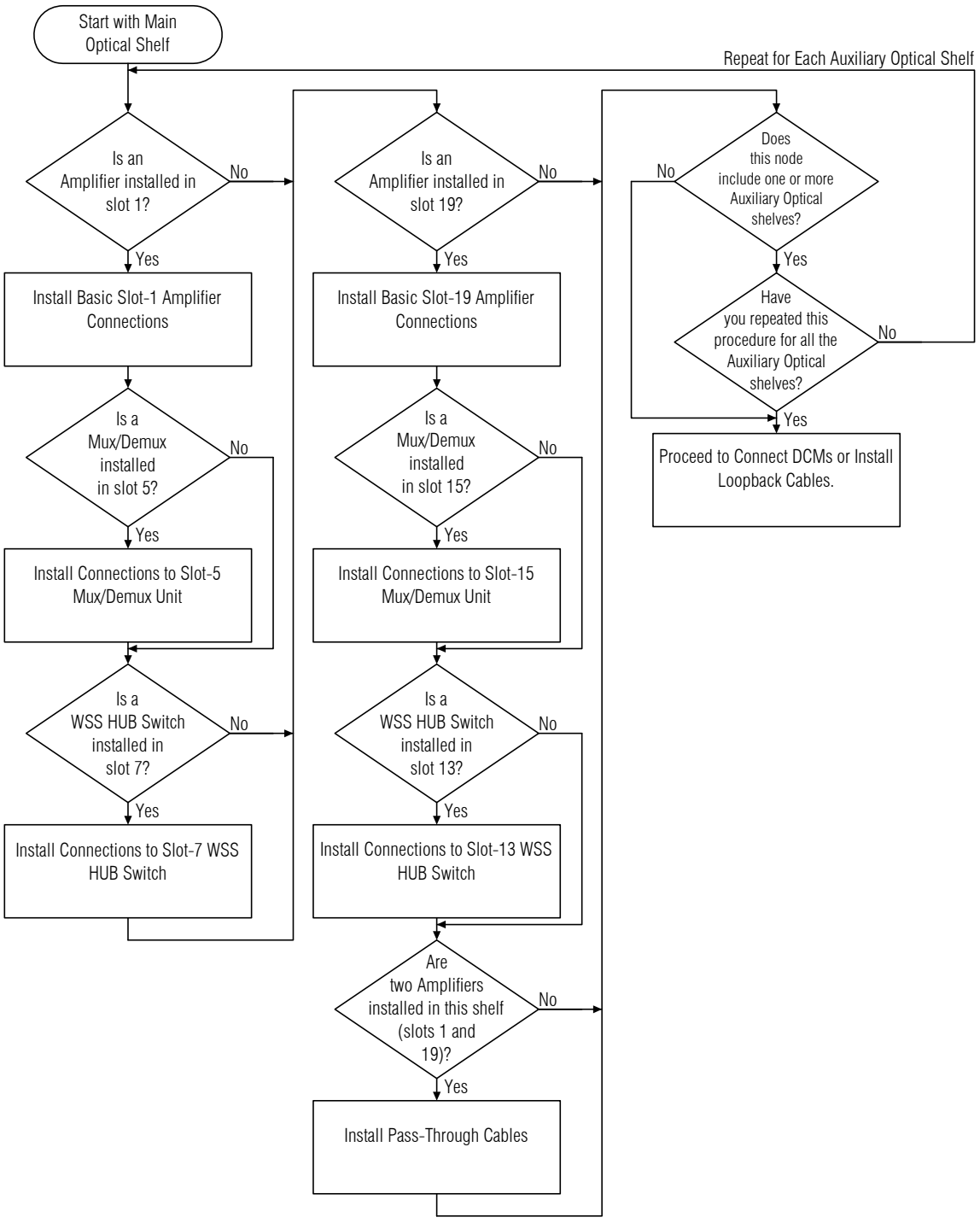


Figure 51: Installing Intrashelf Cables (WSS Core Configuration) (Subprocedure Flowchart)

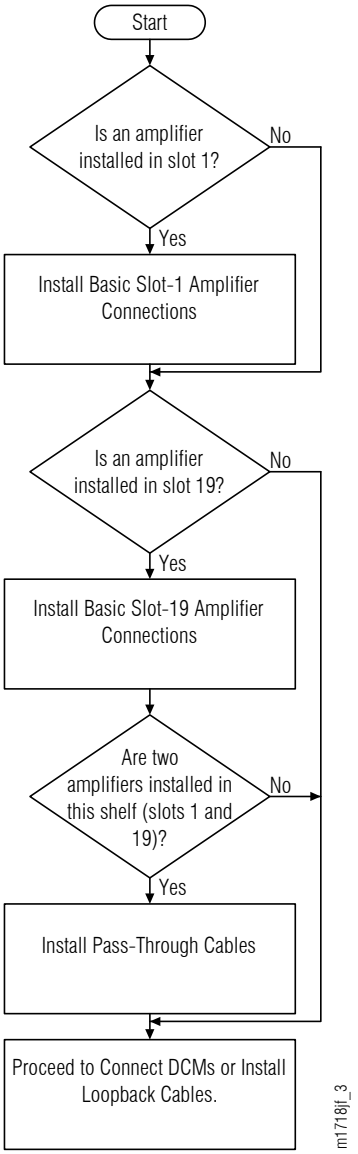


Figure 52: Installing Intrashelf Cables (2D-ROADM Configuration) (Subprocedure Flowchart)

Figure 39 shows the full complement of intrashelf fiber-optic cables that can be installed in an Optical shelf. Typically, depending on the node application, only some of these cables are installed. The cables required for some example applications are illustrated in Examples of Intrashelf Cabling. This procedure provides guidance for installing only those cables that are appropriate for the Optical shelves and plug-in units installed at the node. The procedure is performed once for the Main Optical shelf OS1 and then repeated for each Auxiliary Optical shelf OSn (n = 2...4, 25, 26), as required.

Danger: *Never handle exposed fiber with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove. Follow local safety precautions regarding fiber.*

Danger: *Never look into the end of a fiber-optic cable. Permanent eye damage or blindness can occur very quickly if the laser light is present. Follow local safety precautions regarding fiber.*

Warning: *To avoid damage to the equipment when connecting fibers, always verify the optical specifications. Verify that the optical signal into a receiver meets the appropriate optical specifications listed in* Optical Specifications.

Warning: *Verify the transmit and receive fibers are connected to the correct ports of the plug-in unit. An incorrect connection can result in dropped traffic or an equipment fault and may damage the laser optics.*

Caution: *Before installing fiber-optic cables, always verify that the fiber connectors are free of contamination by visually inspecting with a fiber scope and cleaning the connectors at both ends of the fiber, if necessary. Refer to* Fiber Cable Handling.

Install intrashelf fiber-optic cables as follows:

Step 1
Start with the Main Optical shelf OS1.

Note: *The following steps are performed once for the Main Optical shelf OS1 and then repeated for the Auxiliary Optical shelves OSn (n = 2...4, 25, 26,) as required.*

Step 2
Is an amplifier (APMA-xxxx) plug-in unit installed in slot 1 of the shelf?

If YES:
Proceed to Step 3.

If NO:
Proceed to Step 4.

Step 3
Is this a WSS Core Configuration NE?

If YES:
Proceed to Step 5 (WSS Core Configuration).

If NO:
Proceed to Step 8 (2D-ROADM Configuration).

Step 4
Is this a WSS Core Configuration NE?

If YES:
Proceed to Step 16 (WSS Core Configuration).

If NO:
Proceed to Step 10 (2D-ROADM Configuration).

Install Basic Slot-1 Amplifier Connections

WSS Core Configuration

If an amplifier (APMA-xxxx) plug-in unit is installed in slot 1, three LC-LC fiber-optic cables must be installed as shown in the following figure. The following table lists the connections for each cable.

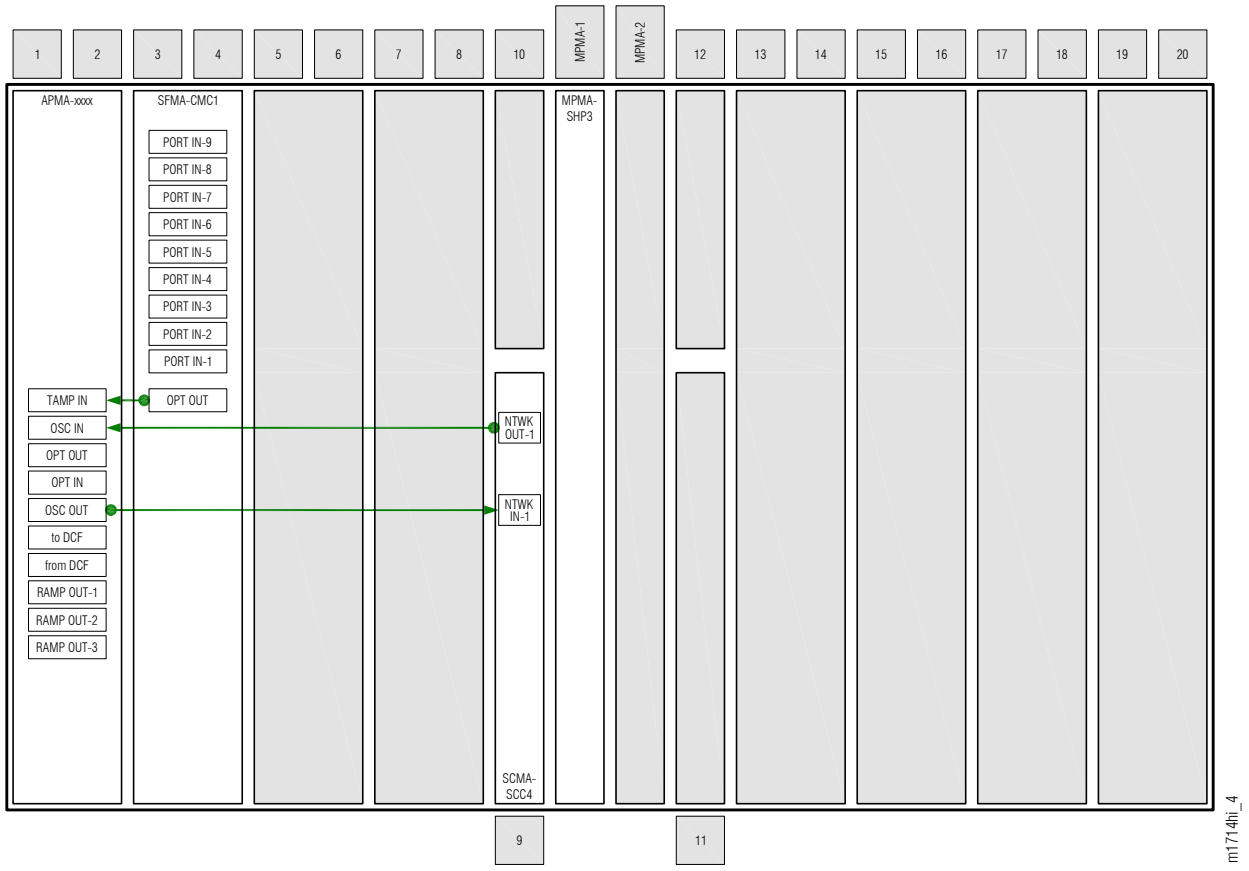


Figure 53: Basic Slot-1 Amplifier Connections (WSS Core Configuration)

Table 18: Basic Slot-1 Amplifier Connections (WSS Core Configuration)

From Amplifier (APMA-xxxx)		To WSS Core Switch (SFMA-CMC1)		To OSC Unit (SCMA-SCC4)	
Shelf Slot	Connector	Shelf Slot	Connector	Shelf Slot	Connector
1	TAMP IN (APMA-xxC1) TAMP IN-1 (APMA-xxU1)	3	OPT OUT	n/a	
1	OSC IN	n/a		9	NTWK OUT-1
1	OSC OUT			9	NTWK IN-1

Step 5
Obtain and clean three LC-LC fiber-optic cables.

Step 6
Connect the cable ends to the appropriate plug-in units and connectors as shown in Figure 53 and listed in the preceding table.

Step 7
Is a Mux/Demux (MDMA-RMC1) plug-in unit installed in slot 5 of the shelf?

If YES:
Proceed to Step 11.

If NO:
Proceed to Step 13.

Install Basic Slot-1 Amplifier Connections
2D-ROADM Configuration

If an amplifier (APMA-xxxx) plug-in unit is installed in slot 1, four LC-LC fiber-optic cables must also be installed as shown in the following figure. The following table lists the connections for each cable.

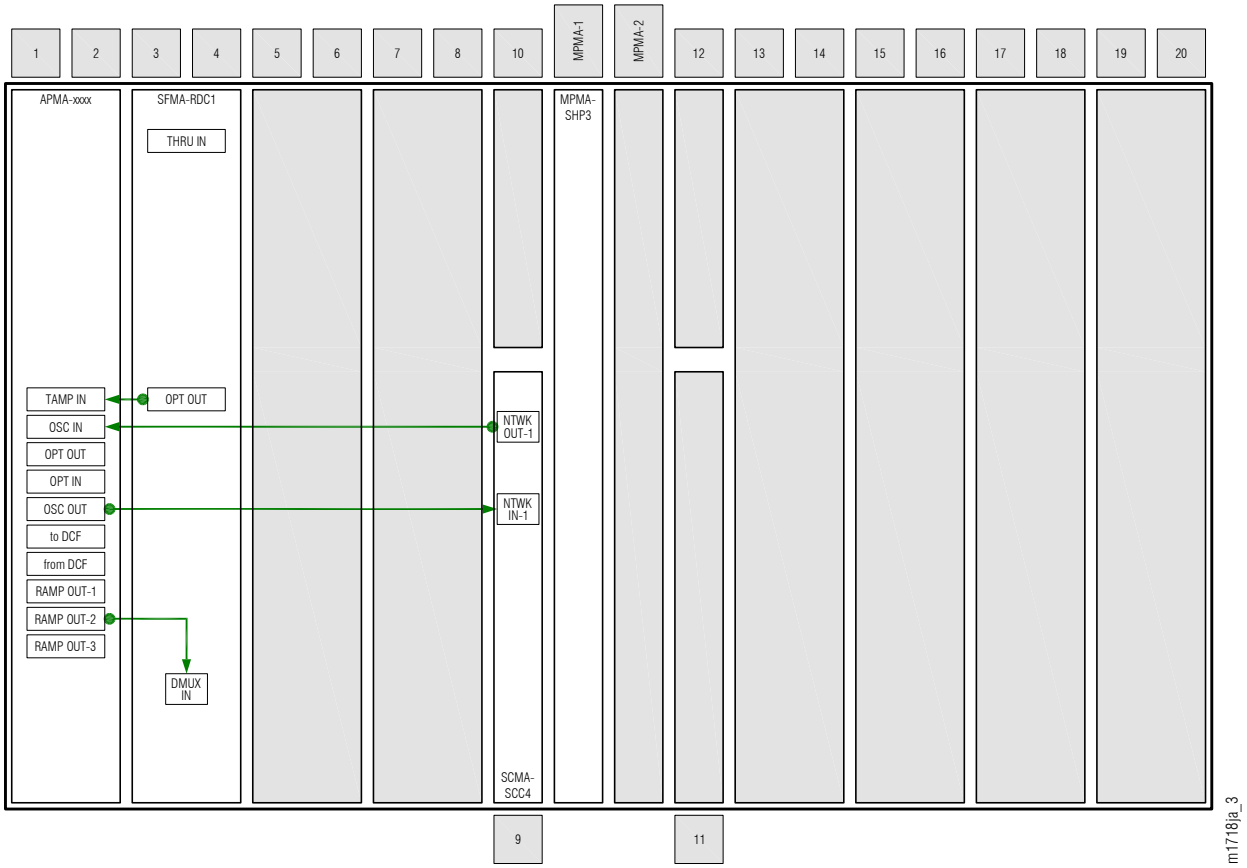


Figure 54: Basic Slot-1 Amplifier Connections (2D-ROADM Configuration)

Table 19: Basic Slot-1 Amplifier Connections (2D-ROADM Configuration)

From Amplifier (APMA-xxxx)		To 2D-ROADM Unit (SFMA-RDC1)		To OSC Unit (SCMA-SCC4)	
Shelf Slot	**Connector**	**Shelf Slot**	**Connector**	**Shelf Slot**	**Connector**
1	TAMP IN (APMA-xxC1) TAMP IN-1 (APMA-xxU1)	3	OPT OUT	n/a	
1	RAMP OUT-2	3	DMUX IN		
1	OSC IN	n/a		9	NTWK OUT-1
1	OSC OUT			9	NTWK IN-1

Step 8
Obtain and clean four LC-LC fiber-optic cables.

Step 9
Connect the cable ends to the appropriate plug-in units and connectors as shown in Figure 54 and listed in the preceding table.

Step 10
Is an amplifier (APMA-xxxx) plug-in unit installed in slot 19 of the shelf?

If YES:
Proceed to Step 20.

If NO:
Proceed to Install LAMs and MPO Connections.

Install Connections to Slot-5 Mux/Demux Unit

If a Mux/Demux (MDMA-RMC1) plug-in unit is installed in slot 5, two LC-LC fiber-optic cables must also be installed as shown in the following figure. The following table lists the connections for each cable.

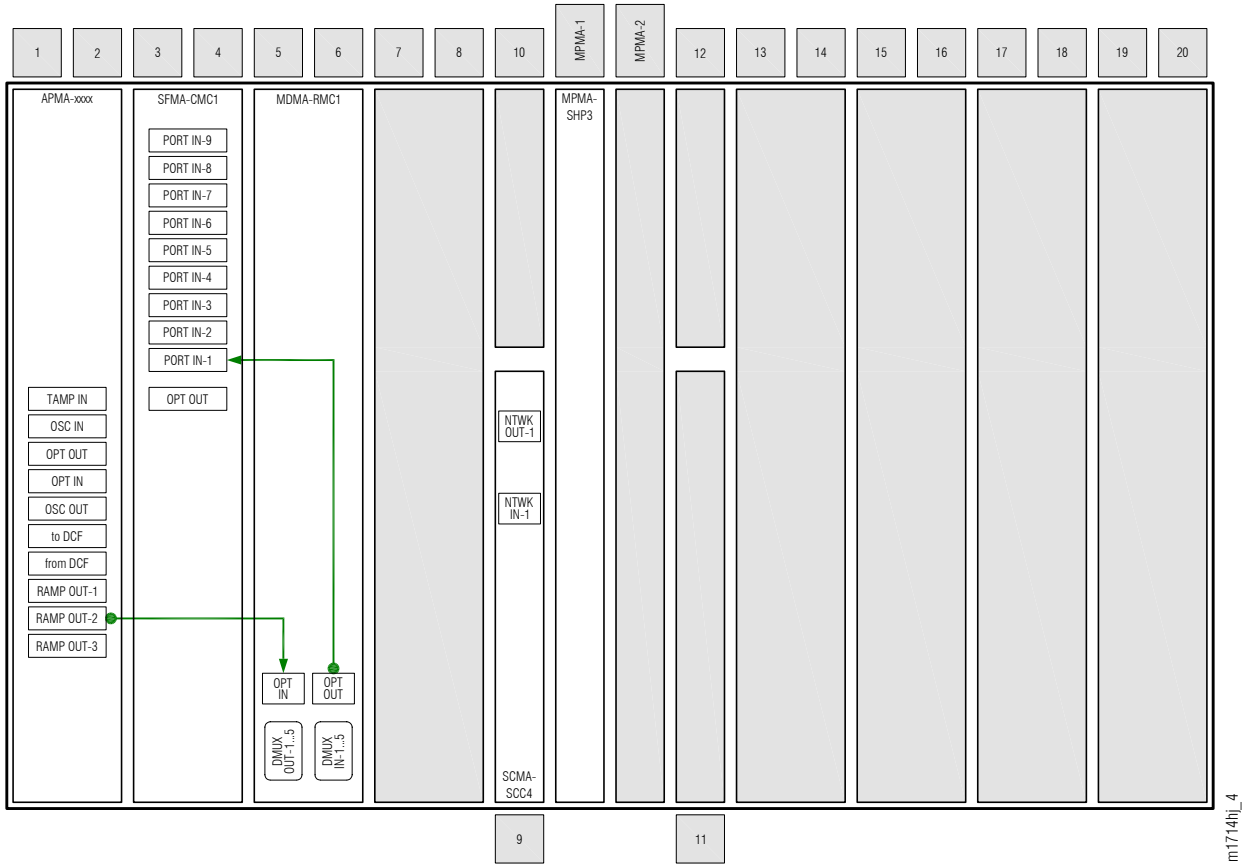


Figure 55: Slot-5 Mux/Demux Connections

Table 20: Slot-5 Mux/Demux Connections

From Amplifier (APMA-xxxx)		From WSS Core Switch (SFMA-CMC1)		To Mux/Demux (MDMA-RMC1)	
Shelf Slot	**Connector**	**Shelf Slot**	**Connector**	**Shelf Slot**	**Connector**
n/a		3	PORT IN-1	5	OPT OUT
1	RAMP OUT-2	n/a		5	OPT IN

Step 11
Obtain and clean two LC-LC fiber-optic cables.

Step 12
Connect the cable ends to the appropriate plug-in units and connectors as shown in Figure 55 and listed in the preceding table.

Step 13
Is a WSS HUB Switch (SFMA-CDC1) plug-in unit installed in slot 7 of the shelf?

If YES:
Proceed to Step 14.

If NO:
Proceed to Step 16.

Install Connections to Slot-7 WSS HUB Switch

If a WSS HUB Switch (SFMA-CDC1) plug-in unit is installed in slot 7, one LC-LC fiber-optic cable must also be installed as shown in the following figure. The following table lists the connections for the cable.

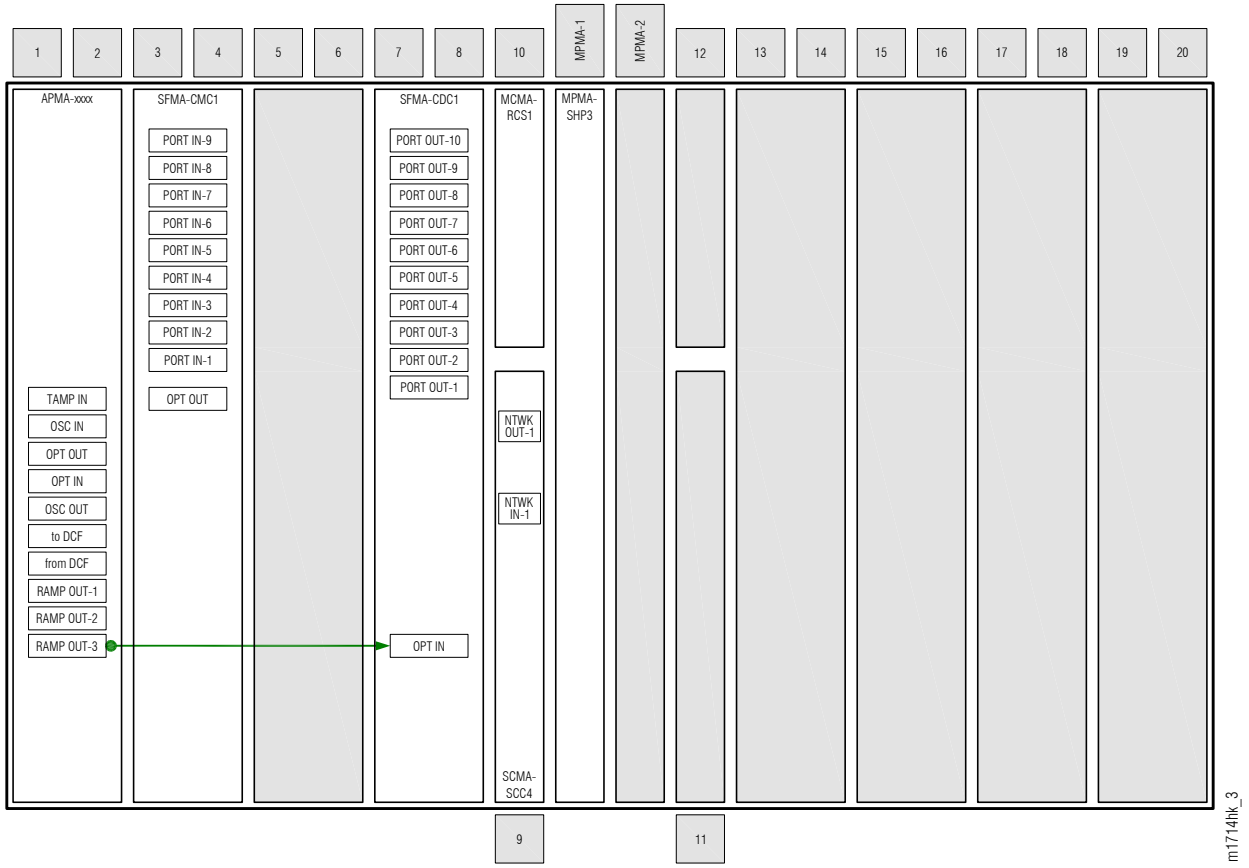


Figure 56: Slot-7 WSS HUB Switch Connections

Table 21: Slot-7 WSS HUB Switch Connections

From Amplifier (APMA-xxxx)		To WSS HUB Switch (SFMA-CDC1)	
Shelf Slot	**Connector**	**Shelf Slot**	**Connector**
1	RAMP OUT-3	7	OPT IN

Step 14
Obtain and clean one LC-LC fiber-optic cable.

Step 15
Connect the cable ends to the appropriate plug-in units and connectors as shown in Figure 56 and listed in the preceding table.

Step 16
Is an amplifier (APMA-xxxx) plug-in unit installed in slot 19 of the shelf?

If YES:
Proceed to Step 17.

If NO:
Proceed to Step 31.

Install Basic Slot-19 Amplifier Connections

WSS Core Configuration

If an amplifier (APMA-xxxx) plug-in unit is installed in slot 19, three LC-LC fiber-optic cables must also be installed as shown in the following figure. The following table lists the connections for each cable.

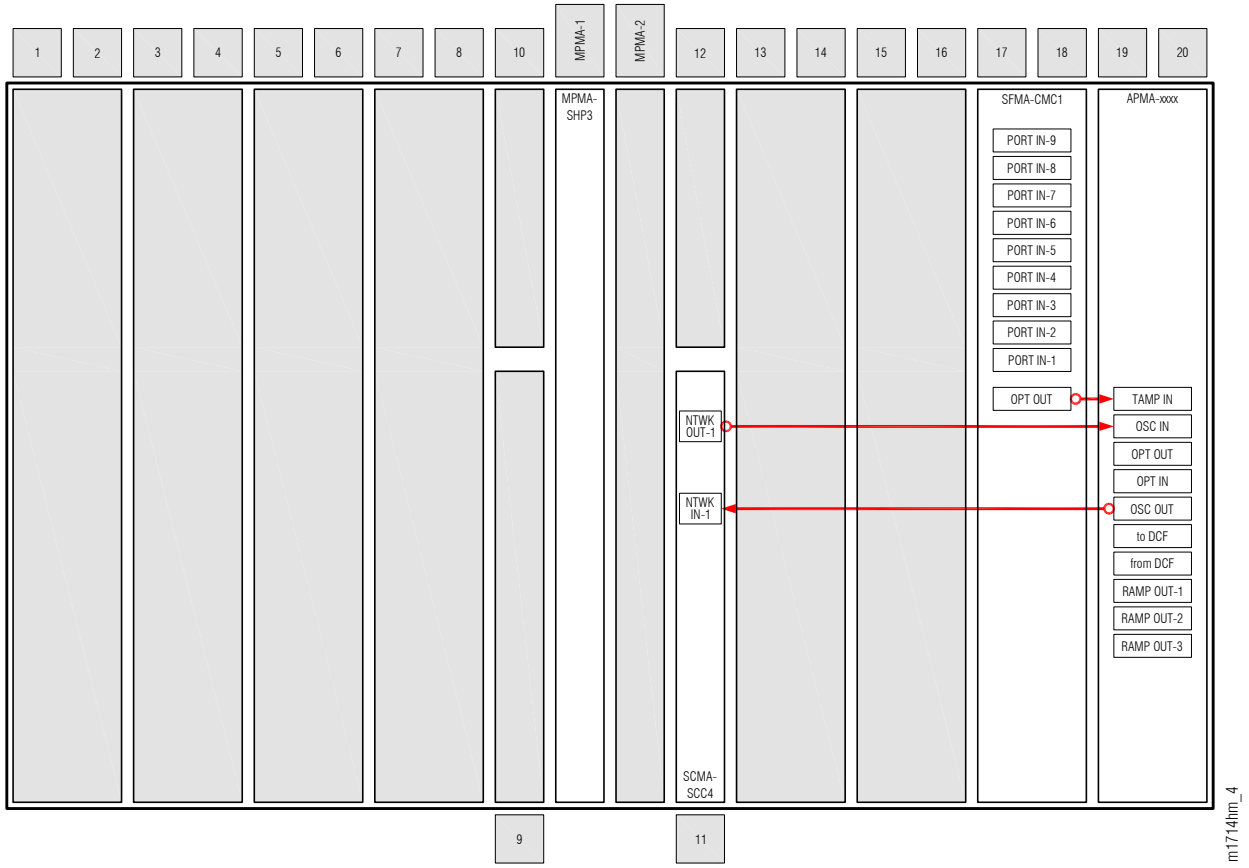


Figure 57: Basic Slot-19 Amplifier Connections (WSS Core Configuration)

Table 22: Basic Slot-19 Amplifier Connections (WSS Core Configuration)

From Amplifier (APMA-xxxx)		To WSS Core Switch (SFMA-CMC1)		To OSC Unit (SCMA-SCC4)	
Shelf Slot	**Connector**	**Shelf Slot**	**Connector**	**Shelf Slot**	**Connector**
19	TAMP IN (APMA-xxC1) TAMP IN-1 (APMA-xxU1)	17	OPT OUT	n/a	
19	OSC IN	n/a		11	NTWK OUT-1
19	OSC OUT			11	NTWK IN-1

Step 17
Obtain and clean three LC-LC fiber-optic cables.

Step 18
Connect the cable ends to the appropriate plug-in units and connectors as shown in Figure 57 and listed in the preceding table.

Step 19
Is a Mux/Demux (MDMA-RMC1) plug-in unit installed in slot 15 of the shelf?

If YES:
Proceed to Step 23.

If NO:
Proceed to Step 25.

Install Basic Slot-19 Amplifier Connections

2D-ROADM Configuration

If an amplifier (APMA-xxxx) plug-in unit is installed in slot 19, four LC-LC fiber-optic cables must also be installed as shown in the following figure. The following table lists the connections for each cable.

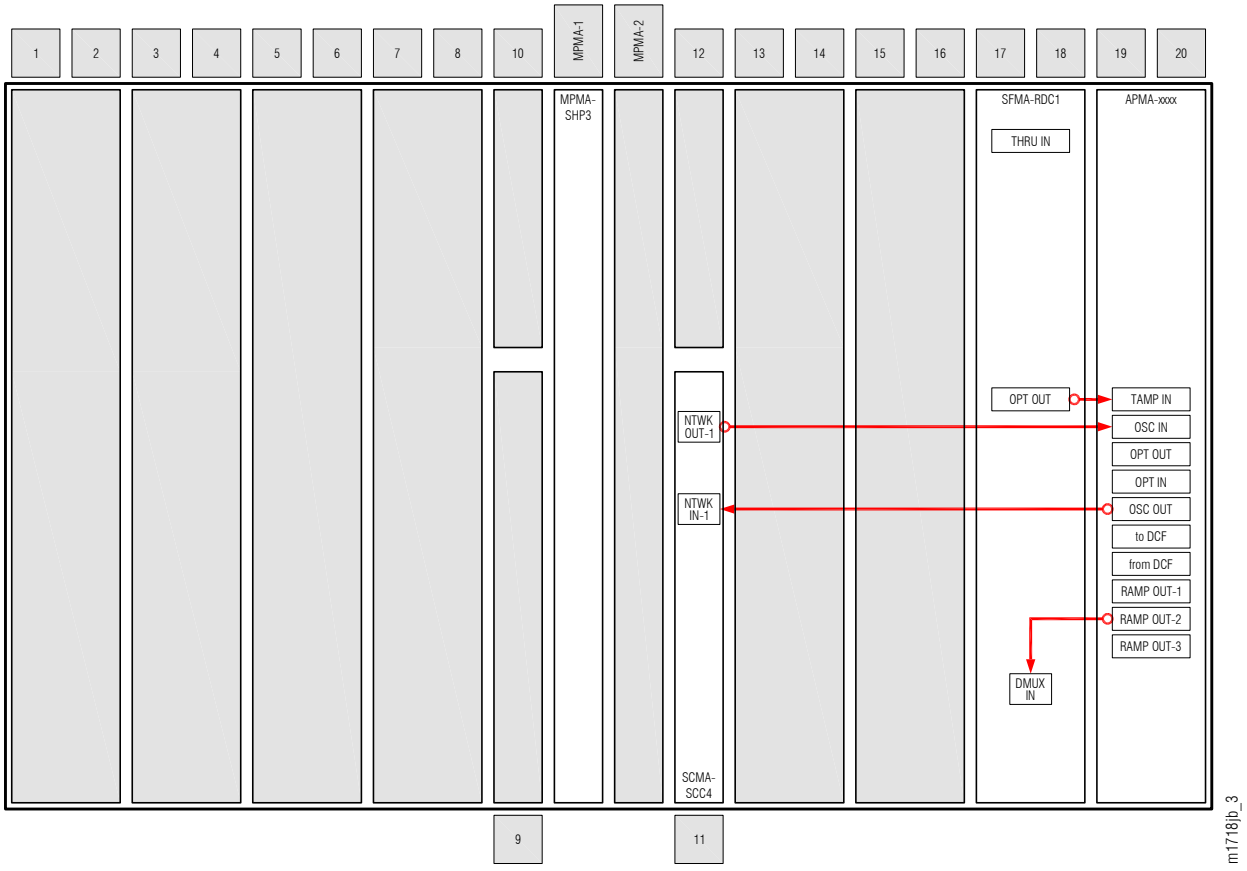


Figure 58: Basic Slot-19 Amplifier Connections (2D-ROADM Configuration)

Table 23: Basic Slot-19 Amplifier Connections (2D-ROADM Configuration)

From Amplifier (APMA-xxxx)		To 2D-ROADM Unit (SFMA-RDC1)		To OSC Unit (SCMA-SCC4)	
Shelf Slot	**Connector**	**Shelf Slot**	**Connector**	**Shelf Slot**	**Connector**
19	TAMP IN (APMA-xxC1) TAMP IN-1 (APMA-xxU1)	17	OPT OUT	n/a	
19	RAMP OUT-2	17	DMUX IN		
19	OSC IN	n/a		11	NTWK OUT-1
19	OSC OUT			11	NTWK IN-1

Step 20
Obtain and clean four LC-LC fiber-optic cables.

Step 21
Connect the cable ends to the appropriate plug-in units and connectors as shown in Figure 58 and listed in the preceding table.

Step 22
Are two amplifier (APMA-xxxx) plug-in units installed in the shelf (one in slot 1 and another in slot 19)?

If YES:
Proceed to Step 32.

If NO:
Proceed to Install LAMs and MPO Connections.

Install Connections to Slot-15 Mux/Demux Unit

If a Mux/Demux (MDMA-RMC1) plug-in unit is installed in slot 15, two LC-LC fiber-optic cables must also be installed as shown in the following figure. The following table lists the connections for each cable.

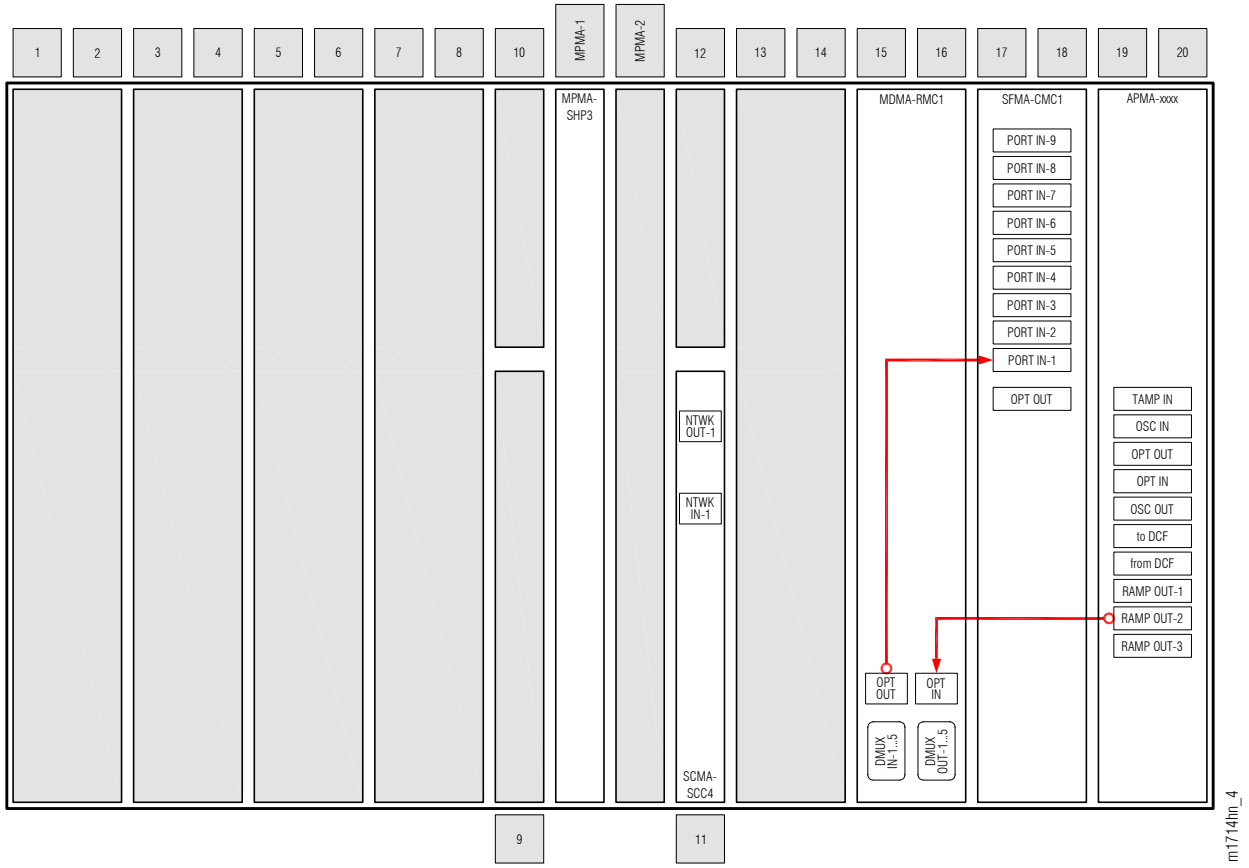


Figure 59: Slot-15 Mux/Demux Connections

Table 24: Slot-15 Mux/Demux Connections

From Amplifier (APMA-xxxx)		From WSS Core Switch (SFMA-CMC1)		To Mux/Demux (MDMA-RMC1)	
Shelf Slot	**Connector**	**Shelf Slot**	**Connector**	**Shelf Slot**	**Connector**
n/a		17	PORT IN-1	15	OPT OUT
19	RAMP OUT-2	n/a		15	OPT IN

Step 23
Obtain and clean two LC-LC fiber-optic cables.

Step 24
Connect the cable ends to the appropriate plug-in units and connectors as shown in Figure 59 and listed in the preceding table.

Step 25
Is a WSS HUB Switch (SFMA-CDC1) plug-in unit installed in slot 13 of the shelf?

If YES:
Proceed to Step 26.

If NO:
Proceed to Step 28.

Install Connections to Slot-13 WSS HUB Switch

If a WSS HUB Switch (SFMA-CDC1) plug-in unit is installed in slot 13, one LC-LC fiber-optic cable must also be installed as shown in the following figure. The following table lists the connections for the cable.

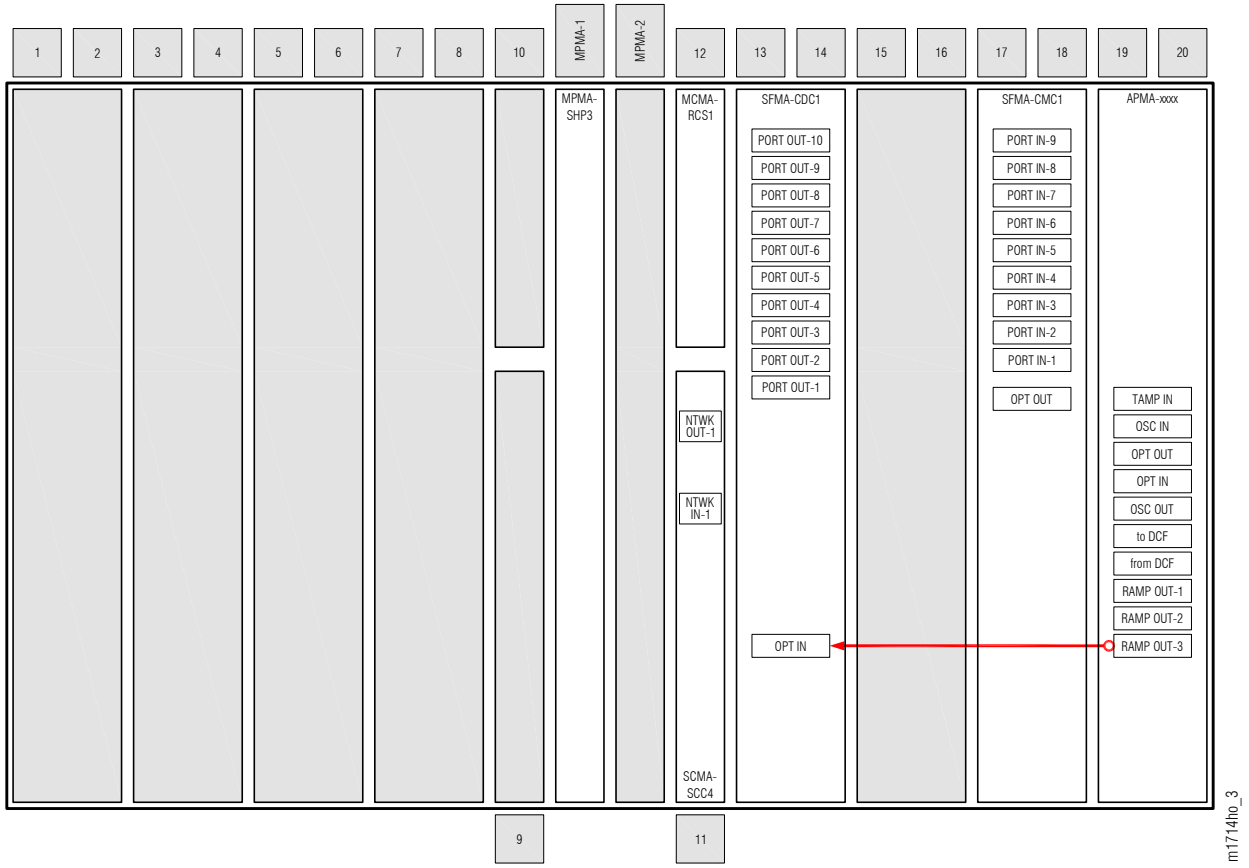


Figure 60: Slot-13 WSS HUB Switch Connections

Table 25: Slot-13 WSS HUB Switch Connections

From Amplifier (APMA-xxxx)		To WSS HUB Switch (SFMA-CDC1)	
Shelf Slot	Connector	Shelf Slot	Connector
19	RAMP OUT-3	13	OPT IN

Step 26
Obtain and clean one LC-LC fiber-optic cable.

Step 27
Connect the cable ends to the appropriate plug-in units and connectors as shown in Figure 60 and listed in the preceding table.

Step 28
Are two amplifier (APMA-xxxx) plug-in units installed in the shelf (one in slot 1 and another in slot 19)?

If YES:
Proceed to Step 29.

If NO:
Proceed to Step 31.

Install Pass-Through Cables, If Required

WSS Core Configuration

If two amplifier (APMA-xxxx) plug-in units are installed in the shelf (slots 1 and/or 19), two LC-LC fiber-optic cables must also be installed as shown in the following figure. The following table lists the connections for each cable.

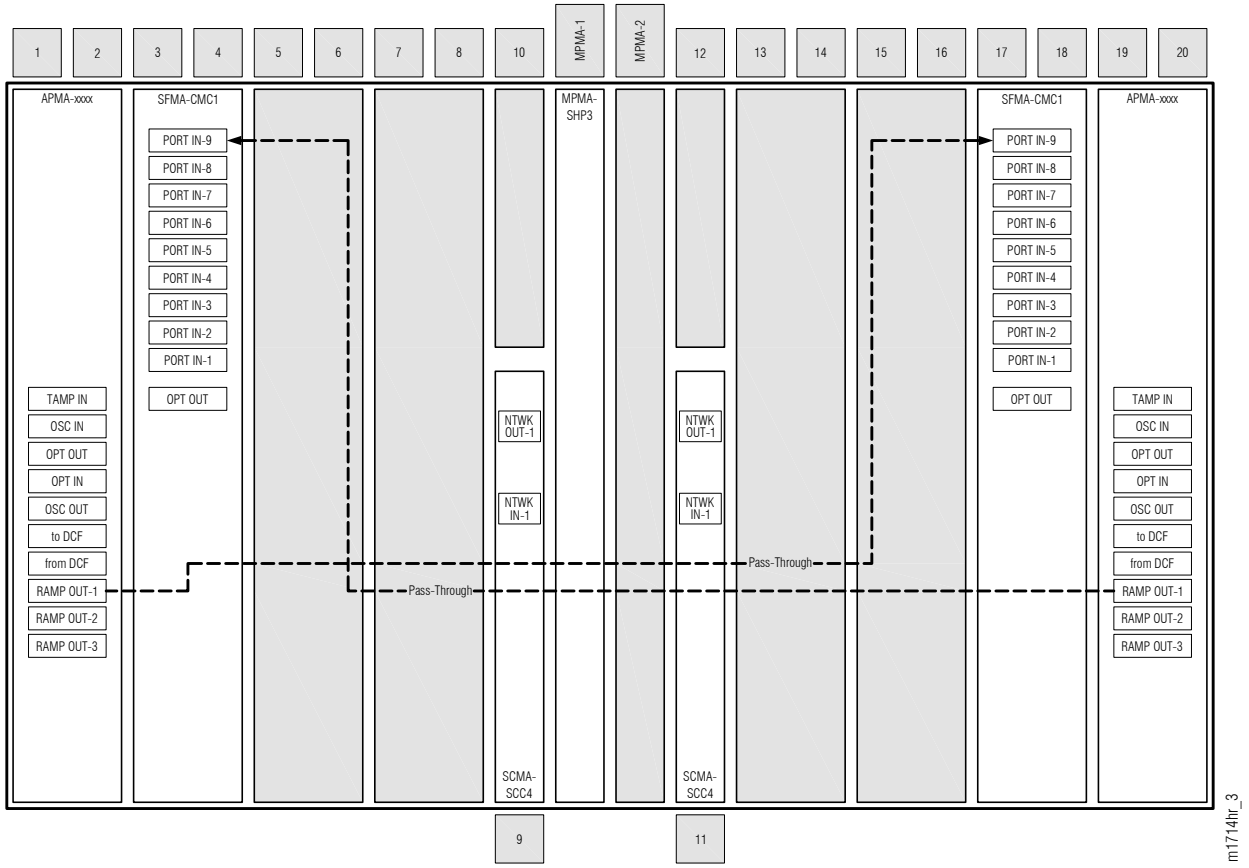


Figure 61: Pass-Through Cable Connections (WSS Core Configuration)

Table 26: Pass-Through Cable Connections (WSS Core Configuration)

Amplifier (APMA-xxxx)		WSS Core Switch (SFMA-CMC1)	
Shelf Slot	**Connector**	**Shelf Slot**	**Connector**
1	RAMP OUT-1	17	PORT IN-9
19	RAMP OUT-1	3	PORT IN-9

Step 29
Obtain and clean two LC-LC fiber-optic cables.

Step 30
Connect the cable ends to the appropriate plug-in units and connectors as shown in Figure 61 and listed in the preceding table.

Step 31
Is the node a HUB node (including one or more Auxiliary Optical shelves)?

If YES:
Repeat this procedure starting from Step 2 for each Auxiliary Optical shelf OSn (n = 2...4, 25, 26). Then proceed to Install LAMs and MPO Connections.

If NO:
Proceed to Install LAMs and MPO Connections.

Install Pass-Through Cables, If Required

2D-ROADM Configuration

If two amplifier (APMA-xxxx) plug-in units are installed in the shelf (slots 1 and/or 19), two LC-LC fiber-optic cables must also be installed as shown in the following figure. The following table lists the connections for each cable.

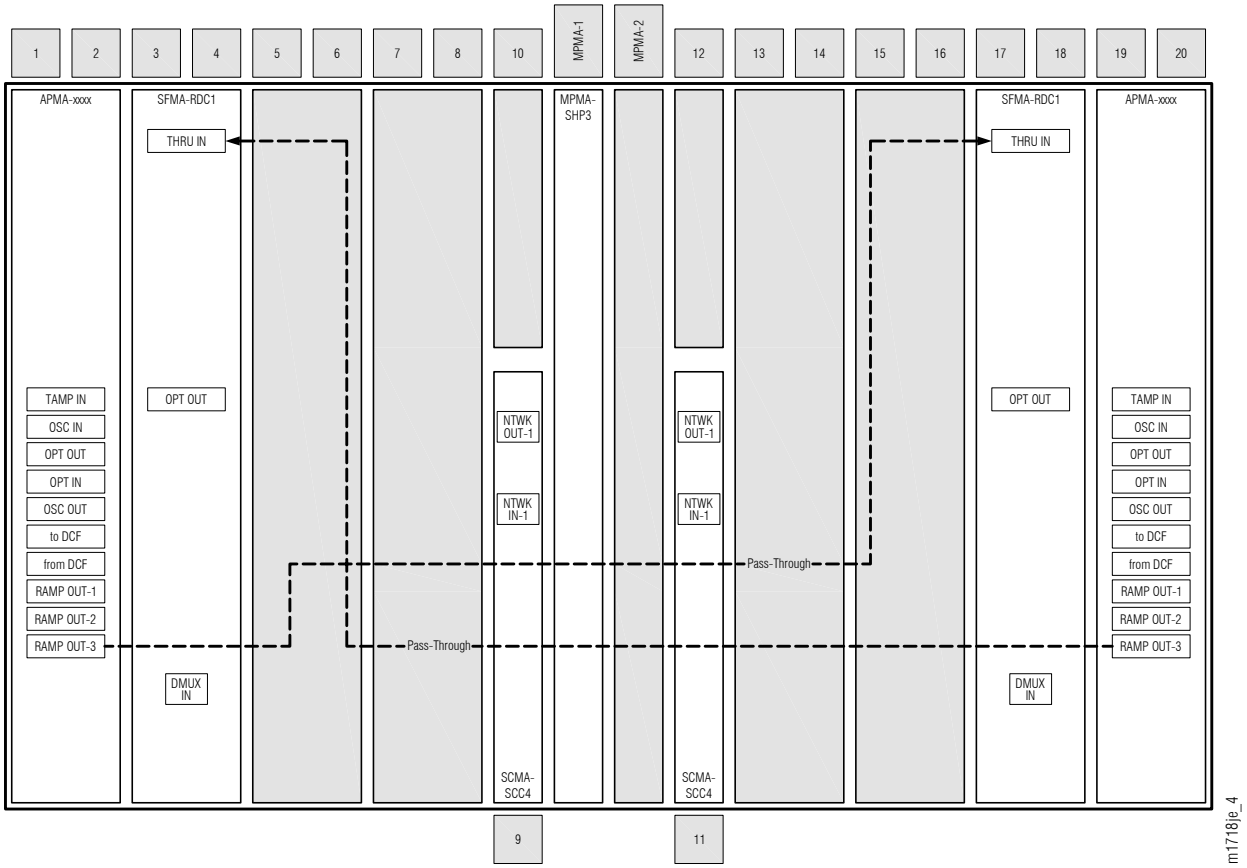


Figure 62: Pass-Through Cable Connections (2D-ROADM Configuration)

Table 27: Pass-Through Cable Connections (2D-ROADM Configuration)

Amplifier (APMA-xxxx)		2D-ROADM Unit (SFMA-RDC1)	
Shelf Slot	**Connector**	**Shelf Slot**	**Connector**
1	RAMP OUT-3	17	THRU IN
19	RAMP OUT-3	3	THRU IN

Step 32
Obtain and clean two LC-LC fiber-optic cables.

Step 33
Connect the cable ends to the appropriate plug-in units and connectors as shown in Figure 62 and listed in the preceding table.

Step 34
Proceed to Install LAMs and MPO Connections.

✔ This procedure is complete.

2.11 Install LAMs and MPO Connections

In this section:

The lambda access module (IPMA-LAM5) is a passive plug-in unit that is used to optically interconnect the MDMA-RMC1 or SFMA-RDC1 unit (in the Optical shelf) to optical line cards (in the Tributary shelf).

For WSS Core Configuration nodes, proceed to Install LAMs and MPO Connections to Mux/Demux Units (WSS Core Configuration). For 2D-ROADM Configuration nodes, proceed to Install LAMs and MPO Connections to 2D-ROADM Units (2D-ROADM Configuration).

2.11.1 Install LAMs and MPO Connections to Mux/Demux Units (WSS Core Configuration)

Each LAM plug-in unit is located in a LAS shelf. LAS shelf LAS-OS1 is associated with the main Optical shelf OS1. If required, another LAS shelf (LAS-OSn) is associated with each Auxiliary Optical shelf OSn (n = 2…4, 25, 26) (HUB nodes only).

Each LAM provides one MPO connector (OPT MAIN) and eight LC-type fiber-optic cable connectors (PORT1…PORT8) that are used to either add or drop eight channels to/from a WDM facility.

The following figure shows the MPO-to-MPO cable interconnections between Mux/Demux plug-in units in an Optical shelf and LAM plug-in units in the associated LAS shelf.

From the following figure, observe the following:

- WDM facilities are associated with LAMs as follows:
  - LAMs on the left side of LAS-OSn support WDM facility OSn-1-PE1 (n = 1…4, 25, 26)
  - LAMs on the right side of LAS-OSn support WDM facility OSn-19-PE1 (n = 1…4, 25, 26)
- Each LAM supports eight channels: 1…8, 9…16, 17…24, 25…32, or 33…40
- Each LAM either adds or drops the eight channels

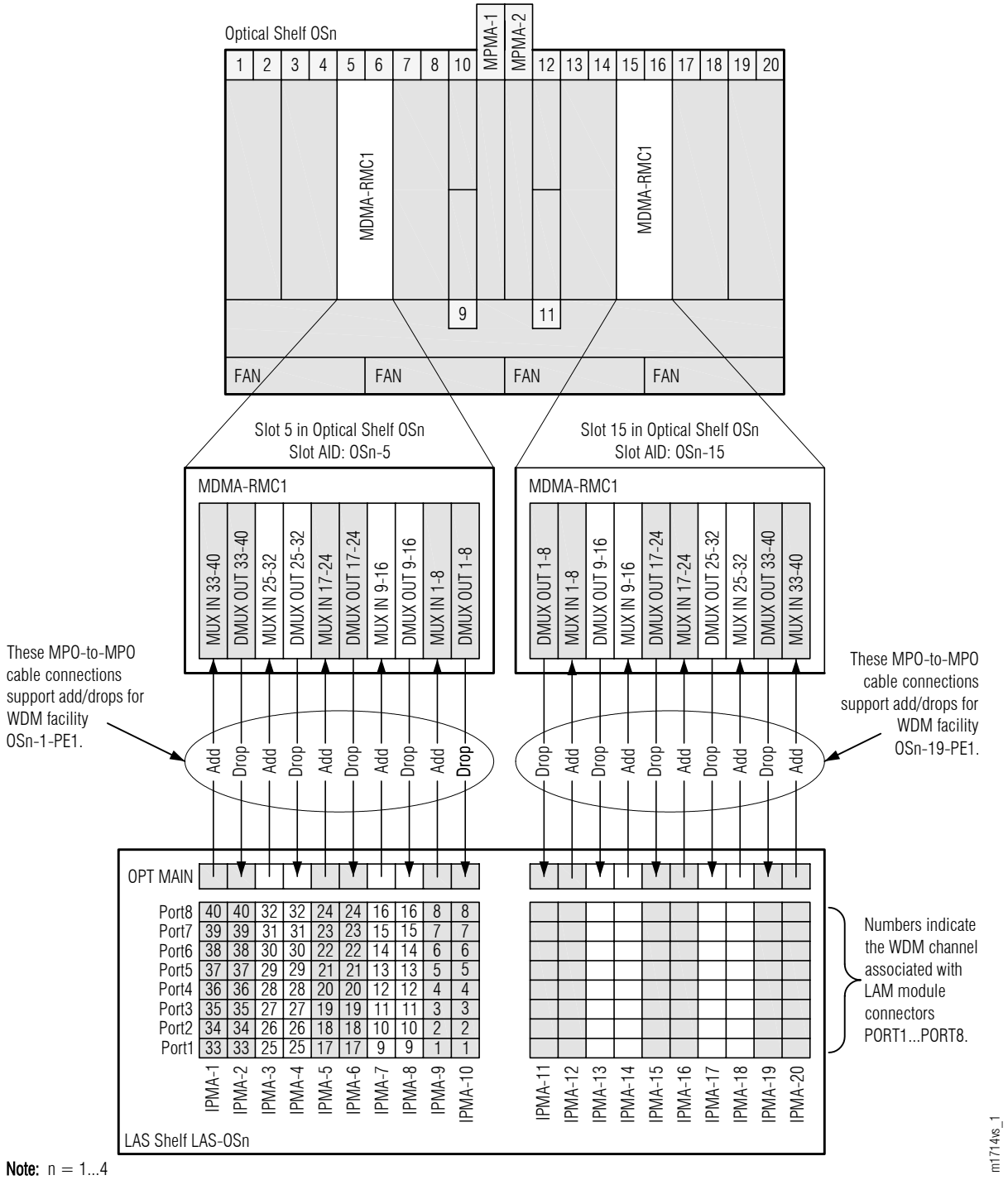


Figure 63: MPO Cable Connections to Shelf LAS-OSn (WSS Core Configuration)

The following table identifies the LAMs needed to add or drop each WDM channel.

Table 28: LAMs Required to Add/Drop WDM Channel (WSS Core Configuration)

WDM -Facility[29]	Add/Drop	Required LAMs (Identified by LAS Shelf Slot Name)					
		LAS Shelf	Channels1...8	Channels9...16	Channels17...24	Channels25...32	Channels33...40
OSn-1-PE1	Add	LAS-OSn	IPMA-9	IPMA-7	IPMA-5	IPMA-3	IPMA-1
	Drop		IPMA-10	IPMA-8	IPMA-6	IPMA-4	IPMA-2
OSn-19-PE1	Add		IPMA-12	IPMA-14	IPMA-16	IPMA-18	IPMA-20
	Drop		IPMA-11	IPMA-13	IPMA-15	IPMA-17	IPMA-19

Danger: *Never handle exposed fiber with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove. Follow local safety precautions regarding fiber.*

Danger: *Never look into the end of a fiber-optic cable. Permanent eye damage or blindness can occur very quickly if the laser light is present. Follow local safety precautions regarding fiber.*

Warning: *To avoid damage to the equipment when connecting fibers, always verify the optical specifications. Verify that the optical signal into a receiver meets the appropriate optical specifications listed in* Optical Specifications.

Step 1
Consult network design specifications to determine the shelf and slot location for each LAM (IPMA-LAM5) to be installed.

