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Bell Labs Innovations

WaveStar™ SubNetwork Management System (SNMS)

User Guide

an InfoWare® Product

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Part 1

WaveStar SNMS User Reference

System Introduction

1

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Background

Introduction

WaveStar SubNetwork Management System (SNMS) is an element management system that supports various WaveStar Network Elements (NEs) such as the WaveStar Bandwidth Manager (BWM), WaveStar Optical Line System (OLS) 400G, WaveStar 2.5G, WaveStar TDM 10G (STM-64), WaveStar TDM 10G OC-192, FT-2000 Large Capacity Terminal (LCT), and OLS AllMetro used in a Synchronous Optical Network (SONET) or Synchronous Digital Hierarchy (SDH) configuration. These products permit a reliable, flexible, high-speed, self-healing, state-of-the-art transmission medium. While these standards are the answer to transmission needs, WaveStar SNMS is the answer to the corresponding operations needs to efficiently manage those NEs.

WaveStar SNMS features

The following list shows some of the ways WaveStar SNMS accomplishes this (see the System Features section of this chapter for more details about specific features provided by WaveStar SNMS):

- WaveStar SNMS provides centralized, secure, remote administration of SONET/SDH and Dense Wavelength Division Multiplexer (DWDM) subnetworks. From a single work center, a WaveStar SNMS user can remotely manage SONET and DWDM NEs. Lucent Technologies patented Dynamic Network Operations (DNO) process gathers network configuration information from the NEs, providing accurate, hands-off population of the WaveStar SNMS database, and ensuring that the WaveStar SNMS management functions operate using the actual network configuration.
- It supports SDH interfaces and allows provisioning of optical interfaces for either SONET or SDH operation on the BWM R. 1.2 (and later) and OLS 400G R. 2.0 (and later) NE releases and AllMetro NEs. User preferences allow you to display data, including alarm severity levels, in either North American or international formats. WaveStar SNMS also provides full support for the SDH interfaces on the BWM NE, including use of SDH nomenclature and support of fixed mode provisioning, where you can specify the set of tributary rates that comprise a line (for example, the set of VC-3 and VC-4 tributaries that comprise an STM-16o line).
- It provides fault, performance, configuration, and security management functions via a Graphical User Interface (GUI).
- It supports 7-layer OSI and TCP/IP communications protocols over LAN physical interfaces as well as CMISE and TL1 application protocols.
- It is able to support communication multiplexing or concentration, to provide network security, and to record all database changes.

- It provides a TL1 cut-through capability, allowing the user to access an NE through a native command set. (Not for OLS 400G.)
- WaveStar SNMS recognizes and administers the interaction between mixed networks of PF2000 (DDM-2000, FT-2000, FiberReach) and WaveStar NEs. WaveStar SNMS manages only WaveStar NEs ; PF-2000 NEs (with the exception of the FT-2000 LCT) are treated as non-managed devices. During subnetwork discovery, WaveStar SNMS discovers only WaveStar NEs; PF2000 NEs are autodiscovered as non-managed devices and added to complete the network topology. Additional details about interworking support between WaveStar NEs and PF2000 NEs are provided in Chapter 7, Administration.

WaveStar SNMS operation

WaveStar SNMS operates as an enhanced graphical tool and as a general configuration management aid. It provides NE, port and cross-connection provisioning capability. The system also provides fault management through sub-network alarm and event preprocessing prior to sending fault information to a network surveillance system.

Objectives

This chapter provides background and introductory information about WaveStar SNMS. It includes available features (see the System Features section) and information about system architecture (see the Hardware Architecture and Software Architecture sections).

After learning the material in this chapter, the user should be able to do the following:

- List the features available on the WaveStar SNMS system and briefly describe the purpose of each.
- Understand the basic concepts of the WaveStar SNMS Hardware Architecture and the components therein.
- Understand the basic concepts of the WaveStar SNMS Software Architecture and the main components therein.

System Features

Fault management

Fault Management monitors alarms and conditions in the subnetwork. WaveStar SNMS receives autonomous alarm messages from NEs when alarm states are set or cleared. These alarm messages are processed and made available to the user, through the GUI, or to other network surveillance systems. WaveStar SNMS supports the following Fault Management tasks:

- Alarm status indication on the network map - for equipment, facility failures, and updates
- Alarm status on equipment view
- Tabular alarm lists and summaries
- Textual alarm summary report
- Alarm provisioning at the NE level (via TL1 cut-through)
- Alarm provisioning at the EMS level
- Alarm resynchronization
- Autonomous alarm handling
- Alarm filtering
- Alarm aging
- Alarm severity assignment profile (ASAP)

Related information

See the 200 series tasks in the *User Tasks* section and Chapter 3, Fault Management for instructions and information about Fault Management.

Performance management

WaveStar SNMS collects Performance Monitoring (PM) data from NEs that have PM data collection activated. It stores collected PM data for a retention period set by the user (up to 30 days). WaveStar SNMS allows the user to view unprocessed PM data, or the data can be exported to an off-line system for more sophisticated analysis and reporting purposes.

Related information

See the 400 series in the *User Tasks* section and Chapter 5, Performance Management in the *User Reference* section for instructions and information about Performance Management.

Configuration management

WaveStar SNMS has a DNO feature that retrieves the internal configurations of NEs and external connectivity relationships. This feature enables the system to discover, without manual intervention, the network topology and internal configuration of Lucent Technologies NEs.

The GUI supports the following Configuration Management tasks:

Network Configuration Management

- Network Element/trail discovery/update/display
- Aggregate management/display

NE Configuration Management

- Equipage discovery/update/display
- Equipment provisioning and pre-provisioning
- Cross-connection provisioning/display
- Tributary reservation and provisioning
- Protection switch management
- Port Provisioning

Software Management

The Software Management feature enables the user to accomplish generic software upgrades by downloading new software releases to NEs, copying software releases from one NE to another, NE data backup and restore, and installing (or activating) new software versions on the NE. Software mangement can be initiated either manually via the GUI or through the EMS scheduler.

Related information

See the 300 series in the *User Tasks* section and Chapter 4, Configuration Management for instructions and information about Configuration Management.

Security management

WaveStar SNMS provides typical security management of user access and password administration. All users are required to have a login and password to communicate with the system. The system administrator assigns users to the NEs they can use (Target Groups) and the actions they can perform (Command Groups). Command Groups and Target Groups can be set up according to the type of tasks users are performing, such as maintenance, provisioning, or monitoring.

Release 3.1 includes two kinds of security management:

- EMS security management

- — defines EMS users (userid and password)
- — partitions the network into user-defined Target Groups
- — defines Command Groups
- — assigns EMS user to Target Groups and Command Groups

- NE security management
  - — provides services to manage NE userid and password

See the Table of Contents and the Task Index for more details on login, password, Command Group, and Target Group administration.

Related information

See the 500 series tasks in the *User Tasks* section and Chapter 6, Security Management for instructions and information about Security Management.

Log management

Log Management provides services to various system modules, including:

- Writing log messages to database tables
- Retrieving log messages from database tables
- Displaying information on selected activities

These log messages are helpful for keeping track of information regarding system performance and actions. The information can be filtered to suit the user's purposes.

Related information

See the 700 series of tasks in the *User Tasks* section and Chapter 8, WaveStar SNMS Logs for more instructions and information about Log Management.

Graphical user interface

The WaveStar SNMS Graphical User Interface (GUI) is Java-based, menu-driven software.

Related information

See the 100 series of tasks in the *User Tasks* section and Chapter 2, The WaveStar SNMS Graphical User Interface for more instructions and information about the GUI.

Cut-through capability

In order for the user to execute NE TL1 commands that may not be explicitly supported, a cut-through capability is available. WaveStar SNMS allows the user access only to the NEs and associated commands defined by the Target and Command Groups respectively to which the user is assigned. A TL1 command builder feature allows the user to create and modify a file of commonly used TL1 commands. A TL1 broadcaster feature allows the user to broadcast this file of commonly used TL1 commands to selected NEs.

Related information

See tasks 300 through 302 in the *User Tasks Manual* for instructions on how to perform, build, and broadcast TL1 cut-through commands.

System administration

System administration of the application is done through GUI windows and UNIX commands. Key administrative functions include system start-up and shutdown, definition of user access to NEs and commands, and configuration of data communications and the network model.

Related information

See the 600 series of tasks in the *User Tasks* section and Chapter 7, Administration for instructions and information about System Administration.

Year 2000 compliance

WaveStar SNMS has been designed to comply with the Year 2000 initiative to ensure correct date presentation and date/time calculation processing for events that occur in the year 2000 and beyond, including data that is received by the system from the supported NEs.

System Architecture

Overview

The WaveStar SNMS system consists of a Hewlett-Packard (HP) host processor and Windows NT PCs connected via an 802.3 Ethernet LAN, with the option to interface via a Wide Area Network (WAN). Printer support is provided for HP printers and compatibles.

A Data Communications Network (DCN) is recommended for large, geographically dispersed configurations to concentrate access from WaveStar SNMS to the managed subnetworks (access NEs with OSI LAN or NEs serving as transport bridges). The same DCN can also be used to access other Network Management systems or other OSs. Every WaveStar SNMS installation requires data connections to each managed subnetwork. The southbound DCN from WaveStar SNMS to the NEs must support an OSI/LAN interface, an IP/LAN interface, or X.25 interface for LCTs. Contact your Lucent Technologies representative for specific information regarding your network needs.

System Architecture Diagram

The following diagram provides a logical representative picture of the system architecture for the host-based WaveStar SNMS.

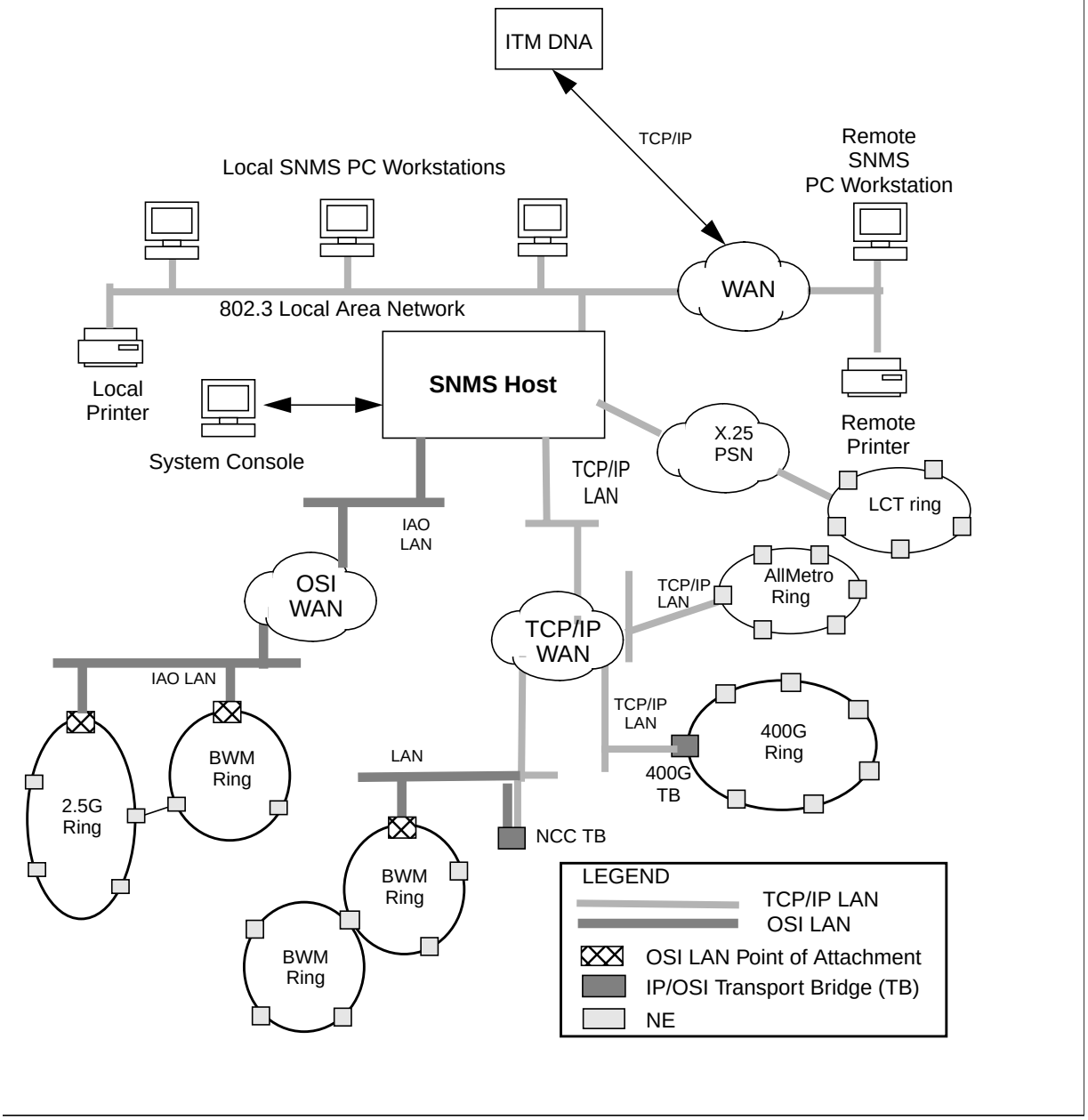


Figure 1-1. WaveStar SNMS System Architecture

Hardware Architecture

Overview

WaveStar SNMS hardware architecture consists of two main components:

- HP 9000/800 K-series server platform and associated peripherals (console and printer)
- Windows NT PCs as workstations

The HP 9000/800 series platform is the main hardware platform on which most application software is executed. The Data Communications Network (DCN) supports the data communications framework between the NEs and the HOST.

NOTE:
The information provided here is intended to give the user a general description of WaveStar SNMS system architecture. For more detailed information and specific host configurations, see the WaveStar Subnetwork Management System (SNMS) Operations, Administration, and Maintenance Guide.

Host platform

The host is an HP 9000/800 K-series series server running HP-UX Version 10.20. The configuration of the HOST is based on the number of equivalent NEs supported by the system. The following aspects of the computer will vary based on the number of NEs supported:

- Model of the computer
- Memory
- Disk drives
- SCSI

System Console

The system console is connected to the host and is used by a system administrator to enter HP-UX commands. HP-UX and application output is sent to the system console as well.

System GUI PC

The system PC is a Pentium-based IBM-compatible PC running Microsoft Windows NT with Service Pack 4. The GUI Client runs on the GUI PC, and transaction requests are issued by the GUI Client to the GUI Server running on the HOST.

NOTE:
For details regarding minimal hardware configuration of the GUI PC, see the *WaveStar Subnetwork Management System (SNMS) Operations, Administration, and Maintenance Guide*.

Local area network (LAN) printers

Local area network (LAN) printers print autonomous messages in real time. The host communicates with a remote printer via a Transmission Control Protocol/ Internet Protocol (TCP/IP) address over an 802.3 LAN.

Software Architecture

Major subsystems

Release 3.1 software architecture can be divided into the following major subsystems:

- Configuration Management
- Fault Management
- Performance Management
- NE Event Handler
- EMS Security Management
- Southbound Management Interface
  - — OSI-based protocol layer
  - — OSI over TCP/IP-based protocol layer
  - — TCP/IP protocol layer
  - — X.25 protocol layer
  - — TL1 Manager
  - — Connection Manager
  - — Gateway process
  - — Q-Adaptor process (Common Management Information Service Element (CMISE) only)
  - — SONET Directory Service (SDS)
- Log Management
- Operation, Administration, and Maintenance
  - — Log and trace
  - — Scheduler
- JAVA-based GUI

NE event handler

The main functions of the NE Event Handler (NEH) are the following:

- Receive non-alarm autonomous messages (TL1 from SB and Common Management Information Service Element (CMISE) from Q3 gateway).
- Distribute the received messages to the user.
- Log by invoking the Log Manager.

The NE Event Handler process is a passive distributor of non-alarm autonomous messages emitted by the NEs. It registers with Southbound for database change messages from TL1 NEs and with Q3 gateway for CMISE NEs.

Security management

Security management is performed on WaveStar SNMS by the system security server. These services support all MFA subsystems.

Southbound

The Element Management System Southbound interface contains the required functionality to connect to the NEs, to manage these connections, and to forward and receive the messages between the NEs and a Management Functional Area (MFA) for all supported communication protocols.

CMISE Southbound

The CMISE Southbound subsystem is made of two processes for the support of Lucent Technologies WaveStar 400G NEs.

- Gateway (GW) process
  - — serves as a bridge process between the MFA and the Q3 Manager
  - — receives requests from MFA and the Connection Manager, and sends them down to the Q3 Manager through a socket interface
  - — receives responses and autonomous notifications coming from NE via socket. Sends them to MFA or the Connection Manager as required.
  - — logs Command and Responses, via the Log Server and Log library.
- Q3 Adaptor process

  The Q-Adaptor maintains a representation of the managed object instances of the managed object classes defined in the information model and converts Common Management Information Service Element (CMISE) requests into the non-TMN format of the underlying OS or NE. It also converts the non-TMN notifications received from a non-TMN OS or NE and converts them to CMISE notifications.

TL1 Southbound

TL1 Southbound is supported by the TL1-Manager process, which is responsible for command/response handling.

Management functional interface

A Management Functional Area (MFA) corresponds to one of the main management functions and related services defined by the TMN standard for EMSs.

The major MFAs of WaveStar SNMS and the associated services include:

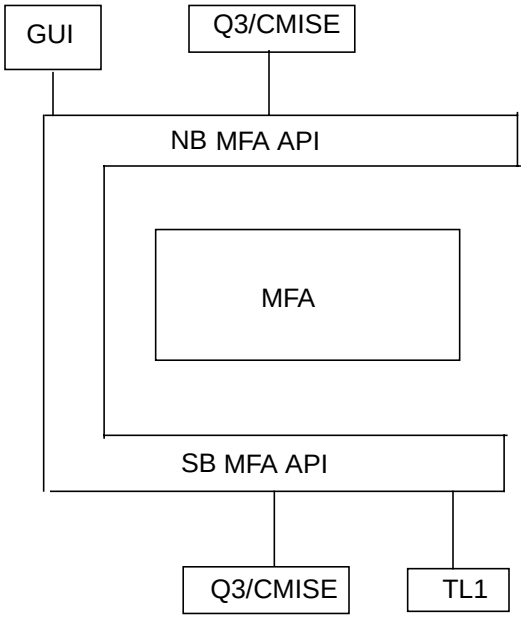
- Configuration Management
- Fault Management
- Performance Management
- Security Management

WaveStar SNMS provides several types of external interfaces with NEs and NMSs. With the variety of message protocols, if different interface specifications for each message protocol had to be provided, maintenance would be difficult. To alleviate this problem, a uniform message interface specification is used for each MFA supported for the Northbound or Southbound Q3 interface. This uniform message interface specification is defined in the Management Functional Area Application Program Interface (MFA API).

