



LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 User Operations Guide

365-375-009R3.0

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Lucent Technologies - Proprietary

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LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 User Operations Guide

365-375-009R3.0 Issue 1 Date: April 2002

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About this information product

Purpose	The <i>LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 User Operations Guide</i> provides the information a user needs to operate a Lucent Technologies LambdaRouter™ All Optical Switch.
Reason for reissue	This is the first issue of this User Operations Guide.
Safety labels	The following safety labels are used in this User Operations Guide:



WARNING

Indicates the presence of a hazard that can cause death or severe personal injury if the hazard is not avoided.



CAUTION

Indicates the presence of a hazard that will or can cause minor personal injury or property damage if the hazard is not avoided. Caution is also used for property-damage-only accidents, including equipment damage, loss of software, or service interruption.

Intended audience This user guide is intended for use by all LambdaRouter™ All Optical Switch operations and maintenance technicians.

How to use this information product This user guide consists of reference and task chapters. The reference chapters provide detailed information for understanding the security, configuration, cross-connection, alarm monitoring and fault management, and software features of the LambdaRouter™ All Optical Switch.

The task chapters provide detailed procedures for performing operations, administration, and provisioning tasks.

The following table provides a brief description of each chapter in this user guide.

Ch.	Title	Contents
1	Safety	Provides laser safety information, electrostatic discharge considerations, and other important safety information pertaining to the LambdaRouter™ All Optical Switch.
2	Operations Interfaces and Managing Systems	Describes the operations interfaces and managing systems that can be used to provision a LambdaRouter™ All Optical Switch.
3	Security Management	Describes system security administration for the LambdaRouter™ All Optical Switch and the Optical Craft Interface (OCI) for LambdaRouter™. Information is provided for user login administration and authentication, system-wide security settings, and security logs.
4	Management and Network Communications	Describes the management network and data network communications features that allow an Optical Craft Interface (OCI) for LambdaRouter™ to connect to a system, and allow each LambdaRouter™ All Optical Switch within a network to be linked.
5	Equipment Configuration Management	Describes the types of provisioning, including pre-provisioning and auto-provisioning, the order in which entities must be provisioned in the database, and the use of access identifiers (AIDs) and other equipment identifiers when performing provisioning tasks.
6	Alarm Monitoring and Fault Management	Describes the LambdaRouter™ All Optical Switch alarm monitoring features, provisioning, protection switching, and an introduction to fault management.
7	Cross-Connection Management	Describes the LambdaRouter™ All Optical Switch transmission interfaces, cross-connection configurations, signal maintenance, and the commands used to establish, modify, and remove cross-connections, operate and release cross-connection loopbacks, and retrieve cross-connection lists and reports. Information is also provided for establishing, removing, and viewing test access cross-connections.

Ch.	Title	Contents
8	Performance Monitoring	Describes the LambdaRouter™ All Optical Switch performance monitoring functions, registers, provisionable thresholds, and profiles for SONET and SDH interfaces.
9	Software Management	Describes software and database installation and upgrade, and backup and restore of provisionable data.
10	Security Management Tasks	Provides detailed procedures for performing user administration and system security tasks on the LambdaRouter™ All Optical Switch and the Optical Craft Interface (OCI) for LambdaRouter™.
11	Management and Network Communication Setup Tasks	Provides detailed procedures for configuring the LambdaRouter™ All Optical Switch and Optical Craft Interface (OCI) to communicate via the management network, and for configuring the LambdaRouter™ All Optical Switch IP addresses to allow communications over the Control Communications Network (CCN).
12	Equipment Configuration Management Tasks	Provides detailed procedures for performing network element provisioning tasks such as: resetting equipment, configuring equipment, provisioning system-wide parameters, and viewing equipment lists.
13	Alarm Monitoring and Fault Management Tasks	Provides detailed procedures for setting alarm reporting states and delay intervals, viewing alarm and status logs, and executing or releasing a forced or manual protection switch.
14	Cross-Connection Management Tasks	Provides detailed procedures for establishing, modifying, removing, and viewing cross-connections, loopbacks, and test access sessions.
15	Performance Monitoring Tasks	Provides detailed procedures for enabling or disabling performance monitoring data collection, provisioning thresholds, initializing registers, assigning performance monitoring profiles to ports, and retrieving performance monitoring data from the LambdaRouter™ All Optical Switch.
16	Software Management Tasks	Provides detailed procedures for performing software installation and upgrade, and database backup and restore tasks on the LambdaRouter™ All Optical Switch.
A	Optical Craft Interface (OCI) Tutorial	Provides information on how to navigate and use the Optical Craft Interface (OCI) for LambdaRouter™ user interface.
B	Abbreviations and Acronyms	Defines abbreviations and acronyms used throughout the LambdaRouter™ All Optical Switch documentation.
GL	Glossary	Defines terms used throughout the LambdaRouter™ All Optical Switch documentation.
IN	Index	Provides detailed access to the contents of this document.

Conventions used

The following typographical conventions are used throughout this user guide:

- **Bold** type is used to identify Optical Craft Interface (OCI) graphical user interface (GUI) menu and button selections.
- ***Bold-italic*** type is used for emphasis.
- `Constant-Width` type is used to identify user-entered information or commands.

The term port unit is used to mean the optical cross-connect interface circuit packs, the OXI, OXI-4A13, OXI-4A15, OXI-10GC, and OXI-2GC.

The term network element is used to mean a LambdaRouter™ All Optical Switch 128 or LambdaRouter™ All Optical Switch 256 unless otherwise specified.

Related documentation

The *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 User Operations Guide* is part of the following set of documents that support the LambdaRouter™ All Optical Switch:

Select Code	Document Title
365-375-011R3.0	<i>LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Installation Guide</i> Available to Lucent installers only.
365-375-008R3.0	<i>LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Applications and Planning Guide</i> Available on customer documentation CD-ROM and paper.
365-375-009R3.0	<i>LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 User Operations Guide</i> Available on customer documentation CD-ROM and paper.
365-375-010R3.0	<i>LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide</i> Available on customer documentation CD-ROM and paper.
365-375-013R3.0	<i>LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Operations Systems Engineering Guide</i> Available on customer documentation CD-ROM and paper.
365-375-015	<i>LambdaRouter™ Optical Network Navigation System (ONNS) User's Guide</i> Available on customer documentation CD-ROM and paper.
365-374-010	<i>LambdaRouter™ All Optical Switch (AOS) 128/256 Software Ordering Guide</i> Available on paper only.
N/A	<i>LambdaRouter™ All Optical Switch (AOS) 128/256 Software Release Description</i> Available on paper only.

Other documents

Customers may need information from the vendor of the personal computer used for the Optical Craft Interface (OCI) for LambdaRouter™ or other managing system, for example, Navis™ Optical Element Management System. Contact your account executive.

Related training

Lucent Technologies offers courses in various aspects of the LambdaRouter™ All Optical Switch, including an Operations and Maintenance course based in part on this User Operations Guide.

Instructor-led courses are offered at Lucent facilities in Altamonte Springs, Florida, or they may be given at customer locations.

The available LambdaRouter™ All Optical Switch courses are listed in the table below.

Course Number	Course
LW2259	LambdaRouter™ All Optical Switch (AOS) 128/256 Applications and Planning—instructor-led This course covers multiple LambdaRouter™ All Optical Switch products.
LW2459	LambdaRouter™ All Optical Switch (AOS) 128/256 Installation and Testing—instructor-led, hands-on This course covers multiple LambdaRouter™ All Optical Switch products.
LW2659	LambdaRouter™ All Optical Switch (AOS) 128/256 Operations and Maintenance—instructor-led, hands-on This course covers multiple LambdaRouter™ All Optical Switch products.

Course registration

The Lucent training catalog can be accessed online; use one of the following web sites:

Type	Description
Internal Lucent	http://product-training.web.lucent.com
External to Lucent	http://www.lucent-product-training.com

To arrange for courses to be taught at your facility (customized and dedicated scheduling), call the Lucent Learning Organization (LLO). Refer to one of the websites listed above for the phone number for your country. In the U.S., call 1-888-LUCENT8 (1-888-582-3688).

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Customer comments on LambdaRouter™ All Optical Switch documents are welcome. A comment form can be found at the beginning of this document. The comment form can be faxed to 1-407-767-2760.

How to order

LambdaRouter™ All Optical Switch customer documents can be ordered from Lucent Technologies as individual paper copies or as a set on CD-ROM (*LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Documentation Library, 365-375-012R3.0*).

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1 Safety

Overview

Purpose This chapter provides important laser, electrostatic discharge (ESD), and other safety information that must be read and understood to ensure the safety of the operator as well as the equipment.

Contents

Laser Safety Information	1-2
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Laser Safety Information

Overview Lightwave/lightguide systems, their associated test sets, and similar operating systems use semiconductor laser transmitters that emit infrared light at wavelengths between approximately 800 nanometers (nm) and 1600 nm. The emitted light is above the red end of the visible spectrum, which is normally not visible to the human eye. Although radiant energy at near-infrared wavelengths is officially designated invisible, some people can see the shorter wavelength energy even at power levels several orders of magnitude below any that have been shown to cause injury to the eye.

Conventional lasers can produce an intense beam of monochromatic light. The term monochromatic light means a single wavelength output of pure color that may be visible or invisible to the eye. A conventional laser produces a small-size beam of light, and because the beam size is small the power density (also called irradiance) is very high. Consequently, lasers and laser products are subject to federal and applicable state regulations, as well as international standards, for their safe operation.

A conventional laser beam expands very little over distance, or is said to be very well collimated. Thus, conventional laser irradiance remains relatively constant over distance. However, lasers used in lightwave systems have a large beam divergence, typically 10 to 20 degrees. Here, irradiance obeys the inverse square law (doubling the distance reduces the irradiance by a factor of 4) and rapidly decreases over distance.

Lasers and eye damage The optical energy emitted by laser and high-radiance LEDs in the 400-1400 nm range may cause eye damage if absorbed by the retina. When a beam of light enters the eye, the eye magnifies and focuses the energy on the retina, magnifying the irradiance. The irradiance of the energy that reaches the retina is approximately 10^5 or 100,000 times more than at the cornea and, if sufficiently intense, may cause a retinal burn.

The damage mechanism at the wavelengths used in telecommunications is thermal in origin, that is, damage caused by heating. Therefore, a specific amount of energy is required for a definite time to heat an area of retinal tissue. Damage to the retina occurs only when one looks at the light sufficiently long that the product of the retinal irradiance and the viewing time exceeds the damage threshold. Optical energies above 1400 nm cause surface and skin burns and do not affect the retina. The thresholds for injury at wavelengths greater than 1400 nm are significantly higher than those for wavelengths in the retinal hazard region.

Classification of lasers

Manufacturers of lasers and laser products in the United States are regulated by the Food and Drug Administration's Center for Devices and Radiological Health (FDA/CDRH) under 21 CFR 1040. These regulations require manufacturers to certify each laser or laser product as belonging to one of four major Classes: I, II, IIa, IIIa, IIIb, or IV.

The International Electro-technical Commission (IEC) is an international standards body that writes laser safety standards. Classification schemes are similar with Classes divided into Classes 1, 2, 3A, 3B, and 4.

Lasers are classified according to the accessible emission limits and their potential for causing injury. Lightwave systems are generally classified as Class I/1, because, under normal operating conditions, all energized laser transmitting circuit packs are terminated on optical fibers which enclose the laser energy with the fiber sheath forming a protective housing. Also, covers are in place over the circuit pack shelves. The circuit packs themselves, however, may be FDA/CDRH Class I or IIIb or IEC Class 1, 3A, or 3B.

Lightwave safety precautions

In its normal operating mode, a lightwave system is totally enclosed and presents no risk of eye injury. It is a Class I/1 system under the FDA/CDRH and IEC classifications.

The lightguide cables that interconnect various components of a lightwave system can disconnect or break, and may expose people to lightwave emission. Also, certain measures and maintenance procedures may expose the technician to emission from the semiconductor laser during installation and servicing.

Unlike more familiar laser devices, such as solid-state and gas lasers, the emission pattern of a semiconductor laser results in a highly divergent beam. In a divergent beam, the irradiance (power density) decreases rapidly with distance. The greater the distance, the less energy will enter the eye and the less potential risk for eye injury. Inadvertently viewing an unterminated fiber or damaged fiber with the unaided eye at distances greater than 5 to 6 inches normally will not cause eye injury provided the power in the fiber is less than a few milliwatts at the shorter wavelengths and a few tens of milliwatts at the longer wavelengths. However, damage may occur if an optical instrument such as a microscope, magnifying glass, or eye loupe is used to stare at the energized fiber end.

**CAUTION**

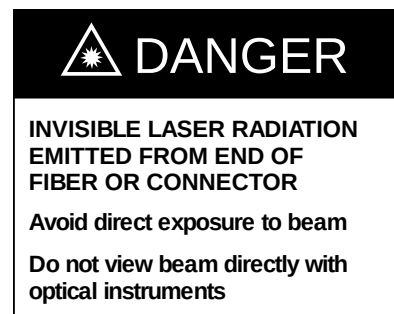
Use of controls, adjustments and procedures other than those specified herein may result in hazardous laser radiation exposure.

Safety precautions for enclosed systems

Under normal operating conditions, lightwave transmission systems are completely enclosed; nonetheless, the following precautions should be observed:

- Because of the potential for eye damage, technicians should not stare into optical connectors or broken fibers.
- Under no circumstance should lightwave/lightguide operations be performed by a technician before satisfactorily completing an approved training course.
- Since viewing lightwave emission directly in excess of Class I/1 limits with an optical instrument such as an eye loupe greatly increases the risk of eye damage, an appropriate label(s) must appear in plain view, in close proximity to the optical port, on the terminal equipment.

The figure below shows the FDA Class IIIB noninterlocked protective housing label.



NC-USM-111

Safety precautions for unenclosed systems

During service, maintenance, or restoration, a lightwave transmission system is considered unenclosed. Under these conditions, follow these practices:

- Only authorized, trained personnel shall be permitted to do service, maintenance, and restoration. Avoid exposing the eye to emissions from unterminated, energized optical connectors at close distances. Laser modules associated with the optical ports of laser circuit packs are typically recessed, which limits the exposure distance. Optical port shutters and automatic power reduction (APR) are engineering controls that are also used to limit the emissions. However, technicians removing or replacing laser circuit packs should not stare or look directly into the optical port with optical instruments or magnifying lenses. (Normal eye wear or indirect viewing instruments, such as a *FIND-R-SCOPE*[™], are not considered magnifying lenses or optical instruments.)

- Only authorized, trained personnel should use the lightwave test equipment during installation or servicing since this equipment contains semiconductor lasers. [Some examples of lightguide test equipment are Optical Time Domain Reflectometers (OTDRs), Hand-Held Loss Test Sets, and Feature Finders.]
- Under no circumstances shall any personnel scan a fiber with an optical microscope without verifying that all lightwave sources on the fiber are turned off.
- All unauthorized personnel shall be excluded from the immediate area of lightwave transmission systems during installation and service.

Consult *ANSI Z136.1, American National Standard for Safe Use of Lasers in the United States or outside the United States, IEC-60825, Part 2* for guidance on the safe use of optical fiber optic communication systems in the workplace.

The following table provides the optical specifications of the LambdaRouter™ All Optical Switch internal laser circuit packs.

Laser Circuit Pack Code	Wavelength (nm)	Output Power (mW)	Fiber Type (μm)	Connector Type	FDA Class/ IEC Class
LUU3AE	1300	1.0	SM (8.8)	LC	I/1
	1550	1.6	SM (8.8)	LC	I/1
LUU1AE	1300	0.5	SM (8.8)	LC	I/1

Lucent Technologies LambdaRouter™ All Optical Switch (AOS) 128/256 complies with FDA/CDRH 21 CFR 1040.10 and 1040.11 as a Class I and as an IEC-60825-1 Class 1 laser product.



Electrostatic Discharge (ESD) Considerations

Overview This section describes electrostatic discharge concerns.

Circuit pack/port unit handling precautions



CAUTION

Industry experience has shown that all integrated circuit packs can be damaged by static electricity that builds up on work surfaces and personnel. The static charges are produced by various charging effects of movement and contact with other objects. Dry air allows greater static charges to accumulate. Higher potentials are measured in areas with low relative humidity, but potentials high enough to cause damage can occur anywhere.

Observe the following precautions when handling circuit packs/units to prevent damage by electrostatic discharge:

- When handling circuit packs/units (storing, installing, removing, etc.) or when working on the backplane, always wear a grounded wrist strap or wear a heel strap and stand on a grounded, static-dissipating floor mat.
- Handle all circuit packs/units by the faceplate or latch and by the top and bottom outermost edges. Never touch the components, conductors, or connector pins.
- Observe all warning labels on bags and cartons. Whenever possible, do not remove circuit packs/units from antistatic packaging until ready to insert them into slots.
- If possible, open all circuit packs/units at a static-safe work position, using properly grounded wrist straps and static-dissipating table mats.
- Always store and transport circuit packs/units in static-safe packaging. Shielding is not required unless specified.

- Keep all static-generating materials such as food wrappers, plastics, and Styrofoam containers away from all circuit packs/units. When removing circuit packs/units from a cabinet, immediately place the circuit packs/units in static-safe packages.
- Whenever possible, maintain relative humidity above 20 percent.
- Always keep the electromagnetic interference (EMI)/ESD protective front covers on the shelves except during an upgrade or maintenance procedure. Once a circuit pack/unit is replaced in the shelf, immediately close the front cover.

Any connectors on the shelf interconnection panel that are not cabled should be fitted with a plastic dust cap to provide ESD protection.

Static control wrist straps

To reduce the possibility of ESD damage, shelves are equipped with grounding jacks to enable personnel to ground themselves using wrist straps, while handling circuit packs/units or working on a shelf. The wrist straps should be checked periodically with a wrist strap tester to ensure that they are working properly. The grounding jacks for connection of wrist straps are located on each user panel and the rear of the equipment bay. These jacks are labeled.



Important Safety Instructions

Overview This section provides important safety instructions that must be followed in order to ensure the safety of the operator and the equipment.

Safety instructions READ AND UNDERSTAND ALL INSTRUCTIONS.

When using this telecommunication equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

1. Follow all warnings and instructions marked on the product.
2. Slots and openings in this product are provided for ventilation. To protect it from overheating, these openings must not be blocked or covered.
3. Opening or removing rear covers or sheet-metal parts may present exposure to high current or electrical energy levels, or to other risks.
4. Never push objects of any kind into this product through slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock. Never spill liquid of any kind on the product.
5. Refer servicing to qualified service personnel.
6. Use caution when installing and modifying telecommunications lines.
7. Never install telecommunication wiring during a lightning storm.
8. Never install telecommunication jacks in wet locations unless the jack is specifically designed for wet locations.
9. Never touch uninsulated telecommunication wires or terminals unless the telecommunication line has been disconnected at the network interface.
10. Installation must include an independent frame ground conductor to building ground. Grounding/bonding circuit continuity is vital for safe operation of this equipment. Never operate with grounding/bonding conductor disconnected.

11. This product has two -48/-60 Vdc input power feeders. Disconnecting one power feeder will not de-energize the product. To reduce the risk of injury, disconnect both power supply cables when removing power from the system.
12. Metallic telecommunication interfaces should not leave the building premises unless connected to telecommunication devices providing primary and secondary protection, as applicable.
13. For continued protection against risk of fire, replace only with same type and rating of fuse.
14. Use only Lucent Technologies manufactured, recognized circuit packs/units/modules.
15. This equipment is intended for installation in Restricted Access Locations where access is controlled or where access can only be gained by service personnel with a key or tool. Access to this equipment is restricted to qualified service personnel only.
16. Power the unit only from -48/-60 Vdc sources providing Safety Extra Low Voltage (SELV) outputs.
17. This equipment must be provided with a readily accessible input power disconnect device as part of the building installation (such as a main power disconnect switch or external circuit breaker).

SAVE THESE INSTRUCTIONS.





2 Operations Interfaces and Managing Systems

Overview

Purpose This chapter describes the LambdaRouter™ All Optical Switch (AOS) operations interfaces, and the LambdaRouter™ Optical Network Navigation System (ONNS), which greatly enhances the basic LambdaRouter™ All Optical Switch capabilities.

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General

Introduction There are remote and local operations interfaces supported by the LambdaRouter™ All Optical Switch, which provide for provisioning, administration, and maintenance functions. The remote operations interfaces are optional but offer greatly enhanced features when used with the LambdaRouter™ All Optical Switch.

The operations interfaces employ standard Transaction Language 1 (TL1) messaging transported by means of the TCP/IP protocol stack via a 10BaseT physical LAN interface. The system also provides local alarm indications and an interface to the local office alarm grid.

The LambdaRouter™ All Optical Switch supports File Transfer Protocol (FTP) for LambdaRouter™ AOS-to-Managing-System file transfers of generic and database files. The implementation of FTP follows IETF STD 0009.

The LambdaRouter™ All Optical Switch can also incorporate networking software, LambdaRouter™ ONNS, which, in conjunction with remote operations interfaces, leads to an enhancement in LambdaRouter™ All Optical Switch basic capabilities.

Operations interfaces The local operations interface consists of the Optical Craft Interface (OCI), formerly called the WaveStar® CIT. RS-232 access is also supported for those users who wish to provision the LambdaRouter™ All Optical Switch using TL1 commands.

The remote operations interfaces consists of the Navis™ Optical Element Management System (EMS). The Navis™ Optical Network Management System (NMS) can be used to manage the entire network.

User panels and office alarms, which may be considered as local operations interfaces, are also provided. For information, refer to the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Applications and Planning Guide, 365-375-008R3.0*.

User interface

The LambdaRouter™ All Optical Switch supports a single method of user interface accessible by the Navis™ Optical EMS, Navis™ Optical NMS, and the OCI.

These interfaces provide a fully functional GUI which supports the following:

- Local/remote access control based on user privilege levels (password protected)
- Displays of the LambdaRouter™ AOS equipment and their states
- Alarms displays
- Network discovery and exploration for easy access to network elements in the local network (Navis™ Optical NMS only)
- Support for user provisioning tasks
- Support for software upgrades and backup and restore functions (Navis™ Optical EMS and OCI interfaces only)
- Generation of equipage, cross-connection, port link, and alarm reports

The LambdaRouter™ Optical Network Navigation System (ONNS) provides a network-level user interface, which provides the following:

- Network maps
- Network discovery and exploration for easy access to each network element in the local network
- Support for network provisioning tasks (including path provisioning)
- Generation of network-level reports

The LambdaRouter™ ONNS GUI is described in the Navis™ Optical NMS documentation.

**Management
communications interface**

The interface between the LambdaRouter™ All Optical Switch and the operations environment—the OCI, Navis™ Optical EMS, or other Managing System—is provided by the 802.3 compliant 10/100BaseT LAN. Access to and from the remote systems, Navis™ Optical EMS or other managing system, is provided via an IP-based management communications network connected to the intraoffice (IAO) LAN. Typically this will be accomplished by connection to EI1, port 4 on the System Controller Shelf.

If an external hub is used on one of the LAN connectors, the number of possible LAN connections is increased. The external hub can be connected to EI1 port 4 on the System Controller Shelf. For a detailed discussion on possible IAO LAN configurations, refer to the “Control and Communications Network (CCN)” (2-15) section of this chapter.



Optical Craft Interface (OCI)

Description The Optical Craft Interface is a desktop or laptop computer loaded with the required LambdaRouter™ All Optical Switch software. It provides the following:

- A GUI based on Windows NT® or Windows® 2000 Professional
- Transaction Language 1 (TL1) interface to the network element
- TL1 command entry cut-through
- Access connections
- Security features to prevent unauthorized access

The Optical Craft Interface GUI provides an easy and intuitive access to operations. When this GUI is used, the TL1 interface is not visible to the user. Many customers develop standardized scripts for use in the field for standard operations.

The Optical Craft Interface user has the means for local and remote access. Remote access uses an external WAN connection to the LAN port on the LambdaRouter™ All Optical Switch.

The Optical Craft Interface is generally co-located with the LambdaRouter™ All Optical Switch. The OCI personal computer can be connected directly to the front of the LambdaRouter™ All Optical Switch frame. This connection can also be made over the IAO LAN.

The Optical Craft Interface provides detailed information and control of the following:

- Provisioning
- Loopback operation and testing
- Reporting
- Alarms and events
- Equipment view and status
- Software management
- Cross-connect assignments
- Protection switching

PCMCIA card The PC or laptop computer must be equipped with a 10BaseT interface network card to communicate with the network element, and a drive that supports a PCMCIA card to create a flash card that will be inserted into the LambdaRouter™ All Optical Switch.

Remote access An OCI or other managing system connected to a LambdaRouter™ All Optical Switch may remotely access other LambdaRouter™ All Optical Switch systems on the network. The support capabilities are the same for both local and remote LambdaRouter™ All Optical Switch systems.

Remote access requires TCP/IP connectivity from the local LambdaRouter™ All Optical Switch to the remote LambdaRouter™ All Optical Switch. File transfers are accomplished by means of FTP.

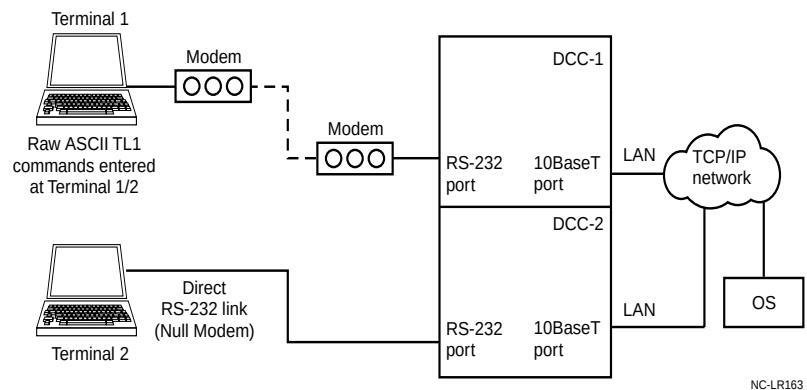


RS-232 Terminal Access

Description The RS-232 terminal access feature allows a LambdaRouter™ All Optical Switch to be provisioned using TL1 commands issued from a personal computer running terminal emulation software.

Connection The terminal is connected, either directly using an RS-232 null modem cable or via modem, to one of the LambdaRouter™ All Optical Switch dual independent RS-232 serial ports located on the back of the System Controller Shelf (SCS). An RS-232 adapter cable is used to connect the terminal to the SCS. The adapter cable splits the DB25 connection on the SCS into two DB9 connectors.

The following figure illustrates the connection of a terminal to the LambdaRouter™ All Optical Switch using both a direct null modem link and a modem link.



NC-LR163

To access the RS-232 interface, the terminal must initially be configured as follows:

Parameter	Setting
Bits Per Second	19200
Data Bits	8
Parity	N (none)
Stop Bits	1

After the initial connection, the Bits Per Second parameter can be changed.

Access considerations Security parameters, as provisioned on the LambdaRouter™ All Optical Switch, apply to the RS-232 connection. Users must log in prior to issuing TL1 commands, and may only issue TL1 commands for which they have adequate security privilege levels.

When using the RS-232 terminal access link, due to the relatively slow speed of the connection, it is recommended that autonomous messages be limited.



Navis™ Optical Element Management System (EMS)

Description The Navis™ Optical EMS is an element management system (EMS) that supports the LambdaRouter™ All Optical Switch through LAN connectivity and centralized element management functions. The Navis™ Optical EMS has a GUI and communicates with the LambdaRouter™ All Optical Switch using TL1 messages. The Navis™ Optical EMS communicates with each LambdaRouter™ All Optical Switch individually.

When used as an end-user system, Navis™ Optical EMS provides a GUI for users to access and manage a LambdaRouter™ All Optical Switch system with visibility down to the circuit pack and port levels. As an end-user system, Navis™ Optical EMS provides element management functions including fault, configuration, and security management.

After a successful login, the Navis™ Optical EMS then logs session activities and performs other critical interactions.

For further information on this management system, refer to the Navis™ Optical EMS documentation.



Navis™ Optical Network Management System (NMS)

Description The Navis™ Optical Network Management System (NMS) is a management tool that provides comprehensive and integrated management of an entire transport network. Navis™ Optical NMS can provide provisioning and maintenance management for the LambdaRouter™ All Optical Switch and other network elements in the LambdaRouter™ All Optical Switch network.

The Navis™ Optical NMS interfaces with other systems, such as Navis™ Optical EMS, to provide complete network management from a single point.

Features The following features are available in the Navis™ Optical NMS:

- Optical end-to-end path management
- Multiple levels of Quality of Service (QoS) service provisioning
- End customer GUI and service provider GUI
- Point-and-click, web-based user interface

Interface The Navis™ Optical NMS interfaces directly to the LambdaRouter™ All Optical Switch for purposes of management of end-to-end paths through a network of LambdaRouter™ All Optical Switch nodes. This interface is provided by a 10BaseT interface on the Restoration Controller (RC) circuit packs on the System Controller Shelf, and employs a special purpose set of TL1 commands.

For purposes related to element management, such as data synchronization and processing alarms and events, the Navis™ Optical NMS interfaces with the LambdaRouter™ All Optical Switch via the Navis™ Optical EMS.

For additional information on this managing system, refer to the documentation provided with Navis™ Optical NMS.



LambdaRouter™ Optical Network Navigation System (ONNS)

Description The LambdaRouter™ Optical Network Navigation System (ONNS) is software that resides on the LambdaRouter™ All Optical Switch. In conjunction with the Network Network Interface (NNI) transport links between the LambdaRouter™ All Optical Switch nodes and with the Control and Communications Network (CCN), the LambdaRouter™ ONNS provides intelligent optical networking. This capability provides automatic end-to-end path routing and connection setup and teardown in response to user requests, as well as determination of restoration paths (in support of 1+1 or mesh restoration).

With mesh restoration, LambdaRouter™ ONNS initiates rerouting of customer traffic upon notification of a path failure; this involves path computation and inter-LambdaRouter™ All Optical Switch signalling to effect switchover to the new path.

The CCN provides the reliable communication method that enables LambdaRouter™ ONNS to signal for the set up and tear down of network paths. These paths may be either the service path set-up (in response to a customer request) or a failure-driven restoration path.

Using the NNI links, in conjunction with Automatic Interconnection Recognition Protocol (AIRP), the LambdaRouter™ ONNS autodiscovers the optical-layer transport connectivity, topology and network resources to support the set-up and tear-down of client-client connections. LambdaRouter™ ONNS, employing Generalized Multiprotocol Label Switching (GMPLS), automatically calculates and provisions the best available routes (with node disjoint routing and restoration protection) upon the TL1 request from the managing system (e.g., the Navis™ Optical NMS), or in response to a path failure event requesting mesh restoration.

The AIRP provides “blind” discovery of LambdaRouter™ All Optical Switch neighbors, when these systems are interconnected by optical line systems whose drop-side OT output lasers are provisioned to turn off when the corresponding input side has no signal present. That way, the application of the AIRP discovery signal to an idle link connection input (ADD OT) by an “upstream” LambdaRouter™ All Optical Switch results in the appearance of signal at the corresponding DROP side, activating the discovery processing at the “downstream” LambdaRouter™ All Optical Switch.

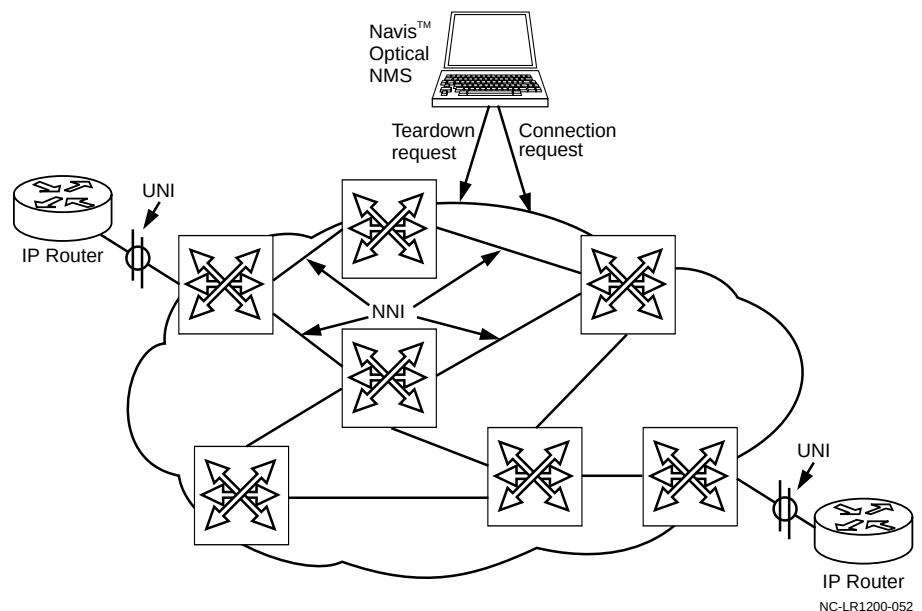
The discovery signal, conveyed by a 16-byte section trace byte sequence (J0), contains both the CCN network address (IP address of the RC pack) of the sending LambdaRouter™ All Optical Switch, as well as the ID of the sending port. In this way, the “downstream” LambdaRouter™ All Optical Switch learns both the CCN address and the sending port of its “upstream” neighboring LambdaRouter™ All Optical Switch. A CCN response message is then delivered to the neighbor, which contains the CCN address and receiving port ID of the “downstream” LambdaRouter™ All Optical Switch. Now the LambdaRouter™ All Optical Switch that originated the discovery process also knows its neighbor CCN address and associated receiving port ID. Neighbor data at each LambdaRouter™ All Optical Switch is passed to its local LambdaRouter™ ONNS for use in path routing computations.

The basic generation and receive processing of the discovery signal is supported by two different port architectures. If the NNI ports are implemented with OEO circuit packs, then the ports themselves are used for the J0 sequence generation and reception. If the NNI ports are implemented with transparent ports, the J0 processing is performed by OEO packs dedicated to this purpose: these are called **link probe** ports. Appropriate cross-connects are made between a link probe port and the transparent port in order to either send or receive the discovery signal to or from the NNI port. Generally, both OXI-10GC and OXI-2GC link probe ports must be available in order to support transparent NNI ports that may be provisioned with either 10G or 2.5G transmission rates, depending on the line system ports to which they are connected.

If necessary, LambdaRouter™ All Optical Switch to LambdaRouter™ All Optical Switch neighbor information may be manually provisioned to enable proper LambdaRouter™ ONNS operation.

For either NNI port type, and even if “blind” discovery might not be supported due to line system behavior, the AIRP procedures for link verification are available. These procedures provide for both automatic periodic verification, and on-demand verification of link connections extending from output ports on one LambdaRouter™ All Optical Switch to input ports on its neighbor. These procedures will indicate whether the transmission connectivity is still intact, and also verify neighbor data that were previously determined either manually or automatically. LambdaRouter™ ONNS is informed about any defects in the link data to remove the offending link connection from the list of currently-available transport resources. Also, event reports are generated by the effected LambdaRouter™ All Optical Switch nodes to alert craft personnel about the link defect.

The following figure shows an optical network of LambdaRouter™ All Optical Switch nodes:



- Features** The main features of the LambdaRouter™ ONNS include:
- Network topology management—auto-discovery of neighbor connections and ports
 - Connection management—end-to-end connection routing, set-up, and tear-down through the LambdaRouter™ ONNS capable elements with start and end points specified by the requester
 - Restoration management
 - 1+1 end-to-end network protection
 - mesh restoration (both non-revertive and revertive)
 - Unprotected connections
 - Optical client User Network Interface (UNI)—automated path set-up and teardown initiated from a router or other client
 - User and management interface—TL1 over TCP/IP

UNI

The LambdaRouter™ All Optical Switch supports User Network Interface (UNI) signaling by means of an IP interface.



Control and Communications Network (CCN)

General The Control and Communications Network (CCN) and Operations Network (ON) used to support the LambdaRouter™ ONNS functions and operations-messaging both use Transmission Control Protocol/Internet Protocol (TCP/IP, shortened to IP). Several different basic configurations can be used to set up the CCN and ON. This section covers basic rules, example configurations, and some description of the protocols used in the CCN and ON for this release of the LambdaRouter™ All Optical Switch.

Rules The phrase **internal IP port** refers to the Restoration Controller (RC) and Restoration Interface Processor (RIP) Ethernet 100BaseT ports whose connectivity is provided by the LambdaRouter™ All Optical Switch backplane. There are no RJ-45 jacks for these ports. The phrase **external IP port** refers to the RC and RIP IP ports whose connectivity is provided by Ethernet RJ-45 jacks on the RC and RIP circuit pack faceplates, or by connectors on the Personality Module (PMOD) faceplates.

Connectivity rules

The following connectivity rules apply to the IP configuration:

- The RIPs must terminate disjoint IP paths to each neighboring LambdaRouter™ All Optical Switch. This implies that connections from RIP1 must terminate on a router different from the router that terminates connections from RIP2.
- The RC0 and RC1 packs must both have connectivity via their external 10BaseT IP port (RJ-45 jack labeled INT-LAN) to the IP network used by the Navis™ Optical NMS (or other network management system) responsible for network path administration.
- DCC1 and DCC2 must both have connectivity to the IP network used by the Navis™ Optical EMS (or other element management system), which is responsible for network element administration such as provisioning and alarm monitoring.
- The local OCI must have connectivity to the DCC circuit packs.
- No external connections are made among the RC and RIP circuit packs. Ethernet connectivity among these packs is provided by internal 100BaseT IP ports with connections on the LambdaRouter™ All Optical Switch backplane.

- IP hubs and IP routers used in the CCN must be either transparent to, or support, the following protocols:
 - Open Shortest Path First (OSPF)
 - Multiple Protocol Label Switching (MPLS)
 - Resource ReSerVation Protocol - Traffic Engineering (RSVP-TE)

Note: If a CCN IP router is transparent to—but does not participate in—OSPF and MPLS, then the LambdaRouter™ All Optical Switch MPLS algorithms will not be able to guarantee node disjoint Label Switched Paths (LSPs).

Refer to the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Applications and Planning Guide, 365-375-008R3.0* for illustrations of the RC, RIP, and PMOD circuit pack faceplates, which show the 10BaseT and 100BaseT connections.

IP address and subnetwork rules

The following IP address and subnetwork rules apply to the IP configuration:

- The RC0 and RC1 internal 100BaseT Ethernet IP ports on the LambdaRouter™ All Optical Switch backplane are provisioned with the same public IP address/subnetwork mask. This is enforced by the system whenever that port on either RC circuit pack is provisioned with an IP address/subnetwork mask.
- The RIP1 and RIP2 and RC0 and RC1 packs internal 100BaseT Ethernet IP ports on the LambdaRouter™ All Optical Switch backplane must all be in the same subnetwork. No other IP port is to be assigned to that subnetwork. This implies that the total number of public IP addresses on that backplane subnetwork is three. This limitation is required so that the OSPF algorithm running on the RIPs correctly identifies the two RIPs and active RC used to support LambdaRouter™ ONNS messaging.
- All external IP ports on the RC and RIP packs must be in subnetworks different from that assigned for the internal 100BaseT Ethernet IP ports on the LambdaRouter™ All Optical Switch backplane.
- RIP1 external IP ports and RIP2 external IP ports should be on different subnetworks.

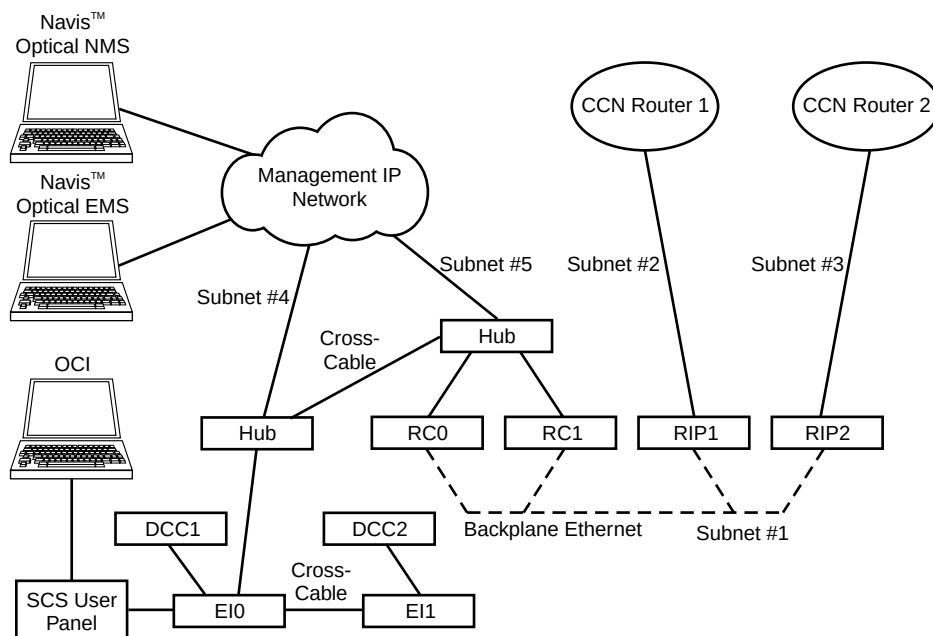
The LambdaRouter™ All Optical Switch provides External Interface (EI0 and EI1) circuit packs in the System Controller Shelf (SCS). The EI circuit packs are typically used as 4-port hubs for the DCC circuit packs and the OCI. Refer to the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Applications and Planning Guide, 365-375-008R3.0* for an illustration of the SCS backplane and a description of the EI0 and EI1 backplane connectors.

Examples The following figures show example IP configurations.

Connection using EI circuit packs

A typical configuration (shown below) using the EI circuit packs is made up of the following connections:

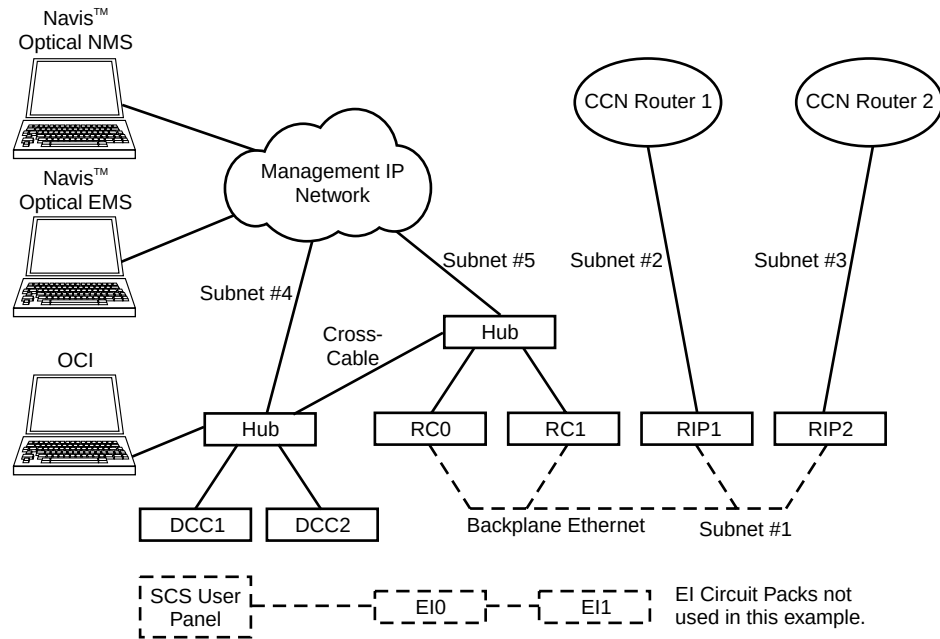
- OCI connected to the SCS User Panel, which connects to EI0 port 4
- EI0 port 3 connected to EI1 port 3 using a cross cable
- DCC1 connected to EI0 port 1
- DCC2 connected to EI1 port 1
- EI0 port 2 connected to a hub for communication with Navis™ Optical EMS and Navis™ Optical NMS



NC-LR1200-065

Connection without EI circuit packs

The next figure shows the IP network without EI connections.



NC-LR1200-064

Protocols The LambdaRouter™ All Optical Switch uses the Operations Network for management system TL1 commands and messages. TCP/IP is used for TL1 command and message transport.

The CCN is used for IP network topology discovery, transport port discovery messaging, and creation of Label Switch Paths (LSPs) for redundant and highly reliable IP communication between network-network (NN) applications. The CCN uses User Datagram Protocol (UDP) and Transmission Control Protocol (TCP) for message delivery.

In the CCN, Open Shortest Path First (OSPF) is used to broadcast, and thereby discover, IP network neighbors and overall topology, and is used for calculating shortest paths between IP network nodes. OSPF uses UDP for message transport. Resource ReSerVation Protocol (RSVP-TE) is used to set up the redundant LSPs that are used between RIP circuit packs on neighbor LambdaRouter™ All Optical Switch nodes. RSVP-TE uses RAW-IP for the messages to set up the LSPs. The NN applications use TCP/IP sessions with MPLS labels over the LSP tunnels for network path administration and restoration messages between LambdaRouter™ All Optical Switch nodes.





3 Security Management

Overview

Purpose This chapter provides detailed information on the security management functions of the LambdaRouter™ All Optical Switch. This includes system security information for the LambdaRouter™ All Optical Switch and user login administration on the LambdaRouter™ All Optical Switch and the Optical Craft Interface (OCI) for LambdaRouter™.

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Introduction to Security Management

Overview Security management is the process of administering user accounts (login IDs, passwords, and privilege levels) and monitoring system security to ensure that only valid users can perform allowed actions and receive authorized information from the system.

Each user must have a login ID and password on the Optical Craft Interface or other managing system used to access a network element. Each user must also have a separate login ID and password on the network element being accessed.

Session management In order to perform maintenance and administration tasks, users must log into the Optical Craft Interface (or other managing system) and establish a logical connection, or session, with a network element. This establishes peer-to-peer communications with the selected system via the TCP/IP stack.

Each session is a unique entity that exists for the duration of the user's activity. The system uses a user ID to determine the authority of the user owning the session and monitors the activity of the session.

For the LambdaRouter™ All Optical Switch, up to a maximum of 13 simultaneous user sessions can be maintained per DCC circuit pack (12 regular users and one Superuser). The network element internally checks to ensure that no more than two Superuser sessions are active at any time for both of the DCC circuit packs.

The Optical Craft Interface supports up to five simultaneous sessions (connections to network elements).



User Login Administration

Introduction User login administration consists of creating, modifying and deleting user records for authorized users of the Optical Craft Interface (or other managing system) and the LambdaRouter™ All Optical Switch.

A user record consists of

- a login ID
- a password
- a user type (Optical Craft Interface or other managing system only)
- the user privilege levels
- the User Notification Registration List (network element only)

Each user has a user record that is stored and maintained in the security database on the Optical Craft Interface (or other managing system) and a separate user record that is stored and maintained in the security database on the LambdaRouter™ All Optical Switch being accessed.

Security administrator Administration of the user security database on the Optical Craft Interface and the network element requires a login with a security privilege level of S4 or S5. A user with a security privilege level of S4 can set the security parameters that are set on a system-wide basis (apply to all users on the network element). A user with a security privilege level of S5 can set the system-wide security parameters and can set security parameters that are specific to individual users.

Optical Craft Interface

A Security Administrator on the Optical Craft Interface can perform the following user provisioning tasks:

- view existing user logins
- add new users and assign user privileges
- delete users
- change passwords for any user
- modify user privileges

Individual users are also permitted to change their own passwords.

LambdaRouter™ All Optical Switch

A Security Administrator on the LambdaRouter™ All Optical Switch can perform the following user provisioning tasks:

- view existing user logins
- view a list of users currently logged into the network element
- add new users and assign user privileges
- delete users
- change passwords for any user
- modify user privileges

Individual users are also permitted to change their own passwords.

**Optical Craft Interface
user logins and passwords**

Up to five user IDs on the Optical Craft Interface are supported, each with password, privilege level, and preference information.

For more information, see “Login ID requirements” (3-5) and “Password requirements” (3-6).

When establishing a session with a network element, the user is prompted to enter a valid login ID and password for the network element.

Important! It is possible to provision the same login ID and password on both the Optical Craft Interface or other managing system and the network element. However, this is a security risk and it is not recommended.

**Optical Craft Interface
Superuser logins and
passwords**

Up to two Superuser logins and passwords may be created on the Optical Craft Interface. Superusers are allowed to change the password and preferences of any Optical Craft Interface user.

For more information, see “Login ID requirements” (3-5) and “Password requirements” (3-6).

Important! The Optical Craft Interface Superusers are Superusers on the OCI only, not on the LambdaRouter™ All Optical Switch.

LambdaRouter™ All Optical Switch user logins and passwords

On the LambdaRouter™ All Optical Switch, up to 500 users are supported, each with a unique login ID and password combination that is validated on each login attempt, and a privilege code which identifies the specific tasks the user is allowed to perform.

Passwords are stored in encrypted form in the network element non-volatile memory and in log files to prevent direct reading of the user passwords.

For more information, see “Login ID requirements” (3-5) and “Password requirements” (3-6).

LambdaRouter™ All Optical Switch Superuser logins and passwords

Two Superuser logins and passwords with full privileges in all functional categories are pre-installed on the system. No other user can be assigned full privileges in all categories.

The Superuser passwords may be changed by any user with a security privilege level of S5. Superuser logins can not be deleted or added. However, Superusers are allowed to change their own login ID.

For more information, see “Login ID requirements” (3-5) and “Password requirements” (3-6).

Important! It is recommended that Superuser logins not be used for normal operations.

Login ID requirements

Login IDs on both the Optical Craft Interface and LambdaRouter™ All Optical Switch are case-sensitive and may be between one and ten alphanumeric characters in length. Any sequence of characters is allowed with the following exception: the keyword ALL, by itself, in any combination of upper and lower case letters is not permitted. However, a login ID containing ALL as a substring (such as tallman), in any combination of upper and lower case letters is allowed.

Password requirements

Passwords on both the Optical Craft Interface and LambdaRouter™ All Optical Switch are case-sensitive, consist of between six and ten characters, and must

- contain at least two non-alphabetic characters (numbers or special characters), at least one of which must be a special character
- begin with a letter

The following table lists the characters that are allowed in a password. No other characters are allowed in a password.

Character	Description	Character	Description
A ... Z	Upper case letters	[	Left square bracket
a ... z	Lower case letters	]	Right square bracket
0 ... 9	Digits	^	Caret
'	Apostrophe	`	Grave accent
-	Hyphen	{	Left curly brace
(	Left parenthesis		Vertical bar
)	Right parenthesis	}	Right curly brace
.	Period	<	Less than
/	Slash	>	Greater than
+	Plus sign	~	Tilde
!	Exclamation mark	%	Percent
*	Asterisk	#	Number sign

User privilege codes

The user privilege code is an alphanumeric code that consists of one or two letters that identify the functional category of commands the user may access, and a single digit that identifies the user authorization level within each functional category. A user can execute commands in a functional category that requires an authorization level equal or less than the authorization level assigned to the user.

A user privilege code is assigned to each user when a login is created or modified on either the LambdaRouter™ All Optical Switch or the Optical Craft Interface. User privilege codes assigned to login IDs on the Optical Craft Interface do not apply to the LambdaRouter™ All Optical Switch.

Functional categories

All commands are grouped into the following functional categories:

- Maintenance (M)
- Provisioning (P)
- Performance Monitoring (PM)
- System and Security Administration (S)
- Test (T)

Authorization levels

The authorization level ranges from 0 (lowest) to 5 (highest) for all functional categories except security, which ranges from 1 to 5. Assigning an authorization level of 0 disables that functional category for that user.

Optical Craft Interface user types

Predefined user types in the Optical Craft Interface are used to set default values when establishing and modifying Optical Craft Interface user logins. These user types apply only to the Optical Craft Interface and not to the LambdaRouter™ All Optical Switch.

Each user type is defined and identified by a specific combination of User Privilege Codes (UPCs). The five predefined user types are as follows:

- Superuser—S5, T5, M5, P5, PM5
- Privileged User—S3, T5, M5, P5, PM5
- General User—S1, T4, M4, P3, PM4
- Maintenance User—S1, T4, M4, P3, PM1
- Reports Only User—S1, T1, M1, P1, PM1

Users may be assigned to combinations of privilege codes that are not one of the predefined sets for a specific user type. Users with privilege codes that do not match one of the predefined types are considered to have a user type of **Other**.

Superuser

A Superuser has access to all security and system provisioning capabilities including:

- adding and deleting users
- modifying user passwords and user priority levels
- assigning user privilege codes and user priority levels
- assigning the User Notification Registration List for other users
- modifying network element security variables
- retrieving logs
- performing backup and restore operations on the network element database
- system provisioning (configuration management, cross-connect management, software management, fault management)

Important! It is recommended that Superuser IDs not be used for normal operations. The Privileged User classification provides access to all typical operational features with the exception of user administration.

Privileged user

A Privileged User has access to all user capabilities (including those that are service-affecting) with the exception of security related capabilities.

General user

A General User has access to all user capabilities except the following:

- network element security administration (capable of changing own password only)
- software installation and system initialization capabilities
- network element access capabilities

Maintenance user

A Maintenance User has access to the following capabilities:

- testing functions
- retrieving network element information
- limited service-affecting commands
- changing own password

Reports Only user

A Reports Only User has access only to those capabilities that retrieve information but do not modify the system, with the following exceptions:

- may change own password
- does not have read access to user login information for other users

**LambdaRouter™ All
Optical Switch
User Notification
Registration List**

The Security Administrator on the LambdaRouter™ All Optical Switch assigns a User Notification Registration List for each user, which determines what messages (other than responses to their own commands) a user is allowed to receive. Users will receive only those notifications for which they are registered.

Some message types are part of groups that are not separable. For example, if a user is registered for DBCHG (database change) messages, all such messages will be received, including modify notifications and establish/remove notifications.

The following notification and response types may be registered to each user:

- establish, modify, and remove database change notifications (DBCHG)
- state change notifications (STCHG)
- alarm notifications (ALARMS)
- protection switch notifications (PSCHG)
- all notifications and responses (ALL)
- responses to own commands (OWN)



LambdaRouter™ All Optical Switch System Security Administration

Introduction The following features provide security management functions for the LambdaRouter™ All Optical Switch:

- user identification and authentication
- user access control
- user notification control
- user command execution control
- user logout
- security activity audit trail
- security variable backup

User identification and authentication In order to gain access to the LambdaRouter™ All Optical Switch, a user must enter a valid login ID and password combination that has been previously provisioned by a Security Administrator (privilege code S5).

Each user, including Superusers, will be prompted to change the originally assigned password on the first login attempt after being added to the system.

In addition to the login ID and password, the LambdaRouter™ All Optical Switch supports the following provisionable user identification and authentication security features:

- User ID Aging Period
- Password Aging Period
- User ID Lockout Threshold
- User ID Lockout Interval
- User ID Lockout Aging Period

User ID aging period

The User ID Aging Period specifies the maximum number of days a user ID may go unused before being disabled. After a user ID is disabled, a Security Administrator with an S5 privilege level can either re-enable or delete the user ID.

The User ID Aging Period is defined on a system-wide basis by a Security Administrator with an S4 privilege level or higher. Setting the User ID Aging Period to 0 disables user ID aging.

The user ID aging period does not apply to Superuser logins.

Password aging period

The Password Aging Period specifies the maximum number of days a user's password remains valid before the system requires the password to be changed. After a password has expired, on the next login attempt, the user will be required to either change the password or cancel the login process.

Any time the password is changed, even if the Password Aging Period has not expired, the aging period counter is reset so that the new password is valid for the specified number of days.

The Password Aging Period is defined on a per-user basis by a Security Administrator with an S5 privilege level. Setting the Password Aging Period to 0 disables password aging.

User ID lockout threshold

The User ID Lockout Threshold specifies the number of sequential invalid login attempts permitted by the same user ID before the user ID is locked out. The user ID is locked out for the amount of time specified by the User ID Lockout Interval. When a user ID is locked out, an Intruder Alert alarm is generated and logged.

The User ID Lockout Threshold is defined on a system-wide basis by a Security Administrator with an S4 privilege level or higher.

User ID logout interval

The User ID Lockout Interval specifies the number of minutes the user ID will be locked out once the User ID Lockout Threshold is exceeded. After the lockout interval expires, the user will be allowed to attempt to log in again with the same user ID.

The User ID Lockout Interval is defined on a system-wide basis by a Security Administrator with an S4 privilege level or higher. Setting the User ID Lockout Interval to 0 disables user ID lockout.

User ID logout aging period

The User ID Lockout Aging Period specifies the number of minutes before the invalid login attempt count is reset.

The User ID Lockout Aging timer starts upon the first invalid login attempt. If the number of sequential invalid login attempts by the same user ID reaches the User ID Lockout Threshold within this time period, the user ID is locked out.

If the number of sequential invalid login attempts by the same user ID does not reach the User ID Lockout Threshold (the user gives up without a successful login), the User ID Lockout Aging Period is applied. If the aging period expires with no further invalid login attempts by the same user ID, the invalid login attempt count is reset to zero and the user ID is not locked out.

The User ID Lockout Aging Period is defined on a system-wide basis by a Security Administrator with an S4 privilege level or higher.

User access control

User access control features determine what specific tasks each user is allowed to perform. This is accomplished by assigning each user ID privilege codes, which are made up of a Functional Category and an Authorization Level within each Functional Category (for example, S5, P3, M2, and so on).

Assigning combinations of privilege codes to a user determines which commands and functions the user may access.

For more information, see “User privilege codes” (3-6).

User notification control

User notification control determines which messages, besides responses to the user's own commands, each user is allowed to receive. This control is accomplished by registering the types of messages a user may receive in a User Notification Registration List.

A Security Administrator with an S5 privilege level assigns a User Notification Registration List for each user.

For more information, see "LambdaRouter™ All Optical Switch User Notification Registration List" (3-9).

User logout

The current session is terminated when a user is logged out. A user logout occurs when the user

- manually logs out of the system
- is forcibly logged out of the system
- has exceeded the inactivity time-out period

Logout by user

Each user may manually log out of the system to terminate the current session.

Forced logout

A Security Administrator with an S5 privilege level may force the logout of individual users, or may simultaneously log out all user sessions.

Forced logout of all users will not log out the S5 user issuing the force logout command or another Superuser. However, a Superuser can force the logout of another Superuser individually.

Inactivity time-out period

The network element will automatically log out any session (including Superusers) that remains inactive for a defined number of consecutive minutes. This is the Inactivity Time-Out Period.

Any user actions that cause communications between the Optical Craft Interface or managing system and the network element will reset the inactivity timer to zero. The inactivity timer does not run while the network element is processing commands associated with the session. A user will not be logged out due to inactivity during output from a long command, such as a transmission test.

When a user is logged out for exceeding the Inactivity Time-Out Period, the logout is recorded in the Security Activity Log.

The Inactivity Time-Out Period is defined on a per-user basis by a Security Administrator with an S5 privilege level. Setting the Inactivity Time-Out Period to 0 disables this feature.

Security activity audit trail

All commands submitted by the user are recorded in the User Session Activity Log. All security related events are recorded in the Security Activity Log. The events in each log are time-stamped.

For more information, see “Security Logs” (3-15).

Security variable backup and restore

The following data relating to security administration can be backed up and restored by a Security Administrator:

- configurable variables (including variables for the two Superusers)
 - thresholds and timeouts
 - user IDs and passwords
 - privileges
- password creation date and time

Security data is backed up to any allowable backup destination (such as non-volatile memory, Optical Craft Interface, or a managing system). All security data backup and restore operations are recorded in the Security Activity Log and the User Session Activity Log.



Security Logs

Introduction The LambdaRouter™ All Optical Switch provides autonomous logging of events that affect system security. The following security log files are available:

- Security Activity Log
- User Session Activity Log

Each security log is a separate file that may be retrieved, saved, and printed. The logs are stored in the non-volatile memory (NVM) of the network element so that the logged data is retained across power failures and system resets.

The log files are circular files of a fixed size. Once the log has been filled to the specified capacity, the next new entry will overwrite the oldest existing entry. Therefore, the data that is available at any given time is limited to the capacity of the file. The time span covered by the log file is designed to provide approximately 72 hours of storage. However, the coverage time span may be reduced during periods of intense activity.

The Security Activity Log and the User Session Activity Log are not used for resynchronization with a management system.

Security Activity Log The Security Activity Log is a time- and date-stamped history of the following security related events:

- successful login history
- network element security variable modification history
- user security data modification history
- software management command history
- system reset history
- logout history

User Session Activity Log

The User Session Activity Log is a time- and date-stamped history of user-initiated commands and response codes. The following information is logged:

- Login ID of the user who executed the command
- Name of the TL1 command logged
- Entity Accessed ID
- Positional input parameters of the logged TL1 command
- Name-value parameters of the logged TL1 command
- Positional input state parameter of the logged TL1 command
- Response (success/denial) code

Command replies and commands that are denied because of bad syntax are not logged in the file. Only the Success/Denial code is stored.





4 Management and Network Communications

Overview

Purpose This chapter provides detailed information on the LambdaRouter™ All Optical Switch management communications and network element communications features.

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Management Communications

Overview The LambdaRouter™ All Optical Switch management communications features allow a managing system to be connected to a local network element in order to perform system provisioning tasks.

Typical managing systems include the Optical Craft Interface and a terminal connected to the network element using the RS-232 port.

For additional information on managing systems, refer to Chapter 2, “Operations Interfaces and Managing Systems” in this manual, and to the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Applications and Planning Guide, 365-375-008R3.0*.

Optical Craft Interface communications The Optical Craft Interface is a hardware and software package that allows craft personnel to provision a local LambdaRouter™ All Optical Switch using a graphical user interface.

The Optical Craft Interface is typically connected directly to the CIT port located on the System Controller Shelf of the LambdaRouter™ All Optical Switch. However, this connection can also be made over the intraoffice local area network (IAO LAN).