Step 2
For each uninstalled LAM, do the following:

Step 3

a) Inspect the LAM for possible damage or debris.

b) Insert the LAM in the appropriate slot of the appropriate LAS shelf.

c) Referring to the following table, identify the MDMA-RMC1 plug-in unit and connector that supports the LAM.

d) Using an MPO-to-MPO fiber-optic ribbon cable, physically connect OPT MAIN of the LAM to the appropriate MDMA-RMC1 plug-in unit connector.

29 OSn refers to the Optical shelf, n = 1...4, 25, 26.

Table 29: MPO-to-MPO Cable Connections to LAS Shelves (WSS Core Configuration)

From LAM			To MDMA-RMC1		
Shelf[30]	Shelf Slot	Connector	Shelf	Shelf Slot	Connector
LAS-OSn	IPMA-1	OPT MAIN	OSn	5	MUX IN 33-40
	IPMA-2	OPT MAIN			DMUX OUT 33-40
	IPMA-3	OPT MAIN			MUX IN 25-32
	IPMA-4	OPT MAIN			DMUX OUT 25-32
	IPMA-5	OPT MAIN			MUX IN 17-24
	IPMA-6	OPT MAIN			DMUX OUT 17-24
	IPMA-7	OPT MAIN			MUX IN 9-16
	IPMA-8	OPT MAIN			DMUX OUT 9-16
	IPMA-9	OPT MAIN			MUX IN 1-8
	IPMA-10	OPT MAIN			DMUX OUT 1-8
LAS-OSn	IPMA-11	OPT MAIN	OSn	15	DMUX OUT 1-8
	IPMA-12	OPT MAIN			MUX IN 1-8
	IPMA-13	OPT MAIN			DMUX OUT 9-16
	IPMA-14	OPT MAIN			MUX IN 9-16
	IPMA-15	OPT MAIN			DMUX OUT 17-24
	IPMA-16	OPT MAIN			MUX IN 17-24
	IPMA-17	OPT MAIN			DMUX OUT 25-32
	IPMA-18	OPT MAIN			MUX IN 25-32
	IPMA-19	OPT MAIN			DMUX OUT 33-40
	IPMA-20	OPT MAIN			MUX IN 33-40

Step 4
Proceed to Connect DCMs or Install Loopback Cables.

2.11.2 Install LAMs and MPO Connections to 2D-ROADM Units (2D-ROADM Configuration)

Each LAM plug-in unit is located in LAS shelf LAS-OS1 which is associated with the optical shelf OS1.

[30] **OSn refers to the Optical shelf, n = 1...4, 25, 26.**

Each LAM provides one MPO connector (OPT MAIN) and eight LC-type fiber-optic cable connectors (PORT1...PORT8) that are used to either add or drop eight channels to/from a WDM facility.

The following figure shows the MPO-to-MPO cable interconnections between 2D-ROADM plug-in units in the optical shelf and LAM plug-in units in the LAS shelf.

From the following figure, observe the following:

- WDM facilities are associated with LAMs as follows:
  - LAMs on the left side of LAS-OS1 support WDM facility OS1-1-PE1
  - LAMs on the right side of LAS-OS1 support WDM facility OS1-19-PE1
- Each LAM supports eight channels: 1...8, 9...16, 17...24, 25...32, or 33...40
- Each LAM either adds or drops the eight channels

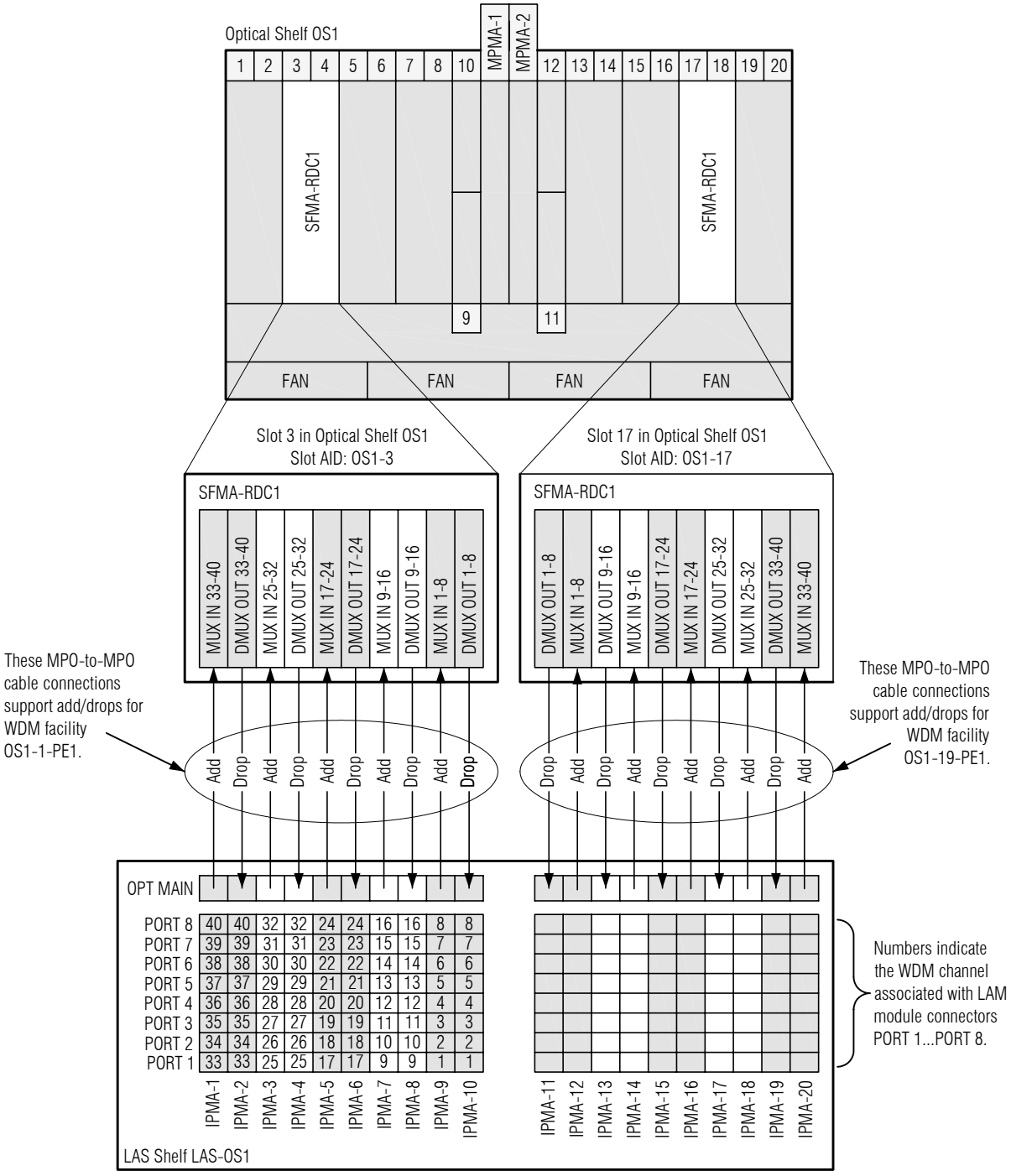


Figure 64: MPO Cable Connections to Shelf LAS-OS1 (2D-ROADM Configuration)

The following table identifies the LAMs needed to add or drop each WDM channel.

Table 30: LAMs Required to Add/Drop WDM Channel (2D-ROADM Configuration)

WDM -Facility	Add/Drop	Required LAMs (Identified by LAS Shelf Slot Name)					
		LAS Shelf	Channels1 ...8	Channels9 ...16	Channels17...24	Channels25...32	Channels33...40
OS1-1-PE1	Add	LAS-OS1	IPMA-9	IPMA-7	IPMA-5	IPMA-3	IPMA-1
	Drop		IPMA-10	IPMA-8	IPMA-6	IPMA-4	IPMA-2
OS1-19-PE1	Add		IPMA-12	IPMA-14	IPMA-16	IPMA-18	IPMA-20
	Drop		IPMA-11	IPMA-13	IPMA-15	IPMA-17	IPMA-19

Danger: *Never handle exposed fiber with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove. Follow local safety precautions regarding fiber.*

Danger: *Never look into the end of a fiber-optic cable. Permanent eye damage or blindness can occur very quickly if the laser light is present. Follow local safety precautions regarding fiber.*

Warning: *To avoid damage to the equipment when connecting fibers, always verify the optical specifications. Verify that the optical signal into a receiver meets the appropriate optical specifications listed in* Optical Specifications.

Step 1
Consult network design specifications to determine the shelf and slot location for each LAM (IPMA-LAM5) to be installed.

Step 2
For each uninstalled LAM, do the following:

Step 3

a) Inspect the LAM for possible damage or debris.

b) Insert the LAM in the appropriate slot of the LAS shelf.

c) Using the following table, identify the SFMA-RDC1 plug-in unit and connector that supports the LAM.

d) Using an MPO-to-MPO fiber-optic ribbon cable, physically connect OPT MAIN of the LAM to the appropriate SFMA-RDC1 plug-in unit connector.

Table 31: MPO-to-MPO Cable Connections to LAS Shelf (2D-ROADM Configuration)

From LAM			To MDMA-RMC1		
Shelf	**Shelf Slot**	**Connector**	**Shelf**	**Shelf Slot**	**Connector**
LAS-OS1	IPMA-1	OPT MAIN	OS1	3	MUX IN 33-40
	IPMA-2	OPT MAIN			DMUX OUT 33-40
	IPMA-3	OPT MAIN			MUX IN 25-32
	IPMA-4	OPT MAIN			DMUX OUT 25-32
	IPMA-5	OPT MAIN			MUX IN 17-24
	IPMA-6	OPT MAIN			DMUX OUT 17-24
	IPMA-7	OPT MAIN			MUX IN 9-16
	IPMA-8	OPT MAIN			DMUX OUT 9-16
	IPMA-9	OPT MAIN			MUX IN 1-8
	IPMA-10	OPT MAIN			DMUX OUT 1-8
LAS-OS1	IPMA-11	OPT MAIN	OS1	17	DMUX OUT 1-8
	IPMA-12	OPT MAIN			MUX IN 1-8
	IPMA-13	OPT MAIN			DMUX OUT 9-16
	IPMA-14	OPT MAIN			MUX IN 9-16
	IPMA-15	OPT MAIN			DMUX OUT 17-24
	IPMA-16	OPT MAIN			MUX IN 17-24
	IPMA-17	OPT MAIN			DMUX OUT 25-32
	IPMA-18	OPT MAIN			MUX IN 25-32
	IPMA-19	OPT MAIN			DMUX OUT 33-40
	IPMA-20	OPT MAIN			MUX IN 33-40

Step 4
Proceed to Connect DCMs or Install Loopback Cables.

2.12 Connect DCMs or Install Loopback Cables

In this section:

As explained in Overview of DCM or Loopback Cabling Core Configuration, each amplifier (APMA-xxxx) plug-in unit must be connected to a Dispersion Compensation Module (DCM), or a loopback fiber must be installed in place of the DCM. The procedure in Connect Amplifiers to DCMs or Install Loopback Cables, guides you in connecting DCMs and installing loopback cables as required.

Before performing the procedure in Connect Amplifiers to DCMs or Install Loopback Cables, you should know whether or not a DCM is required for each amplifier (APMA-xxxx) plug-in unit in the node. For each amplifier that requires a DCM, you should also know where it has been installed. If uncertain, contact your Network Design/ Planning organization.

2.12.1 Overview of DCM or Loopback Cabling Core Configuration

Generally, as shown in the following figure, a Dispersion Compensation Module (DCM) is used with each amplifier (APMA-xxxx) plug-in unit to overcome the effects of chromatic dispersion. However, depending on network design, the DCM is not always required.

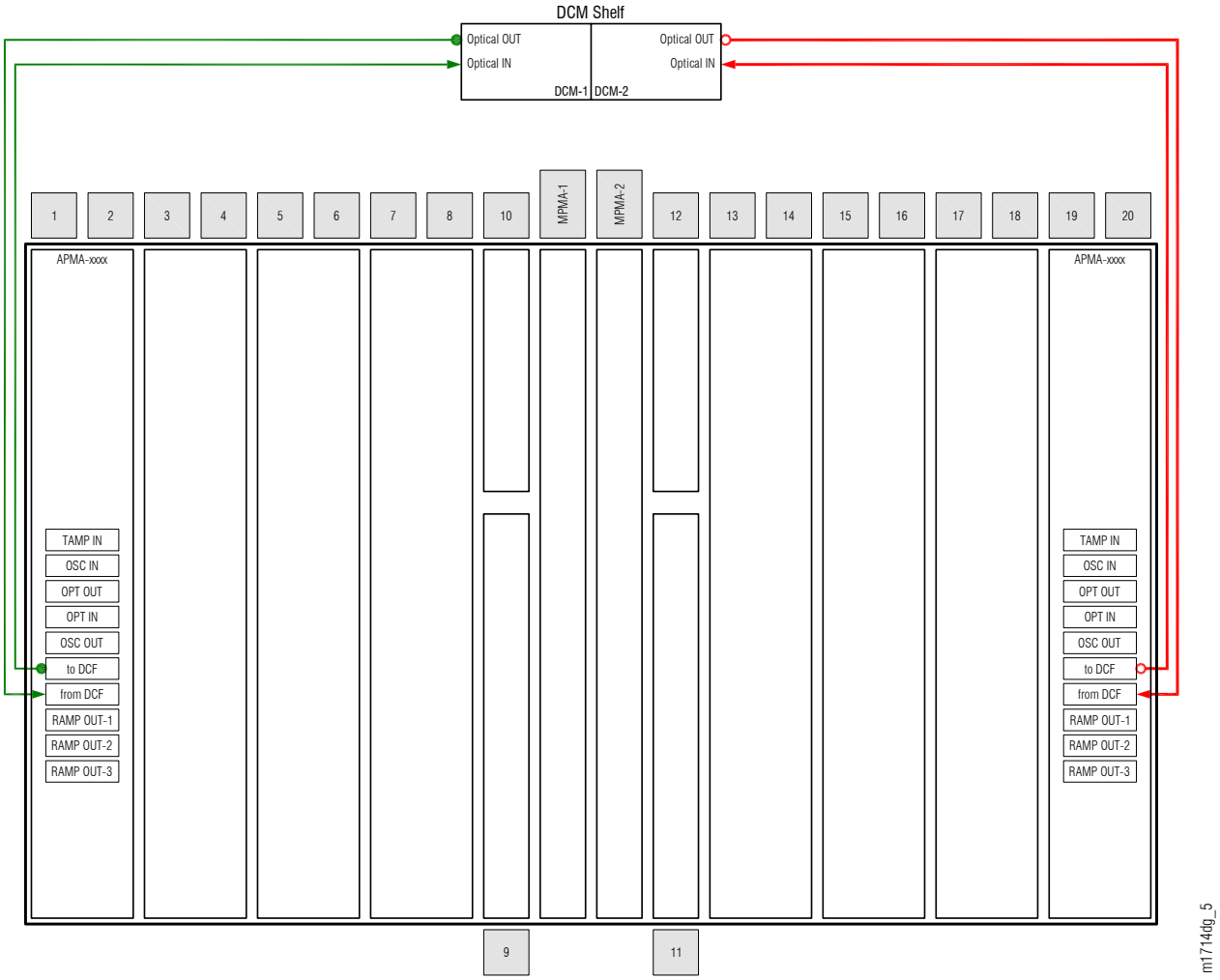


Figure 65: Fiber-Optic Cable Connections to DCMs

If a DCM is not used, a loopback fiber-optic cable should be installed in place of the DCM. the following figure shows an example where loopback cables are used with both amplifiers.

Note: *If the amplifier is unit type APMA-L2C1 or APMA-ULC1, an 11 dB optical attenuator, part number 37-424-612, is required in the loopback.*

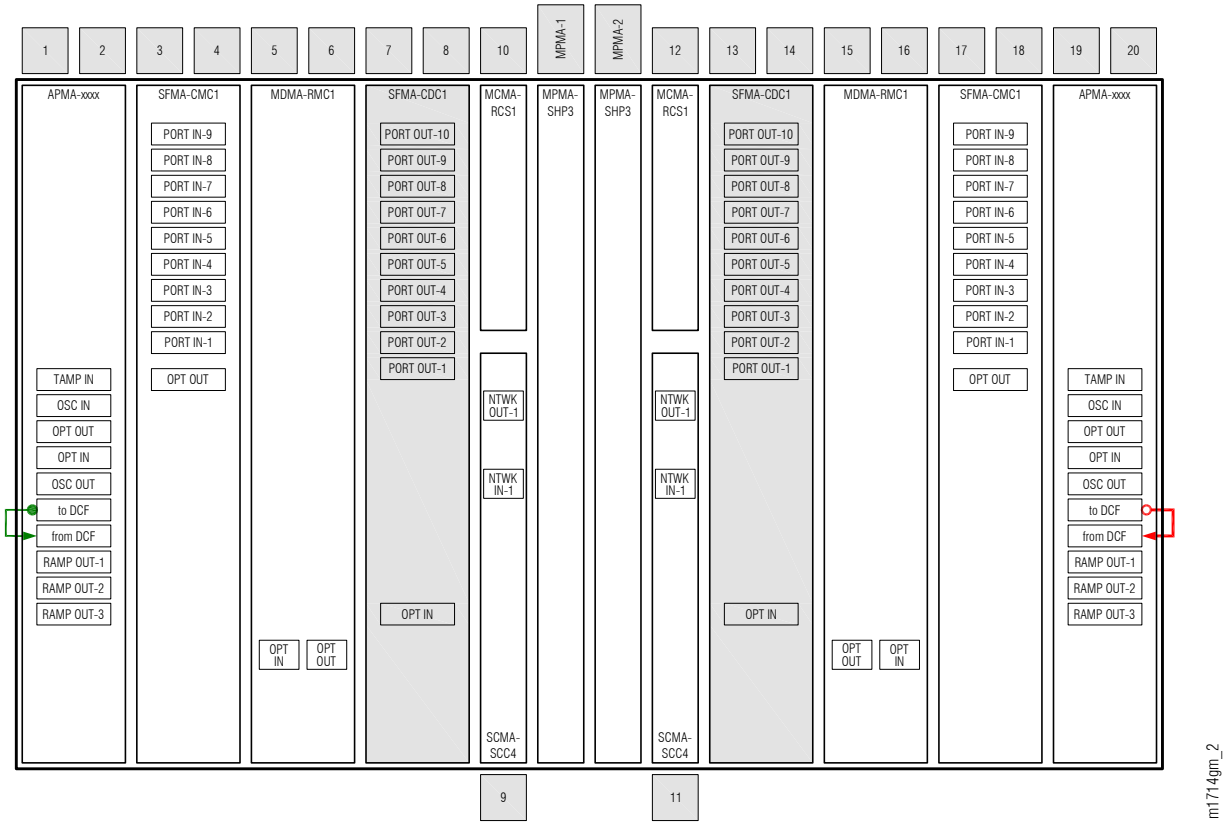


Figure 66: Fiber-Optic Loopback Cable Connections

Depending on network design, one amplifier may require a DCM, and the other may not. In a HUB node, up to eight amplifiers may be equipped (two in each Optical shelf). Each amplifier may or may not use a DCM.

The steps in Connect Amplifiers to DCMs or Install Loopback Cables, should be performed for the Main Optical shelf OS1 and then repeated if the Auxiliary Optical shelves OSn (n = 2...4, 25, 26) are used.

2.12.2 Connect Amplifiers to DCMs or Install Loopback Cables

The following figure shows a flowchart of subtasks that connects DCMs or installs loopback cables.

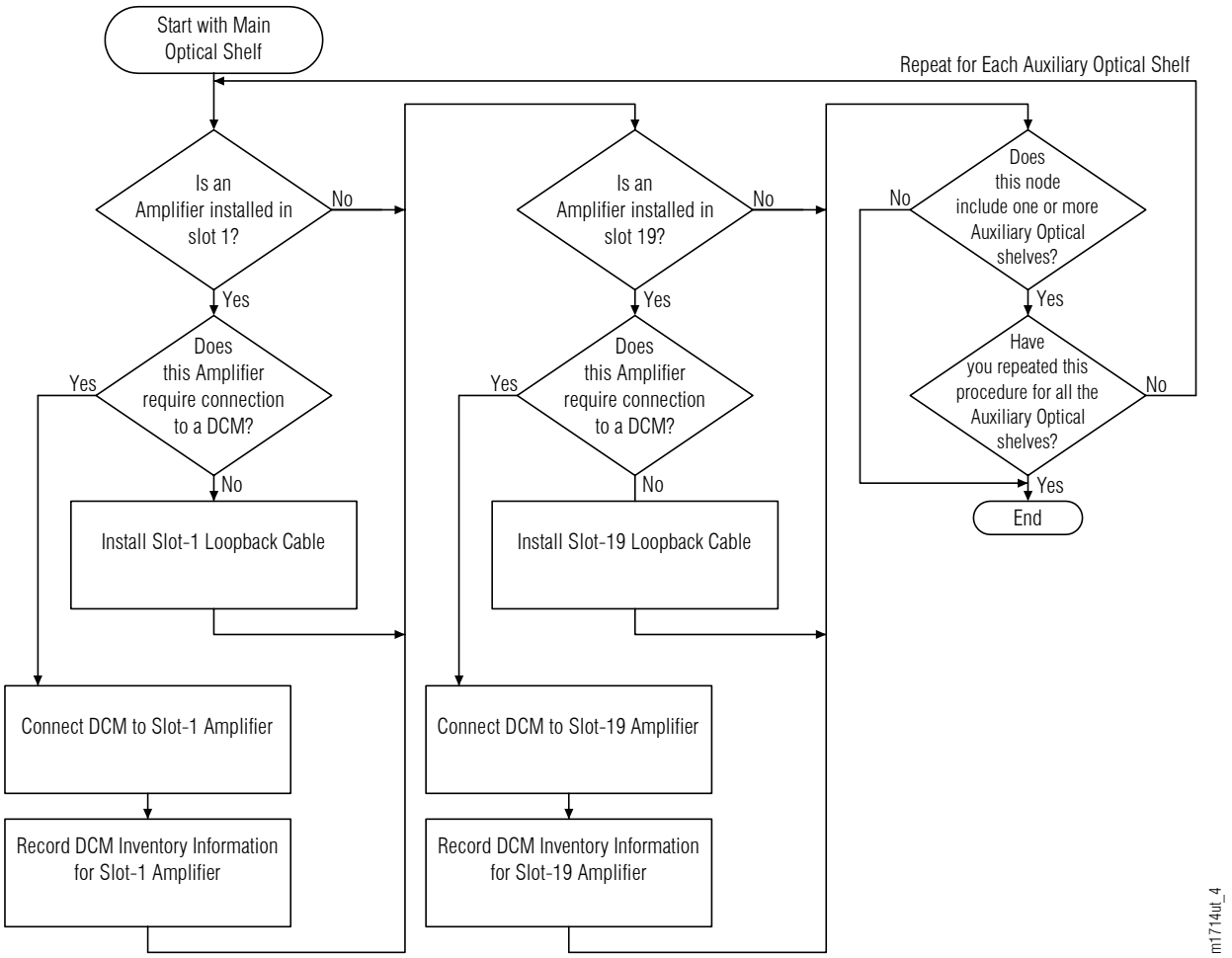


Figure 67: Connect Amplifiers to DCMs or Install Loopback Cables (Subprocedure Flowchart)

Danger: *Never handle exposed fiber with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove. Follow local safety precautions regarding fiber.*

Danger: *Never look into the end of a fiber-optic cable. Permanent eye damage or blindness can occur very quickly if the laser light is present. Follow local safety precautions regarding fiber.*

Warning: *To avoid damage to the equipment when connecting fibers, always verify the optical specifications. Verify that the optical signal into a receiver meets the appropriate optical specifications listed in* Optical Specifications.

Caution: *Before installing fiber-optic cables, always verify that the fiber connectors are free of contamination by visually inspecting with a fiber scope and cleaning the connectors at both ends of the fiber, if necessary. Refer to* Fiber Cable Handling.

Step 1
If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections: For **TERM1** (Serial): TID: FUJITSU User ID: ROOT Password: ROOT/(Route66K) Conn. Mode: Serial Comm. Port: COMx (for example, COM2) Configure: use default[31] For **TERM2** (TCP/IP): TID: FUJITSU User ID: ROOT Password: ROOT/(Route66K) Conn. Mode: TCP/IP IP Address: 192.168.1.1 Port: 2024

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

[31] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

Step 2
Start with the Main Optical shelf OS1.

Note: *The following steps are performed once for the Main Optical shelf OS1 and then repeated for the each Auxiliary Optical shelf OSn (n = 2...4, 25, 26), as required.*

Step 3
Is an amplifier (APMA-xxxx) plug-in unit installed in slot 1 of the shelf?

If YES:
Proceed to Step 4.

If NO:
Proceed to Step 12.

Step 4
Does this amplifier require connection to a DCM?

If YES:
Proceed to Step 5.

If NO:
Proceed to Step 10.

Connect DCM to Slot-1 Amplifier

Step 5
Obtain and clean two LC-SC fiber-optic cables.

Step 6
Connect the cable ends to the plug-in units and connectors listed in the following table.

Table 32: Slot-1 Amplifier-to-DCM Fiber-Optic Cable Connections

From APMA-xxxx		To DCM[32]	
Shelf Slot	**Connector**	**Shelf Slot**	**Connector**
1	to DCF	DCM-1	OPT In
1	from DCF	DCM-1	OPT Out

[32] **DCMs are housed in the SFD3 dispersion compensation shelf (FC9512SFD3).**

Record DCM Inventory Information for Slot-1 Amplifier

Step 7
Enter inventory information for the DCM module connected to the slot-1 amplifier.

TL1	NETSMART 500

`ED-DCM:TID:AID:CTAG:::`
`KEYWORD=DOMAIN;`
AID:
• OS1-1, OS2-1, OS3-1, OS4-1, OS25-1, OS26-1
KEYWORD=DOMAIN:
• Refer to the following table.
Example:
`ED-DCM:FUJITSU:OS1-1:CTAG:::`
`DCM1VENDID=FC9682F220-01,`
`DCM1SERIALNO=1234567,`
`DCM3DOM=07.07,`
`DCM3CLEI=ABCD123456,`
`DCM3USI=ABCDEFGH12345678MNOPQRST;`
	In the tree view, select the Equipment tab.
	Expand the appropriate Optical shelf.
	Select amplifier unit in slot 1.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the DCM tab.
	In the Command Parameters area, enter the DCM inventory information, per your local practice.
	Click Modify.
	Do not close the Operations dialog box.

Table 33: ED-DCM Keyword and Domain Input Parameters

Keyword	Domain (Default in Bold)	Description
DCMxVENDID (x=1…3)	FCnnnnnnnn-mm	DCM vendor ID, where FCnnnnnnnn is the 10-character FC code and mm is the 2-character hardware revision number (13-character string) ***Example:*** `FC9682F220-01`
DCMxSERIALNO (x=1…3)	nnnnnnn	DCM equipment unit serial number (up to a 7-character string)
DCMxDOM (x=1…3)	yy.mm	DCM date of manufacture, where yy = last two digits of the year and mm = 01…12 (5-character string)
DCMxCLEI (x=1…3)	nnnnnnnnnn	COMMON LANGUAGE® Equipment Identifier (CLEI™) (10-character string) ***Note:*** *CLEI attribute is associated with the shelf and provides inventory information about the plug-in unit.*
DCMxUSI (x=1…3)	nnnnnnnnnnnnnnnnnnnnnnnnnn	DCM unique serial identifier (USI) (25-character string)

Step 8
Verify the DCM inventory information.

TL1	NETSMART 500

`RTRV-DCM:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-DCM:FUJITSU:OS1-1:CTAG;`
	Verify that the values shown in the Current Values area of the Operations dialog are correct.
	Close the Operations dialog box.

Step 9
Proceed to Step 13.

Install Slot-1 Loopback Cable

Step 10
Obtain and clean one LC-LC fiber-optic cable.

Step 11
Is the amplifier in slot 1 type APMA-L2C1 or APMA-ULC1?

If YES: from DCF
Connect a 12 dB optical attenuator, part number 956-130-5x12, to the **from DCF** connector of the amplifier plug-in unit. Then proceed to Step 12.

If NO:
An optical attenuator is not required. Proceed to Step 12.

Step 12
Connect the cable ends to the plug-in unit connectors listed in the following table.

Table 34: Slot-1 Amplifier Loopback Cable Connections

From APMA-xxxx		To APMA-xxxx	
Shelf Slot	Connector	Shelf Slot	Connector
1	to DCF	1	from DCF

Step 13
Is an amplifier (APMA-xxxx) plug-in unit installed in slot 19 of the shelf?

If YES:
Proceed to Step 14.

If NO:
Proceed to Step 23.

Step 14
Does this amplifier require connection to a DCM?

If YES:
Proceed to Step 15.

If NO:
Proceed to Step 20.

Connect DCM to Slot-19 Amplifier

Step 15
Obtain and clean two LC-SC fiber-optic cables.

Step 16
Connect the cable ends to the plug-in units and connectors listed in the following table.

Table 35: Slot-19 Amplifier-to-DCM Fiber-Optic Cable Connections

From APMA-xxxx		To DCM[33]	
Shelf Slot	**Connector**	**Shelf Slot**	**Connector**
19	to DCF	DCM-2	OPT In
19	from DCF	DCM-2	OPT Out

Record DCM Inventory Information for Slot-19 Amplifier

Step 17
Enter inventory information for the DCM module connected to the slot-19 amplifier.

[33] **DCMs are housed in the SFD3 dispersion compensation shelf (FC9512SFD3).**

TL1	NETSMART 500

`ED-DCM:TID:AID:CTAG:::`
`KEYWORD=DOMAIN;`
AID:
• OS1-19, OS2-19, OS3-19, OS4-19, OS25-19, OS26-19
KEYWORD=DOMAIN:
• Refer to Table 33.
Example:
`ED-DCM:FUJITSU:OS1-19:CTAG:::`
`DCM1VENDID=FC9682F220-01,`
`DCM1SERIALNO=1234567,`
`DCM3DOM=07.07,`
`DCM3CLEI=ABCD123456,`
`DCM3USI=ABCDEFGH12345678MNOPQRST;`
	In the tree view, select the Equipment tab.
	Expand the appropriate Optical shelf.
	Select amplifier unit in slot 19.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the DCM tab.
	In the Command Parameters area, enter the DCM inventory information, per your local practice.
	Click Modify.
	Do not close the Operations dialog box.

Step 18
Verify the DCM inventory information.

TL1	NETSMART 500

`RTRV-DCM:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-DCM:FUJITSU:OS1-19:CTAG;`
	Verify that the values shown in the Current Values area of the Operations dialog are correct.
	Close the Operations dialog box.

Step 19
Proceed to Step 23.

Install Slot-19 Loopback Cable

Step 20
Obtain and clean one LC-LC fiber-optic cable.

Step 21
Is the amplifier in slot 1 type APMA-L2C1 or APMA-ULC1?

If YES: from DCF
Connect a 12 dB optical attenuator, part number 956-130-5x12, to the **from DCF** connector of the amplifier plug-in unit. Then proceed to Step 22.

If NO:
An optical attenuator is not required. Proceed to Step 22.

Step 22
Connect the cable ends to the plug-in unit connectors listed in the following table.

Table 36: Slot-19 Amplifier Loopback Cable Connections

From APMA-xxxx		To APMA-xxxx	
Shelf Slot	Connector	Shelf Slot	Connector
19	to DCF	19	from DCF

Step 23
Is the node a HUB node (including one or more Auxiliary Optical shelves)?

If YES:
Repeat this subprocedure, starting from Step 3, for each Auxiliary Optical shelf OSn (n = 2...4, 25, 26). Then proceed to Provision HUB Interconnections.

If NO:
Proceed to Step 24.

Step 24
Are all NEs in the network turned up?

If YES:
Proceed to Make Network Connections.

Note: *You have completed the turn-up for the node, but have not connected it to the network. Network connections are made after all the nodes have been turned up (see Figure 2).*

If NO:
Repeat the turn-up procedures, starting from Verify Shelf Labeling, Verify LAN and RICC Cable Connections, Apply Power, and Install Fan Units, for the next NE.

✔ This procedure is complete.

2.13
Provision HUB Interconnections

In this section:

HUB connections are required to pass signals between network degrees residing on different optical shelves. Each HUB connection involves a physical part (an LC-LC fiber-optic cable connection) and a software part (equipment connection), informing the system of the physical connection. The FLASHWAVE 7500 Core Configuration system supports the following schemes for HUB interconnection:

- **Symmetric HUB Interconnection–**HUB connections follow a fixed, predetermined pattern and equipment connections are automatically created by the system software.
- **Asymmetric HUB Interconnection–**HUB connections do not follow a predetermined pattern and equipment connections must be manually entered (not automatic).

For more information on symmetric and asymmetric HUBs, refer to Core Configuration of Core Configuration.

Danger: *Never handle exposed fiber with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove. Follow local safety precautions regarding fiber.*

Danger: *Never look into the end of a fiber-optic cable. Permanent eye damage or blindness can occur very quickly if the laser light is present. Follow local safety precautions regarding fiber.*

Warning: *To avoid damage to the equipment when connecting fibers, always verify the optical specifications. Verify that the optical signal into a receiver meets the appropriate optical specifications listed in* Optical Specifications.

Caution: *Before installing fiber-optic cables, always verify that the fiber connectors are free of contamination by visually inspecting with a fiber scope and cleaning the connectors at both ends of the fiber, if necessary. Refer to* Fiber Cable Handling.

Step 1
If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections: For **TERM1** (Serial): TID: FUJITSU User ID: ROOT Password: ROOT/(Route66K) Conn. Mode: Serial Comm. Port: COMx (for example, COM2) Configure: use default[34] For **TERM2** (TCP/IP): TID: FUJITSU User ID: ROOT Password: ROOT/(Route66K) Conn. Mode: TCP/IP IP Address: 192.168.1.1 Port: 2024

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Step 2
Retrieve the value of keyword HUBMODE.

Note: *If the node is a symmetric HUB node, HUBMODE should be set to AUTO (default). If the node is an asymmetric HUB node, the value of HUBMODE should be MANUAL.*

[34] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
 	
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the tree view, click the Equipment tab.
	
	Select the top-level (system) entity.
	
	Entity ▸ *Properties View*
	
	The Properties dialog box opens.
	Verify the value of HUBMODE.
	
	Close the Properties dialog box.

Step 3
Is HUBMODE set to AUTO?

If YES:
Proceed to Provision HUB Interconnections–Symmetric HUB Node.

If NO:
Proceed to Provision HUB Interconnections–Asymmetric HUB Node.

2.13.1
Provision HUB Interconnections
Symmetric HUB Node

This subprocedure guides you to install only those cables that are appropriate for the plug-in units installed at the node.

Note: *For rules and precautions regarding handling, storing, cleaning, connecting, and disconnecting fiber-optic cables, refer to* Fiber Cable Handling.

The following table lists all possible HUB interconnections for a symmetric HUB node.

Note: *The following tables and figures refer to WSS HUB Switch unit SFMA-CDC1 and WSS Core Switch unit SFMA-CMC1.*

Table 37: Optical Shelf Interconnections for a Symmetric HUB Node

From SFMA-CDC1			To SFMA-CMC1		
Shelf	**Shelf Slot**	**Connector**	**Shelf**	**Shelf Slot**	**Connector**
OS1	7	PORT OUT-1	OS2	17	PORT IN-7
	7	PORT OUT-2		3	PORT IN-7

Table 37: Optical Shelf Interconnections for a Symmetric HUB Node (Cont.)

From SFMA-CDC1			To SFMA-CMC1		
Shelf	Shelf Slot	Connector	Shelf	Shelf Slot	Connector
	13	PORT OUT-1		17	PORT IN-8
	13	PORT OUT-2		3	PORT IN-8
OS2	7	PORT OUT-1	OS1	17	PORT IN-7
	7	PORT OUT-2		3	PORT IN-7
	13	PORT OUT-1		17	PORT IN-8
	13	PORT OUT-2		3	PORT IN-8
OS1	7	PORT OUT-3	OS3	17	PORT IN-7
	7	PORT OUT-4		3	PORT IN-7
	13	PORT OUT-3		17	PORT IN-8
	13	PORT OUT-4		3	PORT IN-8
OS3	7	PORT OUT-1	OS1	17	PORT IN-5
	7	PORT OUT-2		3	PORT IN-5
	13	PORT OUT-1		17	PORT IN-6
	13	PORT OUT-2		3	PORT IN-6
OS2	7	PORT OUT-3	OS3	17	PORT IN-5
	7	PORT OUT-4		3	PORT IN-5
	13	PORT OUT-3		17	PORT IN-6
	13	PORT OUT-4		3	PORT IN-6
OS3	7	PORT OUT-3	OS2	17	PORT IN-5
	7	PORT OUT-4		3	PORT IN-5
	13	PORT OUT-3		17	PORT IN-6
	13	PORT OUT-4		3	PORT IN-6
OS1	7	PORT OUT-5	OS4	17	PORT IN-7
	7	PORT OUT-6		3	PORT IN-7
	13	PORT OUT-5		17	PORT IN-8

Table 37: Optical Shelf Interconnections for a Symmetric HUB Node (Cont.)

From SFMA-CDC1			To SFMA-CMC1		
Shelf	**Shelf Slot**	**Connector**	**Shelf**	**Shelf Slot**	**Connector**
	13	PORT OUT-6		3	PORT IN-8
OS4	7	PORT OUT-1	OS1	17	PORT IN-3
	7	PORT OUT-2		3	PORT IN-3
	13	PORT OUT-1		17	PORT IN-4
	13	PORT OUT-2		3	PORT IN-4
OS2	7	PORT OUT-5	OS4	17	PORT IN-5
	7	PORT OUT-6		3	PORT IN-5
	13	PORT OUT-5		17	PORT IN-6
	13	PORT OUT-6		3	PORT IN-6
OS4	7	PORT OUT-3	OS2	17	PORT IN-3
	7	PORT OUT-4		3	PORT IN-3
	13	PORT OUT-3		17	PORT IN-4
	13	PORT OUT-4		3	PORT IN-4
OS3	7	PORT OUT-5	OS4	17	PORT IN-3
	7	PORT OUT-6		3	PORT IN-3
	13	PORT OUT-5		17	PORT IN-4
	13	PORT OUT-6		3	PORT IN-4
OS4	7	PORT OUT-5	OS3	17	PORT IN-3
	7	PORT OUT-6		3	PORT IN-3
	13	PORT OUT-5		17	PORT IN-4

Table 37: Optical Shelf Interconnections for a Symmetric HUB Node (Cont.)

From SFMA-CDC1			To SFMA-CMC1		
Shelf	Shelf Slot	Connector	Shelf	Shelf Slot	Connector
	13	PORT OUT-6		3	PORT IN-4

- Figures 69 through 70 show the fiber-optic cable interconnections needed to support a 4-degree HUB node. A 3-degree HUB requires interconnections to only one side of the Auxiliary Optical shelf OS2.
- Figures 71 through 74 show the fiber-optic cable interconnections needed to support a 6-degree HUB node. A 5-degree HUB requires interconnections to only one side of the Auxiliary Optical shelf OS3.
- Figures 75 through 80 show the fiber-optic cable interconnections needed to support an 8-degree HUB node. A 7-degree HUB requires interconnections to only one side of the Auxiliary Optical shelf OS4.

The following flowchart shows how fiber-optic cable interconnection tasks are used to interconnect the Optical shelves.

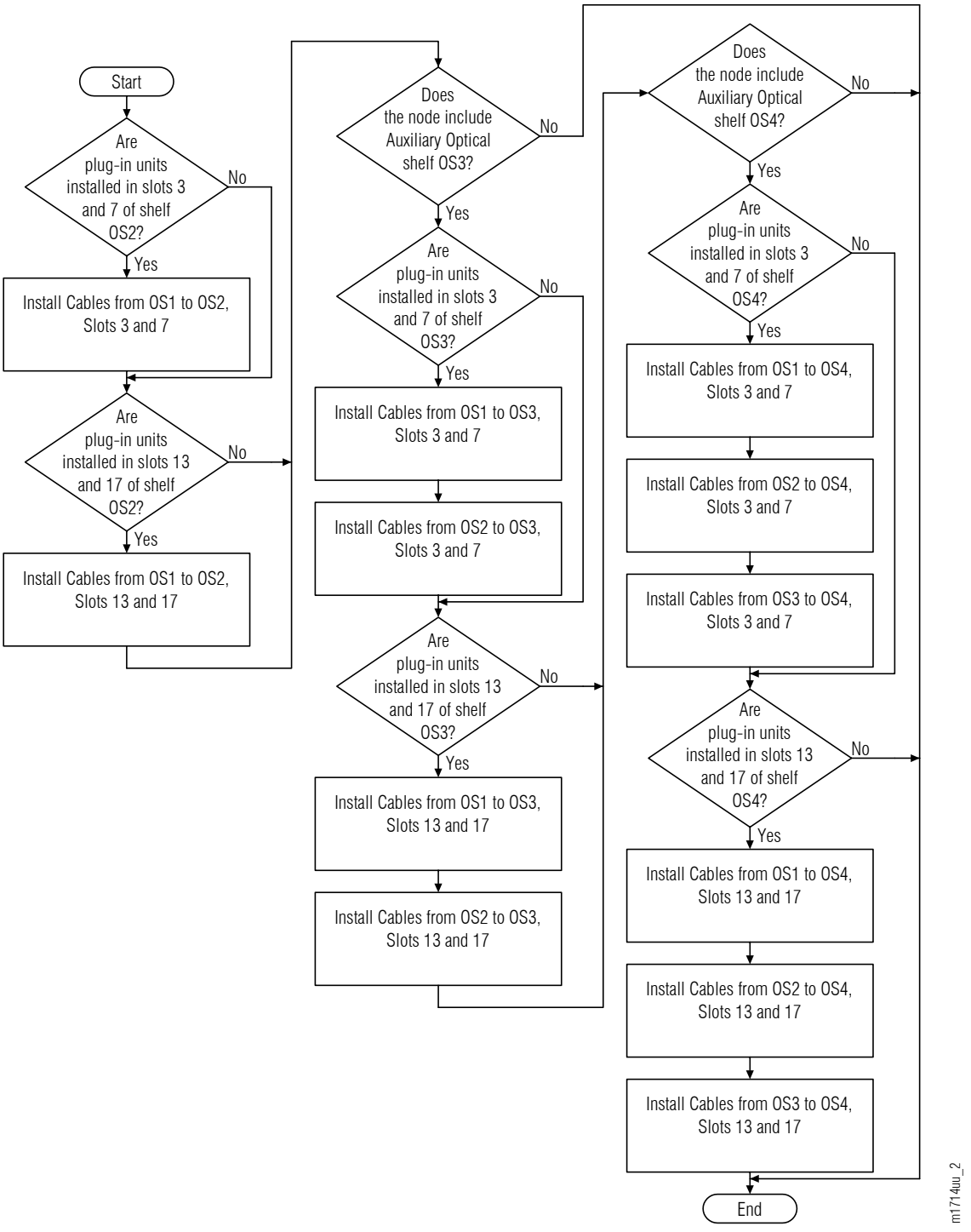


Figure 68: Interconnect Optical Shelves (Subprocedure Flowchart)

Danger: *Never handle exposed fiber with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove. Follow local safety precautions regarding fiber.*

Danger: *Never look into the end of a fiber-optic cable. Permanent eye damage or blindness can occur very quickly if the laser light is present. Follow local safety precautions regarding fiber.*

Warning: *To avoid damage to the equipment when connecting fibers, always verify the optical specifications. Verify that the optical signal into a receiver meets the appropriate optical specifications listed in* Optical Specifications.

Caution: *Before installing fiber-optic cables, always verify that the fiber connectors are free of contamination by visually inspecting with a fiber scope and cleaning the connectors at both ends of the fiber, if necessary. Refer to* Fiber Cable Handling.

Step 1
Are slots 3 and 7 of Auxiliary Optical shelf OS2 equipped with plug-in units?

If YES:
Proceed to Step 2.

If NO:
Proceed to Step 4.

Install Cables from OS1 to OS2, Slots 3 and 7

Step 2
Obtain and clean four LC-LC fiber-optic cables.

Step 3
Connect the cable ends to the appropriate connectors of the plug-in units in the Main Optical shelf OS1 and the Auxiliary Optical shelf OS2 listed in the following table and shown in the following figure.

Table 38: Interconnections between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS2 Slots 3 and 7

From SFMA-CDC1			To SFMA-CMC1		
Shelf	Shelf Slot	Connector	Shelf	Shelf Slot	Connector
OS1	7	PORT OUT-2	OS2	3	PORT IN-7
	13	PORT OUT-2	OS2	3	PORT IN-8
OS2	7	PORT OUT-1	OS1	17	PORT IN-7
	7	PORT OUT-2	OS1	3	PORT IN-7

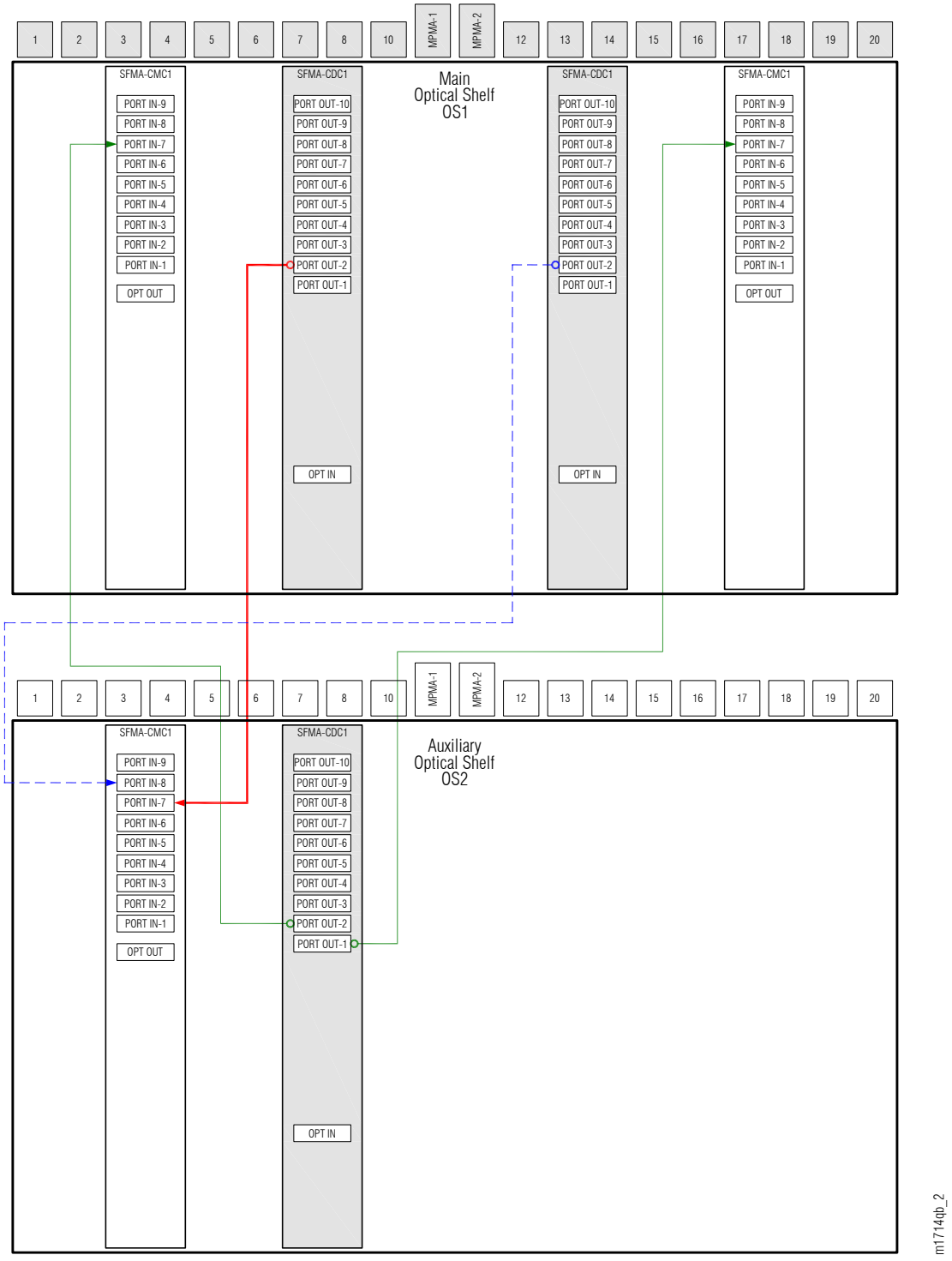


Figure 69: Interconnections for SFMA-CDC1 between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS2 Slots 3 and 7

Step 4
Are slots 13 and 17 of Auxiliary Optical shelf OS2 equipped with plug-in units?

If YES:
Proceed to Step 5.

If NO:
Proceed to Step 33.

Install Cables from OS1 to OS2, Slots 13 and 17

Step 5
Obtain and clean four LC-LC fiber-optic cables.

Step 6
Connect the cable ends to the appropriate connectors of the plug-in units in the Main Optical shelf OS1 and the Auxiliary Optical shelf OS2 listed in the following table and shown in the following figure.

Table 39: Interconnections between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS2 Slots 13 and 17

From SFMA-CDC1			To SFMA-CMC1		
Shelf	**Shelf Slot**	**Connector**	**Shelf**	**Shelf Slot**	**Connector**
OS1	7	PORT OUT-1	OS2	17	PORT IN-7
OS1	13	PORT OUT-1	OS2	17	PORT IN-8
OS2	13	PORT OUT-1	OS1	17	PORT IN-8
OS2	13	PORT OUT-2	OS1	3	PORT IN-8

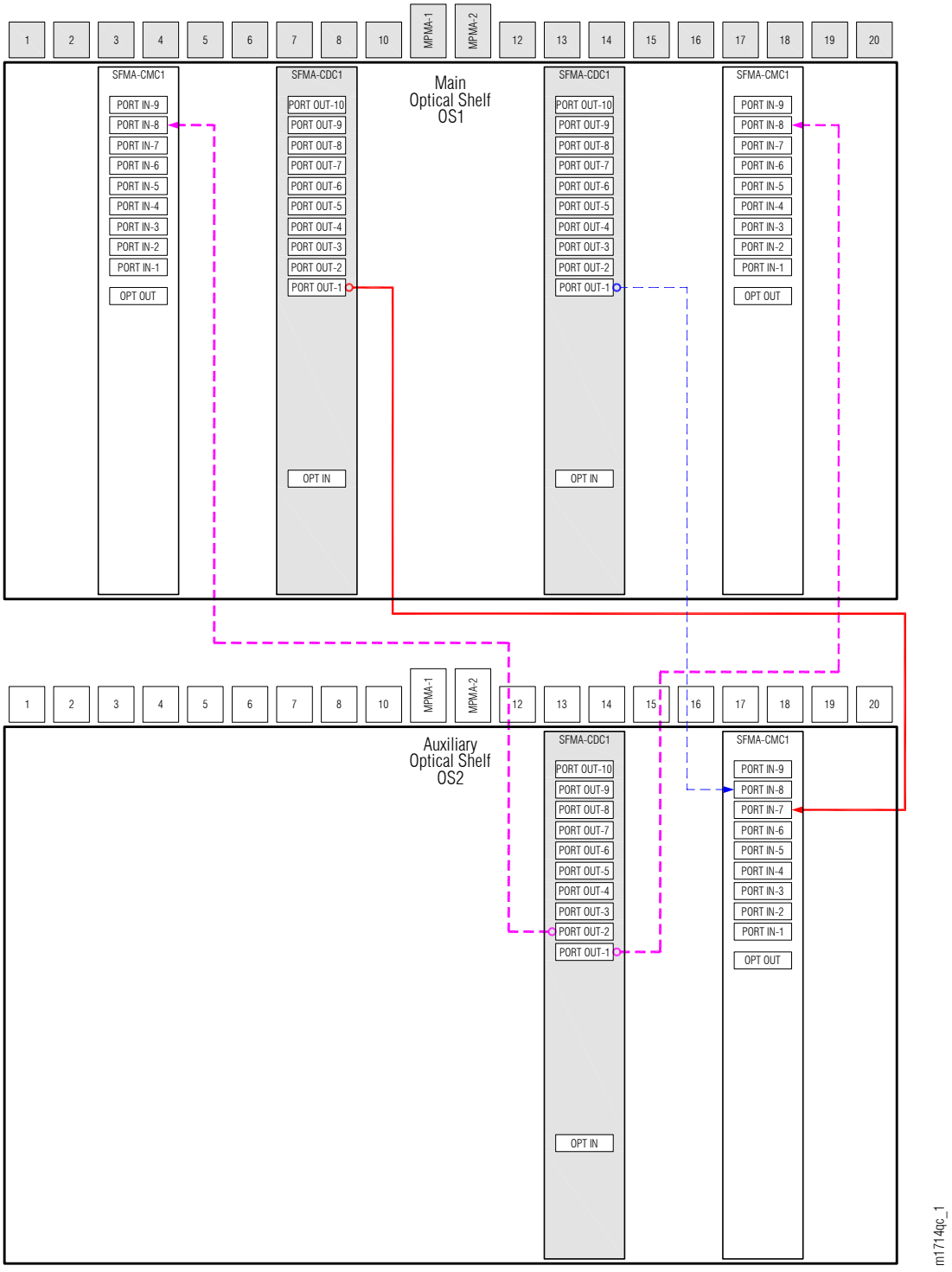


Figure 70: Interconnections for SFMA-CDC1 between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS2 Slots 13 and 17

Step 7
Does the node include Auxiliary Optical shelf OS3?

If YES:
Proceed to Step 8.

If NO:
Proceed to Step 33.

Step 8
Are slots 3 and 7 of Auxiliary Optical shelf OS3 equipped with plug-in units?

If YES:
Proceed to Step 9.

If NO:
Proceed to Step 14.

Install Cables from OS1 to OS3, Slots 3 and 7

Step 9
Obtain and clean four LC-LC fiber-optic cables.

Step 10
Connect the cable ends to the appropriate connectors of the plug-in units in the Main Optical shelf OS1 and the Auxiliary Optical shelf OS2 listed in the following table and shown in the following figure.

Table 40: Interconnections between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS3 Slots 3 and 7

From SFMA-CDC1			To SFMA-CMC1		
Shelf	Shelf Slot	Connector	Shelf	Shelf Slot	Connector
OS1	7	PORT OUT-4	OS3	3	PORT IN-7
	13	PORT OUT-4	OS3	3	PORT IN-8
OS3	7	PORT OUT-1	OS1	17	PORT IN-5
	7	PORT OUT-2	OS1	3	PORT IN-5

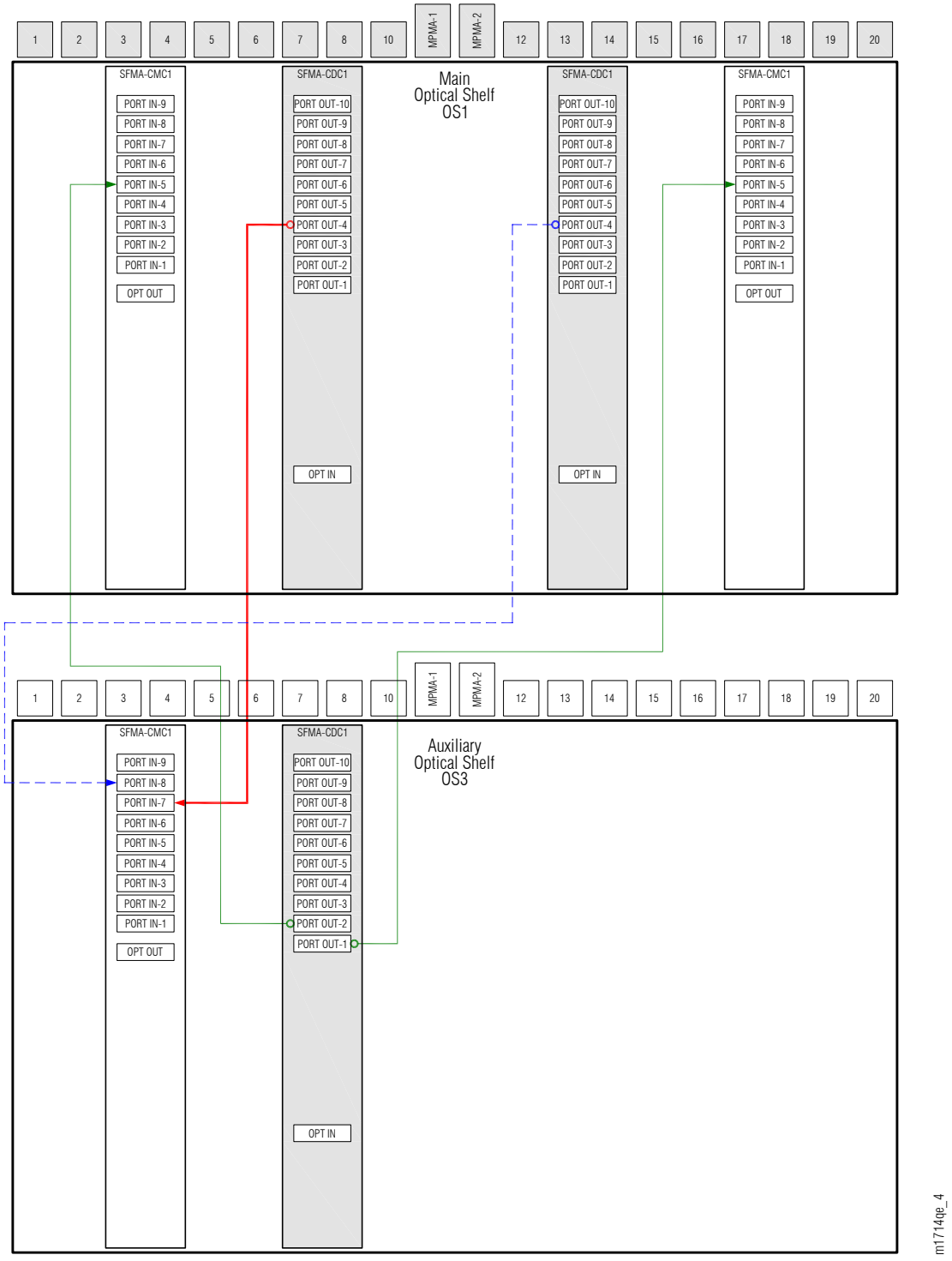


Figure 71: Interconnections for SFMA-CDC1 between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS3 Slots 3 and 7

Install Cables from OS2 to OS3, Slots 3 and 7

Step 11
Obtain and clean four LC-LC fiber-optic cables.

Step 12
Connect the cable ends to the appropriate connectors of the plug-in units in the Auxiliary Optical shelf OS2 and the Auxiliary Optical shelf OS3 listed in the following table and shown in the following figure.

Table 41: Interconnections between Auxiliary Optical Shelf OS2 and Auxiliary Optical Shelf OS3 Slots 3 and 7

From SFMA-CDC1			To SFMA-CMC1		
Shelf	Shelf Slot	Connector	Shelf	Shelf Slot	Connector
OS2	7	PORT OUT-4	OS3	3	PORT IN-5
	13	PORT OUT-4	OS3	3	PORT IN-6
OS3	7	PORT OUT-3	OS2	17	PORT IN-5
	7	PORT OUT-4	OS2	3	PORT IN-5

Step 13
Are slots 13 and 17 of Auxiliary Optical shelf OS3 equipped with plug-in units?