An MFA API specifies all interactions between a MFA, the Northbound subsystem, and the Southbound subsystem. It provides a consistent, uniform, protocol-independent interface between the MFA and external interface subsystems. All MFA APIs are defined through the Interface Definition Language (IDL) interface.

The WaveStar SNMS MFA API is serviced-based even though it is implemented by an object-oriented communication package. The services and supported objects/attributes are defined functionally and grouped by the different MFA servers. Each MFA server process typically instantiates a proxy object that provides the required services.

The following figure shows the relationship between a MFA API, the MFA, and the CMISE message service used in northbound and southbound exchanges between the NE, the WaveStar SNMS host, and a northbound Network Management System (NMS).



WaveStar SNMS supports the CMISE/CMIP transport protocol in a northbound interface with an OS. But the EMS (WaveStar SNMS) was designed primarily to communicate using TL1 commands/responses. WaveStar SNMS must manage NEs such as the OLS 400G via CMIP messages sent and received over an OSI compliant stack. For NEs that use CMISE/CMIP services, such as the OLS 400G, messages that are exchanged between a Northbound NMS, the EMS, and the NE must be “mapped” or translated to their TL1 equivalent command/response via the MFA API.

The QA/MFA interface

Interactions between the Q-Adaptor and an MFA follow the client-server model. These interactions can be grouped into three categories:

- Service invocation—the Q-Adaptor requests services provided by MFA processes and receives responses upon completion of the services.
- Notification—the Q-Adaptor registers its interest to receive notifications with MFA processes and receives notifications upon the occurrence of events.
- Database Retrieval—the Q-Adaptor retrieves information from the MFA data model.

All interactions are performed through the Gateway Server. The Q-Adaptor requests an MFA service by communicating with the Gateway Server using C-structures. The Gateway Server, in turn, uses the C-structure as an input argument, and invokes the corresponding MFA service using the CORBA-based MFA API. Upon completion of the service, the Gateway Server is notified about the result of the service via the MFA API. The Gateway Server informs the Q-Adaptor about the outcome of the request.

For services not currently supported by MFA processes, the Q-Adaptor communicates with the NE via the TL1 Manager to perform the operation. The TL1 command is passed to the Gateway Server in a C-structure. The Gateway Server invokes a service of the Southbound TL1 Manager via the MFA API, to send the command to the NE. Upon receiving a response from the NE, the Southbound TL1 Manager forwards the response to the Q-Adaptor via the Gateway Server.

Connection Manager Process

The Connection Manager (CM) process centralizes the functions of sending, receiving, routing, and processing the connections needed for responses and autonomous messages going in, and coming from, the CMISE and TL1 Southbound subsystems. CM handles the following functions:

- At start-up, load external configurable parameters from a configuration file.
- Create and terminate associations to all NEs.
- Perform association requests in a staggered manner to minimize the impact of the connection processes on the network.
- Implement association recovery mechanisms.
- Receive connection-related indication messages from TL1 and CMISE Southbound subsystems, update association status in memory, and forward notifications to MFA.
- Handle create/modify/delete NEs, store and forward related information.
- Subscribe to notification of incorrect NE type and send notification to MFA as necessary.

Log management

Log Management provides logging, browsing, and purging services of other modules in the system, in order to keep track of information regarding system performance and actions. Log Management consists of three modules:

- Logger—provides one-way services to log messages into a system database.
- Log Browser—provides services for the GUI to display logged messages.
- Log Purger—purges old log messages from a database or temporal log files generated by system modules. Retention periods are settable by the system administrator.

SONET directory services

The SONET Directory Services (SDS) subsystem resides in the Southbound module of the system. A directory of NE information is used by WaveStar SNMS to look up address information about NEs. WaveStar SNMS employs two agents to manage this information: the Directory Services Agent (DSA) and the Directory User Agent (DUA). The DSA maintains the Directory Information Base and the DUA retrieves and gives information to and from it. The DSA process can reside in a Network Communications Controller (NCC) device or the EMS itself.

The DSA organizes network elements into a structure known as the Directory Information Base (DIB). The DUA accesses the DSA for any new NEs registered in the DIB and notifies other WaveStar SNMS processes of the existence of the new NE.

The WaveStar SNMS Graphical User Interface

2

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Background

Introduction

The WaveStar SNMS Graphical User Interface (GUI) is a Java-based, multilevel windowing environment that provides fault, provisioning, configuration, and security management functions and allows you to graphically monitor the status of the network. The WaveStar SNMS GUI is designed to be an intuitive, consistent, easy-to-use interface. Status bar messages and windows keep you informed of the outcome of an operation. The GUI offers point-and-click, menu-driven operation, as well as a cut-through interface to issue TL1 commands to connected NEs. Several types of online help are available to assist you in performing any task.

The GUI runs on PCs. Once a GUI session is started, the GUI server can support multiple platform-independent GUI client connections simultaneously.

Objectives

This chapter provides background and introductory information about the WaveStar SNMS GUI. It includes available features and references to specific task-related instructions.

After learning the information in this chapter, the user should be able to do the following:

- Identify the mouse buttons and know how to use them to perform various GUI functions.
- Obtain their user ID and password and be able to log into the WaveStar SNMS GUI.
- Identify and use the different parts of the WaveStar SNMS Map window, including the main menu bar, the toolbar, the alarm directional button, the subnetwork explorer, and the Map pane.
- Recognize on the Map window the difference between Network Elements, aggregates, the Host, trails, and managed/non-managed devices.
- Display and use the WaveStar SNMS system help documentation.
- Use GUI lists and tables.

Related tasks

For related tasks, see the series 100 tasks or look up individual tasks in the Task Index.

Using the Mouse

Introduction

The mouse is used to move a pointer around the screen. A mouse usually has three buttons, two of which are used to select items on the display.

Diagram

The following diagram shows the different mouse buttons, as configured for a right-handed person. To reconfigure the mouse buttons for a left-handed person, consult the mouse and workstation documentation. The mouse for your workstation or PC may only be equipped with two buttons, so consult the hardware documentation.

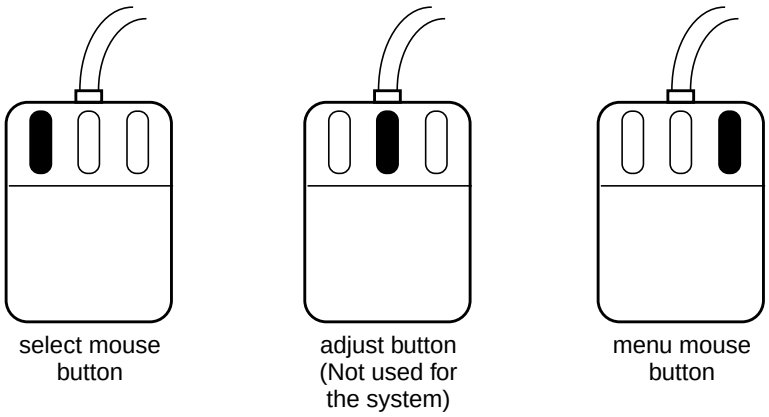

Figure 2-1. Mouse Buttons

Select mouse button

The select mouse button, which is the leftmost button on the mouse, is used to select an item in WaveStar SNMS. The terms “click” and “select” are used interchangeably throughout the WaveStar SNMS documentation. Both terms represent the following operations:

- Activating a button, such as OK, Cancel, or Help
- Activating a menu, such as a pull-down menu on the menu bar
- Selecting an item from a menu
- Selecting an NE/aggregate symbol on the Map window
- Selecting an item from a scroll list
- Moving window focus to a text field to type an entry in the field

To do a click or select operation, position the mouse pointer over the desired list item, NE/aggregate icon, button, field, or menu, and double click the select mouse button.

Menu mouse button

The menu mouse button, which is the rightmost button on the mouse, is used to bring up (activate) a pop-up menu.

To activate a pop-up menu, position the mouse pointer over the object (like an NE or aggregate icon on the Map pane or Subnetwork Explorer), and single-click the menu mouse button.

Manipulating Fields and Text

Entering text

The following guidelines explain how to enter text in windows that contain text fields:

- Press the Tab key to enter text that you have typed in a field. Pressing the Tab key in a text field accepts the data in the text field and moves the cursor focus to the next field that accepts input. If the cursor is positioned in the last enterable field on the window, pressing the Tab key moves the cursor to the first text field on the window.
- Use the Tab key for field-to-field navigation within a window.
- Use the Backspace key to delete text field input.
- You can cut and paste text between text fields and/or text areas using the standard cut and paste hot keys for Microsoft Windows and HP Vue.

Logging Into WaveStar SNMS

Introduction

To start up an instance of the GUI on your PC or workstation, click on the desktop or menu bar icon representing the WaveStar SNMS application. When you click on this icon, a command is sent to the WaveStar SNMS host machine to start up the application.

Click on the same icon/menu item to start up another instance and log into the same host. Click on a separate icon/menu item to start up a GUI instance and log into a different host.

The WaveStar SNMS Login window is then displayed for logging into WaveStar SNMS.

To log into WaveStar SNMS, you must enter a valid user ID (login) and password that you been supplied to you by your WaveStar SNMS system administrator.

When you log into WaveStar SNMS for the first time with a new user login, you must change your password from the default password given for the login. A pop-up window is displayed, indicating that you must change your password before being allowed to log into WaveStar SNMS. You are given the option of continuing the session or exiting the system at this point. If you choose to continue the login session, the Change Password window is displayed, prompting you to change your password from the default password. The system validates your new password. If it is valid, the system re-displays the Login window to re-enter your user ID and your new password.

Successful login

If the user ID and password that you entered are valid, WaveStar SNMS displays an advisory message, the Alarm Notification window and Map window are displayed.

Unsuccessful login attempts

If you cannot log into WaveStar SNMS the first time, because you entered an invalid user login or password, the system allows you to retry a certain number of times (as defined by the system administrator) before you are denied access. You must enter a valid user ID (login) and valid password. See the Valid user ID and Valid password sections in this chapter for definitions of a valid user ID and password.

Password expiration

Passwords must be changed after a period of time, as defined by the system administrator. If you attempt to log into WaveStar SNMS with a password that is about to expire, the system informs you of this via a pop-up window and asks if you want to change your password to log into the system immediately. If you

choose to change your password at this time, the Change Password window is displayed. If you choose not to change your password at this time, but the password expiration period has not yet been reached, you can continue to log into the system. If the password has expired, and you do not change it, the login session will be terminated.

Related Information

See T 100, Log Into WaveStar SNMS for specific instructions on how to log into WaveStar SNMS.

T 500, Change Your User Password describes how to change your user password.

T 517, Globally Provision Login/Password Parameters describes how the system administrator sets up certain aspects of login/password procedures enforced by WaveStar SNMS, such as the password expiration period and the number of login attempts allowed.

Valid user ID

A valid User ID (login) is 1-10 alphanumeric characters in any combination. Special characters (such as ;*&@) are not allowed.

Valid password

A valid password is 6-10 characters. A password must include at least two uppercase and/or two lowercase letters, at least one numeric, and at least one special character (!#$%^&*()-+_=?). The following special characters are not permitted (:,;).

Alarm notification window

Once you have logged in and the GUI is running, the Alarm Notification window is displayed. The Alarm Notification window displays a running tally of the number of Critical, Major, Minor alarms, Not Alarmed (which represents Standing Condition events that require clearing), and Communication alarms for SONET, or Prompt, Deferred alarms, No Alarms (which represents Standing Condition events that require clearing), and Communication alarms for SDH. The number displayed below the box for each alarm severity increases by one whenever a new alarm of that severity occurs. You can click on any of the severity type boxes to display the Alarm List window, filtered for that severity type. If you click on the Communications alarms box, a list of NEs that are currently not communicating with the system is displayed. The Alarm List window is only displayed if there is one or more active alarms or standing condition events in the selected alarm severity category. Once displayed, the Alarm Notification window remains open during the GUI session. When a new alarm is received by WaveStar SNMS, the Alarm Notification window is brought to the forefront of the GUI display to signal the arrival of the new alarm.

GUI application not running

If the WaveStar SNMS host is successfully contacted, but the application and/or GUI server is not functioning on the host, a pop-up message window is displayed, indicating that the WaveStar SNMS application is not currently running on the host machine.

Multiple GUI instances

If the WaveStar SNMS host machine is successfully contacted, and the application is running, but no more GUI instances can be started by the GUI server, a pop-up warning message window is displayed, informing you that no more GUIs can be connected to the host machine, and to retry later.

Session time out

When you do not use a GUI session for 15 minutes (or another time interval specified by the system administrator), a pop-up window is displayed, stating that the GUI session will time out in 60 seconds and asking if you want to exit WaveStar SNMS at this time. If you choose Yes or make no choice, you are automatically logged out of WaveStar SNMS. If you choose No, the GUI session keeps running and the session timeout clock is reset.

Logging Out of WaveStar SNMS

Introduction

When you log out of WaveStar SNMS, all open windows associated with the current session are closed and the GUI client/server sessions are terminated.

Changes made during GUI session

If you have made changes during the GUI session to certain settings, such as user-specified preferences for the GUI or NE positions, a pop-up window is displayed, asking if you want to save the settings. Choose Yes if you want to save the settings or No if you do not want to save them.

Related information

See T 101, Log Out of WaveStar SNMS for specific instructions on how to log out of WaveStar SNMS.

The WaveStar SNMS Map Window

Introduction

After you have logged into WaveStar SNMS, the Map window is displayed. This window provides access to all of the WaveStar SNMS functions and features.

The Map window

The following figure shows the WaveStar SNMS Map window.

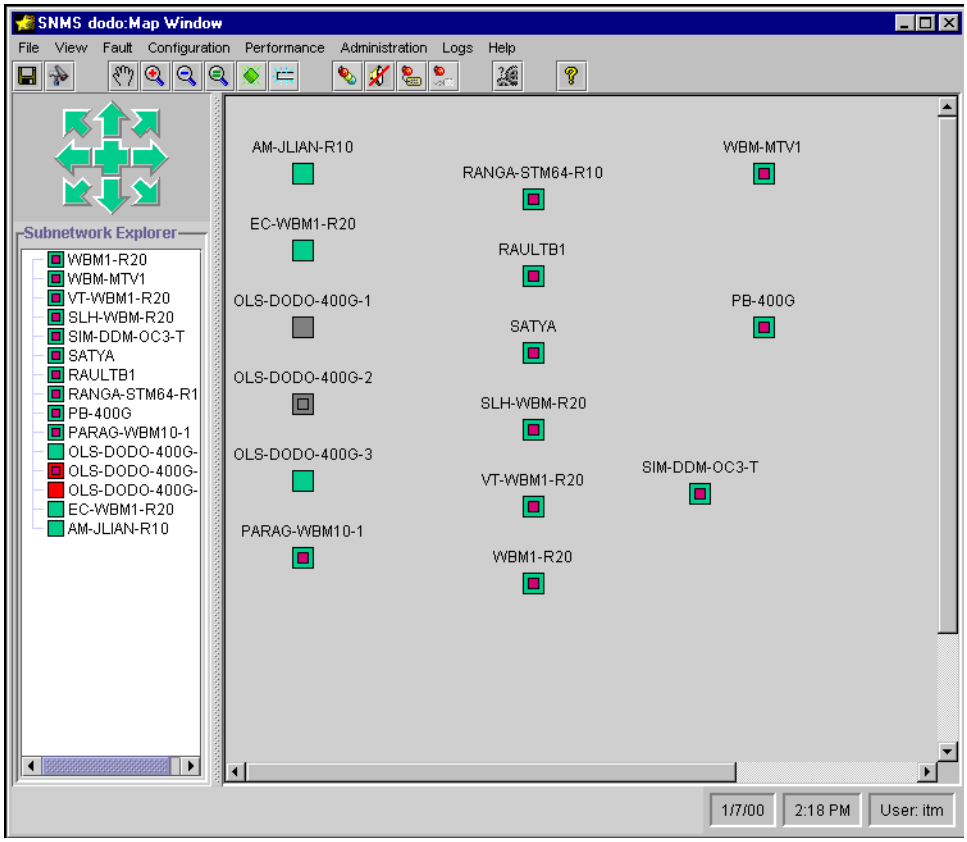

Figure 2-2. The Map Window

Parts of the Map window

The Map window is divided into several different but interrelated areas. It consists of:

- A main menu bar— located just below the Map window label, it provides access to all the main WaveStar SNMS functions. The main functions are summarized in The Map window menu.

- A toolbar— a series of buttons just below the main menu bar that control the Map view and provide a shortcut way of accessing some of the WaveStar SNMS functions. For more details, see the Map Window toolbar section.
- A status bar—a text bar at the bottom of the window that displays messages related to system activity, the current date/time, and the User ID of the user currently logged in.
- An Alarm Directional button—an icon used to indicate that an alarm exists in some portion of the map that is currently not visible.
- The Subnetwork Explorer—an explorer tree that is used to show a textual list of the aggregates and NEs in a subnetwork, along with the subnetwork's hierarchy.
- The Map pane—the portion of the Map window that provides a graphical representation of the network, displaying the NEs, aggregates, and trails between them.

There are three buttons in the upper-right hand corner, in the label portion of the Map window. These buttons are, from left to right:

- the window minimize button
- the window restore button
- the window close button

The Map window menu

All of the main WaveStar SNMS functions are accessed through the main menu bar on the Map window. When you select a main functional menu (for example, Configuration), this displays an associated drop-down menu, which lists a series of related options for you to select.