Both the CIT port and IAO LAN connection are 10BaseT connections that allow the Optical Craft interface to communicate with the network element using TCP/IP protocol. File transfers, such as during remote backup and restore operations, use the File Transfer Protocol (FTP).

Network parameters on both the network element and the Optical Craft Interface must be provisioned in order to allow communications.

LambdaRouter™ All Optical Switch provisioning

To communicate with the managing system, the LambdaRouter™ All Optical Switch must be provisioned with

- a Target Identifier (TID)
- an IP address and subnet mask for both Data Communications Channel (DCC) circuit packs in the System Controller Shelf

The TID and IP addresses are user-provisioned on initial system startup and may be changed at any time. However, if the network parameters are changed, the corresponding changes must be made to the Optical Craft Interface network element name and IP address list.

Optical Craft Interface provisioning

To communicate with the network element, the Optical Craft Interface must be provisioned with

- the Optical Craft Interface IP address for network communications
- a list of existing network element TID and IP addresses associations
- the Optical Craft Interface FTP IP address, username, and password for FTP communications

All Optical Craft Interface network parameters are user-provisionable and may be changed at any time.

RS-232 port communications

When connecting a terminal to the LambdaRouter™ All Optical Switch RS-232 port, either directly using a null modem cable or using a modem, the following RS-232 port parameters must be provisioned:

- baud rate
- data bits
- parity
- stop bits

The RS-232 port parameters are user-provisionable using the terminal that is connected to the RS-232 port. The terminal parameters are also user-provisionable. Refer to the documentation provided with the terminal for information.



Network Element Communications

- Overview** The LambdaRouter™ All Optical Switch supports the use of the optional LambdaRouter™ Optical Network Navigation System (ONNS) to perform connection management functions, including:
- end-to-end path computation for unprotected and protected paths
 - end-to-end connection setup and teardown for unprotected network connections for mesh-based topologies
 - protected network connections for mesh-based topologies using precomputed restoration paths
 - protected network connections for 1+1 topologies
 - end-to-end path restoration triggered by network degradation or failure

The LambdaRouter™ ONNS works with the Control Communications Network (CCN) and the Automatic Interconnection Recognition Protocol (AIRP) to perform the port discovery and link management functions required to provide distributed, automatic end-to-end service establishment and network restoration for the circuit-switched network.

For more information regarding the LambdaRouter™ ONNS and the Control Communications Network, refer to the following manuals:

- *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Applications and Planning Guide, 365-375-008R3.0*
- *LambdaRouter™ Optical Network Navigation System (ONNS) User's Guide, 365-375-015*

Control Communications Network

The Control Communications Network (CCN) provides the signaling method used by management systems (such as LambdaRouter™ ONNS) to set up and tear down network paths, and to provide restoration in response to path failures. CCN topology discovery is provided via the Open Shortest Path First (OSPF) protocol.

The LambdaRouter™ All Optical Switch CCN functionality is provided by the

- Restoration Controller (RC) circuit packs
- Restoration Interface Processor (RIP) circuit packs

Label Switched Paths (LSPs) are set up between RIP circuit packs on neighboring LambdaRouter™ All Optical Switch nodes to provide redundant IP communications between network-network (NN) applications.

All IP addresses in a network path between a specified origination and destination point can be retrieved using the trace route feature.

Restoration Controller circuit packs

The Restoration Controller (RC) circuit packs provide the interface between the Navis™ Optical Network Management System and the CCN. To maximize availability, the LambdaRouter™ All Optical Switch has two RC circuit packs, one provisioned as active and the other as standby.

The RC circuit packs are located in the System Controller Shelf (SCS), and each RC has the following connectors:

- One external 10BaseT ethernet connector that provides termination for the UNI/EI signaling port—this provides either an interface to an External Interface (EI) circuit pack as an alternative path to the management system via the DCC, or a User Network Interface (UNI) for customer control of light paths.
- One external 100BaseT ethernet connector that provides an interface to the Navis™ Optical Network Management System.
- One internal four-port 100BaseT ethernet hub that is used to provide communications between the RC and RIP circuit packs.

The following table provides a brief description of the provisionable data communication parameters for RC circuit packs.

Parameter	Description
IP Address and IP Subnet Mask	Specifies the IP address and subnet mask for RC circuit pack ports. The two external ports on an RC circuit pack are each assigned an IP address and subnet mask, and the internal four-port hub is assigned one IP address and subnet mask. All ports on the hub share the IP address and subnet mask. The external 10BaseT ports on the active and standby RCs share an IP address and subnet mask. The external 100BaseT connectors on the active and standby RCs also share an IP address and subnet mask. The internal four-port hubs on the active and standby RCs are provisioned with unique IP addresses. However, the and subnet mask for each internal port should be set to 255.255.255.0.
Gateway ID	Specifies the IP address for the operations messaging gateway. This parameter is provisionable only for the external 10BaseT port on the active and standby RC circuit pack and is required if an IP address and/or subnet mask have been specified for the external 10BaseT port.

All RC circuit pack provisionable CCN data can be retrieved and reviewed at any time.

Restoration Interface Processor circuit pack

The Restoration Interface Processor (RIP) circuit packs provide the Control Communications Network connectivity between each LambdaRouter™ All Optical Switch in the domain. The CCN application runs on the RIP circuit packs and automatically starts when the RIP circuit packs are booted.

When the LambdaRouter™ ONNS is enabled, the system must have two RIP circuit packs provisioned, and at least one must be in-service. The two RIP circuit packs provide each LambdaRouter™ All Optical Switch in the domain with duplicate, node-disjoint signaling paths to neighboring network elements in the domain. Each path corresponds to a RIP circuit pack.

The RIP circuit packs are located in the System Controller Shelf (SCS), and each RIP has the following connectors:

- One internal four-port 100BaseT ethernet hub that is used to provide communications between the RC and RIP circuit packs.
- One external 100BaseT and one 10BaseT connector that share the same four-port ethernet hub that are used to provide external communications between network elements via the CCN and the external network LAN.

In addition, each RIP circuit pack may be equipped with up to two Personality Modules, with each Personality Module providing two bidirectional OC-48 ports for IP PPP connections.

The following table provides a brief description of the provisionable data communication parameters for RIP circuit packs.

Parameter	Description
IP Address and IP Subnet Mask	Specifies the IP address and subnet mask for RIP circuit pack ports and Personality Module OC-48 ports (when equipped). Each RIP circuit pack requires two user-provisioned IP addresses and subnet masks, one for the internal four-port hub and one for the external four-port hub (all ports on a hub share the single IP address and subnet mask). When equipped, each Personality Module also requires a user-provisioned IP address for each of the OC-48 ports.
Port Status Indicator	Specifies whether the port is active (usable in the CCN). If inactive, no session can be established to that port. This parameter is provisionable only for the RIP circuit pack external 10BaseT and 100BaseT ports, and for the OC-48 ports on a Personality Module. At least one external port or Personality Module port must be provisioned as both Active and OSPF enabled.
OSPF Domain Member Indicator	Specifies whether the port is a member of the CCN OSPF domain (participates in OSPF messages). This parameter is provisionable only for the RIP circuit pack external 10BaseT and 100BaseT ports, and for the OC-48 ports on a Personality Module. At least one external port or Personality Module port must be provisioned as both Active and OSPF enabled.
Format Standard	Specifies whether the OC-48 port on a Personality Module is SONET or SDH format.

All RIP circuit pack provisionable CCN data can be retrieved and reviewed at any time.

Open Shortest Path First protocol

The Open Shortest Path First (OSPF) routing protocol is used for all message routing on the CCN, and for discovering the CCN topology.

The internal 100BaseT port, and all active and OSPF enabled external 10BaseT, 100BaseT, and OC-48 ports on a RIP circuit pack and Personality Module belong to the same OSPF area. All interfaces that are used to connect the RIP circuit packs residing on different LambdaRouter™ All Optical Switch nodes are also included in the OSPF area.

The CCN application running on each RIP circuit pack stores the complete OSPF domain topology of the CCN network. The OSPF protocol is used by the RIP circuit packs to dynamically update the view of the domain topology whenever there is a relevant topological change in the CCN network.

The topology information is used to determine the routes between the RIP packs of different and OTN-adjacent LambdaRouter™ All Optical Switch nodes.

OSPF neighbor information can be retrieved and viewed for the internal 100BaseT ports on the RIP circuit packs.

Label switched paths

The CCN application will create two bidirectional Label Switched Paths (LSPs) upon request from the LambdaRouter™ ONNS. The LSPs are link- and node-diverse, and are created on each OTN-adjacent transmission-capable node that LambdaRouter™ ONNS has requested.

The LSPs begin and end only at transmission-capable nodes, but may cross interceding non-transmission-capable nodes as required.

LambdaRouter™ ONNS cannot send the request to create the LSPs until the port neighbor discovery process has collected sufficient OTN topology data.

After the diverse paths between two neighboring LambdaRouter™ All Optical Switch nodes have been computed, the CCN software on the RIP circuit pack at each end of the path will establish a unidirectional LSP from itself to the RIP circuit pack on the neighboring node along the computed diverse path.

The LSP destination IP address and the IP address for each node in the path can be retrieved and viewed for a RIP circuit pack.

Trace route The trace route command allows a list of network IP addresses to be retrieved that correspond to a route found between a specified origination RC, RIP or Personality Module port and a specified IP address.

The LambdaRouter™ ONNS must be enabled before a trace route can be performed, and the origination port must have its Port Status Indicator set to Active.

Important! Two successive executions of the trace route command specifying the same origination AID and destination IP address can return different route composition information.



Link Management and Port Neighbor Discovery

Overview Link management supports LambdaRouter™ ONNS by performing port and LambdaRouter™ All Optical Switch neighbor discovery, and by verification of connectivity between adjacent network elements.

The port neighbor associations are acquired either through an automatic discovery process or by manual provisioning of the port neighbor information.

The LambdaRouter™ ONNS must be enabled before any link management or port neighbor provisioning can be performed.

Automatic port neighbor discovery

The Automatic Interconnection Recognition Protocol (AIRP) is used to perform automatic port neighbor discovery. Automatic port neighbor discovery is transparent to the user and, when enabled, is initiated after a port has been properly provisioned.

When the automatic port neighbor discovery or verification is active, AIRP transmits a 16 byte identification signal using the SONET J0 section trace byte, and waits for a response over the CCN from the neighboring LambdaRouter™ All Optical Switch.

If the port USAGE parameter is set to NNI on an OEO port, the J0 byte processing is performed on the NNI port.

If the NNI port is a transparent port (OXI, OXI-4A13, or OXI-4A15), the generation and detection of the J0 identification signal requires the use of a specially designated OEO port (OXI-10GC or OXI-2GC) called a **link probe** port. In this case, the AIRP process will call for a cross-connection from the link probe port to the NNI port being tested at any given time. The OEO port then generates or receives the J0 sequence (depending on which end of the link the particular LambdaRouter™ All Optical Switch is located), which is transmitted to (or received from) the transparent NNI port.

After automatic port discovery is completed, the LambdaRouter™ All Optical Switch has a picture of the connectivity to the other network elements to which it has a direct path. A link verification process is performed at a user-provisioned interval (when enabled) to verify that the discovered links are still providing transmission, and that the neighbor association data is still valid.

After automatic port neighbor discovery is initiated, the following actions may be taken:

- the ongoing discovery process for a specific LambdaRouter™ All Optical Switch may be aborted, and restarted after an abort
- the discovery process can be activated on-demand, which initiates the discovery process immediately
- port neighbor data may be retrieved
- port neighbor information may be edited

Automatic port neighbor discovery and link verification provisioning

Automatic port neighbor discovery requires the following hardware related entities to be provisioned:

- the RC and RIP circuit packs must have booted successfully and are provisioned with IP addresses
- the CCN is operational
- transparent ports must
 - have an **Interface Format** set to either **OC48/STM16** or **OC192/STM64**
 - have an available OEO port provisioned with a **Usage** parameter set to **LINK_PROBE** for transmission and reception of the AIRP J0 byte (an OEO port must be available for each data rate and format present on NNI ports on the system)
- all ports participating in automatic port neighbor discovery must
 - have the port **Usage** parameter set to **NNI** (Network-to-Network Interface)
 - be idle and in the IS-NR state

In addition, the following LambdaRouter™ ONNS link discovery and verification parameters must be provisioned. In order to provision the link discovery and verification parameters, the LambdaRouter™ ONNS must be enabled.

Parameter	Description
Automatic Link Discovery	The automatic port neighbor discovery and link verification process may be enabled (Activate) or stopped (Disable). If Activate is selected when automatic port neighbor discovery and link verification is already enabled, the process will begin immediately (rather than waiting for the next scheduled interval).
Discovery Signal Transmit Timer	Specifies the length of time (in seconds) that the discovery signal will be transmitted during each discovery attempt.
Discovery Retry Counter	Specifies the number of times port neighbor discovery or link verification will be re-tried before issuing a notification.
Discovery Retry Interval Timer	Specifies the length of time (in seconds) between retries of port neighbor discovery or link verification.
Link Verification Interval	Specifies the number of hours between the execution of the background automatic link verification process.
Link Verification Start Time	Specifies the start time, in hour of day format, for the execution of the background automatic link verification process. The start time is based on the Link Verification Start Time and the Link Verification Interval. For example, if the Link Verification Start Time is set to 3 and the Link Verification Interval is set to 8, the automatic link verification process will have a start time of 3 a.m., 11 a.m., and 7 p.m. each day.
Link Verification Receive Timer	Specifies the waiting time (in seconds) at the target network element for appearance of the J0 in-band probe signal after receiving verification notification from the source network element. The Link Verification Receive Timer must be set to a value that is less than the Link Verification Response Timer value.
Link Verification Response Timer	Specifies the waiting time (in seconds) at the verification source for an out-of-band response from the target network element. The Link Verification Response Timer must be set to a value that is greater than the Link Verification Receive Timer value.

Manual port neighbor provisioning

Manual port neighbor provisioning allows craft personnel to manually specify neighbor information for each port. The port neighbor information will remain as provisioned until altered by subsequent manual provisioning.

Output ports that are manually provisioned with neighbor data will do one of the following:

- If automatic verification is disabled, the output port will not participate in the automatic verification process.
- If automatic verification is enabled, and no port neighbor information was provisioned, the output port will participate in both the automatic discovery and verification processes. If specific port neighbor information was provisioned, the output port will participate in the automatic verification process only.

The following hardware related entities must be provisioned as part of manual port neighbor provisioning:

- transparent ports must have an **Interface Format** set to either **OC48/STM16** or **OC192/STM64**
- all ports being provisioned must have the port **Usage** parameter set to **NNI** (Network-to-Network Interface)

The following table provides a brief description of the port neighbor parameters that are manually provisionable. In order to manually provision port neighbor information, the LambdaRouter™ ONNS must be enabled.

Parameter	Description
Neighbor IP Address	The IP address (in dotted decimal notation) of the RC circuit pack in the LambdaRouter™ AOS that is a neighbor to the OCH port being provisioned. This parameter must be provisioned together with the Neighbor Port Access Identifier.
Neighbor Port AID	The AID of the OCH port that is a neighbor to the OCH port being provisioned. This parameter must be provisioned together with the Neighbor IP Address.
Discovery Mode	Enables or disables the automatic discovery/link verification process on a specific port. Manual provisioning is allowed for either value of this parameter. This parameter must be set to the same value on both the output port and input port involved in the link.
Propagation Delay	Specifies the propagation delay (in milliseconds) through the link between the pair of OCH ports. This is the amount of time needed for a signal to travel from this node to the neighbor node. This parameter must be set to the same value on both the output port and input port involved in the link.
Administrative Cost	Specifies the administrative cost of the port connection. This parameter must be set to the same value on both the output port and input port involved in the link.
Shared Risk Link Group 1, 2, and 3	Specifies the Shared Risk Link Group identifiers used to exclude links from the connection path(s) being created. Up to three different Shared Risk Link Groups may be configured, each must have a unique identifier. These parameters must be set to the same value on both the output port and input port involved in the link.
Virtual Private Network	Identifies the ports that are contracted to carry traffic for a specific customer. This parameter must be set to the same value on both the output port and input port involved in the link.

Port Link List The Port Link List provides the results of automatic port neighbor discovery or manual port neighbor provisioning, as well as the status of the port link.

The report can be retrieved for a port, port unit, or optical interface shelf, and includes the neighbor IP address and port AID, the port direction, propagation delay, administrative cost, shared risk group links, VPN ID, discovery mode, and link status.

After the report is generated, the data may be saved and/or printed.





5 Equipment Configuration Management

Overview

Purpose This chapter provides detailed information on the LambdaRouter™ All Optical Switch equipment configuration management functions.

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Introduction to Equipment Configuration Management

Overview Equipment provisioning includes configuration of the following data:

- common equipment provisioning data
 - identification data
 - functional parameters
 - configuration data
 - state information
 - signaling options
- slot provisioning data
 - state information
- optical channel (OCH) port provisioning data
 - transport parameters
 - state information
 - signaling options
 - protection switching options
 - performance monitoring profiles

See “Equipment Provisioning” (5-5) for additional information.



AID Overview

Introduction This section provides an overview of the external user AIDs for the LambdaRouter™ All Optical Switch. Information is provided for AID syntax and grammar rules used to define the AIDs, as well as terminology and names used to identify physical and logical entities.

For more information on AIDs, refer to the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Operations Systems Engineering Guide, 365-375-013R3.0*.

AID hierarchy The AID hierarchy is defined to represent the network element structure. AIDs are defined using a physical hierarchy (imposed by the physical architecture of the system), or a logical hierarchy (imposed by the logical grouping of entities).

AID structure The following AID structure is used by the LambdaRouter™ All Optical Switch:

*{Entity Type} [[- {Shelf Number} [[- {Slot Number}]] or
[- {I/O Identifier} - {Block Identifier}]]] - {Entity
Identifier}]*

Fields are separated by hyphens (-). Entries enclosed in { } are variables and fields enclosed in [] are optional.

The following table shows the AID structure and hierarchy.

Entity	Hierarchy
System	{ <i>Entity Type</i> }
Shelf	{ <i>Entity Type</i> }-{ <i>Entity Identifier</i> }
Slot/Circuit Pack	{ <i>Entity Type</i> }-{ <i>Shelf Number</i> }-{ <i>Entity Identifier</i> }
OCH Port	{ <i>Entity Type</i> }-{ <i>Shelf Number</i> }-{ <i>Slot Number</i> }-{ <i>Entity Identifier</i> }
SWIP	{ <i>Entity Type</i> }-{ <i>Shelf Number</i> }-{ <i>I/O Identifier</i> }-{ <i>Block Identifier</i> }-{ <i>Entity Identifier</i> }
Protection/Maintenance Group	{ <i>Entity Type</i> }-{ <i>Entity Identifier</i> }
Fan	{ <i>Entity Type</i> }-{ <i>Entity Identifier</i> }

Entering “all” in an AID field

An AID field value of “all” can be used to specify a set of entities (such as slots or ports) as input parameter values for various TL1 commands.

If “all” is used at a higher level in the AID, lower-level AID components are not allowed. For example, if “all” is used in the Slot Number field, it is not used in the Entity Identifier field.

The following examples illustrate the use of the field value “all”:

- hvdac-0-all selects all HVDAC slots of High-Voltage Shelf 0
- swip-0-in-all selects all input SWIPs on Switch Shelf 0
- och-1-3-all selects all ports on the third port unit on the first optical interface shelf
- och-1-all selects all ports on the first optical interface shelf



Equipment Provisioning

Introduction Equipment provisioning is the process of assigning values to a set of parameters of the system (or any of its subsystems) in order to enable or facilitate the expected use of the entity. Provisionable entities include

- system
- shelves
- slots/circuit packs
- SWIPs
- ports
- cross-connections
- maintenance groups

The provisioning of system components involves the creation of a software representation of the component and/or a record of its parameter values, as well as actual modification of the component parameters.

Working controllers are required to allow user provisioning of controlled equipment. No user provisioning is allowed until the controllers and control links have passed all diagnostics.

The provisionable parameters and values (current and original) are maintained in the non-volatile memory of the PRI MEM circuit packs in the System Controller Shelf.

Provisioning hierarchy The provisioning of equipment is subject to the following hierarchy:

- system
- shelf
- slot/circuit pack (or SWIPs)
- OCH port
- cross-connection

An entity may not be provisioned if the corresponding entities preceding it are not provisioned. For example, a slot may not be provisioned if the shelf in which it is located is not already provisioned.

De-provisioning hierarchy	The de-provisioning of equipment is subject to the following hierarchy: • cross-connection • slot/circuit pack • shelf • system As with provisioning, in order to de-provision an entity, all preceding entities must have been de-provisioned. Deprovisioning an OXI, OXI-4A13, OXI-4A15, OXI-10GC, or OXI-2GC slot automatically deprovisions the ports associated with the slot.
Types of provisioning	The following types of provisioning are supported: • manual provisioning • pre-provisioning • auto-provisioning
Manual provisioning	LambdaRouter™ All Optical Switch software allows manual provisioning of all user-provisionable parameters using any available operations interface. This includes the Optical Craft Interface for LambdaRouter or other managing system.
Pre-provisioning	Pre-provisioning refers to the creation of a component image by assigning parameter values to an entity prior to physically installing the component into the system. With pre-provisioning, a mismatch is possible between the parameter settings in the component and in its image. In this case, parameter modifications may then be initiated either locally or remotely. In the LambdaRouter™ All Optical Switch system, only optical interface shelves and port unit slots may be pre-provisioned. This is done by identifying the optical interface shelf type, slot, and the circuit pack functional name and functional qualifier. Ports will be autonomously created upon pre-provisioning of the associated slot/circuit pack.
Auto-provisioning	Auto-provisioning refers to the automatic generation of a component image (with its current parameter settings) upon addition of the component to the system. Auto-provisioning allows the system to discover its hardware configuration and to create the associated entities autonomously using the original (default) or user-defined, pre-provisioned parameters.

If equipment related parameters have been pre-provisioned and the inserted equipment does not match, the inserted equipment will not be enabled. Pre-provisioned parameters take precedence over auto-provisioning.

Initial system startup

For an initial system startup, some manual provisioning of the system configuration must be performed, including

- installation of system software and mirror mapping/calibration files
- setting the system configuration (identifying as a 128 or 256 system)
- setting network parameters (for example, IP address, subnet mask, and default router address for each DCC, RIP, and RC circuit pack), Target Identifier (TID), and system date and time
- provisioning optical interface shelves (OIS-T, OIS-10G, OIS-2G, and OIS-MX)

Subsequent system startup

After the system has been configured for the initial startup, auto-provisioning is performed upon subsequent system startups and upon circuit pack insertion. Auto-provisioned entities receive default provisioning values.

The following entities are auto-provisioned upon system startup:

- system
- all provisioned shelves (except optical interface shelves)
- all slots on provisioned shelves
- equipped ports

The provisioning of the system configuration triggers the autonomous creation of the applicable shelf objects. The creation of a shelf object triggers the autonomous creation of the associated slot/circuit pack (or SWIPs) objects for all shelves except optical interface shelves. For optical interface shelves, only equipped slots are created autonomously. The creation of a slot/circuit pack triggers the autonomous creation of the associated ports.

Equipment removal

The system detects and reports the removal of any equipment. The removal of equipment updates the state-related information but does not cause the system to delete any entities from the system database. The user must manually delete the equipment through the Optical Craft Interface or other managing system to remove the entity from the system database.

The following equipment can be deleted from the system database:

- optical interface shelves (OIS-T, OIS-10G, OIS-2G, and OIS-MX)
- port units (OXI, OXI-4A13, OXI4A15, OXI-10GC, and OXI-2GC)
- personality modules
- SWIP maintenance groups (SWMGs)

The following restrictions apply to deleting equipment (refer to “De-provisioning hierarchy” (5-6) for additional information):

- All port unit slots must be deleted before an optical interface shelf can be deleted.
- All ports on a port unit must be idle (not involved in a cross-connection) and the slot must be unequipped (circuit pack extracted) before port unit slots can be deleted.

Ports on a port unit are automatically deleted from the system database when the associated port unit is deleted. Ports cannot be deleted individually.

- Both SWMG objects must exist before one can be deleted. The SWMG being deleted must be OOS-MA and the other must be IS-NR.
- Personality module slots must be unequipped (personality module extracted) before personality modules can be deleted.

Important! The removal of equipment may result in alarms and the insertion of maintenance signals.

**Inventory and
equipage checks**

The network element provides an inventory of all electronic equipment that is provisioned in the system. The inventory information (type, version, serial number, and so on) is available to the user via an inventory request. The provisioned data information, including cross-connection information, can be reported on demand.

An equipage check at the slot level is provided to verify the compatibility between the slot provisioning and the circuit pack type and provisioning. An alarm is generated if an invalid configuration is detected.

The LambdaRouter™ All Optical Switch has self-knowledge of equipage and status needed for operation, and supports a set of provisioned data that provides for addressing, communications, and operations. This is accomplished through the use of

- target identifiers (TIDs)
- access identifiers (AIDs)
- circuit pack identifiers

Target identifiers

A Target Identifier (TID) identifies a specific network element within an optical network and is used for remote login requests, and all commands and report requests from users.

The TID is stored in non-volatile memory, and can be provisioned by a user providing the system is in an out-of-service/management state (OOS-MA). Each network element in a network must have a unique TID, which is a case-insensitive string of up to 20 alphanumeric characters (A-Z, a-z, and 0-9), hyphens (-), and forward slashes (/).

Important! The TID must not begin or end with a hyphen.

Access identifiers

An Access Identifier (AID) identifies a specific physical or logical entity within a network element.

Each entity has a unique AID, which is a string of up to 20 alphanumeric characters and hyphens (-). Lowercase letters are translated into uppercase before they are stored in the network element.

Circuit pack identifiers Each circuit pack provides an identifier that provides the following information for the circuit pack:

- apparatus code (circuit pack type)
- serial number
- series number (version)
- Common Language[®] Equipment Identifier (*CLEI*[™]) code
- Equipment Catalog Item (ECI) code

The circuit pack identifier is readable by the system upon insertion of the circuit pack in any allowable slot. The circuit pack identifier is not provisionable by the user.



Equipment Configuration Logs and Reports

Introduction The LambdaRouter™ All Optical Switch provides an inventory of all of the electronic equipment that is available to the user, and can report provisioned data information, including cross-connection information, on demand. The following equipment configuration logs and reports are available:

- Equipment List
- Notification Log

Equipment List The Equipment List provides a listing of equipment for a selected shelf, circuit pack, or OCH port in the network element.

The report includes the AID for the selected entity, as well as additional information that describes the equipment that makes up the selected entity (such as CLEI code and serial number.)

Notification Log The Notification Log provides a list of the most recent activity that has caused changes to the database.

The database change notifications are defined by changes in user-provisionable attributes and any non-user-provisionable attributes specified as being automatically reported via notification.

For additional information on notification registration, see “LambdaRouter™ All Optical Switch User Notification Registration List” (3-9).





6 Alarm Monitoring and Fault Management

Overview

Purpose This chapter provides an introduction to the LambdaRouter™ All Optical Switch alarm monitoring and fault management functions. For detailed information on alarm monitoring and fault management, refer to the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide, 365-375-010R3.0*.

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Introduction to Alarm Monitoring and Fault Management

Fault management Fault management is used to process defects and failures and their contribution to the generation of alarms for transmission and system control equipment.

Defect processing is used to initiate network restoration.

The fault management process involves

- system declaration of a defect or failure (for example, loss of signal)
- system notification of transmission defects to LambdaRouter™ Optical Network Navigation System (ONNS)
- system initiation of an internal correlation process over an integration period to generate alarm and status conditions after a failure is declared
- user response to alarm messages and alarm indicators
- user performance of routine maintenance

All transmission and system control faults are isolated to one or more field-replaceable units.

Alarm monitoring Alarm monitoring allows the LambdaRouter™ All Optical Switch to report failure conditions.

Failure conditions are reported by

- facility/equipment alarm messages
- user/alarm panels
- circuit pack LEDs
- office alarms

Maintenance Maintenance is the system response to faults (defects and failures) to provide fast transmission and system control recovery.

The maintenance process involves autonomous or manual recovery of failures.

Related information For related information and procedures for craft intervention in fault management and maintenance, refer to the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide, 365-375-010R3.0*.



Alarm Monitoring

Introduction The LambdaRouter™ All Optical Switch supports the detection of failure conditions and the autonomous generation and reporting of associated alarms.

Alarm indications include

- messages through the communications interface to the Optical Craft Interface, Navis™ Optical Element Management System, or other managing system
- user panel LEDs
- circuit pack LEDs
- Optical Craft Interface GUI indicators
- office alarms

User panels User panels located on each shelf in the LambdaRouter™ All Optical Switch provide alarm/status information for the shelf. If more than one alarm exists at the shelf, only the highest alarm level LED is illuminated.

Circuit pack LEDs LEDs located on the faceplate of each circuit pack provide an indication of the current status of the individual circuit pack.

Optical Craft Interface GUI indicators Indicators are provided on the Optical Craft Interface GUI for not-alarmed, minor, major, and critical alarms, and for transient condition and protection switch events.

See “Optical Craft Interface Network Element Shelf View” (A-40) for additional information.

Office alarm interface The LambdaRouter™ All Optical Switch provides an interface to the Office Alarm System for each alarm level that leads to office audible or visual alarms. An audible alarm cutoff is provided locally on the system and remotely via user command.

Alarm logs Alarm logs are maintained to provide a list of currently active alarms, as well as a history of alarms.

See “Alarm Monitoring and Fault Management Reports and Logs” (6-10) for additional information.

Alarm notification categories

Alarm reporting is grouped into the following categories:

- optical channel alarms
- equipment alarms
- common alarms
- security alarms
- Control Communications Network (CCN) alarms
- quality of service (QoS) alarms (performance monitoring)

Optical channel alarms

Optical channel alarms cover input signal failures and are issued against an input port. Input port defect notification is also sent to the LambdaRouter™ Optical Network Navigator System (ONNS).

Equipment alarms

Equipment alarms cover transmission and control equipment failures and are issued with respect to a port, circuit pack/slot, shelf, or the system.

Common alarms

Common alarms are issued with respect to a circuit pack, controller complex, shelf, or the system.

Security alarms

Security alarms are issued with respect to login events and managing system access.

Control Communications Network alarms

Control Communications Network alarms are issued with respect to IP network, port, and process fault detection.

Quality of Service alarms

Quality of Service alarms are issued with respect to performance monitoring threshold crossing alerts.

**Alarm declaration types
and states**

Alarm notification declaration types consist of the following:

- standing conditions
- transient conditions

The alarm declaration state for standing alarms will be one of the following:

- Set (to report the occurrence of the fault)
- Clear (to report recovery/clearing of the fault)

Transient conditions do not require a clear.

Alarm correlation

The LambdaRouter™ All Optical Switch has the ability to correlate alarms in order to minimize the number of alarm messages generated for a single fault condition. If multiple alarmable events are generated by a single fault, only the alarm causing the fault will be reported.

Alarm provisioning Provisioning of alarm declaration and clearing times is supported.

Alarm severity levels

The reported alarm level is based on the type and state of the alarm declaration type. The following levels are used:

Declaration Type	Declaration State	Reported Alarm Level	Description
Standing	Set	Critical	Service-affecting conditions (shown as a red indicator on the OCI user interface)
		Major	Any condition inhibiting the ability to detect and/or report fault conditions (shown as a yellow indicator on the OCI user interface)
		Minor	Non-service-affecting conditions that could affect service if a repeated failure occurs (shown as a blue indicator on the OCI user interface)
		Not Alarmed	Non-service-affecting events (shown as a white indicator on the OCI user interface)
	Clear	Clear	Alarm condition clears
Transient	Set	NA	Transient condition

Alarm declaration time

The alarm declaration time is a user-provisionable delay from the time a fault condition occurs to the time an alarm is generated. The fault condition must persist for the entire alarm declaration time delay for an alarm to be generated.

Alarm clearing time

The alarm clearing time is a user-provisionable delay from the time a fault condition clears to the time an alarm clear notification is generated. The fault condition must not recur for the entire alarm clear time delay for a clear notification to be generated.



Protection Switching

Introduction Protection switching allows the system to automatically switch over to the standby or protection circuitry in the event of a failure. In addition, a manual or forced protection switch may be initiated as part of craft fault isolation procedures.

The following control system entities support autonomous and manual protection switching:

- the System Controller Complex Protection Group (SCCPG)
- the High-Voltage Shelf Controller Protection Group (HVCPG)
- the Optical Interface Shelf Controller Protection Group (OICPG)

The current state of the protection groups, both active and standby, can be retrieved. The information returned includes both the overall state of the protection group as well as the individual circuit packs that make up the protection group.

In addition, the output port 2:1 selector provides autonomous, manual, and forced transmission protection switching between fabric 0 and 1.

Autonomous protection switching

Autonomous protection switching is an automatic, non-revertive response to a system-detected fault condition. Controller protection groups and output port 2:1 selectors both support autonomous protection switching in response to fault detection.

Autonomous protection switching takes priority over manual protection switching.

Manual protection switching

Manual protection switching may be initiated by craft personnel as part of fault isolation procedures or routine maintenance. The manual protection switch applies to both the controller and the 2:1 selector.

When performing a manual protection switch of the system controller complex, any active transactions that cannot be aborted will be completed prior to switching the controller complexes.

When performing a manual protection switch of a shelf controller, any active transactions within the shelf domain will be aborted prior to switching the shelf controller.

Manual protection switching is overridden by an autonomous protection switch.

Forced protection switching

Forced protection switching may be initiated by craft personnel as part of fault isolation procedures or routine maintenance. Forced protection switching applies only to output port 2:1 selectors (not to shelf or system controllers), and will create an ABN alarm on the shelf.

A forced protection switch overrides an autonomous or manual protection switch, and remains active until released.

Releasing a protection switch

After operating a manual or forced protection switch on an output port 2:1 selector, craft personnel may release the protection switch. The release command may return the selector to an autonomous fault detection status.

A manual protection switch on a controller entity does not require a release in order to perform another protection switch on the controller entity.

A manual protection switch on an output port 2:1 selector must be released, or otherwise superseded by an autonomous or forced protection switch, before another manual protection switch can be performed on the port.



Alarm Monitoring and Fault Management Reports and Logs

Overview The LambdaRouter™ All Optical Switch provides autonomous logging of system alarms and protection switching activity. The following reports and logs are available:

- Alarm List
- Alarm Log
- Protection Switch Log
- Transient Condition Event List

Each log is a separate read-only file that is stored in the non-volatile memory (NVM) of the network element. The log files are circular files of a fixed size. Once the log has been filled to the specified capacity, the next entry will overwrite the oldest existing entry. Therefore, the data that is available at any given time is limited to the capacity of the file. The time span covered by the log file may be reduced during periods of intense activity. All entries within a log file are time- and date-stamped.

Each of the logs may be retrieved, saved, and printed.

Alarm List The Alarm List provides a list of the currently active alarms on the network element.

The report includes the alarm level and type, identification of affected equipment, effect on service, condition type, and additional details of the failure (if available).

Alarm Log The Alarm Log provides a history and time sequence of the setting and clearing of system alarms.

The log includes the type of trouble, time of occurrence, identification of affected equipment, effect on service, alarm level, alarm condition state, and additional details of the failure (if available).

**Protection Switch
Activity Log**

The Protection Switch Activity Log provides a time-stamped list of protection switching activity that has occurred within the network element. This includes controller and output port 2:1 selector related switching activity.

For controller groups, the log includes the active group ID. For output port 2:1 selectors, the log includes the active unit ID, the type of protection switch (manual, forced, autonomous, or no request), and the active side.

**Transient Condition Event
List**

The Transient Condition Event List provides a time-stamped list of the following transient events:

- protection switch events
- threshold crossing alerts
- other transient events

Each of the transient event types is displayed on a separate tab in the Transient Condition Event Log Screen.





7 Cross-Connection Management

Overview

Purpose This chapter provides detailed information on the LambdaRouter™ All Optical Switch (AOS) cross-connection management functions. A brief description of the transmission interfaces that allow the LambdaRouter™ All Optical Switch to interface with external Optical Line Systems (OLSs) and other network elements (NEs) is also provided.

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Introduction to Cross-Connection Management

Introduction A cross-connection is a configurable optical, or optical-electrical-optical (OEO), transmission path interconnection between input and output ports within a network element. The input and output ports are the only entities from which, and to which, the user can provision cross-connections.

In the LambdaRouter™ All Optical Switch, all cross-connections are strictly non-blocking for all (one-way or two-way) point-to-point cross-connections. This means that no cross-connection request will be denied for lack of a path through the switch fabric. Both bit-rate-independent (transparent) and rate-specific interfaces are supported.

Cross-connection management functions

Cross-connection management functions include all activities necessary to

- provision transmission interfaces
- establish, modify, and remove cross-connections
- operate and release loopback cross-connections
- establish and remove test access sessions
- retrieve cross-connection parameters (including loopback and test access parameters)

Cross-connection management functions on a single network element are performed using the Optical Craft Interface for LambdaRouter™ graphical user interface or other managing system (such as the Navis™ Optical Element Management System).

LambdaRouter™ Optical Network Navigator System

The LambdaRouter™ All Optical Switch supports the use of the LambdaRouter™ Optical Network Navigator System (ONNS) in conjunction with Navis™ Optical Network Management System (NMS) for cross-connection management functions.

The LambdaRouter™ ONNS provides network-wide topology information and supports cross-connection management functions including automatically creating, deleting, and restoring end-to-end data paths for the circuit-switched network.



Transmission Interfaces

Introduction The LambdaRouter™ All Optical Switch supports the following transmission interfaces:

- Optical Cross-Connect Interface (OXI)
- Optical Cross-Connect Interface, four ports with ingress optical amplifiers in the 1310 nm band (OXI-4A13)
- Optical Cross-Connect Interface, four ports with ingress optical amplifiers in the 1550 nm band (OXI-4A15)
- Optical Cross-Connect Interface 10G Client (OXI-10GC)
- Optical Cross-Connect Interface 2.5G Client (OXI-2GC)

The transmission interfaces provide connectivity between external Optical Line Systems (OLs) or client network elements (NEs) and the LambdaRouter™ All Optical Switch.

**Bit-rate-independent
(transparent) interface**

The OXI, OXI-4A13, and OXI-4A15 circuit packs are bit-rate-independent optical interfaces. When a bit-rate-independent, or transparent, optical interface is provisioned, no distinction is made in either the format (SONET/SDH, ATM, or IP) or rate (2.5 Gbps or 10 Gbps) of the signal as long as the input and output ports are consistently provisioned.

While neither format nor rate information is required in optical channel (OCH) port provisioning, a distinction in format may be specified when a port is provisioned because the optical parameters for those signals may differ in wavelength and/or power. If a port is provisioned with an interface format, that information will be checked when a cross-connection request is made and the request will be denied if input port attributes do not match those of the output port.

Transparent interface input port provisioning

The following table provides a brief description of the transparent interface input port parameters. Any requirements or restrictions that apply to provisioning the port parameters are also provided.

Input Port Parameter	Description
Input Port Usage	Specifies the intended usage for the input port. The port must be idle to modify this parameter.
Interface Format	Specifies the interface format of the input port. The port must be idle to modify this parameter.
Interface Optics	Specifies the interface optics type for the input port. This parameter must be set to a value that is compatible with the selected Interface Format. Refer to the Transparent port provisioning table (7-10) for allowed Interface Format and Interface Optics combinations. This parameter may be modified while the port is cross-connected.
Minimum Input Power for DOS	Specifies the minimum ingress power level for detection of signal. This parameter is provisionable only if the Interface Optics type is set to Other.
Ingress Central Office Loss	Specifies the maximum allowed ingress Central Office loss for detection of signal. This parameter is provisionable only for OXI-4A13 and OXI-4A15 ports.
Optical Amplifier Target Output Power	Specifies the input port optical amplifier target output power. This parameter is provisionable only for OXI-4A13 and OXI-4A15 ports, and only if the Interface Optics type is set to Other. If the Interface Optics type is not set to Other, the optical amplifier output power is determined by the system and any provisioned value is ignored.
Auto-Enable Alarm Monitoring	Specifies whether the alarm monitoring on a cross-connected input port will start automatically upon DOS. This parameter can only be modified while the port is cross-connected, and cannot be set to ENABLE when there is detection of signal at the input port.
Keep Alive Alarm	Specifies whether a non-service affecting alarm will be generated upon detection of LOS, LOF, BER, or EBER for an idle input port.
Input SWIP assignments	Specifies the input SWIP assignments for fabric 0 and 1. Only one SWIP assignment may be changed at a time.

Transparent interface output port provisioning

The following table provides a brief description of the transparent interface output port parameters. Any requirements or restrictions that apply to provisioning the port parameters are also provided.

Output Port Parameter	Description
Output Port Usage	Specifies the intended usage for the output port. The port must be idle to modify this parameter.
Output Interface Format	Specifies the interface format of the output port. The port must be idle to modify this parameter.
Output Interface Optics	Specifies the interface optics type for the output port. This parameter must be set to a value that is compatible with the selected output port Interface Format. Refer to the Transparent port provisioning table (7-10) for allowed Interface Format and Interface Optics combinations. The port must be idle to modify this parameter.
Output SWIP assignments	Specifies the output SWIP assignments for fabric 0 and 1. Only one SWIP assignment may be changed at a time.

Rate-specific interfaces

The OXI-10GC and OXI-2GC circuit packs are rate-specific optical interfaces. When a rate-specific optical interface with OEO functionality is provisioned, the interface standard must be specified for both the input and output ports.

Rate-specific interface input port provisioning

The following table provides a brief description of the OXI-10GC or OXI-2GC circuit pack input port parameters. Any requirements or restrictions that apply to provisioning the port parameters are also provided.

Input Port Parameter	Description
Input Port Usage	Specifies the intended usage for the input port. The port must be idle to modify this parameter.
Input Auto Laser Shut-Off (ALSO)	Specifies whether to automatically shut off the port laser upon detection of loss of signal (LOS), loss of frame (LOF), or excessive bit error rate (EBER).
Interface Standard	Specifies the interface standard (SDH or SONET) of the input port. The port must be idle to modify this parameter.
Input Signal Degrade	Specifies the input port bit error rate (BER) threshold for the optical signal. This parameter is provisionable only when the Interface Standard is set to SONET.
Input Degrade Threshold	Specifies the input port bit error rate (BER) threshold for the optical signal. This parameter is provisionable only when the Interface Standard is set to SDH.
Input Signal Failure	Specifies the input port excessive bit error rate (EBER) threshold for the optical signal. This parameter is provisionable only when the Interface Standard is set to SONET.
Input Excessive Degrade Threshold	Specifies the input port excessive bit error rate (EBER) threshold for the optical signal. This parameter is provisionable only when the Interface Standard is set to SDH.
Auto-Enable Alarm Monitoring	Specifies whether the alarm monitoring on a cross-connected input port will start automatically upon DOS. This parameter can only be modified while the port is cross-connected, and cannot be set to ENABLE when there is detection of signal at the input port.
Keep Alive Alarm	Specifies whether a non-service affecting alarm will be generated upon detection of LOS, LOF, BER, or EBER for an idle input port.
Input SWIP Assignments	Specifies the input SWIP assignments for fabric 0 and 1. Only one SWIP assignment may be changed at a time.

Rate-specific interface output port provisioning

The following table provides a brief description of the OXI-10GC or OXI-2GC circuit pack output port parameters. Any requirements or restrictions that apply to provisioning the port parameters are also provided

Output Port Parameter	Description
Port Usage	Specifies the intended usage for the output port. The port must be idle to modify this parameter.
Auto Laser Shut-Off (ALSO)	Specifies whether to automatically shut off the port laser upon detection of loss of signal (LOS), loss of frame (LOF), or excessive bit error rate (EBER).
Interface Standard	Specifies the interface standard (SDH or SONET) of the output port. The port must be idle to modify this parameter.
AIS-L Protection Switch	Specifies whether to perform a protection switch at the output port selector based upon the detection of an AIS-L signal.
Selector Autolock	Specifies whether to monitor the frequency of SONET/SDH triggered protection switch requests. When enabled, if the frequency exceeds three triggers within three seconds, all SONET/SDH triggered protection switch requests will be suppressed for a period of five minutes.
BER Protection Switch	Specifies whether to perform a protection switch at the output port selector based upon the detection of degrade threshold (SDH) or signal degrade threshold (SONET).
Excessive BER Protection Switch	Specifies whether to perform a protection switch at the output port selector based upon the detection of excessive degrade threshold (SDH) or signal failure threshold (SONET).
Output Signal Degrade Threshold	Specifies the output port bit error rate (BER) threshold for the optical signal. This parameter is provisionable only when the output port Interface Standard is set to SONET.
Output Degrade Threshold	Specifies the output port bit error rate (BER) threshold for the optical signal. This parameter is provisionable only when the output port Interface Standard is set to SDH.

Output Port Parameter	Description
Output Signal Failure Threshold	Specifies the output port excessive bit error rate (EBER) threshold for the optical signal. This parameter is provisionable only when the output port Interface Standard is set to SONET.
Output Excessive Degrade Threshold	Specifies the input port excessive bit error rate (EBER) threshold for the optical signal. This parameter is provisionable only when the output port Interface Standard is set to SDH.
Generate Keep Alive Signal	Specifies whether an AIS-L signal will be generated for an idle (non-cross-connected) output port. This parameter must be enabled and the Auto Laser Shutoff parameter must be disabled in order to maintain an outgoing signal to the downstream network element when the output port is either idle (no cross-connection assigned) or busy (cross-connection assigned). Enabling the Generate Keep Alive Signal parameter causes the idle output port to generate an AIS-L signal downstream. Disabling the Auto Laser Shutoff parameter allows the output port to generate an AIS-L signal downstream when the busy output port detects signal failure, or will pass the customer signal when the customer signal has not failed.
Output SWIP Assignments	Specifies the output SWIP assignments for fabric 0 and 1. Only one SWIP assignment may be changed at a time.

Signal maintenance

Signal maintenance involves detecting the presence or absence of optical power at the input and output ports of the transmission interface circuit packs, generating appropriate alarms, and performing fabric path protection switching.

Power monitors are used to detect the presence or absence of optical power at the input and output ports on a transparent optical interface circuit pack, and on the output ports on rate-specific interface circuit packs.

Each OCH port must be provisioned with the proper threshold levels to allow the associated power monitors to detect the loss and return of the optical signal.

Transparent port provisioning

The signal detection and signal loss thresholds for the transparent ingress power monitors are configured by specifying the interface format and optics that are, or will be, connected to each port.

These threshold values are initially set based on user provisioned system-wide default values and are sufficient to enable detection of the presence or loss of any allowable client signal.

Before a port is enabled for use in a cross-connection, the individual port may be provisioned to more accurately represent the connected client interface format and optics.

The system uses the provisioned interface format and interface optics type to compute the detection of signal (DOS) and loss of signal (LOS) thresholds for the power monitors on amplified and non-amplified input ports, and the optical amplifier output power level for amplified ports.

If the interface format and/or the interface optics type is set to **Other**, the minimum input power for DOS and the optical amplifier output power level are selectable by the user. If neither the interface format nor the interface optics type are set to **Other**, the minimum input power for DOS and optical amplifier output power level are computed by the system and cannot be changed by the user.

The associated thresholds for LOS are nominally set 6 dB below the DOS values shown in the Transparent port provisioning table (7-10), after accounting for power monitor sensitivity variations.

For transparent port units with non-amplified input ports (the OXI circuit pack), the signal detection and signal loss thresholds for the egress power monitors are computed and set by the system. The egress power monitor thresholds are determined based on the thresholds set for the input power monitors and the expected loss values through the switch fabric.

The following table shows the nominal minimum ingress power levels that will result in detection of signal; the actual thresholds are set slightly below the values shown in the table to account for small port-to-port variations in the sensitivity of the power monitors. This table also shows the optical amplifier (OA) power levels set by the system for the allowable combinations of the interface format and interface optics types.

Interface Format	Interface Optics (user provisioned)	Min Ingress Power for DOS (dBm)	Ingress Wavelength (nm, OA ports only)	Optical Amplifier Output Power (dBm, OA ports only)
OC-48/ STM-16	SR (ITU I-16)	-10	1310	0.25
	IR (ITU S-16.1)	-5	1310	1.7
	LR (ITU L-16.1)	-2	1310	0
	Other	User provisioned	Implicit in OA pack type	User provisioned
OC-192/ STM-64	VSR600-2R1; VSR2000-2R1	-6	1310	3.7
	VSR600-2M1	2	1310	4.2
	VSR600-2M2	-1	1550	3.6
	VSR2000-2L2	-5	1550	3.6
	SR (ITU I-64.1)	-6	1310	3.7
	IR (ITU S-64.2,3b)	-1	1550	3.6
	LR (ITU L-64.2ac)	-2	1550	0
	Other	User provisioned	Implicit in OA pack type	User provisioned
OC-768/ STM-256	LambdaXtreme	5	1310	0
	Other	User provisioned	Implicit in OA pack type	0
GBELX	SR	-11	1310	0.25
	Other	User provisioned	Implicit in OA pack type	User provisioned
HSBB	IR	-5	1310	1.7
	Other	User provisioned	Implicit in OA pack type	User provisioned
Other	Other	User provisioned	Implicit in OA pack type	User provisioned

OEO port provisioning

Ingress ports on OEO interface circuit packs provide optical-electrical-optical conversion of the incoming signal, and circuitry to monitor the electrical signal and provide signal fail and signal degrade detection.

User provisioning of the OEO ingress port SONET interface Input Signal Degrade/Input Signal Failure, and SDH interface Input Degrade Threshold/Excessive Degrade Threshold settings is permitted.

The signal detection and signal loss thresholds for the OEO egress power monitors are computed and set by the system. User provisioning of the OEO ingress port SONET interface Output Signal Degrade/Output Signal Failure, and SDH interface Degrade Threshold/Excessive Degrade Threshold settings is permitted.



Cross-Connection Configurations

Introduction A cross-connection provides internal transmission capability between a set of input and output ports within a single network element. All cross-connections can be classified as either a one-way or two-way configuration.

A set of associated cross-connections can be established to provide the configuration needed for a particular communications application. The following cross-connection configurations are supported:

- one-way and two-way point-to-point
- one-way and two-way bridged and/or merged
- cross-connect loopback
- test access

A one-way transmission path that has been established from an input port to an output port within a single network element is called a cross-connection leg. Each leg is identified as an entity by

- its pair of input and output ports
- its configuration
- its cross-connection rate (when identified)
- the number of switch fabrics through which it passes

A leg with a transmission path through one switch fabric (either side 0 or side 1) is called a simplex leg. A leg that has a transmission path through both switch fabrics is called a duplex leg. All one-way and two-way point-to-point cross-connections are considered duplex.

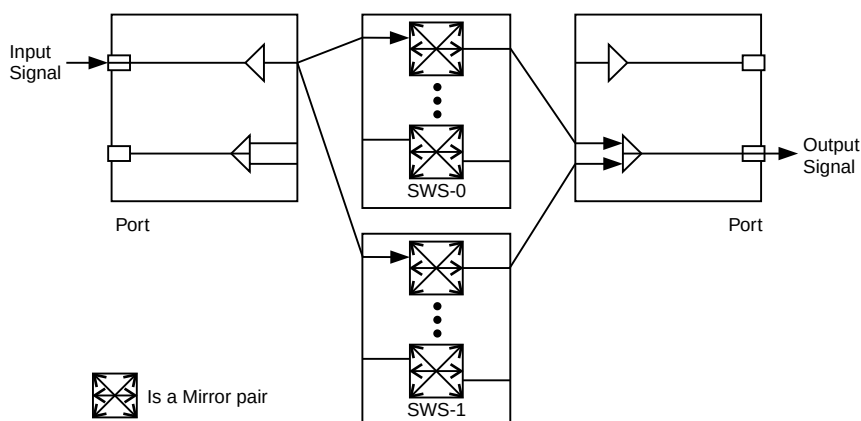
An existing cross-connection can be converted to a different cross-connection configuration by adding or deleting a leg. For example, a one-way duplex point-to-point configuration can be converted to a one-way bridge or merge. A two-way point-to-point configuration can become a bridge and merge configuration.

One-way point-to-point configuration

A one-way point-to-point configuration is a single-leg, duplex transmission path that carries traffic in one direction from an input port, through the duplicated switch fabric, to an output port.

The following figure illustrates an example of a one-way point-to-point configuration on a LambdaRouter™ AOS 256 system. Note that the configuration on a LambdaRouter™ AOS 128 system is similar, with a single Switch Shelf (SWS) divided into Side A and Side B.

In this example, an optical signal at the input port of an Optical Cross-connect Interface (OXI) circuit pack is split by a 1:2 splitter and routed to both switch fabrics. One of the two optical signals from the switch fabrics is selected by the output port 2:1 selector and passed through the output port.



Two-way point-to-point configuration

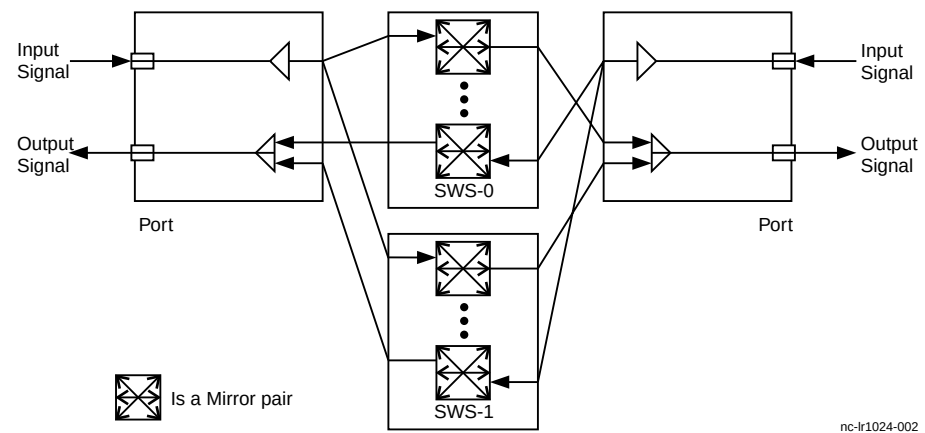
A two-way point-to-point configuration is a two-leg, duplex transmission path with each leg carrying traffic in one direction from an input port, through the duplicated switch fabric, to an output port. The input and output ports do not have to be on the same port unit, and two, three, or four ports can be used.

Each leg of the two-way point-to-point configuration is a one-way point-to-point cross-connection, and each must be at the same cross-connection rate (if identified).

A two-way point-to-point cross-connection may be established or removed by a single command to the network element.

The following figure illustrates an example of a two-way point-to-point configuration on a LambdaRouter™ AOS 256 system. Note that the configuration on a LambdaRouter™ AOS 128 system is similar, with a single Switch Shelf (SWS) divided into Side A and Side B.

In this example, each leg of the cross-connection is between the same input and output port.



Bridged and merged configuration

Bridging allows a one-way 1:2 multicast from an input port where a 1:2 splitter routes the two one-way signals through the duplicated switch fabric to two different output ports. Each one-way leg is a simplex transmission path.

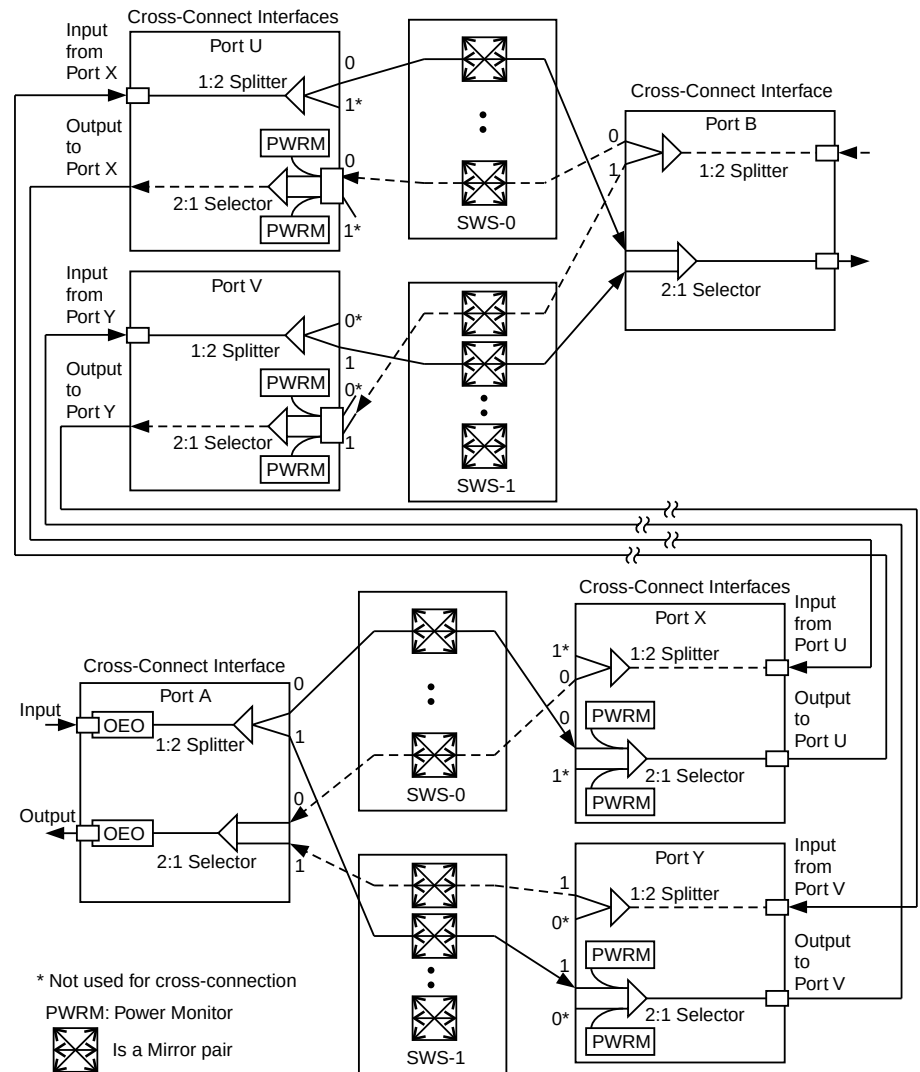
Merging is the cross-connecting of two different input ports to the output of a third port where a 2:1 selector chooses one of the incoming one-way simplex signals.

The use of both bridging and merging at a network element provides “1+1” path protection for two-way traffic or for two independent one-way paths that are carrying traffic in opposite directions.

For most cases, more than one cross-connection command must be used to establish or remove complex bridge and/or merge configurations.

The following figure illustrates an example of a bridged/merged configuration using two LambdaRouter™ AOS 256 systems. One node consists of cross-connect interface ports B, U, and V. The second node consists of cross-connect interface ports A, X, and Y. Note that the configuration on a LambdaRouter™ AOS 128 system is similar, with a single Switch Shelf (SWS) per node, each divided into Side A and Side B.

In this example, an optical signal at the input port B of an OXI circuit pack is split by a 1:2 splitter and routed to both switch fabrics. The two optical signals from the switch fabrics are routed to two different output ports (U and V). The optical signals from the output ports X and Y are received at two input ports (X and Y) on an OXI circuit pack and routed through both switch fabrics. One of the two optical signals from the switch fabrics is selected by the output port 2:1 selector and passed through the output port A of an OXI-10GC or OXI-2GC circuit pack.



nc-lr1024-001

Cross-Connect Loopback Configurations

Introduction Cross-connect loopback configurations are used for maintenance purposes and involve cross-connecting an optical signal from an input port, through the switch fabric, and back to either the default loopback output port or to another compatible output port selected by the user.

The following types of cross-connect loopback topologies are supported:

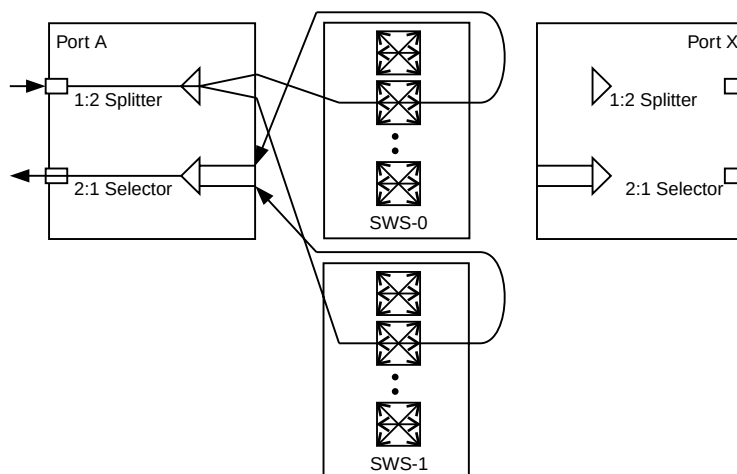
- normal
- forced

Normal cross-connect loopback A normal cross-connect loopback is a non-service-affecting configuration that can be established on any type of input port, and applies only when the port is idle. The loopback is duplex if both fabrics are selected. If one fabric is selected, the loopback is simplex. Fabric selection is an optional parameter.

The default output port is the output port with the same AID as the input port on which the loopback is established. Any idle output port that is compatible with the input port may also be selected.

The following figure illustrates an example of a duplex normal cross-connect configuration on a LambdaRouter™ AOS 256 system. Note that the configuration on a LambdaRouter™ AOS 128 system is similar, with a single Switch Shelf (SWS) divided into Side A and Side B.

In this example, an optical signal at the input port of an OXI circuit pack is split by a 1:2 splitter and routed to both switch fabrics. One of the two optical signals from the switch fabrics is selected by the output port 2:1 selector and passed through the output port.



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Forced cross-connect loopback

A forced cross-connect loopback configuration can be established on any type of input port that already has an existing cross-connection with the exception of input ports that are currently being used for test access sessions, automatic port discovery, or link verification. The loopback is duplex if both fabrics are selected. If one fabric is selected, the loopback is simplex. Fabric selection is not an optional parameter as with normal cross-connect loopbacks.