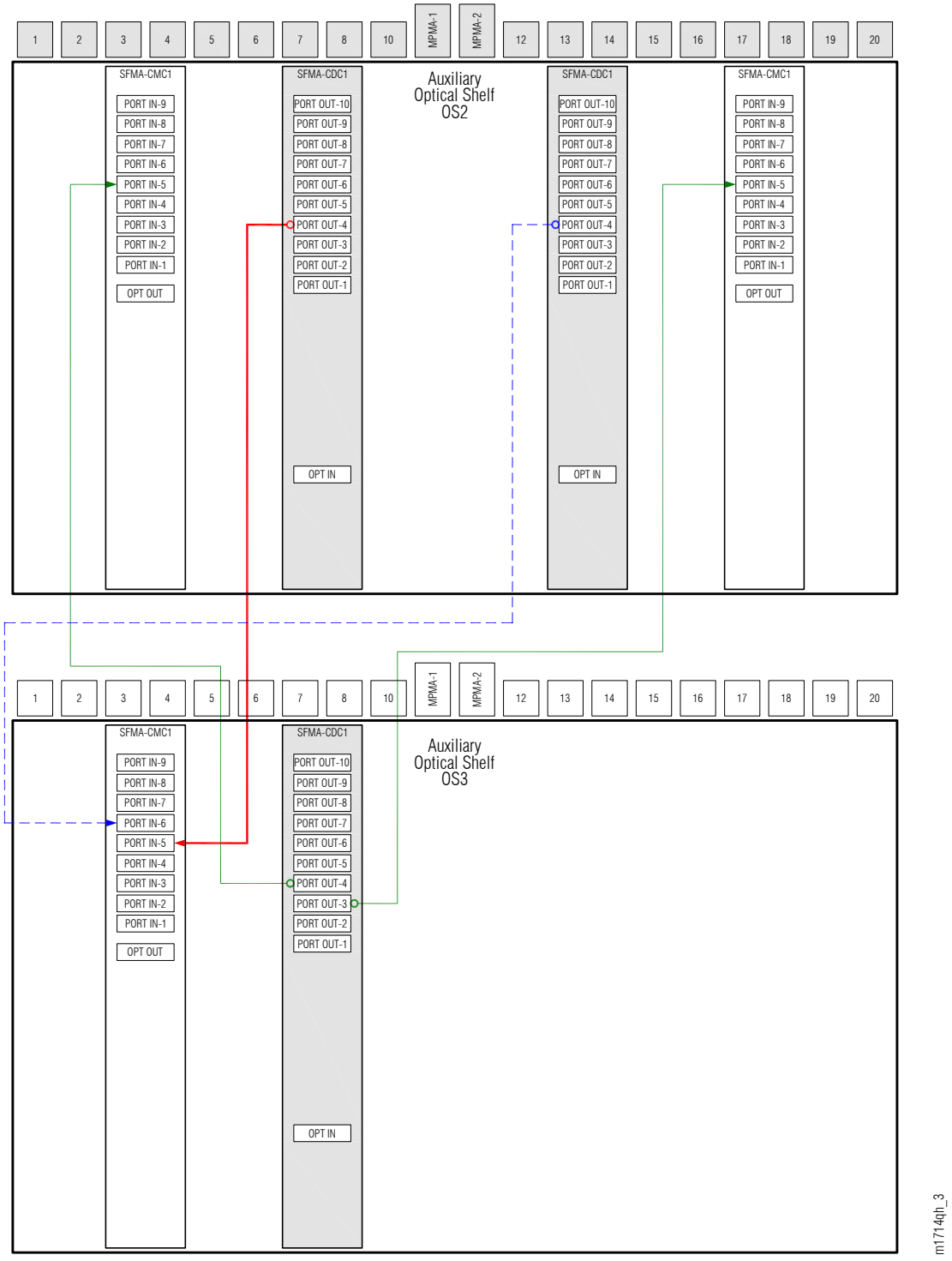


Figure 72: Interconnections for SFMA-CDC1 between Auxiliary Optical Shelf OS2 and Auxiliary Optical Shelf OS3 Slots 3 and 7

If YES:

Proceed to Step 14.

If NO:

Proceed to Step 20.

Install Cables from OS1 to OS3, Slots 13 and 17

Step 14
Obtain and clean four LC-LC fiber-optic cables.

Step 15
Connect the cable ends to the appropriate connectors of the plug-in units in the Main Optical shelf OS1 and the Auxiliary Optical shelf OS3 listed in the following table and shown in the following figure.

Table 42: Interconnections between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS3 Slots 13 and 17

From SFMA-CDC1			To SFMA-CMC1		
Shelf	Shelf Slot	Connector	Shelf	Shelf Slot	Connector
OS1	7	PORT OUT-3	OS3	17	PORT IN-7
OS1	13	PORT OUT-3	OS3	17	PORT IN-8
OS3	13	PORT OUT-1	OS1	17	PORT IN-6
OS3	13	PORT OUT-2	OS1	3	PORT IN-6

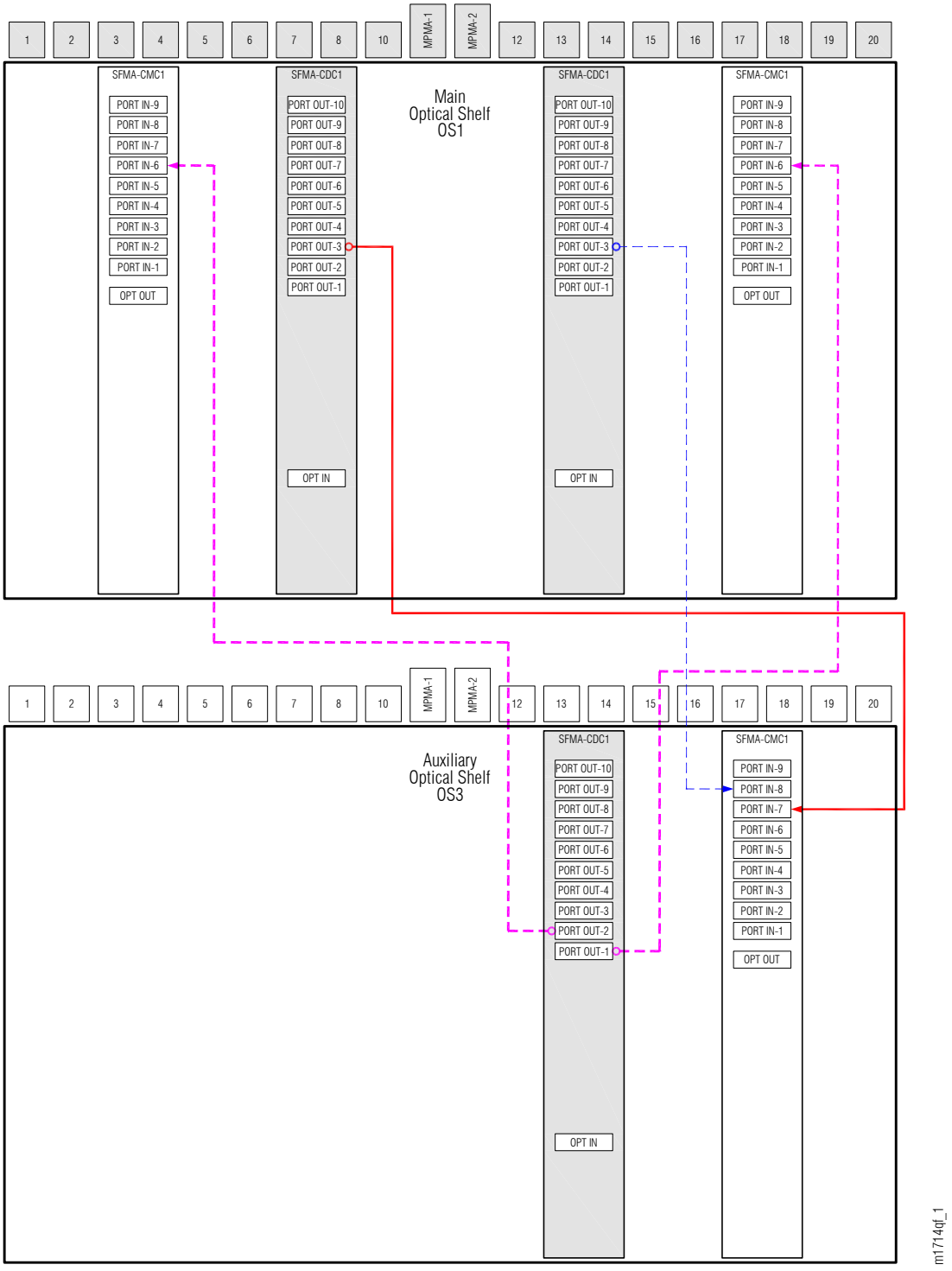


Figure 73: Interconnections for SFMA-CDC1 between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS3 Slots 13 and 17

Install Cables from OS2 to OS3, Slots 13 and 17

Step 16
Obtain and clean four LC-LC fiber-optic cables.

Step 17
Connect the cable ends to the appropriate connectors of the plug-in units in the Auxiliary Optical shelf OS2 and the Auxiliary Optical shelf OS3 listed in the following table and shown in the following figure.

Table 43: Interconnections between Auxiliary Optical Shelf OS2 and Auxiliary Optical Shelf OS3 Slots 13 and 17

From SFMA-CDC1			To SFMA-CMC1		
Shelf	Shelf Slot	Connector	Shelf	Shelf Slot	Connector
OS2	7	PORT OUT-3	OS3	17	PORT IN-5
OS2	13	PORT OUT-3	OS3	17	PORT IN-6
OS3	13	PORT OUT-3	OS2	17	PORT IN-6
OS3	13	PORT OUT-4	OS2	3	PORT IN-6

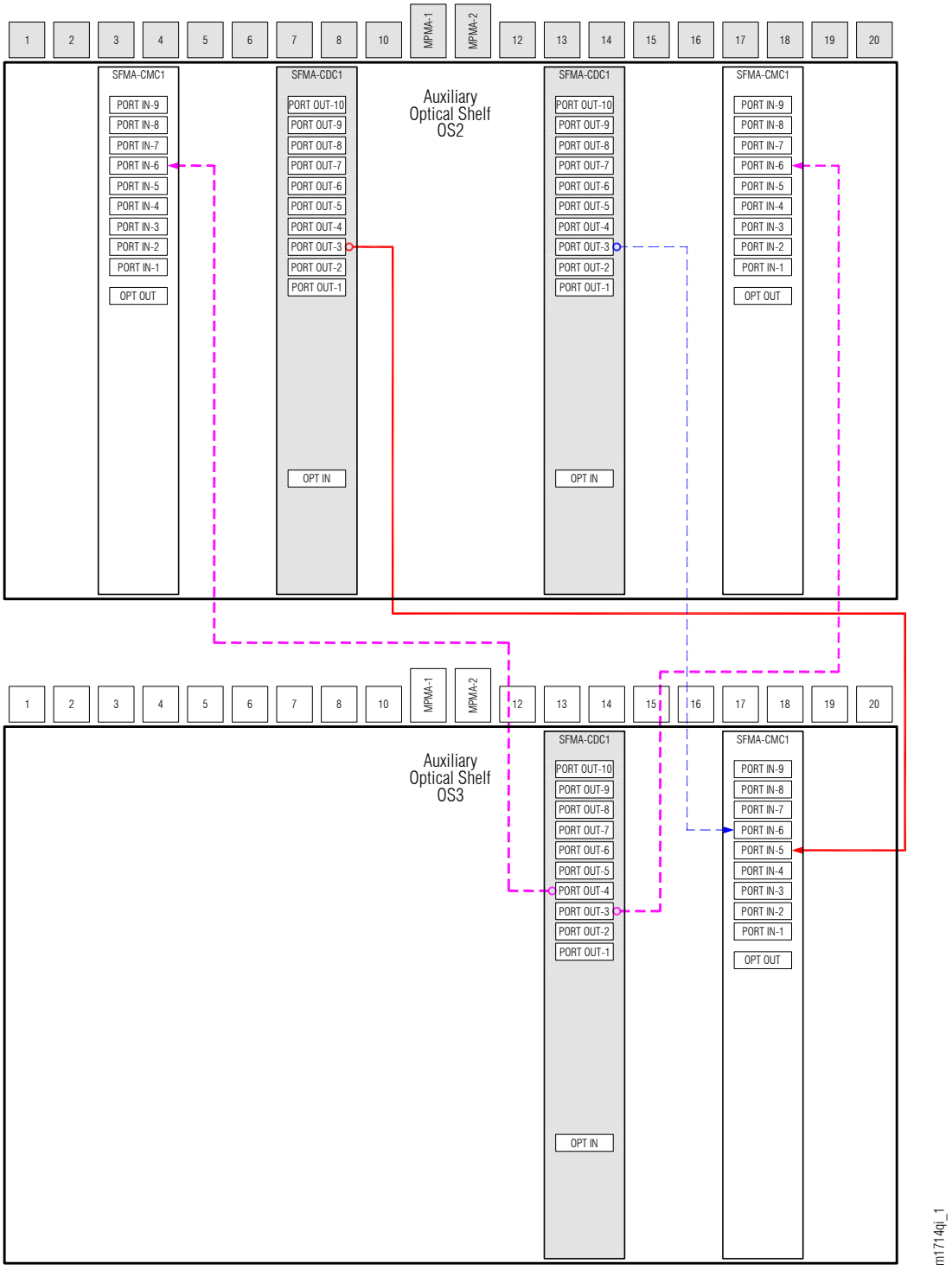


Figure 74: Interconnections for SFMA-CDC1 between Auxiliary Optical Shelf OS2 and Auxiliary Optical Shelf OS3 Slots 13 and 17

Step 18
Does the node include Auxiliary Optical shelf OS4?

If YES:
Proceed to Step 19.

If NO:
Proceed to Step 33.

Step 19
Are slots 3 and 7 of Auxiliary Optical shelf OS4 equipped with plug-in units?

If YES:
Proceed to Step 20.

If NO:
Proceed to Step 27.

Install Cables from OS1 to OS4, Slots 3 and 7

Step 20
Obtain and clean four LC-LC fiber-optic cables.

Step 21
Connect the cable ends to the appropriate connectors of the plug-in units in the Main Optical shelf OS1 and the Auxiliary Optical shelf OS4 listed in the following table and shown in the following figure.

Table 44: Interconnections between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS4 Slots 3 and 7

From SFMA-CDC1			To SFMA-CMC1		
Shelf	Shelf Slot	Connector	Shelf	Shelf Slot	Connector
OS1	7	PORT OUT-6	OS4	3	PORT IN-7
	13	PORT OUT-6	OS4	3	PORT IN-8
OS4	7	PORT OUT-1	OS1	17	PORT IN-3
	7	PORT OUT-2	OS1	3	PORT IN-3

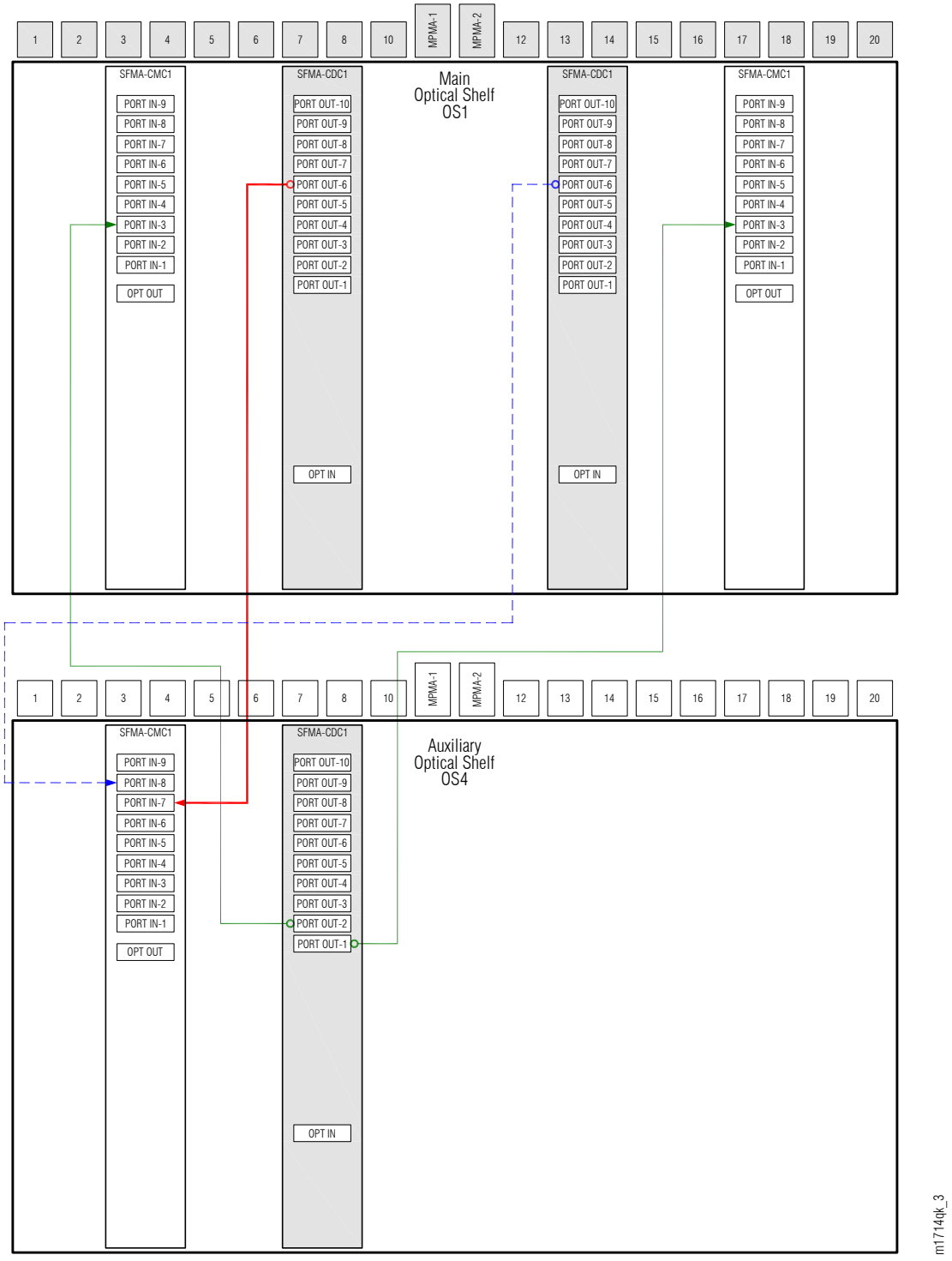


Figure 75: Interconnections for SFMA-CDC1 between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS4 Slots 3 and 7

Install Cables from OS2 to OS4, Slots 3 and 7

Step 22
Obtain and clean four LC-LC fiber-optic cables.

Step 23
Connect the cable ends to the appropriate connectors of the plug-in units in the Auxiliary Optical shelf OS2 and the Auxiliary Optical shelf OS4 listed in the following table and shown in the following figure.

Table 45: Interconnections between Auxiliary Optical Shelf OS2 and Auxiliary Optical Shelf OS4 Slots 3 and 7

From SFMA-CDC1			To SFMA-CMC1		
Shelf	Shelf Slot	Connector	Shelf	Shelf Slot	Connector
OS2	7	PORT OUT-6	OS4	3	PORT IN-5
	13	PORT OUT-6	OS4	3	PORT IN-6
OS4	7	PORT OUT-3	OS2	17	PORT IN-3
	7	PORT OUT4	OS2	3	PORT IN-3

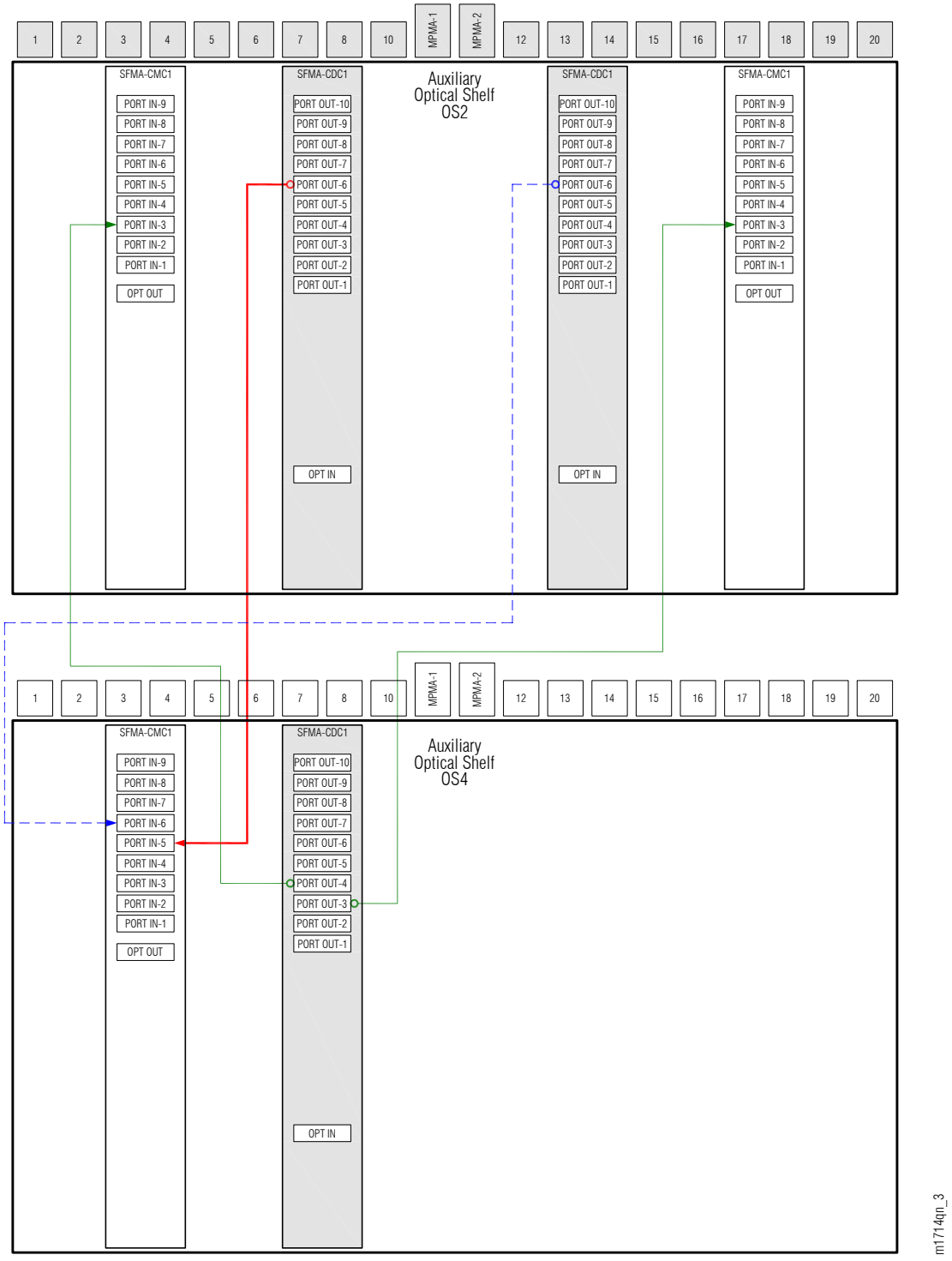


Figure 76: Interconnections for SFMA-CDC1 between Auxiliary Optical Shelf OS2 and Auxiliary Optical Shelf OS4 Slots 3 and 7

Install Cables from OS3 to OS4, Slots 3 and 7

Step 24
Obtain and clean four LC-LC fiber-optic cables.

Step 25
Connect the cable ends to the appropriate connectors of the plug-in units in the Auxiliary Optical shelf OS3 and the Auxiliary Optical shelf OS4 listed in the following table and shown in the following figure.

Table 46: Interconnections between Auxiliary Optical Shelf OS3 and Auxiliary Optical Shelf OS4 Slots 3 and 7

From SFMA-CDC1			To SFMA-CMC1		
Shelf	Shelf Slot	Connector	Shelf	Shelf Slot	Connector
OS3	7	PORT OUT-6	OS4	3	PORT IN-3
	13	PORT OUT-6	OS4	3	PORT IN-4
OS4	7	PORT OUT-5	OS3	17	PORT IN-3
	7	PORT OUT-6	OS3	3	PORT IN-3

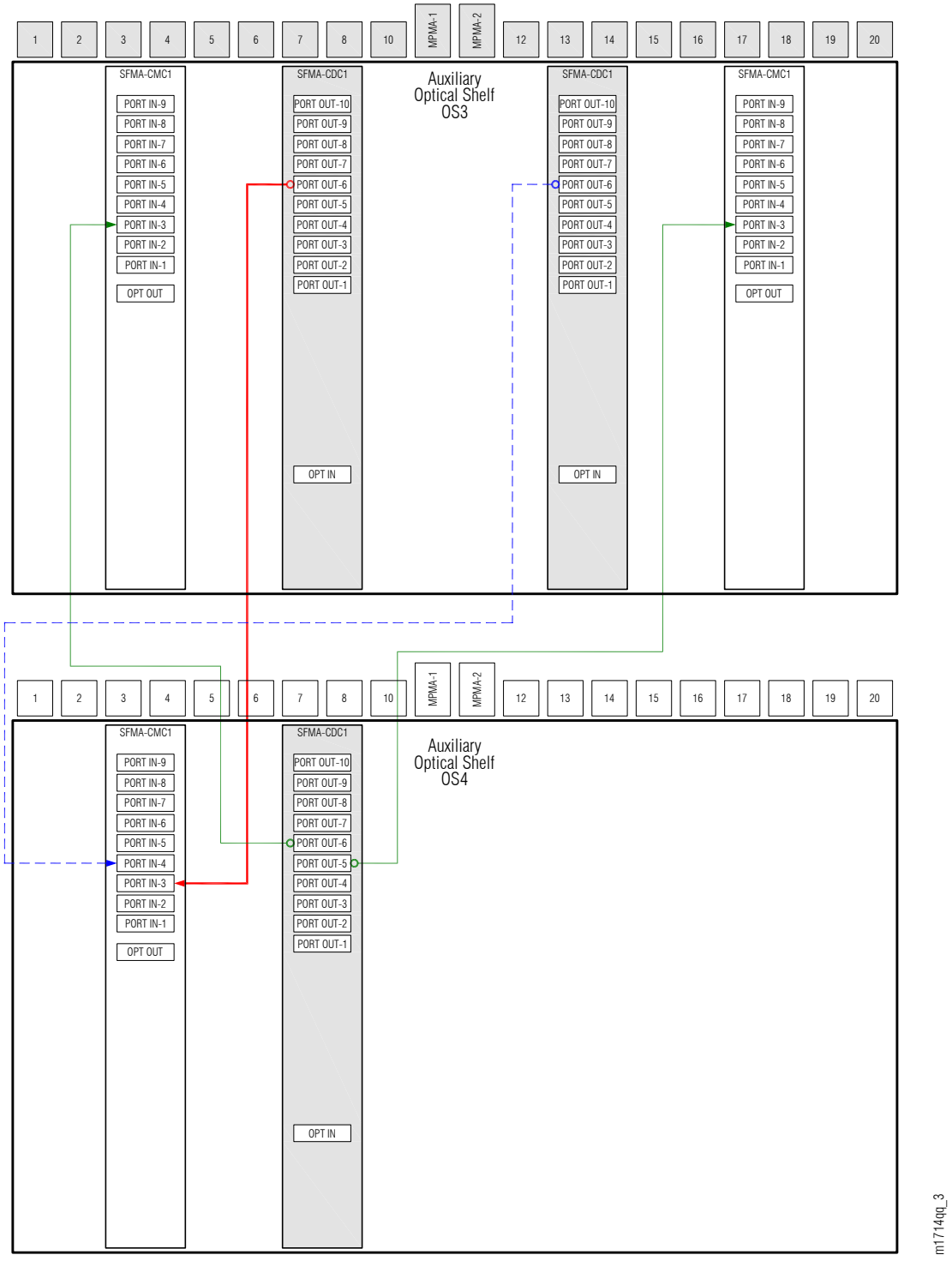


Figure 77: Interconnections for SFMA-CDC1 between Auxiliary Optical Shelf OS3 and Auxiliary Optical Shelf OS4 Slots 3 and 7

Step 26
Are slots 13 and 17 of Auxiliary Optical shelf OS4 equipped with plug-in units?

If YES:
Proceed to Step 27.

If NO:
Proceed to Step 33.

Install Cables from OS1 to OS4, Slots 13 and 17

Step 27
Obtain and clean four LC-LC fiber-optic cables.

Step 28
Connect the cable ends to the appropriate connectors of the plug-in units in the Main Optical shelf OS1 and the Auxiliary Optical shelf OS4 listed in the following table and shown in the following figure.

Table 47: Interconnections between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS4 Slots 13 and 17

From SFMA-CDC1			To SFMA-CMC1		
Shelf	**Shelf Slot**	**Connector**	**Shelf**	**Shelf Slot**	**Connector**
OS1	7	PORT OUT-5	OS4	17	PORT IN-7
	13	PORT OUT-5	OS4	17	PORT IN-8
OS4	13	PORT OUT-1	OS1	17	PORT IN-4
	13	PORT OUT-2	OS1	3	PORT IN-4

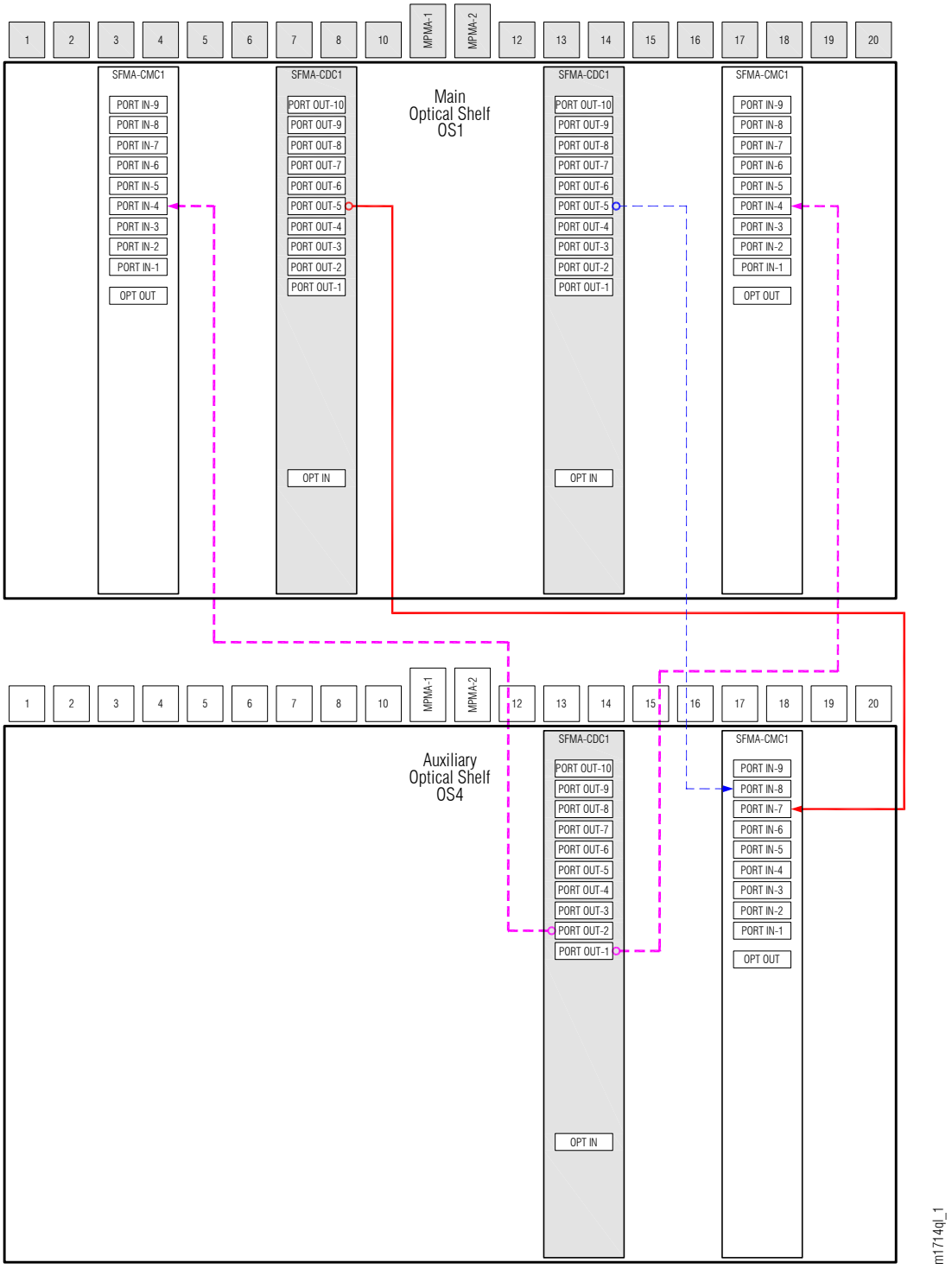


Figure 78: Interconnections for SFMA-CDC1 between Main Optical Shelf OS1 and Auxiliary Optical Shelf OS4 Slots 13 and 17

Install Cables from OS2 to OS4, Slots 13 and 17

Step 29
Obtain and clean four LC-LC fiber-optic cables.

Step 30
Connect the cable ends to the appropriate connectors of the plug-in units in the Auxiliary Optical shelf OS2 and the Auxiliary Optical shelf OS4 listed in the following table and shown in the following figure.

Table 48: Interconnections between Auxiliary Optical Shelf OS2 and Auxiliary Optical Shelf OS4 Slots 13 and 17

From SFMA-CDC1			To SFMA-CMC1		
Shelf	Shelf Slot	Connector	Shelf	Shelf Slot	Connector
OS2	7	PORT OUT-5	OS4	17	PORT IN-5
	13	PORT OUT-5	OS4	17	PORT IN-6
OS4	13	PORT OUT-3	OS2	17	PORT IN-4
	13	PORT OUT-4	OS2	3	PORT IN-4

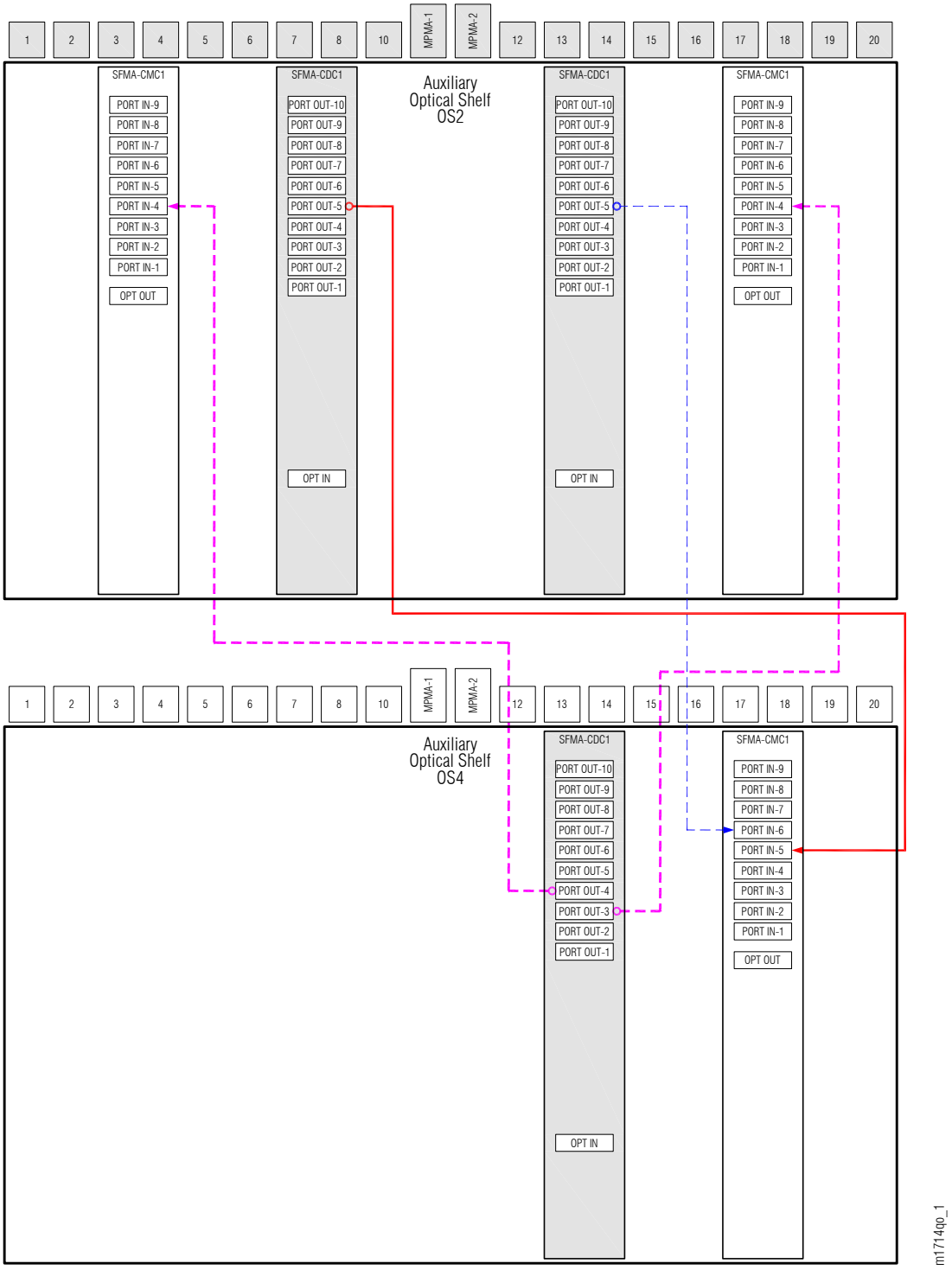


Figure 79: Interconnections for SFMA-CDC1 between Auxiliary Optical Shelf OS2 and Auxiliary Optical Shelf OS4 Slots 13 and 17

Install Cables from OS3 to OS4, Slots 13 and 17

Step 31
Obtain and clean four LC-LC fiber-optic cables.

Step 32
Connect the cable ends to the appropriate connectors of the plug-in units in the Auxiliary Optical shelf OS3 and the Auxiliary Optical shelf OS4 listed in the following table and listed in the following figure.

Table 49: Interconnections between Auxiliary Optical Shelf OS3 and Auxiliary Optical Shelf OS4 Slots 13 and 17

From SFMA-CDC1			To SFMA-CMC1		
Shelf	Shelf Slot	Connector	Shelf	Shelf Slot	Connector
OS3	7	PORT OUT-5	OS4	17	PORT IN-3
	13	PORT OUT-5	OS4	17	PORT IN-4
OS4	13	PORT OUT-5	OS3	17	PORT IN-4
	13	PORT OUT-6	OS3	3	PORT IN-4

Step 33
Are all NEs in the network turned up?

If YES:
Proceed to Connect Network Fiber-Optic Cables.

Note: *You have completed the turn-up for the node, but have not connected it to the network. Network connections are made after all nodes are turned up (see Figure 2).*

If NO:
Repeat the turn-up procedures, starting from Verify Shelf Labeling, Verify LAN and RICC Cable Connections, Apply Power, and Install Fan Units, for the next NE.

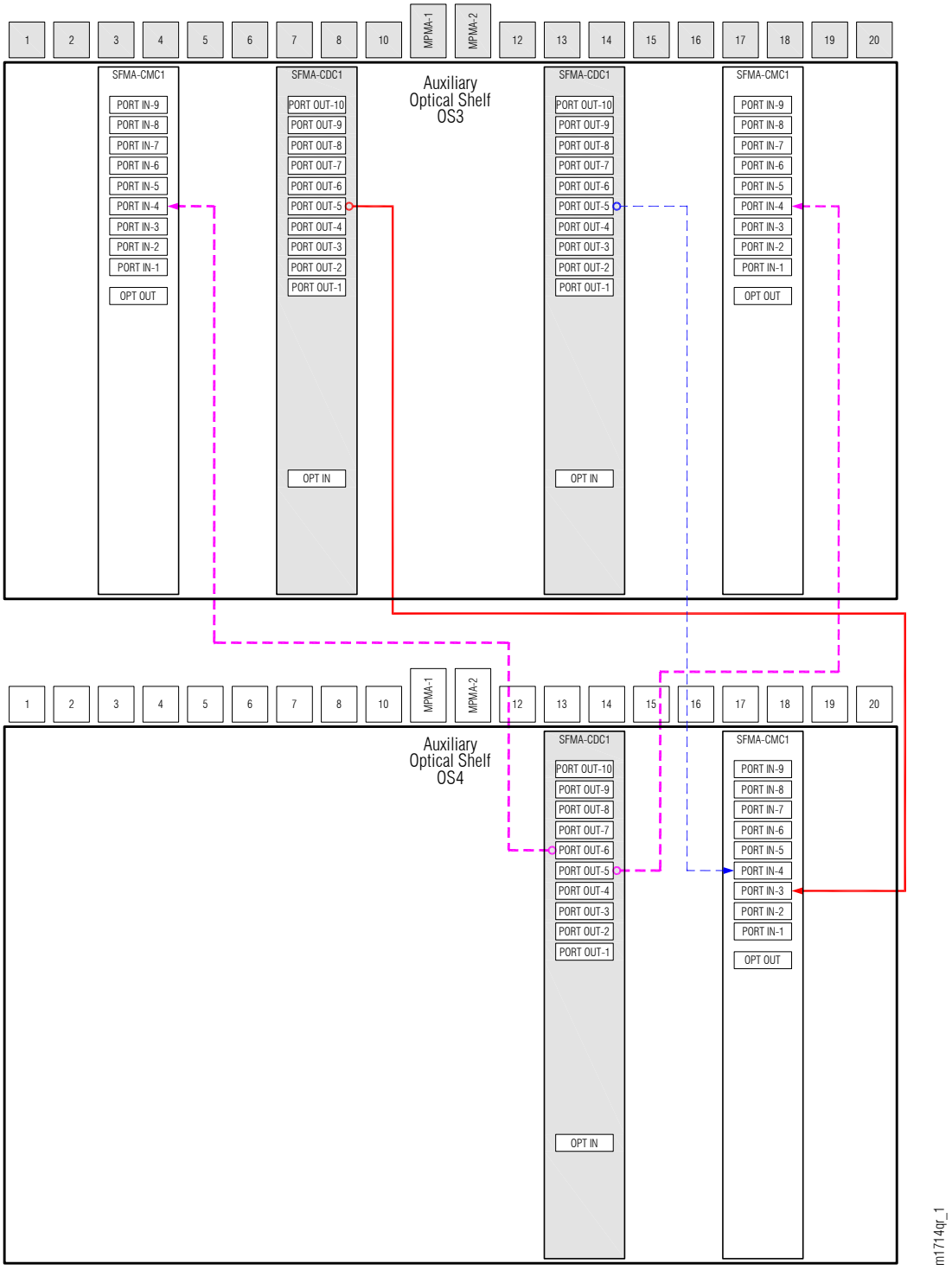


Figure 80: Interconnections for SFMA-CDC1 between Auxiliary Optical Shelf OS3 and Auxiliary Optical Shelf OS4 Slots 13 and 17

✔ This procedure is complete.

2.13.2 Provision HUB Interconnections

Asymmetric HUB Node

This subprocedure guides you to provision a HUB interconnection between two network degrees. The subprocedure must be performed once for each pair of network degrees that are to support pass-through service.

The following three tasks are performed for each HUB interconnection:

- Install two LC-LC fiber-optic cables between WSS HUB Switch units and WSS Core Switch units.
- Install one LAN cable between RICC connectors on backplane of the applicable Optical shelves.
- Create two equipment connections (using the ENT-CONN-EQPT command or equivalent) to inform the system of the LC-LC fiber-optic cable connections.

The following table lists the 12 network degrees that can be potentially connected. For convenience, the twelve degrees are designated by the WDM facility AID. The following table identifies the shelf, plug-in units, and backplane connector group associated with each degree.

Table 50: Network Degrees

Network Degree / WDM Facility AID	Shelf	Plug-In Unit Slot			Backplane Connector Group
		SFMA-CMC1	SFMA-CDC1	MCMA-RCS1	
OS1-1-PE1	OS1	3	7	10	RICC (MCMA-1)
OS1-19-PE1	OS1	17	13	12	RICC (MCMA-2)
OS2-1-PE1	OS2	3	7	10	RICC (MCMA-1)
OS2-19-PE1	OS2	17	13	12	RICC (MCMA-2)
OS3-1-PE1	OS3	3	7	10	RICC (MCMA-1)
OS3-19-PE1	OS3	17	13	12	RICC (MCMA-2)
OS4-1-PE1	OS4	3	7	10	RICC (MCMA-1)
OS4-19-PE1	OS4	17	13	12	RICC (MCMA-2)
OS25-1-PE1	OS25	3	7	10	RICC (MCMA-1)

Table 50: Network Degrees (Cont.)

Network Degree / WDM Facility AID	Shelf	Plug-In Unit Slot			Backplane Connector Group
		SFMA-CMC1	SFMA-CDC1	MCMA-RCS1	
OS25-19-PE1	OS25	17	13	12	RICC (MCMA-2)
OS26-1-PE1	OS26	3	7	10	RICC (MCMA-1)
OS26-19-PE1	OS26	17	13	12	RICC (MCMA-2)

As presented in the following table, each network degree supports six groups of connectors, numbered 1...6. Each group consist of three connectors; one SFMA-CDC1 unit connector, one SFMA-CMC1 unit connector, and one RICC connector (on the backplane). Any group of three connectors can be used to interconnect with another network degree.

Table 51: HUB Connector Groups

Connection Group (Available on Each Network Degree)	Applicable to Network Degree OSn-1-PE1 (WDM Facility AID)			Applicable to Network Degree OSn-19-PE1 (WDM Facility AID)		
	Plug-In Unit		Backplane RICC (MCMA-1) Port	Plug-In Unit		Backplane RICC (MCMA-2) Port
	SFMA-CDC1	SFMA-CMC1		SFMA-CDC1	SFMA-CMC1	
	Slot 7	Slot 3	Slot 10	Slot 13	Slot 17	Slot 12
1	PORT OUT-1	PORT IN-8	PORT 1 (CN35)	PORT OUT-1	PORT IN-8	PORT 1 (CN32)
2	PORT OUT-2	PORT IN-7	PORT 2 (CN36)	PORT OUT-2	PORT IN-7	PORT 2 (CN33)
3	PORT OUT-3	PORT IN-6	PORT 3 (CN37)	PORT OUT-3	PORT IN-6	PORT 3 (CN34)
4	PORT OUT-4	PORT IN-5	PORT 4 (CN28)	PORT OUT-4	PORT IN-5	PORT 4 (CN24)
5	PORT OUT-5	PORT IN-4	PORT 5 (CN29)	PORT OUT-5	PORT IN-4	PORT 5 (CN25)
6	PORT OUT-6	PORT IN-3	PORT 6 (CN30)	PORT OUT-6	PORT IN-3	PORT 6 (CN26)

Table 51: HUB Connector Groups (Cont.)

Connection Group (Available on Each Network Degree)		Applicable to Network Degree OSn-1-PE1 (WDM Facility AID)				Applicable to Network Degree OSn-19-PE1 (WDM Facility AID)		
		Plug-In Unit		Backplane RICC (MCMA-1) Port		Plug-In Unit		Backplane RICC (MCMA-2) Port
		SFMA-CDC1	SFMA-CMC1			SFMA-CDC1	SFMA-CMC1	
		Slot 7	Slot 3	Slot 10		Slot 13	Slot 17	Slot 12
g = 1...6		PORT OUT-g	PORT IN-(9-g)	PORT g		PORT OUT-g	PORT IN-(9-g)	PORT g

The following figure shows the cable connections between two network degrees. Observe the following:

- The two network degrees must reside on different Optical shelves.
- The three connectors used at each network degree can belong to any one of the six groups listed in the preceding table, but all three must belong to the same group.
- The LAN cable interconnects the two RICC connectors.
- The two LC-LC fiber-optic cables interconnect the WSS HUB Switch unit (SFMA-CDC1) on one network degree to the WSS Core Switch unit (SFMA-CMC1) on the other network degree.

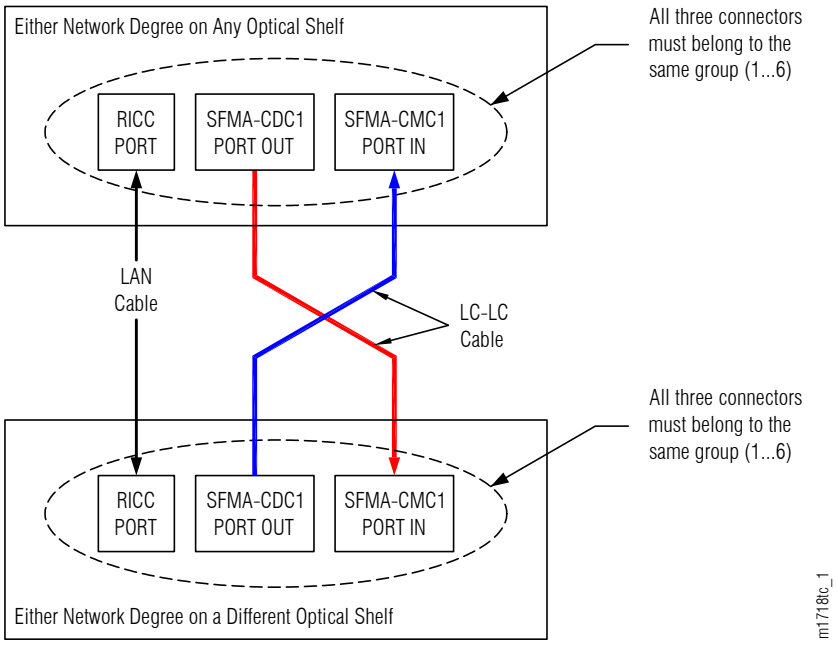


Figure 81: Cable Connections Interconnecting Two Network Degrees

The following table lists the equipment connection AIDs applicable to each group within each network degree.

Hint: *Remember that equipment connections are created using the ENT-CONN-EQPT command, or equivalent, and are used to inform the system of the LC-LC fiber-optic cable connections.*

Table 52: HUB Connector Group Equipment Connection AIDs

Note: OSn refers to the Optical shelf (OS1, OS2, OS3, OS4, OS25, or OS26) that supports the network degree (refer to).

Connection Group (Available on Each Network Degree)	Applicable to Network Degree OSn-1-PE1 (WDM Facility AID)		Applicable to Network Degree OSn-19-PE1 (WDM Facility AID)	
	fromAID	toAID	fromAID	toAID
1	OSn-7-PC1	OSn-3-PC8	OSn-13-PC1	OSn-17-PC8
2	OSn-7-PC2	OSn-3-PC7	OSn-13-PC2	OSn-17-PC7
3	OSn-7-PC3	OSn-3-PC6	OSn-13-PC3	OSn-17-PC6
4	OSn-7-PC4	OSn-3-PC5	OSn-13-PC4	OSn-17-PC5
5	OSn-7-PC5	OSn-3-PC4	OSn-13-PC5	OSn-17-PC4

Table 52: HUB Connector Group Equipment Connection AIDs (Cont.)

Note: OSn refers to the Optical shelf (OS1, OS2, OS3, OS4, OS25, or OS26) that supports the network degree (refer to).

Connection Group (Available on Each Network Degree)	Applicable to Network Degree OSn-1-PE1 (WDM Facility AID)		Applicable to Network Degree OSn-19-PE1 (WDM Facility AID)	
	fromAID	toAID	fromAID	toAID
6	OSn-7-PC6	OSn-3-PC3	OSn-13-PC6	OSn-17-PC3
g = 1...6	OSn-7-PCg	OSn-3-PC(9-g)	OSn-13-PCg	OSn-17-PC(9-g)

There are two equipment connections as shown the following figure. Both equipment connections associate the fromAID of one network degree to the toAID of the other network degree.

The following figure shows the two equipment connections (ENT-CONN-EQPT commands, or equivalent) required to inform the system of the LC-LC fiber-optic cable connections between two network degrees. Observe the following:

- The equipment connections link AIDs belonging to different network degrees. They do not link AIDs belonging to the same network degree.
- The fromAID and toAID associated with each network degree must belong to the same group (1...6). Furthermore, that group must match the group used for making LC-LC fiber-optic cable connections.

  Note: *Compare The following figure to The preceding figure and observe that the equipment connections mirror the LC-LC fiber-optic cable connections.*

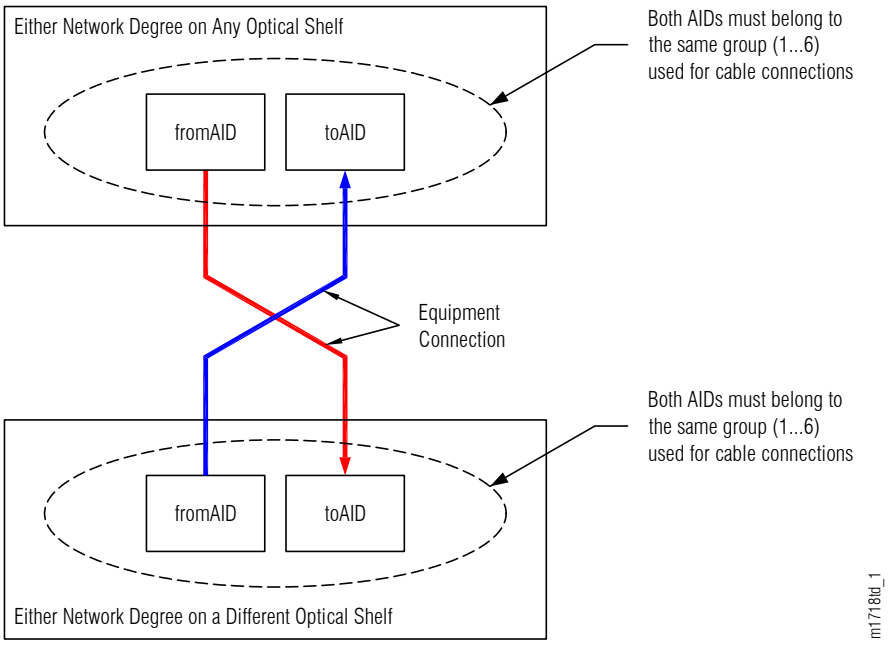


Figure 82: Equipment Connections Interconnecting Two Network Degrees

Provision HUB interconnections as follows:

Note: *Steps of this procedure are illustrated by an arbitrary example interconnecting network degree OS2-1-PE1 (WDM) with network degree OS25-19-PE1 (WDM). The interconnection is made using connection group 4 at degree OS2-1-PE1 (WDM) and connection group 6 at degree OS25-19-PE1 (WDM).*

Step 1
If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[35]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Identify Network Degrees

Step 2

Identify the two network degrees to be connected. The following table lists the 12 network degrees that can be potentially connected. The two network degrees must reside on different Optical shelves.

[35] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

Table 53: Network Degrees

WDM Facility AID	Optical Shelf	Plug-In Unit Slot			Backplane Connector Group
		SFMA-CDC1	SFMA-CMC1	MCMA-RCS1	
OS1-1-PE1	OS1	7	3	10	RICC (MCMA-1)
OS1-19-PE1	OS1	13	17	12	RICC (MCMA-2)
OS2-1-PE1	OS2	7	3	10	RICC (MCMA-1)
OS2-19-PE1	OS2	13	17	12	RICC (MCMA-2)
OS3-1-PE1	OS3	7	3	10	RICC (MCMA-1)
OS3-19-PE1	OS3	13	17	12	RICC (MCMA-2)
OS4-1-PE1	OS4	7	3	10	RICC (MCMA-1)
OS4-19-PE1	OS4	13	17	12	RICC (MCMA-2)
OS25-1-PE1	OS25	7	3	10	RICC (MCMA-1)
OS25-19-PE1	OS25	13	17	12	RICC (MCMA-2)
OS26-1-PE1	OS26	7	3	10	RICC (MCMA-1)
OS26-19-PE1	OS26	13	17	12	RICC (MCMA-2)

Example:
Connect network degree OS2-1-PE1 (WDM) to network degree OS25-19-PE1 (WDM).

Step 3
For both network degrees identified in Step 2, use the preceding table to identify the applicable shelf, plug-in units, and backplane connector group. Make a note of this information for reference.

Example:	Network Degree OS2-1-PE1 (WDM) Equipment	Network Degree OS25-19-PE1 (WDM) Equipment
Shelf	OS2	OS25
SFMA-CDC1	slot 7	slot 13
SFMA-CMC1	slot 3	slot 17
Backplane Connector Group	RICC (MCMA-1)	RICC (MCMA-2)

Choose Connection Groups

Step 4
For both network degrees, choose a connection group 1...6 that is currently unused.

Note: *To determine whether a connection group is currently used, refer to local documentation or inspect the associated connectors as described in the Steps 5 through 6. The same group number can be used for both network degrees.*

Example:
For network degree OS2-1-PE1 (WDM): choose group 4For network degree OS25-19-PE1 (WDM): choose group 6

Verify Connection Group Availability

Step 5

For both network degrees, use the following table to identify the connectors associated with the chosen connector groups. Make a note of this information for reference.

Table 54: HUB Connector Groups

Connection Group (Available on Each Network Degree)	Applicable to Network Degrees OSn-1-PE1 (WDM Facility AID)			Applicable to Network Degrees OSn-19-PE1 (WDM Facility AID)		
	Plug-In Unit		Backplane RICC (MCMA-1) Port	Plug-In Unit		Backplane RICC (MCMA-2) Port
	SFMA-CDC1	SFMA-CMC1		SFMA-CDC1	SFMA-CMC1	
	Slot 7	Slot 3	Slot 10	Slot 13	Slot 17	Slot 12
1	PORT OUT-1	PORT IN-8	PORT 1 (CN35)	PORT OUT-1	PORT IN-8	PORT 1 (CN32)
2	PORT OUT-2	PORT IN-7	PORT 2 (CN36)	PORT OUT-2	PORT IN-7	PORT 2 (CN33)
3	PORT OUT-3	PORT IN-6	PORT 3 (CN37)	PORT OUT-3	PORT IN-6	PORT 3 (CN34)
4	PORT OUT-4	PORT IN-5	PORT 4 (CN28)	PORT OUT-4	PORT IN-5	PORT 4 (CN24)
5	PORT OUT-5	PORT IN-4	PORT 5 (CN29)	PORT OUT-5	PORT IN-4	PORT 5 (CN25)
6	PORT OUT-6	PORT IN-3	PORT 6 (CN30)	PORT OUT-6	PORT IN-3	PORT 6 (CN26)
g = 1...6	PORT OUT-g	PORT IN-(9-g)	PORT g	PORT OUT-g	PORT IN-(9-g)	PORT g

Example:	Network Degree OS2-1-PE1 (WDM) Equipment	Group 4 Connectors	Network Degree OS25-19-PE1 (WDM) Equipment	Group 6 Connectors
Shelf	OS2		OS25	
SFMA-CDC1	slot 7	**PORT OUT-4**	slot 13	**PORT OUT-6**
SFMA-CMC1	slot 3	**PORT IN-5**	slot 17	**PORT IN-3**
Backplane Connector Group	RICC (MCMA-1) slot 10	**PORT 4 (CN28)**	RICC (MCMA-2) slot 12	**PORT 6 (CN26)**

Step 6
Inspect the equipment to verify that the six connectors identified in Step 5 are currently unused.

Step 7
Are all connectors identified in Step 5 currently unused?

If YES:
Proceed to Step 8.

If NO:
One or both of the connector groups chosen in Step 4 may already be in use. Return to Step 4 and choose a different connection group for one or both network degrees.

Install LC-LC Cables

Step 8
Obtain and clean two LC-LC fiber-optic cables.

Step 9
Install the two LC-LC fiber-optic cables between connectors identified in Step 5 (see The following figure):

a) Connect one end of the cable to the appropriate PORT OUT connector on the WSS HUB Switch unit (SFMA-CDC1) associated with one of the network degrees.

b) Connect the other end of the cable to the appropriate PORT IN connector on the WSS Core Switch unit (SFMA-CMC1) on the other network degree.

c) Repeat Step 1 and Step 2 for the other cable.