The following summarizes each of the main functional menu categories:

- **File**—this menu provides access to a set of options for saving, restoring, and copying user preferences, constructing a TL1 Macro Builder File, and logging out of WaveStar SNMS.
- **View**—this menu provides access to a set of options for setting Alarm Severity and Alarm Indications, for viewing the Trail Alarm List, for clearing the Map window status line, for viewing the Alarm Tally window, for zooming in/out of the Map view, and for setting user preferences.
- **Fault**—this menu provides access to the set of Fault Management options for monitoring alarms and conditions in the network.
- **Configuration**—this menu provides access to the set of Configuration Management options for viewing and/or modifying Network Element, port, and line parameters.

- **Performance**—this menu provides access to the set of options for collecting and viewing Performance Monitoring (PM) data.
- **Administration—**this menu provides access to the set of options for Security Management and Network Element administration.
- **Logs**—this menu provides access to the set of options for viewing logs generated by WaveStar SNMS that track network and EMS performance and activity.
- **Help**—this menu provides access to the set of online Help options.

Map Window toolbar

These series of buttons allow you to control the Map view and provide a quck way to access many of the frequently used GUI functions. The toolbar, from left to right, provides a:

— Save Preferences button—details about this function are provided in T 112, Save Preferences/Map Positions.

— Preferences button—details about this function are provided in T 111, Modify User Preferences.

— Map Pan button—this button is used to enable or disable use of the Map Pan feature to reposition the Map view. Single-click on this toolbar button to enable manual “panning” or maneuvering of the map view in the Map pane. Single-click this toolbar button again to disable Map panning.

— Zoom In button—to zoom into a portion of the Map pane display, position the mouse pointer over this button and single-click the mouse select button.

— Zoom Out button—to display an enlarged view of the portion of the Map pane display, position the mouse pointer over this button and single-click the mouse select button.

— Zoom Reset button—to reset the Map pane view, position the mouse pointer over this button and single-click the mouse select button.

— Add an Aggregate button—details about this function are provided in T 615, Add an Aggregate.

— Clear Message Line button—details about this function are provided in Clearing status messages in this chapter.

- Alarm Severity button—click on this button to change the severity level of active alarms displayed on the Map window. The number and the color of the balls shown on the toolbar button indicate the type and severity of alarms currently being displayed on the Map window. You can also change the alarm severity level of displayed alarms using the Preferences function. For details, see T 111, Modify User Preferences.
- Audible Alarms button—details about this function are provided in Audible alarms in this chapter.
- Global Acknowledge button—to acknowledge all active alarms for an NE or aggregate, single-click on this button. A Choose an NE/Aggregate window is displayed. Double-click on the NE or aggregate in the list to select it and click the OK button. All active alarms for the selected NE or aggregate are acknowledged. For more details about this function, refer to T 206, Acknowledge/Unacknowledge All Alarms for an NE and the Alarm indication and acknowledgement section in Chapter 3, Fault Management.
- Global Unacknowledge button—to unacknowledge all active alarms for an NE, single-click on this button. A Choose an NE/Aggregate window is displayed. Double-click on the NE or aggregate in the list to select it and click the OK button. All active alarms for the selected NE or aggregate are unacknowledged. For more details about this function, refer to T 206, Acknowledge/Unacknowledge All Alarms for an NE and the Alarm indication and acknowledgement section in Chapter 3, Fault Management.
- Transient Condition Event Browser—to display a list of transient condition (TC) events that occur in the host's NE network. Transient events do not require a clear message by the NE because they do not change the NE's condition over an extended period of time. For more details about this function, refer to Display the Transient Condition Event Browser.
- Status Dialog button—details about this function are provided in Status window in this chapter.
- Help button—single-click on this button to bring up an online help window which explains the Map window.

To access a toolbar function, position the mouse pointer over the button and single-click the mouse select button.

Alarm directional button

A monitored network can be larger than can be viewed on the Map pane at any one time and alarms can occur on network objects that are not currently being displayed. The Alarm Directional button, which is located in the left-hand portion of the Map window, above the Subnetwork Explorer, shows the relative location and highest severity alarm of the area not visible. When an alarm exists, an arrow point is lit with the color of the alarm level, showing the direction to go on the Map pane to view the map item in an alarm state.

The subnetwork explorer

The Subnetwork Explorer, located in the left-hand portion of the Map window, is a tree diagram that shows the content and hierarchical relationship of aggregates and NEs in the portion of the network currently being viewed on the Map pane.

Improving the display of the subnetwork explorer

If the TID/alias of one or more NEs/aggregates in the Explorer is obscured, use the scroll bars below and to the right of the Explorer to view the complete TID/alias of the item. If the display of the Explorer list is still obscured by Map pane, position the mouse pointer on the window bar just to the right of the Explorer. A two-sided arrow is displayed in place of the mouse's arrow pointer. Click and hold the left (select) mouse button, and drag the two-sided arrow symbol to the right until the desired view of the Explorer is obtained. Then, release the mouse button. If the NE TID/alias listing is in complete view, the scroll bars disappear. You can adjust the display by clicking and dragging the bar between the Map pane and the Explorer to the left or right, as desired.

Element labels

NEs and aggregates are labeled by their Target Identifier (TID), by default. The label format can be changed through the Preferences option from the View menu on the Map window menu bar.

Selecting an item

To select an item on the Subnetwork Explorer, position the mouse pointer on the item and click the mouse select button. The selected item is highlighted.

Expanding/collapsing an item

To expand an item (such as an aggregate) in the Subnetwork Explorer, single-click on the plus ("+") sign next to the item.

To collapse the item, single-click on the minus ("-") sign next to the expanded item.

Pop-Up menu

A pop-up menu of WaveStar SNMS functions for the NE or aggregate can be accessed by positioning the mouse pointer and clicking the menu mouse button.

Map pane display

Any change on the Subnetwork Explorer, such as expansion or contraction of an aggregate, causes a corresponding change in the network display on the Map pane.

Related Tasks

T 102, Select an Item in the Subnetwork Explorer explains how to select an item in the Subnetwork Explorer portion of the Map window.

T 103, Expand or Collapse an Item in the Subnetwork Explorer excplains how to expand or collapse an item (such as an aggregate) in the Subnetwork Explorer portion of the Map window.

The Map pane

The Map pane displays a graphical representation of the network automatically when you log into WaveStar SNMS and the Map window is brought up.

Map pane preferences

The system defaults for different characteristics of the Map pane display, such as NE symbol sizes, shapes, alarm colors, and NE/aggregate labels, can be changed through the Preferences option on the View menu. See Map preferences for more information on changing characteristics of the Map pane display.

Network elements

Each square on the Map pane represents an NE in your Target Group. A square is the default shape for NEs. The shape used to represent NEs can be changed through the Shapes panel on the Preferences window.

By positioning the mouse pointer over a specific NE symbol on the Map pane, you can display the NE type and alias of the NE. If tooltips help is enabled via the Preferences option, the NE type and alias is displayed as a callout and in the status bar at the bottom of the Map window. If tooltips help is disabled, the NE type and alias are just displayed in the status bar on the Map window.

T 111, Modify User Preferences explains how to select or change certain characteristics of the Map window display, such as enabling or disabling tooltips help.

Aggregates

The diamond-shaped symbols on the Map pane represent aggregates. The diamond shape is the default for aggregates; this can be changed through the Shapes panel of the Preferences window. Aggregates are collections of NEs that do not necessarily correspond to any physical connectivity or other NE attributes. An aggregate can consist of a group of related NEs, such as a subnetwork, or a group of colocated NEs that are not necessarily in the same subnetwork. An aggregate can be moved under another parent aggregate on the Map pane or Subnetwork Explorer by selecting it and then dragging it to the parent aggregate symbol.

Non-managed devices

A non-managed device is an NE or other telecommunications entity that is part of the network of NEs that communicate with WaveStar SNMS but is not managed by the system. These NE types are treated as “non-managed devices” and

appear on the Map pane display as circles (the default shape) about the same size as the squares that represent managed NEs.

Non-managed devices that are discovered are added to the WaveStar SNMS database to complete the network map and to avoid retries by WaveStar SNMS to log into a non-managed device.

Certain non-managed devices can only be manually added using the Add an NE window on the GUI, specifying it as a non-managed device, when WaveStar SNMS is not communicating with the NE. You can also change the NE type to a non-managed device through the Modify an NE window. Once a non-managed device has been added, WaveStar SNMS does not attempt to log into it.

EMS alarm icon

The Map window pane contains an additional square-shaped icon, labeled with the WaveStar SNMS host name, that displays the highest severity alarm present on the host. Although this icon looks similar to the NE symbols, it cannot be included in an aggregate or have trails connected to it.

The EMS Alarm icon receives alarms from various application processes and monitors the communication links between the WaveStar SNMS host and the NEs. It indicates, for example, whether a file system has exceeded capacity, whether there are remote printer problems, or whether the UNIX message queues are getting full. The icon is shown with the machine name of the host that is running the EMS application.

Like NEs and aggregates, colors are used on the EMS Alarm icon to show the current state of the application or its communications links. The default colors are the same as for NEs (see the Alarms section). The icon shows the current highest severity alarm for the application. Alarm clearing methods used for NEs and aggregates also apply to the EMS application alarms.

DSA icon

If the EMS-based DSA feature has been enabled, the upper right portion of the Map window pane contains an oval-shaped icon, below the EMS Alarm icon, that represents the Directory Services Agent (DSA) providing NE directory information to WaveStar SNMS. An oval shape is the default; it can be changed through the Shapes panel of the Preferences window. This icon is labeled “DSA”. This icon cannot be included in an aggregate or have trails connected to it.

The only pop-up menu function that is available for the DSA icon is the manual DNO feature for Subnetwork Discovery on the DSA.

Like NEs and aggregates, colors are used on the DSA icon to show the current alarm state. The default colors are the same as for NEs (see the Alarms section). The icon shows the current highest severity alarm for the application. Alarm clearing methods used for NEs and aggregates also apply to the DSA alarms.

Trails

The lines that run between NEs and/or aggregates represent trails. Trails are physical links between NEs or aggregates. If there is more than one trail between two NEs, the phrase “Multiple” is displayed when you position the mouse cursor on the trail line in the Map pane.

Alarms

The color of a map item symbol or trail indicates the level of the most severe active alarm. The default alarm colors for the Map pane display are:

Alarm Color (default)	Alarm Severity Level (SONET)	Alarm Severity Level (SDH)
Red	Critical	Prompt
Yellow	Major	Deferred
Cyan	Minor	
Gray	Throttled	
Green	No Active Alarms	
Magenta	Loss of Communications	
White	Not Alarmed state	Not Alarmed state

The center of an NE symbol may show a different color than the border of an NE/aggregate symbol. When more than one alarm type has occurred, the center of an NE symbol shows the highest severity alarm that has occurred and the border shows the next highest severity alarm. Communication alarms are always top priority and always color the center of the NE symbol. If alarms are being throttled for an NE, the throttled alarm color (gray) is always shown in the center of the symbol, with the color indicating the severity of the last occurring alarm shown in the border. If automatic alarm throttling is enabled, the alarm throttling color is not displayed until the alarm throttling threshold has been passed.

When the color of an NE is white on the Map window (the default color), this indicates that the NE is in a “Not Alarmed” state, or has received one or more Standing Condition (SC) events which require clearing by the NE. This can occur, for example, during an NE data restore operation (see T 343, Restore NE Data for more details). SC events which occur against the NE are counted in the alarm tallies on the Alarm Notification window. When the SC event has been cleared by the NE, the color of the NE returns to green, indicating that there are not active alarms present and the NE is communicating.

The default Alarm display colors shown in the above table can be modified through the Preferences option of the View menu on the Map window main menu bar. For more details, see T 111, Modify User Preferences.

A flashing (blinking) NE symbol indicates that there are one or more unacknowledged alarms against that NE or aggregate. See the Alarm indication and acknowledgement section for more details about alarm acknowledgement/ unacknowledgement.

Audible alarms

A speaker-shaped symbol in the middle of the toolbar on the Map window indicates whether the Audible Alarm feature is enabled or disabled. This symbol has a slash through it if the Audible Alarm feature is disabled. To enable the Audible Alarms feature, click on the symbol. The slash is removed from the symbol. To disable the Audible Alarm feature, click on the symbol again. A slash appears on the speaker-shaped symbol.

The Audible Alarm feature can also be enabled or disabled by selecting **Fault** from the main menu bar on the Map window and then selecting **Audible** from the displayed sub-menu. If the Audible Alarm feature is currently enabled, selecting **Audible** disables the feature. If the Audible Alarm feature is currently disabled, selecting **Audible** enables the feature.

When the Audible Alarm feature is enabled, an audible sound is triggered each time a new alarm occurs on the network. Once triggered, the audible alarm will sound for a short time and then repeat until the alarm is cleared or it is silenced through the GUI. The sound characteristics of the audible alarm correspond to the most severe prevailing alarm condition (Critical, Major, Minor). The alarm sound interval can be changed by the WaveStar SNMS system administrator. See the Audible alarms/events section for more details about the Audible Alarms feature.

Selecting NEs and aggregates

To select a single NE or aggregate on the Map pane, position the mouse pointer over the NE or aggregate icon and click the select mouse button.

To select one or more NEs or aggregates on the Map pane:

1. Position the mouse pointer over a portion of the background adjacent to the items to be selected.
2. Click the mouse select button and drag the mouse pointer. As you drag the mouse pointer, an outlined box appears over the selected area As items in the Map pane are selected, they change color. Release the mouse select button. The items are selected.

   To deselect a selected item in the Map pane, position the mouse pointer over the item and single-click the mouse select button. To deselect a group of items, position the mouse pointer within the boxed region and single-click the mouse select button. Any item in the box that is already selected becomes deselected.

Pop-Up menus

A pop-up menu of WaveStar SNMS functions for the NE or aggregate can be accessed by positioning the mouse pointer on the Map pane icon and clicking the menu mouse button.

Moving NEs and aggegates

To move a single NE or aggregate on the Map pane:

1. Position the mouse pointer over the icon to move.
2. Press and hold the select mouse button.
3. Drag the icon to the new position.
4. Release the select mouse button.

To move a group of NEs or aggregates on the Map pane:

1. Select a group of NEs or aggregates by positioning the mouse pointer in an area of the background adjacent to the items, clicking the select mouse button and dragging the mouse pointer (a faint dashed box appears) to surround the items, and release the mouse select button.
2. Position the mouse pointer over one of the chosen icons. Press and hold the select mouse button.
3. Drag the icons to the new position.
4. Release the select mouse button.

Expanding and collapsing aggregates

To expand an aggregate and show its member NEs on the Map pane, position the mouse pointer over the aggregate symbol and click the left (select) mouse button to select the aggregate. Then, click the right (menu) mouse button. A pop-up menu is displayed. Select **Expand** from the displayed pop-up menu. The aggegate is expanded to show the member NEs on the Map pane.

To collapse the expanded aggregate, select one of the member NEs and double-click on it. The aggregate is collapsed and the aggregate symbol replaces the member NEs on the Map pane display.

Moving an NE to the TOP aggregate level

To move an NE out of an aggregate to the TOP level (which includes all NEs), make sure the aggregate is expanded and then select the NE. Once the NE is selected, click the right (menu) mouse button to display a pop-up menu. Choose **Return to TOP**. The NE is brought to the TOP aggregate level and is taken out of the aggregrate.

Zooming the Map view

The GUI allows you to zoom into (enlarge) a portion of the network on the Map pane to focus on a few NEs or aggregates, or zoom out of the Map pane to show more of the network. The Zoom functions are available through the View menu on the Map window main menu bar.

See T 108, Zoom the Map View for specific instructions on zooming the Map view.

Related tasks

T 104, Select an Item on the Map Pane explains how to select a single item or group of items on the Map pane portion of the Map window.

T 105, Move an Item on the Map Pane explains how to move a single item or group of items on the Map pane portion of the Map window.

T 106, Expand or Collapse an Aggregate on the Map Pane explains how to expand or collapse an aggregate on the Map pane portion of the Map window.

T 107, Move an NE to the TOP Aggregate Level explains how to move an NE out of an aggregate to the TOP aggregate level in the Map window.

T 108, Zoom the Map View explains how to zoom the Map pane view in or out on the Map window.

Finding a Network Element

WaveStar SNMS assists you in locating an NE on the Map window if you cannot find it on the Map pane display or Subnetwork Explorer.

To find an NE:

1. Select **View** from the main menu bar on the Map window. A sub-menu is displayed.
2. Select **Find an NE** from the displayed sub-menu. The Find an NE window is displayed.
3. Enter the TID and/or alias of the NE.
4. Click the OK or Apply button.

   The Map pane display is repositioned to show the NE and the NE is selected in the Map pane and Subnetwork Explorer. If more than one match is found, the item which is found first is indicated in the Subnetwork Explorer portion of the Map pane. If the NE is contained in an unexpanded aggregate, the aggregate is expanded and the NE is highlighted in the Map pane.

Related tasks

T 109, Find a Network Element reviews how to use the Find an NE function as a shortcut way to locate NEs on the Map window.

Clearing status messages

Status messages that are displayed in the status bar on the Map window can be cleared at any time.

To clear the status bar message display, select **View** from the main menu bar on the Map window and then select **Clear Status Line** from the View menu. The message area in the status bar is cleared. The Status line can also be cleared by using the Clear Message Line button on the Map window toolbar.

Related tasks

T 110, Clear Status Messages reviews how to clear status messages from the status bar portion of the Map window.

Map preferences

There are system defaults for how map items are displayed. WaveStar SNMS allows you to change certain characteristics of the Map pane display, such as NE size, NE labels, NE/aggregate shapes, and alarm colors, to suit your own needs. The appearance of Map items on the Map pane can be changed through the Preferences option on the View menu. Preferences are stored on a per-user basis.

The Map Preferences window can be accessed through the View options menu on the main menu bar of the Map window or by clicking the Map Preferences button on the Map window toolbar.

T 111, Modify User Preferences explains how to change user preferences for the Map window display.