A forced duplex cross-connect loopback is a service-affecting configuration. Because both switch fabrics are used for the loopback, no transmission path is available to reach the original output port.

A forced simplex cross-connect loopback is normally a non-service-affecting configuration. Because only one switch fabric is used for the loopback, the other fabric continues to provide a simplex transmission path for the original cross-connection. However, a forced simplex cross-connect loopback may cause the output selector to switch, depending upon the switch fabric that is specified, which could briefly interrupt the original cross-connection.

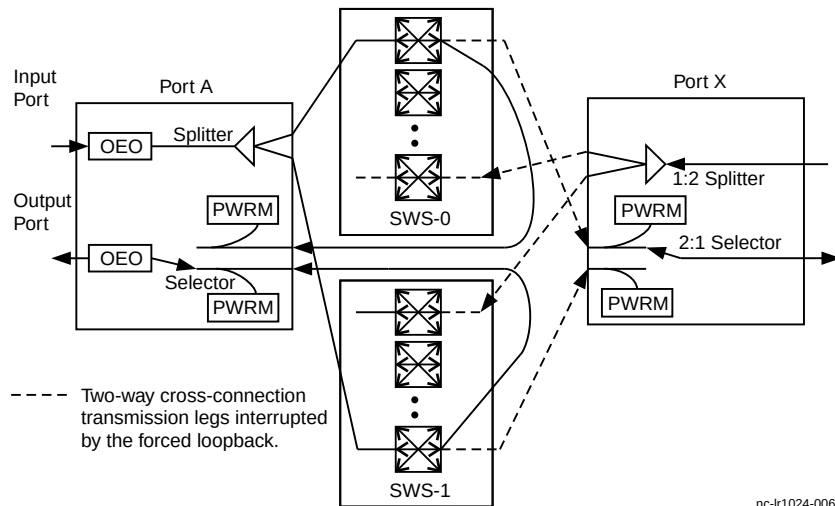
Any forced loopback request will be denied if the specified output port has a protection switch in effect or if the specified input port already has a loopback cross-connect or a test access session established.

The default output port for a forced loopback on a one-way configuration is the output port with the same AID as the input port on which the loopback is established. The default output port for a forced loopback on a two-way configuration is the output port being used for the opposite direction. Any idle output port that is compatible with the input port may also be selected.

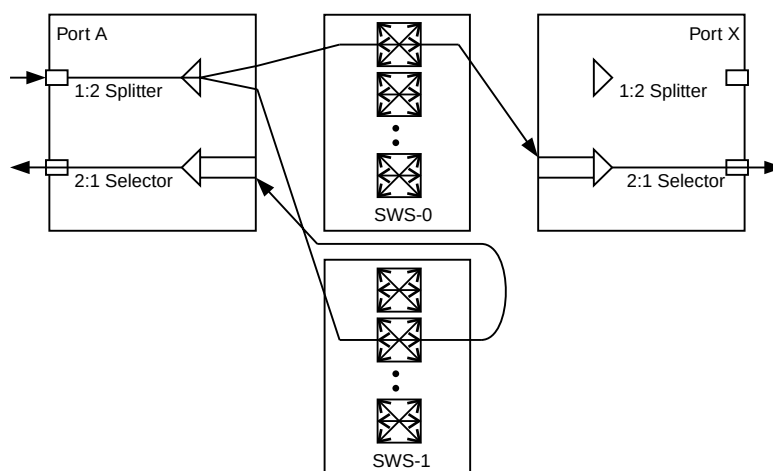
For a two-way forced simplex loopback using the default output port, the transmission path in the opposite direction will be interrupted.

When the forced loopback cross-connection is removed, the original cross-connection is automatically restored by the system.

The following figure illustrates a forced duplex cross-connect loopback for a two-way configuration on a LambdaRouter™ AOS 256 system. Note that the configuration on a LambdaRouter™ AOS 128 system is similar, with a single Switch Shelf (SWS) divided into Side A and Side B.



The following figure illustrates a forced simplex cross-connect loopback for a one-way configuration on a LambdaRouter™ AOS 256 system. Note that the configuration on a LambdaRouter™ AOS 128 system is similar, with a single Switch Shelf (SWS) divided into Side A and Side B.



nc-lr1024-005



Test Access Configurations

Introduction The test access feature allows temporary cross-connections to be established for maintenance purposes. The interval during which a particular set of test access cross-connections exist is referred to as a ***test access session***.

An input port can be cross-connected to a test access output port through either one or both switch fabrics. These cross-connections assist craft personnel in monitoring the quality of transmission service and in isolating circuit faults.

A signal to be monitored during a test access session may be incoming live traffic, a test signal being generated by an external test set, or a test signal being injected by a local or remote OEO input port. An external optical monitor may be attached to the test access output port, or an OEO output port may be used to monitor the signal.

Test access ports The input port to be monitored is referred to as the ***eport***. When there are two input ports to be monitored, as with a two-way cross-connection, one of the ports is designated as the eport; the other is the ***fport***. The eport and fport designation is user-selectable.

The output port used to monitor the signal is referred to as the test access monitoring (TAM) port. When there are two input ports being monitored, a TAM port is assigned to each leg of the test access cross-connection. The TAM port

- may be an idle OEO port or an idle transparent port.
- may be located at the LambdaRouter™ All Optical Switch node where the signal is being injected and/or received. A signal may be injected at one node and monitored at another node.

When a transparent port is designated as a TAM port, an external test set must be connected to monitor the signal, or the port may be cross-connected to an OEO port for signal monitoring.

Any port can be used for a test access cross-connection with the following conditions:

- If a port has been reserved for test access use using optical channel (OCH) port provisioning, the reserved port can be used only for test access cross-connections or cross-connect loopbacks and is not available for other types of cross-connections, even when idle.
- If a port is used for a test access cross-connection that has not been reserved, the port becomes available for other cross-connections when the test access cross-connection is removed.

Test access signal injection

A test signal may be injected either by an external test set connected to an idle or busy input port, or by an idle or busy OEO input port that is currently not detecting an incoming signal. An OEO input port that is currently injecting a signal will ignore an incoming signal until the test access session is manually terminated, which stops the signal injection and removes the test access cross-connection.

An OEO port is capable of injecting a signal with a payload of either all ones, or all zeros. A J0 byte sequence (the same type of sequence as is being used for AIRP port discovery and link verification) may also be inserted by an OEO port into a test signal that is being injected by the port. The J0 byte sequence identifies the LambdaRouter™ All Optical Switch node at which the test signal is being injected, as well as the OEO input port being used.

Test access modes

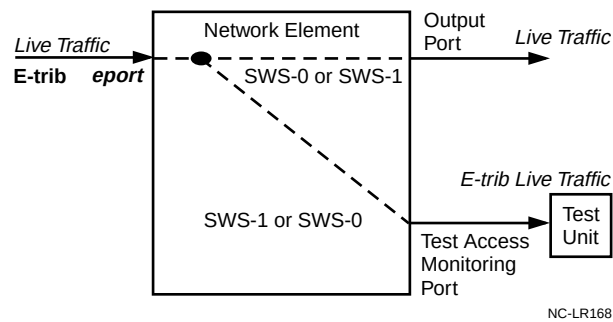
The following test access modes are supported:

- MONE
- MONF
- MONEF

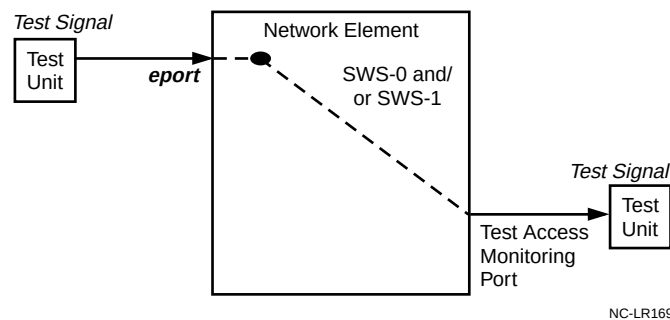
In all modes, the switch fabric that will carry the test access cross-connection is user-selectable. If the switch fabric that is not currently carrying the live traffic signal being monitored is selected, the test access cross-connection is not service-affecting.

MONE test mode The MONE test mode allows a cross-connection leg of a one-way input signal to be monitored. One TAM output port is required.

The following figure illustrates an example of a MONE test mode configuration. In this example, the live traffic optical signal at the eport input port is split by a 1:2 splitter. One leg of the optical signal is routed through one switch fabric to the designated output port. The other leg is routed through a user-selectable switch fabric to a TAM output port for monitoring.



The following figure illustrates another example of a MONE test mode configuration. In this example, a test unit provides the optical signal at the input port which is routed through one or both switch fabrics to a TAM output port for monitoring.

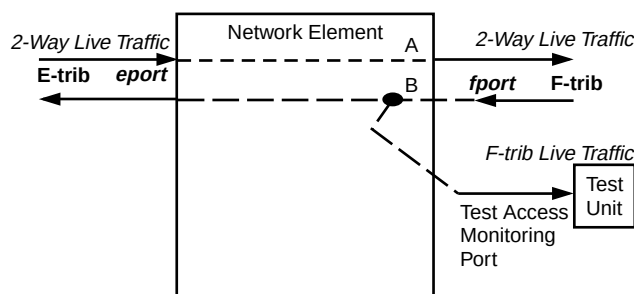


As shown in the previous figures, if an input port already has a cross-connection established, a request for a test access cross-connection will result in two bridge legs, one of which is connected to the TAM port. However, if a request for a test access cross-connection specifies an idle input port, the cross-connection will have only one leg, which will be established between the input port and the TAM port.

MONF test mode

The MONF test mode allows one direction of a two-way cross-connection to be monitored. One TAM output port is required.

The following figure illustrates an example of a MONF test mode configuration. In this example, the optical signal at the *fport* input port is split by a 1:2 splitter. One leg of the optical signal is routed through one switch fabric to the designated output port. The other leg is routed through a user-selectable switch fabric to a TAM output port for monitoring.

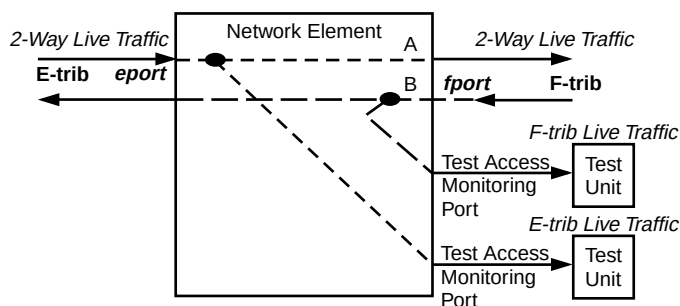


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MONEF test mode

The MONEF test mode allows for simultaneous monitoring of both directions of a two-way cross-connection. Two test access output ports are required. Separate MONE and MONF test access sessions cannot be established to simulate a MONEF session, and one leg of a MONEF test access session cannot be deleted to create a MONE or MONF test access session.

The following figure illustrates an example of a MONEF test mode configuration. In this example, the optical signals at both the *eport* and *fport* input ports is split by the 1:2 splitters. One leg of each optical signal is routed through one switch fabric to the designated output port. The other leg of each optical signal is routed through a user-selectable switch fabric to a TAM output port for monitoring.



NC-LR171

Cross-Connection Commands

Introduction The Optical Craft Interface for LambdaRouter™ GUI provides a cross-connection wizard interface that allows a user to

- create new cross-connections
- add cross-connection legs to an existing cross-connection
- delete existing cross-connections or legs of an existing cross-connection

A separate test access cross-connection wizard interface is provided that allows a user to

- create a new test access cross-connection
- delete existing test access cross-connections
- retrieve test access cross-connection data

Additional functions allow a user to

- retrieve cross-connection data
- operate (establish) loopback cross-connections
- release (remove) loopback cross-connections

Creating a new cross-connection

The Optical Craft Interface cross-connection wizard automates the process of creating new cross-connections on the LambdaRouter™ All Optical Switch by prompting for the selection of a cross-connection type and the input and output ports used by the cross-connection. The number of ports that must be selected is dependent upon the type of cross-connection being created.

After confirming the cross-connection information, the Optical Craft Interface issues the required commands to the network element to create the new cross-connection.

Command validation for creating a new cross-connection

Cross-connection command processing will validate the following in order to create a new cross-connection:

- Input and output AIDs must be valid.
- At least one switch fabric must be equipped and in-service.
- Input and output ports must be idle (not currently in use as the origination point or destination point for an existing cross-connection, loopback cross-connection, test access cross-connection).
- Input and output ports must have a primary state of IS-NR or a primary state of OOS-AU with a secondary state of FLT.
- Input and output ports cannot be designated as test access, link probe, or revertive restoration ports (**USAGE** parameter cannot be set to **TEST_ACC**, **LINK_PROBE**, or **REVERTIVE**).
- The number of cross-connection legs (including a loopback leg) originating from the same input port, or terminating on the same output port, is restricted to two.
- Input port attributes must match output port attributes.

Adding cross-connection legs to an existing cross-connection

Cross-connection legs may be added to an existing cross-connection to modify a cross-connection configuration.

The Optical Craft Interface cross-connection wizard first prompts for the selection of the type of cross-connection to be added, then for the selection of an input or output OCH port. After selecting the port, the Optical Craft Interface displays all cross-connection legs currently associated with the port. One of the cross-connections associated with the port is selected from the list, and the input and output ports to be used by the cross-connection leg(s) are then selected. The number of ports that must be selected is dependent upon the type of cross-connection being added.

After reviewing and confirming the cross-connection information, the Optical Craft Interface issues the required commands to the network element to add the cross-connection legs to the existing cross-connection.

Command validation for adding cross-connection legs

Cross-connection command processing will validate the following in order to add legs to an existing cross-connection. Only valid ports will be displayed by the cross-connection wizard:

- If the existing cross-connection is a simplex configuration, all ports to be added must be idle or one-side busy.
- If the existing cross-connection is a duplex configuration, all ports to be added must be idle.

Additional validation is performed when adding

- a leg to form a one-way bridge
- a leg to form a one-way merge
- two-way legs to form a two-way bridge/merge
- a bridge to an existing bridge
- a merge to an existing merge
- a two-way bridge/merge to an existing two-way bridge/merge

Deleting cross-connections

One or more cross-connection legs may be removed from an existing cross-connection to either delete the cross-connection entirely or to create a new cross-connection configuration. A cross-connection that has either a loopback or test access cross-connection on the input port cannot be deleted until the loopback or test access cross-connection has been removed.

The Optical Craft Interface cross-connection wizard prompts for the selection of a system, optical interface shelf, port unit, or port and displays all cross-connections associated with the selection. One or more of the displayed cross-connections may then be selected for deletion. A diagram of a selected cross-connection configuration can also be displayed.

After reviewing and confirming the cross-connection information, the Optical Craft Interface issues the required commands to the network element to delete the selected cross-connection legs.

Command validation for deleting cross-connection legs

Cross-connection command processing will validate the following in order to delete a cross-connection:

- Input and output port AIDs must be valid.
- Cross-connection configuration is valid.
- Input port is not currently used for an existing loopback or test access cross-connection.
- Cross-connection must exist between the specified input port AID and output port AID.
- A High-Voltage Shelf must be in-service.

**Retrieving
cross-connection data**

Cross-connection data may be retrieved to report the input AID, output AID, and configuration information for each leg or leg-pair of a specified cross-connection (including loopback and test access cross-connections), or all existing cross-connections associated with the specified AID. Cross-connections that were established at the request of the LambdaRouter™ Optical Network Navigator System are also identified in the report.

Cross-connection data associated with a port may be retrieved and displayed in either a text or graphic format. Cross-connection data associated with the system, shelf, or circuit pack may be displayed in text format only. A two-way cross-connection that is part of a LambdaRouter™ ONNS bidirectional path will be displayed as two one-way cross-connections.

Command validation for retrieving cross-connection data

Cross-connection command processing will validate the following in order to retrieve information for a cross-connection:

- Input and output AIDs must be valid.
- Scope parameter must be valid if specified.

Operating a loopback cross-connection

Operating a loopback cross-connection establishes a loopback between an input port and an optionally specified output port. If no output port is specified, a default loopback output port (determined by the type of loopback cross-connection being established) is used.

For normal and forced loopback cross-connections, the switch fabric to be used to establish the loopback (switch fabric 0, switch fabric 1, or both fabrics) must be specified. The Optical Craft Interface for LambdaRouter™ GUI will display the currently active fabric.

After a loopback cross-connection is established, it remains in effect until manually released. When a loopback cross-connection is released, the original cross-connection is automatically restored by the system.

Operate loopback cross-connection command validation

Cross-connection command processing will validate the following in order to establish a loopback cross-connection:

- Input and output port AIDs must be valid.
- Input and output ports must have a primary state of IS-NR or OOS-MA, or a primary state of OOS-AU with a secondary state of FLT.
- Input ports cannot be associated with a cross-connection that belongs to a LambdaRouter™ ONNS path.
- Input and output ports cannot be designated as link probe or revertive restoration ports (**USAGE** parameter cannot be set to **LINK_PROBE** or **REVERTIVE**).
- A loopback cross-connection, test access cross-connection, or AIRP cross-connection does not already exist on the specified port AID.
- Switch fabric must be valid, equipped, and in-service.

Releasing a loopback cross-connection

Releasing a loopback cross-connection removes a normal or forced loopback between the specified input port and the output port being used by the loopback.

LambdaRouter™ ONNS can autonomously release a loopback cross-connection in order to perform a path restoration.

Release loopback cross-connection command validation

Cross-connection command processing will validate the following in order to release a loopback cross-connection:

- Input AID must be valid.
- A loopback cross-connection must already exist on the specified port AID.

Creating a new test access session

The test access cross-connection wizard automates the process of creating new test access sessions on the LambdaRouter™ All Optical Switch. The user is prompted to select the mode for the test access cross-connection, the input and output ports to be used, and the switch fabric that will carry the test access leg of the cross-connection (0 = switch fabric 0, 1 = switch fabric 1, 2 = both fabrics, or 3 = the system will automatically select the fabric that is currently inactive). If the existing cross-connection belongs to a LambdaRouter™ ONNS path, only option 3 is available for selection.

If an OEO input port is being used to inject a test signal, the injected signal pattern and whether or not a J0 byte sequence will be inserted may also be selected.

After confirming the cross-connection information, the Optical Craft Interface issues the required commands to the network element to create the new test access cross-connection.

Command validation for creating a new test access session

Test access cross-connection command processing will validate the following in order to create a new test access cross-connection:

- Input and output AIDs must be valid.
- Input and output port and at least one switch fabric must be provisioned and in-service.
- Input ports must not be associated with a cross-connect loopback or another test access session.
- Input port attributes must match output port attributes.
- Input and output ports must have a primary state of IS-NR or OOS-MA, or a primary state of OOS-AU with a secondary state of FLT.
- Input and output ports cannot be designated as link probe or revertive restoration ports (**USAGE** parameter cannot be set to **LINK_PROBE** or **REVERTIVE**).
- OEO input ports being used to inject a test signal must not be detecting an incoming traffic signal.

Deleting test access sessions

Existing MONE, MONEF, and MONEF test access sessions can be deleted. One leg of a MONEF session cannot be deleted.

The test access cross-connection wizard prompts for the selection of the system, a shelf, port unit, or OCH port and displays all test access sessions associated with the selection. A test access session is then selected for deletion. A diagram of the selected test access session can be displayed and performance monitoring information may be retrieved prior to deleting the test access session.

After reviewing and confirming the cross-connection information, the Optical Craft Interface issues the required commands to the network element to delete the selected test access cross-connection.

LambdaRouter™ ONNS can autonomously delete test access sessions in order to perform a path restoration.

Command validation for deleting test access sessions

Cross-connection command processing will validate the following in order to delete a test access session:

- Input and output port AIDs must be valid.
- A test access session must exist between the specified input port AID and the test access output port AID.
- A High-Voltage Shelf must be in-service.

Retrieving test access session data

Test access session data may be retrieved to report eport, fport, and TAM port AIDs, the test access mode, switch fabric(s) used, and signal injection information for all existing test access sessions associated with a specified AID (system, optical interface shelf, port unit, or port).

Test access session port data can be retrieved and viewed in a graphic format, and performance monitoring information associated with the test access session may also be retrieved.

When a test signal that is being generated by a LambdaRouter™ All Optical Switch OEO port includes a J0 byte sequence, the J0 byte sequence may optionally be included in the retrieval output. The retrieval output will also include a J0 byte sequence that is being received by an OEO TAM port.

A valid J0 byte sequence always begins with **80**. The J0 byte sequence will begin with **8002** if the sequence contains information that identifies the node and the OEO port that is generating the sequence. The next 20 characters in the J0 byte sequence are encoded in hexadecimal format, and identify the IP address for the Restoration Controller circuit pack 100BaseT port and OEO port AID. For example, the sequence **60300000600001001010** represents the IP address 192.192.0.12, and the input port identity 4-1-2.

Command validation for retrieving test access session data

Test access session command processing will validate the following in order to retrieve information for a test access cross-connection:

- Output port AIDs must be valid.



Cross-Connection Reports

Overview The LambdaRouter™ All Optical Switch allows the generation of system and equipment status reports, including a list of cross-connections for a selected AID.

In addition, the test access cross-connection wizard allows generation of a list of test access cross-connections for a selected AID.

Cross-Connection List The Cross-Connection List provides a list of the currently established cross-connections (including loopback and test access cross-connections) for a specific port, all ports on a specific circuit pack, all ports on a specific shelf, or all ports in the network element.

The report includes the input and output AID, cross-connection or loopback type, and switch fabric used in the cross-connection.

After the report is generated, the data may be saved and/or printed.

Test Access Session List The Test Access Session List provides a list of the currently established test access sessions for the system, or for a specific optical interface shelf, port unit, or port in the network element.

The list includes the test access mode and rate, the AID for the applicable eport and/or fport, the switch fabric used, and signal injection information.

After the list is generated, an individual test access session may be selected and viewed in graphic format and performance monitoring information may be retrieved.





8 Performance Monitoring

Overview

Purpose This chapter provides detailed information on the LambdaRouter™ All Optical Switch performance monitoring functions for SONET and SDH interfaces.

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Introduction to Performance Monitoring

Overview Performance monitoring refers to the in-service, non-intrusive monitoring of signal transmission quality.

When performance monitoring is enabled, the network element continuously collects and processes performance monitoring data. The thresholds for various monitored parameters are set via performance monitoring profiles that are associated with ports. The thresholds for all parameters except Physical Layer parameters are user provisionable and threshold crossing notifications may be enabled or disabled.

The performance monitoring functionality is provided by port units that provide optical-electrical-optical conversion (OXI-10GC and OXI-2GC).

Performance monitoring functions

The main functions supported by the LambdaRouter™ All Optical Switch performance monitoring feature include:

- initialization of current performance monitoring registers
- enabling or disabling performance monitoring data collection for SONET or SDH
- accumulation, storage, and retrieval of performance monitoring data
- identification of invalid data by associating the Invalid Data Flag with the register containing such data
- setting performance monitoring data thresholds for monitored parameters via performance monitoring profiles and assigning performance monitoring profiles to ports
- generating quality of service (QoS) Alarm messages when thresholds are matched or exceeded
- enabling or disabling threshold crossing alerts (TCAs)

Performance monitoring daily start time

The start time to begin the daily period of accumulating performance monitoring data is user-provisionable.

The network element can begin the measurement at the start of any hour on the network element clock. The default is midnight (00).

**Performance monitoring
data storage**

When enabled, performance monitoring data is collected for each provisioned OEO port and stored in Current, Previous, and Recent accumulation registers located on the port unit. A copy of the performance monitoring history data (previous and recent) is stored in the associated subrack controller (SRC). Current data is only stored on the port unit and is lost if the port unit fails.

If a port unit fails but is not physically removed from the system, performance monitoring data collection stops for the port unit, but history data is still available to be retrieved. If a port unit is physically removed from the system, all performance monitoring current and history data is deleted for the ports associated with the port unit.

**Performance monitoring
accumulation registers**

The following performance monitoring accumulation registers provide data storage for each SONET (Physical, Section, and Line) and SDH (Physical, Regenerator Section and Multiplex Section) transmission parameter monitored:

- one Current 15 Minutes register
- one Current Day register
- one Previous 15 Minutes register
- one Previous Day register
- 31 Most Recent 15 Minutes registers

All performance monitoring data is date- and time-stamped.

Important! If the network element internal clock is changed by more than 10 seconds, the time-stamps of all performance monitoring registers will be marked as invalid.

Updating the accumulation registers

At each 15 minute boundary (0, 15, 30, and 45 as defined by the local time on the network element), the content of each of the 15 Minute registers is updated as follows:

- The content of the 31st Recent 15 Minutes register is overwritten by the content of the 30th register (which is overwritten by the 29th, and so on).
- The content of the Previous 15 Minutes register is written to the first Recent 15 Minutes register.
- The content of the Current 15 Minutes register is written to the Previous 15 Minutes register and the Current 15 Minutes register is set to zero.

At each day boundary (as defined by the daily start time provisioned on the network element) the contents of the Previous Day performance monitoring register are overwritten by the contents of the Current Day register. The Current Day register is set to zero.

Initializing the accumulation registers

The Current 15 Minute and Current Day performance monitoring accumulation registers for each parameter may be initialized (set to zero). One or more registers may be initialized with a single command.

Performance monitoring threshold registers

The Current 15 Minute and Current Day accumulation registers each have a corresponding threshold register. If at any time during the accumulation period the value in the current period register for a parameter equals or exceeds the value of its corresponding threshold register, a flag indicating that the parameter has crossed its threshold value is set (one flag for each parameter) and a threshold crossing alert (TCA) is generated.

Only one threshold crossing alert is allowed for each parameter per accumulation period.

The generation of threshold crossing alerts can be enabled or disabled independently for each parameter within a parameter grouping in a performance monitoring profile.

Performance monitoring profiles

There are three types of performance monitoring profiles:

- Master Default
- System Default
- Customer Specific

A Master Default profile is provided for each SONET and SDH parameter grouping and cannot be modified or deleted. Each Master Default profile consists of a

- listing of the parameters to be monitored for the group
- TCA threshold values for each parameter in the group
- a performance monitoring indicator for each parameter in the group that enables or disables data collection for individual parameters
- a TCA indicator for each parameter in the group that enables or disables TCA reporting for individual parameters

Initially, System Default profiles are created by copying Master Default profiles. Subsequently, the contents of System Default profiles can be modified. Customer specific profiles are created by copying the corresponding System Default profile, and modifying the contents of the Customer Specific profile as required.

The names of the Master Default and System Default profiles cannot be changed.

Performance monitoring and TCA reporting is managed on a parameter grouping basis. For each parameter group there is a corresponding Master Default profile, System Default profile, and Customer Specific profile (if needed).

SONET parameter groupings

The following SONET parameter groupings are supported:

- Physical
- Section
- Line Near-End
- Line Far-End

Refer to “SONET Threshold registers” (8-10) for the default threshold settings for each parameter.

SDH parameter groupings

The following SDH parameter groupings are supported:

- Physical
- Regenerator Section
- Multiplex Section Near-End
- Multiplex Section Far-End

Refer to “SDH Threshold registers” (8-16) for the default threshold settings for each parameter.

Performance monitoring profile provisioning and assignment

Performance monitoring profile provisioning includes creating, modifying, or deleting the performance monitoring profiles.

Within each System Default or Customer Specific profile, the TCA thresholds, performance monitoring indicator, and TCA reporting indicator are user-provisionable. For Physical parameters, the TCA threshold is not user-provisionable.

Important! If data collection for a particular parameter has been disabled (PM indicator is set to 0), TCA reporting for the same parameter should also be disabled (TCA indicator set to 0).

Multiple copies, or images, of a profile may be created, each with different threshold values, and settings for the performance monitoring indicator and TCA reporting indicator.

After performance monitoring profiles are created and provisioned, a user may

- retrieve the names of all profiles of a specific profile type
- retrieve the contents of a specific profile
- retrieve a profile assignment to display all entities currently assigned to a specific image of a specific profile
- retrieve the profile name of a specific profile type that is assigned to an optical channel (OCH) port
- assign a profile to, or remove a profile from, OCH ports



SONET Interface Performance Monitoring

Introduction Non-intrusive performance monitoring for SONET interfaces is supported at the Section and Line layers by examining the SONET overhead bits for performance monitoring data. Because the LambdaRouter™ All Optical Switch is a non-terminating equipment, the overhead bits are not modified in any way.

SONET Physical Layer performance monitoring is supported using physical performance monitoring parameters. The parameters monitored include:

- Laser Bias Current (LBC)
- Optical Power Transmitted (OPT)
- Optical Power Received (OPR)

The reference values for the parameters should normally be stored in the OEO circuit pack's electrically erasable programmable read only memory (EEPROM). If the reference value for a parameter is missing from the EEPROM, the performance monitoring data retrieval should return a value of NA (not available) for that parameter.

Performance monitoring can be performed on the incoming signal as well as the outgoing signal for all SONET ports that are equipped with OEO devices and have an operational state of "enabled".

**Performance monitoring
activation and deactivation**

Performance monitoring may be activated or deactivated at the OCH port-level, and for individual parameters within the profile assigned to the OCH port.

The following items must be provisioned at the port-level:

- port monitoring mode enabled or disabled [based on the table provided in “Port monitoring mode” (8-9)]
- profile assignment and PM activation enabled or disabled for each individual parameter grouping
- TCA reporting enabled or disabled for the port

The following items must be provisioned at the profile-level:

- TCA thresholds (except for Physical parameters)
- performance monitoring indicators set to enable or disable for individual parameters in the profile
- TCA reporting indicators set to enable or disable for individual parameters in the profile

The port-level and profile-level parameters may be independently enabled or disabled. However, both must be enabled to activate the performance monitoring feature. When activated, performance monitoring data collection will begin automatically for a given OCH port when the port is placed In-Service.

To deactivate performance monitoring, disable either the port monitoring mode or disable monitoring for individual parameters.

Port monitoring mode

The port monitoring mode is the higher level of activation and impacts both performance monitoring and fault management.

Port monitoring mode is enabled or disabled based on the following criteria:

- For output ports that are idle, port monitoring mode is also disabled.
- For input ports that are idle, port monitoring mode is enabled if Keep Alive Alarm (KAALM) is enabled and disabled if KAALM is disabled.
- For output ports that are not idle, port monitoring mode will be enabled or disabled based on the primary and secondary state of the port, as shown in the following table:

Output Port Primary and Secondary States	Port Monitoring Mode
OOS-AU, FLT	Enabled
OOS-AU, UEQ	Disabled
IS-NR	Enabled
OOS-MA	Disabled

- For input ports that are not idle, port monitoring mode will be enabled or disabled based on the primary and secondary state of the port and the input port AUTOMODE parameter, as shown in the following table:

Input Port Primary and Secondary States	AUTOMODE Parameter	Port Monitoring Mode
OOS-AU, FLT	Disabled	Enabled
	Enabled	Disabled
OOS-AU, UEQ	Disabled	Disabled
	Enabled	Disabled
IS-NR	Disabled	Enabled
	Enabled	Disabled
OOS-MA	Disabled	Disabled
	Enabled	Disabled

Provisionable parameters

The provisionable parameters are the lower level of activation and apply only to performance monitoring. The following table lists the parameter groupings that may be enabled or disabled on a per-port basis, and the default mode on system startup.

Parameter Group	Provisionable Parameter	Default
Physical	Physical Layer Performance Monitoring	Disabled
Section	Section Performance Monitoring	Disabled
Near-End Line	Near-End Line Performance Monitoring	Disabled
Far-End Line	Far-End Line Performance Monitoring	Disabled

SONET Threshold registers

Each performance monitoring threshold register (with the exception of Physical parameters) is user-provisionable and is initially provisioned with a default value. When a defined transmission parameter has also been defined to support both near-end and far-end performance monitoring data collection, the default threshold values will initially be the same for both the near-end and far-end.

The following table lists the threshold ranges for the SONET (OC-48 and OC-192) Physical threshold registers.

Parameter	Type of Laser or Receiver			
	OCH2GC Ingress (IR)	OCH2GC Egress (SR)	OCH10GC Ingress (IR)	OCH10GC Egress (SR)
LBC	50% - 150% of LBC _{nominal}	50% - 150% of LBC _{nominal}	50% - 150% of LBC _{nominal}	50% - 150% of LBC _{nominal}
OPT	80% - 120% of OPT _{nominal}	80% - 120% of OPT _{nominal}	70% - 130% of OPT _{nominal}	80% - 120% of OPT _{nominal}
OPR	-17.5 dBm - -3 dBm	-17.5 dBm - -3 dBm	-11 dBm - -1.5 dBm	-13.5 dBm - -1.5 dBm

The following table lists the default values and valid ranges for the SONET (OC-48 and OC-192) Section, Line Near-End and Line Far-End threshold registers.

Parameter	Signal Format	15 Minute		One Day	
		Default	Range	Default	Range
CV-S	OC-48	2240	1-16777215	21504	1-2147483647
	OC-192	8960	1-16777215	86016	1-2147483647
ES-S	OC-48	25	1-900	250	1-86400
	OC-192	25	1-900	250	1-86400
SES-S	OC-48	10	1-810	40	1-77760
	OC-192	10	1-810	40	1-77760
SEFS-S	OC-48	5	1-900	10	1-86400
	OC-192	5	1-900	10	1-86400
CV-L, CV-LFE	OC-48	2240	1-16777215	21504	1-2147483647
	OC-192	8960	1-16777215	86016	1-2147483647
ES-L, ES-LFE	OC-48	25	1-900	250	1-86400
	OC-192	25	1-900	250	1-86400
SES-L, SES-LFE	OC-48	10	1-810	40	1-77760
	OC-192	10	1-810	40	1-77760
UAS-L, UAS-LFE	OC-48	10	1-900	10	1-86400
	OC-192	10	1-900	10	1-86400



SDH Interface Performance Monitoring

Introduction Non-intrusive performance monitoring for SDH interfaces is supported at the Regenerator Section and Multiplex Section by examining the SDH overhead bits for performance monitoring data. Because the LambdaRouter™ All Optical Switch is a non-terminating equipment, the overhead bits are not modified in any way.

SDH Physical Layer performance monitoring is supported using physical performance monitoring parameters. The parameters monitored include:

- Laser Bias Current (LBC)
- Optical Power Transmitted (OPT)
- Optical Power Received (OPR)

The reference values for the parameters should normally be stored in the OEO circuit pack's electrically erasable programmable read only memory (EEPROM). If the reference value for a parameter is missing from the EEPROM, the performance monitoring data retrieval should return a value of NA (not available) for that parameter.

Performance monitoring can be performed on the incoming signal as well as the outgoing signal for all SDH ports that are equipped with OEO devices and have an operational state of "enabled".

**Performance monitoring
activation and deactivation**

Performance monitoring may be activated or deactivated at the OCH port-level, and for individual parameters within the profile assigned to the OCH port.

The following items must be provisioned at the port-level:

- port monitoring mode enabled or disabled [based on the table provided in “Port monitoring mode” (8-14)]
- profile assignment and PM activation enabled or disabled for each individual parameter grouping
- TCA reporting enabled or disabled for the port

The following items must be provisioned at the profile-level:

- TCA thresholds (except for Physical parameters)
- performance monitoring indicators set to enable or disable for individual parameters in the profile
- TCA reporting indicators set to enable or disable for individual parameters in the profile

The port-level and profile-level parameters may be independently enabled or disabled. However, both must be enabled to activate the performance monitoring feature. When activated, performance monitoring data collection will begin automatically for a given OCH port when the port is placed In-Service.

To deactivate performance monitoring, disable either the port monitoring mode or disable monitoring for individual parameters.

Port monitoring mode

The port monitoring mode is the higher level of activation and impacts both performance monitoring and fault management.

Port monitoring mode is enabled or disabled based on the following criteria:

- For output ports that are idle, port monitoring mode is also disabled.
- For input ports that are idle, port monitoring mode is enabled if Keep Alive Alarm (KAALM) is enabled and disabled if KAALM is disabled.
- For output ports that are not idle, port monitoring mode will be enabled or disabled based on the primary and secondary state of the port, as shown in the following table:

Output Port Primary and Secondary States	Port Monitoring Mode
OOS-AU, FLT	Enabled
OOS-AU, UEQ	Disabled
IS-NR	Enabled
OOS-MA	Disabled

- For input ports that are not idle, port monitoring mode will be enabled or disabled based on the primary and secondary state of the port and the input port AUTOMODE parameter, as shown in the following table:

Input Port Primary and Secondary States	AUTOMODE Parameter	Port Monitoring Mode
OOS-AU, FLT	Disabled	Enabled
	Enabled	Disabled
OOS-AU, UEQ	Disabled	Disabled
	Enabled	Disabled
IS-NR	Disabled	Enabled
	Enabled	Disabled
OOS-MA	Disabled	Disabled
	Enabled	Disabled

Provisionable parameters

The provisionable parameters are the lower level of activation and applies only to performance monitoring. The following table lists the parameters that may be enabled or disabled on a per-port basis, and the default mode on system startup.

Parameter Group	Provisionable Parameter	Default
Physical	Physical Layer Performance Monitoring	Enabled
Regenerator Section (RS)	RS Performance Monitoring	Enabled
Near-End Multiplex Section (MS)	Near-End MS Performance Monitoring	Disabled
Far-End Multiplex Section (MS)	Far-End MS Performance Monitoring	Disabled

SDH Threshold registers

Each performance monitoring threshold register (with the exception of Physical parameters) is user-provisionable and is initially provisioned with a default value. When a defined transmission parameter has also been defined to support both near-end and far-end performance monitoring data collection, the threshold register will be the same for both the near-end and far-end.

The following table lists the threshold ranges for the SDH (STM-16 and STM-64) Physical threshold registers.

Parameter	Type of Laser or Receiver			
	OCH2GC Ingress (IR)	OCH2GC Egress (SR)	OCH10GC Ingress (IR)	OCH10GC Egress (SR)
LBC	50% - 150% of LBC _{nominal}	50% - 150% of LBC _{nominal}	50% - 150% of LBC _{nominal}	50% - 150% of LBC _{nominal}
OPT	80% - 120% of OPT _{nominal}	80% - 120% of OPT _{nominal}	70% - 130% of OPT _{nominal}	80% - 120% of OPT _{nominal}
OPR	-17.5 dBm - -3 dBm	-17.5 dBm - -3 dBm	-11 dBm - -1.5 dBm	-13.5 dBm - -1.5 dBm

The following table lists the default values and valid ranges for the SDH (STM-16 and STM-64) Regenerator Section, Multiplex Section Near-End, and Multiplex Section Far-End threshold registers.

Parameter	Signal Format	15 Minute		One Day	
		Default	Range	Default	Range
RS_N_BBE	STM-16	9000	0-7200000	480000	0-619200000
	STM-64	9000	0-7200000	480000	0-619200000
RS_N_ES	STM-16	180	0-900	1500	0-86400
	STM-64	180	0-900	1500	0-86400
RS_N_SES	STM-16	15	0-810	20	0-77760
	STM-64	15	0-810	20	0-77760
RS_N_UAS	STM-16	15	0-900	20	0-86400
	STM-64	15	0-900	20	0-86400
MS_N_BBE MS_F_BBE	STM-16	3648000	0-16777215	6912000	0-2147483647
	STM-64	14592000	0-16777215	27648000	0-2147483647
MS_N_ES MS_F_ES	STM-16	50	0-900	150	0-86400
	STM-64	50	0-900	150	0-86400
MS_N_SES MS_F_SES	STM-16	10	0-810	15	0-77760
	STM-64	10	0-810	15	0-77760
MS_N_UAS MS_F_UAS	STM-16	15	0-900	20	0-86400
	STM-64	15	0-900	20	0-86400



Performance Monitoring Data and Reports

Overview The LambdaRouter™ All Optical Switch allows the retrieval and generation of the following performance monitoring data and reports:

- performance monitoring profile details
- performance monitoring profile assignment list
- performance monitoring port details
- performance monitoring data reports

Performance monitoring profile details Performance monitoring profile details may be retrieved to display the contents of a selected profile. This includes the threshold settings and the condition of the PM and TCA indicators for the individual parameters that make up the profile.

Performance monitoring profile assignment list Performance monitoring profile assignments may be retrieved to display a list of all OCH port AIDs on a specified shelf to which the profile has been assigned.

Performance monitoring port details Performance monitoring data for a specified OCH port may be retrieved to display the profiles that have been assigned to the port, enable/disable information for SONET (Physical, Section, and Line) and SDH (Physical, Regenerator Section, and Multiplex Section), and TCA reporting status.

Performance monitoring data reports Performance monitoring data reports may be generated for a specified OCH port. Data can be retrieved for individual parameters for 15 Minute and One Day intervals for the current and previous time periods. Data reporting can be suppressed for registers that contain all zeros.

The report includes the AID of the OCH port, the monitored parameters, location, monitored level, validity, TCA flag, time period, and the date and time.

After generating a performance monitoring report, the report data may be saved and/or printed.





9 Software Management

Overview

Purpose This chapter provides detailed information on the LambdaRouter™ All Optical Switch software management functions. This includes information on software installation and upgrade, and database backup and restore.

Contents

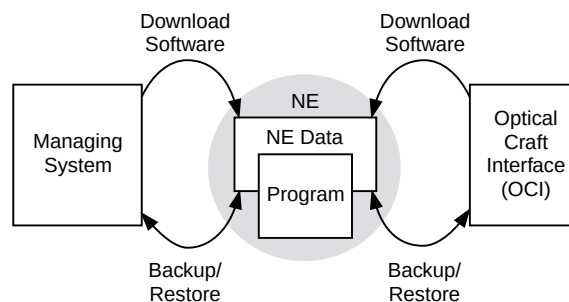
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Introduction to Software Management

- Introduction** Software management functions include all activities necessary to
- download, install, and upgrade the software generic on a network element
 - perform remote backup and restore operations of the network element provisionable data
 - perform local backup and restore operations of the network element provisionable data

The following figure illustrates the software management functions.



nc-lr1024-008

Software management functions may be accessed via all available operations interfaces, including the Optical Craft Interface (OCI) for LambdaRouter™ or other managing system (such as the Navis™ Optical Element Management System).

Definitions The following terms are used in this chapter:

Term	Definition
Generic	A collection of programs and the associated static data that fully support and perform all of the designed functions of the LambdaRouter™ All Optical Switch, the Optical Craft Interface, or the Navis™ Optical Element Management System (Optical EMS). Software systems that configure, control, maintain, and operate the transport network are referred to as generics.
Program	The executable code (software) that controls the network element or Optical Craft Interface.
Provisionable Data	System configuration data provisioned by a user using a Optical Craft Interface or managing system. This includes such data as port configuration parameters and cross-connection data.
Download	The process of transferring files from a managing system (such as the Optical Craft Interface or Navis™ Optical EMS) to a network element. Both software and data can be downloaded.
Upload	The process of transferring files from a network element to a managing system. The LambdaRouter™ All Optical Switch can only upload data.
Activation	The process of starting the software or using the data in execution the first time after installation.
Installation	The process of delivering, expanding, and locating all of the files within a generic into the proper locations within the target system in such a manner that the generic will be activated properly.

Software and database states

A generic or database can assume the following states:

State	Description
PREVIOUS	A previous generic or database. This version of generic or database is available for installation in case of backout from the current installation.
RUNNING	The currently executing generic or current database.
DOWNLOADED	Applies to the previous bin of generic. Indicates that the generic just downloaded is ready for installation.
INPROGRESS	In the previous bin, this indicates that a download is in progress. In the current bin, this indicates that an installation is in progress. This is interpreted in conjunction with the current pointer.
CORRUPT	The generic or data in this bin is unavailable for invocation or execution. For example, a corrupted checksum has been detected.
FAILED	The non-volatile memory (NVM) has failed. This may be the last message written into the NVM prior to its being disabled (based on the life-cycle count of the NVM card.)
INITIAL	The bin on the NVM is empty, such as in a newly inserted blank NVM or an empty previous bin. On the secondary NVM, INITIAL may also indicate a new generic is present.
BACKUP	On the secondary NVM, indicates a database that has been backed up (copied) from primary NVM to secondary NVM.



Infrastructure

System and shelf controllers

The LambdaRouter™ All Optical Switch software executes in the network element system controllers and shelf controllers.

Non-volatile storage

The LambdaRouter™ All Optical Switch provides primary and secondary non-volatile memory (NVM) for storage of software and all provisionable data.

Primary

Each of the duplicated primary NVMs has two partitions. Each partition stores one network element generic (one partition containing the current generic, the other partition containing a previous generic) and their related databases.

The duplicated primary NVM provides a backup to the active NVM. Maintaining two partitions allows for back out to a previous generic.

Secondary

A removable secondary NVM is provided for local software upgrade and data backups.

Labeling

The LambdaRouter™ All Optical Switch provides for labeling of databases and software generics, as described in the sections that follow.

Database

Database labeling is provided for use in subsequent download operations. The labeling includes system target identifier (TID), date of the last modification, date backed up from the network element, and the software generic ID.

Generic

Labeling of the software generic is provided in order to uniquely identify the generic. The generic ID includes the supplier name and type, the version number of the generic, the date built or build number, and the date installed.

The generic label information can be retrieved via the managing system or Optical Craft Interface.



Software and Database Installation and Upgrade

Introduction Installation and upgrade operations may be performed on the LambdaRouter™ All Optical Switch to install and/or update the generic or database on a single network element.

Installation process Installation is the process of interpreting and unpacking the binary program or data that was downloaded to a network element NVM, and copying the constituent data items to their designated locations within the network element.

Initial installation When a network element is first deployed, the generic can only be installed from an NVM card inserted into the Primary Memory (PRI MEM) circuit pack. The network element generic is delivered on a CD-ROM that also contains

- factory data
- Optical Craft Interface software
- utilities to copy the software generic to a hard drive and to install the Optical Craft Interface

The software is then copied from the CD-ROM on the Optical Craft Interface to a blank NVM card, which is now ready for use in the network element. Refer to the *LambdaRouter™ All Optical Switch (AOS) 128/256 Software Release Description* for information on downloading and installing software and data on the LambdaRouter™ All Optical Switch.

After the initial installation of the software, the network element is ready to be provisioned.

Software upgrade process A software upgrade can only be installed by downloading remotely from an external system, or by delivering the generic on an NVM card that will be inserted into the Secondary Memory (SEC MEM) circuit pack.

The download method involves downloading the generic from an external system onto the PRI MEM circuit pack, after which the generic can be activated.

Delivering the generic on an NVM card involves

- creating an NVM card on the Optical Craft Interface (which includes copying the software from CD-ROM to the NVM card)
- inserting the NVM card into the SEC MEM circuit pack NVM slot
- copying the software from SEC MEM to PRI MEM
- activating the generic

When an upgrade requires a conversion of the database from the existing format to a new format, a conversion utility will be provided to automatically convert the database to the new format prior to installing the new generic.

**Commit to or back out from
a new generic installation**

During the installation of a new generic, a system reboot will occur. The initialization process will keep track of whether or not the new generic software functions as expected.

As each shelf controller completes its start-up of the generic, it will report the success or failure of the start-up to the next controller in the hierarchy. The active SYS50D determines the success, partial success, or complete failure of the system startup of the current generic, and reports this information to the user.

If the controller startup is not successful, the user must manually back out and reestablish the previous software.

**Installing new Switch Shelf
calibration data**

When a new Switch Shelf is installed, the matching calibration data must be installed and activated with the shelf. The calibration data is delivered on an NVM card and is installed by inserting the card into the SEC MEM circuit pack and copying the calibration data from SEC MEM to PRI MEM. Once installed, the calibration data is activated and becomes part of the database.



Database Backup and Restore

Introduction Database backup and restore operations may be performed on the LambdaRouter™ All Optical Switch in order to provide protection and recovery from a failure of the primary NVM.

Restore operations are limited to a single network element and can be performed by a remote managing system or by a Optical Craft Interface which may be remote or connected locally to the network element.

Backup process The backup process is the saving of an image of the current data of a network element to a non-volatile storage area either within the network element itself (SEC MEM), or to remote file storage (managing system or Optical Craft Interface).

Restore process The restore process involves retrieving a previous backup for the same network element from a non-volatile storage area either within the network element (SEC MEM) or remote file storage (managing system or Optical Craft Interface), verifying that the database is compatible with the current generic, and copying the image back into the network element.





10 Security Management Tasks

Overview

Purpose This chapter provides detailed procedures for performing user administration and system security tasks on the LambdaRouter™ All Optical Switch and the Optical Craft Interface (OCI).

Contents

Task 100: Adding, Modifying, or Deleting User Login Parameters	<u>10-3</u>
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Task 100: Adding, Modifying, or Deleting User Login Parameters

Purpose This procedure is used to perform the following security administration tasks on either the Optical Craft Interface or LambdaRouter™ All Optical Switch:

- add a new user
- modify login parameters for an existing user (such as password and/or authorization levels)
- delete an existing user

Important! Preinstalled Superuser logins cannot be deleted, and additional Superuser logins cannot be created. With the exception of changing the login ID and password, Superuser logins cannot be modified.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and identify the user's login and any security parameters that must be provisioned.

Related information For related information, see the following sections in this document:

- Chapter 3, "Security Management"
- "Task 201: Logging in to the Optical Craft Interface" (11-6)
- "Task 204: Logging into a Network Element from the Optical Craft Interface" (11-13)
- "Task 101: Changing the Password for the Currently Logged in User" (10-11)
- "Task 102: Viewing Session Information for the Currently Logged in User" (10-14)
- "Task 103: Changing a Superuser Login ID" (10-15)
- "Task 104: Viewing a List of User Logins" (10-17)
- "Task 107: Viewing and Setting Security Parameters for a Network Element" (10-22)

Task Complete the following steps to add, modify, or delete a user login on the Optical Craft Interface or LambdaRouter™ All Optical Switch.

1

IF adding, modifying, or deleting a user login on...	THEN...
the Optical Craft Interface	log into the Optical Craft Interface with a security level of S5 and select Administration>Security>OCI User Provisioning from the Network View Main Menu bar. Result: The User Provisioning Screen appears. Reference: “Task 201: Logging in to the Optical Craft Interface” (11-6)
a network element	connect the Optical Craft Interface to the local network element, log in with a security level of S5, and select Administration>Security>User Provisioning from the System View Main Menu bar. Result: The User Provisioning Screen appears. Reference: “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)

2

IF...	THEN...
adding a new user	go to “SE 100-1: Adding a new user” (10-5).
modifying login parameters for an existing user	go to “SE 100-2: Modifying login parameters for an existing user” (10-8).
deleting an existing user	go to “SE 100-3: Deleting an existing user” (10-9).

.....
N D O F S T E P S
.....

SE 100-1: Adding a new user

Complete the following steps to add a new user on the Optical Craft Interface or network element.

-
- 1** Click **New User** and enter a login ID for the new user.

-
- 2** Enter the user's password in the Enter Password field; then enter the same password again in the Confirm Password field.

For security reasons, asterisks are displayed in place of the password.

-
- 3** Select a User Type from the drop-down list.

Result: The Authorization Levels will be pre-populated based on the selected User Type.

-
- 4** Make any required changes to the Authorization Levels.

.....

5

IF adding a new user to...	THEN...
a network element	continue to Step 6.
the Optical Craft Interface	continue to Step 9.

-
- 6** Set the Password Aging Interval for the new user:

IF password aging...	THEN...
will not be enabled (the password never expires)	click Disable .
will be enabled	click the radio button beside the Days entry field and enter the number of days that the user's password will remain valid.

7 Set the Inactivity Timeout period for the new user:

IF inactivity timeout...	THEN...
will not be enabled (the user will never be logged out due to inactivity)	set the Inactivity Timeout period to 0 (zero).
will be enabled	set the number of minutes a user is allowed to be inactive before the network element will automatically terminate the session.

8 Select the user's Notification Registration List.

9 Click **Add**.

Result: A Confirmation Screen appears.

10 Click **Yes**.

IF adding a new user to...	THEN...
a network element	a message appears asking if the security changes should be saved in the OCI security database. Continue to the next step.
the Optical Craft Interface	a successful completion message appears. Continue to Step 13.

11

IF the security changes...	THEN...
will be saved to the OCI security database	click Yes . Important! Saving the changes to the OCI security database is a potential security risk. It is recommended that the changes not be saved to the OCI security database. Result: An Execution Successful message appears.
will not be saved to the OCI security database	click No . Result: A successful completion message appears. Continue to Step 13.

12 Click **OK**.

Result: A successful completion message appears.

13 Click **OK**.

IF adding a new user to...	THEN...
a network element	the successful completion message closes. Stop! End of Supporting Element.
the Optical Craft Interface	the successful completion message closes and the User Provisioning Screen appears.

14 Click **Close** on the User Provisioning Screen.

Result: The User Provisioning Screen closes.

N D O F S T E P S

SE 100-2: Modifying login parameters for an existing user

Complete the following steps to modify the login parameters for an existing user on the Optical Craft Interface or network element.

-
- 1 Click **Existing User** and select a user login ID from the drop-down list.

Result: The login parameters for the selected user are displayed.
For security purposes, the user's password is not displayed.

- 2 Modify the login parameters for the selected user.

IF modifying a user login on...	THEN...
the Optical Craft Interface	modify any of the following: • user type • authorization levels • password (in both the Enter Password and Confirm Password fields)
a network element	optionally disable the user's login ID by clicking Disable in the User ID Can Be Enabled? field. OR enable the user's login ID by clicking Yes in the User ID Can Be Enabled? field and modify any of the following: • user type • privilege levels • registration list • password (in both the Enter Password and Confirm Password fields) • password aging interval • inactivity timeout period

-
- 3 Click **Modify**.

Result: A Confirmation Screen appears.

4 Click Yes.

IF modifying a user login on...	THEN...
a network element	the Confirmation Screen closes and the System View appears. <i>Stop! End of Supporting Element.</i>
the Optical Craft Interface	the Confirmation Screen closes and a successful completion message appears.

5 Click OK.

Result: The User Provisioning Screen appears.

6 Click Close on the User Provisioning Screen.

Result: The User Provisioning Screen closes.

N D O F S T E P S

SE 100-3: Deleting an existing user

Complete the following steps to delete an existing user from the Optical Craft Interface or network element.

1 Click Existing User and select a user login ID from the drop-down list.

Result: The login parameters for the selected user are displayed. For security purposes, the user's password is not displayed.

2 Click Delete.

Result: A Confirmation Screen appears.

3 Click **Yes**.

IF deleting a user login on...	THEN...
a network element	the Confirmation Screen closes and the System View appears. <i>Stop! End of Supporting Element.</i>
the Optical Craft Interface	the Confirmation Screen closes and a successful completion message appears.

4 Click **OK**.

Result: The User Provisioning Screen appears.

5 Click **Close** on the User Provisioning Screen.

Result: The User Provisioning Screen closes.

N D O F S T E P S



Task 101: Changing the Password for the Currently Logged in User

Purpose This procedure is used to change the password for the currently logged in user on either the Optical Craft Interface or LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and identify the user's login that must be provisioned.

Related information For related information, see the following sections in this document:

- Chapter 3, "Security Management"
- "Task 201: Logging in to the Optical Craft Interface" (11-6)
- "Task 204: Logging into a Network Element from the Optical Craft Interface" (11-13)
- "Task 100: Adding, Modifying, or Deleting User Login Parameters" (10-3)

Task Complete the following steps to change the password for the currently logged in user on either the Optical Craft Interface or LambdaRouter™ All Optical Switch.

1

IF changing the password on...	THEN...
the Optical Craft Interface	log into the Optical Craft Interface and select Administration>Change Password from the Network View Main Menu bar. Result: The Change OCI Login Password Screen appears. Reference: “Task 201: Logging in to the Optical Craft Interface” (11-6)
a network element	connect the Optical Craft Interface to the local network element, log in, and select Administration>Change Password from the System View Main Menu bar. Result: The Change NE Login Password Screen appears. Reference: “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)

2 Enter the password information in the Old Password, New Password, and Confirm Password fields.

Important! The password entered in the New Password and Confirm Password fields must match. Asterisks will be displayed as the passwords are entered.

3 Click **OK**.

Result: A Confirmation Screen appears.

4 Click **Yes**.

Result: The Confirmation Screen closes.

N D O F S T E P S



Task 102: Viewing Session Information for the Currently Logged in User

Purpose This procedure is used to view session information for the currently logged in user on the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in.

Related information For related information, see the following sections in this document:

- Chapter 3, “Security Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 201: Logging in to the Optical Craft Interface” (11-6)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)

Task Complete the following steps to view the session information for the currently logged in user on the LambdaRouter™ All Optical Switch.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Administration>Current Session Info**.

Result: The Current Session Information Screen appears for the currently logged in user.

-
- 2** View the user ID (UID), user privilege code (UPC), and the date and time the current user logged into the network element. Click **OK** when you have finished viewing the information.

Result: The Current Session Information Screen closes.

N D O F S T E P S



Task 103: Changing a Superuser Login ID

Purpose This procedure is used by Superusers to change their own login ID on the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and identify the user's login and any security parameters that must be provisioned.
- Connect the Optical Craft Interface to the local network element and log in as the Superuser for which the login ID will be changed.

Related information For related information, see the following sections in this document:

- Chapter 3, "Security Management"
- "Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element" (11-3)
- "Task 201: Logging in to the Optical Craft Interface" (11-6)
- "Task 204: Logging into a Network Element from the Optical Craft Interface" (11-13)
- "Task 100: Adding, Modifying, or Deleting User Login Parameters" (10-3)
- "Task 101: Changing the Password for the Currently Logged in User" (10-11)

Task Complete the following steps to change the login ID for the currently logged in Superuser on the LambdaRouter™ All Optical Switch.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Administration>Security>User Provisioning**.

Result: The User Provisioning Screen appears.

-
- 2** Click **Existing User** and select the login ID for the currently logged in Superuser from the drop-down list.

Result: The login parameters for the selected user are displayed and the New Login ID for SuperUsers field is enabled. For security purposes, the user's password is not displayed.

-
- 3** Enter the new login ID for the currently logged in Superuser in the New Login ID for SuperUsers field; then click **Modify**.

Result: A Confirmation Screen appears.

-
- 4** Click **Yes**.

Result: A message appears asking if the changes should be saved to the Optical Craft Interface security database.

-
- 5** Click **No**.

Important! Saving changes to network element login IDs and passwords in the Optical Craft Interface security database is a potential security risk and is not recommended.

Result: The message closes. The new Superuser login ID will not take effect until the next user session.

N D O F S T E P S



Task 104: Viewing a List of User Logins

Purpose This procedure is used to view a list of user logins currently provisioned on either the Optical Craft Interface or LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S4 or greater.

Related information For related information, see the following sections in this document:

- Chapter 3, “Security Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 201: Logging in to the Optical Craft Interface” (11-6)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 216: Logging in to a Network Element by Cut-Through” (11-57)
- “Task 100: Adding, Modifying, or Deleting User Login Parameters” (10-3)
- “Task 106: Forcing a User Logout” (10-20)

Task Complete the following steps to view a list of user logins on either the Optical Craft Interface or LambdaRouter™ All Optical Switch.

1

IF viewing a list of user logins on...	THEN...
the Optical Craft Interface	from the Network View Main Menu bar, select Administration>Security>View User Logins . Result: The OCI User Login Account List appears.
a network element	at the Optical Craft Interface, from the System View Main Menu bar, select View>Security>User Logins . Result: The View User Logins Screen appears.

2 View the displayed login parameters for each user. Click on any heading to sort the list in ascending order by the selected heading. Clicking on the same heading a second time will sort the displayed data in descending order.

3 Click **Close**.

Result: The OCI User Login Account List or View User Logins Screen closes.

END OF STEPS



Task 105: Viewing a List of Logged-In Users

Purpose This procedure is used to view a list of users currently logged into the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in.

Related information For related information, see the following sections in this document:

- Chapter 3, “Security Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 201: Logging in to the Optical Craft Interface” (11-6)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 106: Forcing a User Logout” (10-20)

Task Complete the following steps to view a list of currently logged-in users.

- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **View>Security>Logged-In Users**.

Result: The View Logged In User Screen appears.

- 2** View the list of users currently logged into the network element; then click **Close**.

Result: The View Logged in User Screen closes.

N D O F S T E P S



Task 106: Forcing a User Logout

Purpose This procedure is used to forcibly log out a user that is currently logged into the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S5.

Related information For related information, see the following sections in this document:

- Chapter 3, “Security Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 201: Logging in to the Optical Craft Interface” (11-6)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 105: Viewing a List of Logged-In Users” (10-19)

Task Complete the following steps to forcibly log out one or more currently logged-in users.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Administration>Security>Logout NE User**.

Result: The Log Out User Screen appears.

-
- 2** View the list of users currently logged into the network element.

Important! The login ID of the current Optical Craft Interface user is not displayed.

3

IF forcibly logging out...	THEN...
an individual user	select the user login ID that will be forcibly logged out; then click Logout User . Result: A Confirmation Screen appears.
all currently logged in users (except Superusers)	click Logout All . Result: A Confirmation Screen appears.

4 Click **Yes**.

IF forcibly logging out...	THEN...
an individual user	the selected user is forcibly logged out and the Confirmation Screen closes.
all currently logged in users (except Superusers)	all currently logged in users are forcibly logged out except the S5 user executing the command and any other Superuser that is currently logged in.

N D O F S T E P S



Task 107: Viewing and Setting Security Parameters for a Network Element

Purpose This procedure is used to view or set the security parameters for the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S1 or higher to view the current network element security parameter settings, or S4 or higher to set the network element security parameters.

Related information For related information, see the following sections in this document:

- Chapter 3, “Security Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 201: Logging in to the Optical Craft Interface” (11-6)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 100: Adding, Modifying, or Deleting User Login Parameters” (10-3)
- “Task 104: Viewing a List of User Logins” (10-17)
- “Task 108: Viewing Security Logs” (10-25)

Task Complete the following steps to view or set security parameters for the LambdaRouter™ All Optical Switch.