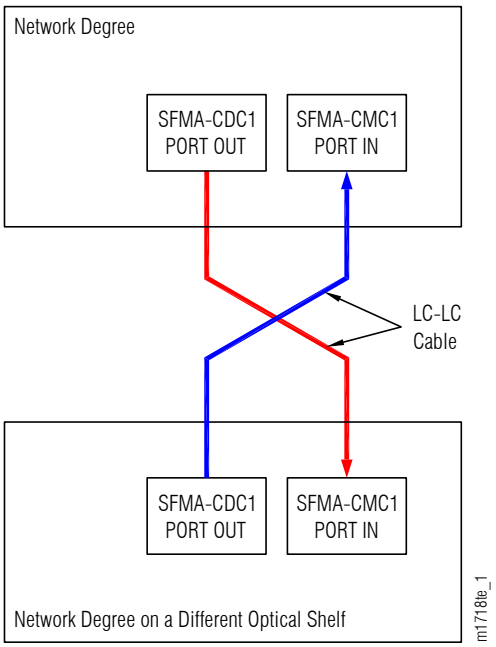


Figure 83: LC Cable Connections Interconnecting Two Network Degrees

Example:	Connect Cable From:			Connect Cable To:		
	SFMA-CDC1 PORT OUT			SFMA-CMC1 PORT IN		
	Shelf	Slot	Connector	Shelf	Slot	Connector
Cable 1	OS2	slot 7	PORT OUT-4	OS25	slot 17	PORT IN-3
Cable 2	OS25	slot 13	PORT OUT-6	OS2	slot 3	PORT IN-5

Install RICC Cable

Step 10
Obtain one LAN cable (21-332-xxx).

Step 11
Install the cable between the backplane connectors identified in Step 5.

a) Connect one end of the cable to the appropriate backplane connector on the shelf associated with one of the network degrees.

b) Connect the other end of the cable to the appropriate backplane connector on the shelf associated with the other network degree.

Example:	Connect RICC Cable From:			Connect RICC Cable to:		
	Shelf	Backplane Connector Group	Connector	Shelf	Backplane Connector Group	Connector
	OS2	RICC (MCMA-1)	PORT 4	OS25	RICC (MCMA-2)	PORT 6

Enter Equipment Connections

Step 12

For both network degrees, use the following table to identify the equipment connection AIDs associated with the connector groups chosen in Step 4. Make a note of this information for reference.

Table 55: HUB Connector Group Equipment Connection AIDs

Note: OSn refers to the Optical shelf (OS1, OS2, OS3, OS4, OS25, or OS26) that supports the network degree.

Connection Group (Available on Each Network Degree)	Applicable to Network Degrees OSn-1-PE1 (WDM Facility AID)		Applicable to Network Degrees OSn-19-PE1 (WDM Facility AID)	
	fromAID	toAID	fromAID	toAID
1	OSn-7-PC1	OSn-3-PC8	OSn-13-PC1	OSn-17-PC8
2	OSn-7-PC2	OSn-3-PC7	OSn-13-PC2	OSn-17-PC7
3	OSn-7-PC3	OSn-3-PC6	OSn-13-PC3	OSn-17-PC6
4	OSn-7-PC4	OSn-3-PC5	OSn-13-PC4	OSn-17-PC5
5	OSn-7-PC5	OSn-3-PC4	OSn-13-PC5	OSn-17-PC4
6	OSn-7-PC6	OSn-3-PC3	OSn-13-PC6	OSn-17-PC3
g = 1...6	OSn-7-PCg	OSn-3-PC(9-g)	OSn-13-PCg	OSn-17-PC(9-g)

Example:	Network Degree OS2-1-PE1 (WDM) (Group 4)	Network Degree OS25-19-PE1 (WDM) (Group 6)
Shelf	OS2	OS25
fromAID	**OS2-7-PC4**	**OS25-13-PC6**
toAID	**OS2-3-PC5**	**OS25-17-PC3**

Step 13

Enter two equipment connections using the AIDs identified in Step 12.

Note: *In both equipment connections the fromAID relates to one network degree and the toAID relates to the other network degree.*

TL1	NETSMART 500

`ENT-CONN-EQPT:TID:fromAID,toAID:CTAG;`
fromAID, toAID:
• As identified in Step 12.
Example:
`ENT-CONN-EQPT:FUJITSU:OS2-7-PC4,OS25-17-PC3;`
Example:
`ENT-CONN-EQPT:FUJITSU:OS25-13-PC6,OS2-3-PC5;`
	NE ▸ *Graphical Cross-Connects*
	The Cross-Connects window opens.
	From the View Rate drop-down list, select XC_EQPT_ASYM.
	From any one of three drop-down lists (top-left, top-right, or bottom), select the equipment associated with the fromAID.
	From a different drop-down list, select the equipment associated with the toAID.
	Click on the fromAID to begin drawing a line that represents the connection.
	Click on the toAID to terminate the line.
	The pending connection is now represented by a dashed line with an arrow pointing to the toAID.
	Entity ▸ *Operations Dialog*
	Click Create.
	The dashed line becomes solid.
	Close the Operations dialog box.
	Close the Cross-Connects window.

Step 14
Verify that the equipment connections are entered.

TL1	NETSMART 500

`RTRV-CONN-EQPT:TID::CTAG;`
Example:
`RTRV-CONN-EQPT:FUJITSU::CTAG;`
	In the tree view area, select the Connect Equip. tab.

The HUB connection is now provisioned.

Step 15
Repeat Steps 2 through 14 until all required HUB connections have been provisioned.

Step 16
Are all NEs in the network turned up?

If YES:
Proceed to Make Network Connections.

Note: *You have completed the turn-up for the node, but have not connected it to the network. Network connections are made after all nodes are turned up (see Figure 2).*

If NO:
Repeat the turn-up procedures, starting from Verify Shelf Labeling, Verify LAN and RICC Cable Connections, Apply Power, and Install Fan Units, for the next NE.

✔ This procedure is complete.

2.14 Make Network Connections

In this section:

Warning: *Verify the transmit and receive fibers are connected to the correct ports of the plug-in unit. An incorrect connection can result in dropped traffic or an equipment fault and may damage the laser optics.*

These subprocedures are performed in the order given, beginning with Connect Network Fiber-Optic Cables.

2.14.1 Connect Network Fiber-Optic Cables

Use the procedure in this section to connect network fiber-optic cables between adjacent nodes. Start at any span, and repeat the subprocedures until network connections are complete for all spans in the network.

At the network level (between NEs), fiber-optic cable connections are made at the OPT IN and OPT OUT connectors of amplifier (APMA-xxxx) plug-in units (located in slot 1 or 19 of Optical shelf OSn (n = 1...4, 25, 26). Figures 84 through 92 shows connections for nine example networks. The transmit end of each cable connects to the OPT OUT connector (on an amplifier plug-in unit) in one node, the receive end connects to the OPT IN connector (on an amplifier plug-in unit) in another node.

Figure 84 shows network cable connections for an example 4-node ring network.

Figure 85 shows network cable connections for two 4-node ring networks interconnected through a 4-degree HUB node. The HUB node includes Auxiliary Optical shelf OS2.

Figure 86 shows network cable connections for a 4-node ring network interconnected to a 3-node linear network through a 3-degree HUB node. The HUB node includes Auxiliary Optical shelf OS2.

Figure 87 shows network cable connections for three 4-node ring networks interconnected through a 6-degree HUB node. The HUB node includes Auxiliary Optical shelves OS2 and OS3.

Figure 88 shows network cable connections for two 4-node ring networks interconnected to a 3-node linear network through a 5-degree HUB node. The HUB node includes Auxiliary Optical shelves OS2 and OS3.

Figure 89 shows network cable connections for four 4-node rings interconnected through an 8-degree HUB node. The HUB node includes Auxiliary Optical shelves OS2, OS3, and OS4.

Figure 90 shows network cable connections for three 4-node ring networks and a 3-node linear network interconnected through a 7-degree HUB node. The HUB node includes Auxiliary Optical shelves OS2, OS3, and OS4.

The following figure shows network cable connections for three 4-node ring networks and two 3-node linear networks interconnected through an 8-degree HUB node. The HUB node includes Auxiliary Optical shelves OS2, OS3, and OS4.

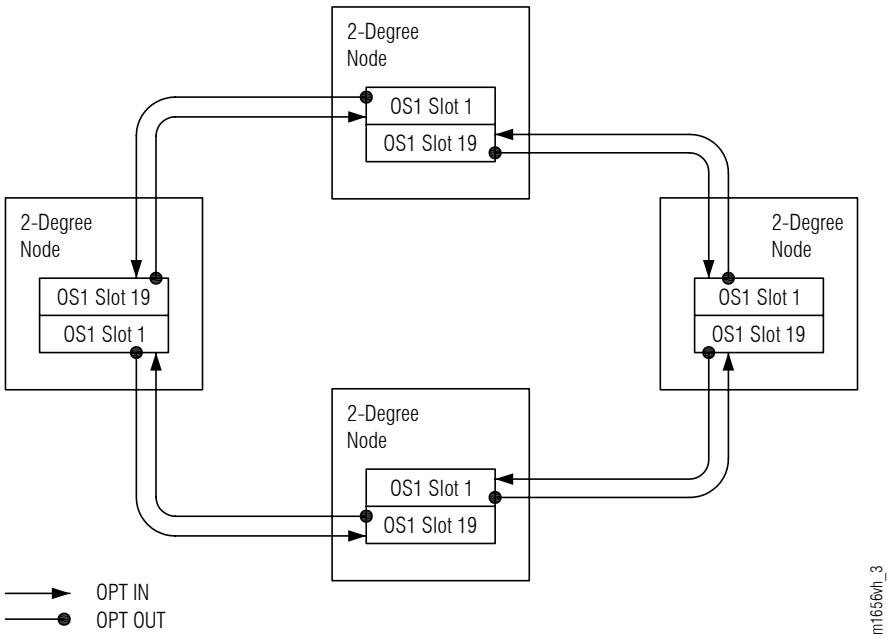


Figure 84: Network Connections for 4-Node Ring Network

The following figures shows network cable connections for a 6-node mesh network with two 3-degree HUB nodes interconnected. Each HUB node includes Auxiliary Optical shelf OS2.

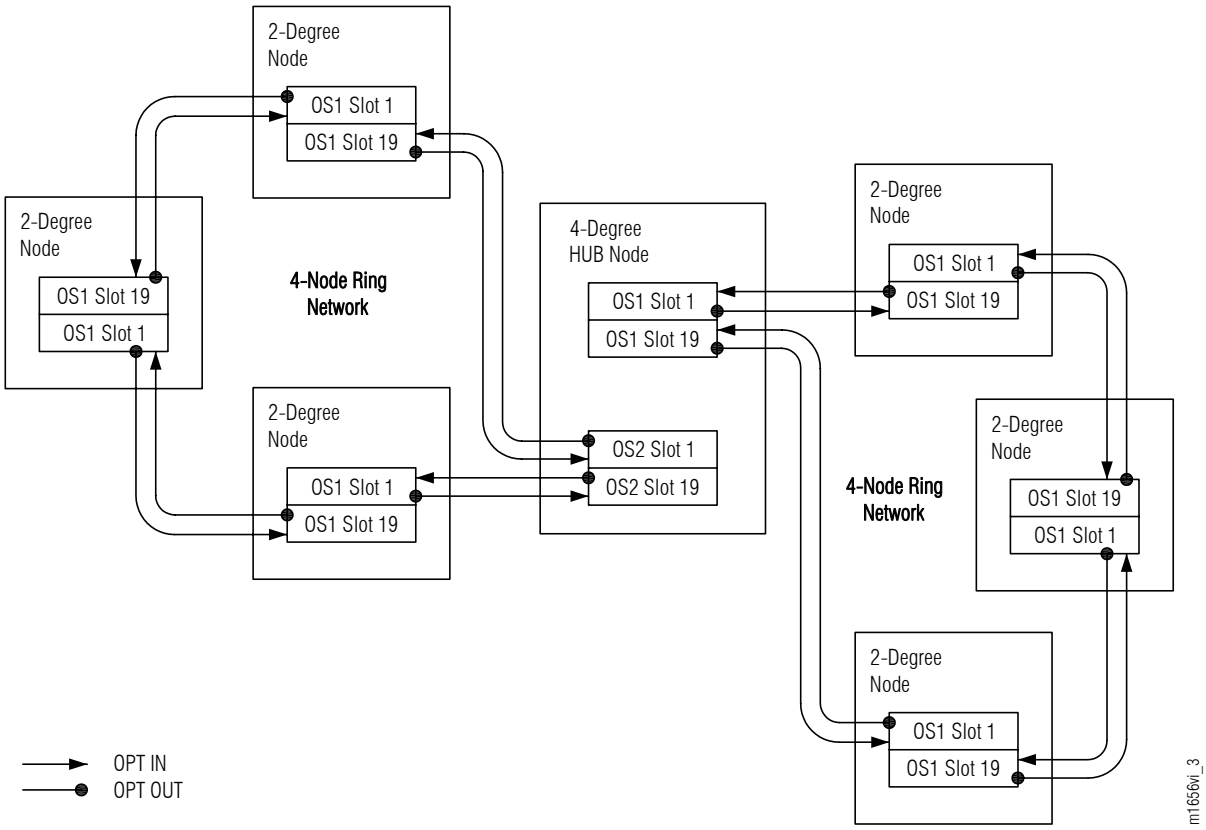


Figure 85: Network Connections for Two Ring Networks Interconnected through 4-Degree HUB Node

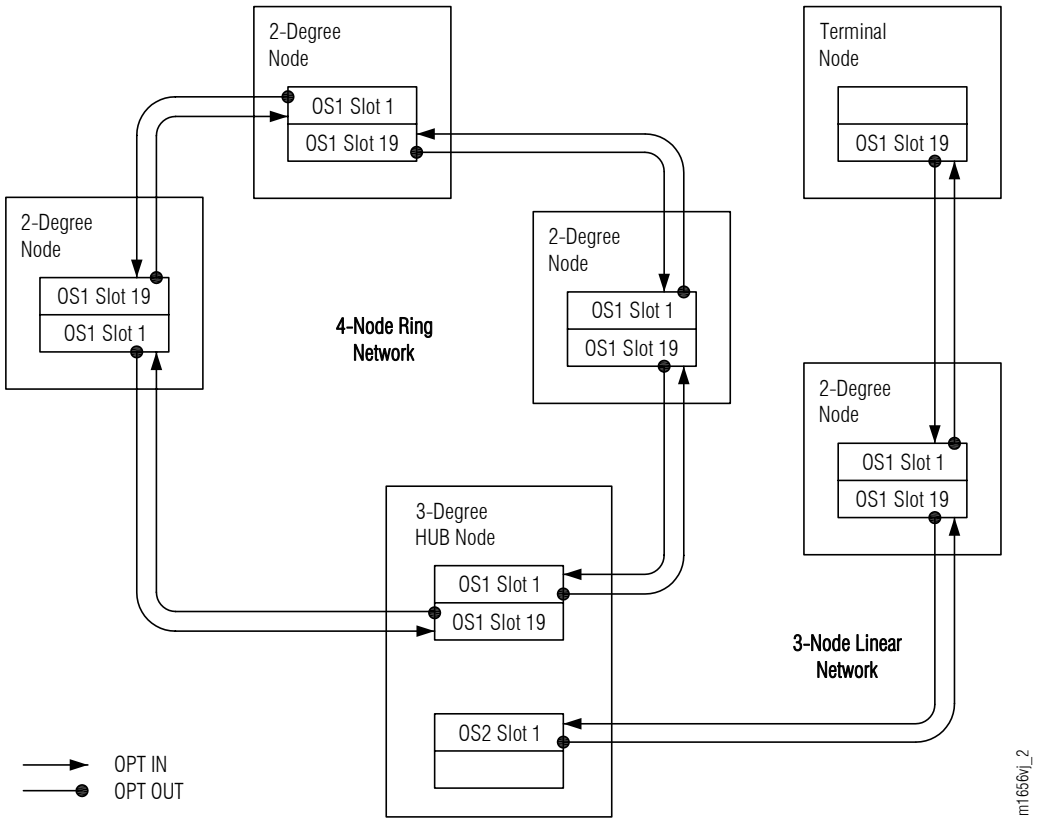


Figure 86: Network Connections for Ring Network and Linear Network Interconnected through 3-Degree HUB Node

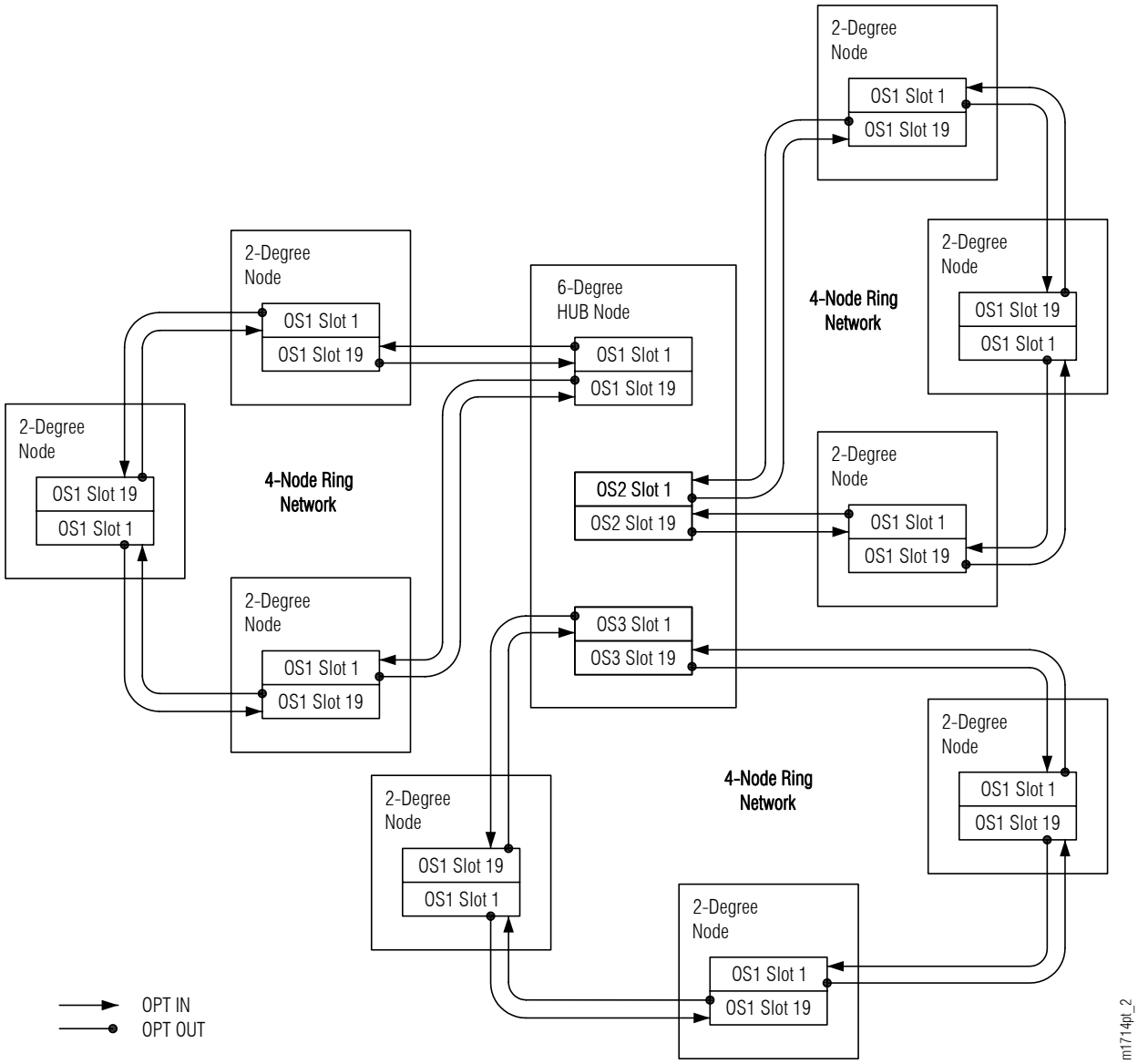


Figure 87: Network Connections for Three Ring Networks Interconnected through 6-Degree HUB Node

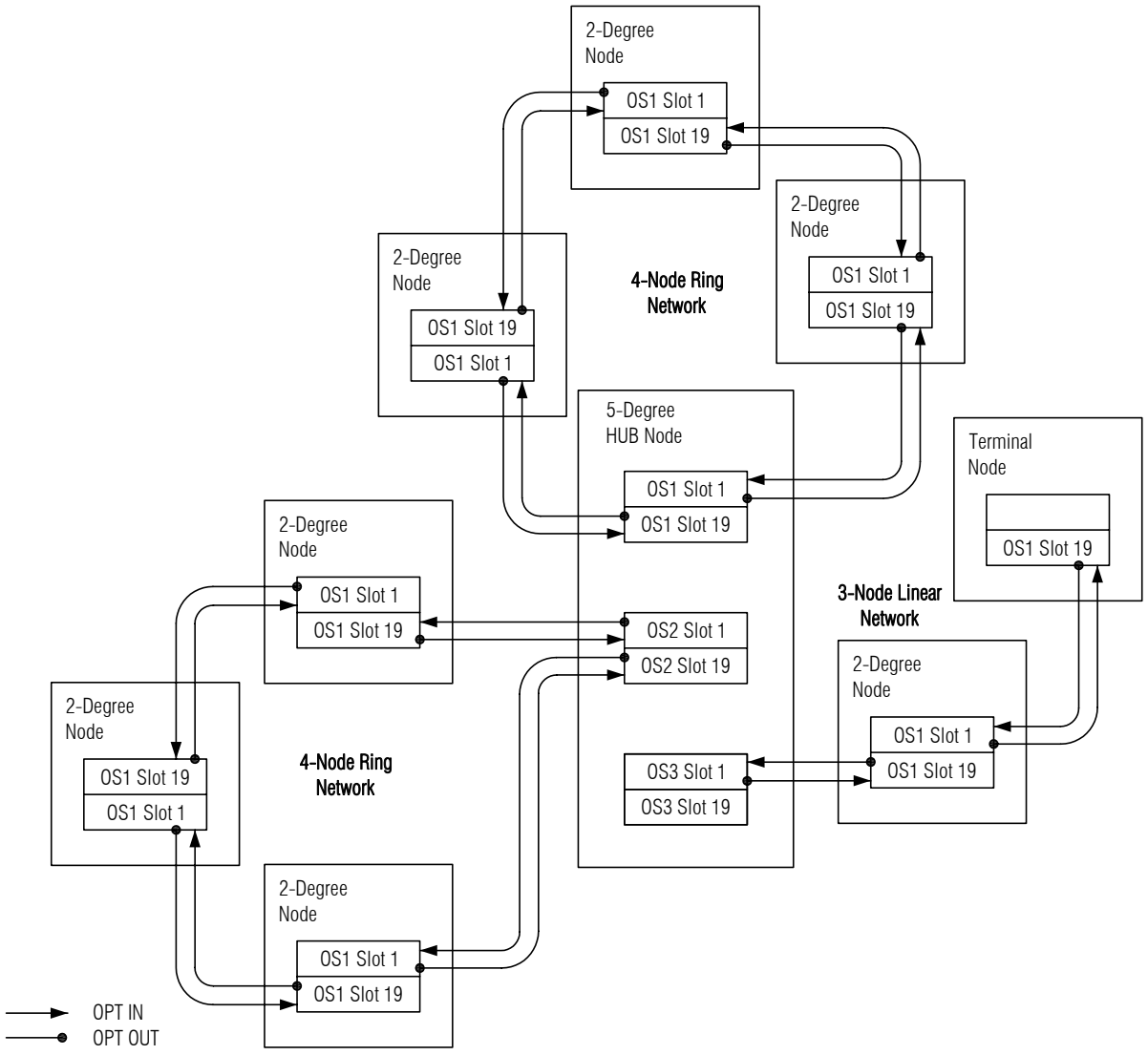


Figure 88: Network Connections for Two Ring Networks and Linear Network Interconnected through 5-Degree HUB Node

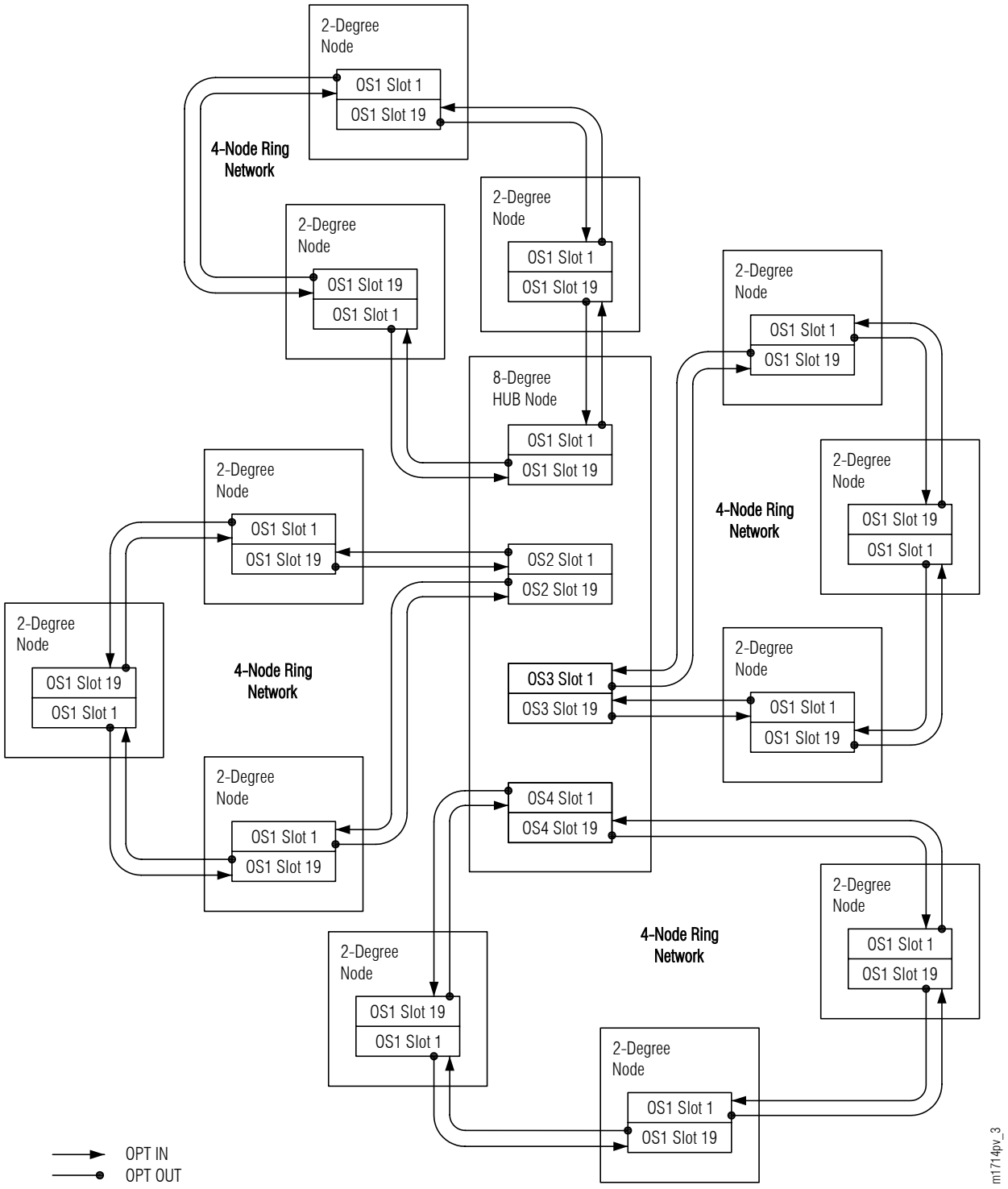


Figure 89: Network Connections for Four Ring Networks Interconnected through 8-Degree HUB Node

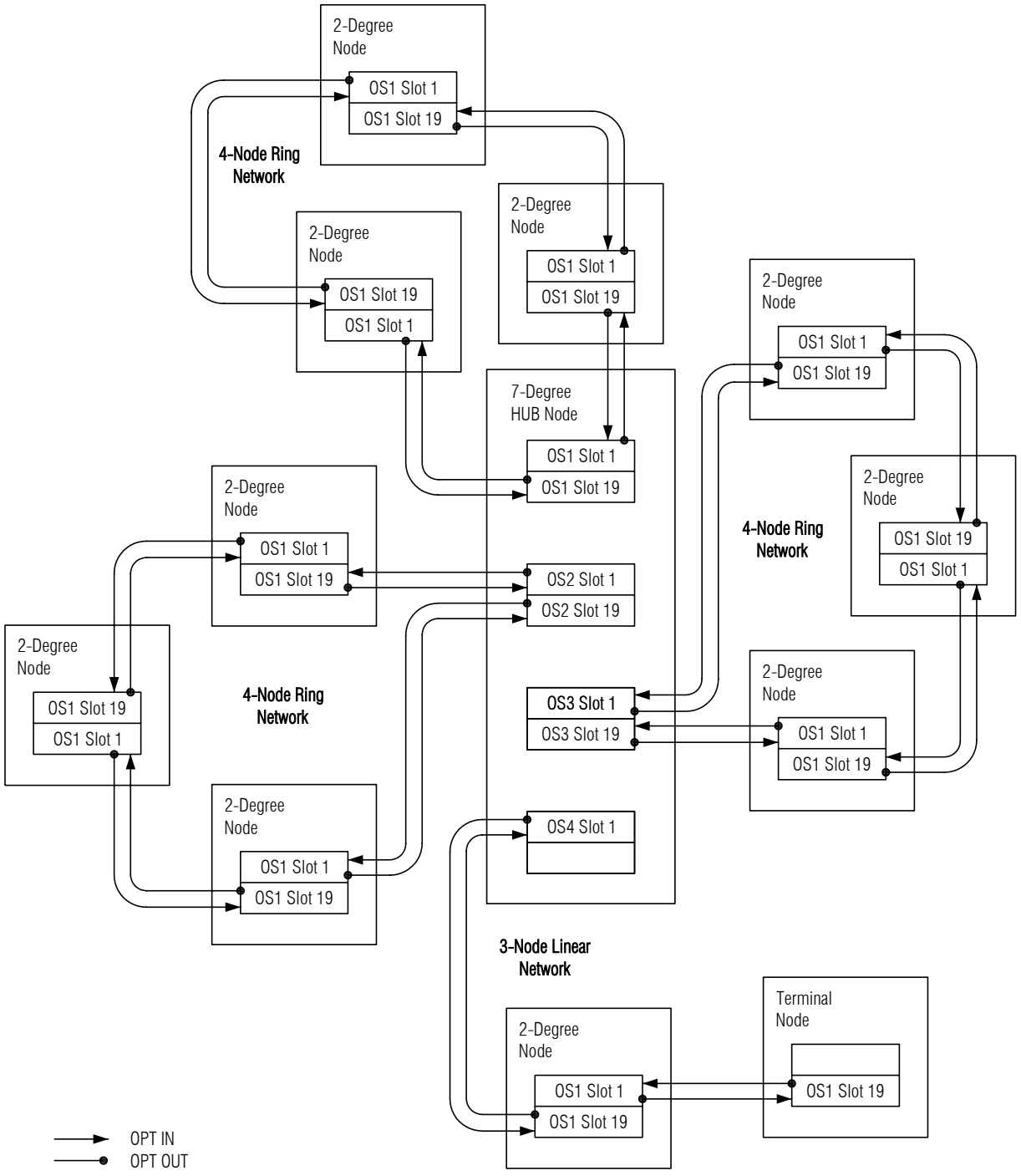


Figure 90: Network Connections for Three Ring Networks and Linear Network Interconnected through 7-Degree HUB Node

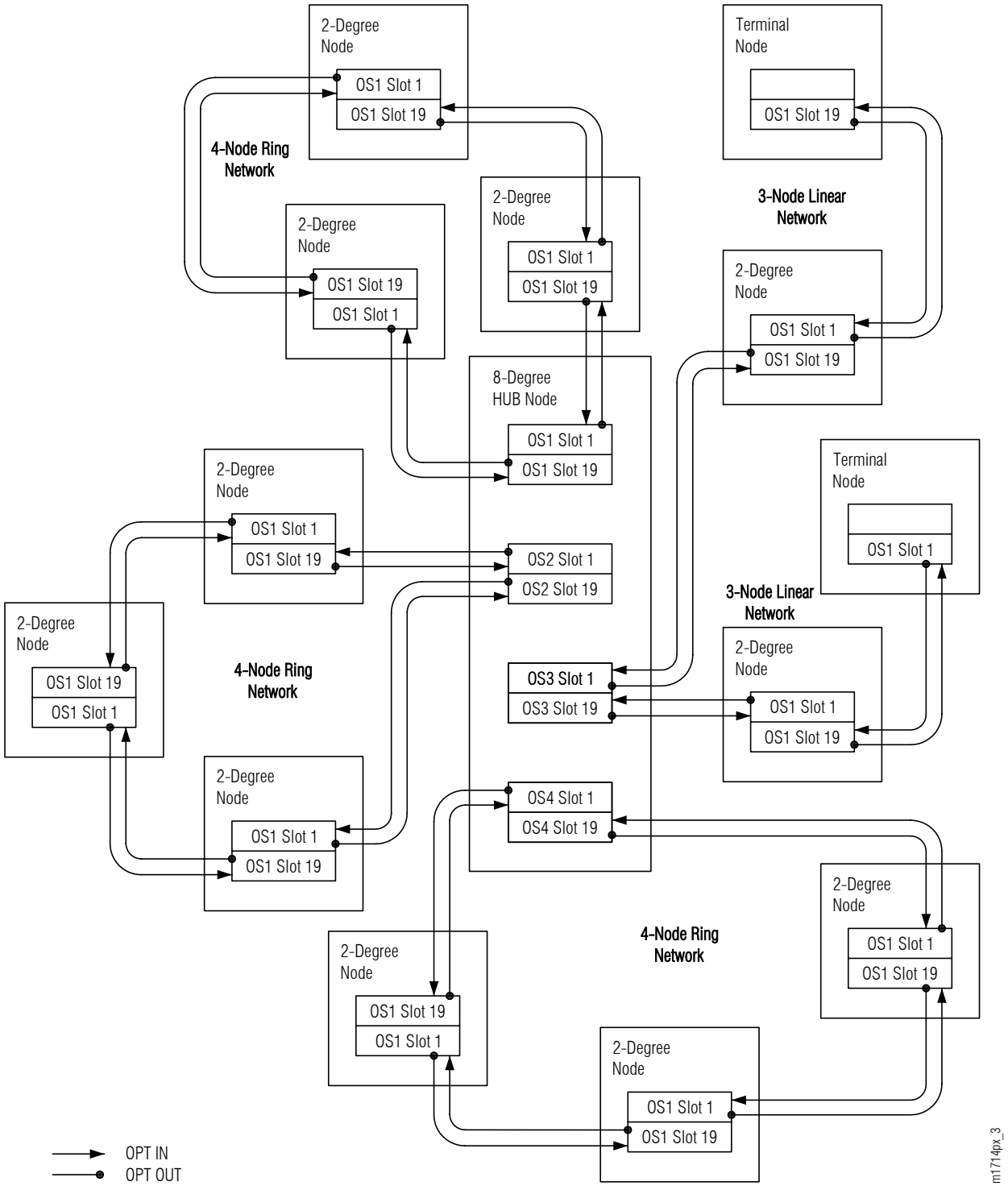


Figure 91: Network Connections for Three Ring Networks and Two Linear Networks Interconnected through 8-Degree HUB Node

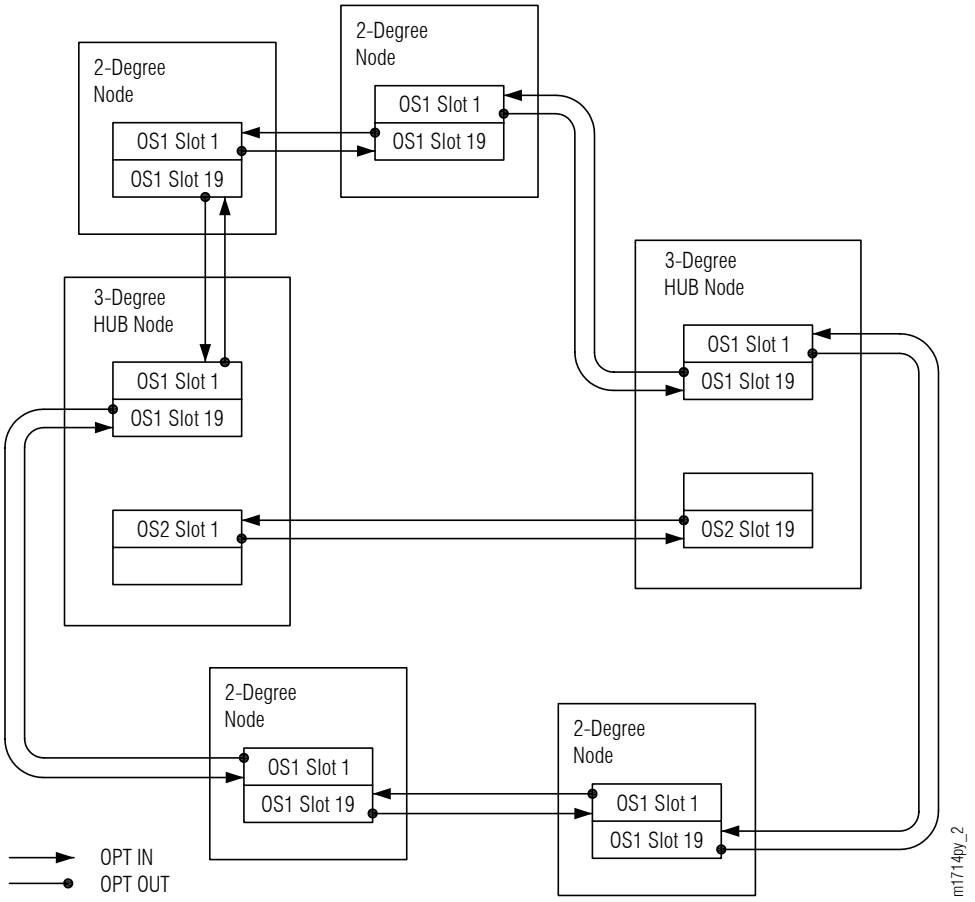


Figure 92: Network Connections for 6-Node Mesh Network Interconnected through Two 3-Degree HUB Nodes

The following figure shows the network fiber-optic cable connections for a representative span. The nodes are labeled Node A and Node B. In Node B, the span cables connect to the amplifier plug-in unit in slot 19 of an Optical shelf. In Node A, the span cables connect to the amplifier plug-in unit in slot 1 of an Optical shelf.

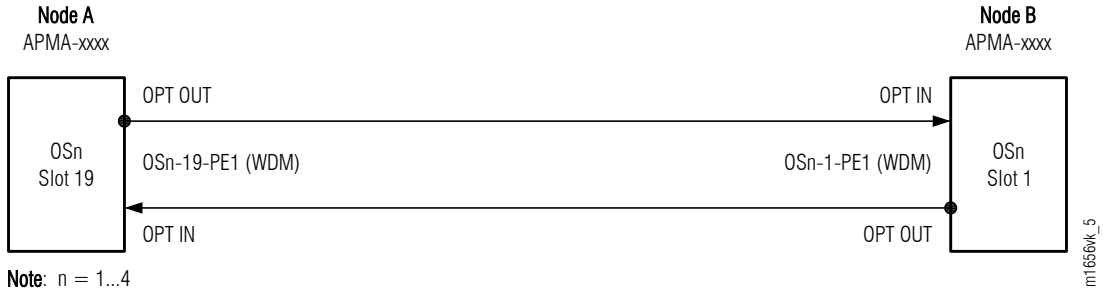


Figure 93: Representative Span between Two Adjacent Nodes

For HUB nodes (containing Main Optical shelf OS1 and one or more Auxiliary Optical shelves), it is important to know whether the span connects to Main Optical shelf OS1 or Auxiliary Optical shelf OSn (n = 2...4, 25, 26). These connections depend on network design, as shown in Figure 85 or Figure 86.

Danger: *Never handle exposed fiber with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove. Follow local safety precautions regarding fiber.*

Danger: *Never look into the end of a fiber-optic cable. Permanent eye damage or blindness can occur very quickly if the laser light is present. Follow local safety precautions regarding fiber.*

Warning: *To avoid damage to the equipment when connecting fibers, always verify the optical specifications. Verify that the optical signal into a receiver meets the appropriate optical specifications listed in* Optical Specifications.

Warning: *Do not make any fiber connections until optical levels have been measured. Failure to check optical power levels before connecting fibers to optical receivers can damage receivers if power levels are not within specification*

Caution: *Before installing fiber-optic cables, always verify that the fiber connectors are free of contamination by visually inspecting with a fiber scope and cleaning the connectors at both ends of the fiber, if necessary. Refer to* Fiber Cable Handling.

Step 1
Identify and clean both ends of the two network fiber-optic cables associated with the span (see Figure 93). Refer to Fiber Cable Handling.

Step 2
For each cable, if an in-line optical attenuator is required by the network engineering design specification, clean the attenuator, and connect it to the receiving end of the cable.

Step 3
Connect the cable ends (with the optical attenuator, if used) to the appropriate plug-in units and connectors as listed in the following table.

Table 56: Network Connections for Representative Span

Note: For HUB nodes, knowing whether the span connects to the Main Optical shelf OS1 or Auxiliary Optical shelf OSn (n = 2...4, 25, 26) is important. These connections depend on network design, as shown in or .

Node A APMA-xxxx			Node B APMA-xxxx		
Shelf	**Shelf Slot**	**Connector**	**Shelf**	**Shelf Slot**	**Connector**
OSn • n = 1...4, 25, 26	19	OPT OUT	OSn • n = 1...4, 25, 26	1	OPT IN
	19	OPT IN[36]		1	OPT OUT

Step 4
Repeat Steps 1 through 3 for each span in the network.

Step 5
Proceed to Verify Fiber Connections.

2.14.2 Verify Fiber Connections

This subprocedure includes steps to verify that every optical transmitter is connected to the correct optical receiver at the downstream node. It will also verify that span losses are in accordance with network design. For an overview of the correct network fiber connections, refer to Connect Network Fiber-Optic Cables. Connection errors may not show up immediately as alarm indicators and can lead to protection switching failures.

This procedure assumes the following:

- Fiber-optic cables are installed as described in Install Intrashelf Fiber-Optic Cables, and Connect Network Fiber-Optic Cables.
- A technician is present at each connected node.

  Note: *This procedure can also be performed from one location by remotely logging on to each NE. However, if a misconnection on a downstream NE is suspected during the verification procedure, a technician will need to go to the downstream NE to verify the physical connections.*

- Network design information is available to judge whether span loss values (retrieved in Step 23) are acceptable.

Danger: *Never handle exposed fiber with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove. Follow local safety precautions regarding fiber.*

[36] If an in-line optical attenuator is required, it is placed at the OPT IN connector to the amplifier plug-in unit.

Danger: *Never look into the end of a fiber-optic cable. Permanent eye damage or blindness can occur very quickly if the laser light is present. Follow local safety precautions regarding fiber.*

Warning: *Verify the transmit and receive fibers are connected to the correct ports of the plug-in unit. An incorrect connection can result in dropped traffic or an equipment fault and may damage the laser optics.*

Warning: *To avoid damage to the equipment when connecting fibers, always verify the optical specifications. Verify that the optical signal into a receiver meets the appropriate optical specifications listed in* Optical Specifications.

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to* Introduction to TL1 Commands *for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
At each site, log on the NE.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

TL1	NETSMART 500
ACT-USER:TID:UID:CTAG::PID; TID: • FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters) UID: • ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters) PID: • ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.) ***Example:*** ACT-USER:FUJITSU:ROOT:CTAG::ROOT;	For **TERM1** (Serial): TID: FUJITSU User ID: ROOT Password: ROOT/(Route66K) Conn. Mode: Serial Comm. Port: COMx (for example, COM2) Configure: use default[37] For **TERM2** (TCP/IP): TID: FUJITSU User ID: ROOT Password: ROOT/(Route66K) Conn. Mode: TCP/IP IP Address: 192.168.1.1 Port: 2024 Click Logon. The NETSMART 500 NE View opens. The Security Message dialog box opens. Click OK. ***Note:*** *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Check Alarms and Conditions

Step 2

At each node in the system, retrieve alarms and conditions. Do not continue this procedure until all alarms and conditions are either cleared or accounted for. Refer to Responding to Alarms and Conditions, for trouble clearing information.

TL1	NETSMART 500
RTRV-COND-ALL:TID::CTAG; ***Example:*** RTRV-COND-ALL:FUJITSU::CTAG;	*NE* ▸ *Alarms* *View* ▸ *Filter* The Alarm Filter dialog box opens. Ensure that all fault types are selected in the Fault Type area. Ensure all severity levels are selected in the Severity area. Click Close. Close Active Alarms window.

[37] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

Verify WDM Facilities are In Service

Step 3
At each node in the system, verify that the WDM facilities are in service.

TL1	NETSMART 500

`RTRV-WDM:TID:AID:CTAG;`
AID:
• OSn-1-PE1, OSn-19-PE1
  • n = 1…4, 25, 26
Example:
`RTRV-WDM:FUJITSU:OS1-1-PE1:CTAG;`
	In the tree view, click the Facilities tab.
	Expand the appropriate Optical shelf OSn (n = 1…4, 25, 26).
	Select a WDM facility.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify that the facility is in service (PRIMARY_STATE: IS).
	Close the Properties dialog box.
	Repeat for the other WDM facility.

Step 4
Are the WDM facilities in service?

If YES:
Proceed to Step 7.

If NO:
Continue with Step 5.

Step 5
Place the WDM facility or facilities in service.

TL1	NETSMART 500

`ED-WDM:TID:AID:CTAG::::IS;`
AID:
• OSn-1-PE1, OSn-19-PE1
  • n = 1…4, 25, 26
Example:
`ED-WDM:FUJITSU:OS1-1-PE1:`
`CTAG::::IS;`
	In the tree view, click the Facilities tab.
	Select the appropriate WDM facility or facilities.
	Note: *Select multiple components using CTRL+click or SHIFT+click.*
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	In the Command Parameters area, select In Service (ED:IS) from the New Prov. State drop-down list.
	Click Modify or Modify All if multiple components are selected.
	Do not close the Operations dialog box.

Step 6
Verify that the service state of the WDM facility or facilities was changed to IS.

TL1	NETSMART 500

`RTRV-WDM:TID:AID:CTAG;`
AID:
• As identified in previous step
Example:
`RTRV-WDM:FUJITSU:OS1-1-PE1:CTAG;`
	In the Current Values area of the Operations dialog box, verify that the Current Values to confirm that the primary state is In Service (PRIMARY_STATE: IS).
	Close the Operations dialog box.

Verify OSC Facilities are In Service

Step 7
At each node in the system, verify that the OSC facilities are in service.

TL1	NETSMART 500

`RTRV-OSC:TID:AID:CTAG;`
AID:
• OSn-9-PE1, OSn-11-PE1
  • n = 1…4, 25, 26
Example:
`RTRV-OSC:FUJITSU:OS1-9-PE1:CTAG;`
	In the tree view, click the Facilities tab.
	Select an OSC facility.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify that the facility is in service (PRIMARY_STATE: IS).
	Close the Properties dialog box.
	Repeat for the other OSC facility.

Step 8
Are the OSC facilities in service?

If YES:
Proceed to Step 11.

If NO:
Continue with Step 9.

Step 9
Place the OSC facility or facilities in service.

TL1	NETSMART 500

`ED-OSC:TID:AID:CTAG::::IS;`
AID:
• OSn-9-PE1, OSn-11-PE1
  • n = 1...4, 25, 26
Example:
`ED-OSC:FUJITSU:OS1-9-PE1:`
`CTAG::::IS;`
	In the tree view, click the Facilities tab.
	Select the appropriate OSC facility or facilities.
	Note: *Select multiple components using CTRL+click or SHIFT+click.*
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	In the Command Parameters area:
	Select In Service (ED:IS) from the New Prov. State drop-down list.
	Click Modify or Modify All if multiple components are selected.
	Do not close the Operations dialog box.

Step 10
Verify that the service state of the OSC facility or facilities was changed to IS.

TL1	NETSMART 500

`RTRV-OSC:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-OSC:FUJITSU:OS1-9-PE1:CTAG;`
	In the Current Values of the Operations dialog box, verify that the primary state is In Service (PRIMARY_STATE: IS).
	Close the Operations dialog box.

Verify Fiber Connections

Step 11
Choose one of the nodes to begin the verification process.

Note: *The following verification steps are applied at each node in turn. The node under verification is called the* ***current node****.*

Step 12
At the current node, identify the amplifier plug-in unit for which you want to verify the fiber connection.

Step 13
At the current node, determine the downstream node to which the amplifier is supposed to transmit. Also, identify the shelf and slot in the downstream node where the amplifier is supposed to transmit, and provide this information to the technician at the downstream node. the following table lists the four possible shelf and slot locations.

Note: *The following table also lists the associated OSC facility AID for use in* Step 16.

Table 57: Downstream Receive Connections and OSC Facilities

Network Receive Connection on Downstream Node			OSC Facility AID
Shelf[38]	Slot	Connector	
OSn	1	OPT IN	OSn-9-PE1
OSn	19	OPT IN	OSn-11-PE1

Step 14
At the downstream node, monitor the node for alarms.

Step 15
At the current node, temporarily disconnect the fiber-optic cable from the amplifier plug-in unit connector OPT OUT.

Step 16
At the downstream node, verify that an OSC LOS alarm is raised for the appropriate OSC facility at the downstream node. Refer to the preceding table.

[38] **OSn refers to the Optical shelf, n = 1...4, 25, 26.**

TL1	NETSMART 500
RTRV-ALM-ALL:TID::CTAG; ***Example:*** RTRV-ALM-ALL:FUJITSU::CTAG;	*NE* ▸ *Alarms* *View* ▸ *Filter* The Alarm Filter dialog box opens. Ensure that all fault types are selected in the Fault Type area. Ensure that all severity levels are selected in the Severity area. Click Close. Close Active Alarms window.

Note: *If a different node or facility produces an alarm instead, correct the fiber connection error, and then repeat the verification process. Refer to* Connect Network Fiber-Optic Cables.

If the fiber-optic cable was disconnected from the amplifier plug-in unit in slot 19 of the Main Optical shelf OS1 at the current node, the OSC facility (OS1-9-PE1) at the downstream node should be alarmed.

Step 17
At the current node, clean and reconnect the fiber-optic cable that was disconnected in Step 15.

Step 18
At the downstream node, verify that the downstream receiver OSC LOS alarm clears within a few seconds.

TL1	NETSMART 500
RTRV-ALM-ALL:TID::CTAG; ***Example:*** RTRV-ALM-ALL:FUJITSU::CTAG;	*NE* ▸ *Alarms* *View* ▸ *Filter* The Alarm Filter dialog box opens. Ensure that all fault types are selected in the Fault Type area. Ensure that all severity levels are selected in the Severity area. Click Close. Close Active Alarms window.

Step 19
Repeat Steps 12 through 18 for each amplifier plug-in unit in the current node, and then proceed to Step 20.

Step 20
Repeat Steps 11 through 19 for every node in the network. Then proceed to Step 21.

Verify Span Loss

Step 21
Choose one of the nodes to begin the verification process.

Note: *The following verification steps are applied at each node in turn. The node under verification is called the* ***current node****.*

Step 22
At the current node, identify the network degree for which you want to verify the span loss.

Step 23
For the current network degree, retrieve the span loss.

TL1	NETSMART 500

`RTRV-PM-PORT:TID:AID:CTAG::SPANLOSS;`
AID:
• OSn-1-PE1, OSn-19-PE1
  • n = 1…4, 25, 26
Example:
`RTRV-PM-PORT:FUJITSU:OS1-1-PE1:`
`CTAG::SPANLOSS;`
	Select the Equipment tab in the tree area.
	Locate the appropriate amplifier equipment entity and expand it to view subentities.
	Select the OSn-s-PE1 (PORT) subentity.
	Reports
	▸ *Selected Entities* ▸ *PM Data*
	The PM Data Query dialog box opens.
	From the MONTYPE drop-down list, select SPANLOSS.
	Click Generate Report.
	The PM Data report window opens.
	Confirm that value in the Validity field is TRUE.
	Span loss is reported in the Monitor Value field.
	Close the PM Data report window.

The TL1 response format is as follows:

```
   SID DATE TIME
M  CTAG COMPLD
   "AID:MONTYPE,MONVAL,VLDTY,LOCN,DIRN"
```

Step 24
Is the value of the validity (VLDTY) parameter TRUE?

Note: *If the validity parameter is FALSE, the returned value is invalid.*

If YES:
Proceed to Step 25.

If NO:
Call Fujitsu at 1-800-USE-FTAC for technical assistance.

Step 25
Is the span loss in accordance with network design?

Note: *The span loss in dB is contained in the monitored value (MONVAL) field.*

If YES:
Proceed to Step 26

If NO:
Call Fujitsu at 1-800-USE-FTAC for technical assistance.

Step 26
Repeat Steps 23 through 25 for each network degree in the current node, and then proceed to Step 27.

Step 27
Repeat Steps 21 through 26 for every node in the network. Then proceed to Reset the Span Loss Variation Alarm References.

✔ This procedure is complete.

2.14.3 Reset the Span Loss Variation Alarm References

This procedure is used to reset the system reference value (SYSREF) for the span loss variation (SLV) alarm associated with each amplifier that is new to the network. The procedure sets the value of SYSREF to the current span loss value.

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
Identify the new network connections, then, starting with any node that includes a new network connection, proceed to Step 2.

Note: *Steps 2 through 16 are performed once for each new network connection. To perform these steps you must be able to identify the OSC facility, WDM facility, and the amplifier equipment associated with the network connection.*

Step 2

If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to Setting Up Craft Interface (TL1 Session through TERM1) through Setting Up Craft Interface (NETSMART 500 Session through TERM2).*

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft Windows platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

TL1	NETSMART 500

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	Comm. Port: COMx (for example, COM2)
	Configure: use default[39]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	The NETSMART 500 NE View opens.
	The Security Message dialog box opens.
	Click OK.
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 graphical user interface.*

Step 3
Edit the OSC facility out of service.

TL1	NETSMART 500

`ED-OSC:TID:AID:CTAG::::OOS;`
AID:
• OSn-9-PE1 (OSC facility for slot-9 plug-in unit)
• OSn-11-PE1 (OSC facility for slot-11 plug-in unit)
  • n = 1…4, 25, 26
Example:
`ED-OSC:FUJITSU:OS1-9-PE1:`
`CTAG::::OOS;`
	In the tree view, click the Facilities tab.
	Expand the appropriate shelf component.
	Select one or more facility components.
	Note: *Select more than one component using CTRL+click (multiple) or SHIFT+click (range).*
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	Select the appropriate facility state from the New Prov. State drop-down list.
	Click Modify or Modify All if multiple components were selected.
	Do not close the Operations dialog box.

[39] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

Step 4
Verify that the OSC facility state is out of service.

TL1	NETSMART 500

`RTRV-OSC:TID:AID:CTAG;`
AID:
• As specified in the previous step
• **ALL** (null)
Example:
`RTRV-OSC:FUJITSU:OS1-9-PE1:CTAG;`
	In the Current Values area of the Operations dialog box, verify the facility state.
	Close the Operations dialog box.

Step 5
Edit the WDM facility out of service.

TL1	NETSMART 500

`ED-WDM:TID:AID:CTAG::::OOS;`
AID:
• OSn-1-PE1 (WDM facility associated with slot-1 amplifier)
• OSn-19-PE1 (WDM facility associated with slot-1 amplifier)
  • n = 1…4, 25, 26
Example:
`ED-WDM:FUJITSU:OS1-1-PE1:`
`CTAG::::OOS;`
	In the tree view, click the Facilities tab.
	Expand the appropriate shelf component.
	Select one or more facility components.
	Note: *Select more than one component using CTRL+click (multiple) or SHIFT+click (range).*
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	Select the appropriate facility state from the New Prov. State drop-down list.
	Click Modify or Modify All if multiple components were selected.
	Do not close the Operations dialog box.

Step 6
Verify that the WDM facility state is out of service.

TL1	NETSMART 500

`RTRV-WDM:TID:AID:CTAG;`
AID:
• As specified in the previous step
• **ALL** (null)
Example:
`RTRV-WDM:FUJITSU:OS1-1-PE1:CTAG;`
	In the Current Values area of the Operations dialog box, verify the facility state.
	Close the Operations dialog box.

Step 7
Edit the amplifier equipment state out of service.

TL1	NETSMART 500

`ED-EQPT:TID:AID:CTAG::::OOS;`
AID:
• OSn-1 (slot 1)
• OSn-19 (slot 19)
  • n = 1…4, 25, 26
Example:
`ED-EQPT:FUJITSU:OS1-1:CTAG::::OOS;`
	In the tree view, click the Equipment tab.
	Expand the appropriate shelf component.
	Select one or more equipment components.
	Note: *Select more than one component using CTRL+click (multiple) or SHIFT+click (range).*
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	Select the appropriate facility state from the New Prov. State drop-down list.
	Click Modify or Modify All if multiple components were selected.
	Do not close the Operations dialog box.

Step 8
Retrieve the amplifier equipment provisioning:

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS1-1:CTAG;`
	In the Current Values area of the Operations dialog box, verify equipment provisioning.
	Close the Operations dialog box.

a) Verify that the amplifier equipment state is out of service.

b) Following local practice, make a record of the current value of SYSREF.

Note: *The current value of SYSREF is noted so that it can be compared to the value of SYSREF after SYSREF is reset to the current span loss value (Step 10).*

Step 9
Edit keyword TCAREF to REFRESET.

Note: *This step resets the system reference value (SYSREF) to the current span loss value.*

TL1	NETSMART 500

`ED-EQPT:TID:AID:CTAG:::`
`TCAREF=REFRESET;`
AID:
• As identified in previous step
Example:
`ED-EQPT:FUJITSU:OS1-1:CTAG:::`
`TCAREF=REFRESET;`
	The NETSMART 500 user interface does not support this TL1 command. However, the NETSMART 500 user interface does provide a TL1 command interface (the NE Command Manager located at the bottom of the NETSMART 500 window) to enter any TL1 command.

Step 10
Retrieve the amplifier equipment provisioning and, following local practice, make a note of the new value of SYSREF.

Note: *The new value of SYSREF can be compared to the value noted in* Step 8*. The value may or may not have changed.*

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS1-1:CTAG;`
	In the tree view, click the Equipment tab.
	Expand the appropriate shelf component.
	Select one or more equipment components.
	Note: *Select more than one component using CTRL+click (multiple) or SHIFT+click (range).*
	Entity ▸ *Properties View*
	Close the Properties dialog box.

Step 11
Place the amplifier equipment back in service.

TL1	NETSMART 500

`ED-EQPT:TID:AID:CTAG::::IS;`
AID:
• OSn-1 (slot 1)
• OSn-19 (slot 19)
  • n = 1…4, 25, 26
Example:
`ED-EQPT:FUJITSU:OS1-1:CTAG::::IS;`
	In the tree view, click the Equipment tab.
	Expand the appropriate shelf component.
	Select one or more equipment components.
	Note: *Select more than one component using CTRL+click (multiple) or SHIFT+click (range).*
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	Select the appropriate facility state from the New Prov. State drop-down list.
	Click Modify or Modify All if multiple components were selected.
	Do not close the Operations dialog box.

Step 12
Verify that the amplifier equipment state is in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS1-1:CTAG;`
	In the Current Values area of the Operations dialog box, verify equipment provisioning.
	Close the Operations dialog box.

Step 13
Place the WDM facility back in service.

TL1	NETSMART 500

`ED-WDM:TID:AID:CTAG::::IS;`
AID:
• OSn-1-PE1 (WDM facility associated with slot-1 amplifier)
• OSn-19-PE1 (WDM facility associated with slot-1 amplifier)
  • n = 1...4, 25, 26
Example:
`ED-WDM:FUJITSU:OS1-1-PE1:CTAG::::IS;`
	In the tree view, click the Facilities tab.
	Expand the appropriate shelf component.
	Select one or more facility components.
	Note: *Select more than one component using CTRL+click (multiple) or SHIFT+click (range).*
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	Select the appropriate facility state from the New Prov. State drop-down list.
	Click Modify or Modify All if multiple components were selected.
	Do not close the Operations dialog box.