The Preferences window has six categories:

Nodes & Lines	Allows you to choose NE size and thickness of trail lines between NEs
Labels	Allows you to choose the size, content, and alignment of Map item labels
Colors	Allows you to choose colors associated with alarms and cross-connections

Shapes	Allows you to choose the shapes used for Map items
Fault	Allows you to set preferences associated with how alarms are displayed in the Map and Alarm Notifcation windows. You can select the severity level of alarms displayed and the definition of alarm levels as Critical/ Major/Minor (SONET) or Prompt/Deferred/Information (No Alarm) (SDH).
Other	Allows you to turn tooltips on and off, to set the date format for items in the Map, alarm lists, and tallies to mm-dd-yyyy or dd-mm-yyyy format, and to set the display of Bidirectional Line Switched Ring (BLSR) Protected Port Groups on the Cross-Connect View window to be singly or in pairs (**Note: the BLSR display option is currently not supported**).

Saving and restoring user preferences

Your chosen preferences for the Map pane display can be saved or restored for each time you log into WaveStar SNMS and bring up the Map window.

T 112, Save Preferences/Map Positions explains how to save user preferences. T 113, Restore Preferences/Map Positions explains how to restore previously saved user preferences.

Copying user preferences

Map display preferences can be copied from another user.

T 114, Copy Preferences/Map Positions describes how to copy user preferences and/or Map positions from another user.

Restoring defaults for the Map display

System defaults for the Map window display can be restored from the View Preferences window by clicking the Get Defaults button in the window and then applying them to the current GUI session or saving them. See T 113, Restore Preferences/Map Positions for complete instructions on setting user preferences for the Map display.

Related task

T 111, Modify User Preferences provides instructions on how to view and modify user preferences for the Map window.

Saving the Map view

WaveStar SNMS allows you to save the positions of NEs and aggregates on the Map pane and/or user preferences for characteristics of the Map display, such as node size, labels, line size, and alarm colors. You can also restore previously

saved settings or copy settings from another user. Map positions and preferences are saved on a per-user basis.

T 112, Save Preferences/Map Positions describes how to save user preferences and/or Map positions.

NOTE:
User preferences can also be saved directly from the Preferences window by clicking the Save button in the window. See T 111, Modify User Preferences for complete instructions on setting user preferences for the Map display.

T 113, Restore Preferences/Map Positions describes how to restore previously saved user preferences and/or Map positions.

Status window

WaveStar SNMS provides a Status window, which allows you to check on the status of on-demand functions you requested to be performed by the system, such as a manual DNO on an NE or manual addition of an NE. The status dialog window is also displayed after the completion of certain GUI functions.

The Status window can be accessed at any time, by clicking the Status Dialog toolbar button on the Map window toolbar, or by selecting **View** from the main menu bar on the Map window, and then selecting **Status Window** from the View sub-menu.

The following figure shows an example of the Status window.

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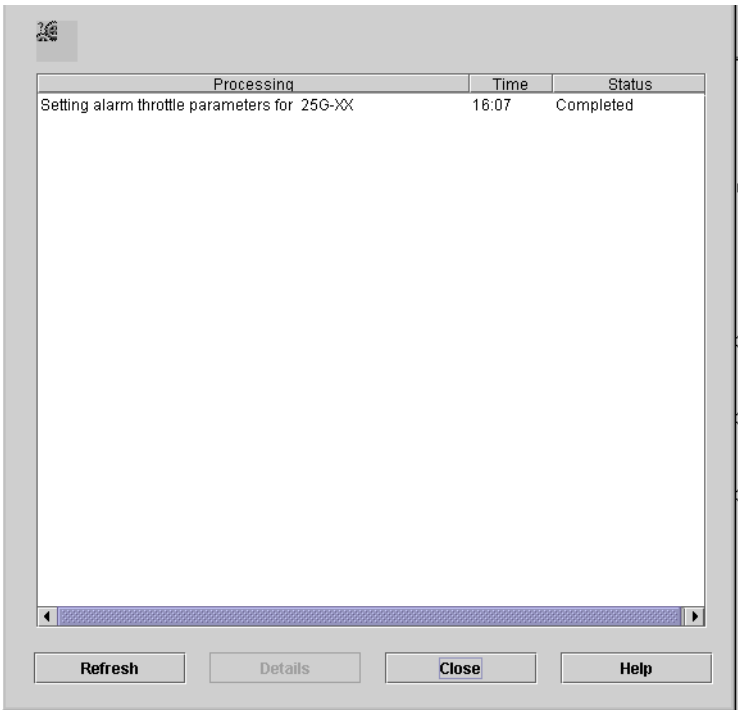

Figure 2-3. Example of Status Window

The Status window is a single table with three columns:

- Processing—this column contains a text string which describes the function that is being performed.
- Time—this column indicates the host time, in hours/minutes, that the function was requested.
- Status—this column indicates the status of the requested function. The status of a function is labeled as shown in the following table:

Status	Meaning
Working	A simple operation is still in progress. When the request has finished processing, the status of the operation changes to show the result, as Completed, Incomplete, or Failed.
Completed	The function has completed successfully. If it is a multi-step function, such as a backup or restore, the percentage of the function completed successfully is shown. Example: 25%
Incomplete	The function is still in the process of being completed, or the function did not complete due to non-communicating NE or another problem.
Failed	The function did not complete successfully due to some problem or error.
Aborted	The function was aborted by the user.

Items on the Status window are shown in the order requested, with the most recent function requested shown at the top of the list. Successfully completed items are removed from the list when you click the Close or Refresh button on the window. Click the Close button to close the Status window.

Many of the functions in WaveStar SNMS can be performed on a single NE or a group of NEs, including aggregates. To view the status of a function being performed on a group of NEs, double-click on the row in the Status window table that refers to the aggregate or group of NEs. A second window is displayed, which shows the status of operations for individual NEs in the aggregate or group.

Help

WaveStar SNMS provides various types of online information to assist you in using the system's functions and features. The types of help available are:

- Tooltips help
- Window help
- Online documentation
- Product information

Tooltips help

Tooltips help assists you in identifying a toolbar button on the Map window toolbar, the function of a window button, or the alias and NE type of a network element on the Map window pane.

To identify a toolbar button, window button, or network element, position the mouse button on the item. The item is identified either by a message in the status bar or a message callout to the right of the item.

Tooltip help can be enabled or disabled through the Preferences option accessible through either the Map window toolbar or through the **View** option on the main menu. See T 111, Modify User Preferences for instructions on how to enable/ disable tooltip help.

Window help

Window help provides specific information about the window's purpose or function.

Window help is accessed by clicking the Help button on any functional window in WaveStar SNMS.

Online documentation

A complete version of the *User Guide* is available to view online through Adobe Acrobat Reader.

An online version of the WaveStar SNMS documentation is accessed by selecting **Help** from the main menu bar on the Map window and then electing **User Guide** from the Help sub-menu.

Product information

General information about WaveStar SNMS, including the full product name, copyright information, the product release number, and other related information is available at any time from a pop-up window that is accessed by selecting **Help** from the main menu bar on the Map window and then selecting **About the EMS** from the Help sub-menu.

To close the Product Information window, click the OK button.

Network Element Explorer

Introduction

The Network Element Explorer is a tool displayed on the Port Provisioning, Cross-Connections, and Equipment Configuration windows that provides a graphical, step-down, hierarchical view of the equipment to be provisioned. The Network Element Explorer consists of a tree diagram that shows the configurable hardware that comprises the Network Element, and the relationship between each hardware component.

Using the network element explorer

The purpose of the Network Element Explorer is to graphically display the desired hardware component and then select it for provisioning purposes.

Equipment hierarchy

The following simple diagram shows the possible equipment levels that can be displayed and configured on the Network Element Explorer.

TID
Lineup
Bay
Shelf
Slot
Circuit Pack
Port
Tributary

Figure 2-4. Equipment Hierarchy on Network Element Explorer

The content and relationship of equipment shown on the explorer varies by NE type. Not every NE contains every level of the hierarchy. Generally, access to a shelf provides access to circuit packs that exist on the shelf. Ports exist on circuit packs, which are placed in slots. Slots are in shelves, shelves are in bays, and bays are in NEs.

Selecting an item

To select an equipment component on the Network Element Explorer, position the mouse pointer on the equipment component and click the mouse select button. The selected item is highlighted.

Expanding/ collapsing an equipment component level

There are two ways of expanding or collapsing an equipment component level on the Network Element Explorer:

1. A select mouse button click on the plus (“+”) or minus (“-”) sign causes the branch associated with the component level to expand (“+”) or collapse (“-”).
2. A double-click on any equipment level selects it and expands to show the component parts. For example, if you double-click on a shelf in the explorer, the diagram expands to show the associated slots, by number.
3. A double-click on the expanded component collapses it back to the next higher component level.

Equipment view display

Any change on the Network Element Explorer, such as expansion or collapse of the equipment level, causes a corresponding change on the Equipment View window.

Window Buttons

Types of window buttons

All of the windows in WaveStar SNMS from which you perform a function have standard buttons that work the same way regardless of the function.

The following table lists the standard window buttons and their function on windows.

Table 2-1. Standard Window Buttons

Button	Function
OK	Accepts input on the window, validates the input, initiates the requested operation, and closes the window.
Apply	Accepts input on the window, validates the input, initiates the requested operation, but leaves the window open.
Cancel	Cancels the operation and dismisses the window. Any insertions or changes made during the use of the window are not saved.
Help	Accesses online help for information about a particular window, function, feature, or task.
Close	Closes the window without performing an operation.

Greyed-out buttons

If a button is greyed out (dimmed) on a window, it means that a function is not available. In some cases, an item has to be selected or specified on the window before the dimmed button is activated.

Exclusive choice buttons

Exclusive choice buttons in WaveStar SNMS let you choose one item or setting from a list of two or more settings. When you change an exclusive choice setting, the previous setting is automatically deactivated.

Exclusive choice buttons are also called “radio buttons” because they work like car radio preset buttons that let you change stations with the press of a button.

To change an exclusive choice setting, click the mouse select button with the pointer positioned on the button. Your choice is activated when the button is darkened.

Example: exclusive choice buttons

The following figure shows a window where one of the exclusive choices (radio buttons) has been selected.

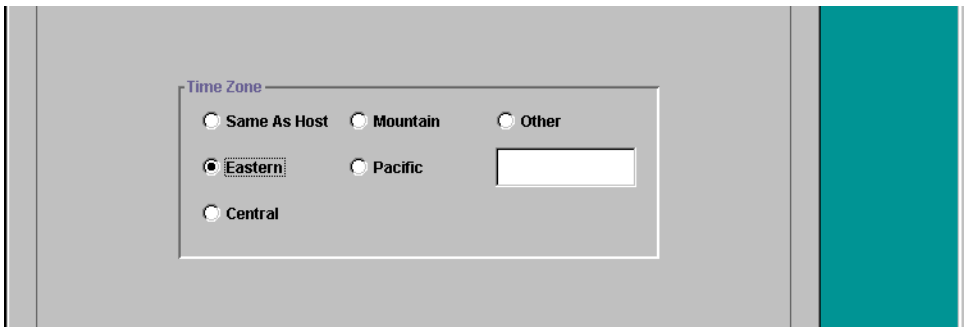

Figure 2-5. Example of Exclusive Choice Button Selection

Push buttons

Some of the function windows in WaveStar SNMS have push buttons that are used to transfer one or more items (such as NEs) between lists on the window.

The following table shows each push button label, its name, and its purpose.

Push buttons (cont.)

Table 2-2. Push Buttons on List Windows

Push Button Label	Push Button Name	Purpose
>	Push Right	When this button is clicked,the selected item is transferred to the list on the right and removed from the list on the left
>>	Push All Right	When this button is clicked, all items on the corresponding list on the left are transferred to the corresponding list on the right
<	Push Left	When this button is clicked, the selected item is transferred to the list on the left and removed from the list on the right
<<	Push All Left	When this button is clicked, all the items on the corresponding list on the right are transferred to the corresponding list on the left

Example: push buttons

The following figure shows a sample window where push buttons are used to transfer items between lists.

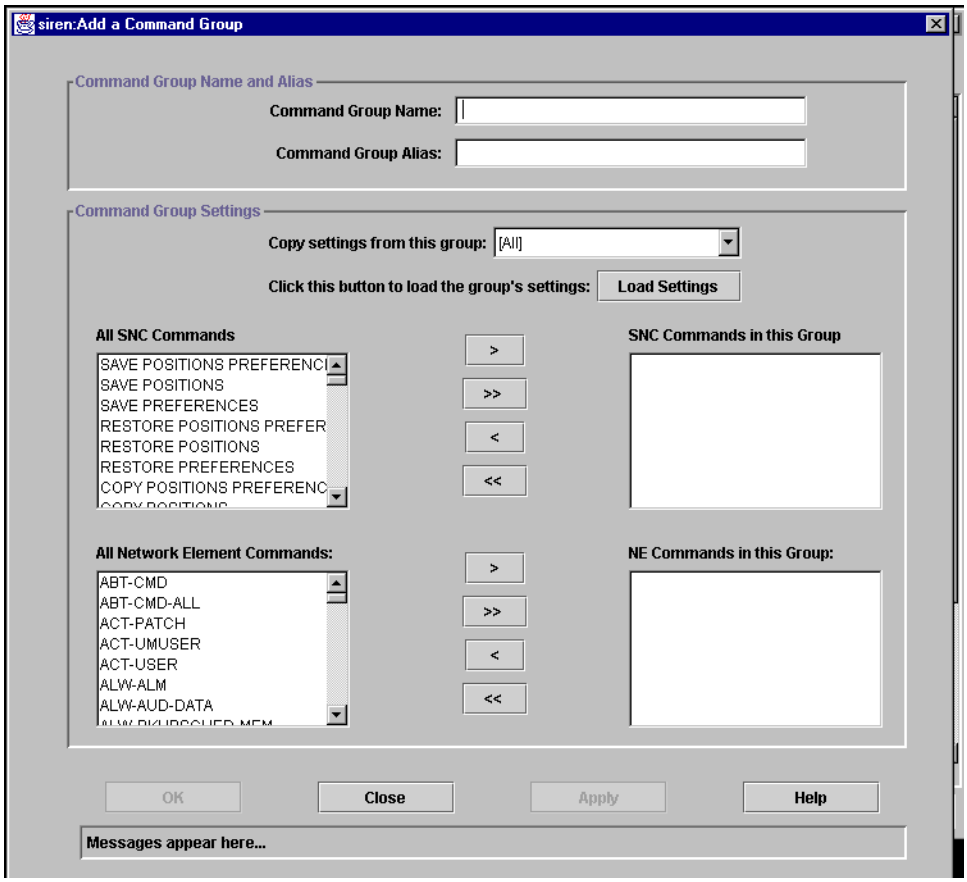

Figure 2-6. Example of Push Buttons on Window

Using Lists

Introduction

A majority of the WaveStar SNMS functions are performed by picking a function to perform (for example, Cut-Through) and then selecting the item (such as a specific NE) on which to perform the function, from a list of similar items.

To select an item from a list, position the mouse pointer over the item(s) and click the select mouse button. The selected item(s) is highlighted. On the type-ahead lists, it may be necessary to double-click the select mouse button to select the item and perform the operation.

WaveStar SNMS provides different methods of locating items on lists to narrow the search to only the item(s) you want. These methods are:

- Scrollable lists
- A filtering/sorting function
- A type ahead field

Scrollable lists

When a window in WaveStar SNMS cannot display all of the information available to you, the information is presented in a scrollable list. The information that you cannot see is available by paging through the scrollable list.

Example: scrollable list window

The following figure shows an example of a scrollable list window in WaveStar SNMS.

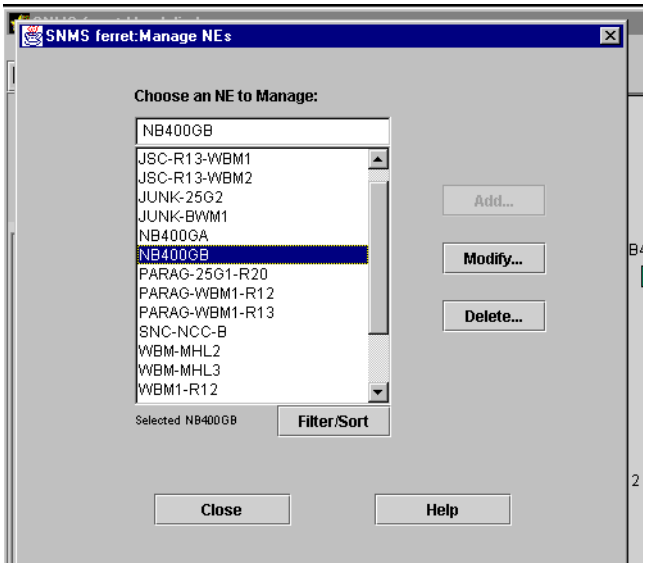

Figure 2-7. Example of a Scrollable List

Using a scrollable list

The vertical bar on the right side of the window is the scroll bar. The scroll bar consists of an up-arrow, a down-arrow, and an elevator box between the two arrows. The scroll bar on the window works as follows:

To:	Do this:
Display the next page	Put the mouse pointer under the elevator box and click the mouse select button.
Display the next line	Put the mouse pointer on the down-arrow and click the mouse select button.
Display the previous page	Put the mouse pointer above the elevator box and click the mouse select button.

To:	Do this:
Display the previous line	Put the mouse pointer on the up-arrow and click the mouse select button.
Display the bottom of the list	Put the mouse pointer on the elevator box, hold down the mouse select button, move the mouse downward (dragging the elevator box to the bottom of the scroll bar), and release the mouse select button.
Display the top of the list	Put the mouse pointer on the elevator box, hold down the mouse select button, drag the elevator box to the top of the scroll bar, and release the mouse select button.

You can select a single item from a scrollable list by positioning the mouse pointer over the item and clicking the mouse select button. This causes the item to become highlighted and indicates your selection.

Filtering and sorting items

WaveStar SNMS has a filter/sort function to further narrow a list to only the item(s) you want. This function allows you to:

- Narrow a list by filtering out all items on the list that do not match all or part of the filename, NE/aggregate name, TID, or alias you supply.
- Sort a list by placing the items in ascending or descending order.

WaveStar SNMS allows you to filter and/or sort the list. Many of the scrollable list windows in WaveStar SNMS provide this function.