1

IF...	THEN...
viewing the current security parameter settings	go to “SE 107-1: Viewing the current network element security parameter settings” (10-23).
setting the security parameters	go to “SE 107-2: Setting the network element security parameters” (10-24).

N D O F S T E P S

**SE 107-1: Viewing the
current network element
security parameter settings**

Complete the following steps to view the current security parameter settings for the LambdaRouter™ All Optical Switch.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **View>Security>NE Security**.

Result: The View NE Security Screen appears.

-
- 2** View the current settings for the network element security parameters; then click **Close**.

Result: The View NE Security Screen closes.

N D O F S T E P S

**SE 107-2: Setting the
network element security
parameters**

Complete the following steps to view the set the security parameters for the LambdaRouter™ All Optical Switch.

-
- 1 At the Optical Craft Interface, from the System View Main Menu bar, select **Administration>Security>Security Provisioning**.

Result: The Provision NE Security Screen appears.

.....

- 2 Enter the required information in the following fields:

Field	Value
User ID Lockout Threshold	2 to 99 attempts
User ID Lockout Aging Period	1 to 999 minutes
User ID Lockout Period	1 to 99 minutes (click Disable to disable the User ID Lockout)
User ID Aging Period	1 to 999 days (click Disable to disable User ID Aging)

.....

- 3 Click **OK**.

Result: A Confirmation Screen appears.

.....

- 4 Click **Yes**.

Result: The Confirmation Screen closes.

.....

N D O F S T E P S

.....



Task 108: Viewing Security Logs

Purpose This procedure is used to view the following security logs on the LambdaRouter™ All Optical Switch:

- Security Activity Log
- User Session Activity Log

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.

Related information For related information, see the following sections in this document:

- Chapter 3, “Security Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 201: Logging in to the Optical Craft Interface” (11-6)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 100: Adding, Modifying, or Deleting User Login Parameters” (10-3)
- “Task 101: Changing the Password for the Currently Logged in User” (10-11)
- “Task 103: Changing a Superuser Login ID” (10-15)
- “Task 106: Forcing a User Logout” (10-20)
- “Task 107: Viewing and Setting Security Parameters for a Network Element” (10-22)

Task Complete the following steps to view the LambdaRouter™ All Optical Switch security logs.

1

IF retrieving the...	THEN...
Security Activity Log	connect the Optical Craft Interface to the local network element, log in with a security level of S5, and select Reports>NE Security Log from the System View Main Menu bar. Result: The Start Date/Time Selection Screen appears. Reference: “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
User Session Activity Log	connect the Optical Craft Interface to the local network element, log in with a security level of S1 or higher, and select Reports>NE User Log . Result: The Start Date/Time Selection Screen appears. Reference: “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)

2

IF...	THEN...
retrieving all log entries	select Retrieve ALL .
retrieving log entries starting with a specific date and time	select the starting date and time.

3 Click **OK**.

Result: The selected security log appears.

4

IF...	THEN...
saving log data to a file	go to “SE 108-1: Saving log data to a file” (10-27).
printing log data	go to “SE 108-2: Printing log data” (10-28).
retrieving updated log data	click Refresh . Result: The displayed log data is updated.
viewing log data is completed	click Close . Result: The log screen closes.

 ND OF STEPS

SE 108-1: Saving log data to a file

 Complete the following steps to save the displayed log data to a file.

1 Click **Save As**.

Result: The Save As dialog box appears.

2 Select the desired destination path, enter a file name; then click **Save**.

Result: The log data is saved to the specified file and the Save As dialog box closes.

 ND OF STEPS

SE 108-2: Printing log data Complete the following steps to print the displayed log data.

-
- 1** Click **Print**.

Result: The Print dialog box appears.

-
- 2** Select the desired printer, configure the necessary print options; then click **OK**.

Result: The log data is printed to the selected printer.

N D O F S T E P S





11 Management and Network Communication Setup Tasks

Overview

Purpose This chapter provides detailed procedures for configuring the Optical Craft Interface and LambdaRouter™ All Optical Switch communication parameters to allow craft personnel to connect the Optical Craft Interface to a network element and log in.

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Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element

Purpose This procedure is used to physically connect the Optical Craft Interface to, or disconnect the Optical Craft Interface from, a local network element local area network (LAN) port.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain a Optical Craft Interface 10BaseT Ethernet interface cable (CAT 3 or higher, CAT 5 recommended) with RJ45 connectors.

Related information For related information, see the following sections in this document:

- “Task 201: Logging in to the Optical Craft Interface” (11-6)
- “Task 202: Viewing the Optical Craft Interface Network Element IP Address List” (11-8)
- “Task 203: Provisioning the Optical Craft Interface with Network Element TIDs and IP Addresses” (11-10)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 215: Logging Out and Disconnecting from a Network Element” (11-53)
- “Task 216: Logging in to a Network Element by Cut-Through” (11-57)
- “Task 217: Logging Out of a Cut-Through Session” (11-61)

Task Complete the following steps to connect the Optical Craft Interface to, or disconnect the Optical Craft Interface from, a local network element LAN port.

1

IF...	THEN...
connecting the Optical Craft Interface to a network element	go to “SE 200-1: Connecting the Optical Craft Interface to a network element” (11-4).
disconnecting the Optical Craft Interface from a network element	go to “SE 200-2: Disconnecting the Optical Craft Interface from a network element” (11-5).

ND OF STEPS

SE 200-1: Connecting the Optical Craft Interface to a network element

Complete the following steps to connect the Optical Craft Interface to a network element LAN connection.

1 Plug one end of the interface cable into the Optical Craft Interface and the other end into the CIT port on the network element System Controller Shelf User Panel.

2 Log into the Optical Craft Interface and the network element.

Reference: “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13).

ND OF STEPS

**SE 200-2: Disconnecting
the Optical Craft Interface
from a network element**

Complete the following steps to disconnect the Optical Craft Interface from a network element LAN port.

-
- 1** Log out of all network elements and the Optical Craft Interface.

Reference: “Task 215: Logging Out and Disconnecting from a Network Element” (11-53).

-
- 2** Disconnect the interface cable from the CIT port on the network element System Controller Shelf User Panel and from the Optical Craft Interface.

N D O F S T E P S



Task 201: Logging in to the Optical Craft Interface

Purpose This procedure is used to log in to the Optical Craft Interface.

Before you begin Before beginning this task, have a valid user ID and password on the Optical Craft Interface.

Related information For related information, see the following sections in this document:

- Chapter 3, “Security Management”
- “Task 203: Provisioning the Optical Craft Interface with Network Element TIDs and IP Addresses” (11-10)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 215: Logging Out and Disconnecting from a Network Element” (11-53)
- “Task 216: Logging in to a Network Element by Cut-Through” (11-57)
- “Task 217: Logging Out of a Cut-Through Session” (11-61)

Task Complete the following steps to log in to the Optical Craft Interface.

- 1** Double-click on the Optical Craft Interface icon on the *Microsoft Windows*® desktop.

Result: The Optical Craft Interface Login Screen appears.

- 2** Enter a valid User ID and Password; then click **OK**.

IF...	THEN...
the login is completed successfully	the Legal Notice Screen appears.
the login fails	verify that the user ID and password are correct and attempt to log in again. If the login has failed a second time, contact the System Administrator. Stop! End of Task.

3 Click **OK**.

Result: The Legal Notice Screen closes and the Optical Craft Interface for LambdaRouter™ Network View Screen appears.

N D O F S T E P S



Task 202: Viewing the Optical Craft Interface Network Element IP Address List

Purpose This procedure is used to view the current list of network element IP addresses stored on the Optical Craft Interface.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task.
- Log into the Optical Craft Interface with a Privilege Code of S1 or greater. It is not necessary to connect to a network element.

Related information For related information, see the following sections in this document:

- Chapter 5, “Equipment Configuration Management”
- “Task 201: Logging in to the Optical Craft Interface” (11-6)
- “Task 203: Provisioning the Optical Craft Interface with Network Element TIDs and IP Addresses” (11-10)
- “Task 205: Setting the Network Element Name” (11-16)
- “Task 206: Setting Network Element Data Communications Parameters” (11-19)

Task Complete the following steps to view the current list of network element IP addresses stored on the Optical Craft Interface.

-
- 1** At the Optical Craft Interface, from the Network View Main Menu bar, select **Administration>NE IP Address List**.

Result: The NE IP Address List Screen appears.

- 2** Select a network element TID from the drop-down list.

Result: The IP addresses (one for each DCC circuit pack) associated with the selected TID are displayed.

3

IF...	THEN...
viewing IP addresses for additional network elements	select each network element TID from the drop-down list. When the last TID has been selected, continue to the next step.
additional TIDs will not be selected	continue to the next step.

4 Click **OK**.

Result: The NE IP Address List Screen closes.

.....
N D O F S T E P S
.....



Task 203: Provisioning the Optical Craft Interface with Network Element TIDs and IP Addresses

Purpose This procedure is used to add, modify, or delete network element Target Identifiers (TIDs) and Data Communications Channel (DCC) circuit pack IP addresses on the Optical Craft Interface.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task.
- Log into the Optical Craft Interface with a Privilege Code of S3 or greater. It is not necessary to connect to a network element.

Related information For related information, see the following sections in this document:

- Chapter 5, “Equipment Configuration Management”
- “Task 201: Logging in to the Optical Craft Interface” (11-6)
- “Task 202: Viewing the Optical Craft Interface Network Element IP Address List” (11-8)
- “Task 205: Setting the Network Element Name” (11-16)
- “Task 206: Setting Network Element Data Communications Parameters” (11-19)

Task Complete the following steps to provision the Optical Craft Interface with network element TIDs and IP addresses.

-
- 1** At the Optical Craft Interface, from the Network View Main Menu bar, select **Administration>NE Name/Address Administration**.

Result: The NE Name/Address Administration Screen appears.

2

IF...	THEN...
entering a new network element name and IP address	click Add . Result: The Add IP Address Screen appears.
modifying an existing network element name and IP address	click the down arrow beside the TID field and select the TID to be modified from the list that is displayed. Click Modify . Result: The Modify IP Address Screen appears with the TID and IP Address fields populated with the current values for the selected network element.
deleting an existing network element name and IP address	click the down arrow beside the TID field and select the TID to be deleted from the list that is displayed. Click Delete . Result: A Confirmation Screen appears.

3

IF...	THEN...
adding or modifying a network element name and IP address	enter the required information in the TID field and both IP Address fields (in dotted decimal format); then click Apply . The IP addresses are the addresses assigned to the network element DCC circuit packs. Result: A Successful Completion Message appears. The TID and IP Address for the network element are saved locally on the Optical Craft Interface. The Optical Craft Interface can now access the network element.
deleting a network element name and IP address	click Yes . Result: A Successful Completion Message appears.

4 Click **OK**.

Result: The Successful Completion Message closes and the Network View appears.

N D O F S T E P S



Task 204: Logging into a Network Element from the Optical Craft Interface

Purpose This procedure is used to log into a network element from the Optical Craft Interface.

Before you begin Before beginning this task:

- Have a valid user ID and password on both the Optical Craft Interface and the network element.
- Ensure the Optical Craft Interface has been provisioned with the network element Target Identifier (TID) and IP address.

Related information For related information, see the following sections in this document:

- Chapter 3, “Security Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 201: Logging in to the Optical Craft Interface” (11-6)
- “Task 203: Provisioning the Optical Craft Interface with Network Element TIDs and IP Addresses” (11-10)
- “Task 215: Logging Out and Disconnecting from a Network Element” (11-53)
- “Task 217: Logging Out of a Cut-Through Session” (11-61)

Task Complete the following steps to log into a network element from the Optical Craft Interface.

1 Connect the Optical Craft Interface to the local network element.

Reference: “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3).

2 Log into the Optical Craft Interface.

Result: The Network View Screen appears.

Reference: “Task 201: Logging in to the Optical Craft Interface” (11-6).

3

IF...	THEN...
an icon exists in the Network View for the desired network element	double click on the network element icon.
an icon does not exist in the Network View for the desired network element	enter the network element TID in the Network View TID field; then select the System button and click Connect .

4

IF the network element...	THEN...
has been provisioned with two IP addresses	the IP Address Selection Screen appears. Continue to the next step.
has been provisioned with one IP address	the Network Element Login Screen appears. Continue to Step 6.

5 Select the IP address to use for the connection; then click **OK**.

Result: The Network Element Login Screen appears.

6 Enter a valid User ID and Password; then click **OK**.

IF...	THEN...
this is the first login for a new user	a message is displayed prompting for a password change. Enter a new password and click OK . Result: A Legal Notice Screen appears.
this is not the first login for a new user	a Legal Notice Screen appears.

7 Click **OK**.

IF the privilege level for the user login is...	THEN...
M0 or P0	a message is displayed stating that certain screens will be inaccessible due to the privilege level. Click OK . Result: The System View Screen for the selected network element appears.
anything other than M0 or P0	the Optical Craft Interface System View Screen for the selected network element appears.

N D O F S T E P S



Task 205: Setting the Network Element Name

Purpose This procedure is used to set the network element name, or Target Identifier (TID).

Important! Because database backups are keyed to the network element TID, changing the network element TID will make all previous database backups invalid.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S3, P3 or greater.

Related information For related information, see the following sections in this document:

- Chapter 5, “Equipment Configuration Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 201: Logging in to the Optical Craft Interface” (11-6)
- “Task 202: Viewing the Optical Craft Interface Network Element IP Address List” (11-8)
- “Task 203: Provisioning the Optical Craft Interface with Network Element TIDs and IP Addresses” (11-10)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 206: Setting Network Element Data Communications Parameters” (11-19)

Task Complete the following steps to provision the TID on the network element.

1 Ensure that the network element is in Maintenance Mode.

Reference: “Task 303: Removing Equipment from and Returning Equipment to Service” (12-17).

-
- 2** At the Optical Craft Interface, from the System View Main Menu bar, select **Administration>Set TID**.

Result: The Provision TID/NE Name Screen appears.

- 3** Enter the TID for the network element in both the New TID/NE Name field and the Confirm TID/NE Name field.
-

- 4** Click **Apply**.

Result: A Confirmation Screen appears.

- 5** Click **OK**.

Result: A Disconnect Warning Message appears.

- 6** Click **OK**.

Result: The network element resets and the Optical Craft Interface login session is terminated. A Communication Failure Message appears.

- 7** Click **OK**.

Result: The Optical Craft Interface System View closes and the Network View appears.

- 8** After the network element has completed the reset, log back into the network element.

Reference: “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13).

9 Perform a database backup.

Reference: “Task 601: Manually Backing Up Software or Data from Primary Memory to Secondary Memory” (16-10).

“Task 603: Manually Backing Up Data from Primary Memory to the Optical Craft Interface” (16-15).

N D O F S T E P S



Task 206: Setting Network Element Data Communications Parameters

- Purpose** This procedure is used to set the following data communications parameters on a network element:
- IP addresses for Data Communications Channel (DCC) circuit packs, and for ports on Restoration Controller (RC) circuit packs, Restoration Interface Processor (RIP) circuit packs, and/or Personality Modules
 - Control Communications Network (CCN) parameters for ports on RIP circuit packs and/or Personality Modules

- Before you begin** Before beginning this task:
- Read and follow all safety precautions in this manual.
 - Obtain the work instructions for this task.
 - Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S3 or greater.
 - The LambdaRouter™ Optical Network Navigator System configuration must be enabled in order to provision CCN parameters on RC or RIP circuit packs or Personality Modules.

- Related information** For related information, see the following sections in this document:
- Chapter 5, “Equipment Configuration Management”
 - “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
 - “Task 201: Logging in to the Optical Craft Interface” (11-6)
 - “Task 202: Viewing the Optical Craft Interface Network Element IP Address List” (11-8)
 - “Task 203: Provisioning the Optical Craft Interface with Network Element TIDs and IP Addresses” (11-10)
 - “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
 - “Task 205: Setting the Network Element Name” (11-16)
 - “Task 208: Initializing the LambdaRouter™ ONNS” (11-34)
 - “Task 209: Enabling or Disabling the LambdaRouter™ ONNS Configuration” (11-37)

Task Complete the following steps to provision the network element data communications and CCN parameters.

- 1 At the Optical Craft Interface, from the System View Main Menu bar, select **Administration>Data Communications**.

Result: The Data Communications Equipment Selection Screen appears.

2

IF setting data communications parameters for...	THEN...
a DCC circuit pack	go to “SE 206-1: Setting a DCC circuit pack IP address” (11-21).
ports on an RC circuit pack	go to “SE 206-2: Setting IP addresses for ports on an RC circuit pack” (11-23).
ports on a RIP circuit pack	go to “SE 206-3: Setting IP addresses and CCN parameters for ports on a RIP circuit pack” (11-24).
ports on a Personality Module	go to “SE 206-4: Setting IP addresses for ports on a Personality Module” (11-26).

N D O F S T E P S

SE 206-1: Setting a DCC circuit pack IP address

Complete the following steps to set a DCC circuit pack IP address.

- 1 In the Equipment Selection Screen, enter an AID for the desired DCC circuit pack, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired DCC circuit pack.

- 2 Click **Select**.

Result: The NE IP Address Provisioning Screen appears.

- 3 Enter the IP Address, Subnet Mask, and Default Router Address (in dotted decimal notation) for the DCC circuit pack; then click **Apply**.

IF the IP address was changed...	THEN...
for the DCC circuit pack carrying the active login session	a Disconnect Warning Message appears. Continue to the next step.
for the DCC circuit pack that is not carrying the active login session	the DCC circuit pack resets. Any user logged into the network element through the DCC circuit pack is disconnected. Continue to Step 6.

- 4 Click **Yes**.

Result: The DCC circuit pack resets and a Communication Failure Message appears.

- 5 Click **OK**.

Result: The Optical Craft Interface System View closes and the Network View appears.

-
- 6** Provision the Optical Craft Interface with the new IP address for the network element.

Reference: “Task 203: Provisioning the Optical Craft Interface with Network Element TIDs and IP Addresses” (11-10).

- 7** If setting additional IP addresses, log back into the network element and repeat this procedure.

Reference: “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13).

N D O F S T E P S

**SE 206-2: Setting IP
addresses for ports on an
RC circuit pack**

Complete the following steps to set the IP address for ports on an RC circuit pack.

-
- 1** In the Equipment Selection Screen, enter an AID for the desired port on an RC circuit pack, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port on an RC circuit pack.

-
- 2** Click **Select**.

Result: The IP Address Provisioning Screen for the selected port appears.

-
- 3** Enter the IP Address and Subnet Mask (in dotted decimal notation) for the RC circuit pack port. If provisioning the external 10BaseT port, also enter the Gateway ID (in dotted decimal notation).

-
- 4** Click **Apply**.

Result: A Confirmation Screen appears.

-
- 5** Click **Yes**.

Result: A successful completion message appears. Any changes made to the RC circuit pack data communications parameters will not take effect until the system is restarted.

-
- 6** Click **OK**.

Result: The successful completion message closes.

7

IF...	THEN...
additional IP addresses will be set	repeat "Task 206: Setting Network Element Data Communications Parameters" (11-19).
data communications provisioning is complete	reset the RC circuit pack. Reference: "Task 302: Resetting a System, Shelf, or Circuit Pack" (12-15).

END OF STEPS

SE 206-3: Setting IP addresses and CCN parameters for ports on a RIP circuit pack

Complete the following steps to set the IP address for internal and external ports, and CCN parameters for external ports on a RIP circuit pack.

- 1 In the Equipment Selection Screen, enter an AID for the desired port on a RIP circuit pack, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port on an RC circuit pack.

- 2 Click **Select**.

Result: The IP Address Provisioning Screen for the selected port appears.

3

IF the selected port is...	THEN...
an internal port or an external port with LambdaRouter™ ONNS disabled	enter the IP Address and Subnet Mask for the port (in dotted decimal notation).
an external port with LambdaRouter™ ONNS enabled	enter the IP Address and Subnet Mask, and configure the Port Status and OSPF Domain Member indicators for the port.

- 4 Click **Apply**.

Result: A Confirmation Screen appears.

5 Click **Yes**.

Result: A successful completion message appears. Any changes made to the RIP circuit pack data communications parameters will not take effect until the system is restarted.

6 Click **OK**.

Result: The successful completion message closes.

7

IF...	THEN...
additional IP addresses will be set	repeat "Task 206: Setting Network Element Data Communications Parameters" (11-19).
data communications provisioning is complete	reset the RIP circuit pack. Reference: "Task 302: Resetting a System, Shelf, or Circuit Pack" (12-15).

N D O F S T E P S

**SE 206-4: Setting IP
addresses for ports on a
Personality Module**

Complete the following steps to set the IP address for ports on a
Personality Module.

-
- 1** In the Equipment Selection Screen, enter an AID for the desired port on a Personality Module, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port on a Personality Module.

-
- 2** Click **Select**.

Result: The IP Address Provisioning Screen for the selected port appears.

-
- 3** Enter the IP Address and Subnet Mask (in dotted decimal notation), configure the Port Status and OSPF Domain Member indicators, and select the interface format for the Personality Module port.

-
- 4** Click **Apply**.

Result: A Confirmation Screen appears.

-
- 5** Click **Yes**.

Result: A successful completion message appears. Any changes made to the Personality Module data communications parameters will not take effect until the system is restarted.

-
- 6** Click **OK**.

Result: The successful completion message closes.

7

IF...	THEN...
additional IP addresses will be set	repeat "Task 206: Setting Network Element Data Communications Parameters" (11-19).
data communications provisioning is complete	reset the Personality Module. Reference: "Task 302: Resetting a System, Shelf, or Circuit Pack" (12-15).

END OF STEPS



Task 207: Viewing the Network Element Data Communications Parameters

- Purpose** This procedure is used to view the following data communications parameters on a network element:
- IP addresses for Data Communications Channel (DCC) circuit packs, and for ports on Restoration Controller (RC) circuit packs, Restoration Interface Processor (RIP) circuit packs, and/or Personality Modules
 - Control Communications Network (CCN) parameters for ports on RIP circuit packs and/or Personality Modules
 - Open Shortest Path First (OSPF) neighbors, label switched path, and trace route information

- Before you begin** Before beginning this task:
- Read and follow all safety precautions in this manual.
 - Obtain the work instructions for this task.
 - Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S1 or greater.

- Related information** For related information, see the following sections in this document:
- Chapter 5, “Equipment Configuration Management”
 - “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
 - “Task 201: Logging in to the Optical Craft Interface” (11-6)
 - “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
 - “Task 206: Setting Network Element Data Communications Parameters” (11-19)

Task Complete the following steps to view the network element data communications and CCN parameters for DCC, RC, and RIP circuit packs and/or Personality Modules.

- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **View>Data Communications**.

Result: The View Data Communications Equipment Selection Screen appears.

2

IF viewing...	THEN...
general data communications parameters	go to “SE 207-1: Viewing general data communications parameters” (11-30).
OSPF neighbor information	go to “SE 207-2: Viewing OSPF neighbor information” (11-31).
label switched path information	go to “SE 207-3: Viewing label switched path information” (11-32).
trace route information	go to “SE 207-4: Viewing trace route information” (11-33).

ND OF STEPS

**SE 207-1: Viewing general
data communications
parameters**

Complete the following steps to view general data communications parameters for a DCC, RC, or RIP circuit pack and/or a Personality Module.

.....

- 1** In the Equipment Selection Screen, enter an AID or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the equipment as follows:

IF viewing...	THEN...
DCC circuit pack state and communications parameters	select a DCC circuit pack
RIP circuit pack primary and secondary state information	select a RIP circuit pack
general data communications parameters for ports on an RC or RIP circuit pack, or on a Personality Module	select the desired port on the RC, RIP, or Personality Module

.....

- 2** Click **Select**.

Result: The Data Communications Screen for the selected equipment appears.

.....

- 3** View the data communications parameters; then click **Close** when done.

Result: The Data Communications Screen closes.

.....
N D O F S T E P S
.....

SE 207-2: Viewing OSPF neighbor information

Complete the following steps to view the OSPF neighbor information for the internal 100BaseT port on a RIP circuit pack.

-
- 1** In the Equipment Selection Screen, enter the AID for the internal 100BaseT port on a RIP circuit pack, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

-
- 2** Click **Select**.

Result: The Data Communications Screen for the selected port appears.

-
- 3** Click the OSPF Neighbors tab.

Result: The OSPF neighbor information for the selected port appears.

-
- 4** Scroll through the list of OSPF neighbors; then click **Close** when done.

Result: The Data Communications Screen closes.

N D O F S T E P S

SE 207-3: Viewing label switched path information

Complete the following steps to view the label switched path information for a RIP circuit pack.

-
- 1** In the Equipment Selection Screen, enter the AID for a RIP circuit pack, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

-
- 2** Click **Select**.

Result: The Data Communications Screen for the selected RIP circuit pack appears.

-
- 3** Click the Label Switched Path tab.

Result: The label switched path information for the selected RIP circuit pack appears.

-
- 4** Enter the destination IP address and click **View**.

Result: The IP addresses of the nodes in the label switched path appear in the scrollable list.

-
- 5** Scroll through the list of nodes in the label switched path; then click **Close** when done.

Result: The Data Communications Screen closes.

.....

N D O F S T E P S

.....

SE 207-4: Viewing trace route information

Complete the following steps to view the data communications parameters for a Personality Module.

-
- 1** In the Equipment Selection Screen, enter the AID for a port on an RC or RIP circuit pack or Personality Module, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

-
- 2** Click **Select**.

Result: The Data Communications Screen for the selected port appears.

-
- 3** Click the Trace Route tab.

Result: The label switched path information for the selected RIP circuit pack appears.

-
- 4** Enter the destination IP address and click **View**.

Result: The IP addresses of the nodes in the route appear in the scrollable list.

-
- 5** Scroll through the list of nodes in the route; then click **Close** when done.

Result: The Data Communications Screen closes.

N D O F S T E P S



Task 208: Initializing the LambdaRouter™ ONNS

Purpose This procedure is used to initialize the LambdaRouter™ ONNS.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Restoration Controller (RC) and Restoration Interface Processor (RIP) circuit packs must be equipped.
- Cabling to Gateway Routers must be connected.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S3, P3 or greater.

Related information For related information, see the following sections in this document:

- Chapter 4, “Management and Network Communications”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 206: Setting Network Element Data Communications Parameters” (11-19)
- “Task 209: Enabling or Disabling the LambdaRouter™ ONNS Configuration” (11-37)

Task Complete the following steps to initialize the LambdaRouter™ ONNS.

1 Enable the LambdaRouter ONNS configuration.

Reference: “Task 209: Enabling or Disabling the LambdaRouter™ ONNS Configuration” (11-37)

-
- 2** Provision the following RC and RIP circuit pack ports (minimum requirements):
- on the active RC circuit pack
 - provision the internal 100BaseT port with an IP address and subnet mask
 - provision the external 10BaseT port with an IP address, subnet mask, and Gateway ID
 - on at least one RIP circuit pack
 - provision the internal 100BaseT port with an IP address and subnet mask
 - on the same RIP circuit pack, provision at least one external port (10BaseT, 100BaseT, or OC-48 Personality Module port) with an IP address, subnet mask, the Port Status Indicator set to **Active**, and the OSPF Domain Member Indicator set to **Enable**.

Result: After the RC and RIP circuit packs have been reset, the LambdaRouter™ ONNS will initialize.

Reference: “Task 206: Setting Network Element Data Communications Parameters” (11-19)

-
- 3** Retrieve the system equipment details and verify that both ONN Status and DCN Status fields show a status of **IS-NR**. This indicates that the LambdaRouter™ ONNS initialization is complete and was successful.

Reference: “Task 300: Viewing the Network Element Configuration Information” (12-3)

-
- 4** Provision OCH ports as Network-to-Network Interface (NNI) ports as required.

Reference: “Task 307: Provisioning Optical Channel (OCH) Port General Parameters” (12-34)

-
- 5** Establish port links using either manual port neighbor provisioning or autonomously using the AIRP neighbor discovery process.

Reference: “Task 210: Provisioning Network Element Port Link Discovery Parameters” (11-40)

“Task 211: Stopping or Activating Automatic Port Link Discovery” (11-43)

“Task 213: Manually Provisioning Port Neighbor Information” (11-48)

N D O F S T E P S



Task 209: Enabling or Disabling the LambdaRouter™ ONNS Configuration

Purpose This procedure is used to enable or disable the LambdaRouter™ ONNS configuration. This task changes the configuration of the system.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P3 or greater.

Related information For related information, see the following sections in this document:

- Chapter 4, “Management and Network Communications”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 206: Setting Network Element Data Communications Parameters” (11-19)
- “Task 208: Initializing the LambdaRouter™ ONNS” (11-34)
- “Task 210: Provisioning Network Element Port Link Discovery Parameters” (11-40)
- “Task 211: Stopping or Activating Automatic Port Link Discovery” (11-43)
- “Task 212: Verifying Port Links” (11-45)
- “Task 214: Viewing Port Links” (11-50)

Task Complete the following steps to enable or disable the LambdaRouter™ ONNS configuration.

1 Remove the system from service.

Reference: “Task 303: Removing Equipment from and Returning Equipment to Service” (12-17).

-
- 2 At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Provision**.

Result: The Provision Parameters for Equipment Screen appears.

- 3 From the Equipment Selection tree on the left side of the screen, enter System for the AID, or select the system from the equipment list, and click **Provision**.

Result: The provisionable parameters for the system are displayed in the Provision Parameters for Equipment Screen.

- 4 Click the **System Parameters** tab.

IF...	THEN...
enabling the LambdaRouter™ ONNS configuration	select Enable in the ONN Configuration field.
disabling the LambdaRouter™ ONNS configuration	select Disable in the ONN Configuration field.

- 5 Click **Apply**.

Result: A Confirmation Screen appears.

- 6 Click **Yes**.

Result: A successful completion message appears.

- 7 Click **OK**.

Result: The successful completion message closes.

- 8 Click **Close** in the Provision Parameters for Equipment Screen.

Result: The Provision Parameters for Equipment Screen closes.

9 Return the system to an in-service (IS) state.

Reference: “Task 303: Removing Equipment from and Returning Equipment to Service” (12-17).

N D O F S T E P S



Task 210: Provisioning Network Element Port Link Discovery Parameters

Purpose This procedure is used to provision the automatic port link discovery parameters for a network element.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P3 or greater.
- Ensure that the LambdaRouter™ ONNS is enabled.

Related information For related information, see the following sections in this document:

- Chapter 4, “Management and Network Communications”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 206: Setting Network Element Data Communications Parameters” (11-19)
- “Task 208: Initializing the LambdaRouter™ ONNS” (11-34)
- “Task 209: Enabling or Disabling the LambdaRouter™ ONNS Configuration” (11-37)
- “Task 211: Stopping or Activating Automatic Port Link Discovery” (11-43)
- “Task 212: Verifying Port Links” (11-45)
- “Task 214: Viewing Port Links” (11-50)

Task Complete the following steps to provision the automatic port link discovery parameters for a network element.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Provision**.

Result: The Provision Parameters for Equipment Screen appears.

- 2** From the Equipment Selection tree on the left side of the screen, enter System for the AID, or select the system from the equipment list; then click **Provision**.

Result: The provisionable parameters for the system are displayed in the Provision Parameters for Equipment Screen.

- 3** Click the **Link Discovery** tab.

Result: The link discovery provisionable parameters are displayed in the Provision Parameters for Equipment Screen.

- 4** Provision the link discovery and verification parameters as required; then click **Apply**.

Result: A Confirmation Screen appears.

- 5** Click **Yes**.

Result: A successful completion message appears.

- 6** Click **OK**.

Result: The successful completion message closes.

7 Click **Close**.

Result: The Provision Parameters for Equipment Screen closes.

N D O F S T E P S



Task 211: Stopping or Activating Automatic Port Link Discovery

Purpose This procedure is used to stop or activate automatic port link discovery for a network element.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P3 or greater.
- Ensure that the LambdaRouter™ ONNS is enabled.

Related information For related information, see the following sections in this document:

- Chapter 4, “Management and Network Communications”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 206: Setting Network Element Data Communications Parameters” (11-19)
- “Task 208: Initializing the LambdaRouter™ ONNS” (11-34)
- “Task 209: Enabling or Disabling the LambdaRouter™ ONNS Configuration” (11-37)
- “Task 210: Provisioning Network Element Port Link Discovery Parameters” (11-40)
- “Task 212: Verifying Port Links” (11-45)
- “Task 214: Viewing Port Links” (11-50)

Task Complete the following steps to stop or activate automatic port link discovery for a network element.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Provision**.

Result: The Provision Parameters for Equipment Screen appears.

- 2 From the Equipment Selection tree on the left side of the screen, enter System for the AID, or select the system from the equipment list, and click **Provision**.

Result: The provisionable parameters for the system are displayed in the Provision Parameters for Equipment Screen.

- 3 Click the **Link Discovery** tab.

Result: The link discovery provisionable parameters are displayed in the Provision Parameters for Equipment Screen.

4

IF...	THEN...
activating scheduled or on-demand automatic port link discovery	select Activate in the Automatic Link Discovery field.
stopping automatic port link discovery	select Disable in the Automatic Link Discovery field.

- 5 Click **Apply**.

Result: A Confirmation Screen appears.

- 6 Click **Yes**.

Result: A successful completion message appears.

- 7 Click **OK**.

Result: The successful completion message closes.

- 8 Click **Close**.

Result: The Provision Parameters for Equipment Screen closes.

N D O F S T E P S



Task 212: Verifying Port Links

Purpose This procedure is used to verify that a port link from a selected output port on the local network element to a specified input port on a neighboring network element is still valid.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of M3 or greater.
- Ensure that the LambdaRouter™ ONNS is enabled.

Related information For related information, see the following sections in this document:

- Chapter 4, “Management and Network Communications”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 206: Setting Network Element Data Communications Parameters” (11-19)
- “Task 208: Initializing the LambdaRouter™ ONNS” (11-34)
- “Task 209: Enabling or Disabling the LambdaRouter™ ONNS Configuration” (11-37)
- “Task 210: Provisioning Network Element Port Link Discovery Parameters” (11-40)
- “Task 211: Stopping or Activating Automatic Port Link Discovery” (11-43)
- “Task 214: Viewing Port Links” (11-50)

Task Complete the following steps to verify the port link associated with a specified output port on a network element.

- 1 At the Optical Craft Interface, from the System View Main Menu bar, select **Fault>Verify Port Link**.

Result: The Verify Port Link Equipment Selection Screen appears.

- 2 Enter an AID for the desired OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

- 3 Click **Select**.

Result: The Verify Port Link Screen appears with the currently provisioned port neighbor IP address and OCH port AID displayed.

- 4 Click **Apply**.

Result: A Confirmation Screen appears.

- 5 Click **Yes**.

Result: The port link is verified.

6

IF the test results...	THEN...
will be retrieved and viewed	go to “SE 212-1: Viewing port link verification test results” (11-47).
will not be retrieved and viewed	Stop! End of Task.

N D O F S T E P S

**SE 212-1: Viewing port link
verification test results**

Complete the following steps to retrieve and view the port link verification test results.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **View>Equipment Details**.

Result: The Equipment Selection Screen appears.

-
- 2** Enter an AID for the desired OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

-
- 3** Click **Select**.

Result: The View OCH Port Details Screen appears for the selected OCH port.

-
- 4** Click the **Output** tab; then click the **Port Link** tab.

Result: The port link information for the OCH port are displayed in the View OCH Port Details Screen.

-
- 5** View the port link information; click **Close** when done.

Result: The View OCH Port Details Screen closes.

N D O F S T E P S



Task 213: Manually Provisioning Port Neighbor Information

Purpose This procedure is used to manually provision port neighbor information for an OCH port.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P3 or greater.
- Ensure that the LambdaRouter™ ONNS is enabled.

Related information For related information, see the following sections in this document:

- Chapter 4, “Management and Network Communications”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 206: Setting Network Element Data Communications Parameters” (11-19)
- “Task 208: Initializing the LambdaRouter™ ONNS” (11-34)
- “Task 209: Enabling or Disabling the LambdaRouter™ ONNS Configuration” (11-37)
- “Task 210: Provisioning Network Element Port Link Discovery Parameters” (11-40)
- “Task 211: Stopping or Activating Automatic Port Link Discovery” (11-43)
- “Task 212: Verifying Port Links” (11-45)
- “Task 214: Viewing Port Links” (11-50)
- “Task 307: Provisioning Optical Channel (OCH) Port General Parameters” (12-34)

Task Complete the following steps to manually provision port neighbor information for an OCH port.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Provision**.

Result: The Provision Parameters for Equipment Screen appears.

- 2** On the left side of the screen, enter an AID for the desired OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment; then click **Provision**.

Result: The parameters for the selected OCH port appear on the right side of the Provision Parameters for Equipment Screen.

- 3** Click the **Port Link Parameters** tab.

Result: The port link parameters for the selected OCH port are displayed in the Provision Parameters for Equipment Screen.

- 4** Provision the OCH port neighbor information; then click **Apply**.

Result: A Confirmation Screen appears.

- 5** Click **Yes**.

Result: A successful completion message appears.

- 6** Click **OK**.

Result: The successful completion message closes.

- 7** Click **Close**.

Result: The Provision Parameters for Equipment Screen closes.

N D O F S T E P S



Task 214: Viewing Port Links

Purpose This procedure is used to view a list of port links and related information on the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S1 or greater.
- Ensure that the LambdaRouter™ ONNS is enabled.

Related information For related information, see the following sections in this document:

- Chapter 4, “Management and Network Communications”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 206: Setting Network Element Data Communications Parameters” (11-19)
- “Task 208: Initializing the LambdaRouter™ ONNS” (11-34)
- “Task 209: Enabling or Disabling the LambdaRouter™ ONNS Configuration” (11-37)
- “Task 210: Provisioning Network Element Port Link Discovery Parameters” (11-40)
- “Task 211: Stopping or Activating Automatic Port Link Discovery” (11-43)
- “Task 212: Verifying Port Links” (11-45)
- “Task 213: Manually Provisioning Port Neighbor Information” (11-48)

Task Complete the following steps to view a list of port links on the LambdaRouter™ All Optical Switch.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Reports>Port Link List**.

Result: The Equipment Selection Screen appears.

-
- 2** Enter an AID for the desired system, optical interface shelf, port unit, or OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

-
- 3** Click **Select**.

Result: The Transmission Port Link Discovery Parameters List Screen appears.

4

IF the list data...	THEN...
will be saved as a text file	click Save As . From the Save As Screen, select a path, enter a filename; then click Save . Result: The list data is saved in the specified file and may be viewed using a text editor.
will be printed	click Print . From the Print Screen, select the desired printer and print options; then click OK . Result: The list data is printed on the selected printer.
will be updated	click Refresh . Result: The Transmission Port Link Discovery Parameters List Screen updates.

5 Click **Close**.

Result: The Transmission Port Link Discovery Parameters List Screen closes.

N D O F S T E P S



Task 215: Logging Out and Disconnecting from a Network Element

Purpose This procedure is used to log out and disconnect the Optical Craft Interface from a network element.

Before you begin Before beginning this task, be currently connected to a network element from a Optical Craft Interface.

Related information For related information, see the following sections in this document:

- Chapter 3, “Security Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)

Task Complete the following steps to log out and disconnect from a network element.

1

IF...	THEN...
only one network element is still connected and all tasks are complete	log out and disconnect from the network element. Reference: “SE 215-1: Disconnecting from one network element” (11-54).
several network elements are connected and all tasks are completed on all of them	log out from all currently connected network elements. Reference: “SE 215-2: Disconnecting from all network elements” (11-55).
all network elements are disconnected and all tasks are complete	log out of the Optical Craft Interface. Reference: “SE 215-3: Logging out from the Optical Craft Interface” (11-56).

2 Disconnect the Optical Craft Interface from the network element.

Reference: “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3).

END OF STEPS

**SE 215-1: Disconnecting
from one network element**

Complete the following steps to log out and disconnect from one network element.

1

IF...	THEN...
the Optical Craft Interface Network View is displayed	from the Main Menu bar, select Network Element>Disconnect from NE . Result: The NE Disconnect List appears.
the Optical Craft Interface System View is displayed	from the Main Menu bar, select File>NE Disconnect . Result: A Confirmation Screen appears. Continue to Step 3.

2 Select the network element to be disconnected; then click **Disconnect**.

Result: A Confirmation Screen appears.

3 Click **Yes**.

Result: The Optical Craft Interface is disconnected from the selected network element and the Optical Craft Interface Network View appears.

N D O F S T E P S

**SE 215-2: Disconnecting
from all network elements**

Complete the following steps to log out and disconnect from all network elements.

-
- 1** At the Optical Craft Interface, from the Network View Main Menu bar, select **Network Element>Disconnect from All NEs**.

Result: A Confirmation Screen displaying a list of all currently connected network elements appears.

-
- 2** Click **Yes**.

Result: The Optical Craft Interface is disconnected from all network elements and the Optical Craft Interface Network View appears.

N D O F S T E P S

**SE 215-3: Logging out from
the Optical Craft Interface**

Complete the following steps to log out from the Optical Craft
Interface.

-
- 1** At the Optical Craft Interface, from the Network View Main Menu bar, select **File>Exit**.

Result: A Confirmation Screen appears.

-
- 2** Click **Yes**.

Result: The Optical Craft Interface application closes and the
Microsoft Windows desktop appears.

.....
N D O F S T E P S



Task 216: Logging in to a Network Element by Cut-Through

Purpose This procedure is used to log in to a network element by cut-through.

Before you begin Before beginning this task:

- Have a valid user ID and password on both the Optical Craft Interface and the network element.
- Ensure that the Optical Craft Interface has been provisioned with the network element Target Identifier (TID) and IP address.

Related information For related information, see the following sections in this document:

- Chapter 3, “Security Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 201: Logging in to the Optical Craft Interface” (11-6)
- “Task 203: Provisioning the Optical Craft Interface with Network Element TIDs and IP Addresses” (11-10)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 215: Logging Out and Disconnecting from a Network Element” (11-53)
- “Task 217: Logging Out of a Cut-Through Session” (11-61)

Task Complete the following steps to log in to the network element by cut-through.

1 Connect the Optical Craft Interface to the local network element.

Reference: “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3).

2 Log in to the Optical Craft Interface.

Result: The Network View Screen appears.

Reference: “Task 201: Logging in to the Optical Craft Interface” (11-6).

3

IF...	THEN...
an icon exists in the Network View for the desired network element	right-click on the network element icon and select Cut Through from the pop up menu.
an icon does not exist in the Network View for the desired network element	enter the network element TID in the Network View TID field, select the Cut-Through button; then click Connect .

4

IF the network element...	THEN...
has been provisioned with two IP addresses	the IP Address Selection Screen appears. Select the IP address to use for the connection and click OK .
has been provisioned with one IP address	continue to the next step.

5

IF...	THEN...
the Login Screen appears	continue to Step 8.
an error message appears indicating that the connection attempt failed	the TID and IP address may be incorrect or there may be a problem communicating with the network element. Verify the TID and IP address are correct. Make corrections as necessary. Refer to “Task 203: Provisioning the Optical Craft Interface with Network Element TIDs and IP Addresses” (11-10). Return to Step 3 once. If the connection fails a second time, continue to the next step.

6 Click the Microsoft Windows **Start** button, then select **Programs> Command Prompt**.

Result: The Command Prompt Window appears.

- 7 In the command prompt window, enter `ping <IP address>` to determine if there are communications with the network element. Replace `<IP address>` with the IP address of the network element to which a connection is being attempted.

IF the ping command...	THEN...
indicates there are no communications (a Request Timed Out error is displayed)	contact the local network administrator to clear the problem. When the problem is cleared, return to Step 3.
indicates there are communications (ping reply times are displayed)	the problem may be in the Optical Craft Interface. Call Lucent Technical Support. Stop! End of Task

- 8 Enter a valid User ID and Password; then click **OK**.

IF...	THEN...
this is the first login for a new user	a message is displayed requesting a password change. Continue to the next step.
this is not the first login for a new user	continue to Step 13.

- 9 Click **Yes**.

Result: The Change Expired Password Screen appears.

- 10 Enter the password information in the Old Password, New Password, and Confirm Password fields.

Important! The password entered in the New Password and Confirm Password fields must match. Asterisks will be displayed as the passwords are entered.

11 Click **OK**.

Result: A Confirmation Screen appears.

12 Click **Yes**.

Result: The Confirmation Screen closes.

13

IF...	THEN...
the No Listbox File Exist error message appears	click OK to clear the message. The error message is just a warning. The Listbox File is not required. Result: The connection is established and the Cut-Through window appears.
the Cut-Through window appears	the connection is established.

N D O F S T E P S



Task 217: Logging Out of a Cut-Through Session

Purpose This procedure is used to log out of a cut-through session.

Before you begin Before beginning this task:

- Have a valid user ID and password on both the Optical Craft Interface and the network element.
- Ensure that a cut-through session is active.

Related information For related information, see the following sections in this document:

- Chapter 3, “Security Management”
- “Task 203: Provisioning the Optical Craft Interface with Network Element TIDs and IP Addresses” (11-10)
- “Task 216: Logging in to a Network Element by Cut-Through” (11-57)

Task Complete the following steps to log out of a cut-through session.

-
- 1** Enter `CANC-USER:<tid>::logoff;` in the TL1 Command Entry Field, or select the CANC-USER command from the Cut-Through Window List Box and edit the command line to include the network element TID as appropriate; then click **Send**.

Result: The login session is terminated.

- 2** At the Optical Craft Interface Cut-Through Main Menu, select **File>Exit**.

Result: A Confirmation Screen appears.

- 3** Click **Yes**.

Result: The Cut-Through Screen closes and the Network View appears.

ND OF STEPS



Task 218: Connecting or Disconnecting a Terminal to or from a Network Element RS-232 Port

Purpose This procedure is used to physically connect a terminal to, or disconnect a terminal from, a local network element RS-232 port.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain an RS-232 Adapter Cable assembly (COMCODE 848822995).
- Obtain either an RS-232 “null modem” serial cable (for direct connection) or two standard RS-232 serial cables and two modems (for connection via modem).

Related information For related information, see the following sections in this document:

- Chapter 2, “Operations Interfaces and Managing Systems”
- “Task 219: Logging in to an RS-232 Terminal Session” (11-66)
- “Task 220: Logging out of an RS-232 Terminal Session” (11-69)

Task Complete the following steps to connect a terminal to, or disconnect a terminal from, a local network element RS-232 port.

1

IF...	THEN...
connecting a terminal directly to a network element	go to “SE 218-1: Connecting a terminal directly to a network element” (11-63).
connecting a terminal to a network element via modem	go to “SE 218-2: Connecting a terminal to a network element via modem” (11-64).
disconnecting a terminal from a network element	go to “SE 218-3: Disconnecting a terminal from a network element” (11-65).

N D O F S T E P S

**SE 218-1: Connecting a
terminal directly to a
network element**

Complete the following steps to connect a terminal directly to a network element RS-232 port.

-
1 Plug the 25-pin end of the RS-232 adapter cable into the J189 DEBUG PORT connector on the network element System Controller Shelf backplane.
.....
- 2** Plug one end of the RS-232 “null modem” serial cable into the terminal serial port and the other end into one of the 9-pin connectors on the RS-232 adapter cable.
.....
- 3** Log into the network element from the terminal.

Reference: “Task 219: Logging in to an RS-232 Terminal Session” (11-66).

.....
N D O F S T E P S
.....

**SE 218-2: Connecting a
terminal to a
network element via
modem**

Complete the following steps to connect a terminal to a network element RS-232 port via modem.

.....

1 Plug the 25-pin end of the RS-232 adapter cable into the J189 DEBUG PORT connector on the network element System Controller Shelf backplane.

.....

2 Plug one end of a standard RS-232 serial cable into the terminal serial port and the other end into a modem.

.....

3 Plug one end of one standard RS-232 serial cable into one of the 9-pin connectors on the RS-232 adapter cable on the network element and the other end into a modem.

.....

4 Connect each modem to a telephone jack and power-on the modems.

It is recommended that the modems be configured as follows:

- autoanswer enabled
- flow control off (or disabled)
- only connect at the baud rate for which the network element is provisioned

Reference: See the modem and Microsoft Windows documentation for information on how to configure the modems.

.....

5 Log into the network element from the terminal.

Reference: “Task 219: Logging in to an RS-232 Terminal Session” (11-66).

.....

N D O F S T E P S

.....

SE 218-3: Disconnecting a terminal from a network element

Complete the following steps to disconnect a terminal from a network element RS-232 port.

1

IF...	THEN...
currently logged into an RS-232 terminal session	log out of the RS-232 terminal session. Reference: "Task 220: Logging out of an RS-232 Terminal Session" (11-69).
not currently logged into an RS-232 terminal session	continue to the next step.

2

IF the terminal is...	THEN...
connected directly to the network element	power-off the terminal and disconnect the RS-232 serial cable from the serial port on the terminal and from the RS-232 adapter cable connected to the network element System Controller Shelf backplane.
connected to the network element via modem	power-off the terminal and the modems. Disconnect the modems from the telephone jacks and disconnect the RS-232 cables from the modems and the terminal and the RS-232 adapter cable.

END OF STEPS



Task 219: Logging in to an RS-232 Terminal Session

Purpose This procedure is used to log in to an RS-232 terminal session.

Before you begin Before beginning this task:

- Have a valid user ID and password on the network element.

Related information For related information, see the following sections in this document:

- Chapter 2, “Operations Interfaces and Managing Systems”
- “Task 218: Connecting or Disconnecting a Terminal to or from a Network Element RS-232 Port” (11-62)
- “Task 220: Logging out of an RS-232 Terminal Session” (11-69)

Task Complete the following steps to log in to an RS-232 terminal session.

1 Connect the terminal to the network element RS-232 port.

Reference: “Task 218: Connecting or Disconnecting a Terminal to or from a Network Element RS-232 Port” (11-62).

2 Power-on the terminal.

IF...	THEN...
this is the first connection of a terminal to the network element	configure the terminal serial port to 19200 bits per second, 8 data bits, no parity, and 1 stop bit. Reference: See the terminal documentation for information on how to configure the terminal serial port.
this is not the first connection of a terminal to the network element	continue to the next step.

3 Press Enter on the keyboard.

Result: The RS-232 menu appears.

4

IF...	THEN...
logging in and entering TL1 commands	continue to the next step.
changing the RS-232 port baud rate	go to “SE 219-1: Changing the RS-232 port baud rate” (11-68).

5 Enter 1 at the RS-232 menu prompt.**Result:** The TL1 Command menu appears.

6 Enter T at the TL1 Command menu prompt.**Result:** Instructions for how to log in are displayed.

7 Enter ACT-USER:<tid>:<loginid>:<ctag>::<password>; at the TL1 Command prompt.**Result:** A message is displayed indicating the login is successful.

8 Enter additional TL1 commands as required.

ND OF STEPS

SE 219-1: Changing the RS-232 port baud rate

Complete the following steps to change the baud rate of the RS-232 port.

-
- 1** Enter 2 at the RS-232 menu prompt.

Result: The Baud Rate menu appears.

-
- 2** Select the desired baud rate from the menu.

Result: A string of random characters appears on the screen.

-
- 3** Set the terminal baud rate to match the baud rate selected for the RS-232 port.

Reference: See the terminal documentation for information on how to configure the terminal serial port.

-
- 4** Press Enter on the keyboard.

Result: The Baud Rate menu appears.

-
- 5** Enter Q at the Baud Rate menu.

Result: The RS-232 Menu appears.

.....

N D O F S T E P S



Task 220: Logging out of an RS-232 Terminal Session

Purpose This procedure is used to log out of an RS-232 terminal session.

Before you begin Before beginning this task, an RS-232 terminal session must already be established.

Related information For related information, see the following sections in this document:

- Chapter 2, “Operations Interfaces and Managing Systems”
- “Task 218: Connecting or Disconnecting a Terminal to or from a Network Element RS-232 Port” (11-62)
- “Task 219: Logging in to an RS-232 Terminal Session” (11-66)

Task Complete the following steps to log out of an RS-232 terminal session.

1 Enter `CANC-USER:<tid>::logoff;` at the TL1 Command prompt.

Result: A message is displayed indicating the logout is successful.

2 Enter Q two times to return to the RS-232 menu.

Result: The RS-232 Menu appears.

3 Power-off the terminal and optionally disconnect the terminal from the network element.

Reference: “Task 218: Connecting or Disconnecting a Terminal to or from a Network Element RS-232 Port” (11-62).

N D O F S T E P S





12 Equipment Configuration Management Tasks

Overview

Purpose This chapter provides detailed procedures for performing equipment configuration tasks on the LambdaRouter™ All Optical Switch.

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Task 300: Viewing the Network Element Configuration Information

- Purpose** This procedure is used to view the network element configuration information. The information includes
- equipment details (such as: TID, system configuration, date and time, interface defaults, and state and alarm information)
 - controller complex information (circuit pack members, alarm level, and state information)
 - network configuration parameters (such as: IP address, subnet mask, and default router information)
 - SWIP details [state and optical channel (OCH) port association]
 - SWIP Block and SWIP status

- Before you begin** Before beginning this task:
- Read and follow all safety precautions in this manual.
 - Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P1, M1 or greater.

- Related information** For related information, see the following sections in this document:
- Chapter 5, “Equipment Configuration Management”
 - “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
 - “Task 201: Logging in to the Optical Craft Interface” (11-6)
 - “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
 - “Task 205: Setting the Network Element Name” (11-16)
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 - “Task 304: Setting the System Date and Time” (12-25)
 - “Task 306: Provisioning System Default Optical Channel (OCH) Port Parameters” (12-32)

Task Complete the following steps to view the network element configuration information.

1

IF retrieving the...	THEN...
equipment details	go to “SE 300-1: Viewing equipment details” (12-4).
controller complex information	go to “SE 300-2: Viewing controller complex information” (12-6).
SWIP details	go to “SE 300-3: Viewing SWIP details” (12-7).
SWIP Block and SWIP status	go to “SE 300-4: Viewing the status of SWIP Blocks and SWIPs” (12-8).

N D O F S T E P S

SE 300-1: Viewing equipment details

Complete the following steps to view equipment details for the LambdaRouter™ All Optical Switch.

- At the Optical Craft Interface, from the System View Main Menu Bar, select **View>Equipment Details**.

Result: The Equipment Selection Screen appears.

- Enter an AID for the desired system, shelf, circuit pack, OCH port, IP port, SWIP block, or SWMG, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

- Click **Select**.

Result: The View Details Screen for the selected equipment appears.

4 View the displayed equipment details.

IF...	THEN...
the View OCH Port Details Screen is displayed for ports on an OXI-2GC, OXI, OXI-4A13, or OXI-4A15 circuit pack OR the View Port Details Screen is displayed for ports on a RIP or RC circuit pack, or on a Personality Module	click Previous Port or Next Port to view the previous or next port on the same circuit pack as desired. Result: The equipment details for the previous or next port are displayed as appropriate.
any View Details Screen other than the View OCH Port Details Screen or View Port Details Screen is displayed OR the View OCH Port Details Screen is displayed for a port on an OXI-10GC circuit pack	continue to the next step.

5 Click **Close**.

Result: The View Details Screen closes.

N D O F S T E P S

**SE 300-2: Viewing
controller complex
information**

Complete the following steps to view controller complex information for the LambdaRouter™ All Optical Switch.

-
- 1** At the Optical Craft Interface, from the System View Main Menu Bar, select **View>Controller Complex**.

Result: The View Controller Complex Details Screen appears.

-
- 2** View the displayed controller complex details. Click **View scc-1-x** to view the details for the other controller complex if desired.

-
- 3** Click **Close**.

Result: The View Controller Complex Details Screen closes.

N D O F S T E P S

SE 300-3: Viewing SWIP details

Complete the following steps to view SWIP details for the LambdaRouter™ All Optical Switch.

-
- 1 At the Optical Craft Interface, from the System View, right-click on the relevant Switch Shelf.

Result: The Switch Shelf right-click pop-up menu appears.

.....

2

IF retrieving a list of...	THEN...
available SWIPs	select List Shelf Available SWIPs from the pop-up menu. Result: A Confirmation Screen appears.
suspect SWIPs	select List Shelf Suspect SWIPs from the pop-up menu. Result: A Confirmation Screen appears.
faulty SWIPs	select List Shelf Faulty SWIPs from the pop-up menu. Result: A Confirmation Screen appears.

.....

- 3 Click **Yes**.

Result: The SWIP Detail List Screen for the Switch Shelf appears with the selected information (available, suspect, or faulty SWIPs).

.....

- 4 View the displayed SWIP information.
-

- 5 Click **Close**.

Result: The SWIP Detail List Screen closes.

.....

N D O F S T E P S

.....

**SE 300-4: Viewing the
status of SWIP Blocks and
SWIPs**

Complete the following steps to view SWIP Block and SWIP status information for the LambdaRouter™ All Optical Switch.

-
- 1 At the Optical Craft Interface, from the System View, double-click on the relevant Switch Shelf.

Result: The Switch Shelf View appears. Each SWIP Block in the selected Switch Shelf is displayed in a color that indicates the status of the SWIP Block.

-
- 2 View the SWIP Block status.

IF the SWIP Block color is...	THEN...
white	the SWIP Block status is Unassigned.
light grey	the SWIP Block status is Reserved.
dark grey	the SWIP Block status is Assigned.

-
- 3 At the Optical Craft Interface, from the Switch Shelf View, right-click on the relevant SWIP Block and select **Block Refresh** from the pop-up menu.

Result: The selected SWIP Block is updated to show the current status.

-
- 4 At the Optical Craft Interface, from the Switch Shelf View, double-click on the SWIP Block that was refreshed in the previous step.

Result: The SWIP Block Display Screen appears with the individual SWIPs that make up the selected SWIP Block. Each SWIP in the selected SWIP Block is displayed in a color that indicates the status of the SWIP.

5 View the status of the SWIPs.

IF the SWIP color is...	THEN...
green	the SWIP status is In-Service (primary state: IS-NR).
grey	the SWIP status is Available (primary state: OOS-MA, secondary state: UEQ or UEQ&BUSY).
white	the SWIP status is Suspect (primary state: OOS-MA, secondary state: MT or MT&BUSY).
a black cross	the SWIP status is Defective (primary state: OOS-MA, secondary state: UAS, FLT).
red with a black cross	the SWIP status is Defective and Alarmable (primary state: OOS-MA, secondary state: UAS&MEA or FLT&MEA).

6

IF...	THEN...
retrieving additional details for a specific SWIP in the SWIP Block	double-click on the desired SWIP. Result: The View SWIP Details Screen appears for the selected SWIP. Continue to the next step.
no additional details are required	continue to Step 9.

7 View the SWIP details. Click **Close** in the View SWIP Details Screen when finished.

Result: The View SWIP Details Screen closes.

8

IF...	THEN...
retrieving additional details for another SWIP in the SWIP Block	return to Step 6.
no additional details are required	continue to the next step.

9 Click **Close**.

Result: The SWIP Block Display Screen closes.

10

IF the status of additional SWIP Blocks...	THEN...
will be retrieved	return to Step 3.
will not be retrieved	at the Optical Craft Interface, from the Shelf View menu, select View>System View Display . Result: The network element System View appears.

END OF STEPS



Task 301: Viewing Network Element Equipment Lists

Purpose This procedure is used to retrieve and view equipment lists of network element shelves, circuit packs, and optical channel (OCH) ports.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P1 or greater.

Related information For related information, see the following sections in this document:

- Chapter 5, “Equipment Configuration Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 300: Viewing the Network Element Configuration Information” (12-3)

Task Complete the following steps to retrieve and view equipment lists of network element shelves, circuit packs, and OCH ports.

1

IF retrieving equipment lists of network element...	THEN...
shelves	at the Optical Craft Interface, from the System View Main Menu Bar, select Reports>Equipment Lists>Shelf . Result: The Shelf List Screen appears. Continue to Step 4.
circuit packs	at the Optical Craft Interface, from the System View Main Menu Bar, select Reports>Equipment Lists>Pack . Result: The Equipment Selection Screen appears. Continue to the next step.
OCH port equipment lists	go to “SE 301-1: Viewing OCH port equipment lists” (12-13).

-
- 2 Enter an AID for the desired shelf, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.
-

- 3 Click **Select**.

Result: The equipment list screen for the selected equipment appears.

- 4

IF the equipment list...	THEN...
will be saved as a text file	click Save As . From the Save As Screen, select a path, enter a filename; then click Save . Result: The equipment list is saved in the specified file and may be viewed using a text editor.
will be printed	click Print . From the Print Screen, select the desired printer and print options; then click OK . Result: The equipment list is printed on the selected printer.
will be updated	click Refresh . Result: The equipment list updates.

- 5 Click **Close**.

Result: The equipment list screen closes.

ND OF STEPS

**SE 301-1: Viewing OCH
port equipment lists**

Complete the following steps to view equipment lists of network element OCH ports.

1

IF retrieving OCH port...	THEN...
general parameters	at the Optical Craft Interface, from the System View Main Menu Bar, select Reports>Equipment Lists>Port>Port General . Result: The Equipment Selection Screen appears.
signal status/power information	at the Optical Craft Interface, from the System View Main Menu Bar, select Reports>Equipment Lists>Port>Signal Status/Power . Result: The Equipment Selection Screen appears.
PM profile and control information	at the Optical Craft Interface, from the System View Main Menu Bar, select Reports>Equipment Lists>Port>PM Profile and Control . Result: The Equipment Selection Screen appears.

- 2** Enter an AID for the desired system, optical interface shelf, port unit, or OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

- 3** Optionally select a Usage or Direction parameter (or both) to filter the OCH port list information. Selecting a Usage of **ALL** and a Direction of **Both** will retrieve a list of all OCH ports associated with the selected equipment.

- 4** Click **Select**.

Result: The Transmission Port List Screen appears with the general parameters, signal status/power, or PM profile and control information displayed as appropriate.