Step 14
Verify that the WDM facility state is in service.

TL1	NETSMART 500

`RTRV-WDM:TID:AID:CTAG;`
AID:
• As specified in the previous step
• **ALL** (null)
Example:
`RTRV-WDM:FUJITSU:OS1-1-PE1:CTAG;`
	In the Current Values area of the Operations dialog box, verify the facility state.
	Close the Operations dialog box.

Step 15
Place the OSC facility back in service.

TL1	NETSMART 500

`ED-OSC:TID:AID:CTAG::::IS;`
AID:
• OSn-9-PE1 (OSC facility for slot-9 plug-in unit)
• OSn-11-PE1 (OSC facility for slot-11 plug-in unit)
  • n = 1...4, 25, 26
Example:
`ED-OSC:FUJITSU:OS1-9-PE1:`
`CTAG::::IS;`
	In the tree view, click the Facilities tab.
	Expand the appropriate shelf component.
	Select one or more facility components.
	Note: *Select more than one component using CTRL+click (multiple) or SHIFT+click (range).*
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	Select the appropriate facility state from the New Prov. State drop-down list.
	Click Modify or Modify All if multiple components were selected.
	Do not close the Operations dialog box.

Step 16
Verify that the OSC facility state is in service.

TL1	NETSMART 500

`RTRV-OSC:TID:AID:CTAG;`
AID:
• As specified in the previous step
• **ALL** (null)
Example:
`RTRV-OSC:FUJITSU:OS1-9-PE1:CTAG;`
	In the Current Values area of the Operations dialog box, verify the facility state.
	Close the Operations dialog box.

Step 17
Repeat Steps 2 through 16 for each new network connection, in every node, that is included in the turn-up. Then proceed to Step 18.

Step 18
Do you want to provision node attributes to support control plane features?

Note: *Control plane provisioning is needed to permit the NETSMART 500 graphical user interface to generate a network topology view (see Figure 96) and to support optical reach validation in A-to-Z path planning (refer to Use the NETSMART 500 Create A to Z Path Wizard).*

If YES:
Proceed to Provision Control Plane.

If NO:
Proceed to Acceptance Testing.

2.15 Provision Control Plane

In this section:

The following figure shows a flowchart of how these subprocedures are used.

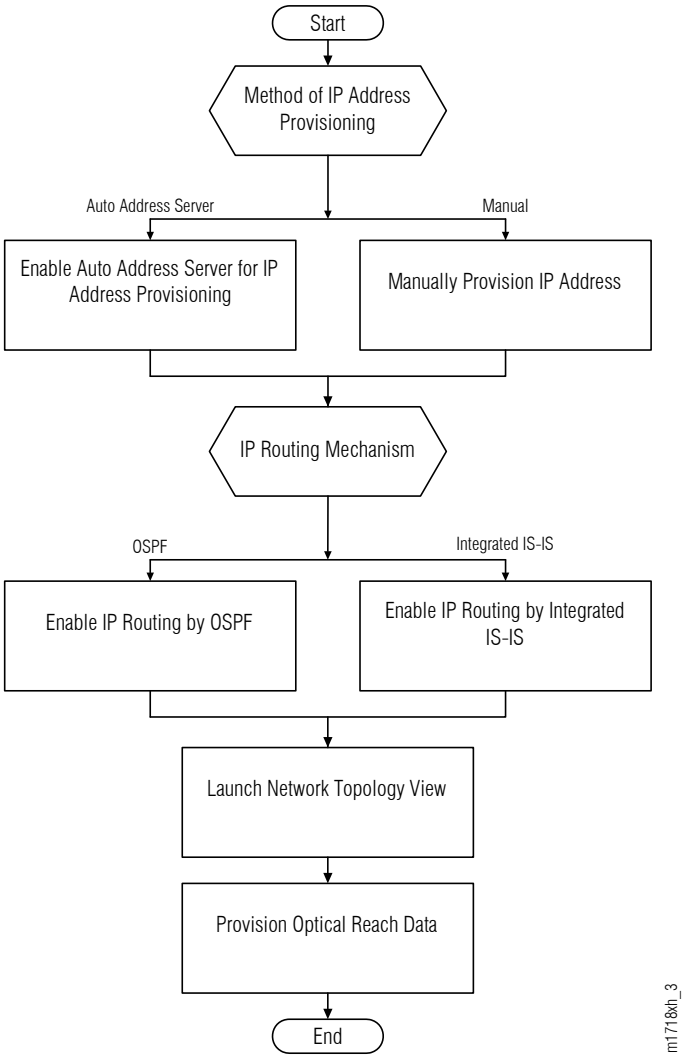


Figure 94: Flowchart to Provision Control Plane to Enable Network Topology View

IP addresses must be provisioned and IP routing must be enabled prior to launching the NETSMART 500 network topology view (refer to Launch Network Topology View). IP addresses can be provisioned indirectly using the auto address server (refer to Enable Auto Address Server for IP Address Provisioning) or they can be provisioned manually (refer to Manually Provision IP Addresses). IP routing can be enabled using the OSPF mechanism (refer to Enable IP Routing by OSPF) or using the Integrated IS-IS mechanism (refer to Enable IP Routing by Integrated IS-IS). The same mechanism should be used for all nodes in the network. Do not enable both mechanisms.

To start, choose one of the following methods for provisioning IP addresses and proceed accordingly:

- Enable Auto Address Server for IP Address Provisioning
- Manually Provision IP Addresses

2.15.1
Enable Auto Address Server for IP Address Provisioning

This subprocedure applies to the node that is to serve as the auto address server. Any NE within the network can be the auto address server, but there can be only one auto address server in the network. If more than one NE within a network is set to be an auto address server, the duplicate server alarm (DUPSVR) will be raised on the server NEs.

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to* Introduction to TL1 Commands *for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
Log on the node that is to serve as the auto address server.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

TL1	NETSMART 500

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	Comm. Port: COMx (for example, COM2)
	Configure: use default[40]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	The NETSMART 500 NE View opens.
	The Security Message dialog box opens.
	Click OK.
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Enable Auto Address Server

Step 2
Enable the Auto Address Server.

TL1	NETSMART 500

`ED-NLP:TID::CTAG:::ADDRSVR=Y;`
Example:
`ED-NLP:FUJITSU::CTAG:::ADDRSVR=Y;`
	Click Communications tab in tree view.
	Select the NLP component.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	In the Command Parameters area, select Y from the ADDRSVR State drop-down list.
	Click Modify.
	A confirmation dialog box opens.
	Click Yes to close the confirmation dialog box and continue.
	Close the Operations dialog box.

[40] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

Step 3
Initialize the OIF.

Note: *The INIT-OIF command must be executed before the ED-NLP command becomes effective.*

TL1	NETSMART 500

`INIT-OIF:TID::CTAG:::TTIMES=DOWN;`
 	
Example:
`INIT-OIF:FUJITSU::CTAG:::`
`TTIMES=DOWN;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click the Initialize tab.
	Click the Stack tab.
	
	Select OIF from the STACK INIT TYPE menu.
	
	Select DOWN from the TTIMES menu.
	Click Initialize.
	Click Yes.
	Click OK.
	
	Close the NETSMART 500 user interface.
	Click Yes.

Note: *The NETSMART 500 software connection to the NE will be lost. After waiting 2 minutes, users should log back on the NE.*

Step 4
Wait 2 minutes before continuing.

Step 5
If necessary, log back on the NE (refer to Step 1 for logon details).

Step 6
Verify that the Auto Address Server is enabled.

TL1	NETSMART 500

`RTRV-NLP:TID::CTAG;`
 	
Example:
`RTRV-NLP:FUJITSU::CTAG;`
	In the tree view, click the Communications tab.
	Select the NLP component.
	
	Entity ▸ *Properties View*
	
	The Properties dialog box opens.
	Verify that ADDRSVR is Y.
	
	Close the Properties dialog box.

Enter Address Pool

Step 7
Enter the address pool.

TL1	NETSMART 500

`ENT-ADDR-POOL:TID::CTAG::ENTRY: KEYWORD=DOMAIN;`
ENTRY:
• 1…20
KEYWORD=DOMAIN:
• GROUP=0…255
• SUBGRP=1…8IPADDR= x.x.x.x (x=0…255)
• MASK=x.x.x.x (x=0…255), **255.255.255.0**
• RANGE=1…150
Example:
`ENT-ADDR-POOL:FUJITSU::CTAG::1: GROUP=1,SUBGRP=2;`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click the Address Pools tab.
	Click the Enter tab.
	In the Command Parameters area, select the appropriate parameters.
	Click Enter.
	A confirmation dialog box opens.
	Click Yes to close the confirmation dialog box and continue.
	Close the Operations dialog box.

Step 8
Initialize the OIF.

Note: *The INIT-OIF command must be executed before the ENT-ADDR-POOL command becomes effective.*

TL1	NETSMART 500

`INIT-OIF:TID::CTAG:::TTIMES=DOWN;`
Example:
`INIT-OIF:FUJITSU::CTAG::: TTIMES=DOWN;`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click the Initialize tab.
	Click the Stack tab.
	Select OIF from the STACK INIT TYPE menu.
	Select DOWN from the TTIMES menu.
	Click Initialize.
	Click Yes.
	Click OK.
	Close the NETSMART 500 user interface.
	Click Yes.

Note: *The NETSMART 500 connection to the NE will be lost. After waiting 2 minutes, NETSMART 500 users should log back on the NE.*

Step 9
Wait 2 minutes before continuing.

Step 10
If necessary, log back on the NE (refer to Step 1 for log on details).

Step 11
Verify that the address pool is entered.

TL1	NETSMART 500

`RTRV-ADDR-POOL:TID::CTAG;`
Example:
`RTRV-ADDR-POOL:FUJITSU::CTAG;`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click the Address Pools tab.
	Click the Enter tab.
	Verify provisioning in the current values area.
	Close the Operations dialog box.

Step 12
Proceed to one of the following procedures to enable IP routing.

Note: *The FLASHWAVE 7500 system supports two methods for IP routing: Integrated IS-IS and OSPF. The same mechanism should be used for all nodes in the network. Do not enable both mechanisms.*

- Enable IP Routing by OSPF
- Enable IP Routing by Integrated IS-IS

✔ This procedure is complete.

2.15.2 Manually Provision IP Addresses

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
Starting with any node, proceed to Step 2.

Note: *Steps 2 through 11 are performed once for each node in the network.*

Step 2
If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[41]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024

	Click Logon. The NETSMART 500 NE View opens. The Security Message dialog box opens. Click OK. ***Note:*** *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Change NEM IP Address Source to Manual

Step 3
Change the NEM IP address source to manual.

[41] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`ED-IP-ADDR:TID:NEM:CTAG::: ADDRSRC=MAN;`
 	
Example:
`ED-IP-ADDR:FUJITSU:NEM:CTAG::: ADDRSRC=MAN;`
	Click the Communications tab in the tree area.
	Select the NEM (IP) entity.
	
	Entity ▸ *Operations Dialog*
	
	From the ADDRSRC drop-down list, select MAN.
	Click Modify.
	
	Do not close the Operations dialog.

Step 4
Initialize the OIF.

Note: *The INIT-OIF command must be executed before the ED-IP-ADDR command becomes effective.*

TL1	NETSMART 500

`INIT-OIF:TID::CTAG:::TTIMES=DOWN;`
 	
Example:
`INIT-OIF:FUJITSU::CTAG::: TTIMES=DOWN;`
	Click the Initialize tab.
	Click the Stack tab.
	
	Select OIF from the STACK INIT TYPE menu.
	
	Select DOWN from the TTIMES menu.
	Click Initialize.
	Click Yes.
	Click OK.
	
	Close the NETSMART 500 user interface.
	Click Yes.

Note: *The NETSMART 500 software connection to the NE will be lost. After waiting 2 minutes, users should log back on the NE.*

Step 5
Wait 2 minutes before continuing.

Step 6
If necessary, log back on the NE (refer to Step 1 for log on details).

Enter the NEM IP Address

Step 7
Set the NEM IP address.

TL1	NETSMART 500

`ED-IP-ADDR:TID:NEM:CTAG:::`
`KEYWORD=DOMAIN;`
KEYWORD=DOMAIN:
• MASK = xxx.xxx.xxx.xxx, **255.255.255.0** (IP subnetwork mask, where xxx = 0…255)
• IP = xxx.xxx.xxx.xxx, **0.0.0.0** (node IP address, where xxx = 0…255)
Example:
`ED-IP-ADDR:FUJITSU:NEM:CTAG:::`
`IP=10.10.10.1,MASK=255.255.255.0;`
	Click the Communications tab in the tree area.
	Select the NEM (IP) entity.
	Entity ▸ *Operations Dialog*
	Enter the IP subnet mask address and node IP address.
	Do not close the Operations dialog.

Step 8
Initialize the OIF.

Note: *The INIT-OIF command must be executed before the ED-IP-ADDR command becomes effective.*

TL1	NETSMART 500

`INIT-OIF:TID::CTAG:::TTIMES=DOWN;`
Example:
`INIT-OIF:FUJITSU::CTAG:::`
`TTIMES=DOWN;`
	Click the Initialize tab.
	Click the Stack tab.
	Select OIF from the STACK INIT TYPE menu.
	Select DOWN from the TTIMES menu.
	Click Initialize.
	Click Yes.
	Click OK.
	Close the NETSMART 500 user interface.
	Click Yes.

Note: *The NETSMART 500 software connection to the NE will be lost. After waiting 2 minutes, users should log back on the NE.*

Step 9
Wait 2 minutes before continuing.

Step 10
If necessary, log back on the NE (refer to Step 1 for log on details).

Step 11
Verify IP address provisioning.

TL1	NETSMART 500

`RTRV-IP-ADDR:TID:NEM:CTAG;`
 	
Example:
`RTRV-IP-ADDR:FUJITSU:NEM:CTAG;`
	Click the Communications tab in the tree area.
	Select the NEM (IP) entity.
	
	Entity ▸ *Properties View*
	
	Verify the parameters in the Current Values area of the Properties dialog box.
	
	Close the Properties dialog box.

Step 12
Is the NEM IP address provisioned for all nodes in the network?

If YES:
Proceed to one of the following procedures to enable IP routing.

Note: *The FLASHWAVE 7500 system supports two methods for IP routing: Integrated IS-IS and OSPF. The same mechanism should be used for all nodes in the network. Do not enable both mechanisms.*

- Enable IP Routing by OSPF
- Enable IP Routing by Integrated IS-IS

If NO:
Return to Step 2 and repeat this procedure for the next node.

✔ This procedure is complete.

2.15.3 Enable IP Routing by OSPF

This subprocedure provides an example for provisioning OSPF for a simple FLASHWAVE 7500 network. For more detailed information about provisioning OSPF for a particular network, refer to the local engineering instructions and Provisioning Dynamic IP Routing (OSPF).

The following figure shows a simple example of OSPF provisioning for a 3-node ring. Example IP addresses are shown for each node. The OSPF interfaces OSn-9-PE1 and OSn-11-PE1 support IP connections to neighboring NEs through the OSC.

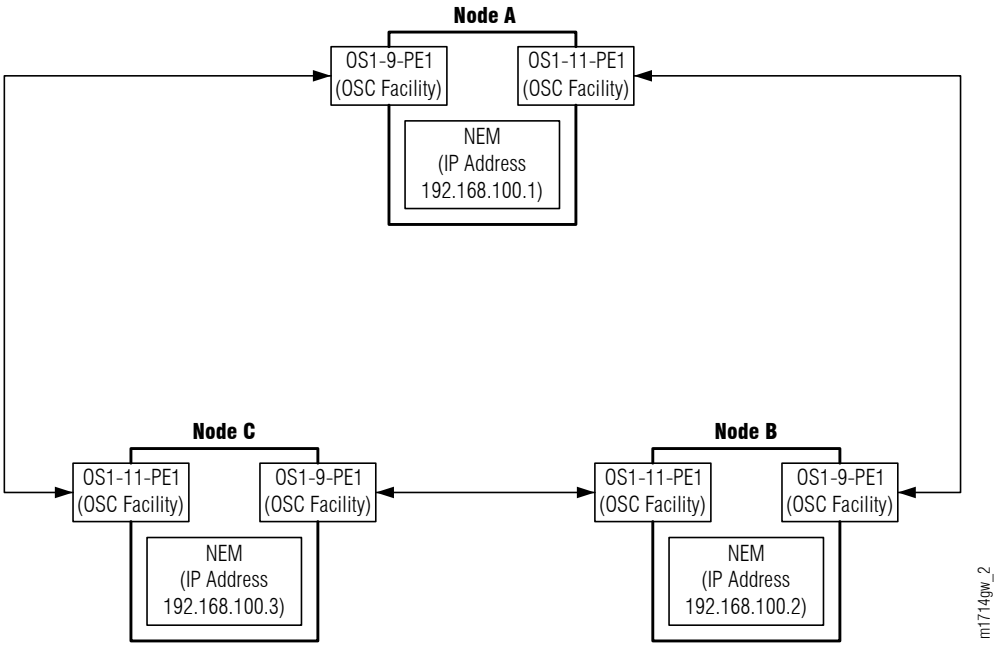


Figure 95: Simple Example of OSPF Provisioning

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to* Introduction to TL1 Commands *for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
Starting with any node, proceed to Step 2.

Note: Steps 2 through 8 *are performed once for each node in the network.*

Step 2
If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[42]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Enable OSPF Process

Step 3
Enable OSPF.

[42] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`ED-OSPF-BASE:TID::CTAG::::IS;`
 	
Example:
`ED-OSPF-BASE:FUJITSU::CTAG::::IS;`
	In the tree view:
	
	Click on the Communications tab.
	
	Expand, if necessary, to reveal OSPF_BASE (OSPF_BASE). Select OSPF_BASE (OSPF_BASE).
	
	Entity ▸ *Operations Dialog*
	
	The Operations dialog box opens.
	
	In the Command Parameters area:
	
	From the State drop-down list, select IS.
	Click Modify.
	
	Do not close the Operations window.

Step 4
Verify that OSPF is in service.

Note: *The OSPF router ID (RTRID) is automatically set to the NEM public IP address.*

TL1	NETSMART 500

`RTRV-OSPF-BASE:TID::CTAG;`
 	
Example:
`RTRV-OSPF-BASE:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the State is IS.
	
	Close the Operations dialog box.

Enter NEM OSPF Interface(s)

Step 5
Enter the NEM OSPF interface.

TL1	NETSMART 500

`ENT-OSPF-IF:TID:NEM:CTAG;`
 	
Example:
`ENT-OSPF-IF:FUJITSU:NEM:CTAG;`
	In the tree view:
	
	Click on the Communications tab.
	
	Expand, if necessary, to reveal OSPF_BASE (OSPF_BASE).
	Select OSPF_BASE (OSPF_BASE).
	
	Entity ▸ ***Operations Dialog***
	
	The Operations dialog box opens.
	Click the Create tab.
	Click the OSPF_IF tab.
	
	From the AID drop-down list, select NEM.
	Click Create.
	Close the Operations window.

Step 6
Verify the NEM OSPF interface.

TL1	NETSMART 500

`RTRV-OSPF-IF:TID:NEM:CTAG;`
 	
Example:
`RTRV-OSPF-IF:FUJITSU:NEM:CTAG;`
	In the tree view:
	
	Click on the Communications tab.
	Expand OSPF_BASE (OSPF_BASE).
	Select NEM (OSPF_IF).
	
	Entity ▸ ***Properties View***
	The Properties dialog opens.
	
	Verify that the provisioning parameters are correct.
	
	Close the Properties dialog box.

Enter OSC OSPF Interface(s)

Step 7
Enter the OSC OSPF interface(s).

Note: *Before creating an OSPF interface on an OSC facility (OSn-9-PE1 or OSn-11-PE1, the OSC facility must be provisioned. Refer to* Provisioning SDCC (SONET/SDH DCC, OSC ODCC, GCC0)*, for SDCC provisioning instructions.*

TL1	NETSMART 500

`ENT-OSPF-IF:TID:AID:CTAG:::`
`KEYWORD=DOMAIN:IS;`
AID:
• OSn-9-PE1
• OSn-11-PE1
  • n = 1…4, 25, 26
KEYWORD=DOMAIN:
• AREAID[43] = xxx.xxx.xxx.xxx (xxx = 0…255), **0.0.0.0**
• TYPE = **P2P**
• Refer to the following table for additional KEYWORD=DOMAIN options.
Example:
`ENT-OSPF-IF:FUJITSU:OS1-11-PE1:`
`CTAG:::AREAID=0.0.0.2:IS;`
	In the tree view:
	Click the Communications tab.
	Expand, if necessary, to reveal OSPF_BASE (OSPF_BASE).
	Select OSPF_BASE (OSPF_BASE).
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the Create tab.
	Click the OSPF_IF tab.
	In the Command Parameters area:
	From the State drop-down list, select IS.
	From the AID drop-down list, select OSn-9-PE1 or OSn-11-PE1.
	Based on the local work order, modify other parameters as required. The following table provides descriptions of ENT-OSPF-IF keyword parameters.
	Click Create.
	Close the Operations window.

Table 58: ENT-OSPF-IF Keyword and Domain Input Parameters

Keyword	Domain (Default in Bold)	Description
AREAID	xxx.xxx.xxx.xxx (xxx = 0…255) **0.0.0.0**	AREAID uniquely identifies the area to which the interface connects. An AREAID value of 0.0.0.0 is used for the OSPF backbone.
TYPE	OSPF interface type	
	BCAST	OSPF interface type for LCN and LMP
	P2P	OSPF interface type for OSC
	LPBK	OSPF interface type for NEM port
TXDELAY	**1**…3600	The estimated number of seconds required to transmit a link state update packet over the interface
RTRSINTV	0…**5**…3600	The number of seconds between LSA retransmissions for adjacencies belonging to this interface. This value is also used when retransmitting database description and link state request packets.
HLOINTV	1…**10**…65535	Length of time, in seconds, between the Hello packets that the router sends on the interface. This value must be the same for all routers attached to a common network.
POLLINTV	0…**120**…2147483647	The larger time interval, in seconds, between the Hello packets sent to an inactive nonbroadcast multiaccess neighbor

[43] OSn-9-PE1 and OSn-11-PE1 OSPF interfaces must be provisioned in the same OSPF area as NEM OSPF interface.

Table 58: ENT-OSPF-IF Keyword and Domain Input Parameters (Cont.)

Keyword	Domain (Default in Bold)	Description
CASTMODE	**BLOCKED**	Status of the multicast capability of the interface. BLOCKED indicates that multicast forwarding is blocked.
DEADINTV	0...**40**...2147483647	Number of seconds that the Hello packets from a router have not been seen before its neighbors declare the router down. This value should be some multiple of the Hello interval. This value must be the same for all routers attached to a common network.
METRIC	1...65535[44]	METRIC (cost) of the interface (link)
RTRPRIO	**0**...255	Router priority of this interface used in broadcast network. This value can be modified to values other than 0 only when more than two Fujitsu NE LCN ports need to be connected together in a broadcast network running OSPF and when there is no other vendor's router participating in this routing domain. This field is used in the designated router election algorithm.
AUTYPE	Authentication type	
	0	Authentication type is "no authentication."
	1	Authentication type is "simple password."
	2	Authentication type is "MD5."
AUKEY	Authentication code used when AUTYPE=1	
	0- to 8-byte ASCII string	8-byte ASCII character string delineated by escape quotes
	null	Empty character string delineated by escape quotes (\"\")
MD5KEY1	Authentication key 1 used for MD5 algorithm when AUTYPE=2	
	0- to 8-byte ASCII string	8-byte ASCII character string delineated by escape quotes
	null	Empty character string delineated by escape quotes (\"\")
MD5KEY2	Authentication key 2 (up to 8 ASCII characters) used for MD5 algorithm when AUTYPE=2	
	0- to 8-byte ASCII string	8-byte ASCII character string delineated by escape quotes
	null	Empty character string delineated by escape quotes (\"\")
ACTKEY	Active MD5 key used for MD5 algorithm when AUTYPE=2	
	1	Key 1 is active.
	2	Key 2 is active.

Step 8
Verify the OSC OSPF interface(s).

[44] Default is 1 for OSC or 10 for LCN and LMP.

TL1	NETSMART 500

`RTRV-OSPF-IF:TID::CTAG;`
 	
Example:
`RTRV-OSPF-IF:FUJITSU::CTAG;`
	In the tree view:
	Click the Communications tab.
	Expand OSPF_BASE (OSPF_BASE).
	
	Select the appropriate OSPF-IF: OSn-9-PE1 or OSn-11-PE1.
	
	Entity ▸ *Properties View*
	
	Verify the state is IS and that provisioning parameters are correct.
	
	Close the Properties View window.

Step 9
Is OSPF provisioned for all nodes in the network?

If YES:
Proceed to Launch Network Topology View.

If NO:
Return to Step 2 and repeat this procedure for the next node.

✔ This procedure is complete.

2.15.4 Enable IP Routing by Integrated IS-IS

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
Starting with any node, proceed to Step 2.

Note: *Steps 2 through 8 are performed once for each node in the network.*

Step 2
If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[45]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Step 3
Enable Integrated IS-IS.

[45] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`ED-NLP:TID::CTAG:::INITS=Y;`
 	
Example:
`ED-NLP:FUJITSU::CTAG:::INITS=Y;`
	Click the Communications tab in the tree area.
	Select the NLP component.
	
	Entity ▸ *Operations Dialog*
	
	For the INTIS parameter, select Yes.
	Click Modify.
	
	A confirmation dialog box opens.
	Click Yes.
	
	Do not close the Operations dialog box.

Step 4
Initialize the OIF.

Note: *The INIT-OIF command must be executed before the ED-NLP command becomes effective.*

TL1	NETSMART 500

`INIT-OIF:TID::CTAG:::TTIMES=DOWN;`
 	
Example:
`INIT-OIF:FUJITSU::CTAG:::`
`TTIMES=DOWN;`
	Click the Initialize tab.
	Click the Stack tab.
	
	Select OIF from the STACK INIT TYPE menu.
	
	Select DOWN from the TTIMES menu.
	Click Initialize.
	Click Yes.
	Click OK.
	
	Close the NETSMART 500 user interface.
	Click Yes.

Note: *The NETSMART 500 software connection to the NE will be lost. After waiting 2 minutes, users should log back on the NE.*

Step 5
Wait 2 minutes before continuing.

Step 6
If necessary, log back on the NE (refer to Step 2 for log on details).

Step 7
Verify that the INITS parameter is set to Y/Yes.

TL1	NETSMART 500

`RTRV-NLP:TID::CTAG;`
 	
Example:
`RTRV-NLP:FUJITSU::CTAG;`
	Click the Communications tab in the tree area.
	Select the NLP component.
	
	Entity ▸ *Properties View*
	
	Verify the parameters in the Current Values area of the Properties dialog box.
	
	Close the Properties dialog box.

Step 8
Is Integrated IS-IS provisioned for all nodes in the network?

If YES:
Proceed to Launch Network Topology View.

If NO:
Return to Step 2 and repeat this procedure for the next node.

2.15.5 Launch Network Topology View

The NETSMART 500 network topology view is a graphical depiction of the network elements connected to the logged-on NE. The topology view is opened from the dashboard, where it displays within the view panel. The following figure shows an example of a NETSMART 500 network topology view of a FLASHWAVE 7500 network configuration. Refer to Operating Control Plane and Network Discovery, for more information about the network topology view, the control plane, and network discovery.

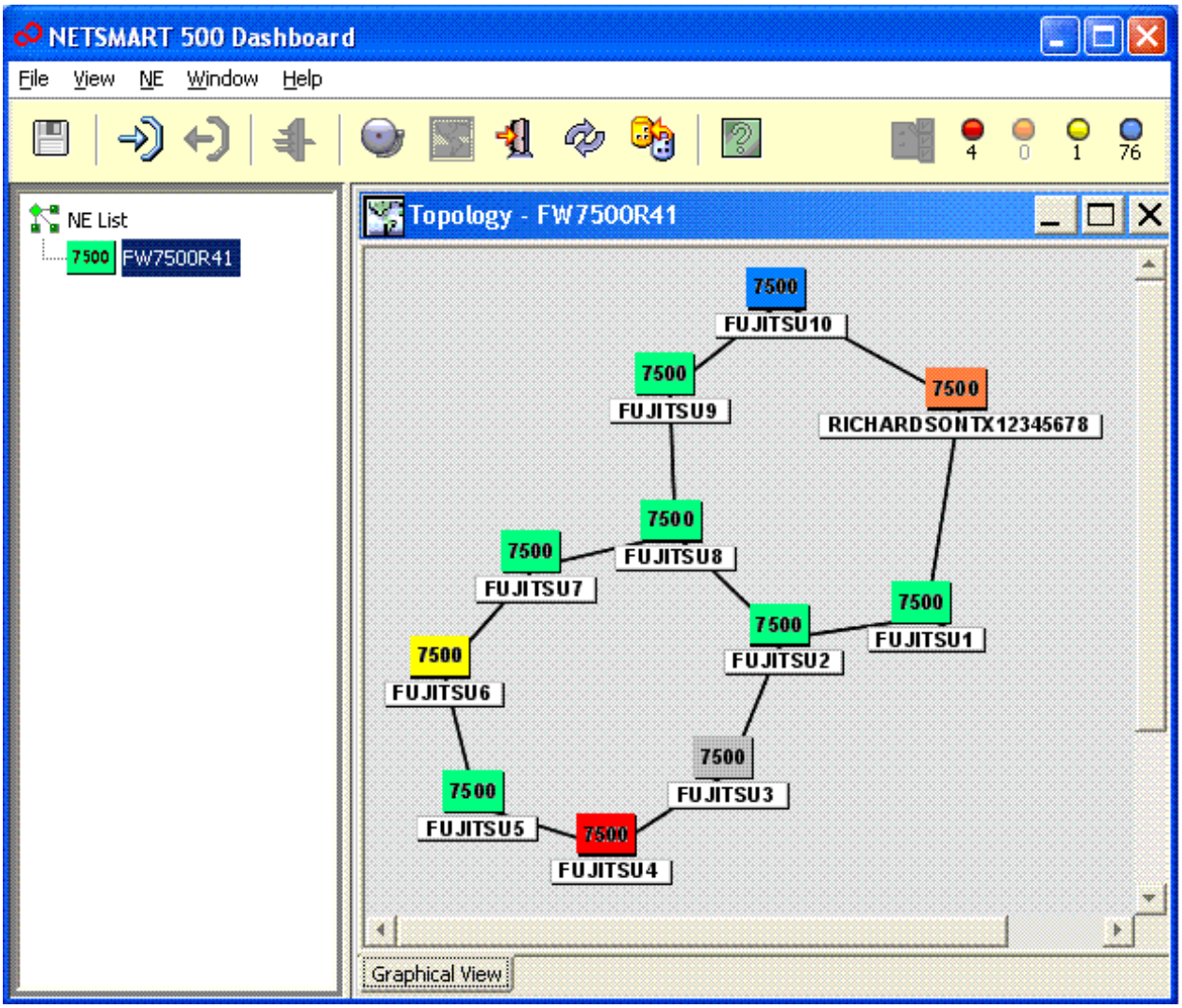


Figure 96: Example of NETSMART 500 Network Topology View

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to* Introduction to TL1 Commands *for information about preconditions, postconditions, AIDs, and parameters.*

Step 1

If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections: For **TERM1** (Serial): TID: FUJITSU User ID: ROOT Password: ROOT/(Route66K) Conn. Mode: Serial Comm. Port: COMx (for example, COM2) Configure: use default[46] For **TERM2** (TCP/IP): TID: FUJITSU User ID: ROOT Password: ROOT/(Route66K) Conn. Mode: TCP/IP IP Address: 192.168.1.1 Port: 2024

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Step 2

Retrieve the Network Topology features to see the graphical network topology view.

Note: *The RTRV-TPNET command is in binary transport version 2 (BTv2) format; therefore, the response is encoded and may not be useful to the user. The NETSMART 500 user interface should be used for this operation because it decodes and formats the data for the user.*

[46] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`RTRV-TPNET:TID::CTAG:::`
`KEYWORD=DOMAIN;`
KEYWORD=DOMAIN:
• Refer to the following table for keyword and domain input parameters.
Example:
`RTRV-TPNET:FUJITSU::CTAG;`
	From the Dashboard:
	In the tree view, select the NE.
	From the menu bar, select:
	NE ▸ *Topology*
	The graphical view of the network topology appears.

Table 59: RTRV-TPNET Keyword and Domain Input Parameters

Keyword	Domain (Default in Bold)	Description
TYPE	Type of retrieval	
	TOPO	Returns only neighbor and TID responses
	AID	Returns only AID mapping
	ALL	Returns neighbor, TID, and AID responses
ITERATOR	252 ASCII characters	When a response does not contain all the data requested (due to size constraints) an Iterator is returned to allow for retrieval of the next set of data. This pattern will continue until all data has been retrieved.
FORMAT	DEBUG	Prints the command response in ASCII

Step 3
Proceed to Provision Optical Reach Data.

2.15.6 Provision Optical Reach Data

Use this procedure to provision control plane optical reach information. Start at any node, and repeat the procedure for each node in the network.

The following figure shows a flowchart for the provisioning process.

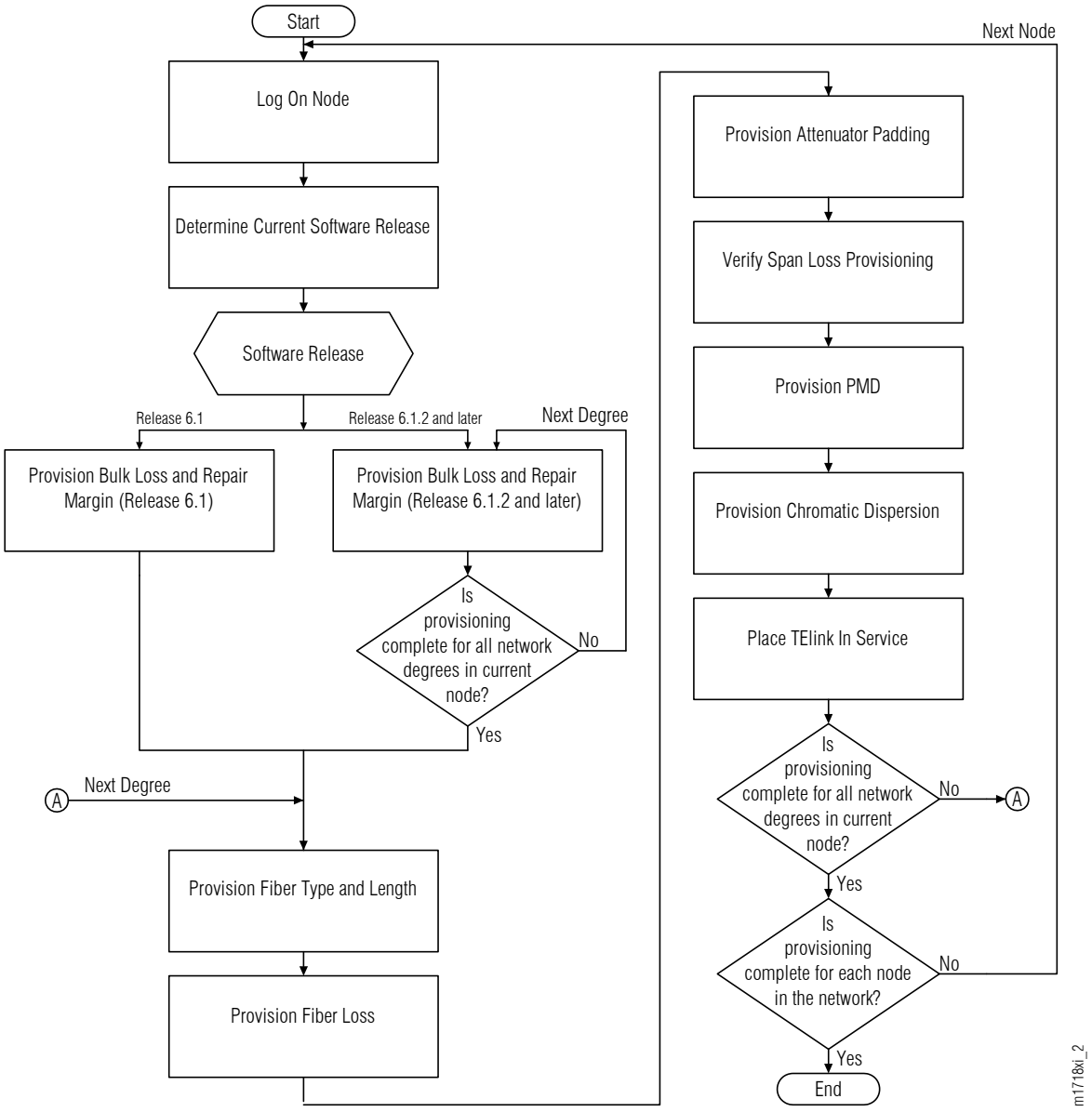


Figure 97: Flowchart for Control Plane Optical Reach Provisioning

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to* Introduction to TL1 Commands *for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
Starting with any node, proceed to Step 2.

Note: Steps 2 through 11 *are performed once for each node in the network.*

Log on Node

Step 2

If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft Windows platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

TL1	NETSMART 500	

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	Comm. Port: COMx (for example, COM2)
	Configure: use default[47]
		For **TERM2** (TCP/IP):
		TID: FUJITSU
		User ID: ROOT
		Password: ROOT/(Route66K)
		Conn. Mode: TCP/IP
		IP Address: 192.168.1.1
		Port: 2024

	Click Logon. The NETSMART 500 NE View opens. The Security Message dialog box opens. Click OK. ***Note:*** *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 graphical user interface.*	

Determine Current Software Release

Step 3
Retrieve the software version information and determine the active GISSUE.

TL1	NETSMART 500

`RTRV-VERSION:TID::CTAG;`
Example:
`RTRV-VERSION:FUJITSU::CTAG;`
	NE ▸ *System Operations*
	The Operation dialog opens.
	Click the Attributes tab.
	Click the Modify tab.
	In the Current Values area of the Operations dialog box, determine the value of the Active GISSUE.
	Close the Operations dialog box.

[47] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

Step 4
Is the active GISSUE 09-01-1?

If YES:
Proceed to Step 5.

If NO:
Proceed to Step 8.

Provision Bulk Loss and Repair Margin (Release 6.1)

Step 5
Provision bulk loss and repair margin for the node.

- Bulk loss (BULKLOSS) refers the receive-side connector loss in decibels. The provisioned value applies to each link in the node.
- Repair margin is used to account for end-of-life fiber degradation. It can be specified as a percentage of total span loss (RPRMRGN) or in decibels (RPRMRGNDB). The provisioned value applies to each link in the node.

  Note: *RPRMRGN and RPRMRGNDB cannot be specified at the same time. If one is specified, then the other parameter value must be set to 0.*

TL1	NETSMART 500

`ED-CPLANE:TID::CTAG:::KEYWORD=DOMAIN;`
KEYWORD=DOMAIN:
• BULKLOSS = **0**...3 (Bulk loss in decibels)
• RPRMRGN = **0**...20 dB (Repair margin, a percentage of computed total span loss)
• RPRMRGNDB = **0**...3 dB (Repair margin in decibels)
Example:
`ED-CPLANE:FUJITSU::CTAG:::`
`BULKLOSS=2,RPRMRGN=10;`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click the Control Plane tab.
	In the Command Parameters area:
	• Enter parameter values.
	• Click Modify.
	Do not close the Operations dialog box.

Step 6
Verify that bulk loss and repair margin parameter values are correct.

TL1	NETSMART 500

`RTRV-CPLANE:TID::CTAG;`
Example:
`RTRV-CPLANE:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that values for the provisioned parameters are correct.
	Close the Operations dialog box.

Step 7
Proceed to Step 12.

Provision Bulk Loss and Repair Margin (Release 6.1.2 and later)

Step 8
Starting with any network degree of the current node, proceed to Step 9.

Note: *Steps 9 through 10 are performed once for each network degree of the node.*

Step 9
Provision bulk loss and repair margin for the network degree.

- Bulk loss (BULKLOSS) refers the receive-side connector loss in decibels.
- Repair margin is used to account for end-of-life fiber degradation. It can be specified as a percentage of total span loss (RPRMRGN) or in decibels (RPRMRGNDB).

  Note: *RPRMRGN and RPRMRGNDB cannot be specified at the same time. If one is specified, then the other parameter value must be set to 0.*

TL1	NETSMART 500

`ED-TELINK:TID:AID:CTAG:::KEYWORD=DOMAIN;`
AID:
• OSn-1-PE1 (WDM facility associated with slot-1 amplifier)
• OSn-19-PE1 (WDM facility associated with slot-19 amplifier)
  • n = 1…4, 25, 26
KEYWORD=DOMAIN:
• BULKLOSS = **0**…3 (Bulk loss in decibels)
• RPRMRGN = **0**…20 dB (Repair margin, a percentage of computed total span loss)
• RPRMRGNDB = **0**…3 dB (Repair margin in decibels)
Example:
`ED-TELINK:FUJITSU:OS1-1-PE1:CTAG:::`
`BULKLOSS=2,RPRMRGN=10;`
	In the tree view:
	Click the Facilities tab.
	Expand the appropriate shelf.
	Expand the appropriate WDM facility.
	Select the TELINK entity for the WDM facility.
	Entity ▸ *Operations Dialog*
	Select the Modify tab
	In the Command Parameters area:
	• Enter parameter values.
	• Click Modify.
	Do not close the Operations dialog box.

Step 10
Verify that the provisioned bulk loss and repair margin attribute values are correct.

TL1	NETSMART 500

`RTRV-TELINK:TID:AID:CTAG;`
AID:
• Same value used in previous step.
Example:
`RTRV-TELINK:FUJITSU:OS1-1-PE1:CTAG;`
	In the Current Values area of the Operations dialog box, verify that values for the provisioned parameters are correct.
	Close the Operations dialog box.

Step 11
Repeat Steps 9 through 10 for each network degree of the current node. Then proceed to Step 12.

Provision Fiber Type and Length

Step 12
Starting with any network degree of the current node, proceed to Step 13.

Note: *Steps 13 through 24 are performed once for each network degree of the node.*

Step 13
Provision fiber type and length.

TL1	NETSMART 500

`ED-TELINK:TID:AID:CTAG:::KEYWORD=DOMAIN;`
AID:
• OSn-1-PE1 (WDM facility associated with slot-1 amplifier)
• OSn-19-PE1 (WDM facility associated with slot-19 amplifier)
  • n = 1…4, 25, 26
KEYWORD=DOMAIN:
• FBRTYPE = **SMF** (single-mode fiber),
  • ELEAF (enhanced large affective area fiber),
  • TW-C (TrueWave® classic fiber),
  • TW-RS (TrueWave reduced slope fiber),
  • TW-P (TrueWave plus fiber)
• FBRLEN = **0**…210.00 (km)
Example:
`ED-TELINK:FUJITSU:OS1-1-PE1:CTAG:::`
`FBRTYPE=SMF,FBRLEN=40.0;`
	In the tree view:
	Click the Facilities tab.
	Expand the appropriate shelf.
	Expand the appropriate WDM facility.
	Select the TELINK entity for the WDM facility.
	Entity ▸ *Operations Dialog*
	Select the Modify tab
	In the Command Parameters area:
	• Select a value from the FBRTYPE pull-down menu.
	• Enter a value for the FBRLEN parameter.
	• Click Modify.
	Do not close the Operations dialog box.

Step 14
Verify that the provisioned values are correct.

TL1	NETSMART 500

`RTRV-TELINK:TID:AID:CTAG;`
AID:
• Same value used in previous step.
Example:
`RTRV-TELINK:FUJITSU:OS1-1-PE1:CTAG;`
	In the Current Values area of the Operations dialog box, verify that values for the provisioned parameters are correct.
	Do not close the Operations dialog box.

Provision Fiber Loss

Step 15
Set one of the following parameters to provision fiber loss:

- FBRLOSS (measured fiber loss, dB)
- LCOEFF (fiber loss coefficient, dB/km)

Note: *Do not set both parameters. The next step describes how the system uses this information to compute fiber loss.*

TL1	NETSMART 500

`ED-TELINK:TID:AID:CTAG:::KEYWORD=DOMAIN;`
AID:
• Same value used in previous step.
KEYWORD=DOMAIN:
• FBRLOSS = **0**...39.00 (dB)
• LCOEFF = 0.17...**0.25**...3900.00 (dB/km)
Example:
`ED-TELINK:FUJITSU:OS1-1-PE1:CTAG:::`
`LCOEFF=0.5;`
	In the Command Parameters area of the Operations dialog:
	• Enter a value for FBRLOSS or LCOEFF.
	• Click Modify.
	Do not close the Operations dialog box.

Step 16
Verify that fiber loss provisioning is correct.

The system calculates COMPFBRLOSS (computed fiber loss) in one of two ways:

- COMPFBRLOS = FBRLOSS (if FBRLOSS is nonzero)
- COMPFBRLOS = LCOEFF*FBRLEN (if FBRLOSS is zero)

TL1	NETSMART 500

`RTRV-TELINK:TID:AID:CTAG;`
AID:
• Same value used in previous step.
Example:
`RTRV-TELINK:FUJITSU:OS1-1-PE1:CTAG;`
	In the Current Values area of the Operations dialog box, verify that values for the provisioned parameters are correct.
	Do not close the Operations dialog box.

Provision Attenuator Padding

Step 17

If a receive-side attenuator was installed for the network degree, set the value of PADR (receive-side attenuator padding in dB). Otherwise, proceed to the next step.

TL1	NETSMART 500

`ED-TELINK:TID:AID:CTAG:::KEYWORD=DOMAIN;`
AID:
• Same value used in previous step.
KEYWORD=DOMAIN:
• PADR = **0**...32 (dB)
Example:
`ED-TELINK:FUJITSU:OS1-1-PE1:CTAG:::`
`PADR=8;`
	In the Command Parameters area of the Operations dialog:
	• Enter a value for PADR.
	• Click Modify.
	Do not close the Operations dialog box.

Verify Span Loss Provisioning

Step 18

Verify that span loss provisioning is correct.

The system calculates COMPSPANLOSS (computed span loss) in one of two ways, depending on whether repair margin was provisioned using RPRMRGN or RPRMRGNDB:

- COMPSPANLOSS = COMPFBRLOSS * (1+RPRMRGN/100) + 2*BULKLOSS + PADR + INDCM

  OR

- COMPSPANLOSS = COMPFBRLOSS +RPRMRGNDB + 2*BULKLOSS + PADR + INDCM

Note: *INDCM is a retrieve-only parameter. Its value depends on the provisioned DCM.*

TL1	NETSMART 500

`RTRV-TELINK:TID:AID:CTAG;`
AID:
• Same value used in previous step.
Example:
`RTRV-TELINK:FUJITSU:OS1-1-PE1:CTAG;`
	In the Current Values area of the Operations dialog box, verify that values for the provisioned parameters are correct.
	Do not close the Operations dialog box.

Provision PMD

Step 19
Set one of the following parameters to provision polarization mode dispersion (PMD):

- FBRPDM (measured PMD, ps)
- PMDCOEFF (PMD coefficient, ps/sqrt[km])

Note: *Do not set both parameters. The next step describes how the system uses this information to compute fiber PMD.*

TL1	NETSMART 500

`ED-TELINK:TID:AID:CTAG:::KEYWORD=DOMAIN;`
AID:
• Same value used in previous step.
KEYWORD=DOMAIN:
• FBRPMD = **0.00**...52.40 (ps)
• PMDCOEFF = 0.00...**0.15**...524.00 (ps/sqrt[km])
Example:
`ED-TELINK:FUJITSU:OS1-1-PE1:CTAG:::`
`LCOEFF=0.5;`
	In the Command Parameters area of the Operations dialog:
	• Enter a value for FBRPMD or PMDCOEFF.
	• Click Modify.
	Do not close the Operations dialog box.

Step 20
Verify that PMD provisioning is correct.

The system calculates COMPFBRPMD (computed fiber PMD) in one of two ways:

- COMPFBRPMD = FBRPMD (if FBRPMD is nonzero)
- COMPFBRPMD = PMDCOEFF*sqrt(FBRLEN) (if FBRPMD is zero)

TL1	NETSMART 500

`RTRV-TELINK:TID:AID:CTAG;`
AID:
• Same value used in previous step.
Example:
`RTRV-TELINK:FUJITSU:OS1-1-PE1:CTAG;`
	In the Current Values area of the Operations dialog box, verify that values for the provisioned parameters are correct.
	Do not close the Operations dialog box.

Step 21
Do you wish to provision chromatic dispersion values?

If you choose to provision chromatic dispersion, three values are required. If you choose not to provision these values, the control plane will calculate chromatic dispersion based on fiber type and fiber length.

If YES:
Proceed to Step 22.

If NO:
Proceed to Step 24.

Provision Chromatic Dispersion

Step 22
Set all three of the following parameters:

- MEASLAMBDA (measured wavelength, nm)
- MEASSPANDISP (measured span dispersion, ps/nm)
- MEASSPANDISPSLOPE (measured span dispersion slope, ps/nm^2)

TL1	NETSMART 500

`ED-TELINK:TID:AID:CTAG:::KEYWORD=DOMAIN;`
AID:
• Same value used in previous step.
KEYWORD=DOMAIN:
• MEASLAMBDA = **1530.00**...1565.00 (nm)
• MEASSPANDISP = **0.00**...3600.00 (ps/nm)
• MEASSPANDISPSLOPE = **0.00**...20.00 (ps/nm^2)
Example:
`ED-TELINK:FUJITSU:OS1-1-PE1:CTAG:::`
`MEASLAMBDA=1550.00,`
`MEASPANDISP=400.00,`
`MEASSPANDISPSLOPE=10.00;`
	In the Command Parameters area of the Operations dialog:
	• Enter values.
	• Click Modify.
	Do not close the Operations dialog box.

Step 23
Verify that chromatic dispersion provisioning is correct.

TL1	NETSMART 500

`RTRV-TELINK:TID:AID:CTAG;`
AID:
• Same value used in previous step.
Example:
`RTRV-TELINK:FUJITSU:OS1-1-PE1:CTAG;`
	In the Current Values area of the Operations dialog box, verify that values for the provisioned parameters are correct.
	Do not close the Operations dialog box.

Place the TElink in Service

Step 24
Place the TElink in service.

TL1	NETSMART 500

`ED-TELINK:TID:AID:CTAG::::IS;`
AID:
• Same value used in previous step.
Example:
`ED-TELINK:FUJITSU:OS1-1-PE1:CTAG::::IS;`
	Select the State tab
	In the Command Parameters area:
	• Select In Service from the New Prov. State drop-down list.
	• Click Modify.
	Do not close the Operations dialog box.

Step 25
Verify that the TElink is in service.

TL1	NETSMART 500

`RTRV-TELINK:TID:AID:CTAG;`
AID:
• Same value used in previous step.
Example:
`RTRV-TELINK:FUJITSU:OS1-1-PE1:CTAG;`
	In the Current Values area of the Operations dialog box, verify that values for the provisioned parameters are correct.
	Close the Operations dialog box.

Step 26
Repeat Steps 13 through 25 for each network degree of the current node. Then proceed to Step 27.

Step 27
Repeat Steps 2 through 26 for each node in the network. Then proceed to Acceptance Testing.

✔ This procedure is complete.

3
Acceptance Testing

In this chapter:

This chapter provides procedures to acceptance test a new FLASHWAVE® 7500 Core Configuration application. These procedures should be performed after all nodes have been turned up (refer to System Turn-Up).

3.1 Test Synchronization Reference Switching

In this section:

This section contains procedures for testing the behavior of synchronization timing (OSn-TMGSYS [n = 10...13, 20...23, 30...33, 40...43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430]). The procedures apply to each Tributary shelf that includes Synchronization plug-in units.

3.1.1 Testing Manual Switching of Externally Timed Tributary Shelf

This procedure applies only to Tributary shelves timed off the primary external clock.

Expected Results–The Tributary shelf should switch to the secondary external clock input as a result of the command to switch to the secondary source. After releasing the manual switch and manually switching back to the primary source, the reference should switch back to the primary external clock input.

Attention: *When entering TL1 commands or NETSMART® 500 steps, refer to* Introduction to TL1 Commands *for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
Perform a manual timing switch to the secondary external clock timing reference.

TL1	NETSMART 500

`OPR-SYNCNSW:TID:AID:CTAG::`
`SOURCE,MAN;`
AID:
• OSn-TMGSYS
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
SOURCE:
• OSn-EXTCLKINS
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
Example:
`OPR-SYNCNSW:FUJITSU:OS100-TMGSYS:`
`CTAG::OS100-EXTCLKINS,MAN;`
	In the tree view, select the Synchronization tab.
	Expand tree elements, if required.
	Select the appropriate TMGSYS entity.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the Sync Switch tab.
	Click the Operate tab.
	Select MAN from the SC menu.
	Select OSn-EXTCLKINS (T1CLK) from the SOURCE menu.
	Click Operate.
	Do not close the Operations dialog box.

Step 2
Verify that the timing reference switched to the secondary external clock input.

The STATE of EXTCLKINP should be STBYH. The STATE of EXTCLKINS should be ACT.

TL1	NETSMART 500

`RTRV-SYNCLIST:TID:AID:CTAG;`
AID:
• OSn-TMGSYS
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
• **ALL** (null)
Example:
`RTRV-SYNCLIST:FUJITSU:`
`OS100-TMGSYS:CTAG;`
	In the Current Values area of the Operations dialog box, verify the timing reference properties.
	Close the Operations dialog box.

Step 3
Release the manual switch.

TL1	NETSMART 500

`RLS-SYNCNSW:TID:AID:CTAG;`
AID:
• OSn-TMGSYS
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
• **ALL** (null)
Example:
`RLS-SYNCNSW:FUJITSU:`
`OS100-TMGSYS:CTAG;`
	In the tree view, select the Synchronization tab.
	Expand tree elements, if required.
	Select the appropriate TMGSYS entity.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the Sync Switch tab.
	Click the Release tab.
	Click Release.
	Close the Operations dialog box.

Step 4
Switch back to the primary external clock input.

TL1	NETSMART 500

`OPR-SYNCNSW:TID:AID:CTAG::`
`SOURCE,MAN;`
AID:
• OSn-TMGSYS
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
SOURCE:
• OSn-EXTCLKINP
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
Example:
`OPR-SYNCNSW:FUJITSU:OS100-TMGSYS:`
`CTAG::OS100-EXTCLKINP,MAN;`
	In the tree view, select the Synchronization tab.
	Expand tree elements, if required.
	Select the appropriate TMGSYS entity.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the Sync Switch tab.
	Click the Operate tab.
	Select MAN from the SC menu.
	Select OSn-EXTCLKINP (T1CLK) from the SOURCE menu.
	Click Operate.
	Do not close the Operations dialog box.

Step 5
Verify that the timing reference switched to the primary external clock input.

The STATE of EXTCLKINP should be ACT. The STATE of EXTCLKINS should be STBYH.

TL1	NETSMART 500

`RTRV-SYNCLIST:TID:AID:CTAG;`
AID:
• OSn-TMGSYS
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
• **ALL** (null)
Example:
`RTRV-SYNCLIST:FUJITSU:`
`OS100-TMGSYS:CTAG;`
	In the Current Values area of the Operations dialog box, verify the timing reference properties.
	Close the Operations dialog box.

Step 6
Release the manual switch.

TL1	NETSMART 500

`RLS-SYNCNSW:TID:AID:CTAG;`
AID:
• OSn-TMGSYS
  • n = 10…13, 20…23, 30…33, 40…43, 100, 101, 110, 111, 120, 130, 200, 201, 210, 211, 220, 230, 300, 301, 310, 311, 320, 330, 400, 401, 410, 411, 420, 430
• **ALL** (null)
Example:
`RLS-SYNCNSW:FUJITSU:`
`OS100-TMGSYS:CTAG;`
	In the tree view, select the Synchronization tab.
	Expand tree elements, if required.
	Select the appropriate TMGSYS entity.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the Sync Switch tab.
	Click the Release tab.
	Click Release.
	Close the Operations dialog box.

Step 7
Proceed to Testing Automatic Equipment Protection Switching of Synchronization Units.

3.1.2
Testing Automatic Equipment Protection Switching of Synchronization Units

This procedure tests automatic switching to the standby timing unit upon removal (or failure) of the active Synchronization unit from a Tributary shelf.

Step 1
Determine which Synchronization plug-in unit is currently active and which is in standby.

The FAIL/SVCE indicator is lit green if the Synchronization plug-in unit is active. If the Synchronization plug-in unit is in standby, the FAIL/SVCE indicator is off.

Synchronization plug-in units are in slots 10 and 12 of the Tributary shelf.

Step 2
Unplug the active Synchronization plug-in unit from the Tributary shelf.

Step 3
Verify that the FAIL/SVCE indicator of the standby Synchronization plug-in unit lights green and an EQPT-RMVD condition is raised.

Step 4
Reinstall the Synchronization plug-in unit.

Step 5
Verify that the EQPT-RMVD condition clears. The Synchronization plug-in unit that became active in Step 3 will remain active because the protection switching is nonrevertive.

Step 6
To switch back to the original active Synchronization plug-in unit, repeat Steps 2 through 5.

Step 7
Repeat all subprocedures in Test Synchronization Reference Switching for each Tributary shelf containing Synchronization plug-in units.

Step 8
Proceed to Verify Network Operation.

3.2 Verify Network Operation

Before accepting a newly turned-up network, you should verify its operation by provisioning representative services on the network and testing those services. Procedures for service addition and testing are given in Service Addition and Acceptance Testing.

The choice of services depends on local practice and available equipment. Fujitsu recommends the following guidelines:

- Choose services that are representative of the types of services that the network is expected to support

  Example:

  If the network is to support OCh-DPRING-protected services, include OCh-DPRING-protected services so that protection switching is verified.

- Ensure that the services test each span within the network bidirectionally
- Ensure that services test both extremes of the DWDM spectrum: Channel 1 and Channel 40

Note: *Long-term bit error rate testing can be accomplished without test sets using the PRBS test signal connection feature of certain FLASHWAVE 7500 OLCs. Refer to* Apply PRBS Test Signal Connection in Testing.

4
ILA Node Turn-Up

In this chapter:

4.1

About System Turn-up Core Configuration ILA Node

This chapter describes how to turn-up a FLASHWAVE® 7500 Core Configuration in-line amplifier (ILA) node.

ILA Node Turn-Up Flowchart

The flowchart in the following figure shows the turn-up sequence for an ILA node.

Note: *This chapter does not include steps to connect the ILA node to the network. Network connections are made after all nodes are turned up as presented in* ILA Node Turn-Up Flowchart.