Example: filter/sort function

The following figure shows an example of a scrollable list window with the filter/sort function.

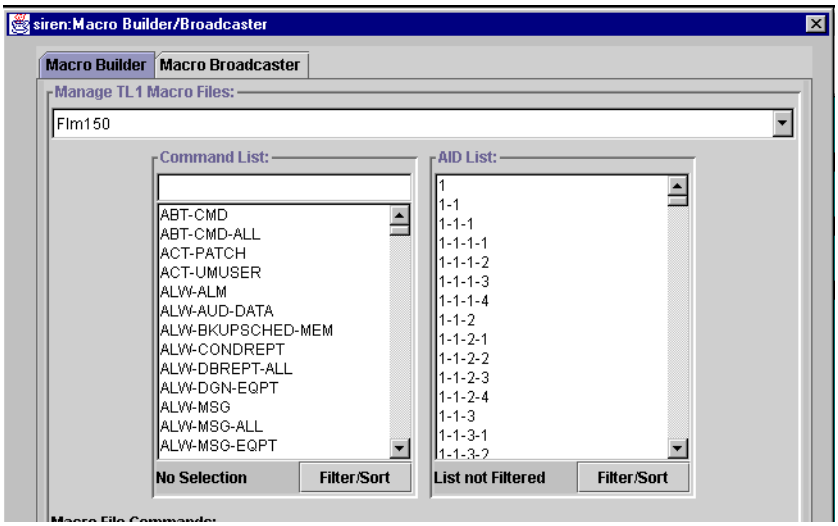

Figure 2-8. Example of Scrollable List Window with Filter/Sort Function

When you click the Filter/Sort button on a list window, a Filter and Sort Options window is displayed to allow you to filter and/or sort the list according to the criteria you specify.

Filter/sort window

The following figure shows a sample Filter and Sort Options window.

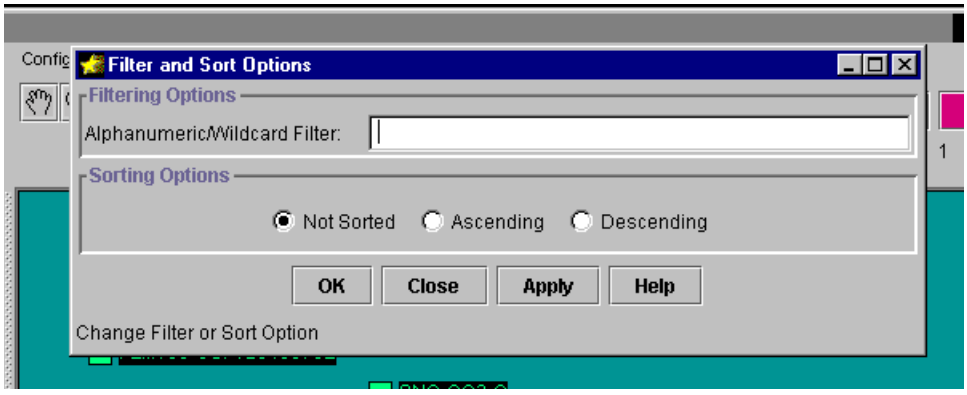

Figure 2-9. Example of Filter/Sort Window

You would fill in the following fields as needed:

- Alphanumeric/Wildcard Filter—This is a text field for entering all or part of the name/label to narrow the list to only those items that match these criteria. An asterisk (*) can be used as a wildcard character to match one or more characters in the name or label. Use the Backspace key to erase what you have entered in this field.
- Sorting Option buttons—These exclusive choice buttons are used to determine the sort order of the list. Click on the Ascending button to display the list in ascending order. Click on the Descending button to display the list in descending order. Click on the Not Sorted button to leave the list as it is.
- OK—After making your filtering/sorting choices, click on the OK button to apply your criteria to the list and close the Filter/Sort window.
- Close—Click on this button to close the window without applying any filtering/sort criteria to the list.
- Apply—After making your filtering/sorting choices, click the Apply button to apply your criteria to the list and leave the Filter and Sort Options window open.
- Help—Click on the Help button to obtain online help for the Filter and Sort Options window.

Type ahead field

Many of the list windows have a “type ahead” field. This is a text field which is usually located above the first item in the list. As you start to type the item name or label in this field, the system automatically selects an item from the list that matches what you have typed. An asterisk (*) can be used in the type ahead field as a wildcard character to match one or more characters of the item name or label. You can also enter the entire name of the item in the type ahead field to expedite the search and selection of an item on the list.

If you select an item from the list, the name of the item appears in the type ahead field.

The status bar on the list window indicates whether the list has also been filtered.

Example: type ahead list

The following figure shows an example of a list where the type ahead field has been used to expedite the search for an item on the list.

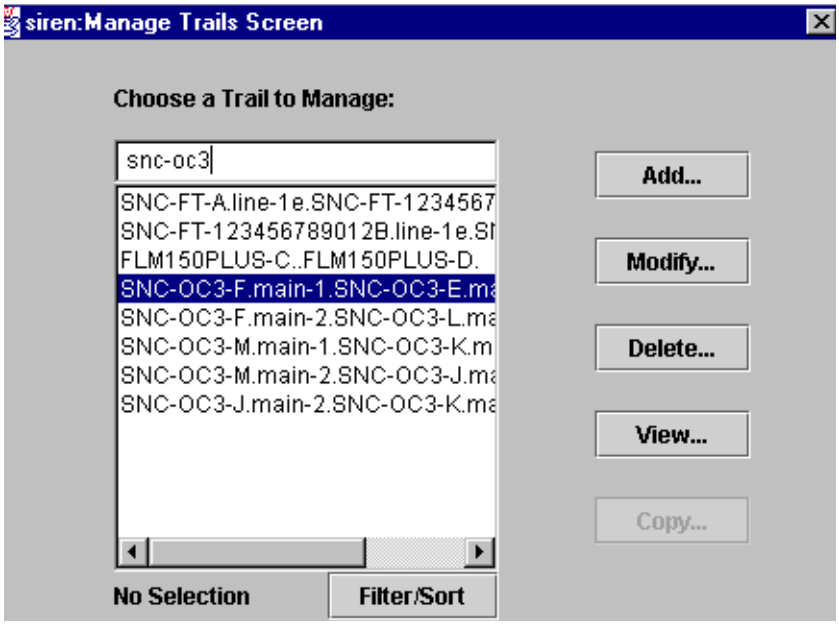

Figure 2-10. Example of Type Ahead List

Sorting Tables

Introduction

Some of the data that WaveStar SNMS retrieves from its managed NEs, such as alarm data, is displayed in multi-column tables. Data is displayed in table format on may windows, including the:

- Alarm Summary
- Trail Alarm Summary
- Alarm List
- Trail Alarm List
- Scheduled Activity Lists

WaveStar SNMS allows you to sort and display data displayed in tables in the exact order that you need it.

Moving and dragging table columns

To change the display order of columns in a table, position the mouse pointer on a column heading, click and hold the select (left) mouse button, and drag the column to a different position in the table.

Example: sorting a table

The following figure shows a sample Alarm Summary window where you may want to change the order of the alarm summary data.

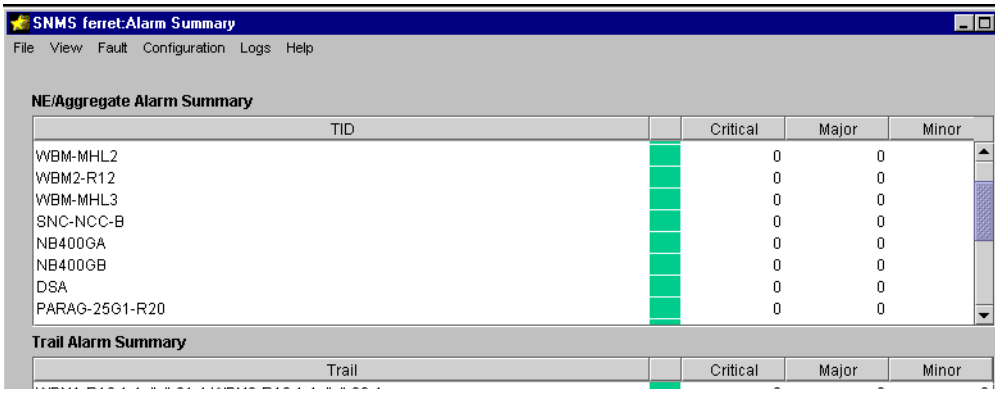

Figure 2-11. Example of Alarm Summary Window

The default order for data on the Alarm Summary window to be displayed is by Critical, Major, and Minor alarms. To change the sort order in which alarm data is displayed on this type of window, you would click on one of the column headers or select the Sort option on the View sub-menu for the Alarm Summary window.

Either action brings up a Sort window. The following figure shows an example of the Sort window.

Example: sort window

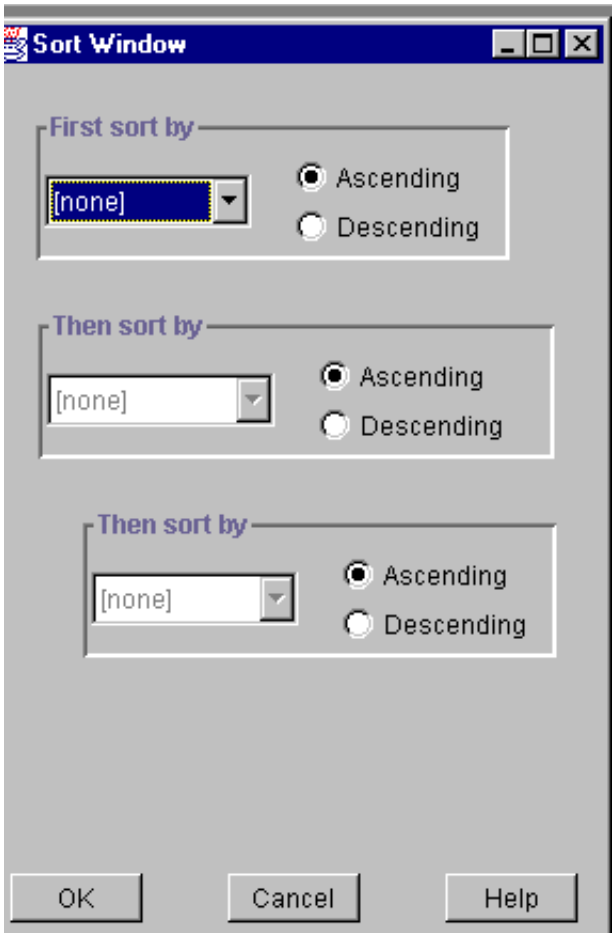

Figure 2-12. Example of Sort Window

The Sort window allows you to select three categories from the table list on which to sort. Each category consists of a drop-down list that contains all of the column names (in column order) from the table list on which to sort, and two exclusive choice radio buttons, labeled Ascending and Descending.

To sort a table, choose a column name from the “First sort by” drop-down list. The item you select becomes the primary sort key for the table list. Then, click the Ascending radio button next to the first drop-down list to sort the table by this item in ascending order or click the Descending radio button to sort by this item in descending order. Ascending order is the default.

To further sort the table data, choose an item from the first **Then Sort By** drop down list and then the second **Then Sort By** drop down list. Choose **none** from the drop down list to indicate no sort at this level. For each level, choose whether to sort the item in Ascending or Descending order. Ascending order is the default.

Related tasks

For related tasks, see T 201, Access the Alarm Summary , T 202, Access the Alarm List and T 207, Display Trail Information.

Fault Management

3

Contents

- Background 2
- Available Features 3

Background

Introduction

Fault Management monitors alarms and conditions in the subnetwork. Users can access Fault Management functions from the Main Menu, or by accessing the pop-up menu on an NE or Aggregate icon in the Map window, or on the items listed in tables or other screens. Some important Fault Management features include the alarm summary and alarm list, viewing autonomous alarms as they are received, alarm throttling, and visible alarm indicators.

Objectives

This chapter provides background and introductory information about Fault Management available for use with WaveStar SNMS. It includes available features and references to specific task-related instructions.

After learning the information in this chapter, the user should be able to do the following:

- Use the Alarm Tally window to identify the number and type of alarms currently in the subnetwork.
- Display the Alarm Summary, Alarm List, and Alarm Details windows to identify various information about current alarms.
- Initiate resynchronization of alarms.
- Limit the amount of autonomous messages that are to be monitored for an NE using the Alarm Throttling feature.
- Administer audible alarms.
- Manage the default alarm severity assignment profile for an NE.

Related tasks

For related tasks, see the 200 series tasks or look up individual tasks in the Task Index.

Available Features

WaveStar SNMS receives autonomous alarm messages from NEs when alarm states are set or cleared. These alarm messages are processed and made available to the user through the GUI. Following is a complete list of Fault Management features, all of which are available to the user via the GUI:

- Alarm Tallies
- Alarm Summary
- Alarm List
- Alarm Indication and Acknowledgement
- Alarm Details
- Trail Alarms
- Alarm Resynchronization
- Alarm Throttling
- Audible Alarms
- Alarm Browser
- Alarm Filtering
- Alarm Severity Assignment Profile Management

In addition to the above alarm windows and reports, the Map window indicates which NEs and aggregates have alarms and their severity level (see Chapter 2, The WaveStar SNMS Graphical User Interface for more information about color-coded NE alarm severity indicators on the Map window). Also, the EMS host icon indicates the alarm status of the host. Furthermore, the Map window indicates which NEs have unacknowledged alarms (by flashing those nodes), and which NEs have exceeded the alarm throttling threshold (with the color gray).

Alarm notification

Another way WaveStar SNMS keeps you informed about current alarms is via the Alarm Notification window. This window contains information on the type and number of current alarms in the subnetwork. It remains open (unless iconified) on your screen, and comes to the front each time another alarm is tallied.

The Alarm Notification window contains five buttons for SONET, labeled Critical, Major, Minor, Not Alarmed (for SONET), or, for SDH, four buttons labeled Prompt, Deferred, No Alarm, and EMS Communications, corresponding to the types of alarms that may appear. The “Not Alarmed” (for SONET) or “No Alarm” (for SDH) represents the number of Standing Condition (SC) events that have been received which require clearing. Below each of these buttons is a number that indicates the current number of alarms/events for each category.

When the color of an NE is white on the Map window (the default color), this indicates that the NE is in a “Not Alarmed” state, or has received one or more Standing Condition (SC) events which require clearing by the NE. When the SC event has been cleared by the NE, the color of the NE returns to green, indicating that there are no active alarms present and the NE is communicating.

To see more information about a specific alarm severity level or the event, just point to the desired severity button on the Alarm Notification window and click. The system then displays the Alarm List window, filtered by the severity type of the clicked button. For instructions on how to use the Alarm List window, see T 202, Access the Alarm List.

Alarm summary

The Alarm Summary feature provides a single-line overview of alarm information for each node and trail in an aggregate. This information is provided via the Alarm Summary window on the GUI. This window lists the NEs in your Target Group and displays the number of critical, major, and minor alarms for each NE. The alarms can be listed by severity or TID. Instructions for displaying and using the Alarm Summary window can be found in T 201, Access the Alarm Summary.

Alarm list

The Alarm List contains a line of various information about each active alarm in an NE. You can sort the list using various critieria, such as alarm severity and age, age alone, condition, date/time logged, and acknowledged vs. unacknowledged. You can also acknowledge or unacknowledge the alarms listed here. Instructions for accessing and using the Alarm List can be found in T 202, Access the Alarm List.

Alarm indication and acknowledgement

The Alarm Indicator feature graphically indicates the arrival of new alarms by flashing the impacted nodes and aggregates. If there are one or more alarms against an NE and alarm indication is enabled, that node will flash (in the color of the highest severity alarm). Likewise, if there are one of more alarms against one or more NEs in an aggregate and alarm indication is enabled, that aggregate will flash. (When all the alarms against an NE or aggregate are acknowledged it no longer flashes.) Users should acknowledge alarms for which they are responsible. (The system tags the acknowledgment so that other users will not attempt to troubleshoot the same problem.) For instructions on acknowledging and unacknowledging alarms, see T 203, Acknowledge/Unacknowledge Alarms , T 204, Acknowledge/Unacknowledge Alarm Groups, T 205, Acknowledge/ Unacknowledge All Alarms, and T 206, Acknowledge/Unacknowledge All Alarms for an NE .

Alarm details

Alarm Details are available to the user via the Alarm List window. This window contains a line of information about each active alarm in an NE or aggregate. Before acknowledging an alarm, it is a good practice to display it on the Alarm List window to check the details and make sure you want to acknowledge it. You can then perform the acknowledgement right from the Alarm List window. For instructions on using the Alarm List window to display alarm details, see T 202, Access the Alarm List.

Trail alarms

Trails are physical links between NEs (see Chapter 6, Security Management for more information about trails.) The system monitors all existing trails for alarm conditions.

NOTE:
NEs can only automatically discover and report to WaveStar SNMS trails over which there is an active DCC. Users can, however, add trails between any pair of termination points on NEs.

The following Information about trail alarms that have occurred can either be displayed on the Alarm Summary window or by selecting the trail:

- Trail Alarm Summary Window—this lists a count of critical, major, and minor alarms for the AIDs that terminate the trail between two NEs.
- Trail Alarm List—this contains a line of information about each active alarm for the trails between two NEs. This information includes alarm severity, occurrence date/time, condition, and date/time logged.

For instructions on displaying and listing trail alarm information, see T 207, Display Trail Information.

Alarm resynchronization

Alarm Resynchronization provides the ability for the system to update its alarm list, autonomous message log, and command/response log from network elements in the subnetwork whenever any outage of NE communications occurs. The system automatically resynchronizes alarms whenever the communications status with an NE changes from “down” to “up.” In addition, users can initiate resynchronization of alarms on demand, as described in T 210, Resynchronize Alarms .

NOTE:
Before resynchronizing alarms for an NE, the user should disable the automatic/manual alarm throttling control for the NE. Alarm resynchronization does not work unless the NE is in an unthrottled state.

The alarm resynchronization process does not clear the existing GUI display and alarm notification/list displays during the resynchronization process, but rather retains the existing alarms until the resynchronization is completed. The system can distinguish between:

- standing alarms that already exist in the GUI and alarm/notification list displays
- new alarms
- alarms that are cleared by the NE between resynchronizations.