-
- 5** Return to Step 4 of “Task 301: Viewing Network Element Equipment Lists” (12-11).

N D O F S T E P S



Task 302: Resetting a System, Shelf, or Circuit Pack

Purpose This procedure is used to reset a LambdaRouter™ All Optical Switch system, optical interface shelf, high-voltage shelf, DCC circuit pack, RC circuit pack, RIP circuit pack, port unit, or Personality Module.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of M4, S4 or greater.

Related information For related information, see the following sections in this document:

- Chapter 5, “Equipment Configuration Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)

Task Complete the following steps to reset a system, optical interface shelf, high-voltage shelf, DCC, RC, or RIP circuit pack, port unit, or Personality Module.

1

IF resetting a...	THEN...
DCC, RC, or RIP circuit pack, port unit, or Personality Module	at the Optical Craft Interface, from the System View Main Menu Bar, select Fault>Reset>Circuit Pack . Result: The Reset Circuit Pack Equipment Selection Screen appears. Continue to the next step.
optical interface shelf or high-voltage shelf	at the Optical Craft Interface, from the System View Main Menu Bar, select Fault>Reset>Shelf . Result: The Reset Shelf Equipment Selection Screen appears. Continue to the next step.
system	at the Optical Craft Interface, from the System View Main Menu Bar, select Fault>Reset>System . Result: A Confirmation Screen appears. Continue to Step 4.

- 2 Enter an AID for the desired DCC, RC, or RIP circuit pack, port unit, Personality Module, optical interface shelf, or high-voltage shelf, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

- 3 Click **Select**.

Result: A Confirmation Screen appears.

- 4 Click **Yes**.

IF resetting a...	THEN...
system or the DCC circuit pack carrying the active login session	the reset terminates the Optical Craft Interface login session and a Communication Failure Message appears. Continue to the next step.
shelf, RC or RIP circuit pack, port unit, Personality Module, or the DCC circuit pack that is not carrying the active login session	a successful completion message appears. Click OK . Stop! End of Task.

- 5 Click **OK**.

Result: The Optical Craft Interface System View closes and the Network View appears.

- 6 Log back into the network element when the reset has completed to perform any additional provisioning tasks.

Reference: “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13).

END OF STEPS



Task 303: Removing Equipment from and Returning Equipment to Service

Purpose This procedure is used to change the primary state of the following LambdaRouter™ All Optical Switch equipment:

- system
- port units (OXI, OXI-4A13, OXI-4A15, OXI-10GC, and OXI-2GC)
- optical channel (OCH) port
- Personality Module
- SWIP maintenance group (SWMG)

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P3 or greater.

Related information For related information, see the following sections in this document:

- Chapter 5, “Equipment Configuration Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)

Task Complete the following steps to change the primary state of the LambdaRouter™ All Optical Switch equipment.

1

IF changing the primary state of...	THEN...
the system	go to “SE 303-1: Changing the primary state of the system” (12-19).
a port unit or OCH port	go to “SE 303-2: Changing the primary state of a port unit or OCH port” (12-20).
an SWMG	go to “SE 303-3: Changing the primary state of an SWMG” (12-22).
a Personality Module	go to “SE 303-4: Changing the primary state of a Personality Module” (12-23).

N D O F S T E P S

SE 303-1: Changing the primary state of the system

Complete the following steps to change the primary state of the system.

-
- 1** At the Optical Craft Interface, from the System View Main Menu Bar, select **Fault>Return to/Remove from Service**.

Result: The Remove from/Return to Service Screen appears.

.....

- 2** From the Equipment Selection tree on the left side of the screen, select the system, or enter the AID for the system; then click **Select Target**.

Result: The current primary state for the system is displayed in the Remove from/Return to Service Screen.

.....

3

IF...	THEN...
removing the System from service	select Remove From Service from the Action drop-down list; then click Apply . Result: A Confirmation Screen appears.
returning the System to service	select Return To Service from the Action drop-down list; then click Apply . Result: A Confirmation Screen appears.

.....

- 4** Click **Yes**.

Result: The Confirmation Screen closes.

5

IF the System was...	THEN...
removed from service	click Close . Result: The Remove from/Return to Service Screen closes.
returned to service	the system restarts and a Communication Failure Message appears. Click OK and when the system restart has completed log back into the network element to perform any additional provisioning tasks. Reference: “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13).

END OF STEPS

**SE 303-2: Changing the
primary state of a port unit
or OCH port**

Complete the following steps to change the primary state of a port unit or OCH port. All ports on a port unit must be removed from service before the port unit itself may be removed from service.

- 1 At the Optical Craft Interface, from the System View Main Menu Bar, select **Fault>Return to/Remove from Service**.

Result: The Remove from/Return to Service Screen appears.

- 2 From the Equipment Selection tree on the left side of the screen, enter an AID for the port unit or OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

- 3 Click **Select Target**.

Result: The current primary state for the equipment is displayed in the Remove from/Return to Service Screen.

4

IF...	THEN...
removing the port unit or OCH port from service	select Remove From Service from the Action drop-down list; then click Apply . Result: A Confirmation Screen appears.
returning the port unit or OCH port to service	select Return To Service from the Action drop-down list; then click Apply . Result: A Confirmation Screen appears.

5 Click **Yes**.

Result: A successful completion message appears.

6 Click **OK**.

Result: The successful completion message closes.

7

IF the primary state of another port unit or OCH port...	THEN...
will be changed	return to Step 2.
will not be changed	click Close . Result: The Remove from/Return to Service Screen closes.

END OF STEPS

SE 303-3: Changing the primary state of an SWMG

Complete the following steps to change the primary state of an SWMG. An SWMG can only be removed from service if the other SWMG is in-service.

- 1 At the Optical Craft Interface, from the System View Main Menu Bar, select **Fault>Return to/Remove from Service**.

Result: The Remove from/Return to Service Screen appears.

- 2 From the Equipment Selection tree on the left side of the screen, enter an AID for the SWMG, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the SWMG.

- 3 Click **Select Target**.

Result: The current primary state for the equipment is displayed in the Remove from/Return to Service Screen.

4

IF...	THEN...
removing the SWMG from service	select Remove From Service from the Action drop-down list; then click Apply . Result: A Confirmation Screen appears.
returning the SWMG to service	select Return To Service from the Action drop-down list; then click Apply . Result: A Confirmation Screen appears.

- 5 Click **Yes**.

Result: A successful completion message appears.

- 6 Click **OK**.

Result: The successful completion message closes.

7

IF the primary state of another SWMG...	THEN...
will be changed	return to Step 2 of this Supporting Element.
will not be changed	click Close . Result: The Remove from/Return to Service Screen closes.

END OF STEPS



**SE 303-4: Changing the
primary state of a
Personality Module**

Complete the following steps to change the primary state of a
Personality Module.

- 1 At the Optical Craft Interface, from the System View Main Menu Bar, select **Fault>Return to/Remove from Service**.

Result: The Remove from/Return to Service Screen appears.

- 2 From the Equipment Selection tree on the left side of the screen, enter an AID for the Personality Module, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

- 3 Click **Select Target**.

Result: The current primary state for the equipment is displayed in the Remove from/Return to Service Screen.

4

IF...	THEN...
removing the Personality Module from service	select Remove From Service from the Action drop-down list; then click Apply . Result: A Confirmation Screen appears.
returning the Personality Module to service	select Return To Service from the Action drop-down list; then click Apply . Result: A Confirmation Screen appears.

5 Click **Yes**.

Result: A successful completion message appears.

6 Click **OK**.

Result: The successful completion message closes.

7

IF the primary state of another Personality Module...	THEN...
will be changed	return to Step 2.
will not be changed	click Close . Result: The Remove from/Return to Service Screen closes.

N D O F S T E P S



Task 304: Setting the System Date and Time

Purpose This procedure is used to set the system date and time on the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S4 or greater.

Related information For related information, see the following sections in this document:

- Chapter 5, “Equipment Configuration Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)

Task Complete the following steps to set the system date and time on the LambdaRouter™ All Optical Switch.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Administration>Set System Time**.

Result: The Provision System Time Screen appears.

-
- 2** Set the year, month, day, and/or time as appropriate; then click **Apply**.

Result: A Confirmation Screen appears.

-
- 3** Click **Yes**.

Result: A successful completion message appears.

-
- 4** Click **OK**.

Result: The successful completion message closes.

N D O F S T E P S



Task 305: Adding or Pre-Provisioning a Port Unit Circuit Pack

Purpose This procedure is used to add or pre-provision a port unit circuit pack to an existing optical interface shelf in order to add cross-connection capacity.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Obtain and use an electrostatic discharge (ESD) strap.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P3 or greater.

Safety precautions Read and understand the following safety precautions before beginning this task.



CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a LambdaRouter™ All Optical Switch system to prevent electrostatic discharge damage to sensitive components.

Related information For related information, see the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide, 365-375-010R3.0* “Task 517: Removing, Inserting, and Replacing a Circuit Pack”, and the following sections in this document:

- Chapter 5, “Equipment Configuration Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 306: Provisioning System Default Optical Channel (OCH) Port Parameters” (12-32)
- “Task 307: Provisioning Optical Channel (OCH) Port General Parameters” (12-34)

Task Complete the following steps to add or pre-provision a port unit circuit pack to an existing optical interface shelf in order to add cross-connection capacity.

.....

- 1** At the Optical Craft Interface, from the System View display, double-click on the optical interface shelf to which the port unit circuit pack will be added or pre-provisioned.

IF adding or pre-provisioning an...	THEN double-click on an...
OXI, OXI-4A13, or OXI-4A15 circuit pack	OIS-T shelf
OXI-10GC circuit pack	OIS-10G or OIS-MX shelf
OXI-2GC circuit pack	OIS-2G or OIS-MX shelf

Result: The Shelf View for the selected shelf appears.

.....

- 2** Note all empty slots (no port unit label for the slot) in the Shelf View.

IF...	THEN...
at least one empty slot exists	continue to the next step.
no empty slots exist	continue to Step 7.

.....

- 3** Right-click on the Shelf View and select **View Details** from the pop-up menu that appears.

Result: The View Shelf Details Screen appears.

- 4 Refer to the following table to determine which SWIP Block assignment parameters apply to the empty slot. For example, if slot 6 on an OIS-T shelf is empty, **SIDE0BLK2** and **SIDE1BLK2** apply.

OIS-T Shelf	SWIP Block Assignment Parameters
Slots 1 through 4	SIDE0BLK1, SIDE1BLK1
Slots 5 through 8	SIDE0BLK2, SIDE1BLK2
Slots 9 through 12	SIDE0BLK3, SIDE1BLK3
Slots 13 through 16	SIDE0BLK4, SIDE1BLK4
Slots 17 through 20	SIDE0BLK5, SIDE1BLK5
Slots 21 through 24	SIDE0BLK6, SIDE1BLK6
Slots 25 through 28	SIDE0BLK7, SIDE1BLK7
Slots 29 through 32	SIDE0BLK8, SIDE1BLK8
OIS-10G Shelf	SWIP Block Assignment Parameters
Slots 1 through 16	SIDE0BLK1, SIDE1BLK1
Slots 17 through 32	SIDE0BLK2, SIDE1BLK2
OIS-2G Shelf	SWIP Block Assignment Parameters
Slots 1 through 8	SIDE0BLK1, SIDE1BLK1
Slots 9 through 16	SIDE0BLK2, SIDE1BLK2
Slots 17 through 24	SIDE0BLK3, SIDE1BLK3
Slots 25 through 32	SIDE0BLK4, SIDE1BLK4
OIS-MX Shelf	SWIP Block Assignment Parameters
Slots 1 through 8 (for OXI-2GC packs only)	SIDE0BLK1, SIDE1BLK1
Slots 9 through 16 (for OXI-2GC packs only)	SIDE0BLK2, SIDE1BLK2
Slots 17 through 32 (for OXI-10GC packs only)	SIDE0BLK3, SIDE1BLK3

- 5 In the View Shelf Details Screen, verify that the empty slots show valid SWIP Block assignments (the SWIP Blocks are not unassigned [UAS]). For example, **SIDE0BLK2** is associated with SWIP Block **B2** and **SIDE1BLK2** is associated with SWIP Block **A8**.

6

IF...	THEN...
all SWIP Block assignments for the empty slots are unassigned (UAS)	click Close in the View Shelf Details Screen and continue to the next step.
at least one SWIP Block assignment for an empty slot is assigned	click Close in the View Shelf Details Screen and continue to Step 9.

7

IF...	THEN...
this is the last shelf	either additional fiber or additional shelves must be installed before port units can be added to the system. Contact Lucent Technical Support. Stop! End of Task.
this is not the last shelf	at the Optical Craft Interface, from the Shelf View Main menu, select View>System View Display . Result: The Optical Craft Interface System View appears.

- 8 Go to Step 1 and repeat this task for the next applicable shelf.

9

IF the slot...	THEN...
has been provisioned	continue to the next step.
has not been provisioned	create a slot for the port unit, then continue with the next step. Reference: "SE 305-1: Creating a port unit slot" (12-30).

-
- 10** Insert the port unit into the empty slot that was verified as having a valid SWIP Block assignment.

Reference: *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide, 365-375-010R3.0* “Task 517: Removing, Inserting, and Replacing a Circuit Pack.”

- 11** Provision the OCH ports as required.

Reference: “Task 307: Provisioning Optical Channel (OCH) Port General Parameters” (12-34).

END OF STEPS

SE 305-1: Creating a port unit slot

Complete the following steps to create (pre-provision) a slot for a port unit.

- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Create New>Circuit Pack**.

Result: The Create New Circuit Pack Screen appears.

- 2** On the left side of the screen, enter an AID for the desired shelf to which the circuit pack will be added, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment; then click **Select Shelf**.

Result: The selection parameters for the slot and circuit pack appear on the right side of the Create New Circuit Pack Screen.

- 3** Select the slot and the type of circuit pack (port unit) to be created; then click **Apply**.

Result: A Confirmation Screen appears.

- 4** Click **Yes**.

Result: A successful completion message appears.

5 Click **OK**.

Result: The successful completion message closes.

6

IF another slot...	THEN...
will be created	return to Step 2 of this Supporting Element to create another slot.
will not be created	click Close in the Create New Circuit Pack Screen. Result: The Create New Circuit Pack Screen closes. The Shelf View displays a circuit pack with diagonal lines across the faceplate to indicate the slot is pre-provisioned but no circuit pack is physically inserted in the slot.

N D O F S T E P S



Task 306: Provisioning System Default Optical Channel (OCH) Port Parameters

Purpose This procedure is used to provision system default optical channel (OCH) port parameters on the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P3 or greater.

Related information For related information, see the following sections in this document:

- Chapter 5, “Equipment Configuration Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 307: Provisioning Optical Channel (OCH) Port General Parameters” (12-34)

Task Complete the following steps to provision system default OCH port parameters on the LambdaRouter™ All Optical Switch.

- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Provision**.

Result: The Provision Parameters for Equipment Screen appears.

- 2** From the Equipment Selection tree on the left side of the screen, enter System for the AID, or select the system from the equipment list, and click **Provision**.

Result: The provisionable parameters for the system are displayed in the Provision Parameters for Equipment Screen.

3 Click the **System Parameters** tab and set the following parameters as required:

- Interface Standard default
- Port Usage default
- Interface Format default

4 Click **Apply**.

Result: A Confirmation Screen appears.

5 Click **Yes**.

Result: A successful completion message appears.

6 Click **OK**.

Result: The successful completion message closes.

7 Click **Close**.

Result: The Provision Parameters for Equipment Screen closes.

N D O F S T E P S



Task 307: Provisioning Optical Channel (OCH) Port General Parameters

Purpose This procedure is used to provision the general parameters for existing optical channel (OCH) ports.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P3 or greater.

Related information For related information, see the following sections in this document:

- Chapter 5, “Equipment Configuration Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 213: Manually Provisioning Port Neighbor Information” (11-48)
- “Task 305: Adding or Pre-Provisioning a Port Unit Circuit Pack” (12-26)
- “Task 306: Provisioning System Default Optical Channel (OCH) Port Parameters” (12-32)
- “Task 602: Provisioning OCH Port Performance Monitoring Options” (15-12)

Task Complete the following steps to provision general parameters for OCH ports.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Provision**.

Result: The Provision Parameters for Equipment Screen appears.

-
- 2 On the left side of the screen, enter an AID for the desired OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment; then click **Provision**.

Result: The parameters for the selected OCH port appear on the right side of the Provision Parameters for Equipment Screen.

.....

3

IF provisioning an...	THEN...
input port	click the Input tab.
output port	click the Output tab.

-
- 4 Click the **General Parameters** tab and configure the port parameters as required.

.....

5

IF...	THEN...
SWIP assignments must be changed	click Assign SWIPs . Result: The SWIP Assignment fields are activated.
SWIP assignments will not be changed	continue to Step 7.

-
- 6 Select the SWIPs for each fabric side as necessary.

-
- 7 Click **Apply**.

Result: A Confirmation Screen appears.

-
- 8 Click **Yes**.

Result: A successful completion message appears.

-
- 9 Click **OK**.

Result: The successful completion message closes.

10

IF...	THEN...
additional OCH ports are being or provisioned	repeat this task.
no other OCH ports are being provisioned	click Close . Result: The Provision Parameters for Equipment Screen closes.

END OF STEPS



Task 308: Deleting a Circuit Pack, Shelf, or Maintenance Group

- Purpose** This procedure is used to delete the following LambdaRouter™ All Optical Switch equipment from the system database:
- port unit (OXI, OXI-4A13, OXI4A15, OXI-10GC, and OXI-2GC)
 - personality module
 - optical interface shelf (OIS-T, OIS-10G, OIS-2G, and OIS-MX)
 - SWIP maintenance group (SWMG)

- Before you begin** Before beginning this task:
- Read and follow all safety precautions in this manual.
 - Obtain the work instructions for this task and note the assigned AIDs.
 - Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P3 or greater.

- Related information** For related information, see the following sections in this document:
- Chapter 5, “Equipment Configuration Management”
 - “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)

- Task** Complete the following steps to delete a circuit pack, optical interface shelf, or SWIP maintenance group from the system database.

1

IF deleting...	THEN...
an optical interface shelf	go to “SE 308-1: Deleting an optical interface shelf” (12-38).
a port unit	go to “SE 308-2: Deleting a port unit” (12-39).
a SWIP maintenance group	go to “SE 308-3: Deleting a SWIP maintenance group” (12-40).
a Personality Module	go to “SE 308-4: Deleting a personality module” (12-41).

N D O F S T E P S

SE 308-1: Deleting an optical interface shelf

Complete the following steps to delete an optical interface shelf from the system database.

- 1 At the Optical Craft Interface, from the System View, double-click on the optical interface shelf to be deleted.

Result: The Shelf View for the selected optical interface shelf appears.

- 2 Verify that no port unit slot objects exist on the shelf.

IF port unit slot objects...	THEN...
do not exist on the shelf	continue to the next step.
exist on the shelf	delete all port unit slot objects. Reference: "SE 308-2: Deleting a port unit" (12-39).

- 3 At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Delete**.

Result: The Delete Equipment Selection Screen appears.

- 4 Enter an AID for the desired optical interface shelf, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment; then click **Select**.

Result: A Confirmation Screen appears.

- 5 Click **Yes**.

Result: The equipment is deleted from the system database.

END OF STEPS

SE 308-2: Deleting a port unit

Complete the following steps to delete a port unit from the system database.

- 1 Verify that cross-connections do not exist on any port associated with the port unit to be deleted [refer to “Task 502: Retrieving Cross-Connections” (14-23)].

IF cross-connections...	THEN...
do not exist on any port associated with the port unit to be deleted	continue to the next step.
exist on one or more port associated with the port unit to be deleted	delete all cross-connections associated with the ports on the port unit being deleted. Reference: “Task 503: Deleting a Cross-Connection” (14-28).

2

IF the port unit...	THEN...
has already been extracted from the optical interface shelf	continue to the next step.
has not been extracted from the optical interface shelf	extract the port unit. Reference: <i>LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide, 365-375-010R3.0</i> “Task 517: Removing, Inserting, and Replacing a Circuit Pack.”

- 3 At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Delete**.

Result: The Delete Equipment Selection Screen appears.

- 4 Enter an AID for the desired port unit, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment; then click **Select**.

Result: A Confirmation Screen appears.

5 Click **Yes**.

Result: The equipment is deleted from the system database.

N D O F S T E P S

SE 308-3: Deleting a SWIP maintenance group

Complete the following steps to delete a SWIP maintenance group (SWMG) from the system database.

- 1** Verify that both SWMGs exist, and that the SWMG to be deleted is OOS-MA and the other SWMG is IS-NR [refer to “Task 300: Viewing the Network Element Configuration Information” (12-3)].

IF the SWMGs...	THEN...
are in the required states	continue to the next step.
are not in the required states	remove the SWMG that is being deleted from service, and/or return the SWMG not being deleted to service as required. Reference: “Task 303: Removing Equipment from and Returning Equipment to Service” (12-17).

- 2** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Delete**.

Result: The Delete Equipment Selection Screen appears.

- 3** Enter an AID for the desired SWMG, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment; then click **Select**.

Result: A Confirmation Screen appears.

- 4** Click **Yes**.

Result: The equipment is deleted from the system database.

N D O F S T E P S

SE 308-4: Deleting a personality module

Complete the following steps to delete a personality module from the system database.

1

IF the personality module...	THEN...
has already been extracted from the system controller shelf	continue to the next step.
has not been extracted from the system controller shelf	extract the personality module. Reference: <i>LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide, 365-375-010R3.0</i> “Task 517: Removing, Inserting, and Replacing a Circuit Pack.”

2 At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Delete**.

Result: The Delete Equipment Selection Screen appears.

3 Enter an AID for the desired personality module, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment; then click **Select**.

Result: A Confirmation Screen appears.

4 Click **Yes**.

Result: The equipment is deleted from the system database.

END OF STEPS



Task 309: Extracting and Inserting an NVM Card

Purpose This procedure is used to extract and insert an NVM card.

Before you begin Before beginning this task:

- Turn off the audible alarm, if necessary.
- Read and follow all safety precautions in this manual.
- Obtain and use an electrostatic discharge (ESD) strap.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P3 or higher.

Safety precautions Read and understand the following safety precautions before beginning this task.



CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a LambdaRouter™ All Optical Switch system to prevent electrostatic discharge damage to sensitive components.



CAUTION

Never try to eject the NVM card when the MEM pack LED is green.

Related information For related information, see the following sections in this document:

- Chapter 9, “Software Management”
- “Task 601: Manually Backing Up Software or Data from Primary Memory to Secondary Memory” (16-10)
- “Task 602: Manually Restoring Data from Secondary Memory to Primary Memory” (16-12)

Task Complete the following steps to extract and insert an NVM card.

1 Remove the System Controller Shelf cover.

Reference: “Task 310: Removing or Replacing a Shelf Cover” (12-45).

2

IF...	THEN...
extracting an NVM card	continue to Step 3.
inserting an NVM card	continue to Step 6.

3

IF extracting a...	THEN...
PRI MEM NVM card	continue to Step 4.
SEC MEM NVM card	momentarily press the push button located on top of the SEC MEM pack. Result: The NVM card ejects from the SEC MEM pack. Continue to Step 7.

4 Remove the system from service.

Reference: “Task 303: Removing Equipment from and Returning Equipment to Service” (12-17).

5 When the PRI MEM pack LED turns from green to red, momentarily press the push button located on top of the PRI MEM pack.

Result: The NVM card ejects from the PRI MEM pack.

-
- 6** Gently slide the NVM card into the appropriate MEM circuit pack.

IF inserting a...	THEN...
PRI MEM NVM card	return the system to an in-service (IS) state. Reference: “Task 303: Removing Equipment from and Returning Equipment to Service” (12-17).
SEC MEM NVM card	continue to the next step.

-
- 7** Replace the System Controller Shelf cover.

Reference: “Task 310: Removing or Replacing a Shelf Cover” (12-45).

N D O F S T E P S



Task 310: Removing or Replacing a Shelf Cover

Purpose This procedure is used to remove or replace a shelf cover.

Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain a screwdriver and electrostatic discharge (ESD) strap.



CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a LambdaRouter™ All Optical Switch to prevent electrostatic discharge damage to sensitive components.

Related information For related information, see the following sections in this document:

- “Task 309: Extracting and Inserting an NVM Card” (12-42)

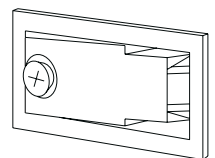
Task Complete the following steps to remove or replace the shelf cover.

1

IF the cover is being...	THEN...
removed	continue to Step 2.
replaced	continue to Step 7.

2

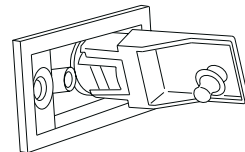
Locate the two ¼-turn fasteners at the bottom of the shelf cover.



3

Use the appropriate size screwdriver to rotate the retaining screws counterclockwise approximately ¼-turn until the shelf cover fasteners are released.

-
- 4 Pull the shelf cover fasteners out and rotate the fasteners ¼-turn counterclockwise.



-
- 5 Grasp the bottom of the cover and pull it forward until it is horizontal (rotated 90 degrees from the closed position).

-
- 6 Lift the pivot pins located at the top of the cover, push back, and lift up on the pins again to remove the cover from the shelf; then lift the cover up until it is free from the shelf framing.

Stop! End of Task.

-
- 7 Position the pivot pins located at the top of the cover under the flange on the shelf framing.

-
- 8 Close the cover and rotate the two shelf cover fasteners ¼-turn clockwise and push back into the locked position.

-
- 9 Use the appropriate size screwdriver to rotate the retaining screws clockwise approximately ¼-turn until the shelf cover fasteners are secured.

N D O F S T E P S



Task 311: Viewing the Network Element Notification Log

Purpose This procedure is used to view the network element notification log.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S1 or greater.

Related information For related information, see the following sections in this document:

- Chapter 5, “Equipment Configuration Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)

Task Complete the following steps to view the network element notification log.

-
- 1 At the Optical Craft Interface, from the System View Main Menu bar, select **Reports>NE Notification Log**.

Result: The Start Date/Time Selection Screen appears.

2

IF...	THEN...
retrieving all log entries	select Retrieve ALL .
retrieving log entries starting with a specific date and time	select the starting date and time.

-
- 3 Click **OK**.

Result: The NE Notification Log Screen appears.

4

IF the log data...	THEN...
will be saved as a text file	click Save As . From the Save As Screen, select a path, enter a filename; then click Save . Result: The log data is saved in the specified file and may be viewed using a text editor.
will be printed	click Print . From the Print Screen, select the desired printer and print options; then click OK . Result: The log data is printed on the selected printer.
will be updated	click Refresh . Result: The NE Notification Log Screen updates.

5 Click **Close**.

Result: The NE Notification Log Screen closes.

END OF STEPS





13 Alarm Monitoring and Fault Management Tasks

Overview

Purpose This chapter provides detailed procedures for configuring alarm monitoring and fault management features on the LambdaRouter™ All Optical Switch.

For additional information on alarm monitoring and fault management, refer to the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide, 365-375-010R3.0*.

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Task 400: Viewing Alarm and Event Reports

Purpose This procedure is used to view the following alarm and event reports:

- NE Alarm List
- NE Alarm Log
- NE Protection Switch Activity Log
- NE Transient Condition (TC) Event List
 - Protection Switch Events
 - Threshold Crossing Alerts
 - Other Transient Events

Before you begin Before beginning this task, read and follow all safety precautions in this manual.

Related information For related information, see the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide, 365-375-010R3.0*, and Chapter 6, “Alarm Monitoring and Fault Management” in this document.

Task Complete the following steps to view alarm and event reports.

1 Connect the Optical Craft Interface to the LambdaRouter™ All Optical Switch and log in with the appropriate Privilege code as listed below:

- NE Alarm List (M1 or higher)
- NE Alarm Log (S1 or higher)
- NE Protection Switch Activity Log (S1 or higher)
- NE Transient Condition Event List (S1 or higher)

Reference: “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3).

“Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13).

2

IF viewing the...	THEN...
NE Alarm List	go to “SE 400-1: Viewing the NE Alarm List” (13-4).
NE Alarm Log	go to “SE 400-2: Viewing the NE Alarm Log” (13-5).
NE Protection Switch Activity Log	go to “SE 400-3: Viewing the NE Protection Switch Activity Log” (13-6).
NE Transient Condition Event List	go to “SE 400-4: Viewing the NE Transient Condition Event List” (13-7).

3

IF the report data...	THEN...
will be saved as a text file	click Save As . From the Save As Screen, select a path, enter a filename; then click Save . Result: The report data is saved in the specified file and may be viewed using a text editor.
will be printed	click Print . From the Print Screen, select the desired printer and print options; then click OK . Result: The report data is printed on the selected printer.
will be updated	click Refresh . Result: The Report Screen updates.

4 Click **Close**.

Result: The Report Screen closes.

N D O F S T E P S

**SE 400-1: Viewing the
NE Alarm List**

Complete the following steps to view the alarm list for the LambdaRouter™ All Optical Switch.

- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Fault>NE Alarm List**.

Result: The NE Alarm List Screen appears.

N D O F S T E P S

**SE 400-2: Viewing the
NE Alarm Log**

Complete the following steps to view the alarm log for the LambdaRouter™ All Optical Switch.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Fault>NE Alarm Log**.

Result: The Start Date/Time Selection Screen appears.

2

IF...	THEN...
retrieving all log entries	select Retrieve ALL .
retrieving log entries starting with a specific date and time	select the starting date and time.

-
- 3** Click **OK**.

Result: The NE Alarm Log Screen appears.

N D O F S T E P S

**SE 400-3: Viewing the NE
Protection Switch
Activity Log**

Complete the following steps to view the protection switch activity log for the LambdaRouter™ All Optical Switch.

-
- 1 At the Optical Craft Interface, from the System View Main Menu bar, select **Reports>NE Protection Switch Activity Log**.

Result: The Start Date/Time Selection Screen appears.

.....

2

IF...	THEN...
retrieving all log entries	select Retrieve ALL .
retrieving log entries starting with a specific date and time	select the starting date and time.

-
- 3 Click **OK**.

Result: The NE Protection Switch Activity Log Screen appears.

.....

N D O F S T E P S



**SE 400-4: Viewing the NE
Transient Condition
Event List**

Complete the following steps to view the transient condition (TC) event list for the LambdaRouter™ All Optical Switch.

-
- 1 At the Optical Craft Interface, from the System View Main Menu bar, select **Fault>NE Transient Events** and one of the following from the submenu:

IF viewing the...	THEN...
protection switch events list	select Protection Switch .
threshold crossing alerts list	select TCA .
other transient events list	select Other .

Result: The NE Transient Condition Events Screen appears with the tab active for the selected TC event list.

-
- 2 View the selected transient condition event list. Optionally click on the other tabs in the NE Transient Condition Events Screen to view a list of the other transient events.

.....
N D O F S T E P S
.....



Task 401: Viewing the Network Element Alarm Delay Interval Configuration

Purpose This procedure is used to view the current configuration of the following LambdaRouter™ All Optical Switch alarm delay intervals:

- Facility Alarm Generate Delay
- Facility Alarm Clear Delay
- Equipment Alarm Generate Delay
- Equipment Alarm Clear Delay

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of M1 or greater.

Related information For related information, see the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide, 365-375-010R3.0* and the following sections in this document:

- Chapter 6, “Alarm Monitoring and Fault Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 400: Viewing Alarm and Event Reports” (13-2)
- “Task 402: Setting Alarm Delay Intervals” (13-10)

Task Complete the following steps to view the current configuration of the LambdaRouter™ All Optical Switch alarm clear and generate delay intervals.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **View>Alarm Configuration**.

Result: The Alarm Configuration Screen appears.

-
- 2** View the alarm configuration information; then click **Close** when done.

Result: The Alarm Configuration Screen closes.

N D O F S T E P S



Task 402: Setting Alarm Delay Intervals

Purpose This procedure is used to set the following alarm delay intervals on a LambdaRouter™ All Optical Switch:

- Facility Alarm Generate Delay
- Facility Alarm Clear Delay
- Equipment Alarm Generate Delay
- Equipment Alarm Clear Delay

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of M3 or greater.

Related information For related information, see the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide, 365-375-010R3.0* and the following sections in this document:

- Chapter 6, “Alarm Monitoring and Fault Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 400: Viewing Alarm and Event Reports” (13-2)
- “Task 401: Viewing the Network Element Alarm Delay Interval Configuration” (13-8)

Task Complete the following steps to set the LambdaRouter™ All Optical Switch alarm clear and generate delay intervals.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Alarm Configuration**.

Result: The Alarm Configuration Provisioning Screen appears.

2

IF configuring the...	THEN...
Facility Alarm Generate Delay interval	enter the number of seconds a facility event must be continuously present before an alarm is set; or select 0 to disable this feature.
Facility Alarm Clear Delay interval	enter the number of seconds a facility event must be continuously absent before an alarm is cleared; or select 0 to disable this feature.
Equipment Alarm Generate Delay interval	enter the number of seconds an equipment event must be continuously present before an alarm is set; or select 0 to disable this feature.
Equipment Alarm Clear Delay interval	enter the number of seconds an equipment event must be continuously absent before an alarm is cleared; or select 0 to disable this feature.

3 Click **OK**.

Result: A Confirmation Screen appears.

4 Click **Yes**.

Result: A successful completion message appears.

5 Click **OK**.

Result: The successful completion message closes.

N D O F S T E P S



Task 403: Testing LEDs and Office Alarms

Purpose This procedure is used to test all LEDs on a shelf (except the Power On LED) and all visual and audible office alarm outputs and corresponding User Panel LEDs on a shelf.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of M3 or greater.

Related information For related information, see the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide, 365-375-010R3.0* and the following sections in this document:

- Chapter 6, “Alarm Monitoring and Fault Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 400: Viewing Alarm and Event Reports” (13-2)
- “Task 401: Viewing the Network Element Alarm Delay Interval Configuration” (13-8)
- “Task 402: Setting Alarm Delay Intervals” (13-10)

Task Complete the following steps to test all LEDs on a shelf (except the Power On LED) and all visual and audible office alarm outputs and corresponding User Panel LEDs on a shelf.

1

IF testing the...	THEN...
shelf LEDs	at the Optical Craft Interface, from the System View Main Menu bar, select Fault>Test>LED . Result: The Equipment Selection Screen appears.
office alarm visible and audible outputs	at the Optical Craft Interface, from the System View Main Menu bar, select Fault>Test>Office Alarm . Result: The Equipment Selection Screen appears.

2 Enter an AID for the shelf, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired shelf; then click **Select**.

IF testing the...	THEN...
shelf LEDs	the Test LED Screen appears.
office alarm visible and audible outputs	the Test Office Alarm Screen appears.

3 Select the number of iterations and click **Start**.

IF testing the...	THEN...
shelf LEDs	a Confirmation Screen appears. Continue to the next step.
office alarm visible and audible outputs	all visual and audible office alarm outputs and the corresponding LED on the User Panel for the selected shelf are tested. When all tests are complete, a successful completion message appears. Continue to Step 5.

4 Click **Yes**.

Result: All LEDs (except the Power On LED) on the shelf, including the User Panel and circuit pack LEDs, are tested. During one iteration of the test, each LED is turned on for two seconds, then off for two seconds, three times. The test cycle is repeated for the number of iterations specified in Step 3.

When all iterations are complete, a successful completion message appears.

5 Click **OK**.

Result: The successful completion message closes.

6

IF...	THEN...
testing is complete	click Close . Result: The Test LED/Test Office Alarm Screen closes.
the shelf LEDs or Office Alarms will be tested again	return to Step 3.

N D O F S T E P S



Task 404: Viewing the Current Status of the Protection Groups

- Purpose** This procedure is used to view the current status of the following LambdaRouter™ All Optical Switch protection groups:
- System Controller Complex Protection Group (SCCPG)
 - High-Voltage Shelf Controller Protection Group (HVCPG)
 - Optical Interface Shelf Controller Protection Group (OICPG)
 - Output port 2:1 selector

- Before you begin** Before beginning this task:
- Read and follow all safety precautions in this manual.
 - Obtain the work instructions for this task and note the assigned AIDs.
 - Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P1+M1 or greater.

- Related information** For related information, see the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide, 365-375-010R3.0* and the following sections in this document:
- Chapter 6, “Alarm Monitoring and Fault Management”
 - “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
 - “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
 - “Task 400: Viewing Alarm and Event Reports” (13-2)
 - “Task 405: Executing or Releasing a Forced or Manual Protection Switch” (13-17)

- Task** Complete the following steps to view the current status of a protection group on the LambdaRouter™ All Optical Switch.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **View>Protection**.

Result: The View Protection Screen appears.

2 From the Equipment Selection tree on the left side of the screen, enter an AID for the system controller shelf, high-voltage shelf, optical interface shelf, or OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

3 Click **Select**.

Result: The protection information for the selected entity is displayed in the View Protection Screen.

4 View the current status of the selected protection group.

5

IF...	THEN...
viewing the status of another protection group	return to Step 2.
viewing the status of protection groups is complete	click Close . Result: The View Protection Screen closes.

N D O F S T E P S



Task 405: Executing or Releasing a Forced or Manual Protection Switch

Purpose This procedure is used to execute or release a forced or manual protection switch.

A manual protection switch may be initiated on the

- System Controller Complex Protection Group (SCCPG)
- High-Voltage Shelf Controller Protection Group (HVCPG)
- Optical Interface Shelf Controller Protection Group (OICPG)
- Output port 2:1 selector

A forced protection switch may be initiated on an output port 2:1 selector.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of M4 or greater.

Related information For related information, see the *LambdaRouter™ All Optical Switch (AOS) 128/256 Release 3.0 Alarm Messages and Trouble-Clearing Guide, 365-375-010R3.0* and the following sections in this document:

- Chapter 6, “Alarm Monitoring and Fault Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 400: Viewing Alarm and Event Reports” (13-2)
- “Task 404: Viewing the Current Status of the Protection Groups” (13-15)

Task Complete the following steps to execute or release a forced or manual protection switch.

- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Fault>Protection Switch**.

Result: The Switch Protection Screen appears.

- 2** From the Equipment Selection tree on the left side of the screen, enter an AID for the system controller shelf, high-voltage shelf, optical interface shelf, or OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.
-

- 3** Click **Select**.

Result: The current protection information for the selected entity is displayed in the Switch Protection Screen.

- 4** View the current status of the selected OCH port or protection group.

Important! When a manual protection switch is operated on an optical interface shelf or high-voltage shelf controller, the newly active optical interface shelf or high-voltage shelf controller should not be addressed by any operations message until three system messages resulting from the controller protection switch have been received. They are as follows:

- **Complete** response to the operate protection switch command
- Report Event **initialization complete** message indicating the newly active optical interface shelf or high-voltage shelf controller
- Report Database Change message indicating the formerly standby optical interface shelf or high-voltage shelf controller has transitioned to active mode

Addressing the optical interface shelf or high-voltage shelf controller before reception of these messages may result in unstable system operations.

5

IF...	THEN...
releasing a forced or manual protection switch	select Clear from the Switch Type dropdown list.
executing a forced or manual protection switch	select the protection switch type from the available options in the Switch Type dropdown list.

6 Click **Apply**.

Result: A Confirmation Screen appears.

7 Click **Yes**.

Result: The protection switch is executed or cleared as appropriate and a successful completion message appears.

8 Click **OK**.

Result: The successful completion message closes.

9 Click **Close** in the Switch Protection Screen.

Result: The Switch Protection Screen closes and the System View appears.

N D O F S T E P S





14 Cross-Connection Management Tasks

Overview

Purpose This chapter provides detailed procedures for performing cross-connection tasks on the LambdaRouter™ All Optical Switch.

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Task 500: Establishing a New Cross-Connection

Purpose This procedure is used to create a new cross-connection of one of the following types on the LambdaRouter™ All Optical Switch:

- one-way or two-way point-to-point
- one-way bridge
- one-way merge
- two-way bridge/merge

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note
 - the assigned AIDs for the input and output OCH ports
 - the cross-connection type to be made
- Input and output OCH ports involved in the cross-connection must be provisioned, in-service, and idle.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P3 or greater.

Related information For related information, see the following sections in this document:

- Chapter 7, “Cross-Connection Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 307: Provisioning Optical Channel (OCH) Port General Parameters” (12-34)
- “Task 501: Adding Cross-Connection Legs to an Existing Cross-Connection” (14-19)
- “Task 502: Retrieving Cross-Connections” (14-23)
- “Task 503: Deleting a Cross-Connection” (14-28)

Task Complete the following steps to create a new cross-connection.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Cross-Connection**.

Result: The Cross-Connection Wizard is invoked and the Cross-Connection Action Selection Screen appears.

- 2** Select **Create a new cross-connection**; then click **Next**.

Result: The Cross-Connection Type Selection Screen appears.

3

IF establishing a...	THEN...
one-way point-to-point cross-connection	go to “SE 500-1: Establishing a new one-way point-to-point cross-connection” (14-4).
two-way point-to-point cross-connection	go to “SE 500-2: Establishing a new two-way point-to-point cross-connection” (14-6).
one-way bridge cross-connection	go to “SE 500-3: Establishing a new one-way bridge cross-connection” (14-9).
one-way merge cross-connection	go to “SE 500-4: Establishing a new one-way merge cross-connection” (14-12).
two-way bridge/merge cross-connection	go to “SE 500-5: Establishing a new two-way bridge/merge cross-connection” (14-14).

N D O F S T E P S

SE 500-1: Establishing a new one-way point-to-point cross-connection

Complete the following steps to establish a new one-way point-to-point cross-connection.

-
- 1** On the Cross-Connection Type Selection Screen, select **1-Way Point to Point**; then click **Next**.

Result: The Cross-Connection Port Selection Screen appears.

- 2** Click **Select** under the source port field.

Result: The Source Port Selection Screen appears.

- 3** Enter an AID for the source OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

-
- 4** Click **Select**.

Result: The Source Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

- 5** Click **Select** under the destination port field.

Result: The Destination Port Selection Screen appears.

- 6** Enter an AID for the destination OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

-
- 7** Click **Select**.

Result: The Destination Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

8 Click **Next**.

Result: The Cross-Connection Summary Screen appears.

9 Verify the selected cross-connection parameters.

IF...	THEN...
all cross-connection parameters are correct	click Finish . Result: A Confirmation Screen appears. Continue to the next step.
the cross-connection type is incorrect	click Start Over . Result: A Confirmation Screen appears. Click Yes and return to Step 2 of “Task 500: Establishing a New Cross-Connection” (14-2).
the cross-connection type is correct but one or more OCH ports are incorrect	click Back . Result: The Cross-Connection Port Selection Screen appears. Reselect the ports as necessary and return to Step 8.

10 Click **Yes**.

Result: A successful completion message appears.

11 Click **OK**.

Result: The Cross-Connection Action Selection Screen appears.

12

IF...	THEN...
additional cross-connections are being established	return to Step 2 of “Task 500: Establishing a New Cross-Connection” (14-2).
additional cross-connections are not being established	click Close to exit the Cross-Connection Wizard.

N D O F S T E P S

SE 500-2: Establishing a new two-way point-to-point cross-connection

Complete the following steps to establish a new two-way point-to-point cross-connection.

-
- 1** On the Cross-Connection Type Selection Screen, select **2-Way Point to Point**; then click **Next**.

Result: The Cross-Connection Port Selection Screen appears.

- 2** Click **Select** under the first source port field (A).

Result: The Source Port Selection Screen appears.

- 3** Enter an AID for the first source OCH port (A), or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.
-

- 4** Click **Select**.

Result: The Source Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

- 5** Click **Select** under the first destination port field (B).

Result: The Destination Port Selection Screen appears.

- 6** Enter an AID for the first destination OCH port (B), or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.
-

- 7** Click **Select**.

Result: The Destination Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

8

IF the source port for the second leg...	THEN...
is the same as the destination port for the first leg	the Cross-Connection Wizard defaults to using the destination port for the first leg (B) as the source port for the second leg (C). No port selection is required. Continue to Step 11.
is not the same as the destination port for the first leg	click Select under the second source port field (C). Result: The Source Port Selection Screen appears.

-
- 9** Enter an AID for the second source OCH port (C), or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.
-

- 10** Click **Select**.

Result: The Source Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

11

IF the destination port for the second leg...	THEN...
is the same as the source port for the first leg	the Cross-Connection Wizard defaults to using the source port for the first leg (A) as the destination port for the second leg (D). No port selection is required. Continue to Step 14.
is not the same as the source port for the first leg	click Select under the second destination port field (D). Result: The Source Port Selection Screen appears.

- 12 Enter an AID for the second destination OCH port (D), or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

- 13 Click **Select**.

Result: The Destination Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

- 14 Click **Next**.

Result: The Cross-Connection Summary Screen appears.

- 15 Verify the selected cross-connection parameters.

IF...	THEN...
all cross-connection parameters are correct	click Finish . Result: A Confirmation Screen appears. Continue to the next step.
the cross-connection type is incorrect	click Start Over . Result: A Confirmation Screen appears. Click Yes and return to Step 2 of “Task 500: Establishing a New Cross-Connection” (14-2).
the cross-connection type is correct but one or more ports are incorrect	click Back . Result: The Cross-Connection Port Selection Screen appears. Reselect the ports as necessary and return to Step 14.

- 16 Click **Yes**.

Result: A successful completion message appears.

- 17 Click **OK**.

Result: The Cross-Connection Action Selection Screen appears.

18

IF...	THEN...
additional cross-connections are being established	return to Step 2 of “Task 500: Establishing a New Cross-Connection” (14-2).
additional cross-connections are not being established	click Close to exit the Cross-Connection Wizard.

END OF STEPS

**SE 500-3: Establishing a
new one-way bridge
cross-connection**

Complete the following steps to establish a new one-way bridge cross-connection.

- 1 On the Cross-Connection Type Selection Screen, select **1-Way Bridge**; then click **Next**.

Result: The Cross-Connection Port Selection Screen appears.

- 2 Click **Select** under the first source port field (A).

Result: The Source Port Selection Screen appears.

- 3 Enter an AID for the first source OCH port (A), or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

- 4 Click **Select**.

Result: The Source Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

- 5 Click **Select** under the first destination port field (B).

Result: The Destination Port Selection Screen appears.

-
- 6** Enter an AID for the first destination OCH port (B), or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.
-

- 7** Click **Select**.

Result: The Destination Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

- 8** Click **Select** under the second destination port field (C).

Result: The Destination Port Selection Screen appears.

- 9** Enter an AID for the second destination OCH port (C), or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.
-

- 10** Click **Select**.

Result: The Destination Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

- 11** Click **Next**.

Result: The Cross-Connection Summary Screen appears.

12 Verify the selected cross-connection parameters.

IF...	THEN...
all cross-connection parameters are correct	click Finish . Result: A Confirmation Screen appears. Continue to the next step.
the cross-connection type is incorrect	click Start Over . Result: A Confirmation Screen appears. Click Yes and return to Step 2 of “Task 500: Establishing a New Cross-Connection” (14-2).
the cross-connection type is correct but one or more ports are incorrect	click Back . Result: The Cross-Connection Port Selection Screen appears. Reselect the ports as necessary and return to Step 11.

13 Click **Yes**.

Result: A successful completion message appears.

14 Click **OK**.

Result: The Cross-Connection Action Selection Screen appears.

15

IF...	THEN...
additional cross-connections are being established	return to Step 2 of “Task 500: Establishing a New Cross-Connection” (14-2).
additional cross-connections are not being established	click Close to exit the Cross-Connection Wizard.

N D O F S T E P S

**SE 500-4: Establishing a
new one-way merge
cross-connection**

Complete the following steps to establish a new one-way merge cross-connection.

-
- 1** On the Cross-Connection Type Selection Screen, select **1-Way Merge**; then click **Next**.

Result: The Cross-Connection Port Selection Screen appears.

-
- 2** Click **Select** under the first source port field (A).

Result: The Source Port Selection Screen appears.

-
- 3** Enter an AID for the first source OCH port (A), or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

-
- 4** Click **Select**.

Result: The Source Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

-
- 5** Click **Select** under the destination port field (B).

Result: The Destination Port Selection Screen appears.

-
- 6** Enter an AID for the destination OCH port (B), or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

-
- 7** Click **Select**.

Result: The Destination Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

-
- 8** Click **Select** under the second source port field (C).

Result: The Source Port Selection Screen appears.

- 9** Enter an AID for the second source OCH port (C), or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.
-

- 10** Click **Select**.

Result: The Source Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

- 11** Click **Next**.

Result: The Cross-Connection Summary Screen appears.

- 12** Verify the selected cross-connection parameters.

IF...	THEN...
all cross-connection parameters are correct	click Finish . Result: A Confirmation Screen appears. Continue to the next step.
the cross-connection type is incorrect	click Start Over . Result: A Confirmation Screen appears. Click Yes and return to Step 2 of “Task 500: Establishing a New Cross-Connection” (14-2).
the cross-connection type is correct but one or more ports are incorrect	click Back . Result: The Cross-Connection Port Selection Screen appears. Reselect the ports as necessary and return to Step 11.

- 13** Click **Yes**.

Result: A successful completion message appears.

- 14 Click **OK**.

Result: The Cross-Connection Action Selection Screen appears.

- 15

IF...	THEN...
additional cross-connections are being established	return to Step 2 of “Task 500: Establishing a New Cross-Connection” (14-2).
additional cross-connections are not being established	click Close to exit the Cross-Connection Wizard.

N D O F S T E P S

**SE 500-5: Establishing a
new two-way bridge/merge
cross-connection**

Complete the following steps to establish a new two-way bridge/merge cross-connection.

- 1 On the Cross-Connection Type Selection Screen, select **2-Way Bridge/Merge**; then click **Next**.

Result: The Cross-Connection Port Selection Screen appears.

- 2 Click **Select** under the source port field (A) for the bridge cross-connection.

Result: The Source Port Selection Screen appears.

- 3 Enter an AID for the source OCH port (A) for the bridge cross-connection, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

- 4 Click **Select**.

Result: The Source Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

- 5 Click **Select** under the first destination port field (B) for the bridge cross-connection.

Result: The Destination Port Selection Screen appears.

- 6 Enter an AID for the first destination OCH port (B) for the bridge cross-connection, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

- 7 Click **Select**.

Result: The Destination Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

8

IF the first source port for the merge cross-connection...	THEN...
is the same as the first destination port for the bridge cross-connection	the Cross-Connection Wizard defaults to using the first destination port for the bridge cross-connection (B) as the first source port for the merge cross-connection (C). No port selection is required. Continue to Step 11.
is not the same as the first destination port for the bridge cross-connection	click Select under the first source port field for the merge cross-connection (C). Result: The Source Port Selection Screen appears.

- 9 Enter an AID for the first source OCH port (C) for the merge cross-connection, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

- 10 Click **Select**.

Result: The Source Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

11

IF the destination port for the merge cross-connection...	THEN...
is the same as the source port for the bridge cross-connection	the Cross-Connection Wizard defaults to using the source port for the bridge cross-connection (A) as the destination port for the merge cross-connection (D). No port selection is required. Continue to Step 14.
is not the same as the source port for the bridge cross-connection	click Select under the destination port field for the merge cross-connection (D). Result: The Source Port Selection Screen appears.

12 Enter an AID for the destination OCH port (D) for the merge cross-connection, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

13 Click **Select**.

Result: The Destination Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

14 Click **Select** under the second destination port field (E) for the bridge cross-connection.

Result: The Destination Port Selection Screen appears.

15 Enter an AID for the second destination OCH port (E) for the bridge cross-connection, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

16 Click **Select**.

Result: The Destination Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

17

IF the second source port for the merge cross-connection...	THEN...
is the same as the second destination port for the bridge cross-connection	the Cross-Connection Wizard defaults to using the second destination port for the bridge cross-connection (E) as the second source port for the merge cross-connection (F). No port selection is required. Continue to Step 20.
is not the same as the second destination port for the bridge cross-connection	click Select under the second source port field for the merge cross-connection (F). Result: The Source Port Selection Screen appears.

18 Enter an AID for the second source OCH port (F) for the merge cross-connection, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.

19 Click **Select**.

Result: The Source Port Selection Screen closes. The selected port is displayed on the Cross-Connection Port Selection Screen.

20 Click **Next**.

Result: The Cross-Connection Summary Screen appears.

21 Verify the selected cross-connection parameters.

IF...	THEN...
all cross-connection parameters are correct	click Finish . Result: A Confirmation Screen appears. Continue to the next step.
the cross-connection type is incorrect	click Start Over . Result: A Confirmation Screen appears. Click Yes and return to Step 2 of “Task 500: Establishing a New Cross-Connection” (14-2).
the cross-connection type is correct but one or more ports are incorrect	click Back . Result: The Cross-Connection Port Selection Screen appears. Reselect the ports as necessary and return to Step 20.

22 Click **Yes**.

Result: A successful completion message appears.

23 Click **OK**.

Result: The Cross-Connection Action Selection Screen appears.

24

IF...	THEN...
additional cross-connections are being established	return to Step 2 of “Task 500: Establishing a New Cross-Connection” (14-2).
additional cross-connections are not being established	click Close to exit the Cross-Connection Wizard.

N D O F S T E P S



Task 501: Adding Cross-Connection Legs to an Existing Cross-Connection

Purpose This procedure is used to add cross-connection legs to an existing cross-connection on the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note
 - the assigned AIDs for the input and output OCH ports
 - the cross-connection type to be made
- A cross-connection must already exist.
- Input and output OCH ports being added to the cross-connection must be provisioned, in-service, and idle.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P3 or greater.

Related information For related information, see the following sections in this document:

- Chapter 7, “Cross-Connection Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 307: Provisioning Optical Channel (OCH) Port General Parameters” (12-34)
- “Task 500: Establishing a New Cross-Connection” (14-2)
- “Task 502: Retrieving Cross-Connections” (14-23)
- “Task 503: Deleting a Cross-Connection” (14-28)

Task Complete the following steps to add cross-connection legs to an existing cross-connection.

- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Cross-Connection**.

Result: The Cross-Connection Wizard is invoked and the Cross-Connection Action Selection Screen appears.

-
- 2** Select **Add leg(s) to an existing cross-connection**; then click **Next**.

Result: The Cross-Connection Type Selection Screen appears.

- 3** Select the type of cross-connection leg(s) to add; then click **Next**.

Result: The Existing Cross-Connection Selection Screen appears.

- 4** On the left side of the screen, enter an AID for the OCH port that has an existing cross-connection, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port; then click **Select**.

Result: All cross-connections associated with the selected port are shown on the right side of the Existing Cross-Connection Selection Screen.

- 5** Select the cross-connection from the list to which the cross-connection legs will be added; then click **Next**.

Result: The Cross-Connection Port Selection Screen appears.

- 6** Click **Select** under a New Source or New Destination port field for a leg being added.

Result: The Port Selection Screen appears.

- 7** Enter an AID for the selected OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.
-

- 8** Click **Select**.

Result: The Port Selection Screen closes and the selected port is displayed on the Cross-Connection Port Selection Screen.

-
- 9** Repeat Step 6 through Step 8 for each new OCH port on the Cross-Connection Port Selection Screen.

Result: When all ports have been selected, the **Next** button is enabled.

- 10** Click **Next**.

Result: The Cross-Connection Summary Screen appears.

- 11** Verify the selected cross-connection parameters.

IF...	THEN...
all cross-connection parameters are correct	click Finish . Result: A Confirmation Screen appears. Continue to the next step.
the cross-connection type is incorrect	click Start Over . Result: A Confirmation Screen appears. Click Yes and return to Step 2 of this task to select a different cross-connection type.
the cross-connection type is correct but one or more ports are incorrect	click Back . Result: The Cross-Connection Port Selection Screen appears. Return to Step 6 of this task to reselect the ports.

- 12** Click **Yes**.

Result: A successful completion message appears.

- 13** Click **OK**.

Result: The Cross-Connection Action Selection Screen appears.

14

IF...	THEN...
additional cross-connection leg(s) are being added	return to Step 2 of this task.
additional cross-connection leg(s) are not being added	click Close to exit the Cross-Connection Wizard.

N D O F S T E P S



Task 502: Retrieving Cross-Connections

Purpose This procedure is used to retrieve a list of cross-connections on the LambdaRouter™ All Optical Switch.

Cross-connection configurations associated with an OCH port may be viewed either in text format or graphically. A text-only report may also be generated for cross-connection configurations associated with the system, shelf, or circuit pack.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P1 or greater.

Related information For related information, see the following sections in this document:

- Chapter 7, “Cross-Connection Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 500: Establishing a New Cross-Connection” (14-2)
- “Task 501: Adding Cross-Connection Legs to an Existing Cross-Connection” (14-19)
- “Task 503: Deleting a Cross-Connection” (14-28)

Task Complete the following steps to view cross-connections in either text or graphic format.

1

IF retrieving cross-connections...	THEN...
associated with a port, to view the cross-connection configurations in graphic format	go to “SE 502-1: Viewing cross-connection configurations in graphic format” (14-24).
associated with the system, shelf, circuit pack, or port to view in text format	go to “SE 502-2: Creating cross-connection text reports” (14-26).

N D O F S T E P S

SE 502-1: Viewing cross-connection configurations in graphic format

Complete the following steps to view cross-connection configurations associated with a port in graphic format.

- 1 At the Optical Craft Interface, from the System View Main menu bar, select **View>Cross-Connections**.

Result: The View Cross-Connections Equipment Selection Screen appears.

- 2 Enter an AID for the system, shelf, port unit, or OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

Result: The View Cross-Connections Selection Screen appears. All cross-connections associated with the selected equipment are shown in text format. Click **Refresh** at any time to update the list.

3

IF the cross-connection list...	THEN...
will be saved as a text file	click Save . From the Save As Screen, select a path, enter a filename, then click Save . Result: The report data is saved in the specified file and may be viewed using a text editor.
will be printed	click Print . From the Print Screen, select the desired printer and print options, then click OK . Result: The report data is printed on the selected printer.

4 Select a cross-connection from the list in the View Cross-Connections Selection Screen; then click **View Graphic**.

Result: The selected cross-connection configuration is displayed in graphic format.

5

IF the selected cross-connection...	THEN...
will be viewed in text format	click View Text . Result: The View Cross-Connections Screen appears.
will not be viewed in text format	continue to Step 7.

6 View the list of cross-connections associated with the selected port; then click **Close**.

Result: The View Cross-Connections Screen closes.

7

IF...	THEN...
viewing additional cross-connections in graphic format	click Back . Result: The View Cross-Connections Selection Screen appears. Continue to the next step.
viewing cross-connections in graphic format is complete	click Close . Result: The View Cross-Connections Screen closes and the System View appears. Stop! End of Task.

8

IF...	THEN...
viewing another cross-connection associated with the currently selected equipment	return to Step 4 of this task.
retrieving a cross-connection list for different equipment	click Browse . Result: The View Cross-Connections Equipment Selection Screen appears. Return to Step 2 of this procedure.

END OF STEPS

SE 502-2: Creating cross-connection text reports

Complete the following steps to create text reports of cross-connection configurations associated with the system, shelf, circuit pack, or OCH port.

- 1 At the Optical Craft Interface, from the System View Main menu bar, select **Reports>Cross-Connection List**.

Result: The Equipment Selection Screen appears.

- 2 Enter an AID for the system, shelf, port unit, or OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

-
- 3** Select the Retrieval Scope for the report (**ALL**, **1WAY**, **2WAY**, **LPBK**). Selecting **ALL** will retrieve all cross-connections associated with the selected entity. Selecting **1WAY**, **2WAY**, or **LPBK** will retrieve only cross-connections of the specified type that are associated with the selected equipment.
-

- 4** Click **Select**.

Result: The Cross-Connection List Screen appears. The cross-connections are displayed in the order in which they are returned from the system. The information can be sorted by clicking on the desired column in the report. Click **Refresh** at any time to update the list.

- 5**

IF the report data...	THEN...
will be saved as a text file	click Save As . From the Save As Screen, select a path, enter a filename, then click Save . Result: The report data is saved in the specified file and may be viewed using a text editor.
will be printed	click Print . From the Print Screen, select the desired printer and print options, then click OK . Result: The report data is printed on the selected printer.

- 6** Click **Close**.

Result: The Cross-Connection List Screen closes.

N D O F S T E P S



Task 503: Deleting a Cross-Connection

Purpose This procedure is used to delete legs of an existing cross-connection on the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note
 - the assigned AIDs for the input and output ports
 - the cross-connection type to be deleted
- A cross-connection must already exist.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P3 or greater.

Related information For related information, see the following sections in this document:

- Chapter 7, “Cross-Connection Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 500: Establishing a New Cross-Connection” (14-2)
- “Task 501: Adding Cross-Connection Legs to an Existing Cross-Connection” (14-19)
- “Task 502: Retrieving Cross-Connections” (14-23)

Task Complete the following steps to delete a cross-connection.

- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Cross-Connection**.

Result: The Cross-Connection Wizard is invoked and the Cross-Connection Action Selection Screen appears.

- 2** Select **Delete leg(s) of an existing cross-connection**; then click **Next**.

Result: The Existing Cross-Connection Selection Screen appears.

-
- 3** On the left side of the Existing Cross-Connection Selection Screen, enter an AID for the system, optical interface shelf, port unit, or OCH port that has an existing cross-connection, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment; then click **Select**.

Result: All cross-connections associated with the selected equipment are shown on the right side of the Existing Cross-Connection Selection Screen.

4

IF deleting...	THEN...
one or more cross-connections in the list	click the checkbox in the Delete column beside each cross-connection to be deleted. Result: A checkmark appears beside the selected cross-connections.
all cross-connections in the list	click the Delete all XC(s) in the List checkbox. Result: A checkmark appears beside all cross-connections in the list.
cross-connections in the same configuration	click the Delete XC(s) in the Configuration checkbox; then select a cross-connection from the list. Result: The selected cross-connection is highlighted.

-
- 5** Click **Finish**.

Result: A Confirmation Screen appears.

-
- 6** Click **Yes**.

Result: A Confirmation Screen appears.