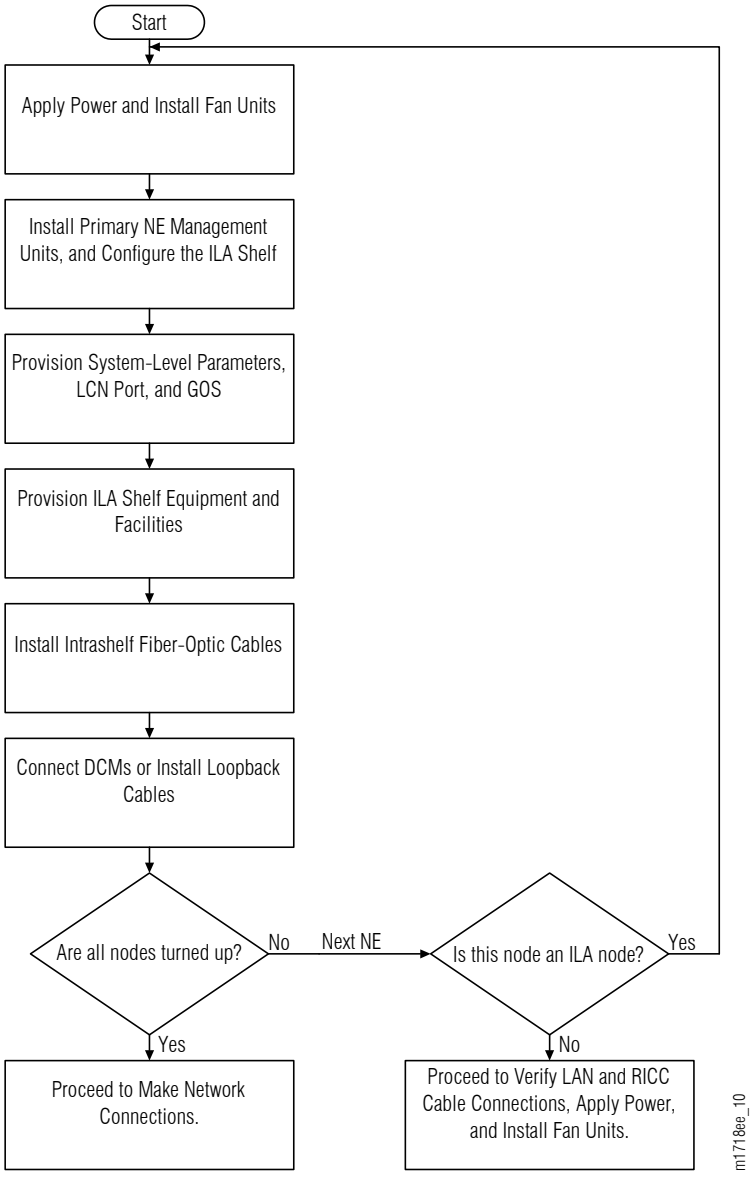


Figure 98: ILA Node Turn-Up (Procedure Flowchart)

Prerequisites

Before proceeding with ILA node turn-up procedures, perform or verify the following:

- Review the node turn-up procedure shown in the preceding figure.
- Familiarize yourself with the provisioning hierarchy for the FLASHWAVE 7500 Core Configuration system (Turn-Up Provisioning Hierarchy FLASHWAVE 7500–Core Configuration).

- Verify that the FLASHWAVE 7500 shelves are installed and that the acceptance procedures listed in Introduction to Equipment Installation, have been completed.
- Ensure that fiber has been placed between the sites.
- Familiarize yourself with the FLASHWAVE 7500 system as described in Introduction to the FLASHWAVE 7500 All-Optical Transport Platform.
- Familiarize yourself with the NETSMART® 500 Element Manager for provisioning the FLASHWAVE 7500 system. Refer to *FNC-0500-0311-010, NETSMART 500 User Guide*.
- Ensure that a terminal emulator (such as a HyperTerminal emulator) is available, and familiarize yourself with its operation.
- Familiarize yourself with the FLASHWAVE 7500 access identifiers (AIDs) described in Access Identifiers.
- Ensure that the craft interface device is connected, activated, and set up in the required interface modes as described in Craft Interface Operations .
- Refer to Introduction to Maintenance and Trouble Clearing, for general procedures and information on replacing plug-in units and handling optical units and optical fibers.
- Refer to Introduction to TL1 Commands for additional command and parameter information and typical response messages.
- Perform initial turn-up procedures locally through the craft interface provided on the front of the shelf.

Danger: *Never look into the end of a fiber-optic cable. Permanent eye damage or blindness can occur very quickly if the laser light is present. Follow local safety precautions regarding fiber.*

Danger: *Never handle exposed fiber with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove. Follow local safety precautions regarding fiber.*

Warning: *When handling FLASHWAVE 7500 plug-in units, wear an ESD wrist strap with a minimum resistance of 1000 kilohms to prevent possible damage to the units. Before using the strap, check it for opens, shorts, and minimum resistance value. If the strap does not pass these checks, do not use it.*

Caution: *Verify that you have received a completed (COMPLD) response to each command before going to the next step. If you are unable to complete a command after several tries, call Fujitsu at 1-800-USE-FTAC for technical assistance.*

Caution: *Before installing fiber-optic cables, always verify that the fiber connectors are free of contamination by visually inspecting with a fiber scope and cleaning the connectors at both ends of the fiber, if necessary. Refer to Fiber Cable Handling.*

Note: *Until it is fully provisioned, the FLASHWAVE 7500 will generate false alarms. These alarms clear as the system is provisioned. Any remaining alarms are cleared (other than LOS, if applicable) at the end of the turn-up procedure.*

Slot Labels and AIDs

The following figure shows and the following table describes plug-in unit slot labels, AIDs, locations, and equipment type and AID mapping on the ILA shelf. Refer also to Access Identifiers.

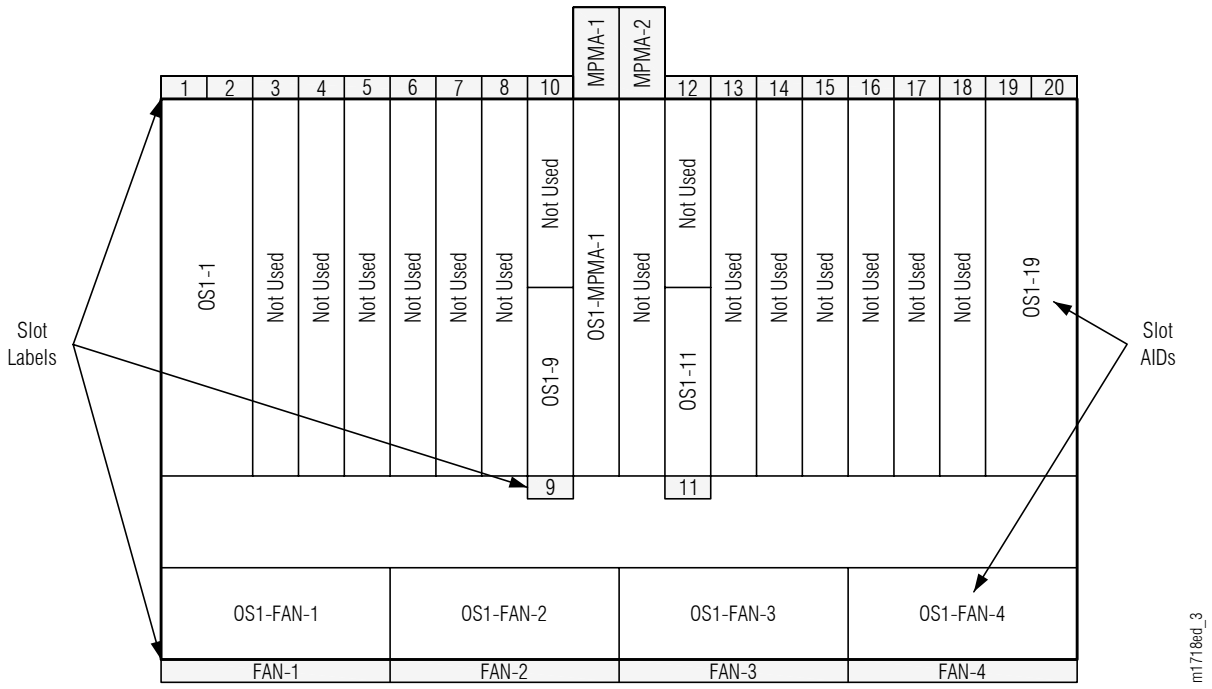


Figure 99: ILA Shelf Plug-In Unit Slot Labels and Slot AIDs

Table 60: ILA Shelf Equipment Type and Slot AID Mapping

Slot Label	Slot AID	Equipment Type	Default Type
n/a	OS1	SHU3 (Shelf)	SHU3
1	OS1-1	APMA-L2C1 APMA-M2C1 APMA-ULC1 APMA-M2U1 APMA-ULU1 APMA-MHU2	APMA-M2C1
2	OS1-2 (AID not used)		
3	OS1-3	Slot not used	n/a
4	OS1-4	Slot not used	n/a
5	OS1-5	Slot not used	n/a
6	OS1-6	Slot not used	n/a

Table 60: ILA Shelf Equipment Type and Slot AID Mapping (Cont.)

Slot Label	Slot AID	Equipment Type	Default Type
7	OS1-7	Slot not used	n/a
8	OS1-8	Slot not used	n/a
9	OS1-9	SCMA-SCC4	SCMA-SCC4
10	OS1-10	Slot not used	n/a
MPMA-1	OS1-MPMA-1	MPMA-SHP3 MPMA-SHP4	MPMA-SHP3
MPMA-2	OS1-MPMA-2	Slot not used	n/a
11	OS1-11	SCMA-SCC4	SCMA-SCC4
12	OS1-12	Slot not used	n/a
13	OS1-13	Slot not used	n/a
14	OS1-14	Slot not used	n/a
15	OS1-15	Slot not used	n/a
16	OS1-16	Slot not used	n/a
17	OS1-17	Slot not used	n/a
18	OS1-18	Slot not used	n/a
19	OS1-19	APMA-L2C1 APMA-M2C1 APMA-ULC1 APMA-M2U1 APMA-ULU1 APMA-MHU2	APMA-M2C1
20	OS1-20 (AID not used)		
Leftmost fan slot	OS1-FAN-1	FAN6	FAN6
Second from left	OS1-FAN-2		
Second from right	OS1-FAN-3		
Rightmost fan slot	OS1-FAN-4		

Note: *Amplifiers plug-in units in slots 1 and 19 should match in type.*

4.2

Apply Power and Install Fan Units

Note: *The fan plug-in units are equipped with preinstalled fan filters.*

Apply power to the shelf and install fan plug-in units as follows:

Step 1
Apply power to the shelf as follows:

a) Ensure that power is available at the rack as indicated by illumination of the green PWR indicators on the power distribution panel at the top of the rack.

b) Set the appropriate circuit breaker at the distribution panel to the ON position to apply power to the shelf.

Step 2
Install fan plug-in units in the shelf as follows:

a) Inspect the fan plug-in unit for possible damage or debris.

b) Verify that a fan filter is installed in the fan plug-in unit. The following figure shows the fan filter location.

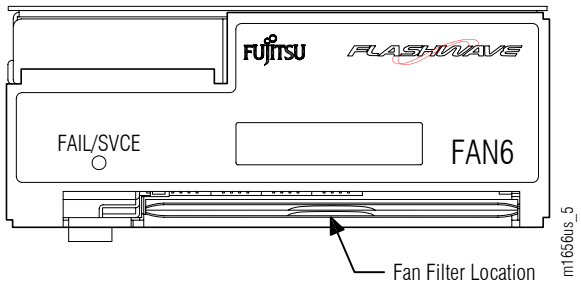


Figure 100: Fan Filter Location

c) Slide the fan plug-in unit into one of the fan slots located at the bottom of the shelf.

d) Ensure that the FAIL/SVCE indicator is lit green.

e) Repeat until four fan plug-in units are installed in the shelf.

Step 3
Proceed to Install Primary NE Management Units, and Configure the ILA Shelf.

4.3 Install Primary NE Management Units, and Configure the ILA Shelf

In this section:

Prerequisites:

If not already done, complete the procedures in Apply Power and Install Fan Units.

If using the NETSMART 500 Element Manager for provisioning, be sure the computer meets or exceeds the following system requirements (refer to *FNC-0500-0311-010, NETSMART 500 User Guide)*:

- Microsoft® operating system:
  - Windows NT® 4.0 (Service Pack 5 and later)
  - Windows 2000
  - Windows XP Professional
- 250 MHz Pentium® processor (1 GHz or faster recommended)
- 128 MB RAM (512 MB RAM recommended)
- 150 MB disk space (minimum)
- CD drive
- LAN card and/or serial craft interface port and connection cable
- 8-bit color (256 colors) minimum (16-bit color recommended)
- 800 by 600 resolution (optimized for 1024 by 768 or larger resolution)
- Web browser:
  - Internet Explorer version 5.5 or later
  - Netscape® version 4.7 (complete installation) or later

Initially, due to factory default settings, the shelf does not behave as an ILA shelf. It becomes an ILA shelf after the system keyword TYPE is changed from the default value (FW7500TRIB) to FW7500U_ILA (Step 7).

The steps in Verify Software Version, ensure that the NEM Shelf Processor unit (MPMA-SHPx) installed in slot MPMA-1 is running the correct software version. When additional OSC plug-in units are installed, the system will automatically update the software on these units, if necessary, to match the software running on the NEM installed in slot MPMA-1.

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to* Introduction to TL1 Commands *for information about preconditions, postconditions, AIDs, and parameters.*

Note: *For plug-in unit slot locations, refer to* About System Turn-up Core Configuration ILA Node .

Note: *Default values are shown in bold.*

This procedure shows how to install the NE management unit and configure the ILA shelf.

4.3.1 Install MPMA-SHPx Plug-In Unit

Step 1
Install the MPMA-SHPx plug-in unit in the shelf as follows:

a) Inspect the unit for possible damage or debris.

b) Install the unit into slot MPMA-1 of the shelf.

The NOT READY and FAIL/SVCE indicators should immediately light amber.

Note: *If the NOT READY and FAIL/SVCE indicators do not light amber, verify that wiring to the PWR terminal in the rear of the shelf is correct, remove the plug-in unit, then repeat* Step 1.

After 5 to 20 minutes, the amber NOT READY and FAIL/SVCE indicators should go out, and the FAIL/SVCE indicator should light green.

Step 2
After waiting up to 20 minutes, did the FAIL/SVCE indicator on the MPMA-SHPx plug-in unit light green?

If YES:
Proceed to Step 3.

If NO:
The NEM Shelf Processor unit may be defective. Remove the unit and set it aside for repair paperwork processing. Obtain another NEM Shelf Processor plug-in unit. Return to Step 1 and repeat this procedure on that NEM Shelf Processor unit.

Step 3
Establish a craft interface connection through connector TERM1 or TERM2 on the front of the shelf. Refer to the following table for set-up procedures.

Table 61: Craft Interface Set-Up Procedures

Type of User Interface	Craft Interface Connector	Set-Up Procedure
TL1 user interface	TERM1 (Serial)	Setting Up Craft Interface (TL1 Session through TERM1)
	TERM 2 (LAN, TCP/IP)	Setting Up Craft Interface (TL1 Session through TERM2)
NETSMART 500 user interface	TERM1 (Serial)	Setting Up Craft Interface (NETSMART 500 Session through TERM1)
	TERM 2 (LAN, TCP/IP)	Setting Up Craft Interface (NETSMART 500 Session through TERM2)

Note: *A TERM1 (serial) connection allows for continuous connectivity between the craft interface and the NE. With a TERM2 (TCP/IP) connection, the communication link between the craft interface and the NE is severed when the INIT-SYS and INIT-OIF commands are processed. The severing of the communication link requires you to reestablish your logon session with the NE.*

Step 4
Log on the NE.

Note: *At this stage, you can only log on the NE using the factory default values for the target identifier (TID), user identifier (UID), and private identifier (PID). TID, UID, and PID values are not case-sensitive.*

Note: *The following table includes brief instructions for setting up the craft interface connection, which should have been completed in the previous step.*

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen appears. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft Windows platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard appears. Click the Logon icon, or select : *NE* ▸ *Logon*

`ACT-USER:TID:UID:CTAG::PID;`
TID: FUJITSU (factory default value)
UID: ROOT (factory default value)
PID: ROOT (factory default value)
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	Note: *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.*
	The NE Logon dialog box opens.
	Make the following selections:

TL1	NETSMART 500
	For **TERM1** (Serial): TID: FUJITSU User ID: ROOT Password: ROOT Conn. Mode: Serial Comm. Port: COMx (for example, COM2) Configure: use default[48] For **TERM2** (TCP/IP): TID: FUJITSU User ID: ROOT Password: ROOT Conn. Mode: TCP/IP IP Address: 192.168.1.1 Port: 2024
	Click Logon. The NETSMART 500 NE View opens. The Security Message dialog box opens. Click OK. ***Note:*** *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

4.3.2 Verify Software Version

Step 5
Retrieve the software version information.

TL1	NETSMART 500

`RTRV-VERSION:TID::CTAG;`
Example:
`RTRV-VERSION:FUJITSU::CTAG;`
	The Shelf Provisioning Mode dialog box opens.[49]
	Click OK.
	In the Current Values area of the Operations[50] dialog box, determine the value of the Active GISSUE.
	Do not close the Operations dialog box.

Step 6
Is the active GISSUE correct?

[48] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.
[49] The Shelf Provisioning Mode dialog only appears when logging on to a factory default shelf.
[50] Upon logging on a factory default shelf, the Operations dialog is automatically opened with the NE Type tab selected. However, if the Operations dialog box does not open automatically, select System Operations from the NE menu and, after the Operations dialog box appears, click the Attributes tab, then the NE Type tab.

The correct GISSUE value for FLASHWAVE 7500 Release 9.1 software is 09-01-1.

If YES:
Proceed to Step 7.

If NO:
Upgrade the system software as described in Upgrading System Software Using TL1 Commands or Upgrading System Software Using NETSMART 500 Software Download Wizard, then repeat this subprocedure.

4.3.3 Change System Type

Step 7
Change system type from FW7500TRIB to FW7500U_ILA.

Note: *This command terminates the communication session and restarts the NE.*

TL1	NETSMART 500

`ED-SYS:TID::CTAG:::TYPE=FW7500U_ILA;`
 	
Example:
`ED-SYS:FUJITSU::CTAG:::`
`TYPE=FW7500U_ILA;`
	In the Operations dialog box:
	• Select the NE Type tab
	• From the Type drop-down list, select FW7500U_ILA.
	• Click Modify.
	
	The Confirmation dialog box opens.
	Click OK.

The NOT READY indicator on the NEM Shelf Processor plug-in unit lights amber and then goes out after 5 to 20 minutes. After the NOT READY indicator goes out, the FAIL/SVCE indicator lights green on the NEM Shelf Processor unit.

Step 8
After the NOT READY indicator goes out and the FAIL/SVCE indicator lights green and stays green, proceed to Step 9.

Step 9
Log on the NE.

Note: *At this stage, you can only log on the NE using factory default values of the target identifier (TID), user identifier (UID), and private identifier (PID). TID, UID, and PID values are not case-sensitive.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Craft Interface Operations .

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen appears. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft Windows platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard appears. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

`ACT-USER:TID:UID:CTAG::PID;`
 	
TID: FUJITSU (factory default value)
 	
UID: ROOT (factory default value)
 	
PID: ROOT (factory default value)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[51]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Step 10
Reinitialize the system software.

Note: *This command automatically logs the user off the NE.*

[51] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`INIT-SYS:TID:AID:CTAG:::LEVEL=WARM;`
AID:
• ALL (null)
Example:
`INIT-SYS:FUJITSU::CTAG:::LEVEL=WARM;`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click Initialize tab.
	Click the NE tab.
	Select Level: WARM.
	Click Initialize.
	Click Yes in the pop-up window to continue.
	If a second pop-up window opens, the connection is lost, and you must log on the NETSMART 500 user interface again to continue by clicking Logon.

The NOT READY indicator on the NEM Shelf Processor plug-in unit lights amber and then goes out after 5 to 20 minutes. After the NOT READY indicator goes out, the FAIL/SVCE indicator lights green on the NEM Shelf Processor unit.

Step 11
After the NOT READY indicator goes out and the FAIL/SVCE indicator lights green and stays green, proceed to Step 12.

Step 12
Log on the NE.

Note: *At this stage, you can only log on the NE using factory default values of the target identifier (TID), user identifier (UID), and private identifier (PID). TID, UID, and PID values are not case-sensitive.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Craft Interface Operations .

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen appears. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft Windows platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard appears. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

`ACT-USER:TID:UID:CTAG::PID;`
 	
TID: FUJITSU (factory default value)
 	
UID: ROOT (factory default value)
 	
PID: ROOT (factory default value)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[52]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Step 13
Following local practice, do you want to provision shelf location identifiers?

Note: *Shelf location identifiers, SHELFLBL and USERLBL, are optional parameters that precisely identify the location of equipment. If provisioned, the values appear in equipment retrieval and alarm messages. The SHELFLBL value indicates the physical location of the bay and shelf. The USERLBL value indicates the frame*

[52] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

identification code (FIC). Telcordia® NMA® OSMINE™ users should keep the SHELFLBL and USERLBL parameters values as NULL (default). For more information, refer to Shelf Location Identifiers.

If YES:
Proceed to Step 14.

If NO:
Proceed to Step 16.

4.3.4 Provision Shelf Location Identifiers

Step 14
Edit the values of shelf location identifiers (SHELFLBL and/or USERLBL).

TL1	NETSMART 500

`ED-EQPT:TID:AID:CTAG:::`
`KEYWORD=DOMAIN:STATE;`
AID:
• OS1
KEYWORD=DOMAIN:
• SHELFLBL = *Up to 13 characters with each character an uppercase letter (A...Z), number (0...9)* (**null** is default)
• USERLBL = *Up to 20 characters with each character an uppercase letter (A...Z), number (0...9), or hyphen (-)* (**null** is default)
Example:
`ED-EQPT:FUJITSU:OS1:CTAG:::`
`SHELFLBL=MAINSHELF,USERLBL=PLANO;`
	In the tree view, click the Equipment tab.
	Expand the appropriate shelf components.
	Select the equipment component.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	In the Command Parameters area type values into the SHELFLBL and/or USERLBL fields, if required.
	Click Modify.
	Do not close the Operations dialog box.

Step 15
Verify the values of the shelf location identifiers.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS1:CTAG;`
	In the Current Values area of the Operations dialog box, verify equipment provisioning.
	Close the Operations dialog box.

4.3.5 Provision OSC Units

Step 16
Install the OSC (SCMA-SCC4) plug-in units in the appropriate slots (9 and 11) of the shelf. See Figure 99 for slot locations. For each OSC plug-in unit to be installed, do the following:

The NOT READY indicators light amber and then go out after 5 to 20 minutes. Independently, the FAIL/SVCE indicators light green.

Note: *The NOT READY indicator remains amber until the backup database is completely copied to the OSC unit. During this time, CPY-MEM and CPY-FILE functions are unavailable and the OSC unit should not be removed.*

a) Inspect the OSC plug-in unit for possible damage or debris.

b) Slide the OSC plug-in unit into the shelf slot.

Note: *Because autoprovisioning is on (by default), the OSC units will begin provisioning when they are inserted into the shelf.*

Step 17
Wait until both of the following conditions are met, then proceed to Step 18.

- NOT READY indicators on the OSC plug-in units go out.
- FAIL/SVCE indicators on the OSC plug-in units light green.

Step 18
Ensure that OSC plug-in units are properly provisioned and that the equipment state is IS, Normal (STATE=IS-NR).

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• OS1-9 (slot 9)
• OS1-11 (slot 11)
Example:
`RTRV-EQPT:FUJITSU:OS1-9&OS1-11:CTAG;`
	In the ILA shelf OS1 graphic view or tree view area, select the equipment slot.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify the PRIMARY_STATE is IS.
	Verify the PRIMARY_STATE_QUALIFIER is NR.
	Close the Properties dialog box.

Step 19
Proceed to Provision System-Level Parameters, LCN Port, and GOS.

✔ This procedure is complete.

4.4 Provision System-Level Parameters, LCN Port, and GOS

In this section:

4.4.1 Provision System-Level Parameters

This subprocedure includes steps to set the NE target identifier (TID), change the date and time, and enter new users.

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to* Introduction to TL1 Commands *for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
If not already done, complete the procedures in Install Primary NE Management Units, and Configure the ILA Shelf.

Step 2
If not already done, log on the NE.

Note: *At this stage, you can only log on the NE using factory default values of the target identifier (TID), user identifier (UID), and private identifier (PID). TID, UID, and PID values are not case-sensitive.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Craft Interface Operations .

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen appears. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft Windows platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard appears. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

`ACT-USER:TID:UID:CTAG::PID;`
 	
TID: FUJITSU (factory default value)
 	
UID: ROOT (factory default value)
 	
PID: ROOT (factory default value)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[53]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Step 3
Inhibit the autonomous messages.

Note: *This step does not apply if you are using the NETSMART 500 user interface.*

Caution: *Ensure that the autonomous messages are allowed after these procedures have been completed. Failure to allow the autonomous messages could cause loss of traffic or the ability to detect remote troubles.*

[53] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`INH-MSG-ALL:TID::CTAG;`
 	
Example:
`INH-MSG-ALL:FUJITSU::CTAG;`
	n/a

Note: *Autonomous messages are inhibited until* Step 3*, when the command is entered to allow autonomous messages.*

Step 4

Change the system identifier (SID) from the default value, *FUJITSU*, to a unique identifier. This identifier acts as the shelf address in the network. The new SID must be from 7 to 20 alphanumeric characters. Hyphens are allowed.

Note: *Allow approximately 20 seconds after completion of the command before verifying the new SID.*

TL1	NETSMART 500

`SET-SID:TID::CTAG::SID;`
TID:
• Existing system ID
SID:
• New system ID
 	
Example:
`SET-SID:FUJITSU::CTAG::FUJITSU1;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click the Attributes tab.
	Click System ID tab.
	
	In the Command Parameters area, enter the new system identifier (SID).
	Click Modify.
	
	Click Yes in the pop-up window to continue.
	
	A second pop-up window will indicate that the connection has been lost. You will have to log on the NETSMART 500 user interface again to continue.
	
	Note: *If using TERM1 (serial connection), the second pop-up window will not appear, you will not be logged off, and you will not need to log on again. In the tree view, verify the new SID. Proceed to* Step 6*.*
	Click Logon.

Step 5

Verify the new SID.

Note: *NETSMART 500 users should wait approximately 20 seconds before attempting to log on the NE using the new SID.*

TL1	NETSMART 500

`RTRV-HDR:TID::CTAG;`
TID:
 	
New system ID
 	
Note: *The TID is the same as the SID set in the previous step.*
 	
Example:
`RTRV-HDR:FUJITSU1::CTAG;`
	To launch the NETSMART 500 user interface from a Microsoft Windows platform, select the following from the Windows task bar:
	
	Start ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500*
	
	The NETSMART 500 Dashboard appears.
	
	Click the Logon icon, or select :
	
	NE ▸ *Logon*
	
	Note: *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.*
	
	The NE Logon dialog box opens.
	Make the following selections:
	
	For **TERM1** (Serial):
	TID: Use new SID
	User ID: ROOT
	Password: ROOT
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[54]
	
	For **TERM2** (TCP/IP):
	TID: Use new SID
	User ID: ROOT
	Password: ROOT
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 graphical user interface.*
	
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click the System ID tab.
	Verify the value of SID.
	
	Close the Operations dialog box.

Step 6
Set the system date, time, and time zone.

Note: *If TZONE is set to a value with DT (that is, xxxxxDT), the time is adjusted automatically for Daylight Saving Time, and a REPT EVT COM message is generated when the adjustment occurs.*

[54] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

Note: *Enter the date in the format YYMMDD (year/month/day) and the time in the 24-hour format HHMMSS (hour/minute/second).*

TL1	NETSMART 500

`SET-DAT:TID::CTAG::DATE,TIME:KEYWORD=DOMAIN;`
DATE:
• YYMMDD
TIME:
• HHMMSS
KEYWORD=DOMAIN:
• Refer to the following table.
Example:
`SET-DAT:FUJITSU::CTAG::990727,050958:TZONE=CST6CDT;`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click the Attributes tab.
	Click the Time tab.
	In the Command Parameters area:
	• Enter the date (YYYYMMDD).
	• Enter the time (HHMMSS).
	• Select a time zone (Refer to the following table).
	Click Modify.
	Do not close the Operations dialog box.

Table 62: SET-DAT Keyword and Domain Input Parameters

Keyword	Domain (Default in Bold)	Description
TZONE	**NODST**	Disables the Daylight Saving Time feature
	NSTNDT	Newfoundland time zone
	AST4 AST4ADT	Atlantic time zone
	EST5 EST5EDT[55]	Eastern time zone
	CST6 CST6CDT[55]	Central time zone
	MST7 MST7MDT[55]	Mountain time zone
	PST8 PST8PDT[55]	Pacific time zone
	AKST9 AKST9AKDT[55]	Alaska time zone
	HST10	Hawaii time zone
	GMT	Greenwich mean time

Step 7
Verify the system date, time, and time zone.

[55] Enables automatic Daylight Saving Time adjustment

TL1	NETSMART 500

`RTRV-DAT:TID::CTAG;`
 	
Example:
`RTRV-DAT:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the updated information is correct.
	
	Close the Operations dialog box.

Step 8
Do you want to change from the default basic security mode to the enhanced security mode?

Note: *For more information about the basic and enhanced security modes, refer to* Security.

Note: *Changing the security level is allowed only by Level 4 users.*

If YES:
Continue with Step 9.

If NO:
Proceed to Step 14.

Step 9
Change the basic security mode to the enhanced security mode.

TL1	NETSMART 500

`ED-DFLT-SECU:TID::CTAG:::`
`SECULVL=ENHANCED;`
 	
Example:
`ED-DFLT-SECU:FUJITSU::CTAG:::`
`SECULVL=ENHANCED;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click the Security tab.
	Click the Settings tab.
	
	Select Enhanced from the SECULVL drop-down list.
	Click Modify.
	
	Do not close the Operations dialog box.

Step 10
Verify that the security mode has changed to the enhanced security mode.

TL1	NETSMART 500

`RTRV-DFLT-SECU:TID::CTAG;`
 	
Example:
`RTRV-DFLT-SECU:FUJITSU::CTAG:`
	In the Current Values area of the Operations dialog box, verify that the updated information is correct.

Step 11
Do you want to change the default Fujitsu security warning message banner to a customized warning message banner?

If YES:
Continue with the next step.

If NO:
Proceed to Step 14.

Step 12
Enter the customized warning message banner information.

TL1	NETSMART 500

`ED-DFLT-SECU:TID::CTAG:::WARN=;`
 	
Example:
`ED-DFLT-SECU:FUJITSU::CTAG:::`
`WARN=\"THIS COMPUTER IS FOR SECURITY`
`PERSONAL ONLY, AUTHORIZED USE REQUIRED\";`
	NE ▸ *Security Administration*
	
	The Security Administration dialog box opens.
	Click the Settings tab.
	
	Click the WARN box and then enter required banner warning message in text box.
	Click Modify.
	
	Do not close the Operations dialog box.

Step 13
Verify the warning message banner has changed.

TL1	NETSMART 500

`RTRV-DFLT-SECU:TID::CTAG;`
 	
Example:
`RTRV-DFLT-SECU:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the updated information is correct.
	
	Close the Operations dialog box.

Step 14
If required, enter additional security information (new users and privilege levels).

Note: *The maximum number of UIDs in the system is 100. This command will be denied if the number of UIDs exceeds 100.*

TL1	NETSMART 500

`ENT-SECU-USER:TID:UID:CTAG::PID,,UPC:KEYWORD=DOMAIN;`
UID:
• User identifier for new user (4 to 10 alphanumeric characters)
PID:
• Private identifier:
  • BASIC mode–6 to 10 characters, including at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -.
  • ENHANCED mode–10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.
UPC:
• User privilege code (1, 2, 3, or 4, with Level 4 allowing greatest access to commands)
KEYWORD=DOMAIN:
• TMOUTA = **Y**, N (Y enables automatic logoff after the specified number of minutes of user inactivity. N disables automatic logoff.)
• TIMEOUT = 5…**10**…**30**…60 (time-out period in minutes when TMOUTA=Y; defaults are 30 minutes for BASIC mode and 10 minutes for ENHANCED mode.)
• UAGE = 1…90, **99** (The UID aging interval expressed in days. UAGE=99 disables UAGE.)
• PAGE = 25…90, **99** (The PID aging interval expressed in days. PAGE=99 disables PAGE.)
Example:
`ENT-SECU-USER:FUJITSU:ROOT:CTAG::NEWPID9,,2:TMOUTA=N;`
	NE ▸ *Security Administration* ▸ *User tab* ▸ *Create*
	Enter the new user ID in the UID field.
	Enter the password in the PID field.
	Select the user privilege code (1…4) in the UPC field.
	In the TMOUTA field, select True to enable automatic time-out or False to disable automatic time-out.
	If automatic time-out is enabled, enter the time-out period (5…60 minutes) in the TIMEOUT field.
	Select the UID aging interval (1…90, 99) from the UAGE pull-down menu.
	Select the PID aging interval (25…90, 99) from the PAGE pull-down menu.
	Click Create.

Step 15

If security information was added in the previous step, verify the new users and privilege levels.

TL1	NETSMART 500

`RTRV-SECU-USER:TID:UID:CTAG;`
UID:
• User identifier (4 to 10 alphanumeric characters)
Example:
`RTRV-SECU-USER:FUJITSU:BILL:CTAG;`
	In the tree view, click the Users tab.
	If necessary, expand the tree view to show the new users added.
	Select the new user.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify the properties for the given user.
	Close the Properties dialog box.

Step 16
Set the system contact and location information, if required.

TL1	NETSMART 500

`ED-SYS:TID::CTAG:::KEYWORD=DOMAIN;`
KEYWORD=DOMAIN:
• CONTACT = \"*up to 40 characters*\"
• LOCATION = \"*up to 40 characters*\"
Example:
`ED-SYS:FUJITSU::CTAG:::`
`CONTACT=\"BILLJONES\",`
`LOCATION=\HINSDALE\";`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click the Attributes tab.
	Click the Modify tab.
	In the Command Parameters area, enter required information in CONTACT and LOCATION fields.
	Click Modify.
	Do not close the Operations dialog box.

Step 17
Verify the system contact and location information.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the updated information is correct.
	Close the Operations dialog box.

Step 18
Do you wish to provision the LCN port to allow remote provisioning over the data network?

If YES:
Proceed to Provision LCN Port.

If NO:
Proceed to Provision GOS.

4.4.2 Provision LCN Port

Provisioning the local communications network (LCN) port involves setting the IP address of the operations support system (OSS) port, placing the LCN port in service (using the ED-LAN command), and finally issuing the INIT-OIF command to enable pending provisioning changes by the system.

The following LCN provisioning restrictions apply:

- The MASK cannot take the following values: 0.0.0.0 or 255.255.255.255.
- The following IP addresses cannot be assigned as the NE IP address:
  - 0.0.0.0 (use of this IP address is allowed but will delete the IP interface)
  - 255.255.255.255
  - 127.xxx.xxx.xxx
  - 224.xxx.xxx.xxx through 239.xxx.xxx.xxx (Class D—not for normal use)
- The NE IP address cannot be the same as the one provisioned by the ENT-CIDR-ROUTE command.
- When the LCN port is used as part of the default gateway (via the ENT-CIDR-ROUTE command), its IP address cannot be changed.

Step 1
If not already done, complete the system parameter provisioning procedures in Provision System-Level Parameters.

Step 2
Set the IP address and mask of the LCN port.

Note: *See your System Administrator for valid IP addresses that can be used on your network.*

TL1	NETSMART 500

`ED-IP-ADDR:TID:LCN:CTAG:::`
`KEYWORD=DOMAIN;`
KEYWORD=DOMAIN:
• MASK = xxx.xxx.xxx.xxx (xxx = 0…255), **255.255.255.0**
• IP = xxx.xxx.xxx.xxx (xxx = 0…255), **0.0.0.0**
• PORT = 1024…**2024**…65535
Example:
`ED-IP-ADDR:FUJITSU:LCN:CTAG:::`
`MASK=255.255.255.128,`
`IP=123.255.255.121,PORT=2024;`
	In the tree view, click the Communications tab.
	Select *LCN (IP)*.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	In the Command Parameters area:
	• Enter the IP address (IP) for the NE.
	• Enter the IP subnet mask (MASK).
	• Enter the Transmission Control Protocol (TCP) port number (PORT).
	Click Modify.
	A confirmation dialog box opens.
	Click Yes to close the confirmation dialog box and continue.
	Close the Operations dialog box.

Step 3
Place LCN port in service (IS state).

TL1	NETSMART 500

`ED-LAN:TID:LCN:CTAG:::KEYWORD=DOMAIN`
`:IS;`
KEYWORD=DOMAIN:
• TARP = **Y**, N
• SIZE = 86…**1518**
• LSAP = **FE**
• OSI = Y, **N**
• IPFWD = **Y**, N
• NETID = Character string of up to 20 alphanumeric delineated by escape quotes (\")
Example:
`ED-LAN:FUJITSU:LCN:CTAG:::`
`SIZE=150:IS;`
	In the tree view, click the Communications tab.
	Expand the parent LCN component by clicking the plus sign (+) to the left of *LCN (IP)*.
	Select the LCN (LAN) component.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	In the Command Parameters area:
	• Select IS from the STATE drop-down list.
	• Make additional parameter modifications as required.
	Click Modify.
	A confirmation dialog box opens.
	Click Yes to close the confirmation dialog box and continue.
	Close the Operations dialog box.

Step 4
Enter default gateway if required.

Note: *Preconditions are associated with the ENT-CIDR-ROUTE command. Refer to* Enter CIDR Route (ENT-CIDR-ROUTE)*, for a list of preconditions, restrictions and keywords associated with the ENT-CIDR-ROUTE command.*

TL1	NETSMART 500
ENT-CIDR-ROUTE:TID::CTAG::LCN: KEYWORD=DOMAIN; KEYWORD=DOMAIN: • DESTIP = 0.0.0.0 • DESTMASK = 0.0.0.0 • NEXTHOP = xxx.xxx.xxx.xxx (xxx = 0…255) • METRIC = 0…**100**…65535 ***Example:*** **ENT-CIDR-ROUTE:FUJITSU::CTAG:: LCN:DESTIP=0.0.0.0, DESTMASK=0.0.0.0, NEXTHOP=128.167.154.170;** ***Note:*** *The NEXTHOP IP address is the same as the gateway IP address.*	*NE* ▸ *Create* Select the IP Routes tab. Select the Enter tab. In the Command Parameters area: • Enter the destination IP address (DESTIP). • Enter the destination IP address mask (DESTMASK). • Enter the IP address of the next system on the route (NEXTHOP). • Enter the cost metric of the route (METRIC). • Select LCN from the PORT drop-down list. Click Enter. A confirmation dialog box opens. Click Yes to close the confirmation dialog box and continue.

Step 5
How are you connected to the NE?

TERM1 (serial)— Go to Step 6.

TERM2 (TCP/IP)— Go to Step 8.

Step 6
Initialize the operation interface (OIF) through a TERM1 (serial) connection.

Note: *The INIT-OIF command must be executed before the ED-IP-ADDR, ED-LAN, and ENT-CIDR-ROUTE commands become effective.*

TL1	NETSMART 500

`INIT-OIF:TID::CTAG;`
 	
Example:
`INIT-OIF:FUJITSU::CTAG;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click Initialize tab.
	Select the Stack tab.
	
	In the Command Parameters area:
	
	Select OIF from the STACK INIT TYPE drop-down list.
	Click Initialize.
	
	A confirmation dialog box opens.
	
	Note: *The confirmation message refers to an Initialize Stack operation. The Initialize Stack operation is the initialization of the OSI stack that results from the processing of the INIT-OIF command.*
	Click Yes.

Step 7
Wait 2 minutes, then go to Step 11.

Step 8
Initialize the operation interface (OIF) through a TERM2 connection.

Note: *The INIT-OIF command must be executed before the ED-IP-ADDR, ED-LAN, and ENT-CIDR-ROUTE commands become effective.*

TL1	NETSMART 500

`INIT-OIF:TID::CTAG;`
 	
Example:
`INIT-OIF:FUJITSU::CTAG;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click Initialize tab.
	Select the Stack tab.
	
	In the Command Parameters area:
	
	Select OIF from the STACK INIT TYPE drop-down list.
	Click Initialize.
	
	A confirmation dialog box opens.
	
	Note: *The confirmation message refers to an Initialize Stack operation. The Initialize Stack operation is the initialization of the OSI stack that results from the processing of the INIT-OIF command.*
	Click Yes.
	
	A connection warning dialog box opens, indicating that the connection has been lost. You will have to log on the NETSMART 500 user interface again when it is time to continue.
	
	Click Logon in the pop-up window to continue.

Step 9
Wait 2 minutes before continuing.

Note: *The NETSMART 500 software connection to the NE will be lost. After waiting 2 minutes, users should log back on the NE.*

Step 10
Log on the NE.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
 	
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	
	Comm. Port: COMx (for example, COM2)
	
	Configure: use default[56]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	
	The NETSMART 500 NE View opens.
	
	The Security Message dialog box opens.
	Click OK.
	
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Step 11
Verify the IP address and mask of the LCN port.

[56] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

TL1	NETSMART 500

`RTRV-IP-ADDR:TID:LCN:CTAG;`
 	
Example:
`RTRV-IP-ADDR:FUJITSU:LCN:CTAG;`
	In the tree view, click the Communications tab.
	Select the *LCN (IP)* component.
	
	Entity ▸ ***Properties View***
	
	The Properties dialog box opens.
	
	Verify the IP address (IP), mask (MASK), and port (PORT) of the LCN port.
	
	Close the Properties dialog box.

Step 12
Verify that the LAN is in service.

TL1	NETSMART 500

`RTRV-LAN:TID:LCN:CTAG;`
 	
Example:
`RTRV-LAN:FUJITSU:LCN:CTAG;`
	In the tree view, click the Communications tab.
	
	Expand the parent LCN component by clicking the plus sign (+) to the left of *LCN (IP)*.
	
	Select the *LCN (LAN)* component.
	
	Entity ▸ ***Properties View***
	
	The Properties dialog box opens.
	
	Verify that the LCN port is in service (STATE: IS).
	
	Close the Properties dialog box.

Step 13
Verify the default gateway.

TL1	NETSMART 500

`RTRV-CIDR-ROUTE:TID::CTAG::PORT:`
`KEYWORD=DOMAIN;`
PORT:
• LCN (local communication network port)
• **ALL** (default)
KEYWORD=DOMAIN:
• NEXTHOP = xxx.xxx.xxx.xxx (xxx = 0…255)
• **ALL**
 	
Example:
`RTRV-CIDR-ROUTE:FUJITSU::CTAG;`
	In the tree view, click the Communications tab.
	
	Select the <TID> (SYSTEM) component.
	
	Entity ▸ ***Properties View***
	
	Select the IP Routes tab.
	Verify current values.
	
	Close the Properties dialog box.

Step 14
Proceed to Provision GOS.

4.4.3 Provision GOS

The grade of service (GOS) table stores system-level default values for newly-created entities, including equipment, facility, and ports entities. It can be used to modify default provisioning in the following areas:

- Default PM threshold levels (PMs)
- Default threshold crossing alerts (TCAs)
- Default alarm severity for standing conditions (ALMs)
- Default values for certain entity attributes (keyword parameter values) of managed objects (MOs)

Attention: *GOS provisioning does not change the provisioning of existing entities (equipment, facilities, or ports). Changes are only applicable to new entities, created after the GOS table is changed. To promote uniformity, Fujitsu recommends that GOS provisioning be performed at turn-up.*

Step 1
If not already done, complete the system parameter provisioning procedures in Provision System-Level Parameters.

Step 2
Do you wish to provision GOS?

Note: *If GOS provisioning is part of your local practice, Fujitsu recommends that GOS provisioning be performed at this time.*

If YES:
Perform GOS provisioning as described in Provisioning GOS, then proceed to Step 3.

If NO:
Proceed to Step 3.

Step 3
Allow autonomous messages, which were inhibited in Step 3.

Note: *This step does not apply if you are using the NETSMART 500 user interface.*

TL1	NETSMART 500

`ALW-MSG-ALL:TID::CTAG;`
 	
Example:
`ALW-MSG-ALL:FUJITSU::CTAG;`
	n/a

Step 4
Proceed to Provision ILA Shelf Equipment and Facilities.

4.5 Provision ILA Shelf Equipment and Facilities

In this section:

The flowchart in the following figure shows the subprocedures used to turn-up the ILA shelf.

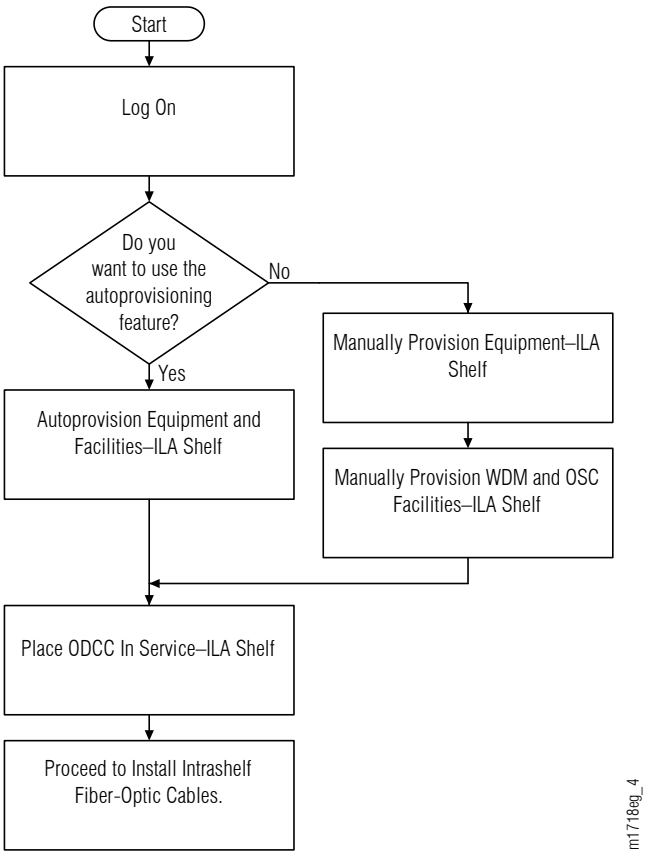


Figure 101: Provision ILA Shelf Equipment and Facilities (Procedure Flowchart)

4.5.1 Log On

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to* Introduction to TL1 Commands *for information about preconditions, postconditions, AIDs, and parameters.*

Step 1

If not already done, complete the procedures in Provision System-Level Parameters, LCN Port, and GOS.

Step 2

If not already done, log on the node. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values shown apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

TL1	NETSMART 500	

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10 non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	Comm. Port: COMx (for example, COM2)
	Configure: use default[57]
		For **TERM2** (TCP/IP):
		TID: FUJITSU
		User ID: ROOT
		Password: ROOT/(Route66K)
		Conn. Mode: TCP/IP
		IP Address: 192.168.1.1
		Port: 2024

	Click Logon. The NETSMART 500 NE View opens. The Security Message dialog box opens. Click OK. ***Note:*** *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*	

Step 3
In provisioning the ILA shelf equipment and facilities, do you want to use the autoprovisioning feature?

If YES:
Proceed to Autoprovision Equipment and Facilities–ILA Shelf.

If NO:
Proceed to Manually Provision Equipment–ILA Shelf.

4.5.2
Autoprovision Equipment and Facilities
ILA Shelf

This subprocedure describes one method for installing and provisioning plug-in units in the ILA shelf. Another option is to use the procedures in Manually Provision Equipment–ILA Shelf, and Manually Provision WDM and OSC Facilities–ILA Shelf.

Note: *For plug-in unit slot locations, refer to* About System Turn-up Core Configuration ILA Node .

[57] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

The FLASHWAVE 7500 system provides automatic provisioning of the equipment and facilities and also provides the automatic in-service provisioning (AISP) capability for all facility types. Autoprovisioning and AISP are the default software settings.

After the plug-in unit is seated, the equipment entity is created and placed in service. Facilities are also created and placed in an Out-of-Service (OOS), Auto In-Service (AINS) state. While in the AINS state, alarms such as LOS are not generated, and the system waits for the application of a valid signal. Upon receiving a valid signal, the system begins a time-out period and then automatically transitions to the In-Service (IS) state. The default time-out period is 8 hours and can be modified using the ED-SYS command.

Note: *Except for shelves, all equipment can be autoprovisioned. Shelves require manual provisioning to place them in service.*

If the facility is lost during the time-out period because of LOF or LOS, the time-out period is reset. Normal alarm reporting begins when the time-out period has completed and the transition to the IS state has occurred.

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to* Introduction to TL1 Commands *for information about preconditions, postconditions, AIDs, and parameters.*

To install and autoprovision the ILA shelf equipment, perform the following steps:

Enable Autoprovisioning

Note: *You should already be logged on the NE (Refer to the* Log On *section).*

Step 1
Retrieve the state of the autoprovisioning feature.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
 	
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the tree view, select the NE (the top-level system entity).
	
	Entity ▸ *Properties View*
	
	In the Current Values area of the Properties dialog box, determine the value of AUTOP (Yes or No).
	
	Close the Properties dialog box.

Step 2
Is autoprovisioning already enabled? (Is the current value of AUTOP set to Yes?)

If YES:
Proceed to Step 5.

If NO:
Proceed to Step 3.

Step 3
Enable autoprovisioning, and provision the AISP feature and the AISP timer if necessary.

TL1	NETSMART 500

`ED-SYS:TID::CTAG:::KEYWORD=DOMAIN;`
KEYWORD=DOMAIN:
• CONTACT = Contact information; 40-character string delineated by escape quotes (\"string\")
• LOCATION = Location information; 40-character string delineated by escape quotes (\"string\")
• AUTOP = **Y**, N (autoprovisioning)
• AISPDEFTM = 00-00…**08-00**…48-00 (default valid signal timer in 1-minute increments)
Example:
`ED-SYS:FUJITSU::CTAG:::AUTOP=Y, AISPDEFTM=08-00;`
	NE ▸ *System Operations*
	The Operations dialog box opens.
	Click the Attributes tab.
	Click the Modify tab.
	Set AUTOP to Yes.
	Click Modify.
	Do not close the Operations dialog box.

Step 4
Verify that autoprovisioning is enabled.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the updated information is correct.
	Close the Operations dialog box.

Install Amplifier Plug-In Units

Step 5
Install the amplifier plug-in units in the appropriate slots (1 and 19) of the shelf. See Figure 99 for slot locations. For each amplifier plug-in unit to be installed, do the following:

a) Inspect the plug-in unit for possible damage or debris.

b) Slide the plug-in unit into the shelf slot.

Verify Amplifier Plug-In Units Are In Service

Step 6
Ensure that both amplifier plug-in units are properly provisioned. The equipment state should be IS, Normal (STATE=IS-NR).

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• OS1-1 (slot 1)
• OS1-19 (slot 19)
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS1-1&OS1-19:CTAG;`
	In the shelf OS1 graphic view or tree view, select the equipment slot.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify the PRIMARY_STATE is IS.
	Verify the PRIMARY_STATE_QUALIFIER is NR.
	Close the Properties dialog box.

Install Filler Panels

Step 7
Install filler panels in any unused slots of the ILA shelf.

Verify WDM Facilities Are In Service

Step 8
Verify that the WDM facility associated with each amplifier plug-in unit is in service and provisioned correctly.

TL1	NETSMART 500

`RTRV-WDM:TID:AID:CTAG;`
AID:
• OS1-1-PE1 (WDM facility for slot-1 amplifier)
• OS1-19-PE1 (WDM facility for slot-19 amplifier)
Example:
`RTRV-WDM:FUJITSU:OS1-1-PE1:CTAG;`
	In the tree view, click the Facilities tab.
	Select the facility.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify that In-Service state and provisioning parameters are correct.
	Close the Properties dialog box.

Step 9
Are the WDM facilities in service and provisioned correctly?

If YES:
Proceed to Step 10.

If NO:
Correct WDM facility provisioning using procedures described in Editing Facility State, or Editing Facility Parameters. Then proceed to Step 10.

Verify OSC Facilities Are In Service

Step 10
Verify that the OSC facility associated with each OSC plug-in unit is in service and provisioned correctly.

TL1	NETSMART 500

`RTRV-OSC:TID:AID:CTAG;`
AID:
• OS1-9-PE1 (OSC facility for slot-9 plug-in unit)
• OS1-11-PE1 (OSC facility for slot-11 plug-in unit)
Example:
`RTRV-OSC:FUJITSU:OS1-9-PE1:CTAG;`
	Click the Facilities tab in the tree area.
	Expand the appropriate shelf component.
	Select the appropriate facility AIDs: OS1-9-PE1 and OS1-11-PE1.
	Note: *Select more than one component using CTRL+click (multiple) or SHIFT+click (range).*
	Entity ▸ *Properties View*
	Verify the new facility.
	Close the Properties dialog box.

Step 11
Are the OSC facilities in service and provisioned correctly?

If YES:
Proceed to Place ODCC In Service–ILA Shelf.

If NO:
Correct OSC facility provisioning using procedures described in Editing Facility State, or Editing Facility Parameters, then proceed to Place ODCC In Service–ILA Shelf.

✔ This procedure is complete.

4.5.3
Manually Provision Equipment
ILA Shelf

This subprocedure describes one method for installing and provisioning plug-in units in the ILA shelf. For an alternative method, refer to Autoprovision Equipment and Facilities–ILA Shelf.

Note: *For plug-in unit slot locations, refer to* About System Turn-up Core Configuration ILA Node .

Note: *This procedure includes steps to install plug-in units in the appropriate slots in the shelf. However, if certain plug-in units are not available, you can complete the procedure without installing them. This is called preprovisioning the slot. In this case, the unit will assume the specified provisioning when the unit is eventually installed in the slot. Note that an unequipped alarm will be raised until the unit is installed.*

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to* Introduction to TL1 Commands *for information about preconditions, postconditions, AIDs, and parameters.*

To install and manually provision equipment in the ILA shelf, perform the following steps:

Disable Autoprovisioning

Note: *You should already be logged on the NE (refer to* Step 2*).*

Step 1
Retrieve the state of the autoprovisioning feature.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the tree view, select the NE (the top-level system entity).
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	In the Current Values area of the Properties dialog box, determine the value of AUTOP (Yes or No).
	Close the Properties dialog box.

Step 2
Is autoprovisioning already disabled? (Is the current value of AUTOP set to No?)

If YES:
Proceed to Step 5.

If NO:
Proceed to Step 3.

Step 3
Disable the autoprovisioning feature.

Note: *If autoprovisioning is already disabled, this command will fail.*

TL1	NETSMART 500

`ED-SYS:TID::CTAG:::AUTOP=N;`
 	
Example:
`ED-SYS:FUJITSU::CTAG:::AUTOP=N;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click the Attributes tab.
	Click the Modify tab.
	Set AUTOP to No.
	Click Modify.
	
	Do not close the Operations dialog box.

Step 4
Verify that the autoprovisioning feature is disabled.

TL1	NETSMART 500

`RTRV-SYS:TID::CTAG;`
 	
Example:
`RTRV-SYS:FUJITSU::CTAG;`
	In the Current Values area of the Operations dialog box, verify that the value of AUTOP is No.
	
	Close the Operations dialog box.

Install and Provision Amplifier Units

Step 5
Install amplifier (APMA-xxxx) plug-in units in the appropriate slots (1 and 19) of the ILA shelf. See Figure 99 for slot locations. For each amplifier plug-in unit to be installed, do the following:

a) Inspect the amplifier plug-in unit for possible damage or debris.

b) Slide the amplifier plug-in unit into the appropriate shelf slot.

Step 6
For each amplifier plug-in unit, create the amplifier equipment entity, and place it in service.

TL1	NETSMART 500

`ENT-EQPT:TID:AID:CTAG::TYPE::IS;`
AID:
• OS1-1 (slot 1)
• OS1-19 (slot 19)
TYPE:
• APMA-L2C1
• **APMA-M2C1**
• APMA-ULC1
• APMA-M2U1
• APMA-ULU1
Example:
`ENT-EQPT:FUJITSU:OS1-1:CTAG::`
`APMA-L2C1::IS;`
	In the tree view, select the Equipment tab.
	Expand the shelf.
	Select slot 1 or 19.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click the State tab.
	In the Command Parameters area:
	• At New Prov. State, select In Service (ENT-IS).
	• Click the Type tab.
	• Select the appropriate equipment type.
	• Click Modify.
	Do not close the Operations dialog box.

Step 7
For each equipment entity created in the previous step, verify that it is in service.

TL1	NETSMART 500

`RTRV-EQPT:TID:AID:CTAG;`
AID:
• OS1-1 (slot 1)
• OS1-19 (slot 19)
• **ALL** (null)
Example:
`RTRV-EQPT:FUJITSU:OS1-1&OS1-19:CTAG;`
	In the Current Values of the Operations dialog box, verify that the Provisioned State is In Service and that the Type is the appropriate equipment type.
	Close the Operations dialog box.

Install Filler Panels

Step 8
Install filler panels in any unused slots of the shelf.

Step 9
Proceed to Manually Provision WDM and OSC Facilities–ILA Shelf.

✔ This procedure is complete.

4.5.4
Manually Provision WDM and OSC Facilities
ILA Shelf

The following steps are used to manually create the WDM and OSC facilities associated with the ILA shelf and place them in service.

Note: *If you have autoprovisioned the ILA shelf (refer to Autoprovision Equipment and Facilities–ILA Shelf), WDM and OSC facilities have already been created. Skip this procedure and continue to Place ODCC In Service–ILA Shelf.*

Note: *Default values are shown in bold.*

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

To manually provision WDM and OSC facilities associated with the ILA shelf, perform the following steps:

Manually Provision WDM Facilities

Note: *You should already be logged on the NE (Step 2).*

Step 1
Two amplifier (APMA-xxxx) plug-in units were installed in Step 5. Amplifier plug-in units are located in slots 1 and 19. For each amplifier plug-in unit, create the associated WDM facility, and place it in service.

TL1	NETSMART 500

`ENT-WDM:TID:AID:CTAG:::KEYWORD=DOMAIN:IS;`
AID:
• OS1-1-PE1 (WDM facility associated with slot-1 amplifier)
• OS1-19-PE1 (WDM facility associated with slot-1 amplifier)
KEYWORD=DOMAIN:
• VSTIMER = hh-mm
Example:
`ENT-WDM:FUJITSU:OS1-1-PE1:CTAG::::IS;`
	NE ▸ *Create*
	Click the Facility tab.
	In the Command Parameters area:
	• Select type WDM.
	• Select the appropriate facility AIDs: OS1-1-PE1 and OS1-19-PE1.
	• Select In Service (IS).
	• Select the desired VSTIMER value.
	Click Create.
	Close the Operations dialog box.

Step 2
Verify that the WDM facility associated with each amplifier plug-in unit is in service and provisioned correctly.

TL1	NETSMART 500

`RTRV-WDM:TID:AID:CTAG;`
AID:
• OS1-1-PE1 (WDM facility for slot-1 amplifier)
• OS1-19-PE1 (WDM facility for slot-19 amplifier)
• **ALL** (null)
Example:
`RTRV-WDM:FUJITSU:OS1-1-PE1:CTAG;`
	Click the Facilities tab in the tree area.
	Expand the appropriate shelf component.
	Select the appropriate facility AIDs: OS1-1-PE1 and OS1-19-PE1.
	Note: *Select more than one component using CTRL+click (multiple) or SHIFT+click (range).*
	Entity ▸ *Properties View*
	Verify the new facility.
	Close the Properties dialog box.

Step 3
Are the WDM facilities in service and provisioned correctly?

If YES:
Proceed to Step 4.

If NO:
Correct WDM facility provisioning by using procedures described in Editing Facility State, or Editing Facility Parameters. Then proceed to Step 4.

Manually Provision OSC Facilities

Step 4
For each OSC plug-in unit, create the OSC facility, and place it in service.

Note: *Two OSC plug-in units (SCMA-SCC4) were installed in* Step 16 *of* Install Primary NE Management Units, and Configure the ILA Shelf. *OSC plug-in units are located in slots 9 and 11 of the shelf.*

TL1	NETSMART 500

`ENT-OSC:TID:AID:CTAG:::KEYWORD=DOMAIN:IS;`
AID:
• OS1-9-PE1 (OSC facility for slot-9 plug-in unit)
• OS1-11-PE1 (OSC facility for slot-11 plug-in unit)
KEYWORD=DOMAIN:
• VSTIMER = hh-mm
• JOSECTRC = **Y**, N
• TRC = \"*up to 62 ASCII characters*\"
• EXPTRC = \"*up to 62 ASCII characters*\"
Example:
`ENT-OSC:FUJITSU:OS1-9-PE1:CTAG:::`
`VSTIMER=04-00:IS;`
	NE ▸ *Create*
	Click the Facility tab.
	In the Command Parameters area:
	• Select type OSC.
	• Select the appropriate facility AIDs: OS1-9-PE1 and OS1-11-PE1.
	• Select In Service (IS).
	• Select the appropriate provisioning options.
	Click Create.
	Close the Operations dialog box.