This allows the system to incrementally update the GUI display and alarm notification/list displays to accurately indicate the subnetwork status to the user.

Alarm throttling

The Alarm Throttling feature enables you to limit the amount of autonomous messages and Critical autonomous messages that should be monitored for an NE.

Alarm throttling can be done on demand for an NE through the Alarm Throttling option on the NE's pop-up menu or be set up to occur automatically when the number of alarms exceed a specified threshold. An alarm throttle level between zero and 3,600 per hour can be specified in the Automatic Alarm Throttling window. The recommended initial level is 100 messages per hour (and this is the default). If an NE has been enabled for alarm throttling and the number of alarms in the NE exceeds the set level, the NE is automatically put on throttled, or partial, alarm monitoring.

See T 223, Automatically Throttle Alarms for instructions on how to automatically throttle alarms for an NE.

The Alarm Throttling feature is useful during events, such as an initial network turn-up (or maintenance activity), where large numbers of messages are generated by an NE. Throttling alarm only allows alarms of a Critical priority to be displayed on the GUI, sent upstream to an OS, or retrieved via alarm queries. (Non-maintenance-related messages are not affected by alarm throttling and continue to be logged in the normal manner.)

See T 208, Monitor Alarms for instructions on using the GUI to toggle manually between a full set of messages and a throttled set of messages through the Alarm Monitoring menu. For instructions on how to view throttled alarm statistics, see T 209, View Throttled Alarm Statistics.

Audible alarms/ events

The audible alarm provides an alternative way to alert the user to existing alarms or standing condition (SC) events. The following list provides an overview of audible alarm specifications:

- Audible alarms are generated at each system interface screen.
- To eliminate possible confusion, the characteristics of the audible alarm (that is, sound, duration, and interval between sounds) is common to all users of the host.
- Individual user interface users can enable or disable the audible alarm feature for their respective system user interface screens.
- The Map window contains the audible alarm symbol near the upper middle of the screen. The symbol is a speaker if the audible alarm is enabled, or a speaker with a slash through it if disabled.
- When the audible alarm is enabled, an audible alarm is initiated at the onset of each new alarm or SC event, with sound characteristics that correspond to the severity level of the most severe alarm/SC event. When there are multiple concurrent alarms or SC events of different severity levels, the sound emitted corresponds to the most severe unacknowledged prevailing alarm or SC event.
- Audible alarms last for a short duration and are repeated after a set time interval, until quieted by the user.

When you log off WaveStar SNMS and then log in again, the Audible Alarm feature is enabled. You can disable it The audible alarm sounds are initially loaded with system default settings. These settings can be adjusted by the system administrator. For instructions on how to enable or disable the Audible Alarm feature or quiet audible alarms, see T 211, Enable/Disable Audible Alarms and T 212, Quiet the Audible Alarm .

Alarm browser

The Alarm Browser lets you view alarms and clear messages for the NEs in your Target Group as they occur. Specifically, it captures *alarm*, *event*, and *clear* messages that are received from NEs in your Target Group and displays them in the Browsing Alarm Audit Log window on your workstation screen. For how to activate the Alarm Browser, see T 200, Activate the Alarm Browser .

Alarm filtering

Alarm filtering is the selective removal of alarm messages from being forwarded to the GUI. Alarm filtering can be applied to reduce the number of alarms forwarded to the GUI caused by intermittent failure, or to filter symptomatic alarms associated with a reported signal failure, such as those that occur during a fiber cut. All alarms that are filtered out are logged in WaveStar SNMS and can be viewed through the Alarm Browser. See T 200, Activate the Alarm Browser.

Types of Alarm Filtering

WaveStar SNMS uses three basic methods to reduce the number of alarms to be displayed:

- Aging—waiting for a pre-set time period to eliminate alarms that are caused by temporary failures (and are cleared within a time period shorter than the aging interval)
- Event-per-Time (EPT) Filtering—EPT, which is primarily an alarm reduction technique, filters transient condition (TC) events such as PM Threshold Crossing Alerts (TCAs). To forward all TC events, set the EPT count to zero. Both the time and number of TEs can be adjusted to only log TCs that exceed the expected normal level.
- Symptomatic Alarm Filtering—Symptomatic Alarm Filtering (SAF) filters out a set of pre-defined symptomatic NE alarms and standing condition (SC) events. The filtering is based on the Probable Cause (Condition Type) of the alarms and SC events received from all NEs, including the EMS-based alarms. The list of Probable Causes for SAF filtering is specified in the SAF filter parameter file, which is a UNIX flat file that can be edited using standard UNIX editing tools such as *vi*. Any alarm (including NE and EMS alarms) that match a Probable Cause specified in the SAF filter parameter file is filtered out. Alarms and events that are filtered out are not shown in the Map window or alarm lists. The SAF filter does not differentiate between NE types for the source of the alarms/events.

  WaveStar SNMS provides a default set of pre-defined Probable Causes for alarms only in the SAF filter parameter file as follows:

  SONET

  - AIS-P (SONET Path Alarm Indication Signal Detected)
  - AIS-L (SONET Line Alarm Indication Signal Detected)
  - AIS (SONET Alarm Indication Signal Detected)
  - RFI-P (SONET Remote Failure Indication-STS path)
  - RFI-L (SONET Remote Failure Indication-line)
  - PDI-P (SONET Remote Failure Indication-VT path)

  SDH

  - MSAIS (SDH MSect Alarm Indication Signal Detected)
  - AUAIS (SDH AU Alarm Indication Signal Detected)
  - MSRDI (SDH MSect Remote Failure Indication)
  - HPRDI (SDH HP Remote Failure Indication)
  - TRIBSDH (SDH Communications Failure)

The set of Probable Causes in the SAF filter parameter file can be modified by editing the file using standard UNIX editing tools.

The SAF filter is enabled by default and cannot be turned off by the user via the GUI. The WaveStar SNMS administrator enables or disables SAF filtering by changing the value of the *SNC_FM_SAF_FLAG* parameter in the */snc/etc/FM_rc* file (see the Adjusting Fault Management Parameters section in this chapter). WaveStar SNMS updates its SAF filtering based on the current Probable Causes specified in the SAF filter parameters file after the system administrator executes the **alarm_filter_update** command.

The Map window displays an “unfiltered view” of alarms, including symptomatic alarms filtered out by the SAF filter, by default. You can choose a “filtered view” of alarms, where the symptomatic alarms listed above in the explanation of the SAF feature are not displayed or counted in the alarm tallies, Map window view, and Alarm List. For instructions on how to switch between a filtered and unfiltered view of alarms, see T 224, Filter Alarms.

Adjusting Aging and EPT Filtering Parameters

WaveStar SNMS provides several adjustable parameters for processing, collecting, and filtering alarm and event messages. These messages are grouped into three categories, as shown in the following table:

Table 3-1. Alarm and Event Categories

Message Type	Condition Status
Active alarms/ events	These alarms/events have not been cleared.
Standing condition alarms/ events	The alarm originator (for example, the NE) send a clear message when the condition no longer exists.
Transient condition events	The alarm originator (for example, the NE) do not send a clear message because the event does not change an NE’s condition for an extended period of time.

The WaveStar SNMS fault management parameters are adjustable for each type of supported NE. The following parameters for alarm aging and EPT filtering can be adjusted.

- **Age Time—**This parameter is the number of seconds that an alarm or standing condition event is held while waiting for a clear message. Enabling this filter suppresses repeated alarm/clear message pairs, such as those that are generated by intermittent failures.

  Alarms that do not clear within the specified time are forwarded to the Map window and other windows that list alarm information, such as the Alarm Summary and Alarm List windows.

  Held alarms do not appear on the alarm windows and are not forwarded to a network surveillance system. These alarm messages are, however, available through the WaveStar SNMS Logs.

  The default value for all NE types and Probable Causes is 0 seconds (in effect, aging is “disabled.”). The maximum value is 3600 seconds.

  However, the value of the Aging Filter flag, SNC_FM_AGING_FLAG, in the file */snc/etc/FM_rc*, which enables or disables the Aging Filtering feature itself, is 1 (enabled). See the Adjusting Fault Management Parameters section in this chapter.

- **Event-Per-Time (EPT) Count—**This parameter is the number of occurrences of a transient condition event that must be generated within the specified EPT Time before the event is flagged in the WaveStar SNMS event log and passed to an external operations system. The events that are counted must have matching condition codes, TIDs, and AIDs. The default count for all NE types and Probable Causes is 0. The maximum count is 3600.

- **EPT Time—**This parameter is the number of seconds that the system maintains an EPT count parameter for a recurring transient event. The default value for all NE types and Probable Causes is 0 seconds. The maximum value is 3600 seconds.

Adjusting Fault Management Parameters

The parameter settings for alarm filtering are maintained in an editable UNIX file under */snc/etc/FM_rc*. The following table shows the environment variables for the filtering parameters, their default value, and their allowed values.

Table 3-2. Alarm Filtering Environment Parameters

Parameter	Environment Variable	Allowed Value	Default Value
Aging Filtering flag (to turn filtering by aging method on/off)	SNC_FM_AGING_FLAG	1=enabled 0=disabled	1 (enabled)
Symptomatic Alarm Filtering (SAF) flag to turn SAF filtering on/ off	SNC_FM_SAF_FLAG	1=enabled 0=disabled	1 (enabled)
Age Time	SNC_FM_DEF_AGE_TIME	0 to 3600 seconds	0 seconds
EPT Flag	SNC_FM_EPT_FLAG	1=enabled 2=disabled	0 (disabled)
EPT Count	SNC_FM_EPT_COUNT	0 to 3600	0 seconds
EPT Time	SNC_FM_DEF_STAT_TIME	0 to 3600 seconds	0 seconds
Auto Throttle Flag	SNC_FM_AUTO_THROTTLE_ FLAG	1=enabled 0=disabled	1 (enabled)
Manual Throttle Flag	SNC_FM_MANUAL_THROTTLE_ FLAG	1=enabled 0=disabled	0 (disabled)
Status Time	SNC_DEF_STAT_TIME	0 to 3600 seconds	3600 seconds
Throttle Level	SNC_FM_DEF_THROTTLE_LEVEL	0 to 3600 seconds	100 seconds

Alarm severity assignment profile management

An Alarm Severity Assignment Profile (ASAP) is used to assign an alarm severity level to a given entity within an NE, based on the probable cause of the alarm and the NE type.

Each entity can be assigned to a specific ASAP. Each ASAP consists of a set of probable causes with specified alarm severity levels. By default, entities of the same type are assigned to a default ASAP for that type.

The following table shows which ASAP capabilities are currently available through the GUI-based ASAP management functions, based on the NE type and the earliest NE release to which it applies, if available. In the table, “NA” means “Not Available”.

	BWM	2.5G	2.5G_10G	10G (STM64)	10G OC192-4F	400G
View an ASAP	1.2	2.0	3.0	1.0	1.0	2.0
Add an ASAP	1.3	NA	3.0	2.0	1.0	2.0
Modify an ASAP	1.2	2.0	3.0	1.0	1.0	2.0
Delete an ASAP	3.0	NA	4.0	2.0	NA	2.0
Assign ASAP to AID	1.2	2.0	3.0	1.0	1.0	2.0
View ASAP Assign-ment for an AID	1.2	2.0	3.0	1.0	1.0	2.0
View all AIDs assigned to a profile	NA	NA	NA	NA	NA	2.0

NOTE:
For OLS 400G R. 2.0 NEs, ASAP provisioning only affects the alarms sent to WaveStar SNMS, not alarms sent to other OSs, including the Craft Interface Terminal (CIT). ASAP provisioning for OLS 400G R. 3.0 NEs affects all alarms generated by the NE and sent to all OSs.

Alarm severity assignment for AllMetro NEs

AllMetro NEs do not support the ASAP feature. Alarm severity assignment is done by direct assignment of the alarm severity for an AID or group of AIDs. Alarm severity provisioning on an AllMetro NE can be done for the following entities:

- Supervisory channels
- Incoming port (OTU IN)
- Environment ports

Alarm severity provisioning for AllMetro environmental points can be done at the port level through the GUI or by issuing TL1 commands in Cut-Through mode. The TL1 commands *RTRV-ATTR-ENV {TID}{AID}* and *SET-ATTR-ENV{TID}{AID}* allow you to retrieve and set the alarm message and notification code for the AID for the specified AID.

For details about use of TL1 commands to provision alarm severity assignment in the AllMetro NE, consult the AllMetro documentation.

Example

A Loss of Signal (LOS), which can be a probable cause of an alarm on an Incoming DS3 Port (the entity) of a BWM NE, may be assigned an alarm severity level of Critical in the ASAP associated with the DS3 port entity type.

NOTE:
For an explanation of specific probable causes for an NE type, refer to the related NE documentation.

Types of ASAPs

There are different types of ASAPs associated with different types of equipment entities. An ASAP can only be assigned to each entity of the same type. Each ASAP/entity type has a specific list of applicable probable alarm causes associated with it.

Example of a profile type

In the OLS 400G, a shelf is a specific entity in an NE that generates its own set of alarms for which there are probable causes. Therefore, a shelf can be a Profile Type for which an ASAP exists or can be created.

Parts of an ASAP

Each Profile Type for an entity in an NE contains:

- A list of probable causes (condition types)
- The service affecting state of each probable cause

  - — Service Affecting (SA)
  - — Non-Service Affecting (NSA)
  - — Service Interrupting (SI)
- The assigned alarm level values for each probable cause
  - — Critical (CR) for SONET or Prompt (PR) for SDH
  - — Major (MJ) for SONET or Deferred (DF) for SDH
  - — Minor (MN) for SONET or Deferred (DF) for SDH
  - — No Alarm (NA) for SONET and SDH
  - — No Report (NR) for SONET and SDH

The display of alarm level values when adding a new ASAP depends on user selection of SONET or SDH alarm severity levels through the Fault panel of the Preferences option through the GUI. See T 111, Modify User Preferences for details on how to access the Fault panel of the Preferences window to determine the alarm severity level (Critical/Major/Minor or Prompt/Deferred/Informational - No Alarm) used by the ASAP.

ASAP options

WaveStar SNMS allows you to:

- Retrieve and view ASAPs for an NE
- Add a new ASAP for an NE
- Modify an existing ASAP
- Delete an ASAP
- View ASAP assignments for NE entities

Adding an ASAP

Each entity/AID (Profile Type) has a default ASAP. When it is first created, a new ASAP inherits the same alarm severity levels as those set up in the default ASAP for a Profile Type. The alarm severity levels for each item in the new ASAP can remain the same as the default ASAP, or be modified as needed. The new ASAP is given a new Profile Name. The newly created ASAP can be assigned to a specific AID (entity) in an NE.

NOTE:
When adding a new ASAP for an NE, the Profile Names “Default” or “default” cannot be used.

Modifying an ASAP

Any ASAP can be modified, including the default ASAP for a Profile Type in an NE, by changing the alarm severity assignments for probable causes in the ASAP.

Deleting an ASAP

Once created, you can delete an ASAP. However, you cannot delete an ASAP that is currently assigned to an entity (AID) in an NE, until you remove the assignment from the AID. You cannot delete the default ASAP for a Profile Type in an NE.

Assigning an ASAP to an NE's AID

Each AID in an NE may generate specific types of alarms. The severity of the alarms with different probable causes generated by each NE's AID depends on the ASAP assigned to the AID. Each NE's AID is assigned to a default ASAP. You can assign an ASAP that you created to an AID. Each AID in an NE can be associated with a different ASAP.

Viewing ASAP assignments for NE entities

Each AID may generate specific types of alarms. The alarm severity level of each probable cause for an NE entity depends on the ASAP assigned to the AID. You can select an ASAP for a Profile Type in an NE and see which entities are assigned to the ASAP.

Related tasks

T 214, View an ASAP describes how to view an existing ASAP.

T 215, Add an ASAP describes how to add a new ASAP for a Profile Type.

T 216, Modify an ASAP describes how to modify an existing ASAP for a Profile Type.

T 217, Delete an ASAP describes how to delete an ASAP.

T 218, Assign ASAP to AID describes how to assign an ASAP to a specific AID in an NE.

T 219, View ASAP Assignments describes how to view the entities to which a selected ASAP, for a selected Profile Type, are assigned in an NE.

Administering fault management functions

WaveStar SNMS allows you to set up or modify several aspects of alarm reporting for the NEs in your network at the same time, using a single GUI window that can be accessed from the Fault menu option on the Map window toolbar. This GUI window allows you to:

- assign severity levels to environmental alarms generated by miscellaneous discretes on the NE (such as “door open” alarms). Severity levels for these types of alarms are set up by assigning an Alarm Severity Assignment Profile (ASAP) to the miscellaneous discrete AID and selecting the alarm severity level
- provision facility and equipment alarm delays
- provision facility and equipment alarm clearing delays
- enable or disable audio/visual alarm indicators
- allow or inhibit the receipt of autonomous messages (**Note:** this option is currently available only for OLS 400G and BWM R. 3.0 NEs)

Related information

The Alarm severity assignment profile management section in this chapter describes Alarm Severity Assignment Profiles (ASAPs) and their use in setting alarm severity levels for an NE entity.

T 220, Provision Environmental Alarms describes how to assign alarm severity levels for environmental alarms generated by miscellaneous discretes (scan points) on the NE, by choosing an ASAP and a message to be displayed.

T 221, Provision Alarm Delays describes how to set alarm generation and clearing delays for NEs.

T 222, Provision Alarm Indicators and Autonomous Messages describes how to enable or disable audio/visual alarm indicators and allow or inhibit autonomous messages for specific NEs in your network.

Configuration Management

4

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Background

Introduction

Network elements of all types allow the user to modify information about system, port, and equipment parameters. WaveStar SNMS supports this functionality through a series of windows that allow the user to see the current configuration information and to modify that information.

WaveStar SNMS has a Dynamic Network Operations (DNO) feature that retrieves the internal configurations of NEs and external connectivity relationships. This feature enables the system to discover the topology of subnetworks consisting of Lucent Technologies NEs.