-
- 7** Click **Yes**.

Result: A successful completion message appears.

8 Click **OK**.

Result: The successful completion message closes.

9

IF...	THEN...
deleting another cross-connection currently displayed in the list	return to Step 4.
retrieving a list of cross-connections for a different equipment selection	return to Step 3.
deleting cross-connections is complete	click Cancel . Result: The Existing Cross-Connection Selection Screen closes.

N D O F S T E P S



Task 504: Establishing (Operating) a Cross-Connect Loopback

Purpose This procedure is used to establish a cross-connect loopback of an optical signal from an input OCH port, through an optionally specified switch fabric, to a selected output OCH port on the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Input and output OCH ports involved in the loopback must be provisioned and have a primary state of IS-NR or OOS-MA, or a primary state of OOS-AU with a secondary state of FLT.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of T4 or greater.

Related information For related information, see the following sections in this document:

- Chapter 7, “Cross-Connection Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 307: Provisioning Optical Channel (OCH) Port General Parameters” (12-34)
- “Task 505: Retrieving Cross-Connect Loopbacks” (14-34)
- “Task 506: Releasing a Cross-Connect Loopback” (14-36)

Task Complete the following steps to establish a cross-connect loopback.

- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Fault>Loopbacks**.

Result: The Cross-Connect Loopback Screen appears.

-
- 2 On the left side of the Cross-Connect Loopback Screen, enter an AID for the desired input OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired input port.
-

- 3 Click **Select**.

Result: Information for the selected OCH port and loopback options are displayed on the right side of the Cross-Connect Loopback Screen.

- 4

IF...	THEN...
the default output port is acceptable	continue to Step 7.
the default output port is not acceptable	click Select under the Output AID field. Result: The Select Output Port Screen appears.

- 5 Enter an AID for the selected output OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired port.
-

- 6 Click **Select**.

Result: The Select Output Port Screen closes and the selected port is displayed on the Cross-Connect Loopback Screen.

- 7 Select the switch fabric to be used for the cross-connect loopback (0, 1, or both). For a forced cross-connect loopback, the Optical Craft Interface displays the active fabric. The inactive fabric is the default choice.

8

IF the selected port...	THEN...
is not already associated with an existing cross-connection (Cross-Connect Status is No)	select Operate Normal Cross Connect Loopback .
is already associated with an existing cross-connection (Cross-Connect Status is Yes)	select Operate Forced Cross Connect Loopback .

9 Click **Apply**.

Result: A Confirmation Screen appears.

10 Click **Yes**.

Result: A successful completion message appears.

11 Click **OK**.

Result: The successful completion message closes.

12

IF...	THEN...
establishing additional cross-connect loopbacks	return to Step 2 of this task.
establishing cross-connect loopbacks is complete	click Close to exit the Cross-Connect Loopback Screen. Result: The Cross-Connect Loopback Screen closes.

N D O F S T E P S



Task 505: Retrieving Cross-Connect Loopbacks

Purpose This procedure is used to retrieve a list of existing cross-connect loopback connections on a system, optical interface shelf, port unit, or an OCH port on the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of P1 or greater.

Related information For related information, see the following sections in this document:

- Chapter 7, “Cross-Connection Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 502: Retrieving Cross-Connections” (14-23)
- “Task 504: Establishing (Operating) a Cross-Connect Loopback” (14-31)
- “Task 506: Releasing a Cross-Connect Loopback” (14-36)

Task Complete the following steps to view existing cross-connect loopback connections.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **View>Loopback**.

Result: The View Loopback Equipment Selection Screen appears.

- 2** Enter an AID for the system, shelf, port unit, or OCH port for which loopback information will be displayed, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

3 Click **Select**.

Result: The View Loopback Screen appears.

4 Review the loopback information; then click **Close**.

Result: The View Loopback Screen closes.

N D O F S T E P S



Task 506: Releasing a Cross-Connect Loopback

Purpose This procedure is used to release a cross-connect loopback of an optical signal on the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- A cross-connect loopback must already exist.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of T4 or greater.

Related information For related information, see the following sections in this document:

- Chapter 7, “Cross-Connection Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 504: Establishing (Operating) a Cross-Connect Loopback” (14-31)
- “Task 505: Retrieving Cross-Connect Loopbacks” (14-34)

Task Complete the following steps to release a cross-connect loopback.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Fault>Loopbacks**.

Result: The Cross-Connect Loopback Screen appears.

- 2** On the left side of the Cross-Connect Loopback Screen, enter an AID for the desired input OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired input port.

3 Click **Select**.

Result: Information for the selected OCH port and loopback options are displayed on the right side of the Cross-Connect Loopback Screen.

4

IF there is...	Then...
no cross-connect loopback associated with the selected port (Cross-Connect Loopback Status is No)	there is no loopback connection to release. Return to Step 2 to select a different OCH port, or click Close .
a normal cross-connect loopback associated with the selected port (Cross-Connect Status is No, Cross-Connect Loopback Status is Yes)	select Release Normal Cross Connect Loopback .
a forced cross-connect loopback associated with the selected port (Cross-Connect Status is Yes, Cross-Connect Loopback Status is Yes)	select Release Forced Cross Connect Loopback .

5 Click **Apply**.

IF...	THEN...
the active fabric was selected	a Confirmation Screen appears.
the inactive fabric was selected	a Confirmation Screen appears.

6 Click **Yes**.

Result: A successful completion message appears.

7 Click **OK**.

Result: The successful completion message closes.

8

IF...	THEN...
releasing additional cross-connect loopbacks	return to Step 2 of this task.
releasing cross-connect loopbacks is complete	click Close to exit the Cross-Connect Loopback Screen. Result: The Cross-Connect Loopback Screen closes.

N D O F S T E P S



Task 507: Establishing a Test Access Session

Purpose This procedure is used to create a new test access session on the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note
 - the assigned AIDs for the input and output ports
 - the test access cross-connection type to be made
- A cross-connection must already exist or a test signal must be injected either manually, using a test set to inject a signal into an idle OCH port, or by an OEO eport.
- An output OCH port must have a primary state of IS-NR or OOS-MA, or a primary state of OOS-AU with a secondary state of FLT.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of T1 or greater.

Related information For related information, see the following sections in this document:

- Chapter 7, “Cross-Connection Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 307: Provisioning Optical Channel (OCH) Port General Parameters” (12-34)
- “Task 508: Deleting a Test Access Session” (14-44)
- “Task 509: Retrieving Test Access Sessions” (14-46)

Task Complete the following steps to create a new test access session.

- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Fault>Test Access**.

Result: The Test Access Wizard is invoked and the Test Access Action Selection Screen appears.

-
- 2 Select **Create a new test access session**; then click **Next**.

Result: The Mode Selection Screen appears.

- 3 Select the mode for the new test access session; then click **Next**.

Result: The Test Access Port Selection Screen appears.

- 4 On the left side of the screen, enter an AID for the desired OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

Result: All cross-connections associated with the selected port (if any) are shown on the right side of the Test Access Port Selection Screen.

- 5

IF...	THEN...
existing cross-connection(s) exist on the selected port	select a cross-connection from the list on the right side of the screen; then click Next . Result: The Test Access TAM Port Selection Screen appears.
no existing cross-connections exist	click Next . Result: The Test Access TAM Port Selection Screen appears.

- 6 Click **Select** under the TAM Port 1 field.

Result: The Equipment Selection Screen appears.

- 7 Enter an AID for the desired OCH port to be used as the TAM port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.

8 Click **Select**.

Result: The selected port is displayed in the TAM Port 1 field.

9

IF creating a...	THEN...
MONE or MONF test access session	continue to Step 12.
MONEF test access session	click Select under the TAM Port 2 field. Result: The Equipment Selection Screen appears.

- 10** Enter an AID for the desired OCH port to be used as the TAM port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.
-

11 Click **Select**.

Result: The selected port is displayed in the TAM Port 2 field.

- 12** Select the switch fabric side for the test access session (0, 1, 2, or 3). For a MONEF test access session select the switch fabric side for both the E port and F port.

Important! Selecting option **3** will use the switch fabric that is not currently carrying live traffic. Selecting **0** or **1** will use the specified switch fabric, and selecting **2** will use both switch fabrics, and may impact live traffic.

13

IF the input OCH port selected in Step 4 was...	THEN...
an OEO port that will be used to inject a test signal	in the E Port Injected Signal and/or F Port Injected Signal field - select 0 if the injected signal will be all zeros - select 1 if the injected signal will be all ones
an OEO port that is not being used to inject a test signal	select NA in the E Port Injected Signal field and/or F Port Injected Signal field and continue to Step 15.
a transparent port	continue to Step 15.

14

IF a J0 byte sequence...	THEN...
will be inserted	select the Yes radio button in the E Port Insert J0 Byte field and/or F Port Insert J0 Byte field.
will not be inserted	select the No radio button in the E Port Insert J0 Byte field and/or F Port Insert J0 Byte field.

15 Click **Finish**.

Result: A Confirmation Screen appears that includes a summary of the test access session being established.

16 Click **Yes**.

Result: The test access session is established and a successful completion message appears.

17 Click **OK**.

Result: The successful completion message closes.

18

IF...	THEN...
establishing another test access session	return to Step 2.
another test access session will not be established	click Close . Result: The Test Access Action Selection Screen closes.

N D O F S T E P S



Task 508: Deleting a Test Access Session

Purpose This procedure is used to delete an existing test access session on the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs for the input and output ports.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of T1 or greater.

Related information For related information, see the following sections in this document:

- Chapter 7, “Cross-Connection Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 307: Provisioning Optical Channel (OCH) Port General Parameters” (12-34)
- “Task 507: Establishing a Test Access Session” (14-39)
- “Task 509: Retrieving Test Access Sessions” (14-46)

Task Complete the following steps to delete an existing test access session.

1 At the Optical Craft Interface, from the System View Main Menu bar, select **Fault>Test Access**.

Result: The Test Access Wizard is invoked and the Test Access Action Selection Screen appears.

2 Select **Delete an existing test access session**; then click **Next**.

Result: The Delete Test Access Selection Screen appears.

3 Click **Browse**.

Result: The Delete Test Access Equipment Selection Screen appears.

-
- 4 Enter an AID for the desired system, shelf, port unit, or OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.
-

- 5 Click **Select**.

Result: The Delete Test Access Selection Screen appears. The test access sessions are displayed in the order in which they are returned from the system. The list can be sorted by clicking on any column in the Delete Test Access Selection Screen.

- 6 Select the test access session to be deleted; then click **Next**.

Result: The Test Access Summary Screen appears.

- 7 Review the test access session information; then click **Finish**.

Result: A Confirmation Screen appears.

- 8 Click **Yes**.

Result: The selected test access session is deleted and the Test Access Action Selection Screen appears.

- 9

IF...	THEN...
deleting another test access session	return to Step 2.
another test access session will not be deleted	click Close . Result: The Test Access Action Selection Screen closes.

N D O F S T E P S



Task 509: Retrieving Test Access Sessions

Purpose This procedure is used to view a list of test access sessions on the LambdaRouter™ All Optical Switch.

Test access sessions may be retrieved for the system, shelf, port unit, or OCH port, and may be viewed either in text format or graphically.

The following test results may also be retrieved for a selected test access session:

- inserted and received J0 byte sequence information
- received monitor power
- performance monitoring data

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task and note the assigned AIDs.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of T1 or greater.

Related information For related information, see the following sections in this document:

- Chapter 7, “Cross-Connection Management”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 307: Provisioning Optical Channel (OCH) Port General Parameters” (12-34)
- “Task 507: Establishing a Test Access Session” (14-39)
- “Task 508: Deleting a Test Access Session” (14-44)

Task Complete the following steps to view test access sessions in either text or graphic format.

- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Fault>Test Access**.

Result: The Test Access Wizard is invoked and the Test Access Action Selection Screen appears.

- 2** Select **View existing test access sessions**; then click **Next**.

Result: The View Test Access Selection Screen appears.

- 3** Click **Browse**.

Result: The View Test Access Equipment Selection Screen appears.

- 4** Enter an AID for the desired system, shelf, port unit, or OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment.
-

- 5** Click **Select**.

Result: The View Test Access Selection Screen appears. The test access sessions are displayed in the order in which they are returned from the system. The list can be sorted by clicking on any column in the View Test Access Selection Screen.

6

IF...	THEN...
the test access session will be viewed in graphic format	go to “SE 509-1: Viewing a test access session in graphic format” (14-49).
the test access session port details and performance monitoring information will be viewed	go to “SE 509-2: Viewing test access session port details and performance monitoring information” (14-50).
test access sessions will not be viewed in graphic format and session test results will not be viewed	click Cancel . Result: The View Test Access Selection Screen closes. Stop! End of task.

N D O F S T E P S

**SE 509-1: Viewing a test
access session in
graphic format**

Complete the following steps to view a test access session in graphic format.

1

IF...	THEN...
viewing port details for a test access session that has already been selected	click View Graphic . Result: The Test Access Session Screen appears.
a test access session has not already been selected	in the View Test Access Selection Screen, select the test access session to be viewed; then click View Graphic . Result: The Test Access Session Screen appears.

2 Review the test access session information.

IF...	THEN...
port details or performance monitoring information for the selected test access session will be viewed	go to “SE 509-2: Viewing test access session port details and performance monitoring information” (14-50).
another test access session will be retrieved	click Back . Result: The View Test Access Selection Screen appears. Return to Step 1.
additional test access sessions will not be retrieved	click Cancel . Result: The Test Access Session Port Details Screen closes.

.....
N D O F S T E P S
.....

**SE 509-2: Viewing test
access session port details
and performance
monitoring information**

Complete the following steps to view test access session port details and performance monitoring information.

1

IF...	THEN...
viewing performance monitoring information for a test access session that has already been selected	click View Result . Result: The View Test Result Screen appears.
a test access session has not already been selected	In the View Test Access Selection Screen, select the test access session to be viewed; then click View Result . Result: The View Test Result Screen appears.

2

IF...	THEN...
viewing OCH port details	click View Port Detail . Result: The View OCH Port Details Screen appears.
OCH port details will not be viewed	continue to Step 4.

3 View the OCH port details; then click **Close** when done.

Result: The View OCH Port Details Screen closes and the View Test Result Screen appears.

4

IF...	THEN...
viewing performance monitoring information for the OCH port	continue to the next step.
the OCH port is a transparent port, OR performance monitoring information will not be viewed	continue to Step 11.

-
- 5 Select the performance monitoring report type from the Select PM Type drop-down list; then click **View PM** for the eport or fport as appropriate.

Result: The PM Parameters Selection Screen appears. The AID for the OCH port is displayed in the Enter AID field.

- 6 Click **Select**.

Result: The performance monitoring parameters for the OCH port are displayed on the right side of the PM Parameters Selection Screen.

- 7 Select the performance monitoring parameters to include, select the time period, monitored date, start time, and monitor level as required; then click **Apply**.

Result: The PM Report Screen for the selected performance monitoring report type appears. Click **Refresh** at any time to update the list.

- 8

IF the report data...	THEN...
will be saved as a text file	click Save As . From the Save As Screen, select a path, enter a filename, then click Save . Result: The report data is saved in the specified file and may be viewed using a text editor.
will be printed	click Print . From the Print Screen, select the desired printer and print options, then click OK . Result: The report data is printed on the selected printer.

- 9 Click **Close**.

Result: The PM Report Screen closes and the View Test Result Screen appears.

10

IF...	THEN...
viewing additional performance monitoring reports for the same OCH port	return to Step 5.
additional performance monitoring reports will not be viewed	continue to the next step.

11 Click **Close**.

Result: The View Test Result Screen closes and the View Test Access Selection Screen appears.

12

IF...	THEN...
viewing port details for the selected test access session	go to “SE 509-1: Viewing a test access session in graphic format” (14-49).
additional test access sessions will not be retrieved	click Cancel . Result: The View Test Access Selection Screen closes.

N D O F S T E P S





15 Performance Monitoring Tasks

Overview

Purpose This chapter provides detailed procedures for configuring performance monitoring profiles, assigning profiles to ports, provisioning performance monitoring parameters on the LambdaRouter™ All Optical Switch.

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Task 600: Provisioning Performance Monitoring Profiles

Purpose This procedure is used to provision performance monitoring profiles. This includes

- creating a new profile
- viewing a profile
- modifying a profile
- renaming a profile
- deleting a profile

System default profiles and profiles that are associated with a port cannot be deleted.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a privilege code of PM3 or greater.

Related information For related information, see the following sections in this document:

- Chapter 8, “Performance Monitoring”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 601: Viewing Performance Monitoring Profile Details” (15-9)
- “Task 602: Provisioning OCH Port Performance Monitoring Options” (15-12)
- “Task 603: Viewing and Setting the Performance Monitoring Data Collection Daily Start Time” (15-17)
- “Task 604: Initializing Performance Monitoring Registers” (15-20)
- “Task 605: Viewing Performance Monitoring Report Data” (15-23)
- “Task 606: Viewing Performance Monitoring OCH Port Details” (15-29)

Task Complete the following steps to provision performance monitoring profiles.

1 At the Optical Craft Interface, from the System View Main Menu bar, select **Performance>Provision PM Profile**, then select the appropriate menu option for one of the following profile types:

- SONET Physical
- SONET Section
- SONET Line
- SONET Line FE
- SDH Physical
- SDH Regenerator Section
- SDH Multiplex Section
- SDH Multiplex Section FE

Result: The Provision PM Profile Screen appears.

2

IF...	THEN...
creating a new profile	go to “SE 600-1: Creating a new PM profile” (15-4).
viewing details for an existing profile	go to “SE 600-2: Viewing details for an existing PM profile” (15-5).
modifying a profile	go to “SE 600-3: Modifying an existing PM profile” (15-6).
renaming a profile	go to “SE 600-4: Renaming an existing PM profile” (15-7).
deleting a profile	go to “SE 600-5: Deleting an existing PM profile” (15-8).

3 Click **Close** in the Provision PM Profile Screen.

Result: The Provision PM Profile Screen closes.

N D O F S T E P S

SE 600-1: Creating a new PM profile

Complete the following steps to create a new PM profile.

-
- 1** In the Provision PM Profile Screen, click the radio button beside the New Profile field and enter a name for the profile being created.

-
- 2** Click **Create**.

Result: A Confirmation Screen appears.

-
- 3** Click **Yes**.

Result: A profile of the selected type is created with default parameters and a successful completion message appears.

-
- 4** Click **OK**.

Result: The successful completion message closes.

N D O F S T E P S

**SE 600-2: Viewing details
for an existing PM profile**

Complete the following steps to view the details for an existing PM profile.

-
- 1** In the Provision PM Profile Screen, click the radio button beside the Existing Profile field and select the name of the profile to be viewed from the drop-down list.
-

- 2** Click **Details**.

Result: The View PM Profile Details Screen appears.

- 3** View the details for the selected PM profile.

IF...	THEN...
retrieving a list of OCH port AIDs to which the selected PM profile is assigned	click View Assigned AIDs . Result: The View Assigned AIDs Screen appears. Continue to the next step.
a list of assigned AIDs will not be retrieved	continue to Step 6.

- 4** From the Equipment Selection tree on the left side of the screen, select an optical interface shelf; then click **Select Shelf**.

Result: A list of the OCH port AIDs to which the PM profile has been assigned appears on the right side of the screen.

- 5** View the list of AIDs.

IF...	THEN...
viewing a list of assigned AIDs for a different optical interface shelf	return to Step 4.
viewing the assigned AIDs is completed	click Close . Result: The View Assigned AIDs Screen closes and the View PM Profile Details Screen appears.

-
- 6 Click **Close**.

Result: The View PM Profile Details Screen closes.

N D O F S T E P S

SE 600-3: Modifying an existing PM profile

Complete the following steps to modify an existing PM profile. Master Default and System Default profiles cannot be modified.

-
- 1 In the Provision PM Profile Screen, click the radio button beside the Existing Profile field and select the name of the profile to be modified from the drop-down list.

-
- 2 Click **Modify**.

Result: The Edit PM Profile Screen appears displaying the threshold parameters and values for the selected profile.

-
- 3 Click in the Value field beside the threshold parameter to be edited and enter the new value for the parameter.

Repeat this step for each parameter to be edited.

-
- 4 After all threshold parameter values have been edited, click **Apply**.

Result: A Confirmation Screen appears.

-
- 5 Click **Yes**.

Result: A successful completion message appears.

-
- 6 Click **OK**.

Result: The successful completion message closes.

N D O F S T E P S

SE 600-4: Renaming an existing PM profile

Complete the following steps to rename an existing PM profile. Master Default and System Default profiles cannot be renamed.

-
- 1** In the Provision PM Profile Screen, click the radio button beside the Existing Profile field and select the name of the profile to be renamed from the drop-down list.

-
- 2** Click **Rename**.

Result: The Rename PM Profile Screen appears.

-
- 3** Enter the new name for the PM profile in the Enter New PM Name field; then click **Apply**.

Result: A Confirmation Screen appears.

-
- 4** Click **Yes**.

Result: A successful completion message appears.

-
- 5** Click **OK**.

Result: The successful completion message closes.

END OF STEPS

SE 600-5: Deleting an existing PM profile

Complete the following steps to delete an existing PM profile. Master Default and System Default profiles cannot be deleted.

-
- 1** In the Provision PM Profile Screen, click the radio button beside the Existing Profile field and select the name of the profile to be deleted from the drop-down list.

-
- 2** Click **Delete**.

Result: A Confirmation Screen appears.

-
- 3** Click **Yes**.

Result: A successful completion message appears.

-
- 4** Click **OK**.

Result: The successful completion message closes.

N D O F S T E P S



Task 601: Viewing Performance Monitoring Profile Details

Purpose This procedure is used to retrieve and view the thresholds and PM indicator and TCA indicator settings for individual parameters within previously defined performance monitoring profiles, and to retrieve a list of AIDs to which PM profiles have been assigned.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a privilege code of PM1 or greater.

Related information For related information, see the following sections in this document:

- Chapter 8, “Performance Monitoring”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 600: Provisioning Performance Monitoring Profiles” (15-2)
- “Task 602: Provisioning OCH Port Performance Monitoring Options” (15-12)
- “Task 603: Viewing and Setting the Performance Monitoring Data Collection Daily Start Time” (15-17)
- “Task 604: Initializing Performance Monitoring Registers” (15-20)
- “Task 605: Viewing Performance Monitoring Report Data” (15-23)
- “Task 606: Viewing Performance Monitoring OCH Port Details” (15-29)

Task Complete the following steps to retrieve and view performance monitoring profiles that have already been defined, and lists of AIDs to which the profiles have been assigned.

1 At the Optical Craft Interface, from the System View Main Menu bar, select **Performance>View PM Profile & Assigned AIDs**, then select the appropriate menu option for one of the following profile types:

- SONET Physical
- SONET Section
- SONET Line
- SONET Line FE
- SDH Physical
- SDH Regenerator Section
- SDH Multiplex Section
- SDH Multiplex Section FE

Result: The PM Profile Name Selection Screen appears.

2 Select a profile name from the drop-down list; then click **Select**.

Result: The View PM Profile Details Screen appears.

3

IF...	THEN...
retrieving a list of OCH AIDs to which the selected PM profile is assigned	click View Assigned AIDs . Result: The View Assigned AIDs Screen appears. Continue to the next step.
a list of assigned AIDs will not be retrieved	continue to Step 7.

4 From the Equipment Selection tree on the left side of the screen, select an optical interface shelf; then click **Select Shelf**.

Result: A list of the OCH port AIDs to which the PM profile has been assigned appears on the right side of the screen.

5 View the list of AIDs.

IF...	THEN...
retrieving a list of assigned AIDs for a different optical interface shelf	return to Step 4.
viewing the assigned AIDs is completed	click Close . Result: The View Assigned AIDs Screen closes and the View PM Profile Details Screen appears.

6 Click **Close** in the View PM Profile Details Screen.

Result: The View PM Profile Details Screen closes.

7

IF...	THEN...
retrieving another profile of the same type	return to Step 2.
additional profiles of the same type will not be viewed	click Close in the PM Profile Name Selection Screen. Result: The PM Profile Name Selection Screen closes.

N D O F S T E P S



Task 602: Provisioning OCH Port Performance Monitoring Options

Purpose This procedure is used to provision the following performance monitoring options for an individual OCH port:

- assign performance monitoring profiles
- enable or disable performance monitoring data collection
- enable or disable threshold crossing alert (TCA) reporting

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a privilege code of P3 or greater.

Related information For related information, see the following sections in this document:

- Chapter 8, “Performance Monitoring”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 307: Provisioning Optical Channel (OCH) Port General Parameters” (12-34)
- “Task 600: Provisioning Performance Monitoring Profiles” (15-2)
- “Task 601: Viewing Performance Monitoring Profile Details” (15-9)
- “Task 603: Viewing and Setting the Performance Monitoring Data Collection Daily Start Time” (15-17)
- “Task 604: Initializing Performance Monitoring Registers” (15-20)
- “Task 605: Viewing Performance Monitoring Report Data” (15-23)
- “Task 606: Viewing Performance Monitoring OCH Port Details” (15-29)

Task Complete the following steps to provision performance monitoring options for OCH ports.

- 1 At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Provision**.

Result: The Provision Parameters for Equipment Screen appears.

- 2 On the left side of the screen, enter an AID for the desired OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment; then click **Provision**.

Result: The parameters for the selected OCH port appear on the right side of the Provision Parameters for Equipment Screen.

3

IF provisioning an...	THEN...
input port	click the Input tab.
output port	click the Output tab.

- 4 Click the **PM Profile and Control** tab.

Result: The OCH port performance monitoring options are displayed in the Provision Parameters for Equipment Screen.

- 5 Provision each of the following as applicable:

IF...	THEN...
assigning performance monitoring profiles to the port	go to “SE 602-1: Assigning profiles to OCH ports” (15-14).
enabling or disabling performance monitoring data collection for the port	go to “SE 602-2: Enabling or disabling PM data collection for OCH ports” (15-15).
enabling or disabling threshold crossing alert reporting for the port	go to “SE 602-3: Enabling or disabling TCA reporting for OCH ports” (15-16).

6 Click **Apply**.

Result: A Confirmation Screen appears.

7 Click **Yes**.

Result: A successful completion message appears.

8 Click **OK**.

Result: The successful completion message closes.

9 Click **Close**.

Result: The Provision Parameters for Equipment Screen closes.

END OF STEPS

SE 602-1: Assigning profiles to OCH ports

Complete the following steps to assign performance monitoring profiles to OCH ports.

1 Select a performance monitoring profile from the PM Profile drop-down list for each parameter grouping (such as Physical, Section, Regenerator Section, and so on), as applicable.

2

IF...	THEN...
viewing PM profile details	click View Details beside the applicable PM Profile field. Result: The View PM Profile Details Screen appears.
PM profile details will not be viewed	return to Step 5 in “Task 602: Provisioning OCH Port Performance Monitoring Options” (15-12).

-
- 3** View the performance monitoring profile details; then click **Close**.

Result: The View PM Profile Details Screen closes.

N D O F S T E P S

**SE 602-2: Enabling or
disabling PM data
collection for OCH ports**

Complete the following steps to enable or disable performance
monitoring data collection for OCH ports.

1

IF...	THEN...
enabling PM data collection	select the PM Activation Enable radio button for each parameter grouping as applicable. Result: PM data collection is enabled for the selected parameter groupings.
disabling PM data collection	select the PM Activation Disable radio button for each parameter grouping as applicable. Result: PM data collection is disabled for the selected parameter groupings.

-
- 2** Return to Step 5 in “Task 602: Provisioning OCH Port Performance Monitoring Options” (15-12).

N D O F S T E P S

**SE 602-3: Enabling or
disabling TCA reporting for
OCH ports**

Complete the following steps to enable or disable TCA reporting for OCH ports.

1

IF...	THEN...
enabling TCA reporting	select the TCA Report Activation Enable radio button. Result: TCA reporting is enabled for the entire port.
disabling TCA reporting	select the TCA Report Activation Disable radio button. Result: TCA reporting is disabled for the entire port.

2 Return to Step 5 in “Task 602: Provisioning OCH Port Performance Monitoring Options” (15-12).

ND OF STEPS



Task 603: Viewing and Setting the Performance Monitoring Data Collection Daily Start Time

Purpose This procedure is used to view or set the performance monitoring data collection daily start time for the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a privilege code of PM1 or greater to view the current PM data collection daily start time, or PM3 or greater to set the PM data collection daily start time.

Related information For related information, see the following sections in this document:

- Chapter 8, “Performance Monitoring”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 600: Provisioning Performance Monitoring Profiles” (15-2)
- “Task 601: Viewing Performance Monitoring Profile Details” (15-9)
- “Task 602: Provisioning OCH Port Performance Monitoring Options” (15-12)
- “Task 604: Initializing Performance Monitoring Registers” (15-20)
- “Task 605: Viewing Performance Monitoring Report Data” (15-23)
- “Task 606: Viewing Performance Monitoring OCH Port Details” (15-29)

Task Complete the following steps to view or set the performance monitoring data collection daily start time for the LambdaRouter™ All Optical Switch.

1

IF...	THEN...
viewing the current PM data collection daily start time	go to “SE 603-1: Viewing the current PM data collection daily start time” (15-18).
setting the PM data collection daily start time	go to “SE 603-2: Setting the PM data collection daily start time” (15-19).

ND OF STEPS

**SE 603-1: Viewing the
current PM data collection
daily start time**

Complete the following steps to view the current PM data collection daily start time for the LambdaRouter™ All Optical Switch.

- 1 At the Optical Craft Interface, from the System View Main Menu bar, select **Performance>View PM Start Time**.

Result: The View PM Day Start Screen appears.

- 2 View the current settings for PM data collection daily start time; then click **Close**.

Result: The View PM Day Start Screen closes.

ND OF STEPS

**SE 603-2: Setting the
PM data collection daily
start time**

Complete the following steps to set the PM data collection daily start time for the LambdaRouter™ All Optical Switch.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Performance>Provision PM Start Time**.

Result: The Provision PM Day Start Screen appears.

-
- 2** Set the PM Day Start Hour to begin daily performance monitoring data collection. Valid entries range from **0** (midnight) to **23** (11 p.m.).

-
- 3** Click **Apply**.

Result: A Confirmation Screen appears.

-
- 4** Click **Yes**.

Result: A successful completion message appears.

-
- 5** Click **OK**.

Result: The successful completion message closes.

END OF STEPS



Task 604: Initializing Performance Monitoring Registers

Purpose This procedure is used to initialize the performance monitoring registers for selected OCH ports.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a privilege code of PM3 or greater.

Related information For related information, see the following sections in this document:

- Chapter 8, “Performance Monitoring”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 600: Provisioning Performance Monitoring Profiles” (15-2)
- “Task 601: Viewing Performance Monitoring Profile Details” (15-9)
- “Task 602: Provisioning OCH Port Performance Monitoring Options” (15-12)
- “Task 603: Viewing and Setting the Performance Monitoring Data Collection Daily Start Time” (15-17)
- “Task 605: Viewing Performance Monitoring Report Data” (15-23)
- “Task 606: Viewing Performance Monitoring OCH Port Details” (15-29)

Task Complete the following steps to initialize the performance monitoring registers for selected OCH ports.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Performance>Initialize PM Registers**.

Result: The Initialize Registers for a Performance Monitoring Port Screen appears.

-
- 2** From the Equipment Selection tree on the left side of the screen, enter an AID for the desired OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired OCH port.
-

- 3** Click **Select**.

Result: The register information for the selected OCH port appears.

- 4** Select the performance monitoring register Type, Location, Direction, and Time Period that will be initialized.

Important! Selecting **ALL** for the Register Type, Location, Direction, and/or Time Period registers will cause all registers for that category to be initialized.

- 5** Select an option for the Apply To field:

IF registers are being initialized for...	THEN select...
the port selected in Step 2 only	This Port Only
all ports on the same circuit pack as the port selected in Step 2	All Ports, This Pack
all ports of the same type and on the same shelf as the port selected in Step 2	All Ports, This Type, This Shelf

- 6** Click **Apply**.

Result: A Confirmation Screen appears.

- 7** Click **Yes**.

Result: The Confirmation Screen closes.

8

IF...	THEN...
additional registers for the same port will be initialized	return to Step 4.
registers for a different port will be initialized	return to Step 2.
initializing registers is completed	click Close in the Initialize Registers for a Performance Monitoring Port Screen. Result: The Initialize Registers for a Performance Monitoring Port Screen closes.

END OF STEPS



Task 605: Viewing Performance Monitoring Report Data

Purpose This procedure is used to retrieve and view performance monitoring report data for a specified OCH port.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a privilege code of PM1 or greater.

Related information For related information, see the following sections in this document:

- Chapter 8, “Performance Monitoring”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 600: Provisioning Performance Monitoring Profiles” (15-2)
- “Task 601: Viewing Performance Monitoring Profile Details” (15-9)
- “Task 602: Provisioning OCH Port Performance Monitoring Options” (15-12)
- “Task 603: Viewing and Setting the Performance Monitoring Data Collection Daily Start Time” (15-17)
- “Task 604: Initializing Performance Monitoring Registers” (15-20)
- “Task 606: Viewing Performance Monitoring OCH Port Details” (15-29)

Task Complete the following steps to retrieve and view performance monitoring report data for a specified OCH port.

1 At the Optical Craft Interface, from the System View Main Menu bar, select **Performance>PM Data Reports**, then select the appropriate menu option for one of the following:

- All SONET
- SONET Physical
- SONET Section
- SONET Line NE
- SONET Line FE
- All SDH
- SDH Physical
- SDH Regenerator Section
- SDH Multiplex Section NE
- SDH Multiplex Section FE

Result: The PM Parameter Selection Screen appears for the selected profile type.

2 From the Equipment Selection tree on the left side of the screen, enter an AID for the desired OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired OCH port.

3 Click **Select**.

Result: The parameter selection options appear on the right side of the screen.

-
- 4** Select the parameters for which performance monitoring data will be retrieved by moving the parameter names from the Available Parameters list to the Selected Parameters list.

If All SONET or All SDH, or a profile type of SONET Line NE, SONET Line FE, SDH Multiplex Section NE, or SDH Multiplex Section FE was selected in Step 1, perform this step for the Near End and Far End parameters by clicking on the appropriate tab over the Available Parameters list.

IF...	THEN...
moving one or more parameters from the Available list to the Selected list	click on an item in the Available list (to select multiple items, press and hold the Ctrl key then click on the items in the Available list); then click Select . Result: The selected items are moved to the Selected list.
moving all parameters from the Available list to the Selected list	click Select All . Result: The all items are moved to the Selected list.
moving one or more parameters from the Selected list to the Available list	click on an item in the Selected list (to select multiple items, press and hold the Ctrl key then click on the items in the Selected list); then click Remove . Result: The selected items are moved to the Available list.
moving all parameters from the Selected list to the Available list	click Remove All . Result: The all items are moved to the Available list.

-
- 5** Select the Time Period, Monitored Date, Start Time, and Monitor Level options as required to filter the performance monitoring report information.

-
- 6** Click **Apply**.

Result: The PM Report Screen for the selected parameter type appears. Click **Refresh** at any time to update the list.

7

IF...	THEN...
saving report data to a file	go to “SE 605-1: Saving report data to a file” (15-27).
printing report data	go to “SE 605-2: Printing report data” (15-28).
viewing report data is completed	click Close . Result: The PM Report Screen closes.

8

IF...	THEN...
retrieving additional performance monitoring data for the same OCH port	return to Step 4.
retrieving performance monitoring data for a different OCH port	return to Step 2.
retrieving performance monitoring data is completed	click Close in the Parameter Selection Screen. Result: The Parameter Selection Screen closes.

END OF STEPS

SE 605-1: Saving report data to a file

Complete the following steps to save the displayed performance monitoring report data to a file.

- 1** Click **Save As**.

Result: The Save As dialog box appears.

- 2** Select the desired destination path, enter a file name; then click **Save**.

Result: The log data is saved to the specified file and the Save As dialog box closes.

N D O F S T E P S

SE 605-2: Printing report data

Complete the following steps to print the displayed performance monitoring report data.

1 Click **Print**.

Result: The Print dialog box appears.

2 Select the desired printer, configure the necessary print options; then click **OK**.

Result: The report data is printed to the selected printer.

N D O F S T E P S



Task 606: Viewing Performance Monitoring OCH Port Details

Purpose This procedure is used to view the following performance monitoring options that have been previously provisioned for an individual OCH port:

- assigned performance monitoring profiles
- performance monitoring data collection status
- threshold crossing alert (TCA) reporting status

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Connect the Optical Craft Interface to the local network element and log in with a privilege code of P1, M1 or greater.

Related information For related information, see the following sections in this document:

- Chapter 8, “Performance Monitoring”
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 307: Provisioning Optical Channel (OCH) Port General Parameters” (12-34)
- “Task 600: Provisioning Performance Monitoring Profiles” (15-2)
- “Task 601: Viewing Performance Monitoring Profile Details” (15-9)
- “Task 602: Provisioning OCH Port Performance Monitoring Options” (15-12)
- “Task 603: Viewing and Setting the Performance Monitoring Data Collection Daily Start Time” (15-17)
- “Task 604: Initializing Performance Monitoring Registers” (15-20)
- “Task 605: Viewing Performance Monitoring Report Data” (15-23)

Task Complete the following steps to view the performance monitoring information that has been provisioned for an OCH port.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **View>Equipment Details**.

Result: The Equipment Selection Screen appears.

-
- 2** In the Equipment Selection Screen, enter an AID for the desired OCH port, or navigate the equipment list by clicking on the plus sign (+) next to each entity to highlight the desired equipment; then click **Select**.

Result: The View OCH Port Details Screen appears for the selected port.

-
- 3** Click the **PM Profile and Control** tab.

Result: The OCH port performance monitoring details are displayed in the View OCH Port Details Screen. Click **Refresh Port** at any time to update the information.

-
- 4** View the OCH port performance monitoring information. Click the **Input** tab or **Output** tab as applicable.

-
- 5** Click **Close**.

Result: The View OCH Port Details Screen closes.

N D O F S T E P S





16 Software Management Tasks

Overview

Purpose This chapter provides detailed procedures for performing software installation and database backup and restore tasks on the LambdaRouter™ All Optical Switch.

Contents

Task 600: Viewing Software and Data Properties	16-2
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Task 600: Viewing Software and Data Properties

- Purpose** This procedure is used to view
- the release of software currently active on the Optical Craft Interface (OCI)
 - an overview of the release and status of the software in the secondary NVM, or in the Active and Previous partitions of the primary NVM on the network element
 - detailed information for the software and data on the network element

- Before you begin** Before beginning this task:
- Read and follow all safety precautions in this manual.
 - Obtain the NVM card containing the network element software, if required.
 - Obtain and use an electrostatic discharge (ESD) strap.



CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a LambdaRouter™ All Optical Switch, to prevent electrostatic discharge damage to sensitive components.

- Related information** For related information, see the following sections in this document:
- Chapter 9, “Software Management”
 - “Task 601: Manually Backing Up Software or Data from Primary Memory to Secondary Memory” (16-10)
 - “Task 602: Manually Restoring Data from Secondary Memory to Primary Memory” (16-12)
 - “Task 603: Manually Backing Up Data from Primary Memory to the Optical Craft Interface” (16-15)
 - “Task 604: Manually Restoring Data from the Optical Craft Interface to Primary Memory” (16-17)

Task Complete the following steps to view the properties of the Optical Craft Interface or network element software and data.

1

IF retrieving...	THEN...
software release information on the Optical Craft Interface	go to “SE 600-1: Viewing the Optical Craft Interface software release number” (16-4).
network element TID, system type, and release information	go to “SE 600-2: Viewing the network element TID, system type, and release” (16-5).
an overview of software and data properties on the network element	go to “SE 600-3: Viewing an overview of software and data properties on the network element” (16-6).
detailed software and data on the network element	go to “SE 600-4: Viewing detailed information for the software and data on the network element” (16-7).
detailed software and data on the Optical Craft Interface	go to “SE 600-5: Viewing detailed information for the software and data on the Optical Craft Interface” (16-8).

N D O F S T E P S

**SE 600-1: Viewing the
Optical Craft Interface
software release number**

Complete the following steps to view the release number of the software currently installed on the Optical Craft Interface.

-
- 1** Log into the Optical Craft Interface.

Reference: “Task 201: Logging in to the Optical Craft Interface” (11-6).

-
- 2** At the Optical Craft Interface, from the Network View Main Menu bar, select **Help>About LambdaRouter AOS OCI**.

Result: The LambdaRouter AOS OCI About Screen appears with the current software release and build information.

-
- 3** Click **OK**.

Result: The OCI About Screen closes.

N D O F S T E P S

**SE 600-2: Viewing the
network element TID,
system type, and release**

Complete the following steps to view the network element TID, system type, and release information.

-
- 1** Connect the Optical Craft Interface to the network element and log in.

Reference: “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3).

“Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13).

-
- 2** At the Optical Craft Interface, from the System View Main Menu bar, select **Help>About This Network Element**.

Result: The About NE Screen appears with the network element TID, system type, and release information.

-
- 3** Click **OK**.

Result: The About NE Screen closes.

N D O F S T E P S

**SE 600-3: Viewing an
overview of software and
data properties on the
network element**

Complete the following steps to retrieve an overview of the software and data properties on the network element.

-
- 1 Connect the Optical Craft Interface to the network element and log in.

Reference: “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3).

“Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13).

-
- 2 At the Optical Craft Interface, from the System View Main Menu bar, select **View>Software/Data in NE**.

Result: The Software and Data Info Screen appears.

-
- 3 View the software and data information. The information can be sorted by clicking on the desired column in the report.

-
- 4 When finished viewing the software and data properties, click **Close**.

Result: The Software and Data Info Screen closes.

N D O F S T E P S

**SE 600-4: Viewing detailed
information for the
software and data on the
network element**

Complete the following steps to view detailed information on the software and data on the network element.

-
- 1** Connect the Optical Craft Interface to the network element and log in.

Reference: “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3).

“Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13).

-
- 2**

IF viewing properties for the...	THEN...
software generic	at the Optical Craft Interface, from the System View Main Menu bar, select View>Software Generic . Result: The Select Generic Screen appears.
database	at the Optical Craft Interface, from the System View Main Menu bar, select View>NE Data . Result: The Select Database Screen appears.

-
- 3** Select the desired entry; then click **OK**.

IF...	THEN...
a software generic was selected	the Generic Info Screen appears.
a database was selected	the Database Info Screen appears.

-
- 4** View the displayed information for the selected database or software generic. The information can be sorted by clicking on the desired column in the report.

-
- 5** When finished viewing the information for the selected database or software, click **Close**.

Result: The Generic Info or Database Info Screen closes.

END OF STEPS

**SE 600-5: Viewing detailed
information for the
software and data on the
Optical Craft Interface**

Complete the following steps to view detailed information on the software and data on the Optical Craft Interface.

-
- 1** Log into the Optical Craft Interface.

Reference: “Task 201: Logging in to the Optical Craft Interface” (11-6).

2

IF viewing properties for the...	THEN...
software generic	at the Optical Craft Interface, from the System View Main Menu bar, select View>Software Generic . Result: The Select Generic Screen appears.
database	at the Optical Craft Interface, from the System View Main Menu bar, select View>NE Data . Result: The Select Database Screen appears.

-
- 3** Select **OCI** from the Look In drop-down list.

Result: The network element software generic or database information stored on the Optical Craft Interface is displayed.

-
- 4** Select the desired entry; then click **OK**.

IF...	THEN...
a software generic was selected	the Generic Info Screen appears.
a database was selected	the Database Info Screen appears.

-
- 5** View the displayed information for the selected database or software generic. The information can be sorted by clicking on the desired column in the report.

-
- 6** When finished viewing the information for the selected database or software, click **Close**.

Result: The Generic Info or Database Info Screen closes.

N D O F S T E P S



Task 601: Manually Backing Up Software or Data from Primary Memory to Secondary Memory

Purpose This procedure is used to manually back up network element data or a software release from the active primary NVM to the secondary (backup) NVM.

Backing up the network element data and/or software should be done

- before and after major provisioning data changes
- periodically according to local policy
- if the network element TID has been changed

Changes to the network element software generic and database are covered in the applicable *Software Release Description* document for the current software generic. This document should be reviewed prior to performing this task for any detailed procedures or cautions that may apply to software management of the generic running on the system.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S4 or greater.

Related information For related information, see the following sections in this document:

- Chapter 9, “Software Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 602: Manually Restoring Data from Secondary Memory to Primary Memory” (16-12)
- “Task 603: Manually Backing Up Data from Primary Memory to the Optical Craft Interface” (16-15)
- “Task 604: Manually Restoring Data from the Optical Craft Interface to Primary Memory” (16-17)

Task Complete the following steps to manually back up network element data or a software release from the active primary NVM to the secondary (backup) NVM.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Software>Copy NVM**.

Result: The Copy NVM Screen appears.

-
- 2** Select **Active Primary to Secondary** for the type of copy.

-
- 3** Select the information to be copied from the Data Type drop-down list (Data, Generic Software, or Data and Generic Software).

-
- 4** Click **OK**.

Result: A Confirmation Screen appears.

-
- 5** Click **Yes**.

Result: The selected data is copied from the primary NVM to the secondary NVM.

END OF STEPS



Task 602: Manually Restoring Data from Secondary Memory to Primary Memory

Purpose This procedure is used to manually restore network element data from the secondary NVM to the active primary NVM.

Restoring the network element data from the secondary NVM may need to be done after a known or suspected database corruption.

Depending on the number of database changes that have occurred since the last backup, manually applying recent changes after database restoration can be a time-intensive process. Make absolutely sure that restoration is necessary before performing this task.

Important! The data being restored must be data that was originally backed up from the same network element with the same TID. If the TID for the network element has been changed since the last backup, the data cannot be restored.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S4 or greater.

Related information For related information, see the following sections in this document:

- Chapter 9, “Software Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 601: Manually Backing Up Software or Data from Primary Memory to Secondary Memory” (16-10)
- “Task 603: Manually Backing Up Data from Primary Memory to the Optical Craft Interface” (16-15)
- “Task 604: Manually Restoring Data from the Optical Craft Interface to Primary Memory” (16-17)

Task Complete the following steps to manually restore network element data from the secondary NVM to the active primary NVM.

.....

1 Remove the system from service.

Reference: “Task 303: Removing Equipment from and Returning Equipment to Service” (12-17).

.....

2 At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Software>Copy NVM**.

Result: The Copy NVM Screen appears.

.....

3 Select **Data** as the data type to be copied.

Important! The SWIP calibration files are included in the database and are part of **Data**.

.....

4 Select **Secondary to Active Primary** for the type of copy.

.....

5

IF copying the data...	THEN...
should include a database restore	check the box beside Include Restore.
should not include a database restore	ensure the box beside Include Restore is not checked.

.....

6 Click **OK**.

Result: A Confirmation Screen appears.

7 Click **Yes**.

IF the Data Type being copied is...	THEN...
Data and the Include Restore option was selected	the database is copied into the previous folder of the primary NVM and the system performs a reset. During the reset the database is copied into the current folder of primary NVM and becomes active. During the reset the system automatically disconnects the Optical Craft Interface. When the system reset has completed, the system is in service. Stop! End of Task.
Data and the Include Restore option was not selected	the selected data is copied from the secondary NVM to the previous primary NVM. Continue to the next step.

8 Return the system to an in-service (IS) state.

Reference: “Task 303: Removing Equipment from and Returning Equipment to Service” (12-17).

ND OF STEPS

☐

Task 603: Manually Backing Up Data from Primary Memory to the Optical Craft Interface

Purpose This procedure is used to manually back up data from the LambdaRouter™ All Optical Switch to remote Optical Craft Interface storage.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S4 or greater.
- Ensure that an FTP profile has been created.

Related information For related information, see the following sections in this document:

- Chapter 9, “Software Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 601: Manually Backing Up Software or Data from Primary Memory to Secondary Memory” (16-10)
- “Task 602: Manually Restoring Data from Secondary Memory to Primary Memory” (16-12)
- “Task 604: Manually Restoring Data from the Optical Craft Interface to Primary Memory” (16-17)
- “Task 605: Creating an FTP Profile” (16-19)

Task Complete the following steps to manually back up data from the LambdaRouter™ All Optical Switch to the Optical Craft Interface.

-
- 1** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Software>Remote Backup**.

Result: The Backup Database Screen appears.

- 2** Select **OCI** from the Backup To drop-down list.

Result: The Destination Directory Path updates to display the directory, TID, software release running on the LambdaRouter™ All Optical Switch, and the date and time of the backup.

- 3** Select the **FTP** tab, then select the appropriate FTP profile from the Profile drop-down list.

Result: The FTP profile entry fields are populated with the information for the selected profile.

- 4** Click **Backup**.

Result: A Confirmation Screen appears.

- 5** Click **Yes**.

Result: A Progress Indicator Screen appears and the database is backed up to the Optical Craft Interface.

N D O F S T E P S



Task 604: Manually Restoring Data from the Optical Craft Interface to Primary Memory

Purpose This procedure is used to manually restore data from remote Optical Craft Interface storage to the LambdaRouter™ All Optical Switch.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the work instructions for this task.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S4 or greater.
- Ensure that an FTP profile has been created.

Related information For related information, see the following sections in this document:

- Chapter 9, “Software Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 601: Manually Backing Up Software or Data from Primary Memory to Secondary Memory” (16-10)
- “Task 602: Manually Restoring Data from Secondary Memory to Primary Memory” (16-12)
- “Task 603: Manually Backing Up Data from Primary Memory to the Optical Craft Interface” (16-15)
- “Task 605: Creating an FTP Profile” (16-19)

Task Complete the following steps to manually restore data from remote Optical Craft Interface storage to the LambdaRouter™ All Optical Switch.

1 Remove the system from service.

Reference: “Task 303: Removing Equipment from and Returning Equipment to Service” (12-17).

-
- 2 At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Software>Remote Restore**.

Result: The Restore Database Screen appears.

- 3 Select **OCI** from the Restore From drop-down list.

Result: The Destination Directory Path updates to display the directory, TID, software release running on the LambdaRouter™ All Optical Switch, and the date and time of the backup.

- 4 Select the **FTP** tab, then select the appropriate FTP profile from the Profile drop-down list.

Result: The FTP profile entry fields are populated with the information for the selected profile.

- 5 Select the **OCI** tab and select the data file to be restored.
-

- 6 Click **Restore**.

Result: A Confirmation Screen appears.

- 7 Click **Yes**.

Important! The database restore operation may change previously provisioned parameters.

Result: A Confirmation Screen appears.

- 8 Click **Yes**.

Result: The database is restored from the Optical Craft Interface and the system resets.

N D O F S T E P S



Task 605: Creating an FTP Profile

Purpose This procedure is used to create an FTP profile for the Optical Craft Interface that is used when manually backing up data from a network element to the Optical Craft Interface, or when manually restoring data from the Optical Craft Interface to a network element.

Before you begin Before beginning this task:

- Read and follow all safety precautions in this manual.
- Obtain the IP address for the Optical Craft Interface and ensure that a Microsoft Windows® user name and password have been set up to be used in the FTP profile. Refer to the Microsoft Windows user documentation for information.
- Connect the Optical Craft Interface to the local network element and log in with a Privilege code of S4 or greater.

Related information For related information, see the following sections in this document:

- Chapter 9, “Software Management”
- “Task 200: Connecting or Disconnecting the Optical Craft Interface to or from a Network Element” (11-3)
- “Task 204: Logging into a Network Element from the Optical Craft Interface” (11-13)
- “Task 603: Manually Backing Up Data from Primary Memory to the Optical Craft Interface” (16-15)
- “Task 604: Manually Restoring Data from the Optical Craft Interface to Primary Memory” (16-17)

Task Complete the following steps to create an FTP profile for the Optical Craft Interface.

1

IF...	THEN...
creating a default FTP profile	go to “SE 605-1: Creating a default FTP profile” (16-21).
creating an FTP profile for a specific user	continue to the next step.

-
- 2** At the Optical Craft Interface, from the System View Main Menu bar, select **Configuration>Software>Remote Backup**.

Result: The Backup Database Screen appears.

- 3** Select the **FTP** tab.

Result: The Backup Database Screen updates to display the FTP profile entry fields.

- 4** Enter the following information:

Field	Description
Profile	A unique name for the FTP profile.
User Name and Password	A valid Microsoft Windows user name and password that have already been created on the Optical Craft Interface.
Server	The IP address of the Optical Craft Interface.

- 5** Click **Add**.

Result: The profile is added to the FTP profile list.

- 6** Click **Save**.

Result: The FTP profile list is saved.

- 7** Click **Close**.

Result: The Backup Database Screen closes.

N D O F S T E P S

SE 605-1: Creating a default FTP profile

Complete the following steps to create a default FTP profile for the Optical Craft Interface.

-
- 1** At the Optical Craft Interface, from the Network View Main Menu bar, select **Administration>View OCI IP Addresses**.

Result: The OCI IP Address Administration Screen appears.

-
- 2** Enter the FTP IP address, FTP User ID, and FTP password for the Optical Craft Interface. Enter the FTP password in both the FTP User Password and Confirm Password fields.

-
- 3** Click **Apply**.

Result: The OCI IP Address Administration Screen closes.

END OF STEPS





Appendix A: Optical Craft Interface (OCI) Tutorial

Overview

Purpose This tutorial provides an overview of the Optical Craft Interface (OCI) features and capabilities, and information on how to navigate and use the graphical user interface (GUI).

Important! Multiple versions of the Optical Craft Interface GUI can be installed on the Optical Craft Interface at the same time. Screens, menus, and messages shown in this tutorial may differ slightly from those that appear on your system.

Related information This tutorial is intended to provide generic information relating to the Optical Craft Interface GUI operation only. For detailed information on how to use the Optical Craft Interface to perform specific tasks on a LambdaRouter™ All Optical Switch, refer to the following manuals that are appropriate for your system:

- User Operations Guide
- Alarm Messages and Trouble-Clearing Guide
- Operations Systems Engineering Guide

Unless otherwise specified, the term network element refers to any LambdaRouter™ All Optical Switch (AOS) 128/256 system.

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Hardware Overview

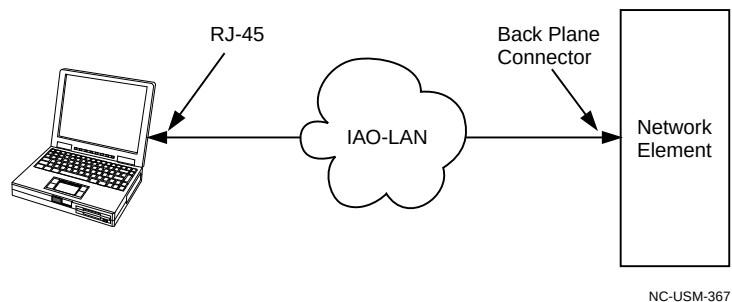
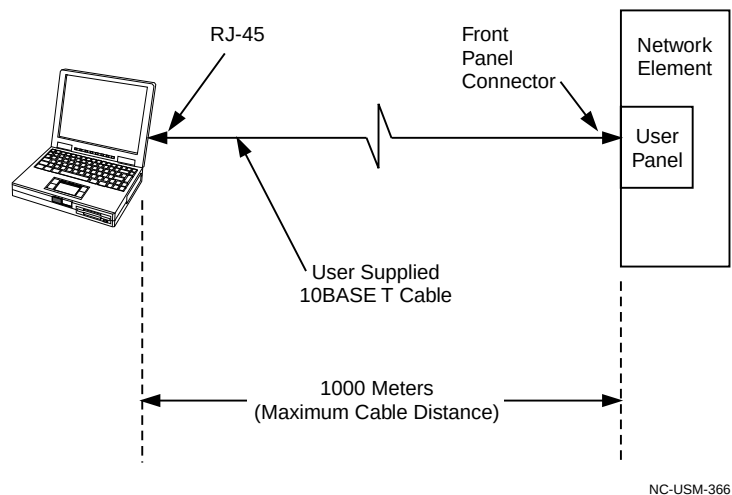
Description	The Optical Craft Interface is a customer-furnished laptop or desktop computer that is the primary tool used by Craft personnel to interface with, and provision, a network element. The Optical Craft Interface provides • a Windows-based GUI • a Transaction Level 1 (TL1) cut-through command interface • direct and remote access to network elements • security features to prevent unauthorized access
Minimum system requirements	It is recommended that the computer used to run the Optical Craft Interface application meet or exceed the following specifications: • Microsoft Windows 2000 Professional or Microsoft Windows NT Workstation 4.0 with Service Pack 6 or later • Intel <i>Pentium</i>® III 500 MHz processor with 256 MB of RAM • standard floppy drive for 1.44 MB 3.5-inch disks • a 6.5 GB hard disk with 500 MB free space • 4x speed CD-ROM drive • Personal Computer Memory Card International Association (PCMCIA) Type II slot with driver software that supports read/write of PCMCIA flash disk cards • SVGA color display capable of 1024 x 768 resolution • 10/100BaseT network interface card Additional software that must be installed on the computer used to run the Optical Craft Interface application includes: • Microsoft Peer Web Services (FTP server or equivalent) • Adobe® Acrobat® Reader 4.0 or later (used to view online user documentation) The Optical Craft Interface application requires a minimum of 50 MB of hard disk space. An additional 30 MB is required during installation of the Optical Craft Interface software.

Communication

The Optical Craft Interface communicates with the network of LambdaRouter™ All Optical Switch network elements via a 10/100BaseT Local Area Network (LAN) connection.

The physical connection of the Optical Craft Interface to the LAN may be either by direct connection to the CIT Port on the network element System Controller Shelf User Panel, or by a network connection using the intraoffice local area network (IAO LAN).

The interface between the Optical Craft Interface and the network element supports TL1 commands and File Transfer Protocol (FTP) for software downloads and provisionable data backup and restore.



Software Overview

Features and uses The Optical Craft Interface application is a graphical user interface (GUI) that provides full access to the administrative, maintenance, and provisioning capabilities of the network element.

The services provided by the Optical Craft Interface include

- protection from unauthorized access to Optical Craft Interface and network element functions through the use of logins, passwords, and multiple authorization levels
- easy access to each network element in the local network
- visual display of the bays, shelves, and equipped circuit pack types and states for a network element
- provisioning of cross-connections, equipment, software management, and fault management for a network element
- software upgrade and database backup and restore for a network element
- report generation for network element equipage, cross-connections, alarms, and states

Multi-User capability A maximum of seven user IDs, each with an assigned password, privilege level, and preference information, may be provisioned on the Optical Craft Interface.

Two of the seven user IDs are Superuser IDs that are automatically configured when the Optical Craft Interface application is installed. The Superusers cannot be deleted, and with the exception of changing the Superuser password, may not be modified.

The remaining five user IDs can be added, modified, or deleted as necessary, and are provisioned by a Security Administrator (Superuser or any other user with an S5 security privilege).

Only one user may be logged into the Optical Craft Interface at a time. However, the one user logged into the Optical Craft Interface can be logged into up to five network elements at a time. Each network element can accommodate up to 26 simultaneous Optical Craft Interface sessions (24 users plus two Superusers).

Window components

The Optical Craft Interface application uses standard Microsoft Windows-based GUI components, which include:

- title bar
- menus (available from a menu bar and, in some cases, right-click pop-up menus)
- toolbar
- status bar
- display areas/views

Important! Not all window components are available in every view.

Window types

The Optical Craft Interface application uses the window types described in the following table:

Window Type	Description
Display Screen or View	A primary window that displays a graphical depiction of an object and allows the user to view configuration information or parameters (but not set them), or to select an object for further interaction.
Modal Window	A secondary window which requires the user to complete interaction within that window, including closing the window, before continuing with any further interaction outside the window.
Non-Modal Window	A secondary window which allows the user to interact with any other window.
Dialog Box	A secondary window designed to allow the user to enter additional information.

Navigation

The Optical Craft Interface application uses standard Windows functionality for using the keyboard or a pointing device (such as a mouse, touchpad, trackball, or other integrated pointing device) to navigate screens and select objects. This functionality includes:

- single-clicking the left pointing device button to highlight (or select) a menu item, window button, or other object
- double-clicking the left pointing device button to select or open an object
- pressing the Tab key to advance the cursor to the next window field or button

Pop-up menus The Optical Craft Interface application provides context-sensitive pop-up menus that duplicate some of the functionality of the Main menus.

Right-click with the screen pointer positioned over an element on the screen, or over an area of the screen, to display a pop-up menu with options that are valid for that selection.

Menu shortcuts (hotkeys) Menu shortcuts, or hotkeys, are a keyboard key or combination of keys that invoke a particular command. Optical Craft Interface menus with an underlined letter in the menu name may be accessed using keyboard shortcuts.

Press and hold the **Alt** key, then press the underlined letter in the menu to select that option.

Tooltips Tooltips provide a small pop-up window that contains a brief description of the item currently under the screen pointer.

Position the pointer over the desired object and remain stationary for one to two seconds to display the object tooltip.

Drop-down list boxes Drop-down list boxes are standard Windows control items that display a current setting or option, but can be opened to display a valid list of choices by clicking on the list box or a “down-arrow” button beside the list box.

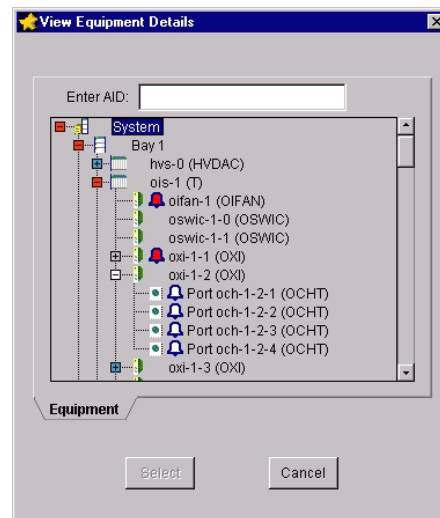
User interface views The following main views make up the Optical Craft Interface application:

- Optical Craft Interface login
- Network View
- System View
- Cut-Through View

All tasks performed on the Optical Craft Interface or a network element use one or more of these views. Each view contains additional screens, menus, and dialogs used to perform the required task.