Step 5
Verify that the OSC facility associated with each OSC plug-in unit is in service and provisioned correctly.

TL1	NETSMART 500

`RTRV-OSC:TID:AID:CTAG;`
AID:
• OS1-9-PE1 (OSC facility for slot-9 plug-in unit)
• OS1-11-PE1 (OSC facility for slot-11 plug-in unit)
• **ALL** (null)
Example:
`RTRV-OSC:FUJITSU:OS1-9-PE1:CTAG;`
	Click the Facilities tab in the tree area.
	Expand the appropriate shelf component.
	Select the appropriate facility AIDs: OS1-9-PE1 and OS1-11-PE1.
	Note: *Select more than one component using CTRL+click (multiple) or SHIFT+click (range).*
	Entity ▸ *Properties View*
	Verify the new facility.
	Close the Properties dialog box.

Step 6
Are the OSC facilities in service and provisioned correctly?

If YES:
Proceed to Place ODCC In Service–ILA Shelf.

If NO:
Correct OSC facility provisioning using procedures described in Editing Facility State, or Editing Facility Parameters. Then proceed to Place ODCC In Service–ILA Shelf.

✔ This procedure is complete.

4.5.5 Place ODCC In Service ILA Shelf

An optical data communications channel (ODCC) can be assigned to every OSC facility up to a maximum of two channels per ILA shelf. The ODCC is used for communication with network-side NEs.

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

Step 1
Two OSC plug-in units (SCMA-SCC4) are installed and the OSC facility associated with each OSC plug-in unit has been created and is in service. The OSC plug-in units are located in slots 9 and 11 of shelf OS1. For each OSC plug-in unit, create the associated ODCC and place it in service.

TL1	NETSMART 500

`ENT-SDCC:TID:AID:CTAG:::`
`KEYWORD=DOMAIN:IS;`
 	
AID (matching OSC facility AID):
• OS1-9-PE1 (ODCC facility for slot-9 plug-in unit)
• OS1-11-PE1 (ODCC facility for slot-11 plug-in unit)
KEYWORD=DOMAIN:
• K = 1…**7**, 8
• L2CR = **PLUS-R**, NTWK, USER, PLUS-C
• T200 = 50…**200**…5000
• T203 = 2…**10**…300
• N200 = 2, **3**…16
• N201 = 260…**1024**
• SRV = **AITS**, UITS
• NETID = User-defined network identifier. Character string of up to 20 alphanumeric delineated by escape quotes (\").
• INSTID = Identifies the NLP (ISIS) management-port instance. Refer to command ENT-SDCC for more information about keyword INSTID.
 	
Example:
`ENT-SDCC:FUJITSU:OS1-9-PE1:CTAG:::`
`K=8,SRV=UITS:IS;`
	NE ▸ *Create*
	
	The Operations dialog box opens.
	Click the DCC tab.
	
	Select ODCC from the TYPE drop-down list in the Command Parameters area.
	
	Additional parameter choices appear:
	• From the AID drop-down list, select the ODCC facility AIDs: OS1-9-PE1 and OS1-11-PE1.
	• From the STATE drop-down list, select IS.
	• If required, use the additional fields to set KEYWORD=DOMAIN values.
	
	Click Create.
	
	A confirmation dialog box opens.
	Click Yes.
	
	Close the Operations dialog box.

Step 2
Initialize the operation interface (OIF).

Note: *The INIT-OIF command must be executed before the ENT-SDCC command becomes effective.*

TL1	NETSMART 500

`INIT-OIF:TID::CTAG;`
 	
Example:
`INIT-OIF:FUJITSU::CTAG;`
	NE ▸ *System Operations*
	
	The Operations dialog box opens.
	Click Initialize tab.
	Select the Stack tab.
	
	In the Command Parameters area:
	
	Select OIF from the STACK INIT TYPE menu.
	Click Initialize.
	
	A Confirmation dialog box opens.
	Click Yes.
	Click Logon.

Step 3
Wait 2 minutes before continuing.

Note: *The NETSMART 500 software connection to the NE will be lost. After waiting 2 minutes, users should log back on the NE.*

Step 4
Verify the ODCC.

TL1	NETSMART 500

`RTRV-SDCC:TID:AID:CTAG;`
AID (matching OSC facility AID):
• OS1-9-PE1 (ODCC facility for slot-9 plug-in unit)
• OS1-11-PE1 (ODCC facility for slot-11 plug-in unit)
• **ALL** (null)
Example:
`RTRV-SDCC:FUJITSU:ALL:CTAG;`
	Restart the NETSMART 500 user interface, and log back on the NE.
	Note: *Refer to* Step 2.
	In the tree view, select the Communications tab.
	Expand the ILA shelf OS1 and OSC facility to locate the ODCC entity.
	Select the ODCC entity.
	Entity ▸ *Properties View*
	The Properties dialog box opens.
	Verify that the State is IS.
	Close the Properties dialog box when done.

Step 5
Proceed to Install Intrashelf Fiber-Optic Cables.

4.6
Install Intrashelf Fiber-Optic Cables

There are two types of ILA nodes. The following figures shows the fiber-optic cable connections that need to be installed for each node. The first ILA node, the following figure, uses type APMA-xxC1 amplifiers and does not support in-service upgrade to OADM.

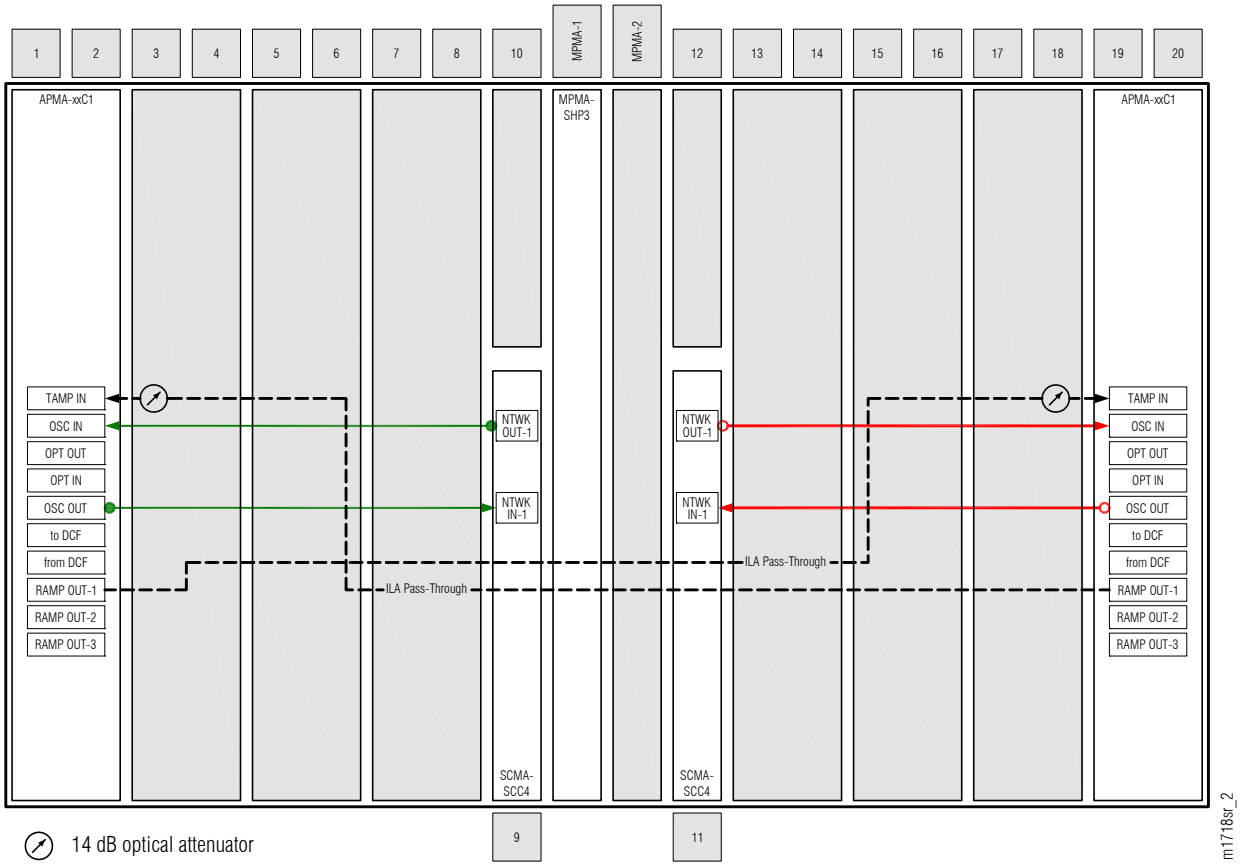


Figure 102: Cables for ILA Node with APMA-xxC1 Amplifiers

The second ILA node, the following figure, uses Universal Amplifiers (APMA-xxU1) and does support in-service upgrade to OADM.

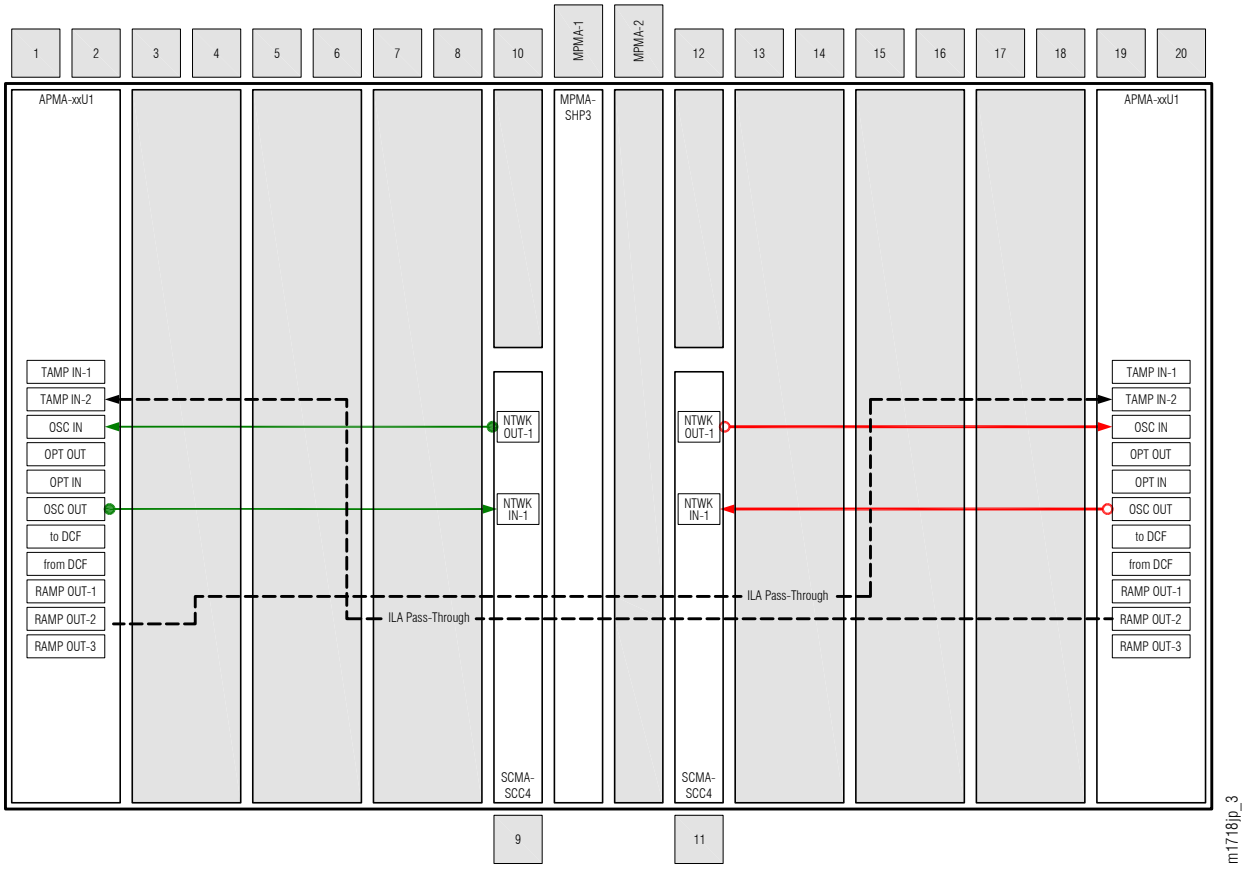


Figure 103: Cables for ILA Node with APMA-xxU1 Amplifiers

Note: *For rules and precautions regarding handling, storing, cleaning, connecting, and disconnecting fiber-optic cables, refer to Fiber Cable Handling.*

Danger: *Never handle exposed fiber with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove. Follow local safety precautions regarding fiber.*

Danger: *Never look into the end of a fiber-optic cable. Permanent eye damage or blindness can occur very quickly if the laser light is present. Follow local safety precautions regarding fiber.*

Warning: *To avoid damage to the equipment when connecting fibers, always verify the optical specifications. Verify that the optical signal into a receiver meets the appropriate optical specifications listed in* Optical Specifications.

Caution: *Before installing fiber-optic cables, always verify that the fiber connectors are free of contamination by visually inspecting with a fiber scope and cleaning the connectors at both ends of the fiber, if necessary. Refer to Fiber Cable Handling.*

Install intrashelf fiber-optic cables as follows:

Step 1
Install slot-1 amplifier connections to OSC as follows:

a) Obtain and clean two LC-LC fiber-optic cables.

b) Connect the cable ends to the appropriate plug-in units and connectors as shown in the following figure and listed in the following table.

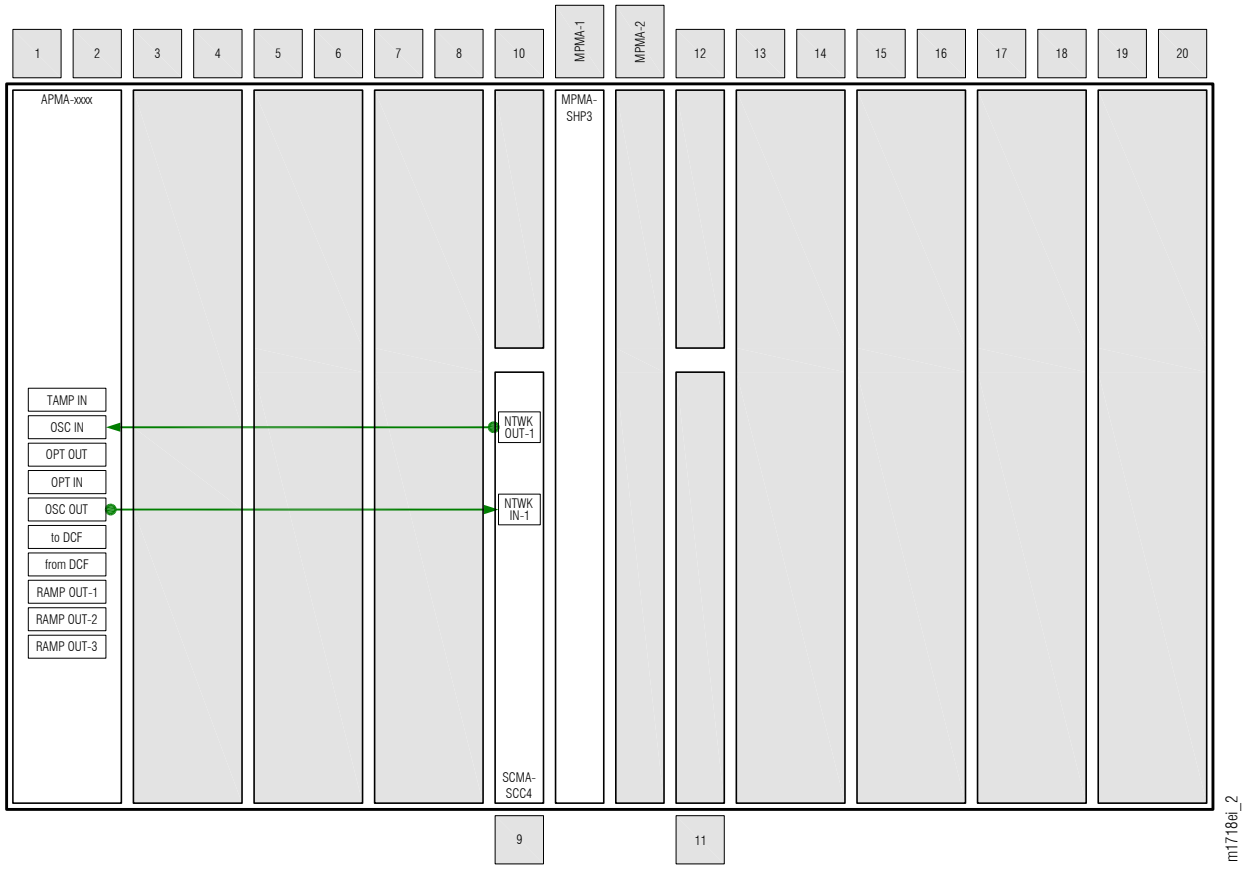


Figure 104: Slot-1 Amplifier Connections to OSC

Table 63: Slot-1 Amplifier Connections to OSC

From Amplifier (APMA-xxxx)		To OSC Unit (SCMA-SCC4)	
Shelf Slot	Connector	Shelf Slot	Connector
1	OSC IN	9	NTWK OUT-1

Table 63: Slot-1 Amplifier Connections to OSC (Cont.)

From Amplifier (APMA-xxxx)		To OSC Unit (SCMA-SCC4)	
Shelf Slot	Connector	Shelf Slot	Connector
1	OSC OUT	9	NTWK IN-1

Step 2

Install slot-19 amplifier connections to OSC as follows:

a) Obtain and clean two LC-LC fiber-optic cables.

b) Connect the cable ends to the appropriate plug-in units and connectors as shown in the following figure and listed in the following table.

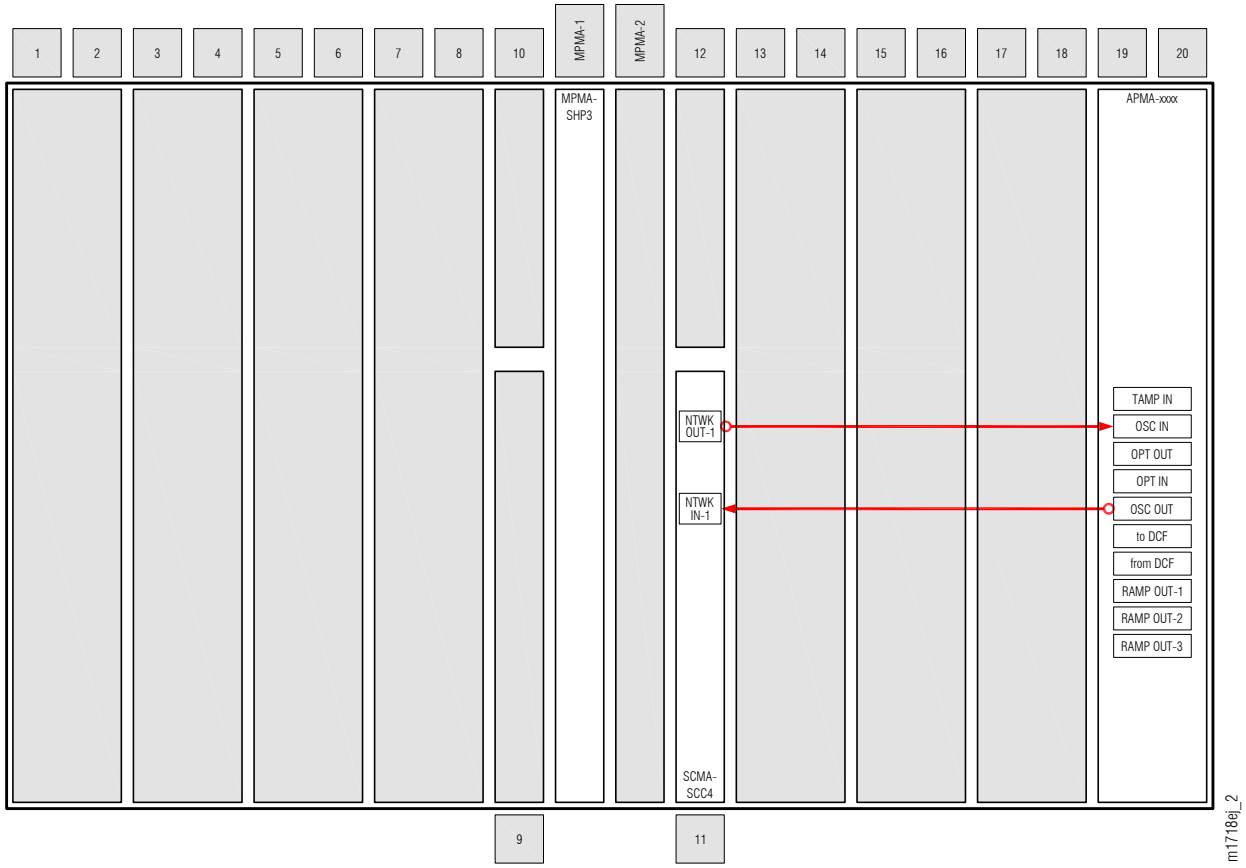


Figure 105: Slot-19 Amplifier Connections to OSC

Table 64: Slot-19 Amplifier Connections to OSC

From Amplifier (APMA-xxxx)		To OSC Unit (SCMA-SCC4)	
Shelf Slot	Connector	Shelf Slot	Connector
19	OSC IN	11	NTWK OUT-1
19	OSC OUT	11	NTWK IN-1

Step 3
Are the amplifiers type APMA-xxU1?

If YES:
Proceed to Step 6.

If NO:
Proceed to Step 4.

Step 4
Install pass-through connections between APMA-xxC1 amplifiers as follows:

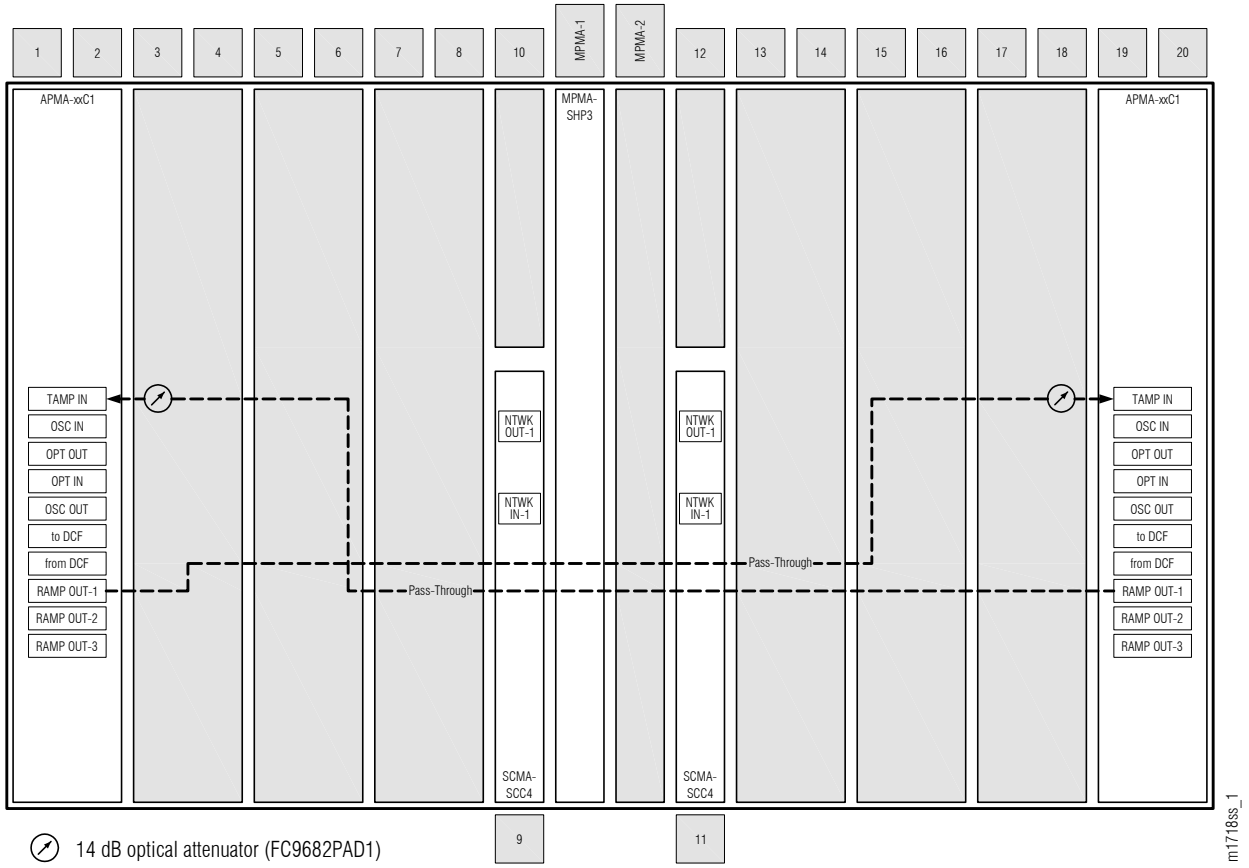


Figure 106: Pass-Through Connections between APMA-xxC1 Amplifiers

Table 65: Pass-Through Connections between APMA-xxC1 Amplifiers

From Amplifier (APMA-xxC1)		To Amplifier (APMA-xxC1)	
Shelf Slot	**Connector**	**Shelf Slot**	**Connector**
1	RAMP OUT-1	19	TAMP IN
1	TAMP IN	19	RAMP OUT-1

a) Connect a 14 dB optical attenuator (FC9682PAD1) to the TAMP IN connectors of the two amplifier plug-in units.

b) Obtain and clean two LC-LC fiber-optic cables.

c) Connect the cable ends to the appropriate plug-in units and connectors as shown in the following figure and listed in the following table.

Note: *At the TAMP IN connection, the cable connects to the optical attenuator.*

Step 5
Proceed to Connect DCMs or Install Loopback Cables.

Step 6
Install pass-through connections between APMA-xxU1 amplifiers as follows:

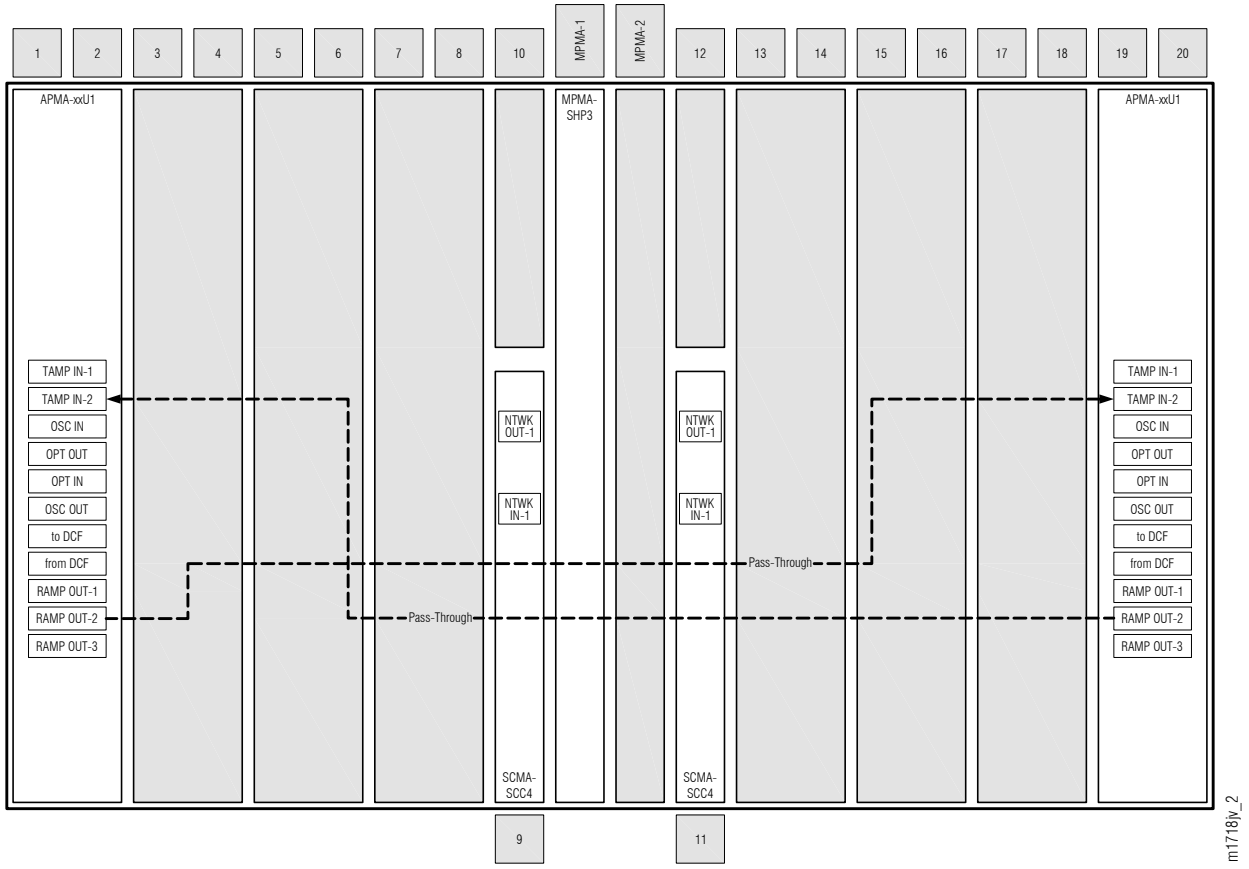


Figure 107: Pass-Through Connections between APMA-xxU1 Amplifiers

Table 66: Pass-Through Connections between APMA-xxU1 Amplifiers

From Amplifier (APMA-xxU1)		To Amplifier (APMA-xxU1)	
Shelf Slot	**Connector**	**Shelf Slot**	**Connector**
1	RAMP OUT-2	19	TAMP IN-2

Table 66: Pass-Through Connections between APMA-xxU1 Amplifiers (Cont.)

From Amplifier (APMA-xxU1)		To Amplifier (APMA-xxU1)	
Shelf Slot	Connector	Shelf Slot	Connector
1	TAMP IN-2	19	RAMP OUT-2

a) Obtain and clean two LC-LC fiber-optic cables.

b) Connect the cable ends to the appropriate plug-in units and connectors as shown in the following figure and listed in the following table.

Step 7
Proceed to Connect DCMs or Install Loopback Cables.

4.7 Connect DCMs or Install Loopback Cables

In this section:

As explained in Overview DCM or Loopback Cabling Core Configuration ILA Node, each amplifier (APMA-xxxx) plug-in unit must be connected to a Dispersion Compensation Module (DCM), or a loopback fiber must be installed in place of the DCM. The procedure in Connect Amplifiers to DCMs or Install Loopback Cables, guides you in connecting DCMs and installing loopback cables as required.

Before performing the procedure in Connect Amplifiers to DCMs or Install Loopback Cables, you should know whether or not a DCM is required for each amplifier (APMA-xxxx) plug-in unit in the node. For each amplifier that requires a DCM, you should also know where it has been installed. If uncertain, contact your Network Design/ Planning organization.

4.7.1 Overview DCM or Loopback Cabling Core Configuration ILA Node

Generally, as shown in the following figure, a Dispersion Compensation Module (DCM) is used with each amplifier (APMA-xxxx) plug-in unit to overcome the effects of chromatic dispersion. However, depending on network design, the DCM is not always required.

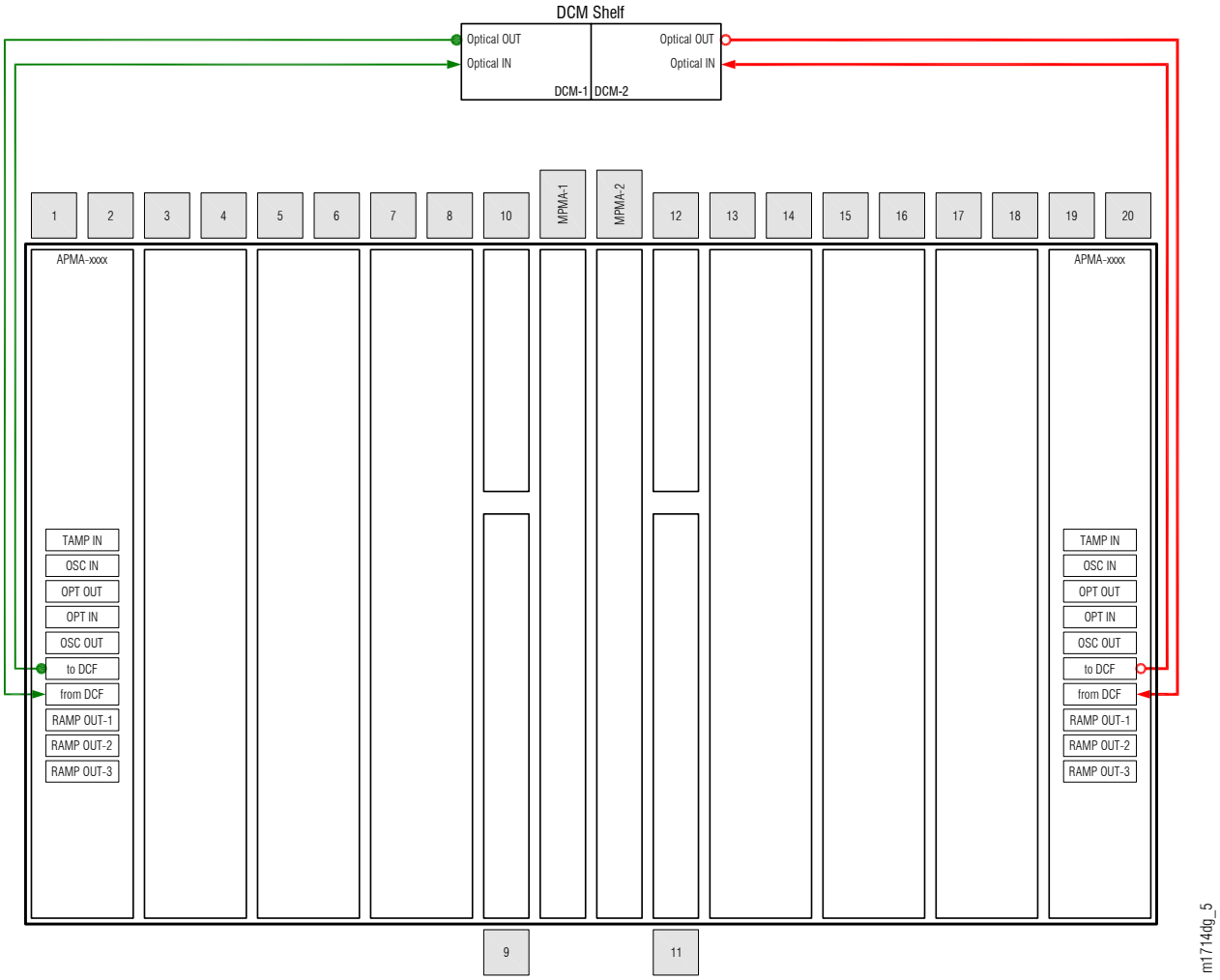


Figure 108: Fiber-Optic Cable Connections to DCMs

If a DCM is not used, a loopback fiber-optic cable should be installed in place of the DCM. The following figure shows an example in which loopback cables are used with both amplifiers. If the amplifier is type APMA-L2C1 or APMA-ULC1, an 11 dB attenuator with LC connector type is required. Otherwise an optical attenuator is not required.

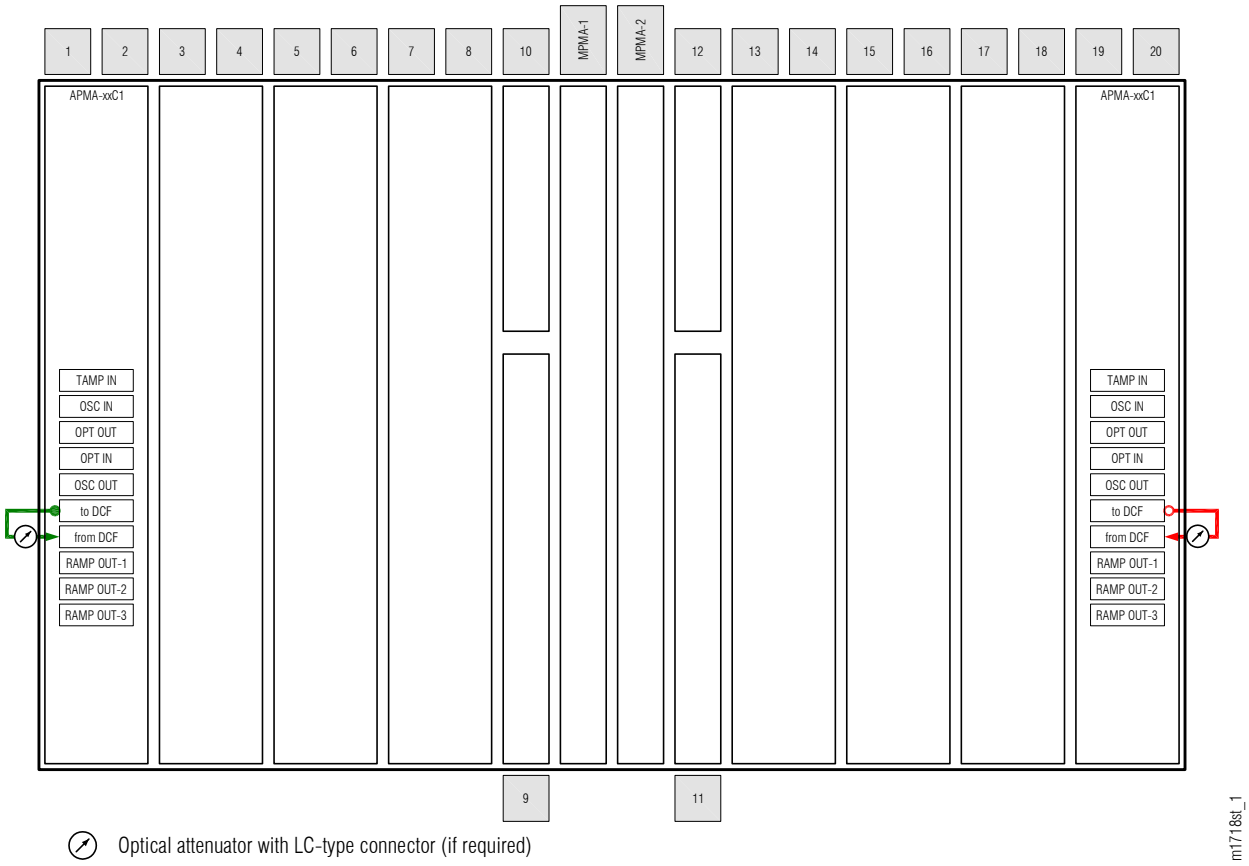


Figure 109: Fiber-Optic Loopback Cable Connections

4.7.2 Connect Amplifiers to DCMs or Install Loopback Cables

Note: *For rules and precautions regarding handling, storing, cleaning, connecting, and disconnecting fiber-optic cables, refer to Fiber Cable Handling.*

To connect amplifiers to DCMs or install loopback cables, perform the following steps:

Step 1
Does the amplifier (APMA-xxxx) plug-in unit installed in slot 1 require connection to a DCM?

If YES:
Proceed to Step 2.

If NO:
Proceed to Step 6.

Connect DCM to Slot-1 Amplifier

Step 2
Obtain and clean two LC-SC fiber-optic cables.

Step 3
If an in-line optical attenuator is required by the network engineering design specification, clean the attenuator, and connect it to the receiving end of the cable.

Step 4
Connect the cable ends (with the optical attenuator, if used) to the plug-in units and connectors listed in the following table.

Table 67: Slot-1 Amplifier-to-DCM Fiber-Optic Cable Connections

From APMA-xxxx		To DCM[58]	
Shelf Slot	Connector	Shelf Slot	Connector
1	to DCF	DCM-1	OPT In[59]
1	from DCF	DCM-1	OPT Out

Step 5
Proceed to Step 9.

Install Slot-1 Loopback Cable

Step 6
Is the amplifier in slot 1 type APMA-L2C1 or APMA-ULC1?

If YES: from DCF
Connect a 12 dB optical attenuator, part number 956-130-5x12, to the **from DCF** connector of the amplifier plug-in unit. Then proceed to Step 7.

If NO:
An optical attenuator is not required. Proceed to Step 7.

Step 7
Obtain and clean one LC-LC fiber-optic cable.

58 **DCMs are housed in the SFD3 dispersion compensation shelf (FC9512SFD3).**
59 If an in-line optical attenuator is required by the network engineering design specification, it is placed at the **OPT In** connector to the DCM unit.

Step 8
Connect the cable ends to the plug-in unit connectors listed in the following table.

Table 68: Slot-1 Amplifier Loopback Cable Connections

From APMA-xxxx		To APMA-xxxx	
Shelf Slot	Connector	Shelf Slot	Connector
1	to DCF	1	from DCF[60]

Step 9
Does the amplifier (APMA-xxxx) plug-in unit installed in slot 19 require connection to a DCM?

If YES:
Proceed to Step 10.

If NO:
Proceed to Step 14.

Connect DCM to Slot-19 Amplifier

Step 10
Obtain and clean two LC-SC fiber-optic cables.

Step 11
If an in-line optical attenuator is required by the network engineering design specification, clean the attenuator, and connect it to the receiving-end of the cable.

Step 12
Connect the cable ends (with the optical attenuator, if used) to the plug-in units and connectors listed in the following table.

Table 69: Slot-19 Amplifier-to-DCM Fiber-Optic Cable Connections

From APMA-xxxx		To DCM[61]	
Shelf Slot	Connector	Shelf Slot	Connector
19	to DCF	DCM-2	OPT In[62]

60 If an in-line optical attenuator is required, it is placed at the **from DCF** connector.
61 **DCMs are housed in the SFD3 dispersion compensation shelf (FC9512SFD3).**
62 If an in-line optical attenuator is required, it is placed at the **OPT In** connector to the DCM unit.

Table 69: Slot-19 Amplifier-to-DCM Fiber-Optic Cable Connections (Cont.)

From APMA-xxxx		To DCM[61]	
Shelf Slot	Connector	Shelf Slot	Connector
19	from DCF	DCM-2	OPT Out

Step 13
Proceed to Step 17.

Install Slot-19 Loopback Cable

Step 14
Is the amplifier in slot 19 type APMA-L2C1 or APMA-ULC1?

If YES: from DCF
Connect a 12 dB optical attenuator, part number 956-130-5x12, to the **from DCF** connector of the amplifier plug-in unit. Then proceed to Step 15.

If NO:
An optical attenuator is not required. Proceed to Step 15.

Step 15
Obtain and clean one LC-LC fiber-optic cable.

Step 16
Connect the cable ends to the plug-in unit connectors listed in the following table.

Table 70: Slot-19 Amplifier Loopback Cable Connections

From APMA-xxxx		To APMA-xxxx	
Shelf Slot	Connector	Shelf Slot	Connector
19	to DCF	19	from DCF[63]

[61] **DCMs are housed in the SFD3 dispersion compensation shelf (FC9512SFD3).**
[63] If an in-line optical attenuator is required, it is placed at the **from DCF** connector.

Step 17
Are all NEs in the network turned up?

If YES:
Proceed to Make Network Connections.

Note: *You have completed the turn-up for the ILA node, but have not connected it to the network. Network connections are made after all nodes are turned up. Refer to* Figure 98.

If NO:
Repeat the turn-up procedures for the next NE. If the next NE is another ILA node, start at Apply Power and Install Fan Units. Otherwise, start at Apply Power and Install Fan Units.

✔ This procedure is complete.

5
Nodal Test Tool

In this chapter:

This chapter provides procedures to use the Nodal Test Tool for the FLASHWAVE® 7500 Core and ETSI Configuration applications.

5.1 About the Nodal Test Tool

Note: *Applies to: Core and ETSI Configurations*

This section provides information regarding the Nodal Test Tool for Release 7.1 and later.

The FLASHWAVE 7500 Nodal Test Tool is used to test for fiber connection loss and establish a baseline for the optical power levels using a wavelength transmitted through plug-in units in the optical shelves of Core or ETSI Configurations. Refer to Nodal Test Tool Prerequisites for specific configurations that support the Nodal Test Tool.

The Nodal Test Tool detects dirty fibers by taking power measurements from port to port. The tool measures the light power at both ends of the fibers to calculate the insertion fiber loss by subtracting OPR from OPT. The calculated insertion fiber loss value is compared with an expected deviation range to judge the fiber connectivities (from port to port). If the insertion fiber loss is within the expected deviation range, the test is judged successful (that is, the fiber is healthy). If the insertion fiber loss is not within the expected deviation range, the test is judged failed (fiber is not healthy).

Note: *Power levels (too low or too high) outside the acceptable deviation range are often an indication of dirty or misconnected fibers.*

The OPR-TEST-PATH command starts the Nodal Test Tool function. The RTRV-TEST-PATH command retrieves the fiber loss report after the Nodal Test Tool function has completed. Alternatively, the NETSMART® 500 Nodal Fiber Test wizard can be used in place of the commands.

The Nodal Test Tool can be used at system turn-up (when the NE is not in service) or for in-service testing (traffic exists on the NE). The following table shows a summary of the system turn-up and in-service Nodal Test Tool requirements.

Note: *Refer to Nodal Test Tool Prerequisites for more information on requirements for the Nodal Test Tool.*

Table 71: Requirements for System Turn-Up or In-Service Testing with Nodal Test Tool

Testing Situation	Requirements
System turn-up (NE not in service)	• Shelves are installed and connected according to work order and local practices. • At least one NEM plug-in unit is installed. • One or two amplifier plug-in units are installed (depending on configuration). • Amplifiers on the network side have loopback cables. • At least one OLC is installed. • At least one wavelength (cross-connect) is provisioned.
In-service (traffic exists on NE)	• The NE is provisioned and is in a working state. • System should be in an alarm free state. • The NE is handling traffic.

5.2 Nodal Test Tool Prerequisites

Caution: *Read the prerequisites section and the entire procedure before beginning the procedure. If you have any questions, call 1-800-USE-FTAC (1-800-873-3822).*

Supported Configurations

The following table shows the configurations that support the Nodal Test Tool and the type of testing that can be done with the Nodal Test Tool.

Note: *The Extension Configuration (Stand Alone Shelf [SAS]) does not support the Nodal Test Tool.*

Table 72: Configurations That Support Nodal Test Tool

Shelf Type	Supported Configurations	Supported Testing with Nodal Test Tool	
		System Turn-Up Test	In-Service Test
23-inch Universal Shelf (FC9682SHU3)	Core 2D-ROADM	Yes	Yes
	Core WSS ROADM	Yes	Yes
	Core WSS ROADM Multi-degree HUB (up to 8-degree)	Yes	Yes
	Core WSS ROADM Asymmetrical HUB (up to 12-degree)	No	Yes
	Core ILA	No	Yes
	Core Express	No	Yes
19-inch ETSI Front Access Shelf (FC9682SHU4)	ETSI 2D-ROADM	Yes	Yes
	ETSI WSS ROADM	Yes	Yes
	ETSI WSS ROADM Multi-degree HUB (up to 8-degree)	Yes	Yes
	ETSI ILA	No	Yes
	ETSI Express	No	Yes

Supported Fiber Connections

The following figures show the fiber connections for a Core/ETSI WSS ROADM configuration. The following table provides an index for the fiber connections shown in the figure and the fiber connections that support the Nodal Test Tool.

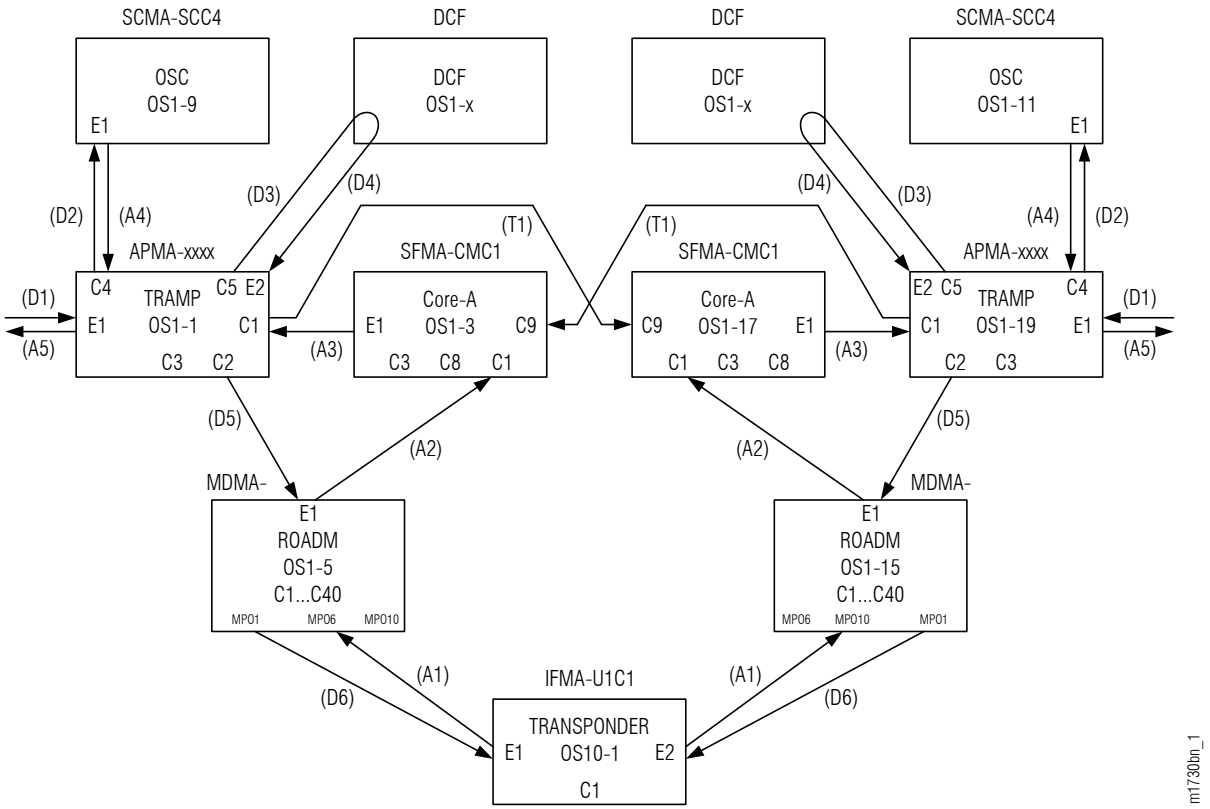


Figure 110: Fiber Connections for Core/ETSI WSS ROADM Configuration (Ring)

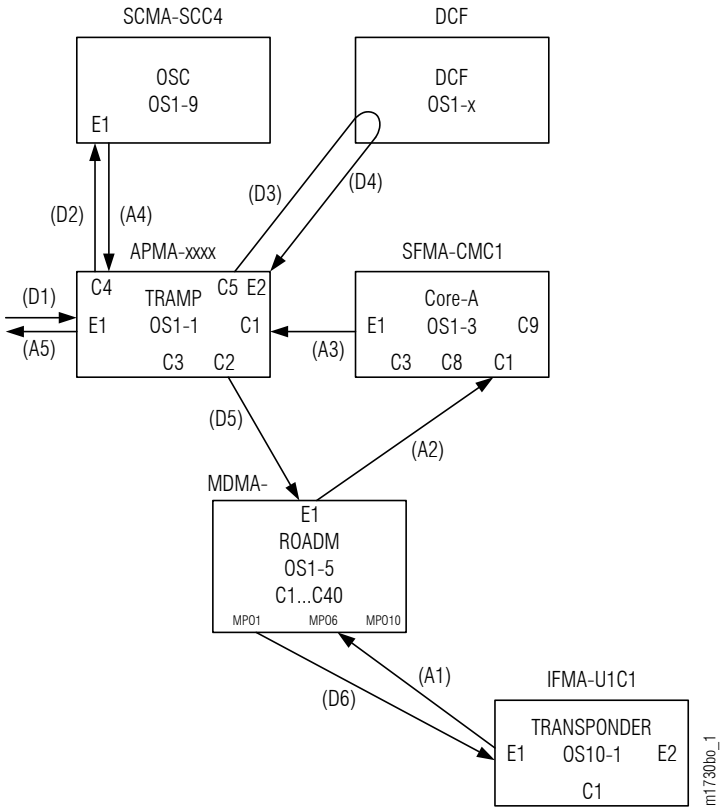


Figure 111: Fiber Connections for Core/ETSI WSS ROADM Configuration (Terminal)

Table 73: Supported Fiber Connections for Core/ETSI WSS ROADM Configuration

Fiber Connection Index for Core/ETSI WSS ROADM Configuration	Fiber Connections				Supported by Nodal Test Tool
	From		To		
	Equipment Name	Port Number	Equipment Name	Port Number	
D1/A5	APMA-xxxx	E1	APMA-xxxx[64]	E1	No
D2	APMA-xxxx[64]	C4	SCMA-SCC4	E1	No
D3	APMA-xxxx[64]	C5	DCF	n/a	No
D4	DCF[66]	n/a	APMA-xxxx[64]	E2	Yes
D5	APMA-xxxx[64]	C2	MDMA-RMC1	E1	Yes

64 Refer to General Requirements for the Nodal Test Tool for the amplifier units that support the Nodal Test Tool.
65 The SCMA-SCC4 unit does not have monitor points.
66 The DCF does not have monitor points.

Table 73: Supported Fiber Connections for Core/ETSI WSS ROADM Configuration (Cont.)

Fiber Connection Index for Core/ETSI WSS ROADM Configuration	Fiber Connections				Supported by Nodal Test Tool
	From		To		
	Equipment Name	Port Number	Equipment Name	Port Number	
D6	MDMA-RMC1	MPOn (n = 1... 10)	IFMA-Uxxx (Transponder)	E1/E2	No
T1	APMA-xxxx[64]	C1	SFMA-CMC1	E9	Yes
A1	IFMA-Uxxx (Transponder)	E1/E2	MDMA-RMC1	MPOn (n = 1... 10)	No
A2	MDMA-RMC1	E1	SFMA-CMC1	C1	Yes
A3	SFMA-CMC1	E1	APMA-xxxx[64]	C1	Yes
A4	SCMA-SCC4[65]	E1	APMA-xxxx[64]	C4	No

The following figures show the fiber connections for a Core/ETSI 2D-ROADM configuration. The following table provides an index for the fiber connections shown in the figure and the fiber connections that support the Nodal Test Tool.

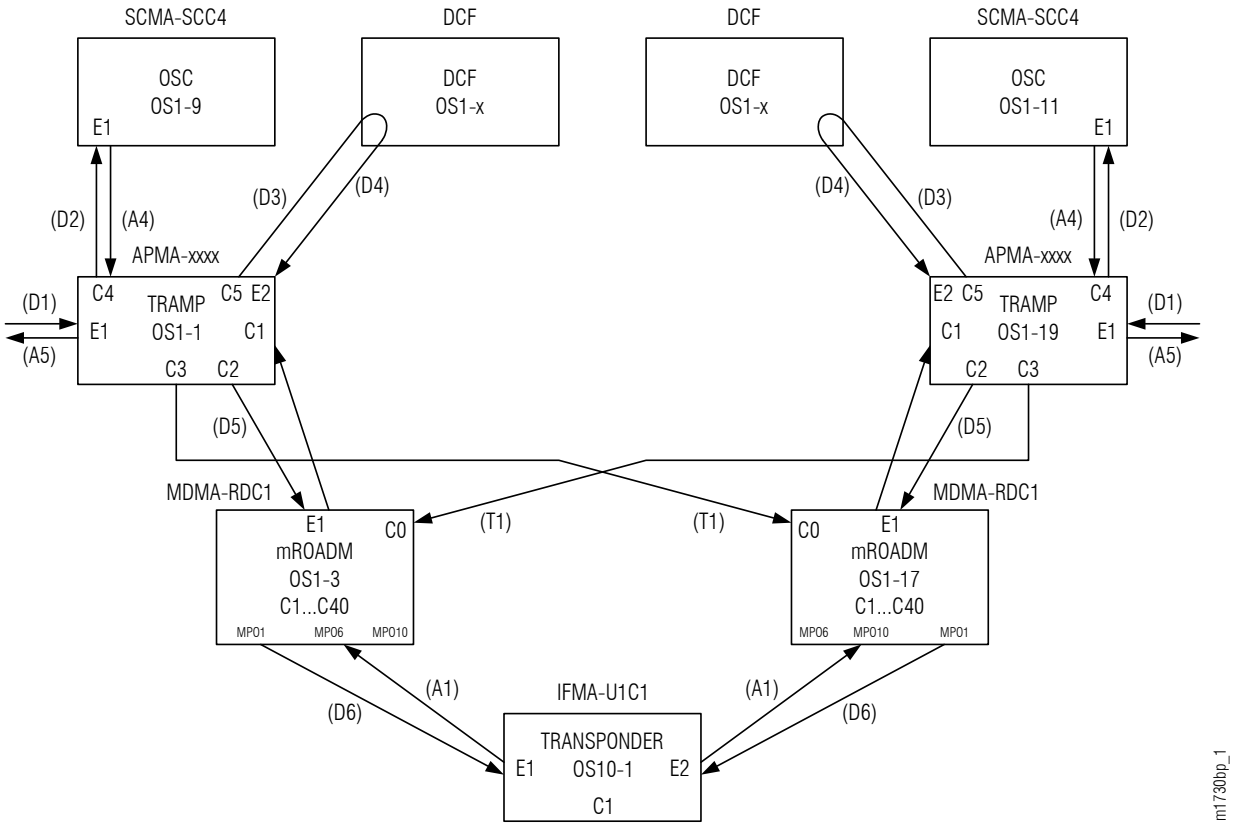


Figure 112: Fiber Connections for Core/ETSI 2D-ROADM Configuration (Ring)

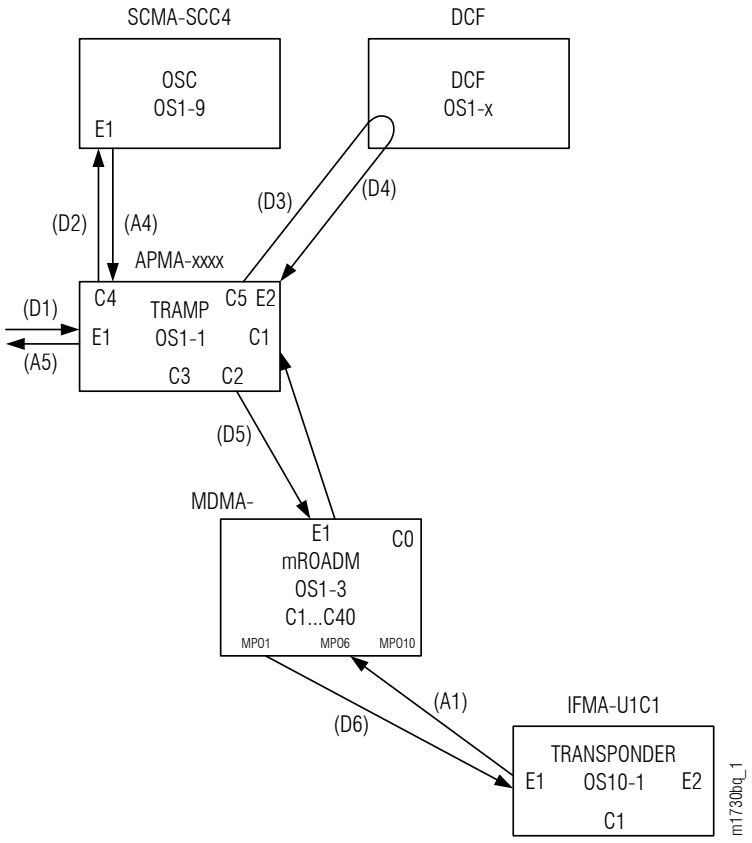


Figure 113: Fiber Connections for Core/ETSI 2D-ROADM Configuration (Terminal)

Table 74: Supported Fiber Connections for Core/ETSI 2D-ROADM Configuration

Fiber Connection Index for Core/ETSI 2D-ROADM Configuration	Fiber Connections				Supported by Nodal Test Tool
	From		To		
	Equipment Name	Port Number	Equipment Name	Port Number	
D1/A5	APMA-xxxx	E1	APMA-xxxx[67]	E1	No
D2	APMA-xxxx[67]	C4	SCMA-SCC4	E1	No
D3	APMA-xxxx[67]	C5	DCF	n/a	No
D4	DCF[69]	n/a	APMA-xxxx[67]	E2	Yes
D5	APMA-xxxx[67]	C2	MDMA-RDC1	E1	Yes

[67] Refer to General Requirements for the Nodal Test Tool for the amplifier units that support the Nodal Test Tool.
[68] The SCMA-SCC4 unit does not have monitor points.
[69] The DCF does not have monitor points.