The GUI supports the following configuration management tasks:

- NE and subnetwork discovery
- Software Management
- NE parameter provisioning
- NE port parameter provisioning
- Cross-connection provisioning
- NE equipment inventory
- Inter-NE trail management
- Multiple GNE configuration
- TL1 command macro building and broadcasting
- Administrative scheduling
- Equipment provisioning
- Protection provisioning

Objectives

This chapter provides background and introductory information about Configuration Management in WaveStar SNMS. It includes available features and references to specific task-related instructions.

After learning the information in this chapter, the user should be able to do the following:

- Initiate a TL1 cut-through session, build TL1 commands using the TL1 macro builder, and broadcast TL1 commands using the TL1 broadcast window.
- Download, copy, and activate new generic software releases.
- Provision NE ports, equipment, cross-connections, and protection groups.
- Initiate DNO.
- Establish the correct date and time via the date/time synchronization and Fallback/Spring Ahead features.

Related tasks

For related tasks, see the 300 series of tasks in the *User Tasks* section or look up individual tasks in the Task Index.

Cut-Through

Introduction

In order for the user to execute NE native commands that may not be explicitly supported by a particular release of WaveStar SNMS, a cut-through capability has been developed. In addition, with the command builder and broadcaster, TL1 cut-through gives the user powerful capabilities. See T 300, Perform Cut-Through Commands,T 301, Build TL1 Commands, and T 302, Broadcast TL1 Commands for instructions on performing TL1 functions. Two additional points to remember are:

- WaveStar SNMS allows the user access to only the NEs and associated commands defined by the Target and Command groups for which the user is validated.
- Not all TL1 commands displayed in the Cut-Through window can be executed. The capability to execute commands depends on the subnetwork equipment. If the equipment uses CMISE, such as the OLS 400G, Cut-Through is not available.

NOTE:
Instructions about actual TL1 commands are beyond the scope of this user documentation (which focuses on the GUI and its administration), but see your Lucent Technologies account representative for operations guides that contain complete information about all TL1 commands.

Initiating an NE cut-through session

The NE Cut-Through window allows you to access and communicate with an NE, using the TL1 command set. You can submit TL1 cut-through commands to the NE directly. (For specific NE command information, see the appropriate NE documentation.)

NOTE:
Commands such as *rlogin* and *act-user* are disabled, but they are not needed since WaveStar SNMS is already logged into the NEs.

Related information

See T 300, Perform Cut-Through Commands for how to initiate and perform cut-through.

Building TL1 commands

The TL1 macro builder allows you to create a TL1 command file to assist in performing maintenance and provisioning activities on one or more NEs (such as download of standard configuration), without having to manually enter a set of TL1 command strings. This feature both reduces the amount of manual entry needed to create TL1 command strings and allows for the reuse, at a later time, of the commands built on the same NE or other NEs of the same type.

Related information

See T 301, Build TL1 Commands for how to build TL1 commands.

Broadcasting TL1 commands to NEs

The broadcasting TL1 commands feature allows you to perform maintenance and provisioning activities (such as download of standard configuration) on one or more NEs, utilizing the TL1 command files created by the TL1 macro builder feature, and broadcasting those files to multiple NEs of the same type. This feature saves you time by performing similar tasks on multiple NEs in one step, and by reducing the manual entry required in the creation of TL1 command strings.

Related information

See T 302, Broadcast TL1 Commands for how to broadcast TL1 commands.

Port Provisioning

Introduction

Lucent Technologies NEs can change the state of ports without issuing a *rept-dbchg* message. WaveStar SNMS therefore cannot detect these changes. To ensure that you receive an accurate list of available Access Identifiers (AIDs) when selecting ports to provision, first do a manual DNO (see T 327, Manually Initiate DNO) for the NE or NEs that you plan to provision.

NOTE:
When cross-connections are added or deleted, the AID list in the port provisioning window is not updated automatically. To ensure that the AID list information is accurate, perform a manual DNO (see T 327, Manually Initiate DNO) on the NEs that have had cross-connections added or deleted prior to any port provisioning.

Port configuration discovery

There is generally a fixed relationship between circuit packs and their number and type of ports. Upon discovery of an NE, for ports of a fixed type, WaveStar SNMS may automatically retrieve an NE's current set of ports and their type, or it may automatically retrieve an NE's current equipment and derive the set of ports and their type. (This is the automatic discovery portion of DNO.) Deriving the port information from the equipment is the preferred method. Regardless of the method of obtaining the information, the system maintains the ports and their type in its configuration management database.

For NEs managed via TL1, obtaining the port information directly from the NE is done via TL1 RTRV-*rr* commands (where *rr* represents the various port types). For NEs managed using CMISE, the NE's current port configuration is obtained via CMISE M-GET commands. The responses to these commands include the NE's current ports and their attributes.

Port configuration provisioning

WaveStar SNMS provides a GUI-based function to enable you to select an NE and port or tributary, and view the current values of that port's or tributary's attributes.

Related information

For instructions on provisioning ports, see T 305, Provision NE Ports.

Optical associations

Unlike other WaveStar NEs where physical ports correspond to the transmission interface they support (including the rate and format), the WaveStar OLS 400G and AllMetro NE interfaces correspond to optical physical interface ports, optical

channel frequencies, and optical lines. The optical physical interface port units for the OLS 400G and AllMetro are:

- Optical Translator Unit (OTU)—SONET/SDH or low speed broadband (LSBB) signals are translated to optical channel wavelengths
- Optical Demultiplexing Unit (ODU)—a single optical line is separated into individual SONET/SDH LSBB signals
- Optical Multiplexing Unit (OMU)—individual SONET/SDH LSBB signals are combined into a single optical line
- Optical Amplifier (OA)—device used to amplify optical wavelength signal
- Optical Translation Unit Protection (OTUP)—provides protection ports for optical channels (**AllMetro NEs only)**

WaveStar SNMS allows you to provision the optical equivalent of physical interface ports on an OLS 400G or AllMetro NE, or make a logical *association* between the physical interface and the optical lines, optical channels, optical interface ports (low speed broadband and optical interfaces) and the supervisory channel, including the type/purpose of the optical component in signal transport.

Association types supported

Association types supported by NE type and node type are:

Assocation Type	NE Type	Node Type
Add	OLS 400G, AllMetro	All types
Drop	OLS 400G, AllMetro	All types
Terminal Add	OLS 400G R. 3.0	All types
Terminal Drop	OLS 400G R. 3.0	All types
External Add	OLS 400G R. 3.0	All types
External Drop	OLS 400G R. 3.0	All types
Terminal	AllMetro, OLS 400G R. 2.0 - 2.1	All types
Thru	AllMetro	2-Fiber Add/Drop Large terminals, 2-Fiber Add/ Drop Small terminals

Capabilities

WaveStar SNMS allows you to add or delete optical associations.

Optical connections

Optical associations in WaveStar SNMS can be provisioned in groups to form *connections*.

Connection types supported

Connection types supported by NE type and node type are:

Connection Type	NE Type	Node Type
Add	OLS 400G, AllMetro	All types
Drop	OLS 400G, AllMetro	All types
Single OTU Thru and Two OTU Thru	OLS 400G	■ 2-Fiber Full Add/ Drop Ring terminal 40 ■ 4-Fiber Add/Drop Ring terminal 40 ■ 2-Fiber Full Add/ Drop Ring terminal 80 ■ 4-Fiber Full Add/ Drop Ring terminal 80
Compatible Optics Add	OLS 400G	All types
Compatible Optics Drop	OLS 400G	All types
Add Protection	AllMetro	2-Fiber Add/Drop Small terminal , 2-Fiber Add/ Drop Large terminal
Drop Protection	AllMetro	2-Fiber Add/Drop Small terminal , 2-Fiber Add/ Drop Large terminal
Drop and Continue	AllMetro	2-Fiber Add/Drop Small terminal , 2-Fiber Add/ Drop Large terminal
No OTU Through	AllMetro	2-Fiber Add/Drop Small terminal , 2-Fiber Add/ Drop Large terminal
One OTU Through	AllMetro	2-Fiber Add/Drop Small terminal , 2-Fiber Add/ Drop Large terminal

Capabilities

WaveStar SNMS allows to add optical connections.

Related information

For instructions on using the Optical Associations Manager, see the following tasks in the *User Tasks* section:

- T 334, Display the Optical Associations Manager Window
- T 335, Add an Optical Association or Connection
- T 336, Delete an Optical Association

Equipment Configuration

Introduction

Different NE types are of varying complexity and configurability, ranging from single-shelf NEs at a single location to multi-bay and multi-shelf NEs that are flexible in their arrangements and may be distributed between rooms and floors of a central office or even distributed across central office locations and remote sites. The equipment window gives a set of hierarchically arranged equipment views. The shelf view is the lowest level view. There may also be a system view and a bay/line-up view, depending on how large and complex the NE is. The Equipment Configuration window also allows you to “drill down” into the NE equipment hierarchy.

NOTE:
If WaveStar SNMS does not recognize a circuit pack on the requested shelf, the window shows that slot filled with unknown equipment. Circuit packs may not be recognized when the vendor firmware is nonstandard or when the board is a new release that is not yet supported.

Equipment discovery and inventory maintenance

Upon discovery of an NE, WaveStar SNMS automatically retrieves an NE’s current equipment configuration and maintains this information in its database. This is the automatic discovery portion of DNO. An NE’s equipment includes any item that it is able to report; for example, bays, shelves, and circuit packs. For network elements managed via TL1, the network element’s current equipment configuration is obtained through TL1 RTRV-EQPT commands. For network elements managed using CMISE, the network element’s current equipment is obtained through CMISE M-GET commands.

NOTE:
In addition to the equipment information (bays, shelves, slots, and circuit packs), the OLS 400G NE also provides information on the set of equipment associations required to specify optical channels and the equipment connections for optical lines. WaveStar SNMS retrieves and maintains these optical channel and line associations in its database.

Control point and scan point parameters (OLS 400G)

As part of equipment inventory management for OLS 400G NEs, WaveStar SNMS retrieves and maintains in its database the NE’s current attribute values for control and scan points. Control points are used to control external devices associated with the managed system, while scan points are used to monitor external conditions related to the managed system.

Equipment graphical display

To graphically depict the varying NE types effectively, WaveStar SNMS decomposes them into different numbers of hierarchically arranged graphical displays. For example, with a single-shelf system only a single display at the shelf level is needed, and this shelf level display is also a system-level display. On the other hand, a system such as the WaveStar BWM is composed of multiple bays containing multiple shelves, and the bays are typically arranged into multiple aisles. To effectively depict the WaveStar BWM requires several levels of display: system (one or more line-ups), line-ups (one or more adjacent bays, with each bay containing one to three shelves), and shelves (each containing many circuit packs).

Equipment provisioning

Older generation NE types have little or no configurability of their equipment entities (their bays, shelves, slots, or circuit packs). New generations of NEs, however, can be expected to have an increasing amount of configurability in this area. SNMS supports equipment provisioning as needed for each NE type.

Some of the attributes reported on WaveStar BWM equipment are provisionable. In addition, the WaveStar BWM, 2.5G, and OLS 400G NEs allow users to manually provision new bays, shelves, and circuit packs. The WaveStar BWM therefore has establish and remove functions that apply to bays, shelves, and circuit packs; and attribute modification functions for shelves, slots, and circuit packs. New bays and shelves are created by specifying and provisioning new bay and shelf IDs. New circuit packs are created by associating a circuit pack type and/or circuit pack qualifier with a circuit pack slot. New bays are also implicitly created by creating new shelves with Shelf IDs that imply a bay that does not currently exist. For example, if a shelf with ID 10-1 is added and there is not currently a bay with the Bay ID 1 in the system, that bay is automatically created and reported by the WaveStar BWM.

Related information

For instructions on viewing NE equipment configurations, see T 306, Provision NE Equipment Information (Display Equipment Provisioning Information).

Cross-Connections

Introduction

WaveStar SNMS provides a graphical means of viewing and provisioning NE cross-connections via the Cross-Connection window. This window is designed to display connection termination points and cross-connections for a selected NE. This section provides information about cross-connection functionality and the Cross-Connection window.

Cross-connection functionality

WaveStar SNMS provides the following major functions associated with the provisioning of cross-connections:

- Perform Dynamic Network Operation (DNO) on discovering NE.
- Discover cross-connections as part of DNO.
- Include cross-connections as part of the system database.
- Provision cross-connections on demand from the GUI.
- Provision cross-connections to and from all tributaries in a 2-fiber/4-fiber Bi-directional Line Switched Ring (BLSR) port protecton group (applies to both service tributaries and protection tributaries).
- Provision cross-connections from service tributaries in 1+1 line-protected port protection groups
- Display status of cross-connections on the GUI.
- List cross-connections, including input and output tributaries, topology of the cross-connection, and the presence or absence of reservations.
- Modify cross-connections on demand from the GUI.
- Delete cross-connections on demand from the GUI.
- Establish, delete, modify, and retrieve tributary reservations on the GUI.
- Update the database upon receiving autonomous database messages from the NE on addition, deletion, and modification of cross-connections.
- Log all requests/responses and autonomous database update messages.
- Provide user access from the GUI.

The Cross-Connection window

The Cross-Connection window provides the user with access to all cross-connection features. It contains an interface tailored to the large, modern cross-connection fabrics now supported by the system. The window (see T 312, Display the NE Cross-Connection Window) for instructions on displaying the Cross-Connection window) consists of a menu bar, a toolbar, a status bar, a net work

element explorer, and a main view. The main view area is further broken down into four (or eight) port areas. This window is used for all cross-connection operations, including viewing, adding, modifying, and deleting cross-connections.

Toolbar

The Cross-Connection window contains a toolbar (at the upper left) that contains a series of buttons used for specifying different types of cross-connections or tributary reservations. If you are unsure of the operation that a certain toolbar button will perform, point at it with the cursor and after 2 seconds a tooltip is displayed, showing the operation of that button. This information is also displayed in the status bar.

After the cross-connection buttons, the next button in the toolbar is used to delete an existing cross-connection. (It is disabled until the user chooses a cross-connection that can be deleted.)

The next button is used to modify a cross-connection. (It is disabled until the user chooses a cross-connection that can be modified.

The next button is used for the Reservation feature. Click this button after you have chosen a tributary to reserve. The system displays a pop-up window for selection of tributary parameters for the reservation. (The Reservation feature is only available for BWM NEs.)

The next button is used for the show/hide mode. Click this button to show cross-connection lines - click it again to hide the cross-connection lines.

The next button is for the Cancel function. Click this button when you have started a cross-connection and want to terminate the operation. (This button is disabled until you select a cross-connection type.)

The next button is for Toggle View. Click this button to change the number of port areas displayed in the view panel. Initially the view is set to Toggle to Four, which shows four port areas (and the contents of the pop-up menus in the explorer accommodate all eight ports). When you click the Toggle View button, the view changes to Toggle to Eight, which shows eight port areas (and the contents of the pop-up menus in the explorer accommodate four ports).

Status bar

The status bar, at the bottom of the Cross-Connections window, provides the following information to the user:

- The source and destination AID and the cross-connection type of a selected cross-connection in the cross-connection view area.
- The cumulative information about a cross-connection being added, as it is selected by the user.
- Information about the status of add/delete/modify operations that have been requested.

When a port tributary is displayed in the Main View of the Cross-Connection window, and you position the mouse cursor on the tributary block, a message is displayed next to the tributary address in the status bar identifying it as a “Source” or “Destination” tributary. The “Source” and “Destination” literal displayed in the status bar is used to indicate whether the tributary could act as a “Source” or “Destination” , or both, for additional cross-connections.

Displaying ports

Ports are displayed on the Cross-Connection window between the arrow buttons surrounding the main view area. (See T 313, Display Ports on the NE Cross-Connect Window for instructions on displaying ports in the main view area of the Cross-Connection window.) Top and Bottom port areas appear between the left and right arrow buttons, while Left and Right port areas appear between the up and down arrow buttons.

NOTE:
Cross-connection prerequisites for some NE types may prevent the user from provisioning a cross-connection to or from a tributary *only* if the port unit slot containing the tributary has already been provisioned (or pre-provisioned) with information that determines the number of ports and the rate of the ports in the port unit slot.

Tributary/port group blocks

Ports that are selected for cross-connection groups always expand into one of the following tributary/port group building blocks.

- STS-1—contains only a single STS-1 worth of signal, with no access to lower-rate cross-connections
- STS-3—contains only a single STS-3 worth of signal, with no access to lower-rate cross-connections.
- STS-3/STS-1—this building block contains an STS-3 and allows access to the corresponding STS-1s that are accessible through that STS-3.
- STS-12/STS-3—this building block contains an STS-12 worth of signal, and allows access to both the STS-12 and the corresponding STS-3s. No access to the STS-1s is available.
- STS-12/STS-3/STS-1—this building block is the same as the previous, except access to the corresponding STS-1s is allowed.

Any building block that contains multiple layers has each layer of the building block as mutually exclusive to the layers above and below it. This means that if the building block is an STS-1/VT1.5, then the existence of a VT1.5 cross-connection makes the STS-1 unavailable, and any STS-1 cross-connection makes *all* of the VT1.5s unavailable.

Furthermore, in the STS-12/STS-3/STS-1 building block, an STS-12 cross-connection disables all STS-3 and STS-1 ports. An STS-3 cross-connection disables the STS-12 and the three STS-1s that are part of the cross-connected

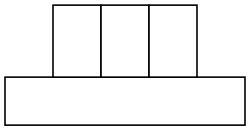
STS-3. Any STS-1 cross-connection disables the entire STS-12 and the single STS-3 of which the STS-1 is a part.

The following explains how these various tributary building blocks are represented graphically on the Cross-Connection window:They are defined as follows:

STS-1
STS-3

This tributary group displays a single STS-1 or STS-3 for cross connection. The would be used when, for example, the port chosen supports only some number of STS-1 or STS-3 cross connection, but not a combination of the two.