Equipment selection trees

An equipment selection “tree”, or hierarchy, allows the user to select the desired equipment to be viewed or provisioned. The following figure shows an example of an equipment selection tree.



Equipment selection tree indicators

Expandable branches of the equipment selection tree are indicated by a plus sign (+) in a square box beside the equipment name. Clicking the plus sign expands that equipment selection to display all subtending equipment.

An expanded branch of the equipment selection tree is indicated by a minus sign (-) in a square box beside the equipment name. Clicking the minus sign collapses the equipment selection.

Equipment that cannot be expanded or collapsed has no plus or minus sign beside the equipment label, indicating that this is the lowest level of equipment that is selectable.

Indicators are provided to show the current alarm status of the equipment. A bell icon is displayed beside the equipment on which an alarm or standing condition event has occurred. The color of the bell icon indicates the severity of the alarm or event (red - critical/prompted, yellow - major/prompted, blue - minor/deferred, white - not alarmed standing condition event/info).

The square box with the plus or minus sign beside each equipment level above the equipment on which an alarm or standing condition event has occurred will also change color to reflect the highest level alarm or event that exists on the subtending equipment.



Optical Craft Interface Login Screen

Overview The Optical Craft Interface Login Screen allows a user to log into and access the Optical Craft Interface application functions.

It should be noted that after successfully logging in, the user is only logged into the Optical Craft Interface and is not automatically logged into a network element.

Once logged in, the user may

- perform provisioning tasks on the Optical Craft Interface
- connect and log into one or more network elements

Login Screen components The Optical Craft Interface Login Screen is made up of the

- copyright screen
- login dialog box

The following figure shows an example of the Login Screen.



Accessing the Optical Craft Interface Login Screen

Before you begin If provisioning tasks will be performed on a network element, connect the Optical Craft Interface to the network element before starting this procedure. If provisioning tasks will be performed only on the Optical Craft Interface, no connection to a network element is required.

Task Complete the following steps to access the Optical Craft Interface Login Screen.

-
- 1** Power on the Optical Craft Interface and boot the Microsoft Windows[®] operating system.
-
- 2** On the Windows desktop, double-click on the Optical Craft Interface icon.

Result: The Optical Craft Interface Login Screen appears.

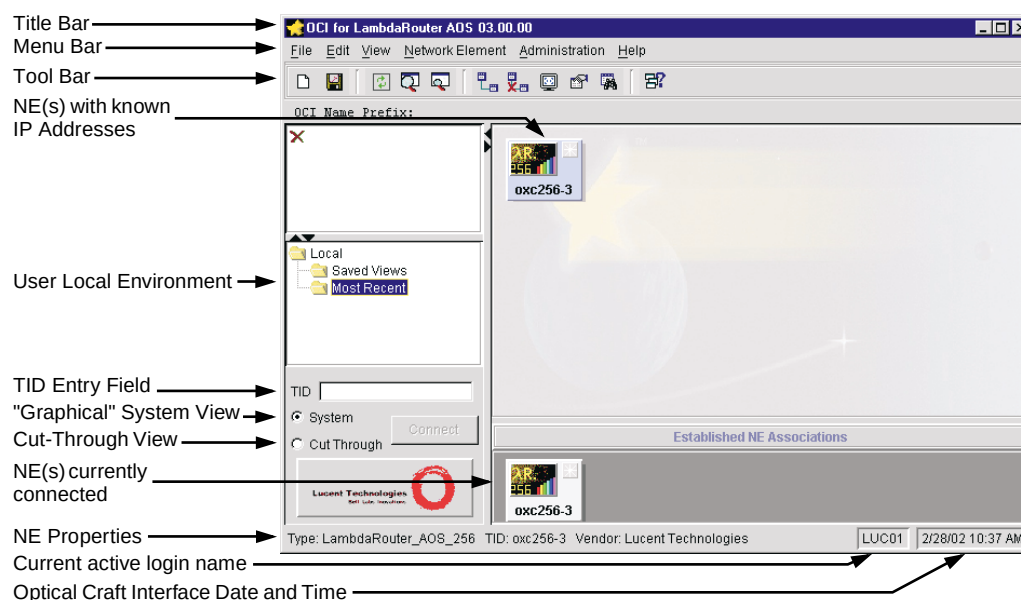
N D O F S T E P S



Optical Craft Interface Network View

- Overview** The Optical Craft Interface Network View allows a user to
- perform provisioning tasks on the Optical Craft Interface
 - view all network elements accessed or previously provisioned with a known TID and IP address
 - connect and log into one or more network elements

Network View components The following figure shows the Optical Craft Interface Network View with major components identified.



NC-LR185

The following table provides a brief description of each Optical Craft Interface Network View component.

Component	Description
Title Bar	Displays the name and software release number of the Optical Craft Interface user interface.
Menu Bar	Provides the drop-down menus used to provision the Optical Craft Interface and access network elements.
Tool Bar	Provides one-click access to certain menu commands.
NE(s) with Known IP Addresses	Shows an icon view of each of the network elements with a known TID and IP address that are available for connection.
User Local Environment	Provides an Explorer-like tree view of the local environment. Allows for easy access to saved views and network elements that have been recently connected.
TID Entry Field	Allows for entry of a system Target Identifier (TID) for connection to a network element in either the graphical system view, or the cut-through view.
System View Selection	When selected, manually entering a system TID displays the Optical Craft Interface graphical System View for the network element.
Cut-Through View Selection	When selected, manually entering a system TID displays the Optical Craft Interface Cut-Through View for the network element.
NE(s) Connected	Displays an icon for each network element to which the Optical Craft Interface is currently connected.
NE Properties	Displays network element type, TID, and vendor information for a selected network element.
Current Active Login Name	Displays the user ID for the currently logged in user.
Date and Time	Displays the current date and time set locally on the Optical Craft Interface.



Optical Craft Interface Network View Menus

Main menu The Optical Craft Interface Network View Main menu bar has the following menu selections:

- File
- Edit
- View
- Network Element
- Administration
- Help

Each Main menu selection allows a user to perform specific tasks as described in this manual. The currently logged in user must have the appropriate security privilege code to access the Network View menus.



Accessing the Optical Craft Interface Network View

Before you begin If provisioning tasks will be performed on a network element, connect the Optical Craft Interface to the network element before starting this procedure. If provisioning tasks will be performed only on the Optical Craft Interface, no connection to a network element is required.

Task Complete the following steps to access the Optical Craft Interface Network View.

-
- 1** With the Optical Craft Interface Login Screen displayed (see “Accessing the Optical Craft Interface Login Screen” (A-11)), enter a valid user ID and password and click **OK**.

Result: A Legal Notice Screen appears.

-
- 2** Click **OK**.

Result: The Legal Notice Screen closes and the Optical Craft Interface Network View appears.

N D O F S T E P S



Configuring Display Preferences

Before you begin A connection to a network element is not required to perform this task.

Task Complete the following steps to configure the Optical Craft Interface display preferences.

-
- 1** From the Optical Craft Interface Network View Main menu (see “Accessing the Optical Craft Interface Network View” (A-15)), select **View>Preferences**.

Result: The Preferences dialog box appears.

-
- 2** Click the **Network View** tab and configure the icon size, screen dividers, and miscellaneous preference settings as required.

-
- 3** Click the **System View** tab and configure the alarm format settings as required.

-
- 4** Click the **Toolbar** tab and select the toolbar location and the buttons that will be available on the toolbar as required.

-
- 5** Click **OK**.

Result: The Preferences dialog box closes and the Optical Craft Interface Network View appears. The new settings take effect immediately.

N D O F S T E P S



Saving or Creating Network Views

Before you begin A connection to a network element is not required to perform this task.

Task Complete the following steps to save the information being displayed in the Network View.

- 1 With the Optical Craft Interface Network View displayed (see “Accessing the Optical Craft Interface Network View” (A-15)), save or create a network view.

IF...	THEN...
the information currently displayed in the Network View is being saved to a specified view name	from the Network View Main menu, select File>Save View As . Result: The Save View As dialog box appears. Continue to Step 2.
a new blank view is being created	from the Network View Main menu, select File>New View . Result: The New View dialog box appears. Continue to Step 2.

-
- 2 Enter the desired name for the view and click **OK**.

Result: The view is saved, and the specified view name appears in the Saved Views directory.

.....
N D O F S T E P S
.....



Creating Network Element Icons in a Saved Network View

Before you begin The user must be logged into the Optical Craft Interface to display previously saved views. No network connection is required.

Task Complete the following steps to create network element icons in a saved Network View.

- 1 With the Optical Craft Interface Network View displayed (see “Accessing the Optical Craft Interface Network View” (A-15)), select **Administration>NE Name/Address Administration**.

Result: The NE Name/Address Administration dialog box appears.

- 2 Click **Add**.

Result: The Add IP Address dialog box appears.

- 3 Enter the TID and IP Address information for the network element and click **APPLY**.

Result: A successful completion message appears.

- 4 Click **OK**.

Result: The Optical Craft Interface Network View appears.

- 5 With the Optical Craft Interface Network View displayed, in the User Local Environment, expand the **Saved Views** path until the desired view name is displayed.
-

- 6 Click on the desired view name in the **Saved Views** path.

Result: The selected view is displayed.

-
- 7** From the Network View Main menu, select **Edit>New NE**.

Result: The New Icon dialog box appears.

- 8** Enter the TID for the network element, select the network element type, and click **OK**.

Result: A network element icon is displayed in the Network View for the entered TID.

- 9** From the Network View Main menu, select **File>Save Settings**.

Result: The current view information is saved.

ND OF STEPS



Displaying Previously Saved Network Views

Before you begin The user must be logged into the Optical Craft Interface to display previously saved views. No network connection is required.

Task Complete the following steps to display previously saved Network Views.

1 With the Optical Craft Interface Network View displayed (see “Accessing the Optical Craft Interface Network View” (A-15)), in the User Local Environment, expand the **Saved Views** path until the desired view name is displayed.

2 Click on the desired view name in the **Saved Views** path.

Result: The selected view is displayed.

N D O F S T E P S



Deleting Saved Network Views

Before you begin The user must be logged into the Optical Craft Interface to display previously saved views. No network connection is required.

Task Complete the following steps to delete saved Network Views.

1 With the Optical Craft Interface Network View displayed (see “Accessing the Optical Craft Interface Network View” (A-15)), in the User Local Environment, expand the **Saved Views** path until the desired view name is displayed.

2 Click on the desired name in the **Saved Views** path.

Result: The selected view is displayed.

3 From the Network View Main menu, select **File>Delete View**.

Result: The selected view is deleted from the **Saved Views** path.

N D O F S T E P S



Viewing the Most Recent Network Element Connections

Before you begin The user must be logged into the Optical Craft Interface to display the most recent network element connections. No network connection is required.

Task Complete the following steps to display the most recent network element connections.

-
- 1** With the Optical Craft Interface Network View displayed (see “Accessing the Optical Craft Interface Network View” (A-15)), in the User Local Environment, click **Most Recent**.

Result: Icons for the most recent network element connections appear in the Network View.

N D O F S T E P S



Displaying Network Element Properties

Before you begin The user must be logged into the Optical Craft Interface to display the network element properties. No network connection is required.

Task Complete the following steps to display the properties for a selected network element.

-
- 1** With the Optical Craft Interface Network View displayed (see “Accessing the Optical Craft Interface Network View” (A-15)), click on a network element icon.

Result: The network element icon is highlighted.

- 2** From the Optical Craft Interface Network View Main menu, select **Network Element>Properties**.

Result: The NE Properties Screen appears and displays the network element type, TID, and vendor.

- 3** Click **OK**.

Result: The NE Properties Screen closes and the Optical Craft Interface Network View appears.

N D O F S T E P S



Displaying the List of Supported Network Element Types and Releases

Before you begin The user must be logged into the Optical Craft Interface to display the list of supported network elements. No network connection is required.

Task Complete the following steps to display the list of network element types and releases supported by the Optical Craft Interface.

-
- 1 With the Optical Craft Interface Network View displayed (see “Accessing the Optical Craft Interface Network View” (A-15)), select **Help>Supported Network Elements**.

Result: The Supported NEs list box appears.

-
- 2 View the list of supported network element types and releases. Click **OK** when complete.

N D O F S T E P S



Accessing the System View

Before you begin The Optical Craft Interface must be connected to the network and the user must be logged into the Optical Craft Interface to access the System View.

Task Complete the following steps to access the System View.

- 1 With the Optical Craft Interface Network View displayed (see “Accessing the Optical Craft Interface Network View” (A-15)), select a network element to display in the System View.

IF the network element icon...	THEN...
is currently displayed in the Network View	double-click on the network element icon. Result: If the network element has been provisioned with two IP addresses, the IP Address Selection Screen appears. Continue to Step 2. Result: If the network element has been provisioned with one IP address, the Network Element Login Screen appears. Continue to Step 3.
is not currently displayed in the Network View	enter the TID for the network element in the TID field, select the System radio button, then click Connect. Result: If the network element has been provisioned with two IP addresses, the IP Address Selection Screen appears. Continue to Step 2. Result: If the network element has been provisioned with one IP address, the Network Element Login Screen appears. Continue to Step 3.

- 2 Select the IP address to use for the connection and click **OK**.

Result: The Network Element Login Screen appears.

-
- 3** Enter a valid network element user ID and password and click **OK**.

Result: A Legal Notice appears.

- 4** Click **OK**.

Result: The Legal Notice closes and the System View for the selected network element appears. All bays in the network element are displayed.

N D O F S T E P S



Accessing the Cut-Through View

Before you begin The Optical Craft Interface must be connected to the network and the user must be logged into the Optical Craft Interface to access the Cut-Through View.

Task Complete the following steps to access the Cut-Through View.

- 1 With the Optical Craft Interface Network View displayed (see “Accessing the Optical Craft Interface Network View” (A-15)), select a network element.

IF the network element TID...	THEN...
is currently displayed as an icon in the Network View	right-click on the network element icon and select Cut-Through from the pop-up menu. Continue to Step 3.
is not currently displayed in the Network View and will be manually entered	enter the TID for the network element in the TID field, select the Cut-Through radio button, then click Connect . Continue to Step 3.
is not currently displayed in the Network View and will be selected from a list of TIDs	from the Network View Main menu, select Network Element>Cut-Through . Result: The NE Cut-Through List dialog box appears. Continue to the next step.

- 2 Select either the **directory** or **Local data store** radio button to display a list of known TIDs. Select a TID from the Found box, then click **Cut-Through**.

3

IF the network element...	THEN...
has been provisioned with two IP addresses	the IP Address Selection Screen appears. Select the IP address to use for the connection and click OK .
has been provisioned with one IP address	continue to the next step.

4

IF...	THEN...
the Login Screen appears	continue to Step 7.
the Login Screen does not appear	the TID and IP address may be incorrect or there may be a problem communicating with the network element. Verify the TID and IP address are correct. Make corrections as necessary. Refer to “Task 203: Provisioning the Optical Craft Interface with Network Element TIDs and IP Addresses” (11-10). Return to Step 1 once. If the connection fails a second time, continue to the next step.

5 Click the Microsoft Windows **Start** button, then select **Programs> Command Prompt**.

Result: The Command Prompt Window appears.

-
- 6** In the command prompt window, enter `ping <IP address>` to determine if there are communications with the network element. Replace `<IP address>` with the IP address of the network element to which a connection is being attempted.

IF the ping command...	THEN...
indicates there are no communications (a Request Timed Out error is displayed)	contact the local network administrator to clear the problem. When the problem is cleared, return to Step 1.
indicates there are communications (ping reply times are displayed)	the problem may be in the Optical Craft Interface. Call Lucent Technical Support. Stop! End of Task

-
- 7** Enter a valid User ID and Password then click **OK**.

IF...	THEN...
this is the first login for a new user	a message is displayed requesting a password change. Continue to the next step.
this is not the first login for a new user	continue to Step 12.

-
- 8** Click **Yes**.

Result: The Change Expired Password Screen appears.

-
- 9** Enter the password information in the Old Password, New Password, and Confirm Password fields.

Important! The password entered in the New Password and Confirm Password fields must match. Asterisks will be displayed as the passwords are entered.

10 Click **OK**.

Result: A Confirmation Screen appears.

11 Click **Yes**.

Result: The Confirmation Screen closes.

12

IF...	THEN...
the No Listbox File Exist error message appears	click OK to clear the message. The error message is just a warning. The Listbox File is not required. Result: The connection is established and the Cut-Through window appears.
the Cut-Through window appears	the connection is established.

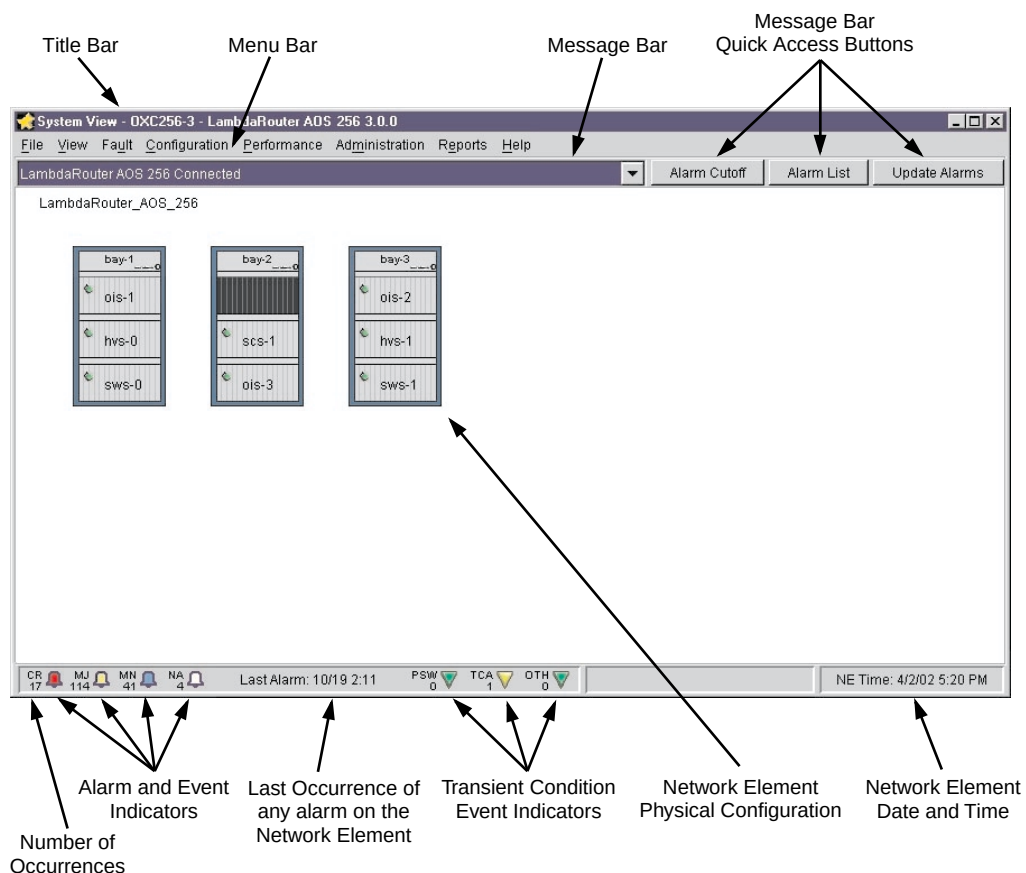
N D O F S T E P S



Optical Craft Interface System View

- Overview** The Optical Craft Interface System View allows a user to
- display a graphical view of the physical configuration of a network element
 - perform system and user provisioning tasks on a network element
 - display shelf and circuit pack details for a network element
 - perform cross-connection operations
 - perform alarm and fault management operations
 - backup and restore software and the database
 - execute and release protection switching
 - change the primary state of selected equipment
 - view reports and logs for a network element
 - restart selected equipment

System View components The following figure shows an example of the Optical Craft Interface System View with major components identified.



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The following table provides a brief description of each Optical Craft Interface System View component.

Component	Description
Title Bar	Displays the type and TID of the network element, and the software release number of the network element.
Menu Bar	Provides the menus used to provision the network element.
Message Bar	Provides a history of messages received in response to commands. Buttons are also provided for Alarm Cutoff, Alarm List, and Update Alarms.
Quick Access Buttons	Provides quick access to Alarm Cutoff, Alarm List, and Alarm Update functions.
Network Element Configuration	Shows an icon view of each of the physical configuration of a network element. Each shelf is shown with an alarm indicator to identify the highest level alarm for that shelf.
Alarm and Standing Condition Event Indicators	Provides a color coded visual indication of alarms and standing condition events that have occurred anywhere within the network element. The number of occurrences for each alarm or standing condition event type is also displayed. If no alarm or event of a specific type has been generated, the corresponding indicator is displayed as green. When alarms or events are generated, the indicators are displayed in the following colors: • Critical (CR) Alarm (or Prompted for SDH) – red • Major (MJ) Alarm (or Prompted for SDH) – yellow • Minor (MN) Alarm (or Deferred for SDH) – blue • Not Alarmed (NA) Standing Condition Event (or Info for SDH) – white
Last Alarm	Displays the date and time of the last occurrence of any alarm or standing condition event on the network element.

Component	Description
Transient Condition (TC) Event Indicators	Provides color coded visual indications of Protection Switch (PSW), Threshold Crossing Alert (TCA), and Other (OTH) transient condition events that have occurred anywhere within the network element. Each indicator also displays the number of occurrences for each TC event type since the last time a list of the TC event type was viewed. After logging into a network element with the OCI GUI, the TC event indicators are initially displayed as green and the counters are set to zero. When TC events occur, the color of the corresponding button indicator changes to light brown and the counter increments for each occurrence of an event. Double-clicking on a TC event indicator button displays a tabbed screen that provides a detailed list for each TC event type. The active tab corresponds to the TC event type that was selected. When the TC event list is displayed, the button indicator for the selected TC event type is reset to green. However, the TC event counter will not be reset until a different tab is selected, or the TC event list screen is closed. If new TC events occur while the TC event list is displayed, the color of the TC event indicators is not changed, but the TC event counters will be updated.
Date and Time	Displays the current date and time on the network element.



Optical Craft Interface System View Menus

Main menu The Optical Craft Interface System View Main menu bar has the following menu selections:

- File
- View
- Fault
- Configuration
- Performance
- Administration
- Reports
- Help

Each Main menu selection allows a user to perform specific tasks as described in this manual. The currently logged in user must have the appropriate security privilege code on the network element to access the System View menus.



Refreshing the System View

Before you begin The Optical Craft Interface must be connected to the network and the user must be logged into a network element to refresh the System View.

Task Complete the following steps to refresh the System View.

- 1** From the Optical Craft Interface System View Main menu (see “Accessing the System View” (A-25)), select **View>Refresh Equipment**.

Result: The Equipment Selection Screen appears.

- 2** Enter an AID for the desired equipment, or navigate the equipment list by clicking on the plus sign (+) next to each entity.
-

- 3** Highlight the required equipment and click **Select**.

Result: The System View is refreshed (updated) to display current equipage information.

N D O F S T E P S



Viewing the Command Response History

Before you begin The Optical Craft Interface must be connected to the network and the user must be logged into a network element to view the command response history.

Task Complete the following steps to view the command response history.

-
- 1 With the Optical Craft Interface System View displayed (see “Accessing the System View” (A-25)), click on the Message bar.

Result: The Message bar expands to display all command responses received during the current login session.

-
- 2 When viewing of the Command Response History is complete, click on the Message bar in the System View.

Result: The Message bar collapses and displays the most recent command response received.

END OF STEPS



Enabling and Disabling TL1 Logging

Before you begin The Optical Craft Interface must be connected to the network and the user must be logged into a network element to enable or disable TL1 logging.

Task Complete the following steps to enable or disable TL1 logging.

1 Access the Optical Craft Interface System View.

Reference: “Accessing the System View” (A-25).

2

IF TL1 logging...	THEN...
is not currently enabled and is being enabled	from the System View Main menu, select File>Enable TL1 Logging . Result: The Enable TL1 Logging Screen appears. Continue to Step 3.
is currently enabled and is being disabled	from the System View Main menu, select File>Disable TL1 Logging . Result: TL1 commands will no longer be saved to the log file. Stop! End of Task.
is currently enabled and the TL1 log file is being changed	from the System View Main menu, select File>Set/Change TL1 Logging File . Result: The Set/Change TL1 Logging File Screen appears. Continue to Step 3.

3 Select the path for the log file and enter the log file name in the File Name field, then click **Use as Log File**.

Result: All TL1 commands will now be saved to the specified file.

ND OF STEPS



Accessing a Network Element Shelf View

Before you begin The Optical Craft Interface must be connected to the network and the user must be logged into the Optical Craft Interface to access the Shelf View.

Task Complete the following steps to access a Network Element Shelf View.

- 1** With the Optical Craft Interface System View displayed (see “Accessing the System View” (A-25)), double-click on the shelf to display in the Network Element Shelf View.

Result: The Shelf View Screen appears and displays each circuit pack and slot in the selected shelf.

N D O F S T E P S

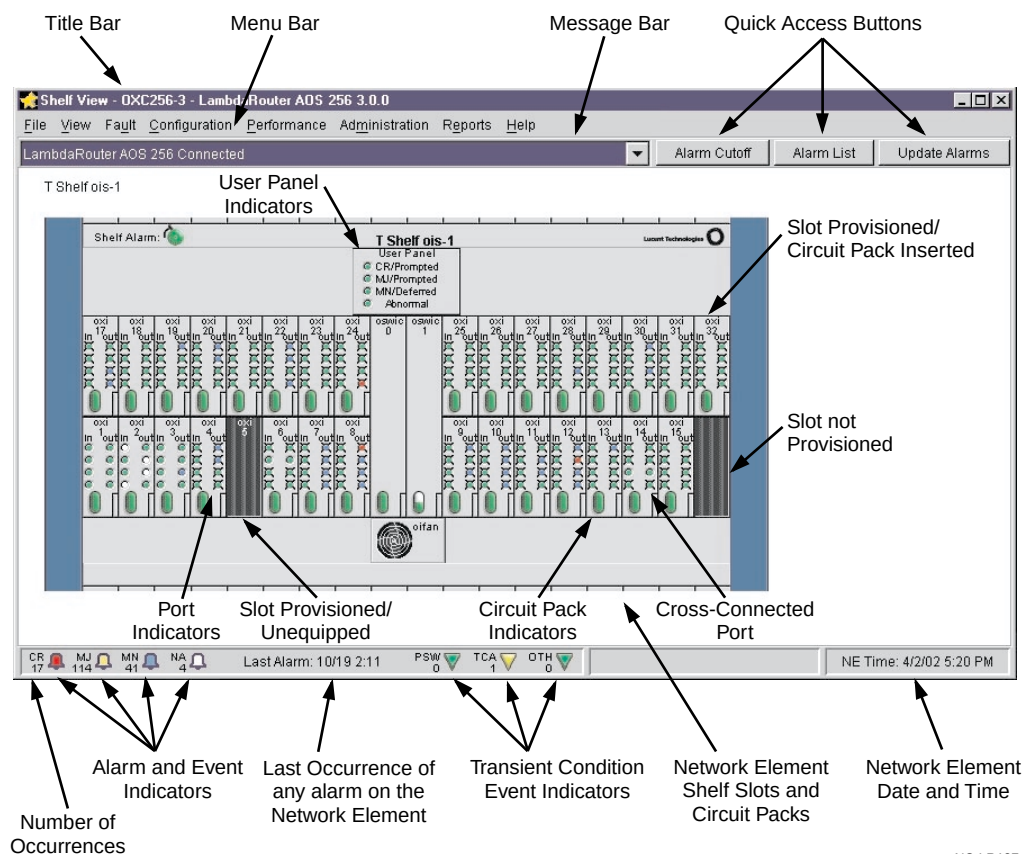


Optical Craft Interface Network Element Shelf View

Overview The Optical Craft Interface Network Element Shelf View allows a user to

- view a graphical representation of a shelf, and the circuit packs in the shelf, within the network element
- access the shelf, individual circuit packs, or ports (when equipped) to view information for, or provision, the shelf, circuit packs, or ports
- view protection information for circuit packs in the shelf (when applicable)
- invoke a protection switch (when applicable)

Network Element Shelf View components The following figure shows an example of an Optical Craft Interface Network Element Shelf View with major components identified.



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The following table provides a brief description of the window components that are unique to the Optical Craft Interface Network Element Shelf View. Refer to “System View components” (A-32) for descriptions of common window components.

Component	Description	
User Panel Indicators	Optical interface shelf, high-voltage shelf, and system controller shelf User Panel indicators provide a visual indication that a Critical alarm (Prompted for SDH), Major alarm (Prompted for SDH), Minor alarm (Deferred for SDH), or abnormal condition (forced protection switch and/or normal or forced loopback) exists on the shelf. System controller shelf User Panel Abnormal indicator provides an indication of the loopback status for the entire system. On any shelf User Panel, only the indicator for the highest level condition will be illuminated at one time.	
Slots and Circuit Packs	Provides a graphical representation of each slot and circuit pack in the shelf. Right-clicking on a slot displays a pop-up menu that allows certain functions to be performed on the slot/circuit pack (including viewing the slot details or performing a protection switch). The appearance of the slot varies as follows:	
	IF the slot appears...	THEN...
	black (empty)	the slot is not provisioned.
	as diagonal lines across a circuit pack faceplate	the slot is provisioned but a circuit pack has not been inserted.
	black with the name of the circuit pack in the slot	the slot is provisioned but the circuit pack has been extracted. The slot is unequipped.
	as a circuit pack faceplate	the slot is provisioned and a circuit pack is inserted.

Component	Description
Circuit Pack Indicators	Provides a visual indication that circuit pack alarms have occurred and the current state of the circuit pack. The indicators appear on the circuit pack “faceplate”. The alarm indicator (alarm bell icon) is only displayed if an alarm has occurred on the circuit pack. The color of the alarm indicator identifies the severity of the alarm: • red – Critical (CR) Alarm (or Prompted for SDH) • yellow – Major (MJ) Alarm (or Prompted for SDH) • blue – Minor (MN) Alarm (or Deferred for SDH) • white – Not Alarmed (NA) Standing Condition Event (or Info for SDH) The circuit pack state indicator is always displayed on the circuit pack faceplate and provides a visual indication of the current primary and secondary state of the circuit pack: • all green – IS-NR, ACT • half green, half white – IS-NR, STBY • red – OOS • question mark – unknown state, circuit pack not inserted
Port Indicators	Provides a color coded visual indication of the status of ports available on optical cross-connect interface, Restoration Interface Processor (RIP), and Restoration Controller (RC) circuit packs. The port indicators are displayed in the following colors: • green – no alarm condition exists for the port • red – a critical (prompted for SDH) alarm condition exists for the port • yellow – a major (prompted for SDH) alarm condition exists for the port • blue – a minor (deferred for SDH) alarm condition exists for the port • white – a not-alarmed (information for SDH) condition exists for the port • flashing red – incoming loss of signal (LOS) A black cross on a port indicator (regardless of the color of the indicator) identifies cross-connected ports. Right-clicking on a port indicator displays a pop-up menu that allows certain functions to be performed on the port (including viewing the port details or provisioning the port).

Component	Description
SWIP Block and SWIP Indicators	Provides a color coded visual indication of the status of the SWIP Blocks and SWIPs on a Switch Shelf. The SWIP Blocks are displayed in the following colors: • white – the SWIP block is unassigned • light grey – the SWIP block is reserved • dark grey – the SWIP block is assigned The SWIPs are displayed in the following colors: • green – the SWIP status is In-Service • grey – the SWIP status is Available • white – the SWIP status is Suspect • a black cross – the SWIP status is Defective • red with a black cross – the SWIP status is Defective and Alarmable Right-clicking on a SWIP Block or SWIP displays a pop-up menu that allows certain functions to be performed on the SWIP Block or SWIP (including viewing details or provisioning a SWIP).



Optical Craft Interface Network Element Shelf View Menus

Main menu The Optical Craft Interface Network Element Shelf View Main menu bar has the following menu selections:

- File
- View
- Fault
- Configuration
- Performance
- Administration
- Reports
- Help

Each Main menu selection allows a user to perform specific tasks as described in this manual. The currently logged in user must have the appropriate security privilege code on the network element to access the System View menus.



Displaying Equipment Details

Before you begin The Optical Craft Interface must be connected to the network and the user must be logged into a network element to display shelf, circuit pack, and port information.

Task Complete the following steps to display shelf, circuit pack, port, SWIP block, and SWIP information.

- 1** With the Optical Craft Interface Network Element Shelf View displayed (see “Accessing a Network Element Shelf View” (A-39)), display detail information for the shelf or for a slot/circuit pack.

IF displaying information for...	THEN
a shelf	right-click with the screen pointer positioned anywhere within the shelf EXCEPT over a slot. Result: A pop-up menu appears.
a slot/circuit pack	right-click with the screen pointer positioned anywhere within the desired slot/circuit pack EXCEPT over a port. Result: A pop-up menu appears.
an OCH port or an RC, RIP, or Personality Module port	right-click with the screen pointer positioned over the desired port. Result: A pop-up menu appears.
a SWIP block	right-click with the screen pointer positioned over the desired SWIP block. Result: A pop-up menu appears.
a SWIP	right-click with the screen pointer positioned over the desired SWIP. Result: A pop-up menu appears.

2

IF displaying information for...	THEN...
a shelf, slot/circuit pack, port, or SWIP	select View Details from the pop-up menu. Result: The View Details Screen appears for the selected object.
a SWIP block	select List Block Details from the pop-up menu. Result: The SWIP Block Details Screen appears for the selected object.

3 Click **Close**.

Result: The View Details Screen closes and the Network Element Shelf View appears.

N D O F S T E P S



Refreshing the Network Element Shelf View

Before you begin The Optical Craft Interface must be connected to the network and the user must be logged into a network element to refresh the Network Element Shelf View.

Task Complete the following steps to refresh the Network Element Shelf View any time the network element configuration or status may have changed since the last time the Optical Craft Interface retrieved the network element information.

- 1** With the Optical Craft Interface Network Element Shelf View displayed (see “Accessing a Network Element Shelf View” (A-39)), refresh the shelf view, or an individual slot, OCH port, or SWIP block in the shelf.

IF refreshing...	THEN...
any shelf view	right-click with the screen pointer positioned anywhere within the shelf EXCEPT over a slot. Result: A pop-up menu appears.
any slot/circuit pack	right-click with the screen pointer positioned over the slot/circuit pack to be refreshed. Result: A pop-up menu appears.
an OCH port (optical interface shelf view only)	right-click with the screen pointer positioned over the OCH port to be refreshed. Result: A pop-up menu appears.
SWIP block (switch shelf view only)	right-click with the screen pointer positioned over the SWIP block to be refreshed. Result: A pop-up menu appears.

2 Select the appropriate refresh option from the pop-up menu.

IF refreshing...	THEN...
any shelf view	select Refresh Shelf . Result: A Confirmation dialog box appears.
any slot/circuit pack	select Refresh Circuit Pack . Result: The circuit pack is refreshed (updated) to display current equipage information. Stop! End of Task.
an OCH port (optical interface shelf view only)	select Refresh Port . Result: The OCH port is refreshed (updated) to display current status information. Stop! End of Task.
SWIP block (switch shelf view only)	select Refresh Block . Result: The SWIP block is refreshed (updated) to display current status information. Stop! End of Task.

3 Click **Yes**.

Result: The Network Element Shelf View is refreshed (updated) to display current equipage information.

N D O F S T E P S



Returning to the Network Element System View

Before you begin The Optical Craft Interface must be connected to the network, the user must be logged into a network element, and a Shelf View must be currently displayed.

Task Complete the following steps to return to the Network Element System View from the Network Element Shelf View.

-
- 1** From the Optical Craft Interface Network Element Shelf View Main menu (see “Accessing a Network Element Shelf View” (A-39)), select **View>System View Display**.

Result: The Network Element Shelf View closes and the Network Element System View appears.

END OF STEPS



Optical Craft Interface Cut-Through View

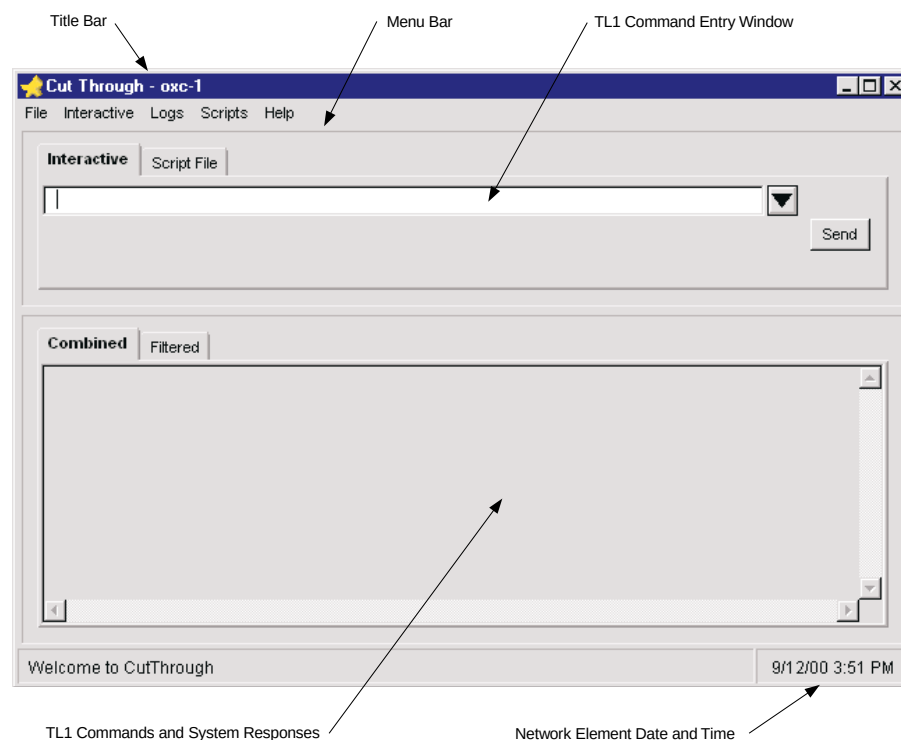
Overview The Optical Craft Interface Network Cut-Through View allows a user to bypass the graphical user interface and manually execute TL1 commands on a network element.

The TL1 commands may be executed either one at a time (interactive mode) or as part of a script.

Cut-Through View components

Important! When performing provisioning tasks with the graphical user interface, warnings are generated to inform the user if an action may have service affecting results. No service affecting warnings are generated when using the Cut-Through View.

The following figure shows the Optical Craft Interface Cut-Through View with major components identified.



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The following table provides a brief description of each Optical Craft Interface Cut-Through View component.

Component	Description	
Title Bar	Displays the TID of the selected network element.	
Menu Bar	Provides the drop-down menus used to execute TL1 commands and scripts.	
TL1 Command Entry	Allows the user to manually enter TL1 commands, select TL1 commands from a list, or select a TL1 command script.	
TL1 Commands and System Responses	Displays the TL1 commands and the system responses to the commands. There are two display modes: combined and filtered.	
	Mode	Description
	Combined	Displays commands in the order in which they are sent along with system responses as they are received. In this mode, the commands and their associated responses may be separated by other commands and responses.
	Filtered	Displays sent commands only after a system response to the command is received. Autonomous messages are displayed in a separate window.
Date and Time	Displays the current date and time set on the network element.	



Optical Craft Interface Cut-Through View Menus

Main menu The Optical Craft Interface Cut-Through View Main menu bar has the following menu selections:

- File
- Interactive
- Logs
- Scripts
- Help

Each Main menu selection allows a user to perform specific tasks as described in this manual. The currently logged in user must have the appropriate security privilege code on the network element to access the Cut-Through View menus.



Entering TL1 Commands in Interactive Mode

Task Complete the following steps to enter TL1 commands in interactive mode.

- 1 With the Optical Craft Interface Cut-Through View displayed (see “Accessing the Cut-Through View” (A-27)), enter or select a TL1 command in the **TL1 Command Entry** field.

IF...	THEN...
manually entering a TL1 command	type the TL1 command in the TL1 Command Entry field. Continue to Step 2.
selecting a TL1 command from a list	click the down-arrow located beside the TL1 Command Entry field to display a drop-down list of TL1 commands, then select the desired TL1 command from the list. Result: The selected command appears in the TL1 Command Entry field.

- 2 Click **Send**.

Result: The result of the TL1 command execution is dependant upon the command response mode. See “Changing TL1 Command Response Mode” (A-55).

- 3

IF...	THEN...
the command response mode is Combined	the TL1 command appears in the TL1 Command/Response window. The system response is displayed when it is received.
the command response mode is Filtered	the TL1 command is displayed in the TL1 Command/Response window when the system response to the command is received.

-
- 4** Repeat this task as necessary to enter additional TL1 commands in interactive mode.

N D O F S T E P S



Changing TL1 Command Response Mode

Task Complete the following steps to change the TL1 command response mode to either Combined or Filtered.

- 1** With the Optical Craft Interface Cut-Through View displayed (see “Accessing the Cut-Through View” (A-27)) select the desired TL1 command response mode.

IF setting the command response mode to...	THEN...
combined	click the Combined tab located above the TL1 Command/Response window.
filtered	click the Filtered tab located above the TL1 Command/Response window.

- 2** Execute TL1 commands as required.

IF...	THEN...
executing TL1 commands in Interactive mode	see “Entering TL1 Commands in Interactive Mode” (A-53).
executing a TL1 command script	see “Running a TL1 Command Script” (A-57).

ND OF STEPS



Creating a TL1 Command Script

Task Complete the following steps to create a TL1 command script.

- 1 With the Optical Craft Interface Cut-Through View displayed (see “Accessing the Cut-Through View” (A-27)), select **Scripts>New** from the Main menu.

Result: A warning message is displayed indicating that ASCII text is the only file format supported.

- 2 Click **OK**.

Result: The *Microsoft Windows*® Notepad appears.

- 3 Enter the TL1 commands in the script file as required.

Note the following:

- one TL1 command is allowed per line
- lines beginning with // are ignored

- 4 When the script is complete, from the Notepad Main menu, select **File>Exit**.

Result: A Confirmation Screen is displayed.

- 5 Click **Yes**.

Result: The SaveAs dialog box appears.

- 6 Enter a name for the command script, select the destination directory, and click **Save**.

Result: The command script is saved.

END OF STEPS



Running a TL1 Command Script

Task Complete the following steps to run a TL1 command script.

- 1 With the Optical Craft Interface Cut-Through View displayed (see “Accessing the Cut-Through View” (A-27)), select **Scripts>Run** from the Main menu.

Result: The Run TL1 Script File dialog box appears.

- 2 Enter the path and filename for the TL1 command script, or click **Browse** to select the script file.

- 3 Click **OK**.

Result: The Select TL1 Script Execution Mode dialog box appears.

- 4 Select the TL1 script execution mode.

IF...	THEN...
Pause and Prompt Each Command is selected	the script will pause after each command is sent.
Stop on Deny from NE is selected	the script will stop executing commands if a deny is received from the network element.
Send All Commands is selected	all script commands will be sent to the network element.

- 5 Click **OK**.

Result: The TL1 command script begins executing.

6

IF the execution mode is...	THEN...
Pause and Prompt Each Command	the script pauses after each command is sent and a dialog box appears asking if the next command should be sent. Continue to Step 7.
Stop on Deny from NE	all commands are sent to the network element. Continue to Step 8.
Send All Commands	all commands are sent to the network element. After the last command is sent, a Warning message appears. Continue to Step 9.

7

IF...	THEN...
the next command should be executed	click Yes . Repeat Step 7 for each command. Result: When the last command has been sent to the network element, a Warning message appears. Continue to Step 9.
the next command should not be executed	click No . Result: Execution of the command script is aborted and a Warning message appears. Continue to Step 9.

8

IF...	THEN...
no Deny is received from the network element.	all commands are sent to the network element. After the last command is sent, a Warning message appears.
a Deny is received from the network element.	execution of the command script is aborted and a Warning message appears.

9 Click **OK**.

Important! Continue to monitor the TL1 Command/Response window for responses received from the network element.

Result: The Warning message closes and the Cut-Through View appears.

N D O F S T E P S



Stopping a Running TL1 Command Script

Task Complete the following steps to stop a running TL1 command script.

-
- 1** With the Optical Craft Interface Cut-Through View displayed (see “Accessing the Cut-Through View” (A-27)) and a TL1 command script running, select **Scripts>Stop** from the Main menu.

Result: A Confirmation dialog box appears.

- 2** Click **Yes**.

Result: The command script aborts and a Warning message appears.

- 3** Click **OK**.

Result: The Warning message closes and the Cut-Through View appears.

N D O F S T E P S



Exiting the Optical Craft Interface Cut-Through View

Task Complete the following steps to exit the Optical Craft Interface Cut-Through View.

-
- 1** Enter `CANC-USER:<tid>::logoff;` in the TL1 Command Entry Field, or select the CANC-USER command from the Cut-Through Window List Box and edit the command line to include the network element TID as appropriate, and click **Send**.

Result: The login session is terminated.

- 2** With the Optical Craft Interface Cut-Through View displayed (see “Accessing the Cut-Through View” (A-27)), select **File>Exit** from the Main menu.

Result: A Confirmation dialog box appears.

- 3** Click **Yes**.

Result: The Cut-Through View closes and the Optical Craft Interface Network View appears.

N D O F S T E P S





Appendix B: Abbreviations and Acronyms

Numerics	10BT 10 BaseT
	10G 10 Gigabits per second
	100BT 100 BaseT
	2G/2.5G 2.5 Gigabits per second
A	ABN Abnormal
	ACO Alarm Cut-Off
	ACO/TST Alarm Cut-Off and Test
	ACT Active
	ACTY Activity
	ADC Analog-to-Digital Converter
	ADM Add/Drop Multiplexer
	AID Access Identifier
	AINS Automatic In-Service
	AIRP Automatic Interconnection Recognition Protocol

AIS Alarm Indication Signal

AIS-L Alarm Indication Signal-Line

AIS-MS Alarm Indication Signal-Multiplex Section

ALM Alarm

ALSO Automatic Laser Shut-Off

ANR Abnormal

ANSI American National Standards Institute

AOS All Optical Switch

APP Apparatus Code

APR Automatic Power Reduction

ARP Address Resolution Protocol

ARST Autonomous Reset

ASAP Alarm Severity Assignment Profile

ASCII American Standard Code for Information Interchange

ASIC Application-Specific Integrated Circuit

ATM Asynchronous Transfer Mode

ATTR Attribute

B **BBE** Background Block Error

BER Signal Degrade B2 Bit Error Rate

BIP Bit Interleaved Parity

BT BaseT

C	CC Communication Client
	CCD CTLI-D Controller Device
	CCN Control Communications Network
	CIT Craft Interface Terminal
	CLEI™ Common Language® Equipment Identifier
	CO Central Office
	COM Common
	CONTR Controller
	CP Circuit Pack
	CP-ID Circuit Pack Identifier
	CPF Circuit Pack Failure
	CPLD Complex Programmable Logic Device
	CPU Central Processing Unit
	CR Critical
	CSA Canadian Standards Association
	CSMA/CD Carrier Sense Multiple Access/Collision Detect
	CSR Composite Service Request
	CTL Controller
	CTLI-D Control Interface to Devices
	CV Coding Violation
	CV-L Coding Violation-Line (Near End)
	CV-LFE Coding Violation-Far End Line
	CV-S Coding Violation-Section

- D** **DAC** Digital-to-Analog Converter
- DATAFLT** Database Fault
- DBCHG** Database Change
- DCC** Data Communications Controller; Data Communications Channel
- DCE** Data Communications Equipment
- DHCP** Dynamic Host Configuration Protocol
- DLC** Download Client
- DLS** Download Server
- DNS** Domain Name Server
- DOS** Detection of Signal
- DTE** Data Terminal Equipment
- DTP** Data Transfer Process
- DVM** Digital Voltage Meter
- DWDM** Dense Wavelength Division Multiplexing
- E** **EB** Errored Block
- EBER** Signal Fail B2 Excessive Bit Error Rate
- ECI** Equipment Catalog Item
- ECS** Express Connection Service
- EEPROM** Electrically Erasable Programmable Read Only Memory
- EI** External Interface
- EIS** Engineering Information Standards
- ELSR** Edge Label Switched Router
- EM** Equipment Management
- EMI** Electromagnetic Interference
- EMS** Element Management System

EO Expansion Operations Network

EOF End of File

EOL End of Line

EOR End of Record

EPROM Electrically Programmable Read Only Memory

EQ Equipped; Equipment

EQPT Equipment

ESD Electrostatic Discharge

ES Errored Seconds

ES-L Errored Seconds-Line (Near End)

ES-LFE Errored Seconds-Far End Line

ES-S Errored Seconds-Section

ETS European Telecommunications Standard

ETSI European Telecommunications Standards Institute

F **FCC** Federal Communications Commission; Fast Communications Channel

FCIO Function Controller Input/Output Device

FDA/CDRH Federal Drug Administration, Center for Devices and Radiological Health

FDP Fiber Distribution Panel

FE Far End

FEND Far End

FI Facility Interface

FIFO First In First Out

FIT Failure In Time

FLT Fault

FM Fault Management

FTP File Transfer Protocol

G GBELX Gigabit Ethernet

GMPLS Generalized Multiprotocol Label Switching

GMT Greenwich Mean Time

GPIO General Purpose Input/Output

GUI Graphical User Interface

H HSBB High-Speed Broadband

HSWIC High-Voltage Shelf Switch Interface Controller

HV High Voltage

HVCPG High-Voltage Shelf Controller Protection Group

HVDAC High-Voltage Digital-to-Analog Converter

HVFAN High-Voltage Shelf Fan

HVS High-Voltage Shelf

I IAO Intraoffice

IAO LAN Intraoffice Local Area Network

ID Identifier

IDC Insulation Displacement Connector

IEC International Engineering Consortium

IEEE Institute of Electrical and Electronics Engineers

IETF Internet Engineering Task Force

IF In Frame

IFMT Interface Format

IIC Inter-Integrated Circuit

IMF Infant Mortality Factor

IMPROPRML Improper Removal

INTSFT Internal Software

I/O Input/Output

IOPT Interface Optics

IP Internet Protocol

IP-CPY-MEM In Progress–Copy Memory

IR Intermediate Reach

IS In Service

IS-NR In Service-Normal

ISO International Standards Organization

ITE Information Technology Equipment

ITU International Telecommunications Union

ITU-T International Telecommunications Union—
Telecommunication Standardization Sector

J **J0** SONET/SDH Section Trace Byte

JTAG Joint Test Action Group

K **KA** Keep Alive

KAALM Keep Alive Alarm

L **L<number>** Layer <number>

L/MS Line/Multiplex Section

LAN Local Area Network

LBC Laser Bias Current

LC Lucent Connector

LED Light-Emitting Diode

LID LED Interface Device; Logical Identifier

LLC Logical Link Control
LLO Lucent Learning Organization
LM Loss Parameter
LMPTST Lamp Test
LOF Loss of Frame
LOS Loss of Signal
LPBKCRS Loopback Cross-Connect
LPBK-DX Loopback–Duplex
LPBK-SX Loopback–Simplex
LR Long Reach
LSAP LLC Service Access Point
LSBB Low Speed Broadband
LVDS Low Voltage Differential Signal

M **M** Maintenance
MA Management; Messaging Agent
MAC Media Access Control
MAN Metropolitan Area Network
MD Mediation Device
MEA Mismatch of Equipment and Attributes
MEM Memory
MEMS Micro-Electromechanical System
MIB Management Information Base
MJ Major
MLOS Mapper Loss of Signal
MMIS Memory Mismatch

MN Minor

MON Monitoring

MONE Monitor E-tributary

MONEF Monitor E- and F-tributary

MONF Monitor F-tributary

MPLS Multiprotocol Label Switching

MS Multiplex Section

MS_F_BBE Multiplex Section Far End Background Block Errors

MS_F_ES Multiplex Section Far End Errored Seconds

MS_F_SES Multiplex Section Far End Severely Errored Seconds

MS_F_UAS Multiplex Section Far End Unavailable Seconds

MS_N_BBE Multiplex Section Near End Background Block Errors

MS_N_ES Multiplex Section Near End Errored Seconds

MS_N_SES Multiplex Section Near End Severely Errored Seconds

MS_N_UAS Multiplex Section Near End Unavailable Seconds

MT Maintenance

MTBMA Mean Time Between Maintenance Activities

MTTF Mean Time To Failure

MTTR Mean Time To Repair

N **NBF** Non-blocking Fabric

NDF New Data Flag

NE Near End; Network Element

NEBS Network Equipment-Building System

NEDS Network Equipment Development Standards

NEND Near End

NIC Network Interface Card

NMON Non-Monitoring

NMS Network Management System

NNI Network to Network Interface

NP Network Path

NR Not Reported

NSA Non-Service-Affecting

NVM Non-Volatile Memory

NVMU Non-Volatile Memory Usage

NVMW Non-Volatile Memory Wearout

NVRAM Non-Volatile RAM

○ **OA** Optical Amplifier

OC-n Optical Carrier <number>

OCH Optical Channel

OCI Optical Craft Interface

OEO Optical to Electrical to Optical

OICPG Optical Interface Shelf Controller Protection Group

OIFAN Optical Interface Shelf Fan

OIM Optical Interface Module

OIS Optical Interface Shelf

OIS-10G Optical Interface Shelf-10Gbps

OIS-2G Optical Interface Shelf-2.5Gbps

OIS-MX Optical Interface Shelf-Mixed

OIS-S Optical Interface Shelf-SDH/SONET

OIS-T Optical Interface Shelf-Transparent

OLS	Optical Line System
OMERR	Out of Memory Error
ON	Operations Network
ONI	Operations Network Interface
ONNS	Optical Network Navigation System
OOF	Out of Frame
OOS	Out of Service
OOS-AU	Out of Service Autonomous
OOS-MA	Out of Service Management
OPI	Operations Peripheral Interface
OPR	Operate; Optical Power Received
OPT	Optical Power Transmitted
OS	Operations System
OSPF	Open Shortest Path First
OSWIC	Optical Interface Shelf Switch Interface Controller
OTDR	Optical Time Domain Reflectometer
OTU	Optical Translator Unit
OXC	Optical Cross-Connect
OXI	Optical Cross-Connect Interface
OXI-10GC	Optical Cross-Connect Interface-10 Gbps Client
OXI-2GC	Optical Cross-Connect Interface-2.5 Gbps Client
OXI-4A13	Optical Cross-Connect Interface-4 ports with optical amplifiers in the 1310 nm band
OXI-4A15	Optical Cross-Connect Interface-4 ports with optical amplifiers in the 1550 nm band

P P Provisioning

PCMCIA Personal Computer Memory Card International Association

PFVP Power Filter Voltage Protection

PFVP-CB Power Filter Voltage Protection with Circuit Breaker

PIC Peripheral Interface Controller

PID Password Identifier

PLD Programmable Logic Device

PM Performance Monitoring

PMD Polarization Mode Dispersion

PMOD Personality Module

POR Power On Reset

PPP Point-to-Point Protocol

PRI Primary Nonvolatile Memory

PROGFLT Program Fault

PROV Provisioned

PSCHG Protection Switch Change

PST Primary State

PU Port Unit

PWR Power

PWRM Power Monitor

Q QoS Quality of Service

- R** **RC** Restoration Controller
- RCCN** Restoration Controllers Communications Network
- RIP** Restoration Interface Processor
- RS** Regenerator Section
- RS_N_BBE** Regenerator Section Near End Background Block Errors
- RS_N_ES** Regenerator Section Near End Errored Seconds
- RS_N_SES** Regenerator Section Near End Severely Errored Seconds
- RS_N_UAS** Regenerator Section Near End Unavailable Seconds
- RSVP** Resource Reservation Protocol
- RSVP-TE** Resource Reservation Protocol-Traffic Engineering
- RU** Resource Usage
- S** **S** Security
- SA** Service-Affecting
- SAP** Service Access Point
- SB** Secondary Boot
- SCC** System Controller Complex
- SCCPG** System Controller Complex Protection Group
- SCFAN** System Controller Shelf Fan
- SCMMA** System Controller in Maintenance
- SCS** System Controller Shelf
- SD** Signal Degrade
- SDH** Synchronous Digital Hierarchy
- SDRAM** Synchronous Dynamic Random Access Memory
- SEC MEM** Secondary Non-Volatile Memory
- SEEPROM** Serial EEPROM

SEFS Severely Errored Framing Seconds

SEFS-S Severely Errored Framing Seconds-Section

SELV Safety Extra Low Voltage

SES Severely Errored Seconds

SES-L Severely Errored Seconds-Line (Near End)

SES-LFE Severely Errored Seconds-Far End Line

SES-S Severely Errored Seconds-Section

SF Signal Fail

SI Switch Interface

SID Source Identifier

SI-S Switch Interface-SONET/SDH (cable)

SI-T Switch Interface-Transparent (cable)

SLA Service Level Agreement

SLN Serial Number

SMC Serial Management Controller

SMEM Secondary MEM

SMF Single Mode Fiber

SMI Serial Management Interface

SMS Service Management System

SN Serial Number

SNIP Serial Number Identification Port

SNMP Simple Network Management Protocol

SNMS SubNetwork Management System

SONET Synchronous Optical Network

SPLTR Splitter

SR Short Reach

SRC Subrack Controller

SSN Series Number

STBY Standby

STBYS Standby Switched

STCHG State Change

STM Synchronous Transfer Mode

STS Synchronous Transport Signal

SWIC Switch Interface Controller

SWIP Switch Interface Point

SWMG SWIP Maintenance Group

SWS Switch Shelf

SYSCTL System Controller

T **T** Test

TA Test Access

TAM Test Access Monitoring

TC Transient Condition

TCA Threshold Crossing Alert

TCP/IP Transmission Control Protocol/Internet Protocol

TID Target Identifier

TL1 Transaction Language 1

TMN Transport Management Network

TSA Test Alarm

TSS Technical Support Services

- U** **UAS** Unassigned; Unavailable Seconds
- UAS-L** Unavailable Seconds-Line (Near End)
- UAS-LFE** Unavailable Seconds-Far End Line
- UDP** User Datagram Protocol
- UEQ** Unequipped
- UI** Unit Interface
- UIA** User Interface Appliance
- UID** User Identification
- UL** Underwriters Laboratories
- UNEQ** Unequipped
- UNI** User to Network Interface
- UPC** User Privilege Code
- V** **V/V** Voltage to Voltage
- VSR** Very Short Reach
- W** **WAN** Wide Area Network
- WDM** Wavelength Division Multiplexing
- WINS** Windows Internet Network Service





Glossary

Numerics

0x1 Facility Interface

A transmission interface without line or equipment protection switching.

0x1 Line Operation

Operation between network elements, without protection in a single bidirectional line (no protection line is available).

1+1 Client Protection

A protection architecture, in which connections between a LambdaRouter™ All Optical Switch and client network elements can be configured as 1+1 at the optical level.

1+1 Protection Group

A protection architecture, in which one working function is protected by one protection function. In addition, the protection function is fully synchronized with the working function. The functions are permanently bridged upstream, and one is selected downstream.

1+1 Restoration

A type of network restoration. The restoration path, including the end-points, is provisioned when initial path provisioning is done. The restoration path always carries the same signal as the service path, and the egress LambdaRouter™ All Optical Switch automatically switches over to it when the service path fails.

1x1 Protection Group

A protection architecture, in which one working function is protected by one protection function. In contrast to the 1+1 Protection Group, the protection function is not fully synchronized with the working function.

A Access Identifier (AID)

A technical specification for explicitly naming entities (both physical and logical) of a network element, following Telcordia TL1 syntax.

Accumulation Registers

Used in performance monitoring. Registers that provide data storage for each SONET (Section and Line) and SDH (Regenerator Section and Multiplex Section) transmission parameter monitored.

Activation

The process of starting software or using the data in execution the first time after installation.

Active (ACT)

Indication that a circuit pack or module is in service and is currently providing service functions. *See also* Standby.

Active Path

One of two signals entering a constituent path selector. The active path is the one currently being selected.

Add/Drop Multiplexer (ADM)

A synchronous network element capable of combining signals of different rates and having those signals added to or dropped from the stream.

Alarm

A visible or audible signal to the operations environment that a communication, equipment, or processing failure has occurred.

Alarm Correlation

A LambdaRouter™ All Optical Switch feature that minimizes the number of alarm messages generated for a single fault condition.

Alarm Cut-Off (ACO)

A mechanism to silence local Central Office audible alarms. It is activated by a user panel button or a user command.

Alarm Indication Signal (AIS)

A code sent downstream in a network to indicate an upstream failure.

Alarm List

A LambdaRouter™ All Optical Switch status report that lists active alarms on the network element. It includes alarm level and type, affected equipment, effect on service, condition description, and additional details of the failure, if available.

Alarm Log

A history and time sequence of the setting and clearing of alarms on the LambdaRouter™ All Optical Switch. The alarm log contains as many as 512 alarm messages. It includes the type of trouble, time of occurrence, identification of affected equipment, effect on service, alarm level, alarm condition state, and additional details of the failure, if available.

Alarm Notification Category

One of the types of LambdaRouter™ All Optical Switch alarm messages: Optical Channel, Equipment, Common, Security, Control Communications Network (CCN), or Quality of Service (QoS) Alarm.

Alarm Severity

An attribute that defines the priority of an alarm message. The way alarms are processed depends on their severity.

American Standard Code for Information Interchange (ASCII)

A standard seven-bit code that represents letters, numbers, punctuation marks, and special characters in the interchange of data among computing and communications equipment.

Apparatus Code (APP)

A circuit pack identifier stored in EEPROM.

Asynchronous

The essential characteristic of time-scales or signals, such that their corresponding significant instants do not necessarily occur at the same average rate.