Table 74: Supported Fiber Connections for Core/ETSI 2D-ROADM Configuration (Cont.)

Fiber Connection Index for Core/ETSI 2D-ROADM Configuration	Fiber Connections				Supported by Nodal Test Tool
	From		To		
	Equipment Name	Port Number	Equipment Name	Port Number	
D6	MDMA-RDC1	MPOn (n = 1... 10)	IFMA-Uxxx (Transponder)	E1/E2	No
T1	APMA-xxxx[67]	C3	MDMA-RDC1	C0	Yes
A1	IFMA-Uxxx (Transponder)	E1/E2	MDMA-RDC1	MPOn (n = 1... 10)	No
A3	MDMA-RDC1	E1	APMA-xxxx[67]	C1	Yes
A4	SCMA-SCC4 [68]	E1	APMA-xxxx[67]	C4	No

The following figure shows the fiber connections for a Core/ETSI ILA configuration. The following table provides an index for the fiber connections shown in the figure and the fiber connections that support the Nodal Test Tool.

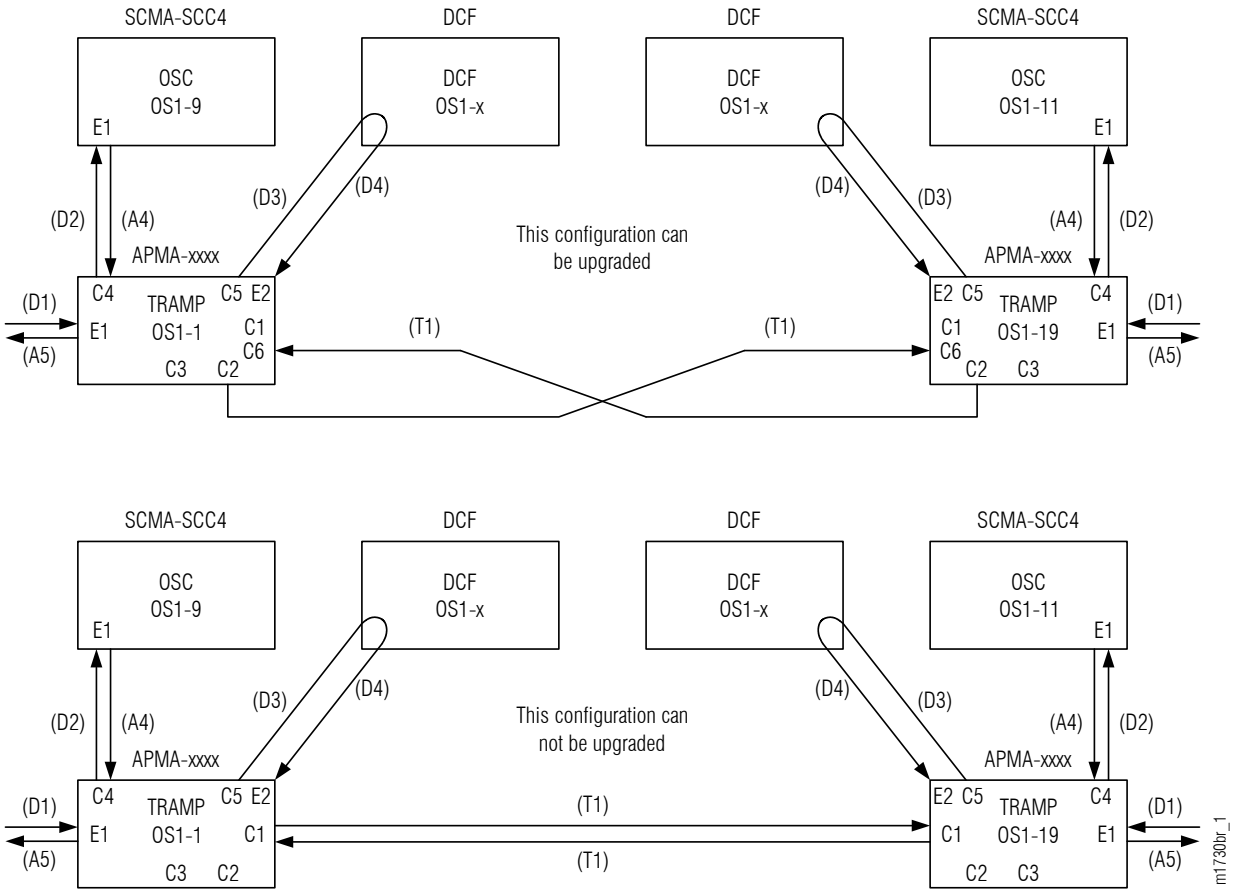


Figure 114: Fiber Connections for Core/ETSI ILA Configuration

Table 75: Supported Fiber Connections for Core/ETSI ILA Configuration

Fiber Connection Index for Core/ETSI ILA Configuration	Fiber Connections				Supported by Nodal Test Tool
	From		To		
	Equipment Name	Port Number	Equipment Name	Port Number	
D1/A5	APMA-xxxx	E1	APMA-xxxx[70]	E1	No
D2	APMA-xxxx[70]	C4	SCMA-SCC4	E1	No
D3	APMA-xxxx[70]	C5	DCF	n/a	No

70 Refer to General Requirements for the Nodal Test Tool for the amplifier units that support the Nodal Test Tool.
71 The SCMA-SCC4 unit does not have monitor points.
72 The DCF does not have monitor points.

Table 75: Supported Fiber Connections for Core/ETSI ILA Configuration (Cont.)

Fiber Connection Index for Core/ETSI ILA Configuration	Fiber Connections				Supported by Nodal Test Tool
	From		To		
	Equipment Name	Port Number	Equipment Name	Port Number	
D4	DCF[72]	n/a	APMA-xxxx[70]	E2	Yes
T1	Release 4.3 APMA-xxxx[70]	C1	Release 4.3 APMA-xxxx[70]	C1	Yes
	Release 4.3 APMA-xxxx[70]	C1	Release 5.1 APMA-xxxx[70] (operating in Rel. 4.3 mode)	C1	Yes
	Release 5.1 APMA-xxxx[70] (operating in Rel. 4.3 mode)	C1	Release 4.3 APMA-xxxx[70]	C1	Yes
	Release 5.1 APMA-xxxx[70] (operating in Rel. 4.3 mode)	C1	Release 5.1 APMA-xxxx[70] (operating in Rel. 4.3 mode)	C1	Yes
	Release 5.1 APMA-xxxx[70] (operating in Rel. 5.1 mode)	C2	Release 5.1 APMA-xxxx[70] (operating in Rel. 5.1 mode)	C6	Yes
	Release 6.1 or later APMA-xxxx	C1	Release 6.1 or later APMA-xxxx	C1	Yes
A4	SCMA-SCC4 [71]	E1	APMA-xxxx	C4	No

The following figure shows the fiber connections for a Core/ETSI Express configuration. The following table provides an index for the fiber connections shown in the figure and the fiber connections that support the Nodal Test Tool.

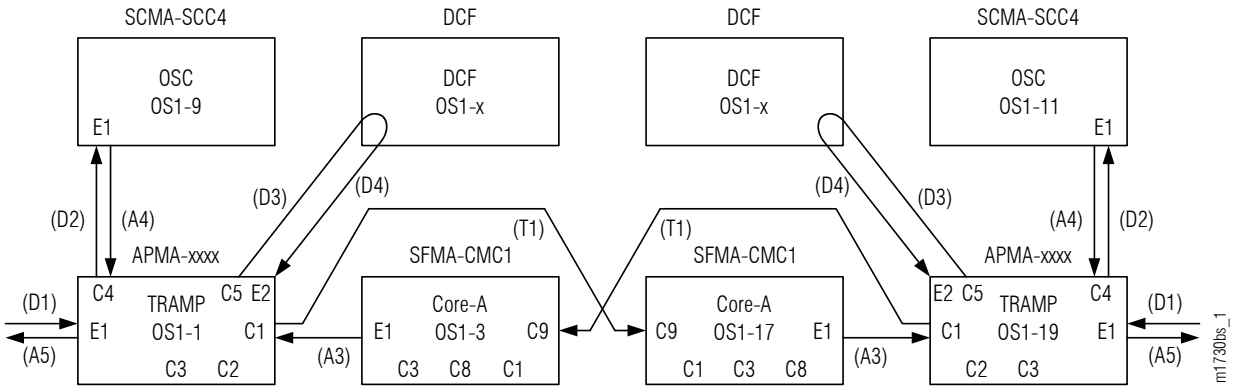


Figure 115: Fiber Connections for Core/ETSI Express Configuration

Table 76: Supported Fiber Connections for Core/ETSI Express Configuration

Fiber Connection Index for Core/ETSI Express Configuration	Fiber Connections				Supported by Nodal Test Tool
	From		To		
	Equipment Name	Port Number	Equipment Name	Port Number	
D1/A5	APMA-xxxx	E1	APMA-xxxx[73]	E1	No
D2	APMA-xxxx[73]	C4	SCMA-SCC4	E1	No
D3	APMA-xxxx[73]	C5	DCF	n/a	No
D4	DCF[75]	n/a	APMA-xxxx[73]	E2	Yes
T1	APMA-xxxx[73]	C1	SFMA-CMC1	C9	Yes
A3	SFMA-CMC1	E1	APMA-xxxx[73]	C1	Yes
A4	SCMA-SCC4 [74]	E1	APMA-xxxx[73]	C4	No

The following figure shows the fiber connections for a Core/ETSI Multi-degree HUB configuration. The following table provides an index for the fiber connections shown in the figure and the fiber connections that support the Nodal Test Tool.

[73] Refer to General Requirements for the Nodal Test Tool for the amplifier units that support the Nodal Test Tool.
[74] The SCMA-SCC4 unit does not have monitor points.
[75] The DCF does not have monitor points.

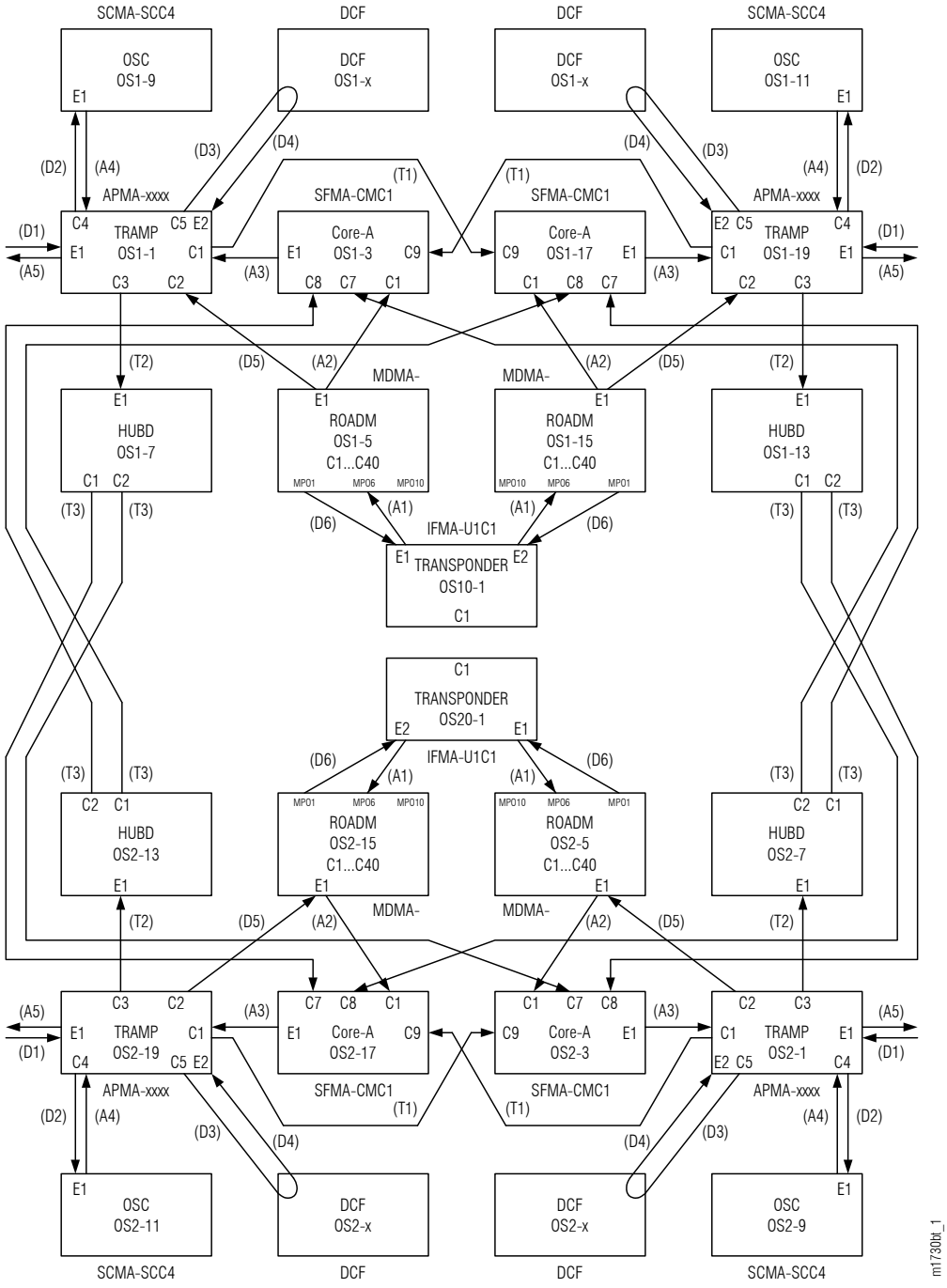


Figure 116: Fiber Connections for Core/ETSI Multi-Degree HUB Configuration

Table 77: Supported Fiber Connections for Core/ETSI Multi-Degree HUB Configuration

Fiber Connection Index for Core/ETSI Multi-Degree HUB Configuration	Fiber Connections				Supported by Nodal Test Tool
	From		To		
	Equipment Name	Port Number	Equipment Name	Port Number	
D1/A5	APMA-xxxx	E1	APMA-xxxx[76]	E1	No
D2	APMA-xxxx[76]	C4	SCMA-SCC4	E1	No
D3	APMA-xxxx[76]	C5	DCF	n/a	No
D4	DCF[78]	n/a	APMA-xxxx[76]	E2	Yes
D5	APMA-xxxx[76]	C2	MDMA-RMC1	E1	Yes
D6	MDMA-RMC1	MPOn (n = 1... 10)	IFMA-Uxxx (Transponder)	E1/E2	No
T1	APMA-xxxx[76]	C1	SFMA-CMC1	C9	Yes
T2	APMA-xxxx[76]	C3	SFMA-CDC1	E1	Yes
T3	SFMA-CDC1	C1...C6	SFMA-CMC1	C3...C8	Yes
A1	IFMA-Uxxx (Transponder)	E1/E2	MDMA-RMC1	MPOn (n = 1... 10)	No
A2	MDMA-RMC1	E1	SFMA-CMC1	C1	Yes
A3	SFMA-CMC1	E1	APMA-xxxx[76]	C1	Yes
A4	SCMA-SCC4 [77]	E1	APMA-xxxx[76]	C4	No

General Requirements for the Nodal Test Tool

- The FLASHWAVE 7500 node is running Release 7.1 or later.
- The optical shelf or shelves to be tested are installed and equipped, including the following plug-in units:
  - Two OSC plug-in units (SCMA-SCC4) for ROADM configuration. The OSC units occupy slots 9 and 11. When testing in the FLASHWAVE 7500 ETSI shelf, OSC units are placed in slots 13 and 15.
  - Two SCMA-SCC4 units can be used in a linear end node configuration; however, the SCMA-SCC4 unit on the unpopulated side of the shelf provides additional nonvolatile memory storage. Refer to your company's

[76] Refer to General Requirements for the Nodal Test Tool for the amplifier units that support the Nodal Test Tool.
[77] The SCMA-SCC4 unit does not have monitor points.
[78] The DCF does not have monitor points.

recommended practices for populating SCMA-SCC4 units for linear end nodes since these nodes may be populated with one or two units.

- LAM units FC9682LAMx, 2 for terminal and 4 for full OADM shelf.

  Note: *In Linear end node configurations, unused slots should be equipped with filler panels.*

  Warning: *The Nodal Test Tool must **NOT** be used to test Raman amplifiers (APMA-DRC1). Attempting to use this tool with these units will damage the laser on the APMA-DRC1 amplifiers.*

- Two amplifier plug-in units are required for ROADM testing. In the Core configuration, the amplifiers populate slots 1 and 19. In the FLASHWAVE 7500 ETSI configuration, the amplifiers are in slots 1 and 11. One amplifier plug-in unit is used in the linear test configuration. Only the following amplifiers are supported:
  - APMA-M2C1 (FC9682M2C1-I02 or later)
  - APMA-L2C1 (FC9682L2C1-I03 or later)
  - APMA-ULC1 (FC9682ULC1 all issues)
  - APMA-ULU1 (FC9682ULU1 all issues)
  - APMA-M2U1 (FC9682M2U1 all issues)
  - APMA-MHU1 (FC9682MHU1 all issues)
  - APMA-MHU2 (FC9682MHU2 all issues)
- Fan units are installed.
- MPO cables FC9682MP11, 2 for terminal and 4 for OADM shelf.

ROADM/ HUB Configuration Requirements for the Nodal Test Tool

- Two WSS Switch plug-in units (SFMA-CMC1) are needed for ROADM configuration. In the 23-inch (or ANSI) shelf, the SFMA-CMC1 units occupy slots 3 and 17. In the FLASHWAVE 7500 ETSI shelf, the WSS Switch is in slots 3 and 9. One WSS Switch plug-in units is needed for Linear end node configurations.
- Two Mux/Demux plug-in units (MDMA-RMC1) for ROADM configuration. In the 23-inch (or ANSI) shelf, the MDMA-RMC1 units occupy slots 5 and 15. In the ETSI configuration, these units are in slots 5 and 7. One mux/demux plug-in unit is required for Linear configuration. One Mux/Demux plug-in unit is needed for linear end node configuration.
- If the node is equipped with SFMA-CDC1 HUB drop units, the user can run the HUB connectivity test to verify optical connections between the optical Core shelves and the subtended optical Core shelves. This same test option is available to verify the connections in ETSI HUB configurations. These tests should be run after verifying the optical shelves.

2D-ROADM Configuration Requirements for the Nodal Test Tool

The 2D-ROADM configuration replaces the separate Mux/Demux and switch units with an SFMA-RDC1 (2D-ROADM unit). Two SFMA-RDC1 units in slots 3 and 17 are required for the 2D-ROADM configuration. In the FLASHWAVE 7500 ETSI shelf, the SFMA-RDC1 units occupy slots 3 and 9. One SFMA-RDC1 is required in slot 3 or 17 for linear applications, or slots 3 or 9 in a FLASHWAVE 7500 ETSI shelf.

Additional Equipment Requirements

The following table lists additional FLASHWAVE 7500 Release 7.1 and later system components required to use the Nodal Test Tool.

Table 78: Additional Equipment Requirements for Nodal Test Tool

Equipment	Part Number	Description	Quantity
IFMA-xxxx	FC9682xxxx	Any OLC unit applicable for the configuration ***Note:*** *Refer to Optical Line Cards and SFP/XFP Modules for information on applicable OLC units.*	1 (minimum requirement)
LAM units	FC9682LAMx	LAM plug-in units ***Note:*** *The LAM units are used to connect the IFMA-xxxx to the system.*	2 (linear) 4 (full OADM shelf)
MPO cables	FC9682MP11	MPO cables ***Note:*** *The MPO cables are used to connect the IFMA-xxxx to the system.*	2 (linear) 4 (full OADM shelf)
LC-to-LC cable assembly	27-100-00.5	LC-to-LC cable assembly (0.5 meter) for amplifier OPT OUT and OPT IN connectors	2 (as required)
Attenuator, 20 dB	37-466-612	20 dB attenuator (LC connectors) required for loopback of APMA-L2C1, APMA-ULU1, and APMA-MHU1 amplifier plug-in units. For loopback of APMA-ULC1 amplifier plug-in units, combine with 10 dB attenuator for a total of 30 dB attenuation. For loopback of APMA-M2C1/M2U1 or APMA-L2C1 plug-in units, no attenuation is required.	2 (as required)
Attenuator, 10 dB	37-465-612	10 dB attenuator (LC connectors) used with 20 dB attenuator (for 30 dB total attenuation) for loopback of APMA-ULC1 amplifier plug-in units.	2 (as required)

Documentation Requirements

The following documentation should be on-site and available when performing this procedure:

- FLASHWAVE 7500 Release 9.1 documentation set, FNC-7500-0091-010

  If using for system turn-up, the following documents are required to complete this procedure:

  - Core configuration–Introduction to System Turn-Up Core Configuration
  - ETSI configuration–Introduction to System Turn-Up Small and ETSI Configuration
  - Core and ETSI configuration–Introduction to System Operations Service Provisioning
  - Core and ETSI configuration–Responding to Alarms and Conditions
- NETSMART® 500 Version 4.3 User Guide, FNC-0500-0043-010
- Fiber Cable Handling
- Engineering Work Order (referred to as Work Order) as required by local practices and standards

5.3 Using Nodal Test Tool for In-Service Testing

Perform the following procedure to test fiber connections and baseline the optical power levels for a in-service node using the Nodal Test Tool.

Step 1
Log on the NE. If already logged on, proceed to the next step.

Note: *Up to 11 users (including operations support system [OSS]) can log on a single node for monitoring or provisioning purposes.*

Note: *The target identifier (TID), user identifier (UID), and private identifier (PID) values apply to initialized (factory default) systems. Consult your Network System Administrator for specific TID, UID, and PID values.*

Note: *The following table includes brief instructions for setting up the craft interface. For detailed information, refer to* Setting Up Craft Interface (TL1 Session through TERM1) *through* Setting Up Craft Interface (NETSMART 500 Session through TERM2).

TL1	NETSMART 500
Start a terminal or terminal emulator program (for example, HyperTerminal). For **TERM1** (Serial): Press CTRL+X. For **TERM2** (TCP/IP): Establish a Telnet session using IP address 192.168.1.1 and default port 23. The Welcome screen opens. Press 3 for TL1.	To launch the NETSMART 500 user interface from a Microsoft® Windows® platform, select the following from the Windows taskbar: *Start* ▸ *All Programs* ▸ *Fujitsu* ▸ *NETSMART 500* The NETSMART 500 Dashboard opens. Click the Logon icon, or select : *NE* ▸ *Logon* ***Note:*** *If this is an Enhanced Security System, a warning message appears. You must read and agree to the conditions to access the system. Click I Agree to continue.* The NE Logon dialog box opens. Make the following selections:

TL1	NETSMART 500

`ACT-USER:TID:UID:CTAG::PID;`
TID:
• FUJITSU (Target identifier of the node; 7 to 20 non–case-sensitive, alphanumeric characters)
UID:
• ROOT (User identifier; 4 to 10non–case-sensitive, alphanumeric characters)
PID:
• ROOT/(Route66K) (Private identifier associated with the UID. For the basic mode, the PID must have 6 to 10 characters with at least one non–case-sensitive, alphabetic character and one nonalphabetic character such as a number or ! @ # $ % ^ ( ) _ + | ~ { } [ ] ? or -. For the enhanced security mode, the PID must have 10 to 20 characters with at least two characters from each of four groups: lowercase letters, uppercase letters, numbers, and special characters ! @ # $ % ^ & ( ) or *. The enhanced security PID can also include special characters _ + | { } [ ] or ~. The PID must not contain the associated UID.)
Example:
`ACT-USER:FUJITSU:ROOT:CTAG::ROOT;`
	For **TERM1** (Serial):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: Serial
	Comm. Port: COMx (for example, COM2)
	Configure: use default[79]
	
	For **TERM2** (TCP/IP):
	TID: FUJITSU
	User ID: ROOT
	Password: ROOT/(Route66K)
	Conn. Mode: TCP/IP
	IP Address: 192.168.1.1
	Port: 2024
	
	Click Logon.
	The NETSMART 500 NE View opens.
	The Security Message dialog box opens.
	Click OK.
	Note: *Refer to FNC-0500-0311-010, NETSMART 500 User Guide, for complete instructions on starting the NETSMART 500 user interface.*

Step 2
Retrieve all alarms and conditions.

TL1	NETSMART 500

`RTRV-COND-ALL:TID::CTAG;`
Example:
`RTRV-COND-ALL:FUJITSU::CTAG;`
	NE ▸ *Alarms*
	The Active Alarms window opens.
	View ▸ *Filter*
	The Alarm Filter dialog box opens.
	Ensure that all Fault Types and Severity Levels are selected in the Alarm Filter dialog box.
	Click Close.
	Verify the condition in the Active Alarms window.
	Close the Active Alarms window.

[79] The default serial port settings are recommended: baud rate– 9600, parity– none, data bits– 8, stop bits– 1.

Step 3
Are any active alarms or conditions being reported on the NE?

If YES:
Clear all alarms and standing conditions before continuing this procedure. Refer to the *Maintenance and Trouble Clearing* practice. After the alarms and conditions are cleared, go to the next step.

Note: *If the provided procedures do not clear an alarm or condition, contact the Fujitsu Technical Assistance Center at 1-800-USE-FTAC (1-800-873-3822).*

If NO:
Go to the next step.

Step 4
Retrieve and verify that the cross-connects have been provisioned for the fiber connections.

Note: *At least one cross-connect is required to be provisioned on the fiber to use the Nodal Test Tool.*

TL1	NETSMART 500

`RTRV-CRS-WCH:TID:fromAID,toAID:CTAG;`
fromAID, toAID:
 	
The AID parameters can be one of the following:
• **ALL**, **ALL**
• ALL, toAID
• fromAID, ALL
• fromAID, toAID
 	
Refer to the Retrieve Cross-Connect, WCH (RTRV-CRS-WCH) for a description of the AID values.
 	
Example:
`RTRV-CRS-WCH:FUJITSU:ALL:CTAG;`
	NE ▸ *Graphical Cross-Connects*
	
	The Cross-Connects window opens.
	
	In the Cross-Connects window, verify that the cross-connect lines are solid.
	
	Close the Cross-Connects window.

Step 5
Have cross-connects been provisioned for the fiber connections?

Note: *Any channel can be used for cross-connects in the Nodal Test Tool.*

If YES:
Go to the next step.

If NO:
Go to Introduction to System Operations Service Provisioning to provision cross-connects for the fiber connection.

Step 6
Start the nodal fiber test.

TL1	NETSMART 500

`OPR-TEST-PATH:[TID]:[fromAID][,toAID]:CTAG;`
fromAID, toAID:
The AID parameters can be one of the following:
• **ALL**, **ALL**
• ALL, toAID
• fromAID, ALL
• fromAID, toAID
Refer to the Operate Test Path (OPR-TEST-PATH) for a description of the AID values.
Example:
`OPR-TEST-PATH:FUJITSU::CTAG;`
	Reports ▸ *Fiber Test*
	The Fiber Test report window opens.

Step 7
Retrieve the fiber loss report.

TL1	NETSMART 500

`RTRV-TEST-PATH:[TID]:[fromAID][,toAID]:CTAG;`
fromAID, toAID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-TEST-PATH:FUJITSU::CTAG;`
	Reports ▸ *Fiber Test*
	The Fiber Test report window opens.
	If fiber baseline test is required for a specific connection, highlight a connection in the Fiber Test report window, right-click, and select Operations Dialog from the pop-up menu.
	The Operations dialog box opens.
	Select the desired connections.
	Click Operate.
	Close the Operations dialog box.

Step 8
Review the fiber loss report for fiber connections that failed the test. The following figures provide an example of the fiber loss report generated by the Nodal Test Tool.

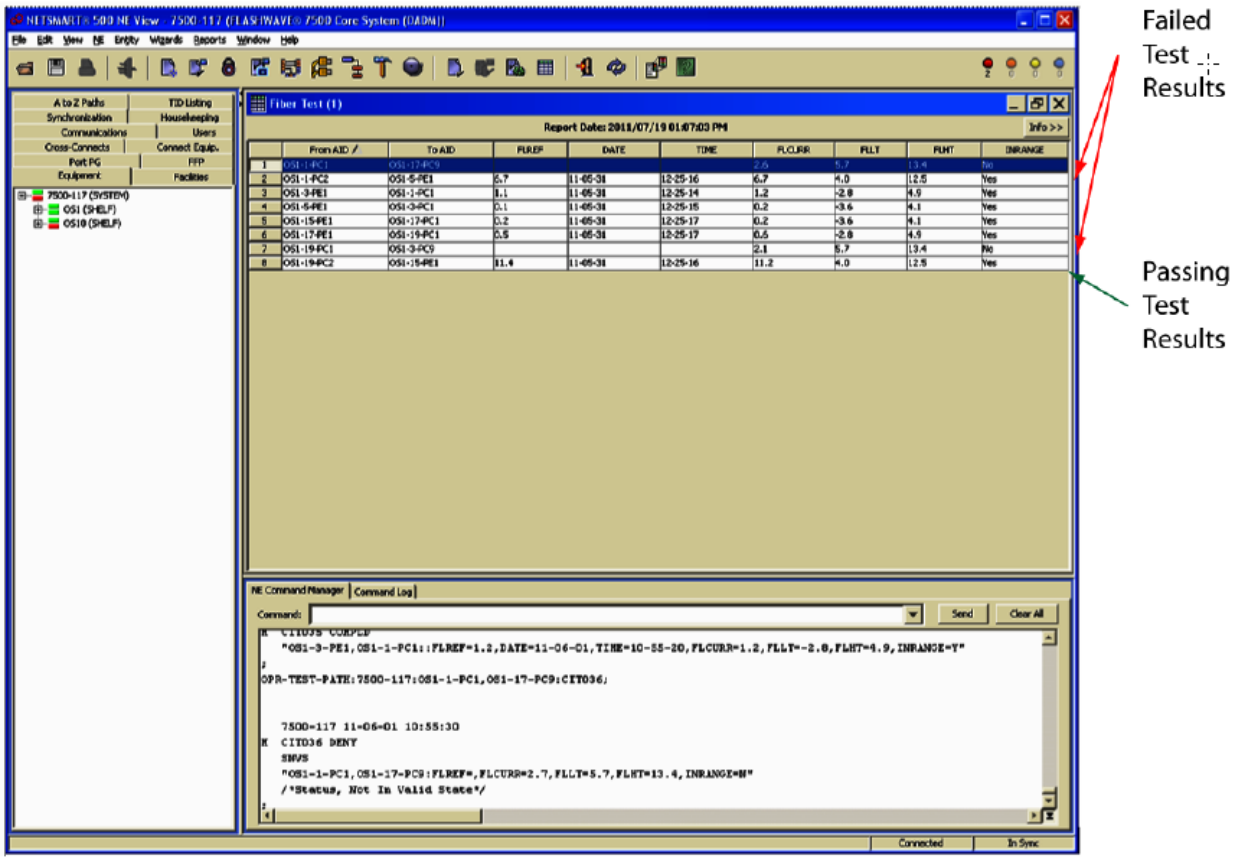


Figure 117: NETSMART 500 Fiber Loss Test Results Screen

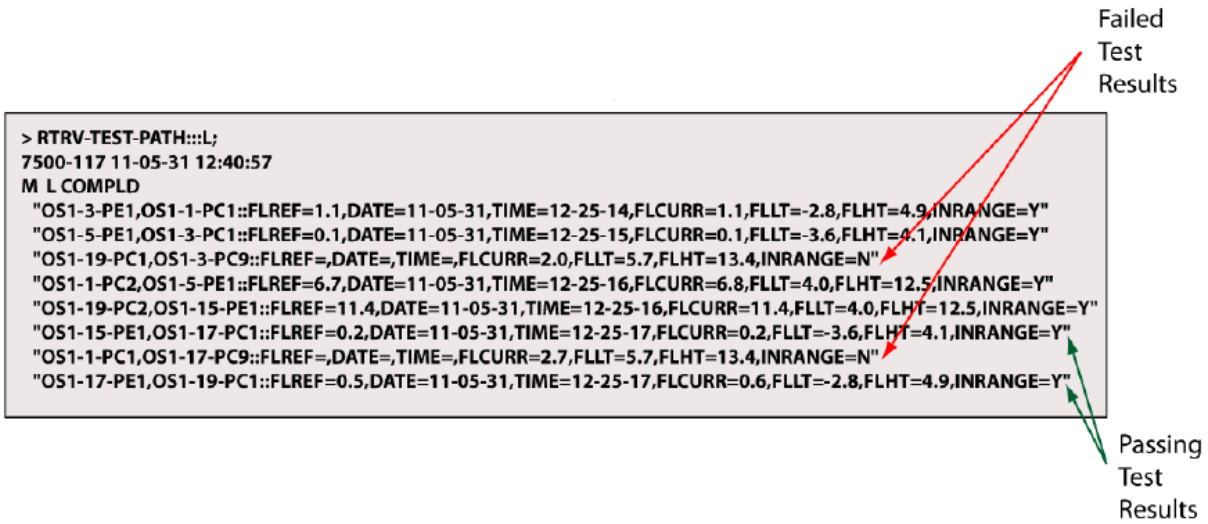


Figure 118: TL-1 Fiber Loss Test Results Screen

Step 9
Did any fibers fail the test?

If YES:
Go to the next step.

If NO:
This procedure is complete.

Danger: *Never look into the end of a fiber-optic cable. The equipment contains high-power optical laser devices that transmit light at a dangerous level. Permanent eye damage or blindness could occur. Follow local safety precautions regarding fiber-optic cables.*

Danger: *Never handle exposed fiber with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove. Follow local safety precautions regarding fiber.*

Step 10
For each fiber connection that failed the test, clean the optical connectors on the fiber cable (refer to *Fiber Cable Handling*), verify that the fiber is properly connected to the plug-in unit, and then repeat the test beginning with Step 6.

If cleaning the optical connectors and verifying that the fiber is properly connected to the plug-in unit do not resolve the fiber failure, call 1-800-USE-FTAC (1-800-873-3822) for technical assistance.

5.4 Using Nodal Test Tool for System Turn-Up

In this section:

This procedure applies to: *Core and ETSI Configurations*

Warning: *Follow all admonishments (Dangers, Warnings, and Cautions) in this procedure and the associated documentation listed in Nodal Test Tool Prerequisitesto prevent service interruptions (if applicable), damage to equipment, or harm to personnel.*

Warning: *The Nodal Test Tool must **NOT** be used to test Raman amplifiers (APMA-DRC1). Attempting to run this procedure with these units will damage the laser on the APMA-DRC1 amplifiers.*

Attention: *When entering TL1 commands or NETSMART 500 steps, refer to Introduction to TL1 Commands for information about preconditions, postconditions, AIDs, and parameters.*

Perform the following procedure to test fiber connections and baseline the optical power levels at system turn-up using the Nodal Test Tool.

5.4.1 Prepare and Configure the Node for Fiber Testing (If Necessary)

Step 1
Has the node already been equipped and fibered according to a work order, and is fiber testing the only required task?

If YES:
Go to the next step.

If NO:
Go to Step 3.

Step 2
Does the equipped and fibered NE meet the prerequisites listed in Nodal Test Tool Prerequisites?

If YES:
Go to Install Loopback Cables on Slot 1 Amplifier (If Installed).

If NO:
Go to the next step.

Step 3
Follow the procedures listed in the following table to prepare and configure the node for fiber testing.

Note: *Some procedures listed in the table may have been performed previously because of a work order.*

Table 79: Configuration Procedures to Provision Node

Task No.	Task Name	Document and Procedure	
		Core Configuration	ETSI Configuration
1	Verify shelf labeling and intershelf connections.	Verify Shelf Labeling, Verify LAN and RICC Cable Connections, Apply Power, and Install Fan Units	Verify Shelf Labeling, Verify LAN and RICC Cable Connections, and Install Fan Units
2	Install shelf processors.	Install Primary NE Management Units in Shelf OS1, and Configure Shelf OS1 as the Main Optical Shelf	Install NEM Units and Configure Main Optical Shelf
3	Create Auxiliary shelf, and install shelf processors.	Create Subtending Shelves and Install Shelf Processors	Create Subtending Shelves and Install Shelf Processors
4	Provision optical equipment.	Provision Optical Shelf Equipment and Facilities	Provision Optical/ILA Shelf Equipment and Facilities
5	Install intrashelf fiber-optic cables.	Install Intrashelf Fiber-Optic Cables	Interconnect Amplifier and OSC Units
			Install WSS System Cables
			Install 2D-ROADM System Cables
6	Install LAMs and MPO connections.	Install LAMs and MPO Connections	Install LAMs and MPO Connections
7	Install and provision the required OLC plug-in unit. ***Note:*** *If you have not received a work order that specifies an OLC, use any OLC unit applicable for the configuration.*	Install and Manually Provision the OLC	

Table 79: Configuration Procedures to Provision Node (Cont.)

Task No.	Task Name	Document and Procedure	
		Core Configuration	ETSI Configuration
8	Create the service facility for OLC. ***Note:*** *If you have not received a work order that specifies a facility, any facility is applicable for fiber testing.*	Create the OLC Facilities Manually	
9	Create cross-connect for the OLC. ***Note:*** *If you have not received a work order that specifies a wavelength/channel, any wavelength/channel is applicable for fiber testing.*	Provision OLC Adds and Drops ***Attention:*** *If the Nodal Fiber Test Wizard will be used for testing do not perform task 9 (creating cross-connects).*	

5.4.2 Install Loopback Cables on Slot 1 Amplifier (If Installed)

Step 1
Obtain and clean an LC-LC fiber-optic cable?

Step 2
Is an Amplifier installed in slot 1 of the shelf?

If YES:
Go to Step 3.

If NO:
Go to Install Loopback Cables on Slot 19 or 11 Amplifier (If Installed).

Step 3
Is the Amplifier in slot 1 an APMA-L2C1, APMA-ULC1, APMA-MHU1, or APMA-ULU1 unit?

If YES:
Attenuation is required. Go to Step 4.

If NO:
Attenuation is not required. Go to Step 5.

Step 4
Install the loopback cable with attenuation as follows:

a) Obtain and clean attenuators (if attenuators are required).

   Insert one 20 dB attenuator when testing with the APMA-L2C1, APMA-ULU1, and APMA-MHU1 amplifiers. Insert the attenuator(s) into the OPT IN connector of the APMA-xxxx plug-in unit in slot 19 or 11 of the shelf under test (OSn, n = 1...4). When testing with the APMA-ULC1 amplifier, insert one 20 dB attenuator into the OPT IN port and one 10 dB attenuator into the OPT OUT port. No attenuator is required for APMA-M2C1/M2U1 or APMA-L2C1 plug-in units.

b) Using LC-LC fiber-optic cable, connect the attenuator to connector OPT OUT of the same APMA-xxxx plug-in unit.

c) Go to Install Loopback Cables on Slot 19 or 11 Amplifier (If Installed).

Step 5
Install one LC-LC loopback cable (without attenuation) as follows:

a) Connect one end of the cable to connector OPT IN of the amplifier plug-in unit in slot 1 of the shelf under test (OSn, n = 1...4).

b) Connect the other end of the cable to connector OPT OUT of the same amplifier plug-in unit.

c) Go to Install Loopback Cables on Slot 19 or 11 Amplifier (If Installed).

5.4.3
Install Loopback Cables on Slot 19 or 11 Amplifier (If Installed)

Note: *Use slot 19 for Core configuration and slot 11 for ETSI configuration.*

Step 1
Obtain and clean an LC-LC fiber-optic cable?

Step 2
Is an Amplifier installed in slot 19 or 11 of the shelf?

If YES:
Go to Step 3.

If NO:
Go to Step 6.

Step 3
Is the Amplifier in slot 19 or 11 an APMA-L2C1, APMA-ULC1, APMA-MHU1, or APMA-ULU1 unit?

If YES:
Attenuation is required. Go to Step 4.

If NO:
Attenuation is not required. Go to Step 5.

Step 4
Install the loopback cable with attenuation as follows:

a) Obtain and clean attenuators (if attenuators are required).

   Insert one 20 dB attenuator when testing with the APMA-L2C1, APMA-ULU1, and APMA-MHU1 amplifiers. Insert the attenuator(s) into the OPT IN connector of the APMA-xxxx plug-in unit in slot 19 or 11 of the shelf under test (OSn, n = 1...4). When testing with the APMA-ULC1 amplifier, insert one 20 dB attenuator into the OPT IN port and one 10 dB attenuator into the OPT OUT port. No attenuator is required for APMA-M2C1/M2U1 or APMA-L2C1 plug-in units.

b) Using LC-LC fiber-optic cable connect attenuator to connector OPT OUT of the same APMA-xxxx plug-in unit.

c) Go to Step 6.

Step 5
Install one LC-LC loopback cable (without attenuation) as follows:

a) Connect one end of the cable to connector OPT IN of the amplifier plug-in unit in slot 1 of the shelf under test (OSn, n = 1...4).

b) Connect the other end of the cable to connector OPT OUT of the same amplifier plug-in unit.

Step 6
Repeat steps in Prepare and Configure the Node for Fiber Testing (If Necessary) through Step 5 in this subprocedure for each shelf equipped with amplifier units and fibered for testing. Then proceed to the next step.

Step 7
Do you want to use the NETSMART 500 Nodal Fiber Test Wizard to perform the fiber testing?

Note: *NETSMART® 500 Version 4.3 or later is required to use the Nodal Test Tool.*

If YES:
Go to Nodal Fiber Test Wizard.

If NO:
Proceed to Step 8.

Step 8
Was an OLC installed and provisioned in Step 3 in Prepare and Configure the Node for Fiber Testing (If Necessary) or previously provisioned according to a work order?

Note: *At least one OLC must be installed and provisioned to use the Nodal Test Tool.*

If YES:
Proceed to Step 9.

If NO:
Go to Table 79, and perform task number 7 to install and provision the OLC. Then proceed to Step 9.

Step 9
Were a service facility and wavelength provisioned in Step 3 in Prepare and Configure the Node for Fiber Testing (If Necessary) or previously provisioned according to a work order for the OLC?

Note: *At least one wavelength must be provisioned to use the Nodal Test Tool.*

If YES:
Proceed to Step 10.

If NO:
Go to Table 79, and perform task numbers 8 and 9 to provision a service facility and wavelength for the OLC. Then proceed to the next step.

Attention: *Installing the LC-LC loopback cable causes the FLASHWAVE 7500 platform to raise an OSC MISCON alarm on each OSC facility. Failure to resolve these alarms will prevent the Nodal Test Tool from successfully completing testing.*

Step 10
Clear the OSC MISCON alarms by performing the following task:

a) Take the applicable OSC facility out of service.

TL1	NETSMART 500

`ED-OSC::AID:CTAG::::OOS;`
Refer to the Edit OSC Facility (ED-OSC) for a description of the AID values.
Example:
`ED-OSC:FUJITSU:OS1-9-PE1:CTAG::::OOS;`
	In the Tree view or shelf OSn graphic view.
	Expand the appropriate shelf, and select the applicable slot:
	• Select slot 9 or 11 for Core configuration.
	• Select slot 13 or 15 for ETSI configuration.
	Entity ▸ *Operations Dialog*
	The Operations dialog box opens.
	Click Start tab.
	Select Out of Service (ED-OOS).
	Click Modify.
	Do not close the Operations dialog box.

b) Change remote OSC connection to SAME.

TL1	NETSMART 500

`ED-OSC:TID:AID:CTAG:::REMOTE=SAME;`
Refer to the Edit OSC Facility (ED-OSC) for a description of the AID values.
Example:
`ED-OSC:FUJITSU:OS1-9-PE1:CTAG:::REMOTE=SAME;`
	Modify ▸ *Command Parameters*
	Select the REMOTE check box.
	From the drop down tab (to the right) select SAME.
	Click Modify.

c) Place the OSC facility back into service.

TL1	NETSMART 500

`ED-OSC:TID:AID:CTAG::::IS;`
Refer to the Edit OSC Facility (ED-OSC) for a description of the AID values.
Example:
`ED-OSC:FUJITSU:OS1-9-PE1:CTAG::::IS;`
	Click Start tab.
	Select In Service (ED-IS).
	Click Modify.
	Close the Operations dialog box.

Step 11
Repeat Step 10 for each OSC unit in slots in slot 9 and 11 for 23" Core shelf (SHU3) and slots 13 and 15 of the ETSI shelf (SHU4). Then go to Start Nodal Fiber Test.

5.4.4 Start Nodal Fiber Test

Step 1
Start the nodal fiber test.

TL1	NETSMART 500

`OPR-TEST-PATH:[TID]:[fromAID][,toAID]:CTAG;`
fromAID, toAID:
The AID parameters can be one of the following:
• **ALL**, **ALL**
• ALL, toAID
• fromAID, ALL
• fromAID, toAID
Refer to the Operate Test Path (OPR-TEST-PATH) for a description of the AID values.
Example:
`OPR-TEST-PATH:FUJITSU::CTAG;`
	Reports ▸ *Fiber Test*
	The Fiber Test report window opens.

Step 2
Retrieves the fiber loss report.

TL1	NETSMART 500

`RTRV-TEST-PATH:[TID]:[fromAID][,toAID]:CTAG;`
fromAID, toAID:
• As identified in previous step
• **ALL** (null)
Example:
`RTRV-TEST-PATH:FUJITSU::CTAG;`
	Reports ▸ *Fiber Test*
	The Fiber Test report window opens.
	If fiber baseline test is required for a specific connection,
	highlight a connection in the Fiber Test report window, right-click, and select Operations Dialog from the pop-up menu.
	The Operations dialog box opens.
	Select the desired connections.
	Click Operate.
	Close the Operations dialog box.

Step 3
Repeat Steps 1 through 2 for each fiber connection required. Then proceed to the next step.

Step 4
Review the fiber loss report for fiber connections that failed the test. The following figures provide an example of the fiber loss report generated by the Nodal Test Tool.

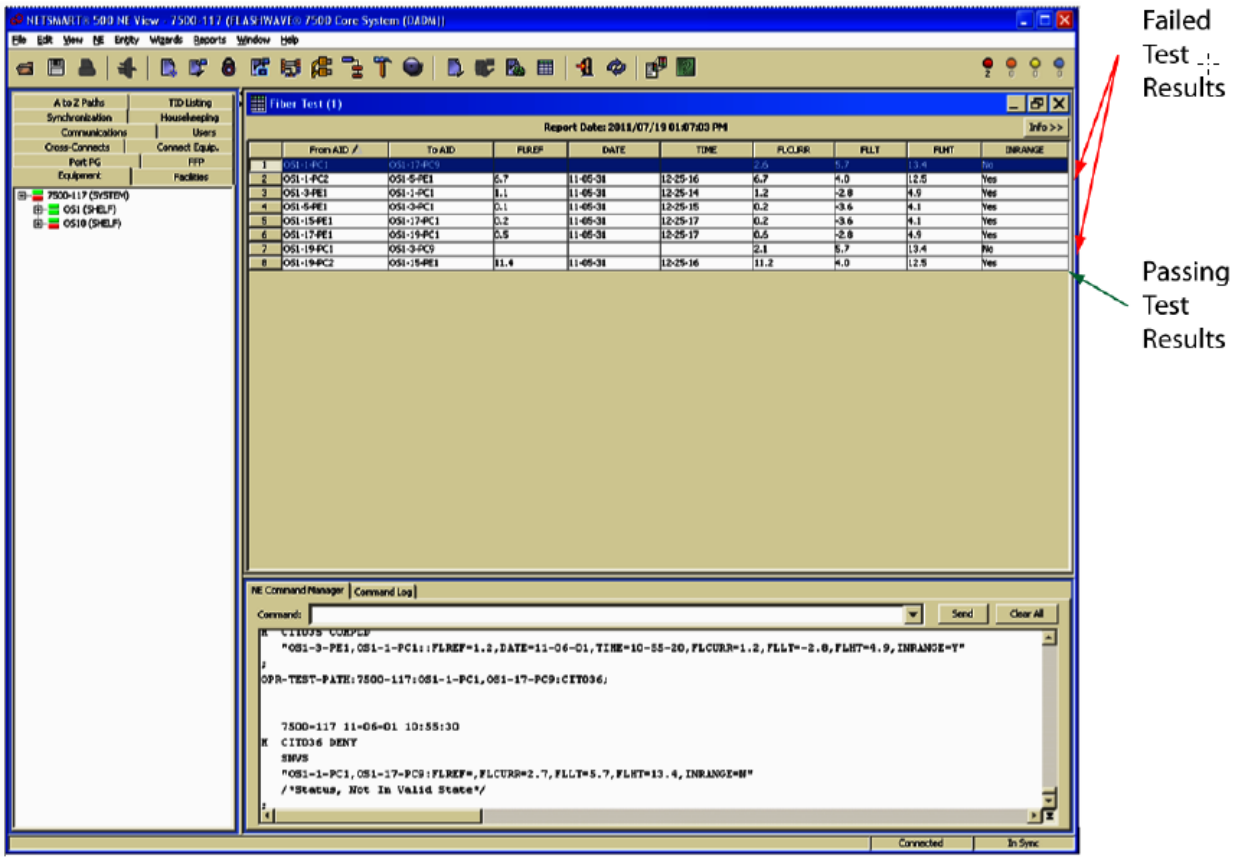


Figure 119: NETSMART 500 Fiber Loss Test Results Screen

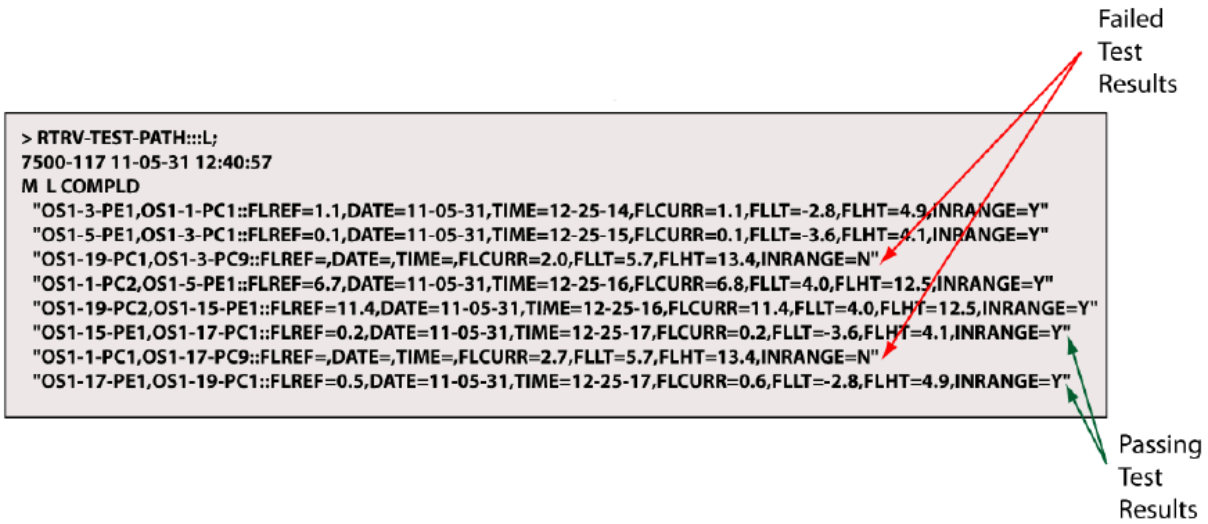


Figure 120: TL-1 Fiber Loss Test Results Screen

Step 5
Did any fibers fail the test?

If YES:
Go to Step 6.

If NO:
Go to Step 7.

Danger: *Never look into the end of a fiber-optic cable. The equipment contains high power optical laser devices that transmit light at a dangerous level. Permanent eye damage or blindness could occur. Follow local safety precautions regarding fiber-optic cables.*

Danger: *Never handle exposed fiber with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove. Follow local safety precautions regarding fiber.*

Step 6
For each fiber connection that failed the test, clean the optical connectors on the fiber cable (refer to *Fiber Cable Handling*), verify that the fiber is properly connected to the plug-in unit, and then repeat the test beginning with Step 1.

If cleaning the optical connectors and verifying that the fiber is properly connected to the plug-in unit do not resolve the fiber failure, call 1-800-USE-FTAC (1-800-873-3822) for technical assistance.

Step 7
Return OSC unit remote connection to DIFF by performing the following task:

a) Take the applicable OSC facility out of service.

TL1	NETSMART 500

`ED-OSC::AID:CTAG::::OOS;`
 	
Refer to the Edit OSC Facility (ED-OSC) for a description of the AID values.
 	
Example:
`ED-OSC:FUJITSU:OS1-9-PE1:CTAG::::OOS;`
	In the Tree view or shelf OSn graphic view.
	
	Expand the appropriate shelf, and select the applicable slot:
	
	• Select slot 9 or 11 for Core configuration.
	• Select slot 13 or 15 for ETSI configuration.
	
	Entity ▸ *Operations Dialog*
	
	The Operations dialog box opens.
	Click Start tab.
	
	Select Out of Service (ED-OOS).
	Click Modify.
	
	Do not close the Operations dialog box.

b) Change remote OSC connection to DIFF.

TL1	NETSMART 500

`ED-OSC:TID:AID:CTAG:::REMOTE=DIFF;`
Refer to the Edit OSC Facility (ED-OSC) for a description of the AID values.
Example:
`ED-OSC:FUJITSU:OS1-9-PE1:CTAG:::REMOTE=DIFF;`
	Modify ▸ *Command Parameters*
	Select the REMOTE check box.
	From the drop down tab (to the right) select DIFF.
	Click Modify.

c) Place the OSC facility back into service.

TL1	NETSMART 500

`ED-OSC:TID:AID:CTAG::::IS;`
Refer to the Edit OSC Facility (ED-OSC) for a description of the AID values.
Example:
`ED-OSC:FUJITSU:OS1-9-PE1:CTAG::::IS;`
	Click Start tab.
	Select In Service (ED-IS).
	Click Modify.
	Close the Operations dialog box.

Step 8
Proceed to Remove Loopback Cables.

5.4.5 Remove Loopback Cables

Step 1
Remove the loopback cables attached to the amplifier units in slots 1 and 19 (or 11).

Step 2
If attenuators were used for testing, remove them from the amplifiers.

Step 3
Place port covers in the amplifier ports.

This procedure is complete.

A
Data Record Forms

In this appendix:

This appendix provides the forms to aid engineers and technicians during installation, turn-up, and acceptance testing procedures.

A.1
Shelf Voltage Measurement Record

The following table provides a form to record voltages while verifying power connections to the Optical and Tributary shelves. For more information, refer to Checking Power at Optical/Tributary Shelf.

Table 80: Shelf Voltage Measurements Record

Optical Shelf AID	Measurement		Tributary Shelf AID	Measurement	
	MAIN A	MAIN B		MAIN A	MAIN B
OS1	_____ V DC	_____ V DC	OS10	_____ V DC	_____ V DC
OS2	_____ V DC	_____ V DC	OS11	_____ V DC	_____ V DC
OS3	_____ V DC	_____ V DC	OS12	_____ V DC	_____ V DC
OS4	_____ V DC	_____ V DC	OS13	_____ V DC	_____ V DC
OS25	_____ V DC	_____ V DC	OS20	_____ V DC	_____ V DC
OS26	_____ V DC	_____ V DC	OS21	_____ V DC	_____ V DC
			OS22	_____ V DC	_____ V DC
			OS23	_____ V DC	_____ V DC
			OS30	_____ V DC	_____ V DC
			OS31	_____ V DC	_____ V DC
			OS32	_____ V DC	_____ V DC
			OS33	_____ V DC	_____ V DC
			OS40	_____ V DC	_____ V DC
			OS41	_____ V DC	_____ V DC
			OS42	_____ V DC	_____ V DC
			OS43	_____ V DC	_____ V DC
			OS100	_____ V DC	_____ V DC
			OS200	_____ V DC	_____ V DC
			OS300	_____ V DC	_____ V DC
			OS400	_____ V DC	_____ V DC

A.2
Network-Side Optical Power Measurement Record

The following table provides a form to record network-side optical power levels. This form can be used with the following procedures:

- Connect Network Fiber-Optic Cables
- Measuring Optical Tributary Power

Table 81: Network-Side Optical Power Level Record

WDM Facility	Transmit	Receive		
	Optical Power	Optical Power	Attenuation	Optical Power with Attenuation
OS1-1-PE1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS1-19-PE1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS2-1-PE1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS2-19-PE1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS3-1-PE1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS3-19-PE1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS4-1-PE1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS4-19-PE1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS25-1-PE1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS25-19-PE1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS26-1-PE1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS26-19-PE1	_____ dBm	_____ dBm	_____ dBm	_____ dBm

A.3
Client-Side Optical Power Measurement Record

The following table provides a form to record client-side optical power levels. This form can be used with the following procedures:

- Connect Revenue Traffic
- Measuring Optical Tributary Power

Table 82: Client-Side Optical Power Level Record (Tributary Shelf OS___)

OLC AID	Client		Transmit	Receive		
			Optical Power	Optical Power	Attenuation	Optical Power with Attenuation
OS__-1	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
	Muxponder/ Flexponder™	TRIB 1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 2	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 3	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 4	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 5	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 6	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 7	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 8	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__-2	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__-3	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
	Muxponder/ Flexponder™	TRIB 1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 2	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 3	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 4	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 5	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 6	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 7	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 8	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__-4	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__-5	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
	Muxponder/ Flexponder™	TRIB 1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 2	_____ dBm	_____ dBm	_____ dBm	_____ dBm

Table 82: Client-Side Optical Power Level Record (Tributary Shelf OS___) (Cont.)

OLC AID	Client		Transmit	Receive		
			Optical Power	Optical Power	Attenuation	Optical Power with Attenuation
		TRIB 3	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 4	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 5	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 6	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 7	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 8	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__-6	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__-7	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
	Muxponder/ Flexponder™	TRIB 1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 2	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 3	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 4	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 5	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 6	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 7	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 8	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__-8	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__-13	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
	Muxponder/ Flexponder™	TRIB 1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 2	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 3	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 4	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 5	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 6	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 7	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 8	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__-14	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__-15	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
	Muxponder/ Flexponder™	TRIB 1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 2	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 3	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 4	_____ dBm	_____ dBm	_____ dBm	_____ dBm

Table 82: Client-Side Optical Power Level Record (Tributary Shelf OS___) (Cont.)

OLC AID	Client		Transmit	Receive		
			Optical Power	Optical Power	Attenuation	Optical Power with Attenuation
		TRIB 5	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 6	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 7	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 8	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__–16	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__–17	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
	Muxponder/ Flexponder™	TRIB 1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 2	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 3	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 4	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 5	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 6	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 7	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 8	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__–18	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__–19	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm
	Muxponder/ Flexponder™	TRIB 1	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 2	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 3	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 4	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 5	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 6	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 7	_____ dBm	_____ dBm	_____ dBm	_____ dBm
		TRIB 8	_____ dBm	_____ dBm	_____ dBm	_____ dBm
OS__–20	Transponder		_____ dBm	_____ dBm	_____ dBm	_____ dBm

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