Asynchronous Transfer Mode (ATM)

A high-speed transmission technology characterized by high bandwidth and low delay. It uses a packet switching and multiplexing technique that allocates bandwidth on demand.

Authorization Level

A numeric code that determines what commands within a functional category a user may access on the LambdaRouter™ All Optical Switch. The authorization level ranges from 0 (lowest) to 5 (highest) for all functional categories except security, which ranges from 1 to 5. Assigning an authorization level of 0 disables that functional category for a particular user.

Automatic Interconnection Recognition Protocol (AIRP)

A protocol used by LambdaRouter™ All Optical Switch in conjunction with LambdaRouter™ Optical Network Navigation System (ONNS), to perform automatic port neighbor discovery.

Automatic Port Neighbor Discovery

A network element process that uses the Automatic Interconnection Recognition Protocol (AIRP) to automatically discover the association of input ports and output ports in adjacent LambdaRouter™ All Optical Switch network nodes.

Auto-Provisioning

The capability of the LambdaRouter™ All Optical Switch to discover its hardware configuration and to create associated database entries autonomously using the original (default) or user-defined, pre-provisioned parameters. These parameters are maintained in non-volatile memory (NVM) and/or hardware registers.

Automatic Protection Switch

A protection switch that occurs automatically in response to an automatically detected fault condition.

B Backup and Restore

The capability to copy and restore databases between Primary Non-Volatile Memory (NVM) and Secondary NVM, Primary NVM and Navis™ Optical Element Management System, and Primary NVM and Optical Craft Interface.

Bandwidth Management

The capability that allows LambdaRouter™ All Optical Switch users to provision either unidirectional or bidirectional optical, or optical-electrical-optical (OEO), cross-connections for transmission paths through the switch fabric.

Bay

A hardware frame in which shelves are mounted and housed.

Bidirectional Line

A transmission path consisting of two fibers that handle traffic in both the transmit and receive directions.

Bit Error Rate (BER)

The ratio of error bits received to the total number of bits transmitted.

Blank (BLK)

The status of a circuit pack slot that contains a bus extender (blank) circuit pack; the pack itself.

Bridging

A one-way 1:2 multicast from an input port where a 1:2 splitter routes the two one-way signals through the duplicated switch fabric to two different output ports. Each one-way leg is a simplex transmission path. *See also* Merging.

Broadband Communications

Voice, data, and/or video communications at greater than 2 Mbps rates.

Busy State

Indication that a port is being used in a cross-connection.

C Calibration Database

A database that indicates initial control voltages for each Switch Shelf mirror in an array. The calibration data is delivered on a non-volatile memory (NVM) card and is installed by inserting the card into the secondary NVM (SEC MEM) on the LambdaRouter™ All Optical Switch.

Card

A removable integrated circuit board/circuit pack.

Central Office (CO)

A building in which common carriers terminate customer circuits.

Channel

A (one-way) transmission pathway from an input port to an output port in the network element, at any supported transmission rate and/or format.

Circuit Pack (CP)

A single field-replaceable electronic or opto-electronic unit. It comprises mechanical piece-parts, electronic components, and their associated connections and performs a specific function.

Circuit Pack Extraction

The process of software acknowledgement of an event associated with the physical removal of a circuit pack from a shelf slot, or the opening of its latch.

Circuit Pack Identifier (CP-ID)

A code that is derived from the circuit pack type (apparatus code), serial number, series number (version), CLEI™ code, and ECI code of each circuit pack. The circuit pack identifier is readable by the system upon insertion of the pack in any allowable slot.

Circuit Pack Insertion

The process of acknowledging and subsequently provisioning a valid circuit pack that has been inserted into a shelf slot. Circuit pack insertion requires equipage and latch closure acknowledgments, and a response to the insertion cannot be completed prior to the detection of the latch closure.

Client

A client network interface.

Cold Standby

A standby function that does not function simultaneously with the active function. It requires a form of initialization (provisioning) before it can assume the role of the active function.

Command Echo

The ability of the LambdaRouter™ All Optical Switch to repeat the text of entered commands to a user provisioned for this feature.

Command Functional Categories

Logical groupings of LambdaRouter™ All Optical Switch commands. These include maintenance (M), provisioning (P), security (S), test (T), and performance monitoring (PM).

Command Group

An administrator-defined group that defines commands to which a user has access.

Common Alarm

A LambdaRouter™ All Optical Switch alarm message category that indicates a controller software fault, controller autonomous reset, data storage problem, software version mismatch, or security-related issue. Common alarm issue points are circuit pack, controller complex, shelf, or system.

Common Language® Equipment Identifier (CLEI™)

A Telcordia code that identifies telecommunications equipment to facilitate inventory, maintenance, investment tracking, and circuit maintenance processes. CLEI codes are stored in circuit pack EEPROM.

Configuration Management (CM)

The activities necessary to create, modify, retrieve, and delete data that controls the configuration and operation of LambdaRouter™ All Optical Switch hardware and software. These activities include equipment provisioning, alarm monitoring and fault management, cross-connection management, software management, and performance management.

Configuration Query

A user-initiated request for a report on provisioned data.

Control Bay

The LambdaRouter™ All Optical Switch frame that contains one System Controller Shelf and up to two Optical Interface Shelves. There is one Control Bay per LambdaRouter™ All Optical Switch system.

Control Communications Network (CCN)

An IP network, using Restoration Controller (RC) and Restoration Interface Processor (RIP) circuit packs, that provides the signaling method used by LambdaRouter™ Optical Network Navigation System (ONNS) to set up and tear down network paths, and to provide restoration in response to path failures.

Control Communications Network (CCN) Alarm

A LambdaRouter™ All Optical Switch alarm message category of alarms that are issued with respect to IP network, port, and process fault detection. Control Communications Network alarms are issued for a port.

Controller Reset

The capability of rebooting shelf controllers locally (manually, on equipment) and through command. An Optical Craft Interface, Navis™ Optical Element Management System, or other managing system can reset the LambdaRouter™ All Optical Switch system or shelf controllers without affecting transmission.

Craft Interface Terminal (CIT)

See Optical Craft Interface (OCI).

Critical (CR) Alarm

An indication of a severe, service-affecting condition.

Cross-Connection

A configurable optical, or optical-electrical-optical (OEO), transmission path interconnection between input and output ports within a single network element.

Cross-Connection Capacity

The total number of cross-connections, as measured by the number of fabric input and fabric output points. A fabric with N input points and N output points provides a cross-connection capacity of N. **See also** Non-Blocking Cross-Connection Capacity; Switch Interface Capacity.

Cross-Connection Configuration

A set of one or more associated cross-connection legs. Examples of configurations that are supported in the LambdaRouter™ All Optical Switch are one-way point-to-point (one duplex leg); two-way point-to-point (two duplex legs); one-way bridge (two simplex legs); one-way merge (two simplex legs); one-way bridge and merge (three simplex legs); and two way bridge and merge (four simplex legs).

Cross-Connection Fabric

See Switch Shelf (SWS).

Cross-Connection Leg

A one-way connection provisioned from one input port to one output port within a single network element. A leg with a transmission path through one switch fabric is called a simplex leg. A leg that has a transmission path between both fabrics is called a duplex leg.

Cross-Connection List

An Optical Craft Interface for LambdaRouter™ status report that lists current cross-connections for the following: a specific port, all ports on a specific circuit pack, all ports on a specific shelf, or all ports in the network element. The report includes the input and output AID, cross-connection type (including loopback type and test access mode), and switch fabric used.

Cross-Connection Loopback

A cross-connection, for maintenance purposes, from an input port through the switch fabric to an output port. An output port may be selected with an access identifier (AID) that is the same or different from the input AID. LambdaRouter™ All Optical Switch supports normal, forced simplex, and forced duplex loopbacks. A forced simplex loopback allows one of the transmission paths in the forward direction to remain operational.

Cross-Connection Management

The activities necessary to establish and remove cross-connections, operate and release loopback cross-connections, and retrieve cross-connection parameters.

Cross-Connection Rate

The transmission rate associated with the cross-connection, which is determined by the type of ports being used. Ports provided by transparent circuit packs allow cross-connections to be bit-rate-independent. Ports provided by optical-electrical-optical circuit packs limit cross-connections to a specific rate, such as 10 Gbps.

Cross-Connection Topology

The basic nature of a cross-connection configuration. All cross-connections can be classified into two topologies: one-way (unidirectional) and two-way (bidirectional).

Cross-Connection Type

See Cross-Connection Configuration.

Crosstalk

An unwanted signal introduced into one transmission path from another.

Cut-Through

An American Standard Code for Information Interchange (ASCII) interface to a network element (NE). It enables the user to send Transaction Language 1 (TL1) messages directly to the NE.

D Data Communications Controller (DCC)

A LambdaRouter™ All Optical Switch circuit pack that provides the interface between the system and the operations data communications network, which is physically accessed via the LAN connection on the External Interface packs. There are two DCC packs on the System Controller Shelf, for active/active service.

Database Labeling

A LambdaRouter™ All Optical Switch feature that records system target identifier (TID), date of last database modification, date backed up from the network element, and the software generic ID, for use in subsequent download operations.

Debug Support

Maintenance activity access for Lucent personnel.

Default Provisioning

The implementation of parameter values that are preprogrammed at the factory.

Defect

A limited interruption of the ability of an item to perform a required function. It may or may not lead to maintenance action, depending on the results of additional analysis. *See also* Failure.

Dense Wavelength Division Multiplexing (DWDM)

The transmitting of two or more signals of different wavelengths simultaneously over a single fiber.

Deprovisioning

The inverse order of provisioning, to manually remove or delete previously provisioned parameters.

Details Screen

A text-based display of parameter settings, states, and all other information related to the detailed item on the display.

Detection of Signal (DOS)

The detection of a signal that meets provisioned threshold values, applying to both input and output ports.

Dialog Box

A secondary Optical Craft Interface graphical user interface (GUI) window designed to allow the user to enter additional information.

Dimmed State

The condition of a graphical user interface control that is not currently available to a user. This state is indicated on the Optical Craft Interface screen by a greyed image.

Discovery

The process of detecting circuit pack presence during system initialization, prior to hardware interrupt enabling.

Dispersion

The phenomenon in which different wavelengths or different polarizations of light travel at different speeds through a fiber optic cable.

Dither

In LambdaRouter™ All Optical Switch, the capability to make small adjustments to the orientation of ingress and egress switch fabric mirrors in order to minimize cross-connection signal loss.

Download

The process of transferring files from a managing system such as the Optical Craft Interface or Navis™ Optical Element Management System to a network element, such as the LambdaRouter™ All Optical Switch. Both software and data can be downloaded to the LambdaRouter™ All Optical Switch. **See also** Upload.

Downstream

At or toward the destination of the considered transmission stream.

Duplex Control

A control architecture that includes two controllers, one active, one standby, that protect each other; if the active one fails, the inactive takes over.

Duplex Cross-Connection

A cross-connection that has a transmission path through both switch fabrics.

Duplex Cross-Connection Fabric

A cross-connection fabric consisting of two identical subunits (Switch Shelves), which form a 1+1 protection group.

E Egress

The direction away from the fabric.

Electromagnetic Compatibility (EMC)

The ability of equipment or systems to operate without causing or receiving degradation from electromagnetic interference (EMI).

Electromagnetic Interference (EMI)

High-energy, electrically induced magnetic fields that cause data corruption in cables passing through the fields.

Electronic Industries Association (EIA)

A trade association of the electronic industry that establishes electrical and functional standards.

Electrostatic Discharge (ESD)

A static electrical energy potentially harmful to circuit packs.

End Guard

A panel that is installed at the ends of a LambdaRouter™ All Optical Switch bay lineup; it meets ETSI standards.

Entity (Entity Type)

A physical or logical aspect of the LambdaRouter™ All Optical Switch, including the entire system, that has been assigned a name recognizable by the system. Examples include: a shelf, slot, port, switch interface point (SWIP), protection group, fan, and so on.

Entity Identifier

A particular entity, which is identified by the last portion of the access identifier (AID) pertaining to the entity. Examples include: a High-Voltage Shelf (HVS), a particular Restoration Controller (RC) slot, a particular optical channel, a particular optical interface shelf protection group, and so on.

E-Port (eport)

A LambdaRouter™ All Optical Switch input port that terminates an incoming “E-tributary”. In traditional networks, an incoming E-tributary refers to a circuit incoming to the Test Access equipment from the Central Office equipment. E-Port also refers to an idle input port to be used for establishing a one-way Test Access cross-connection.

Equipage Check

A system check of equipment that results in an alarm if there is a mismatch between a circuit pack and the provisioned slot in which it is installed.

Equipment Alarm

A LambdaRouter™ All Optical Switch alarm message category that indicates transmission and control equipment failures and service interruption owing to failures in power supply, fuse, or fan assembly, or configuration problems. Equipment alarms are issued for port, circuit pack/slot, shelf, and system.

Equipment Catalog Item (ECI)

A circuit pack identifier stored in Erasable Electrical Programmable Read Only Memory (EEPROM).

Equipment Fail (EF) State

A state in which any of the protection group’s circuit packs have failed, and no higher priority request (for example, Clear, Forced Switch) is present. The protection group leaves the EF state when all EF indications are cleared, or a higher priority request has been received.

Equipment List

A report, available through user request, that lists equipment for a selected shelf, circuit pack, or port in the LambdaRouter™ All Optical Switch. The report includes the AID for the selected entity and other information, such as CLEI code, serial number, and cabling information.

Equipment Protection

The protection switching for the redundant common transmission and control equipment in the network element.

Equipment Provisioning

The assigning of values to a set of parameters of the system, or any of its subsystems, to enable the expected use of the entity. Provisionable LambdaRouter™ All Optical Switch entities include system, shelves, slots/circuit packs, ports, cross-connections, and protection groups.

Equipped (EQ) Status

Indication that a circuit pack or interface module is in the system database and physically in the frame.

Event

Significant change detected by the system. Events in controlled network elements include signal failures, equipment failures, signals exceeding thresholds, and protection switch activity. When an event occurs, the controlled network element will generate an alarm or status message and send it to the managing system.

External Interface (EI)

The LambdaRouter™ All Optical Switch circuit pack that provides interfaces to the Data Communications Controller (DCC) circuit pack, Optical Craft Interface port (CIT port), and Intraoffice (IAO) LAN. The EI provides local office alarm relay closures and miscellaneous discrete inputs and outputs. It also provides the interface to alarm closures on the System Controller Shelf (SCS) User Panel. Duplex EIs are located on the SCS.

Extraction

Physical removal of a circuit pack from a slot, causing a system-initiated removal of an entity from service.

F Fabric

The physical hardware that provides the switching function within the network element; a mesh of interconnections between inputs and outputs. In LambdaRouter™ All Optical Switch, the fabric is a set of mirrors that allows connection between any one of a set of inputs to any one of a set of outputs.

Fabric Wavelength Window

The allowable range of wavelengths transmitted by a given fabric. For LambdaRouter™ All Optical Switch, that range is from 1260 nm to 1360 nm, and from 1500 nm to 1620 nm.

Facility

A one-way or two-way circuit that carries a transmission signal.

Facility Interface (FI)

See Transmission Interface.

Facility Loopback

A loopback of the incoming facility signal to the output of the same facility, without going through a switch fabric. A facility loopback is not supported on LambdaRouter™ All Optical Switch.

Failure

A standing defect. *See also* Software Failure.

Failures in Time (FIT)

A unit of hazard rate used to measure the reliability of non-reparable equipment. A hazard rate of 1 FIT corresponds to a Mean Time to Failure (MTTF) of one billion hours.

Far End (FE, FEND)

Any network element in a maintenance subnetwork other than the one at which the user is posted. *Also called* remote.

Fault

A generic term for anomaly, defect, and failure.

Fault Detection

The ability to identify communications, equipment, and processing failures.

LambdaRouter™ All Optical Switch provides continuous, autonomous, in-service fault detection and isolation on transmission and control equipment.

Fault Management

In LambdaRouter™ All Optical Switch, capabilities that provide fault detection, isolation, reporting and facility/equipment alarms, user/alarm displays, circuit pack LEDs, office alarms, and records provisioning.

Fiber Distribution Panel (FDP)

In LambdaRouter™ All Optical Switch, a Switch Shelf panel that contains connectors for 256 inputs and 256 outputs.

Fiber Management Unit

A LambdaRouter™ All Optical Switch duct used to control and store cables and protect them from physical damage. It is used in both overhead and underfloor installations.

Fiber Organizer

A frame between bays that is used for managing fiber cables.

File Transfer Protocol (FTP)

A protocol used by LambdaRouter™ All Optical Switch for transfer of software and data between the network element and its managing system and between network elements.

F-Port (fport)

A LambdaRouter™ All Optical Switch input port that terminates an incoming “F-tributary”. In traditional networks, an incoming F-tributary refers to a circuit incoming to the Test Access equipment from the facility side. For an existing two-way incoming signal, the input port for either direction can arbitrarily be called the “eport”, and the input port for the other direction is therefore called the “fport”. For a LambdaRouter™ All Optical Switch, an “fport” has no meaning unless a two-way cross-connection already exists.

G General User

An Optical Craft Interface user type with access to all commands except network element (NE) security administration, software installation, system initialization, and NE access capabilities.

Generic

A collection of programs and associated static data that fully support and perform all of the designed functions of the LambdaRouter™ All Optical Switch, Optical Craft Interface, or Navis™ Optical Element Management System (EMS).

Generic Labeling

The unique identification of a software generic release so that it is recognized by the system and is available to the user upon query. The label includes the supplier name and type, version number of the generic, the date built or build number, and the date installed. The generic label information can be retrieved via the managing system or Optical Craft Interface.

H Hard Failure

An unrecoverable nonsymptomatic (primary) failure that causes signal impairment or interferes with critical network functions.

High-Voltage Digital-to-Analog Converter (HVDAC)

The LambdaRouter™ All Optical Switch circuit pack that provides the digital-to-analog converters and high-voltage linear amplifiers used to control a subset of the Micro-electromechanical System (MEMS) mirrors in the Switch Shelf (SWS).

High-Voltage Shelf (HVS)

The LambdaRouter™ All Optical Switch shelf that houses High-Voltage Digital-to-Analog Converter (HVDAC) circuit packs.

High-Voltage Shelf/Optical Interface Shelf (HVS/OIS) User Panel

The LambdaRouter™ All Optical Switch module that receives alarm status information. It provides visual indications of shelf status through LEDs and a means for generating alarm cutoff and LED test interrupts to the shelf Switch Interface Controller (SWIC) circuit packs. **See also** System Controller Shelf (SCS) User Panel.

Hot Standby

A standby function that is fully operational and acts in synchronism with an active function. It is able to take over the role of the active function without the need for initialization. **See also** Active; Cold Standby.

I Idle State

The state of a port that is not cross-connected.

Ingress

The direction toward the fabric.

Insert

The physical insertion of a circuit pack into a slot, causing a system-initiated restoral of an entity into service and/or creation of an entity and associated attributes.

Insertion Loss

The decrease in optical signal power incurred by a signal passing through the entire system.

In-Service (IS) State

An administrative state for equipment entities (ports, circuit packs). IS indicates that the entity is fully capable and allowed to perform its specified functions.

Interface Bay

The LambdaRouter™ All Optical Switch frame that contains optical interface shelves.

Intermediate Reach (IR)

A standard for optics, concerning transmitters and receivers in a system, that insures that transmission can be maintained for intermediate distances (50 km). This standard constrains the output power of the transmitter and the sensitivity of the receiver for moderate haul applications (up to 50 km; a compromise between long and short reaches) without the need for regeneration. ***See also*** Long Reach; Short Reach; Very Short Reach.

International Telecommunications Union–Telecommunications Standards Sector (ITU-T)

One of three sectors of the ITU. The ITU-T sets global telecommunications standards.

Inventory Query

A user-initiated request for a report on all electronic equipment in the system.

J J0 Byte Sequence

A 16-byte sequence of J0 bytes that can be inserted in the section overhead of a SONET or SDH test signal that is being generated by a LambdaRouter™ All Optical Switch OEO input port that is not detecting an incoming signal. The byte sequence will include the IP v4 address of the LambdaRouter™ All Optical Switch and the Access Identifier (AID) of the OEO input port that is generating the test signal. The sequence is transmitted in hexadecimal format, and is used by AIRP and Test Access functions.

Jitter

The short-term variation of the significant instants of a digital signal from their ideal positions in time. Jitter may cause crosstalk or distortion of the original analog signal, or both, and is potentially a source of bit errors at the input ports of digital equipment. ***See also*** Wander.

K Keep Alive

A SONET AIS-L signal used for alarm suppression when an input signal is not present.

L Labeling

The LambdaRouter™ All Optical Switch capability to label database and software generics. **See also** Database Labeling; Generic Labeling.

Lambda

The Greek letter used to signify the wavelength of a complete cycle of signal that propagates through space. Common examples of such signals are radio waves and light waves.

LambdaRouter™ All Optical Switch (AOS)

Generic term used to refer to any LambdaRouter™ All Optical Switch 128/256 configuration.

LambdaRouter™ All Optical Switch (AOS) 128

The Lucent Technologies fully optical signal switching system that uses Micro-electromechanical System (MEMS), a fabric technology consisting of arrays of electrically configurable mirrors. It provides 128x128 input and output ports with a maximum of 112 usable for cross-connections (16 are reserved as spares).

LambdaRouter™ All Optical Switch (AOS) 256

The Lucent Technologies fully optical signal switching system that uses Micro-electromechanical System (MEMS), a fabric technology consisting of arrays of electrically configurable mirrors. It provides 256x256 input and output ports with a maximum of 224 usable for cross-connections (32 are reserved as spares).

LambdaRouter™ Optical Network Navigation System (ONNS)

Software that resides on individual LambdaRouter™ All Optical Switch systems and provides networking capabilities between LambdaRouter™ All Optical Switch network nodes via the Control Communications Network (CCN).

Lamp Test (LMPTST)

A user panel button used to test LEDs.

LC Connector (LC)

A Lucent-designed small form-factor plastic optical fiber connector, designed for applications where space is limited. The LC, which is half the size of other common connectors, is ferrule-based and uses the familiar insertion/release mechanism similar to an ordinary telephone plug.

Line

See Port.

Line Protection

Backup for optical interfaces. Line protection protects against failures of line facilities, including the interfaces at both ends of a line, the optical fibers, switching failures, and any equipment between the two ends.

Link Management

The activities necessary to automatically discover, or manually provision port neighbors, verify connectivity between network elements, and coordinate the ports on the two ends of a link connection.

Location

A user-provisionable identifier of the physical positioning of a specific shelf.

Log

System-maintained data of user session activity, including changes, alarms and security activity, and protection switching.

Login ID

See User ID.

Long Reach (LR)

A standard for optics, concerning transmitters and receivers in a system, that insures that transmission can be maintained for long distances (tens of kilometers). This standard constrains the output power of the transmitter and the sensitivity of the receiver for long-haul applications (up to 80 km) without the need for regeneration. *See also* Intermediate Reach; Short Reach; Very Short Reach.

Loopback

A circuit configuration used to compare an original transmitted signal with the resulting received signal. LambdaRouter™ All Optical Switch supports cross-connection loopback for maintenance purposes.

Loss of Frame (LOF)

An indication of consecutive errored framing patterns in an incoming signal.

Loss of Signal (LOS)

An indication that a signal is below the provisioned threshold values for either the input or output port.

Low-Voltage Shutdown

The capability of LambdaRouter™ All Optical Switch to detect when power drops below a predefined input voltage level and to shut down gracefully. Cross-connection maps and other provisioned data are maintained through the power loss.

M Maintenance Condition

An equipment state in which some normal service functions are suspended, either because of a problem or for special functions (copy memory) that cannot be performed while normal service is being provided.

Maintenance User

An Optical Craft Interface user login with access to testing, retrieval of network element information, and limited service-affecting commands.

Major (MJ)

An indication of a service-affecting failure.

Manual Port Neighbor Provisioning

A process that allows craft personnel to manually specify neighbor information for each port. *See also* Automatic Port Neighbor Discovery.

Manual Provisioning and Deprovisioning

User-initiated provisioning or deprovisioning by the following commands or graphical user interface (GUI) equivalent actions: create, delete, modify, remove, restore.

Manual Switch State

The events that follow the issuing of the manual switch command. While in the Manual Switch state, the system may switch the active unit automatically, if required for protection switching.

Mapping

The logical association of one set of values, such as addresses on one network, with quantities or values of another set, such as devices or addresses on another network.

Mediation Device (MD)

A device that allows for exchange of management information between managing systems and network elements.

Memory (MEM)

The LambdaRouter™ All Optical Switch circuit pack that provides the non-volatile memory (NVM) necessary to store executable code and data for the system. Two primary MEMs (PRI MEMs) are located in the System Controller Shelf and serve as duplicated NVM. They communicate with the SYS50D circuit packs. A secondary MEM (SEC MEM) provides backup to the primary MEMs. Program and configuration data are stored on a PCMCIA card, which can be accessed from the faceplate of the MEM and is removable.

Merging

The use of two simplex cross-connection legs between two different input ports and one output port where a 2:1 selector chooses one of the incoming one-way signals. The use of bridging and merging at a network element provides 1+1 path protection for two-way traffic. *See also* Bridging.

Micro-electromechanical System (MEMS)

The LambdaRouter™ All Optical Switch fabric technology, which consists of a large number of electrically configurable mirrors, fabricated on a single substrate.

Minimum Configuration

A set of network element (NE) entities that are required to exist for the NE to be operational. These entities are created automatically by the system during initialization.

Minor (MN)

An indication of a non-service-affecting failure of equipment or facility.

MONE Test Mode

Test Access cross-connection mode. In the MONE test mode, the quality of the optical signal [either being received at or being injected by the E-tributary input port (eport)] is being monitored at a Test Access Monitoring (TAM) output port. *See also* MONEF Test Mode; MONF Test Mode.

MONEF Test Mode

Test Access cross-connection mode. In the MONEF test mode, the quality of the optical signals [either being received at or being injected by the E-tributary input port (eport) and F-tributary input port (fport)] are being monitored simultaneously at two different Test Access Monitoring (TAM) output ports. *See also* MONE Test Mode; MONF Test Mode.

MONF Test Mode

Test Access cross-connection mode. In the MONF test mode, the quality of the optical signal [either being received at or being injected by the F-tributary input port (fport)] is being monitored at a Test Access Monitoring (TAM) output port. *See also* MONE Test Mode; MONEF Test Mode.

N Navis™ Optical Element Management System (EMS)

A Lucent product that provides element management functionality for a variety of networking products, including LambdaRouter™ All Optical Switch. **Formerly called** WaveStar® SNMS (SubNetwork Management System).

Navis™ Optical Network Management System (NMS)

A Lucent product that provides comprehensive and integrated network management functionality for an entire transport network. Navis™ Optical NMS can provide provisioning and maintenance management for the LambdaRouter™ All Optical Switch, and other network elements in the LambdaRouter™ All Optical Switch network. **Formerly called** WaveStar® NMS (Network Management System).

Network Element (NE)

A telecommunications network node that supports network transport services and is directly manageable by a managing system.

Network to Network Interface (NNI)

A LambdaRouter™ All Optical Switch to LambdaRouter™ All Optical Switch interface within a network. Ports configured as NNI are able to participate in automatic port neighbor discovery.

Network View

The Optical Craft Interface screens and menu options used to set up an association with network elements or to administer the Optical Craft Interface GUI itself.

Node

All equipment that is controlled by one system controller. A node is not always directly manageable by a managing system.

Non-Blocking Cross-Connection Capacity

The service cross-connection capacity guaranteed to the user to be free from blocking.

Non-Blocking Fabric

The characteristic that no cross-connection request will be denied because of a lack of a path through the fabric, when the desired input and output ports are available.

Non-Revertive Protection Switching

A process in which an active and standby line exist. When a protection switch occurs, the standby line is selected to support traffic, thereby becoming the active line. The original active line then becomes the standby line. This status remains in effect even when the fault clears (there is no automatic switch back to the original status). *See also* Revertive Protection Switching.

Non-Volatile Memory (NVM)

Memory that retains its stored data after power has been removed; for example, a hard disk.

No Request State

The state in which no protection switching activities are occurring.

Not Monitored (NMON)

A provisioning state for equipment that is not equipped with monitors or alarms.

O Off-Board Devices

Transmission devices that are associated with a controller but are located on another circuit pack. *See also* On-Board devices.

Office Alarm Interface

An interface to the Office Alarm System for each alarm level that leads to audible or visible Central Office alarms. Audible alarm cutoff (ACO) is provided locally on the equipment and remotely through user command. Critical, Major, and Minor audible and visible alarms are supported.

On-Board Devices

Transmission devices associated with a controller and located on the same circuit pack. *See also* Off-Board devices.

One-Way Bridge and Merge Cross-Connection

A complex one-way cross-connection configuration that consists of two concatenated basic bridge and merge cross-connection configurations that share a common simplex leg.

One-Way Double Merge Cross-Connection

A complex one-way cross-connection configuration that consists of two merge cross-connections that share the same source (input) ports. It can also be considered as two bridge cross-connections that share the same destination (output) ports.

One-Way Point-to-Point Cross-Connection

A one-leg duplex interconnection between an input port and an output port. It can be set up and taken down by a single command to the network element.

One-Way Simplex Cross-Connection

A cross-connection leg with a transmission path through a single switch fabric. A simplex cross-connection leg can be added to or deleted from an existing cross-connection to form another type of cross-connection configuration. For example, a simplex leg can be deleted from an existing bridge or merge cross-connection to form a one-way point-to-point cross-connection.

Opacity

Bit-rate and format dependence. The LambdaRouter™ All Optical Switch opaque interfaces are the OXI-10GC and OXI-2GC.

Open Shortest Path First (OSPF) Protocol

A routing protocol used by LambdaRouter™ All Optical Switch to perform Control Communications Network (CCN) topology discovery. The topology information is used to determine routes between the Restoration Interface Processor (RIP) circuit packs in adjacent LambdaRouter™ All Optical Switch nodes.

Open Systems Interconnection (OSI)

A seven-layer reference model, a logical structure for network operations standardized by the International Standards Organization (ISO).

Operations Interface

Any interface providing information on the system behavior or control. In LambdaRouter™ All Optical Switch, operations interfaces include equipment LEDs, user panels, Optical Craft Interface, and office alarms.

Operations System (OS)

A central-computer-based system used to provide operations, administration, and maintenance functions. An example of an OS is the Navis™ Optical Element Management System (EMS).

Operator

User of the system with operator-level user privileges.

Optical Channel Alarms

A LambdaRouter™ All Optical Switch alarm message category that reports input signal failures and are issued against an input port.

Optical Channel Management

A LambdaRouter™ All Optical Switch application that enables adding, dropping or connecting of services traffic through the network, through optical line systems (OLSs).

Optical Craft Interface (OCI)

The user interface terminal used by craft personnel to communicate with the network element. The Optical Craft Interface runs on a PC with Windows NT® or Windows 2000 and provides graphical user interface (GUI) functionality and Transaction Language 1 (TL1) command entry through cut-through. **Formerly called** WaveStar® CIT (Craft Interface Terminal).

Optical Cross-Connect Interface (OXI)

A LambdaRouter™ All Optical Switch circuit pack that performs optical splitting, power monitoring, and rate- and format-independent transport for signals to and from the network element. OXIs are located in the Optical Interface Shelf-Transparent. Each transparent OXI pack provides four input ports (without optical amplifiers) and four output ports.

Optical Cross-Connect Interface-2.5 Gbps Client (OXI-2GC)

A LambdaRouter™ All Optical Switch circuit pack that supports 2.5 Gbps SONET/SDH signals (OC-48/STM-16). OXI-2GCs are located in the Optical Interface Shelf-2Gbps (OIS-2G) and the Optical Interface Shelf-Mixed (OIS-MX). Each OXI-2GC provides two input and two output ports.

Optical Cross-Connect Interface-10 Gbps Client (OXI-10GC)

A LambdaRouter™ All Optical Switch circuit pack that supports 10 Gbps SONET/SDH signals (OC-192/STM-64). OXI-10GCs are located in the Optical Interface Shelf-10Gbps (OIS-10G) and the Optical Interface Shelf-Mixed (OIS-MX). Each OXI-10GC provides one input and one output port.

Optical Cross-Connect Interface-4A13 (OXI-4A13)

A LambdaRouter™ All Optical Switch circuit pack that performs optical splitting, power monitoring, and rate- and format-independent transport for signals to and from the network element. OXI-4A13 circuit packs are located in the Optical Interface Shelf-Transparent. Each OXI-4A13 pack provides four input ports (optical amplifiers in the 1310 nm band) and four output ports.

Optical Cross-Connect Interface-4A15 (OXI-4A15)

A LambdaRouter™ All Optical Switch circuit pack that performs optical splitting, power monitoring, and rate- and format-independent transport for signals to and from the network element. OXI-4A15 circuit packs are located in the Optical Interface Shelf-Transparent. Each OXI-4A15 pack provides four input ports (optical amplifiers in the 1550 nm band) and four output ports.

Optical Interface Shelf

A generic term for any transmission interface shelf used in LambdaRouter™ All Optical Switch, including the OIS-T shelf for transparent circuit packs, the OIS-10G for OXI-10GC circuit packs, the OIS-2G for OXI-2GC circuit packs, and the OIS-MX for a combination of OXI-10GC and OXI-2GC circuit packs.

Optical Interface Shelf-2.5 Gbps (OIS-2G)

The LambdaRouter™ All Optical Switch transmission interface shelf that contains 32 OXI-2GC optical-electrical-optical circuit packs and two Switch Interface Controllers (SWICs).

Optical Interface Shelf-10 Gbps (OIS-10G)

The LambdaRouter™ All Optical Switch transmission interface shelf that contains 32 OXI-10GC optical-electrical-optical circuit packs and two Switch Interface Controllers (SWICs).

Optical Interface Shelf/High-Voltage Shelf (OIS/HVS) User Panel

The LambdaRouter™ All Optical Switch module that receives alarm status information. It provides visual indications of shelf status through LEDs and a means for generating alarm cutoff and LED test interrupts to the shelf Switch Interface Controller (SWIC) circuit packs. *See also* System Controller Shelf (SCS) User Panel.

Optical Interface Shelf-Mixed (OIS-MX)

The LambdaRouter™ All Optical Switch transmission interface shelf that contains a combination of 16 OXI-2GC circuit packs, 16 OXI-10GC circuit packs and two Switch Interface Controllers (SWICs).

Optical Interface Shelf-SDH/SONET (OIS-S)

The LambdaRouter™ All Optical Switch general shelf type that contains OXI-10GC or OXI-2GC circuit packs, which provide the opaque OC-192/STM-64 and OC-48/STM-16 interfaces between the LambdaRouter™ All Optical Switch and customer equipment. Each OIS-S contains opaque circuit packs and cannot contain transparent circuit packs.

Optical Interface Shelf-Transparent (OIS-T)

The LambdaRouter™ All Optical Switch shelf that contains the transparent OXI, OXI-4A13, or OXI-4A15 circuit packs. Each OIS-T contains two Switch Interface Controllers (SWICs) and as many as 32 OXI, OXI-4A13, or OXI-4A15 circuit packs.

Optical Line System (OLS)

Any system using a fiber-optic or other optical technology for transmission.

Optical Loss Budget

The allocation of allowable or necessary signal loss in a transmission system, or signal loss to connection subsections of that system.

Optical Return Loss (ORL)

The power of a signal, reflected back to its source in an optical system.

Optical Translator Unit (OTU)

The WaveStar® OLS 1.6T (400G/800G) module that provides wavelength translation and signal regeneration from or to the line system.

Out of Service (OOS)

A state in which an equipment entity is not allowed or is incapable of providing its intended function.

P Parameter

A variable that is given a value for a specified application, or a constant, variable, or expression that is used to pass values between components.

Performance Management

The activities necessary to provision the system, ports, and profiles used in performance monitoring.

Performance Monitoring

The monitoring of signal transmission on SONET and/or SDH interfaces in order to ensure that the desired quality of service is provided. When enabled, performance monitoring data is continuously collected and processed using threshold profiles associated with each port.

Personal Computer Memory Card International Association (PCMCIA) card

Non-volatile memory in a form similar to a floppy disk. LambdaRouter™ All Optical Switch program and configuration data are stored on a PCMCIA card in the MEM circuit packs.

Personality Module (PMOD)

Modules that provide two OC-48 port connections for Restoration Interface Processor (RIP) circuit packs. Up to two Personality Modules may be mounted on each RIP circuit pack.

Point-to-Point Cross-Connection

A duplex cross-connection from a single input point to a single output point. It can be either one-way or two-way.

Polarization Mode Dispersion (PMD)

Output pulse broadening due to random coupling of the two polarization modes in an optical fiber.

Port

A physical transmission interface, comprising both an input and an output, which may be used to carry traffic between network elements. (*Also called* line. Port emphasizes the physical interface, and line emphasizes the interconnection. Either may be used to identify the signal being carried.)

Port Link List

A list that provides the results of automatic port neighbor discovery or port neighbor provisioning parameters, including the status of the port link.

Port Pack

See Port Unit.

Port State Provisioning

A feature that allows a user to set the port state to in-service or out-of-service.

Port Unit (PU)

A transmission circuit pack that receives and transmits optical signals. The OXI, OXI-4A13, OXI-4A15, OXI-10GC, and OXI-2GC are the LambdaRouter™ All Optical Switch port units.

Power Filter Voltage Protection (PFVP) Unit

A LambdaRouter™ All Optical Switch unit that receives power supply current, suppresses high-frequency emissions, and passes current through the backplane to the circuit packs. This unit also disconnects current through the power source when input voltage falls below an acceptable level, or when a short circuit occurs. PFVPs are located on the Switch Shelf, Optical Interface Shelves, and System Controller Shelf. In the OIS-10G and OIS-2G, the PFVP has an internal circuit breaker.

Pre-provisioning

The process by which a user specifies parameter values for an entity before all of the equipment is present. These parameters are stored in non-volatile memory (NVM).

Primary Non-Volatile Memory (PRI MEM)

A non-volatile MEM circuit pack designated as the primary storage device for the LambdaRouter™ All Optical Switch. *See also* Memory.

Privilege Code

See User Privilege Code.

Privileged User

An Optical Craft Interface user login with access to all user capabilities, including those that are service-affecting, with the exception of security-related capabilities.

Program

The executable software code that controls the LambdaRouter™ All Optical Switch network element or Optical Craft Interface.

Protection

Extra capacity (channels, circuit packs) in power or control equipment that is intended to be used not for service but rather as backup for equipment failures. In active and standby contexts, protection is used to describe a function that at power-up becomes standby.

Protection Group

Protection switching configuration. Within a protection architecture, one working function is protected by one protection function. LambdaRouter™ All Optical Switch supports protection switching with a System Controller Protection Group, High-Voltage Shelf Controller Protection Group, and Optical Interface Shelf Protection Group. *See also* Revertive Protection Switching; Non-Revertive Protection Switching.

Protection Switch Activity Log

A time-stamped list of LambdaRouter™ All Optical Switch protection switching activity that has occurred within the network element. Facility, equipment, and synchronization-related switching activity is covered. The log includes the protection group ID and the type of protection switch (manual, forced, clear, or automatic).

Protection Switching

LambdaRouter™ All Optical Switch capability to automatically switch to standby or protection circuitry in the event of failure. A manual or forced protection switch may also be initiated as part of operator fault isolation procedures.

Provisioned (PROV)

Indication that a circuit pack is ready to perform its intended function. A provisioned circuit pack can be active (ACT), in-service (IS), standby (STBY), or out-of-service (OOS).

Provisioning

The process of assigning values to a set of variable parameters of the system (or any of its subsystems) to enable or facilitate the expected use of the system (or subsystem). Provisioning of system components includes the creation of a software representation of the component and/or a record of its parameter values, as well as actual modification of the component parameters. Provisioning can be automatic or initialized by manual command. *See also* Auto-Provisioning; Manual Provisioning and Deprovisioning; Pre-Provisioning.

Q Quality of Service (QoS)

The performance specification of a communications channel.

Quality of Service (QoS) Alarm

A LambdaRouter™ All Optical Switch alarm message category of alarms that are issued with respect to performance monitoring threshold crossing alerts. Quality of Service alarms are issued for a port.

R Rapid Network Restoration

A LambdaRouter™ All Optical Switch application that enables speedy restoration of services via alternate paths by removing the need for manual recabling operations. LambdaRouter™ All Optical Switch offers 1+1 pre-provisioned network restoration, and auto re-route mesh restoration when used with the LambdaRouter™ Optical Network Navigation System (ONNS).

Rapid Service Provisioning

A LambdaRouter™ All Optical Switch application that enables speedy provisioning of optical-layer service, eliminating the need to dispatch craft personnel for manual facility interconnections.

Receive-Direction

The signal direction toward the network element.

Recovery

A predefined process, in response to communication, equipment, or processing failure, that results in a return to normal operation of the network element.

Recovery after Power Failure

The LambdaRouter™ All Optical Switch capability to automatically reset the system after power failure without user intervention, when input voltage rises above a pre-set level. The system returns to its provisioned state prior to the failure.

Remote Network Element

Any network element (NE) that is connected to the NE under consideration. *Also called* Far End.

Remote Provisioning

A feature allowing the user to provision from a remote location through a managing system and LAN.

Reports Only User

An Optical Craft Interface user type with permissions to access only those capabilities that retrieve information from the system but do not modify the system.

Restoration Controller (RC)

The LambdaRouter™ All Optical Switch circuit pack that provides the interface between the Navis™ Optical Network Management System (NMS) and the Control Communications Network (CCN) for managing the path setup process. The RC circuit pack is also the location where path computation (routing) is performed in response either to requests for path setup and tear-down (from Navis™ Optical NMS), or in response to a path failure in order to initiate a mesh auto-reroute service restoration. Two RC circuit packs are located in the System Controller Shelf (SCS), and each provides one external 10BaseT ethernet connector, one external 100BaseT ethernet connector, and one internal four-port 10/100BaseT ethernet hub.

Restoration Interface Processor (RIP)

The LambdaRouter™ All Optical Switch circuit pack that provides Control Communications Network (CCN) connectivity between each LambdaRouter™ All Optical Switch in a domain. The CCN application runs on the RIP circuit packs. Two RIP circuit packs are located in the System Controller Shelf (SCS), and each provides one internal four-port 10/100BaseT ethernet hub and one external 10/100BaseT ethernet hub. Each RIP circuit pack may also be equipped with up to two Personality Modules.

Revertive Protection Switching

The ability of a working and protection function to revert autonomously to active and standby, respectively, upon the repair of the failure that caused a protection switch. **See also** Non-Revertive Protection Switching.

S SanDisk

A vendor Personal Computer Memory Card International Association (PCMCIA) card; a pre-formatted SanDisk is used in LambdaRouter™ All Optical Switch for software installation. **See also** Personal Computer Memory Card International Association (PCMCIA) card.

Scripting

The Optical Craft Interface feature that supports the ability for the user to create and edit Transaction Language 1 (TL1) scripts and save them for later use.

Secondary Non-Volatile Memory (SEC MEM)

A MEM circuit pack designated as the secondary storage device for LambdaRouter™ All Optical Switch. **See also** Memory.

Security Administrator

1. An Optical Craft Interface or managing system user who has been assigned a security privilege level of S5 and can view existing user logins, add new users and assign user privileges, delete users, change passwords for any user, and modify user privileges. 2. A LambdaRouter™ All Optical Switch user with a privilege level of S5 who can view existing user logins, view a list of users currently logged into the network element, add new users and assign user privileges, delete users, and change passwords for any user.

Security Alarm

A LambdaRouter™ All Optical Switch alarm message category of alarms that are issued with respect to login events and managing system access, and that indicate an intruder alert condition. Security alarms are issued for the system.

Security Log

A LambdaRouter™ All Optical Switch file of all security-related events. It is stored in non-volatile memory of the network element.

Security Management

In LambdaRouter™ All Optical Switch, the administration of user accounts (login IDs, passwords, and privilege levels) and the monitoring of system security to insure that only valid users can perform allowed actions and receive authorized information.

Serial Number (SLN, SN)

A circuit pack identifier that is stored in Electrically Erasable Programmable Read-Only Memory (EEPROM).

Serial Number Identification Port (SNIP)

A Switch Shelf interface to the High-Voltage Shelf that provides the unique 16-bit serial number of the Switch Shelf.

Series Number (SSN)

A circuit pack identifier that is stored in Electrically Erasable Programmable Read-Only Memory (EEPROM).

Session

A logical connection from the Optical Craft Interface or other managing system to a network element.

Shelf

A set of circuit packs sharing a common physical housing, power source, electronic or opto-electronic backplane, and shelf controller.

Shelf View

An Optical Craft Interface graphical depiction of one shelf. Selectable objects in this view are the shelf, the slots/circuit packs, and the ports.

Short Reach

A standard for optics, concerning transmitters and receivers in a system, that ensures that transmission can be maintained for short distances (10 km). *See also* Long Reach; Intermediate Reach.

Signal Degrad (SD)

A condition that triggers automatic protection switching when the line bit error rate (B2) exceeds a user-provisionable threshold.

Signal Fail (SF)

Loss of signal (LOS), loss of frame (LOF), Alarm Indication Signal-Line (AIS-L), or line bit error rate (B2) greater than the user-provisionable threshold.

Signal Injection

The capability for a LambdaRouter™ All Optical Switch OEO input port to inject a test signal with a payload containing either all 1s (AIS-L) or all 0s (UNEQ) when requested by using a test access command. Signal injection is possible only when the input port is not detecting an incoming signal. A j0-byte sequence may be inserted in an injected test signal.

Signal Maintenance

In LambdaRouter™ All Optical Switch, the capability of the system to detect the presence or absence of optical power at input and output ports, monitor and react to maintenance signals, generate appropriate alarms, and perform fabric-path protection switching.

Signal Rate

An attribute that defines the bit rate and format of a signal.

Single-Mode Fiber (SM)

An 8.3-μ diameter low-loss, long-span optical fiber typically operating at either 1310 nm, 1550 nm, or both.

Site Address

The unique address for a network element.

Slip

A repetition or deletion of a block of bits in a bit-stream, caused by a sufficiently large discrepancy in the read and write rates at a receiver buffer.

Slot

A physical position in a shelf designed to hold a circuit pack and connect it to the backplane.

Slot Provisioned State

A transition state for circuit pack insertion. A slot will transition from empty to equipped when the circuit pack insertion is detected and validated, and the hardware registers are loaded. The slot remains so provisioned until the object is deprovisioned.

Slot State Provisioning

Modification of a slot state through a user command.

Software Backup

The process of saving an image of the current network element (NE) databases, which are contained in NE primary non-volatile memory (NVM, PRI MEM), to SEC MEM or remote storage.

Software Delivery

In LambdaRouter™ All Optical Switch, the delivery to a customer of network element generic software, Optical Craft Interface software, factory data, and utilities on a CD-ROM, with accompanying documentation in hard copy and on CD-ROM.

Software Failure

A data or results error detected by the software itself during execution.

Software ID

A number that provides the software version information for the system.

Software Installation

The process of interpreting and unpacking the binary data program that was downloaded to a network element non-volatile memory (NVM) and copying the constituent data items to their designated locations in the network element.

Software Management

The activities necessary to download, upgrade, install, back up, and restore the generic software and provisionable data on the Optical Craft Interface and network element.

Software Upgrade

The process that installs a new release of software.

Standby (STBY)

A state in which a circuit pack is in service but is not providing service functions. The circuit pack is ready to be used to replace a similar circuit pack either by protection or by duplex switching, in hot standby or cold standby functions. *See also* Active; Cold Standby; Hot Standby.

Standing Condition

The declaration type of a notification message (event or alarm) that requires a Clear message. *See also* Transient Condition.

State

A software parameter indicating the current autonomous and user-defined limitations on the behavior of the entity in question.

Status

The indication of the instantaneous condition of an equipment entity.

Strictly Non-Blocking Fabric (NBF)

Architecture that ensures unhindered signal throughput. Strictly NBF is a fabric architecture such that any incoming signal can be directed to any idle output port, without the need to rearrange any of the existing cross-connections, and without blocking, degrading, or otherwise affecting any of the remaining signals through the system.

Subnetwork

A group of interconnected/interrelated network elements.

Superuser

1. An Optical Craft Interface user type with highest level of permissions to access the system. Up to two superusers logins and passwords may be created on the Optical Craft Interface. 2. A LambdaRouter™ All Optical Switch user with full privileges in all functional categories. Two superuser logins and passwords are pre-installed on the system.

Suppression

A process by which alarms that have been identified as an “effect” are not displayed to a user. Alarms can be suppressed through user provisioning.

Switch Bay

In LambdaRouter™ All Optical Switch, the frame that houses the Switch Shelf, High-Voltage Shelf, and optical interface shelf, either the OIS-T, OIS-10G, OIS-2G, or OIS-MX.

Switch Interface Cable (SI cable)

Cable that connects the Optical Interface Shelf backplane and the Fiber Distribution Panel.

Switch Interface Capacity

The capacity in number of optical interconnection links between any one of the transmission interface shelves and the cross-connection fabric. This term applies to bidirectional capacity (for example, switch interface capacity of 128 corresponds to 128 optical links in each direction).

Switch Interface Controller (SWIC, LGH1 and LGH1AE)

A LambdaRouter™ All Optical Switch circuit pack that provides control functions for optical cross-connect interface or High-Voltage Digital-to-Analog Converter (HVDAC) functions, and a control interface to the Control Bay. There are two types of SWICs. The SWIC for the Optical Interface Shelf-Transparent (OIS-T) and High-Voltage Shelf (HVS) is coded LGH1 and is referred to in software as oswic when in an OIS-T and hswic when in an HVS. The SWIC for the Optical Interface Shelf-SDH/SONET (OIS-S) is coded LGH1AE and is referred to in software as oswic.

Switch Interface Point (SWIP)

A Micro-electromechanical System (MEMS) mirror, the dedicated optical interface (connector and collimator) connected to it, and the dedicated electrical control interface (electrodes, cable connectors) for its operation. Users of LambdaRouter™ All Optical Switch software will view it as a single object in the system.

Switch Interface Point (SWIP) Maintenance Group (SWMG)

A grouping of Switch Interface Points (SWIPs) that are treated as a unit for switch maintenance. This grouping is sometimes referred to as *switch side*.

Switch Request States

State that is defined for protection groups: Forced Switch, Manual Switch Failure, and No Request.

Switch Shelf (SWS)

The LambdaRouter™ All Optical Switch component that contains the Micro-electromechanical System (MEMS) mirror arrays, optical lenses, fibers and connectors, also referred to as switch fabric.

Synchronization

The function that assures accuracy and stability of clocks used to transmit data in digital networks. In LambdaRouter™ All Optical Switch, clocking is used for 10 Gbps and 2.5 Gbps signals that go through optical-electrical-optical conversion for performance monitoring. The clocking is extracted from the ingress signal and used to transmit egress signal (through timing). An internal clock is used to transmit signal defect (AIS) when the clock from the ingress signal is not available. Synchronization is done on the OXI-10GC and OXI-2GC packs.

Synchronous Digital Hierarchy (SDH)

A hierarchical set of digital transport structures, standardized for the transport of suitable adapted payloads over transmission networks.

Synchronous Optical Network (SONET)

The North American standard for the rates and formats that define optical signals and their constituents.

SYS50D

The LambdaRouter™ All Optical Switch circuit pack that provides the main system control functions. Duplex SYS50Ds are located in the System Controller Shelf and operate as an active/standby pair.

System Controller Complex

The grouping of a SYS50D circuit pack, Restoration Controller (RC), and an External Interface (EI) circuit pack, treated as a unit for controller maintenance and protection switching.

System Controller Shelf (SCS)

The middle shelf of the LambdaRouter™ All Optical Switch Control Bay. It contains the SYS50D and other control packs.

System Controller Shelf (SCS) User Panel

The LambdaRouter™ All Optical Switch module that monitors the temperature of the shelf, receives alarm status information, and provides visual indications of shelf status through LEDs. The SCS User Panel provides an ESD wrist strap ground connector and a port used to connect an Optical Craft Interface to the system. An NE Acty LED indicates software download, loopback, or a forced or manual switch.

System Logs

Autonomous records of system events that can be retrieved by user commands. The system provides a User Session Activity Log, Database Change Log, Alarm Log, Security Activity Log, and Protection Switch Log. Each log has a capacity to store 72 hours of data.

System View

An Optical Craft Interface graphical depiction of the entire network element. Selectable objects in this view are bays and shelves in the network element.

T Target Identifier (TID)

A provisionable parameter used to identify a particular network element within a network. The parameter is a case-insensitive ASCII character string of up to 20 characters. The allowed characters are the letters **A** through **Z** and **a** through **z**, the numbers **0** through **9**, and the special characters hyphen (-) and forward slash (/). The string must not begin or end with a hyphen.

Template

A collection of parameters that define a specific network element configuration.

Terminal Access

Accessing and provisioning a LambdaRouter™ All Optical Switch using a personal computer or dumb terminal connected to the RS-232 port located on the back of the LambdaRouter™ All Optical Switch System Controller Shelf (SCS). Provisioning is performed using TL1 commands.

Test Access Cross-Connection

A type of cross-connection that is used for maintenance purposes to monitor the transmission quality of live traffic or an injected signal. Test Access cross-connections involve temporarily cross-connecting an optical signal from an input port, through a switch fabric side, to an output port that has been selected to serve as a test access monitoring port. *See also* MONE Test Mode; MONEF Test Mode; MONF Test Mode.

Test Access Monitoring (TAM) Port

The output port of a Test Access cross-connection.

Threshold Crossing Alert

Used in performance monitoring. A notification that a monitored parameter has exceeded a threshold value for a port. The generation of threshold crossing alerts can be enabled or disabled independently for each parameter.

Through Timing

Timing derived by the network element from the ingress signal and used to transmit the egress signal.

Transaction Language 1 (TL1)

A machine-to-machine communications language that is a subset of ITU human-to-machine language. TL1 is the interface language between the Optical Craft Interface, Navis™ Optical Element Management System, Navis™ Optical Network Management System, and a LambdaRouter™ All Optical Switch.

Transient Condition

The declaration type of a notification message (event only) that does not require a Clear message. *See also* Standing Condition.

Transmission Control Protocol/Internet Protocol (TCP/IP)

Networking protocols used by LambdaRouter™ All Optical Switch to interface with a customer's Intraoffice Local Area Network (IAO LAN).

Transmission Interface

Also known as facility interface. The components that provide connectivity between external Optical Line Systems (OLSS) or client network elements (NEs) and the LambdaRouter™ All Optical Switch. The LambdaRouter™ All Optical Switch transmission interfaces are the OXI, OXI-4A13, and OXI4A15 circuit packs containing transparent bidirectional ports, and the OXI-10GC and OXI-2GC circuit packs containing opaque bidirectional ports. Transmission interface functions include receipt, splitting, selection, and output of signals.

Transmission Interface Shelf

See Optical Interface Shelf entries.

Transmit-Direction

The direction away from the network element.

Transparency

Bit-rate and format independence. The OXI, OXI-4A13, and OXI4A15 circuit packs are the LambdaRouter™ All Optical Switch transparent interfaces.

Trouble-Clearing

Activity to correct an alarmed condition.

Two-Way Bridge/Merge Cross-Connection

A two-way cross-connection configuration that consists of a bridge cross-connection in one direction, and a merge cross-connection in the other direction.

Two-Way Double Merge Cross-Connection

A complex two-way cross-connection configuration that consists of two one-way double merge cross-connections, one in each direction of the two-way.

Two-Way Point-to-Point Cross-Connection

Two cross-connection duplex legs that interconnect two input ports and two output ports. A pair of input and output ports used for opposite directions may or may not have the same access identifier (AID). Each of the two cross-connection legs can be established by a single command to the network element and must have a compatible transmission rate.

Two-Way Simplex Cross-Connection

Two simplex cross-connection legs that interconnect two input ports and two output ports. A pair of input and output ports used for opposite directions may or may not have the same access identifier (AID). A pair of two-way simplex cross-connection legs can be added to or deleted from an existing cross-connection to form another type of cross-connection configuration. For example, a two-way simplex cross-connection can be added to an existing two-way point-to-point cross-connection to form a two-way bridge/merge cross connection.

U Unequipped (UNEQ) Signal

An indication that an incoming signal has valid SDH/SONET Section/Regenerator Section overhead with a Synchronous Payload Envelope (SPE) comprising all zeroes.

Unit Interface Appliance (UIA)

The physical device used by the person who runs Optical Craft Interface software and accesses network elements. The LambdaRouter™ All Optical Switch UIA is a PC or laptop with Microsoft Windows NT or Windows 2000.

Unit Interface (UI) Cable

The specified cable type used in the interface between the System Controller Shelf circuit packs and the Switch Interface Controller (SWIC) circuit packs.

Universal Coordinated Time (UTC)

Formerly called Greenwich Mean Time (GMT). A time-zone-independent indication of an event. The local time can be calculated from the Universal Coordinated Time.

Upgrade Kit

Orderable components that enable either a lower capacity LambdaRouter™ All Optical Switch system to be upgraded to a higher capacity LambdaRouter™ All Optical Switch system, or an earlier version/release system to be upgraded to a later version/release system.

Upload

The process of transferring files from a network element to a managing system. LambdaRouter™ All Optical Switch can only upload data. **See also** Download.

Upstream

At or toward the source of the considered transmission stream.

User ID (UID)

An Optical Craft Interface or LambdaRouter™ All Optical Switch user code that comprises one to ten alphanumeric, case-sensitive characters. Any sequence of characters is allowed, except as follows: The keyword ALL by itself, in any combination of uppercase and lowercase (that is, ALL ALL, aLL, and so on), is not allowed as a valid user ID. A user ID containing ALL as a substring, however, in any combination of uppercase and lowercase (such as tallman), is allowed as a valid user ID.

User to Network Interface (UNI)

An IP network interface that allows automated network path setup and teardown to be initiated from an IP router or other client that is external to the LambdaRouter™ All Optical Switch network.

User Notification Registration List

A security feature that determines what messages a LambdaRouter™ All Optical Switch user is allowed to receive.

User Panels

Components on each shelf of the LambdaRouter™ All Optical Switch that monitor the temperature of shelves, receive alarm status information, and provide visual indications of shelf status through LEDs. These panels also provide a means for generating alarm cutoff and LED test interrupts to the shelf Switch Interface Controller (SWIC) circuit packs.

In addition to the status LEDs, the System Controller Shelf user panel provides an ESD wrist strap ground connector and a port used to connect an Optical Craft Interface to the system.

Temperature monitoring, ESD wrist strap ground connectors, and Optical Craft Interface ports are not included in the user panels for the Optical Interface Shelves and High-Voltage Shelves. They also do not support near end (NE) or far end (FE) alarms.

User Privilege Code (UPC)

Permissions assigned to each user when a login is created or modified on either the Optical Craft Interface or LambdaRouter™ All Optical Switch. The UPC is an alphanumeric code of one or two letters that identify the functional category of commands the user may access, and a single digit that indicates the user authorization level for that functional category. UPCs assigned to login IDs on the Optical Craft Interface do not necessarily apply to LambdaRouter™ All Optical Switch.

User Record

Data associated with each user on an Optical Craft Interface or other managing system and on the LambdaRouter™ All Optical Switch network element (NE). Each record (separate on the managing system and the NE) comprises a login ID, password, user type, user privilege level, user priority level (NE only), and User Notification Registration list (NE only).

User Session Activity Log

A LambdaRouter™ All Optical Switch file of all user-initiated commands from login through logout.

User Type

Assigned privilege codes for Optical Craft Interface users that determine which commands and capabilities the user may access. Predefined user types are Superuser, Privileged User, General User, Maintenance User, and Reports Only User. Users may also be assigned a type of “Other.” The default user type is “Reports Only.”

V Very Short Reach (VSR)

A standard for optics (as defined in ITU-T Recommendation G.693), concerning transmitters and receivers in a system, that insures that transmission can be maintained for very short distances (up to 2 km). *See also* Long Reach; Intermediate Reach; Short Reach.

Virtual Private Network (VPN)

A leased network that is part of a larger network but operated independently.

Volatile Memory

A type of memory that is lost if electrical power is interrupted.

W Wander

The long-term variation of the significant instants of a digital signal from their ideal positions in time. Wander is mainly generated by the variation in transmission characteristics of the media and equipment, which includes disruption in synchronization reference distribution. Wander is a potential source of slips in synchronous networks. *See also* Jitter.

Wavelength Division Multiplexing (WDM)

A means of increasing the information-carrying capacity of an optical fiber by simultaneously transmitting signals at different wavelengths.

Wavelength Range of Operation

A range within the infrared wavelength spectrum in which the system is designed to operate.

Wavelength Window

A standard range of wavelengths in which the intrinsic transmission loss of an optical fiber is low enough to be usable for optical transmission systems. The standard wavelength windows are approximately 850 nm (not used in telecommunications), 1310 nm, and 1550 nm.

WaveStar® CIT (Craft Interface Terminal)

See Optical Craft Interface (OCI).

WaveStar® NMS (Network Management System)

See Navis™ Optical Network Management System (NMS).

WaveStar® OLS (Optical Line System)

A Lucent Technologies lightwave transmission system, for example, WaveStar® OLS 1.6T. Using Dense Wave Division Multiplexing technology, the system combines multiple signals of different wavelengths, transmits the resulting signal over a single fiber, and then demultiplexes the signal at the receiving end.

WaveStar® SNMS (SubNetwork Management System)

See Navis™ Optical Element Management System (EMS).

Wizard

Form of user assistance that automates a task through a dialog with the user.

Working

Descriptor for a physical entity. In revertive switching, the working entity carries service under normal operation. In non-revertive switching the descriptor has no particular meaning. In active and standby operations, **working** indicates the function, when present and healthy, that will become active at power-up. *See also* Protection; Revertive Protection Switching; Non-Revertive Protection Switching.



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