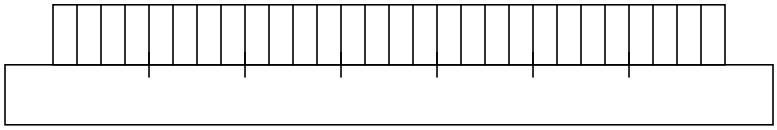
STS-3/STS-1



This tributary group is seen more often, and is used to display any STS-3 tributary that contains STS-1 tributaries that can also be cross connected. The larger box at the bottom of the graphic represents a single STS-3. The three smaller boxes on top each represent a single STS-1. This graphic is used whenever an STS-3 tribtuary can be cross connected at either STS-3 or as three STS-1s.

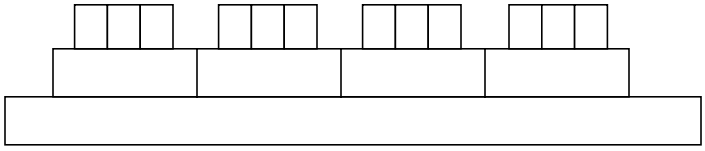
Note: All of the tributary groups that contain more than one level (as does the one above) represent two different rates of cross connections within a single tributary group. This means that the two different levels (the STS-3 and the STS-1, in this case), are mutually exclusive. You can **either** cross connect the STS-3 tributary, **or** the three STS-1 tributaries, but not both.

STS-1/VT1.5



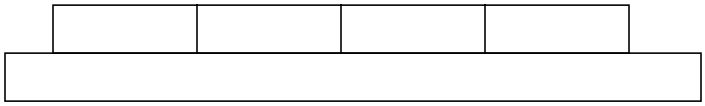
This graphic is used whenever a tributary can be cross connected at the STS-1 or VT1.5 rate. The large box at the bottom represents a single STS-1, and the 28 smaller boxes on top each represent a single VT1.5. A single tributary group (m-1, for instance) is dragged into the View Area and this graphic is displayed.

STS-12/STS-3/STS-1



This is the most complex of the graphics used in the cross connection window. The bottom box represents a single STS-12 tributary. The four boxes in the middle each represent a single STS-3 tributary. And the smaller boxes on top of each STS-3 each represent a single STS-1 tributary. This graphic is used to show an STS-12 tributary that can be cross connected at either STS-12, as four STS-3s or as a combination of STS-3s and STS-1s. This graphic will be shown when an STS-12 triburary is selected in a network element that allows cross-connections at all three rates.

STS-12/STS-3



This graphic is similar to the above graphic, but does not contain the STS-1 boxes. The bottom box represents a single STS-12 triburary and the four smaller boxes on top each represent single STS-3 tributaries. This graphic will be shown when an STS-12 tributary is selected and the network element only allows cross connections at the STS-12 and STS-3 rates.

The graphics are designed to provide an immediate visual indication of what is cross connected already and what is available for cross connection. Boxes that are yellow do not contain any cross connections. Boxes that are dark blue do contain cross connections. Boxes that are grey are not available for cross-connection.

For SDH configurations:

- An STS-1 building block is used for a VC-3 tributary.
- An STS-12/STS-3/STS-1 blocks are used for STM-4/STM-1/VC-3 or STM-1 ports/tributaries
- An STS-3/STS-1 blocks are used for STM-1/VC-4 ports/tributaries.

For SDH ports/port groups:

- A SONET DS-3 circuit pack can be used for SDH. In this case, the circuit pack supports 8 ports at the VC-3 cross-connection rate. Therefore, 8 STS-1 building blocks are displayed.

- An STM-16 is equal to an OC-48. You can make 4 VC-4/4c cross-connections (equal to STS-12), 16 VC-4 cross-connections (equal to STS-3) or 48 VC-3 cross-connections (equal to STS-1). Consequently, the breakdown to building blocks for an STM-16 is the same as the breakdown for the OC-48.
- An STM-4 is equal to an OC-12. You can make 1 VC-4/4c cross-connection (equal to STS-12), 4 VC-4 cross-connections (equal to STS-3), or 12 VC-3 cross-connections (equal to STS-1). Consequently, the breakdown to building blocks for an STM-4 is the same as the breakdown for the OC-12.
- An STM-1 is equal to an OC-3. You can make one VC-4 or 3 VC-3 cross-connections. The breakdown to building blocks for the STM-1 is the same as the breakdown for the OC-3.

Any building block that contains multiple layers has each layer of the building block Color conventions

Color conventions

Listed in the following table are the default color conventions used to represent cross connection and tributary properties. These colors may be changed through the Preferences window (see T 111, Modify User Preferences).

Table 4-1. Color Conventions for Cross Connection and Tributary Properties

Color	Representation
Green	Tributary is selected as a source for cross-connection
Magenta	Cross connection destination(s) (shows when selected)
Red	Cross connection line whose redline property is enabled
Dashed line	Standby cross connection
Orange	Cross connection on tributary is in the process of a pending operation (such as creation, deletion, modification).
Light yellow	Tributary which is not being used for any cross connection or reservation
Blue	Tributary which is being used for a cross connection
Dark blue	Tributary changes to this color when a cross-connection is created. Also indicates a reserved tributary.
Purple	Tributary which is a destination tributary for a cross-connection
Dark green	Tributary which is uni-directional
Grey	Tributary not available for cross-connection

A grey box is also displayed when:

- A multiple level graphic is displayed and there are cross connections at a lower rate than the highest rate in the graphic. For example, the graphic showing both STS-3 and STS-1 tributaries may have a grey STS-3 box if any of the STS-1 boxes are blue (already cross-connected in both directions).
- A multiple level graphic is displayed and for some reason the network element will not allow cross connection at a particular rate in the graphic. This will sometime occur when a specific setting in the network element is made to disable a certain rate.

For network element which allow cross-connections at multiple rates within a single tributary, for which no graphic exists (such as STS-3/STS-1/VT1.5), the explorer will allow the user to drag and drop either the STS-3 tributary, or the STS-1 tributary to the View Area. In all other cases, only the bottom most level of tributaries shown in the explorer can be dragged to the View Area.

Entering cross-connections

The general steps for entering cross-connections on the Cross-Connection window in the GUI are as follows:

1. Find the triburaries that are to be cross connected together and display them in the view area.
2. Choose the box that represents the source tributary for the cross connection by clicking on the box. The box will turn green. The cross connection type buttons on the toolbar will become enabled, but only those that can use the tributary chosen as a source.
3. Choose a cross connection type by clicking on the button in the toolbar for that cross connection type.
4. Choose the box that represents the destination tributary for the cross connection by clicking on it. Both the source and destination boxes will now turn orange (an operation is pending on these tributaries).
5. If it is necessary to provide further information before the cross connection can be completed, an additional information (Cross-Connect Attributes) window is opened. It contains parameter names and lists of values for each parameter. Choose the parameter values for this cross connection and choose OK.
6. Confirm entry of the cross connection when the confirmation window is displayed.

The cross-connection command is now sent to the network element. When the command has completed (either correctly or with errors), the orange color is removed from the chosen tributaries. If the cross connection was created in the

network element, the tributaries will turn blue. If the command failed, they will revert to their original colors.

Related information

T 312, Display the NE Cross-Connection Window

T 315, Add a Single NE Cross-Connection

T 316, Add a Roll Cross-Connection

T 317, Add an NE Multi-Cast Cross-Connection

Cross-connection topologies

Cross-connection topologies supported by the system include the following:

- One-way point-to-point cross-connection
- Two-way point-to-point cross-connection
- One-way Dual Ring Interworking (path protected) for FT-2000 LCT R. 4.0 NEs
- Multicast cross-connection. Also encompasses bridge cross-connections. A bridge cross-connection allows the addition of a second leg to an existing one-way point-to-point cross-conection, resulting in a 1:2 one-way cross-connection from one input tributary to two output tributaries.
- Roll cross-connection: this refers to the operation of moving the input of an existing leg of a one-way or two-way point-to-point cross-connection from the current input tributary to a new input tributary, while leaving the output unchanged. (For BWM R. 1.2/1.3 and later and 10G (STM-64) NEs.)
- Path-switching and dual ring interworking cross-connections
- Path-protected cross-connection (DRI) for 2.5G R. 2.0 NEs or Dual Node Interworking (DNI;SDH equivalent of DRI) for TDM 10G (STM-64) NEs
- Redlining: this refers to the ability to mark a cross-connection and prevent it from being deleted (for 2.5G NEs)

The system also provides the ability to provision cross-connections at VC-4/STS-3 ports between tributaries on SDH and SONET ports.

Cross-connections by NE type

The following highlights the cross-connection capabilities for NE releases. Cross-connections available for an earlier NE release are also available for a later release of the same NE type.

BWM R. 1.2

- SDH support (VC-3/VC-4 cross-connections)
- STS-3 cross-connections
- Cross-connections at VC-4/STS-3 between tributaries on SDH and SONET ports
- Reservations at the STS-1 level

2.5G R. 2.0

- STS-3 cross-connections
- Path-protected cross-connections (DRI)
- Redline

BWM R. 2.0

- VC-4-4c cross-connections (fixed rate)
- STS-12 cross-connections (fixed rate)
- Tributaries on STM-64 port

TDM 10G (STM-64)

- 1-way and 2-way cross-connections
- Path-protected cross-connections (Dual Node Interworking/DNI)
- VC-3, VC-4-4c cross-connections (fixed)
- Roll

FT-2000 LCT R. 4.0

- STS-3 cross-connections
- STS-12 cross-connections
- 1-way, 2-way, and 1-way DRI (1-way path protected) cross-connections
- Pre–provisioning of cross-connections

Related information

See T 312, Display the NE Cross-Connection Window, T 313, Display Ports on the NE Cross-Connect Window, T 314, View NE Cross-Connections—Textual, T 315, Add a Single NE Cross-Connection, T 316, Add a Roll Cross-Connection,, and T 317, Add an NE Multi-Cast Cross-Connection for instructions on adding cross-connections.

Deleting cross-connections

There are three scenarios where a request to delete a cross-connection will be *denied*:

1. A request to remove redlined cross-connections
2. A request to remove a cross-connection from a tributary used in a loopback cross-connection
3. A request to remove a cross-connection from a tributary used in a test access connection

Related information

See T 318, Delete NE Cross-Connections—Graphical and T 319, Delete an NE Cross-Connection—Textual for instructions on deleting cross-connections.

Modifying cross-connections

The system allows you to modify various cross-connection information, including the source TID, destination TID, and circuit audit number.

For the 2.5G NE, the system also allows you to modify the “redline” status of an existing cross-connection. If the “redline” status is set to “yes” on a given cross-connection leg, the cross-connection associated with that leg cannot be deleted. If a tributary associated with the cross-connection has an exisitng loopback for testing, the “redline” status cannot be modified.

Related information

See T 320, Modify NE Cross-Connections—Graphical and T 321, Modify NE Cross-Connections—Textual for instructions on modifying cross-connections.

Reservations

WaveStar SNMS provides you with the option of “reserving” any tributaries on any tranmission interface for future cross-connections. Tributaries can be reserved to:

- reduce the completion time for making a cross-connection
- support subsequent cross-connections involving BLSR interfaces by a Network Monitoring System (NMS) that does not have all the information needed to make such cross-connections. This type of cross-connect may be needed to “squelch” or protect a circuit from a disconnect if the node that adds or drops the circuit from a BLSR cross-connection becomes isolated due to some failure condition.

NOTE:
The Reservation feature is currrently available for WaveStar BWM NEs only at the STS-1 rate.

Making a reservation

WaveStar SNMS allows you to reserve a single tributary.

A reservation of a tributary creates a two-way connection for that tributary between the transmission interface and the interface to the main cross-connect fabric (the “switch interface” or “SWIF”), but not through the main cross-connect fabric.

If tributaries at both ends of a desired cross-connection have these established/reserved connections, then a subsequent request to make a cross-connection between the reserved tributaries only needs to operate on the main cross-connect fabric. The “to” and “from” port shelf tributaries are already reserved for the cross-connection. Use of reservations in this way reduces the time to complete a cross-connection.

See T 330, Add a Reservation for instructions on how to establish a reservation.

Reservations and cross-connections

Reservations can only be established on a tributary without an existing cross-connection or tributary reservation. Any tributary that is being used for a cross-connection is displayed as light blue on the Cross-Connect window. Any tributary that has an existing reservation is displayed as dark blue on the Cross-Connect window.

Parameter values that are entered with the subsequent cross-connection override the set reservation parameters.

If a cross-connection is deleted, the tributary reservation and its set attributes remain.

A pass-through cross-connection cannot be made on tributaries with existing reservations.

Reservation restrictions

Reservations should not be made on:

- an existing cross-connection or reservation on the tributary.
- protection tributaries of a 1+1 line protected port protection group.
- protection tributaries of a 1xN equipment electrical interface port protection group.
- a DS3 port set to only transmit or receive data (since a reservation creates a two-way connection for the tributary).
- a tributary with a cross-connect loopback.
- a tributary with a test access cross-connection.

Reservation data and DNO

When an NE is discovered automatically or manually added to the WaveStar SNMS database, reservation data for the NE is updated through the DNO feature.

A manual DNO can be performed on demand or scheduled to update just tributary reservation data for an NE.

For more details about the DNO feature, see the Dynamic Network Operations section in this chapter.

Modifying a reservation

WaveStar SNMS allows you to modify the AID, TID, and signal rate of the reserved tributary. You cannot modify a reserved tributary that has an existing cross-connection or test access connection.

See T 331, Modify a Reservation for instructions on how to modify a reservation.

Deleting reservations

WaveStar SNMS allows you to delete a tributary reservation. A reservation cannot be deleted if the reserved tributary has an existing cross-connection.

See T 332, Delete a Reservation for instructions on how to delete a reservation.

Protection Groups

Introduction

Protection group management can include both equipment and port protection groups.There are several types of protection strategies, including:

- 1+1 protection (where a service entity and a protection entity serve as a pair, with only one of them active at any given time)
- 1xN equipment protection (where a single protection entity is shared by multiple service entities)
- 4-fiber BLSR protection (for SONET)
- 4-fiber MS-SPRing protection (for SDH)
- 2-fiber BLSR protection (for SONET)
- 2-fiber MS-SPRing protection (for SDH)
- Path/DRI for TDM 10G (STM-64) and 2.5G NEs
- Unprotected entities (0x1 protection)

WaveStar SNMS allows you to retrieve an NE's current protection configuration for its transmission interfaces and to configure, at NE level, the rate, member ports, and attributes of its protection groups. Protection group modifications are done per NE for its associated protection groups.

The types of electrical and optical interfaces and protection types supported by WaveStar SNMS are shown in the following table by NE release.

Interface	Type of Protection	SNMS/ BWM Rel.	SNMS/ 2.5G Rel.	SNMS/ STM-64 Rel.
DS3 Port Unit	1XN Equipment Protection	R2.1-/R1.0-	R2.1-/R2.0	
EC1 Port Unit	1XN Equipment Protection	R2.1-/R2.0-		
STM1E Port Unit	1XN Equipment Protection			R3.0-/R1.0-
E4 Port Unit	1XN Equipment Protection			
OC-3 Port Unit	1+1 Line Protection	R2.1-/R1.2-	R2.1-/R2.0	
STM-1o Port Unit	1+1 Line Protection	R2.1-/R1.2-		R3.0-/R1.0-
OC-12 Port Unit	1+1 Line Protection	R2.1-/R1.2-	R2.1-/R2.0	
STM-4o Port Unit	1+1 Line Protection	R2.1-/R1.3-		

Interface	Type of Protection	SNMS/ BWM Rel.	SNMS/ 2.5G Rel.	SNMS/ STM-64 Rel.
OC-48 Port Unit	1+1 Line Protection 2-Fiber BLSR Protection 4-Fiber BLSR Protection	R3.0-/R2.0- R3.0-/R2.0- R1.1-/R1.0-	N/A R2.1-/R2.0 N/A	
STM-16o Port Unit	1+1 Line Protection 2 Fibre MS-SPRing 4-Fiber MS-SPRing	R2.1-/R1.3- Future R2.1-/R1.2-		R3.0-/R1.0- R3.0-/R1.0- N/A
OC-192 Port Unit	1+1 Line Protection 2-Fiber BLSR Protection 4-Fiber BLSR Protection	N/A Future R3.0-/R2.0-		
STM-64o Port Unit	1+1 Line Protection 2 Fibre MS-SPRing 4-Fiber MS-SPRing	N/A R3.0-/R2.0- R3.0-/R2.0-		N/A R3.0-/R1.0- N/A
Tributary	PATHDRI		R2.1-/R2.0	R3.0-/R1.0-

Protection group discovery

WaveStar SNMS retrieves an NE's currrent protection group data for transmission interfaces and stores this information in its database when DNO is performed upon discovery of the NE or update of this information is requested while performing a manual DNO on the NE. For NEs with multiple bays/shelves, such as the WaveStar BWM, DNO can be performed to update protection group data for a selected single bay or shelf.

Provisioning protection groups

Protection groups can be added, modified, or deleted from an NE. You can also view the member ports and attributes for a protection group in an NE.

To add a new protection group for an NE, you select a protection group type from a list of available protection group types for the NE type, pick the rate of the protection group, assign a user-specified protection group ID which is associated with the selected bay and shelf, choose the members (ports) of the protection group, and provision the attributes for the group. In creating or modifying protection groups, WaveStar SNMS enforces that all members (ports) of the group are within the same shelf and bay and of the same transmission rate. When you select the first member port on the shelf,the first port becomes the reference port for the other members of the protection group and the remaining allowable choices are other ports on the same shelf.

The following table shows the available protection group types and the operations that can be performed on each one.

Protection Group Type	Operation	NE Release
4F BLSR/MS-SPRing	Establish, Modify, Delete	BWM R. 1.0
2F BLSR/MS-SPRing	Establish, Modify, Delete	2.5G R. 2.0, BWM, R. 2.0, 10G (STM-64) R. 1.0
1+1 Optical	Establish, Modify, Delete	BWM R. 1.2, 2.5G R. 2.0, 10G (STM-64) R. 1.0
1xN Electrical	Modify	BWM R. 1.0, 2.5G R. 2.0 10G (STM-64)
Path/DRI	Modify	2.5G R. 2.0, 10G (STM-64) R. 1.0

For the optical interfaces, protection switching provides protection against both equipment and facility (line) failures. For the WaveStar NEs, one universal constraint is that all the entities, service and protection, must be within the same shelf.

Modifying protection groups

Once a protection group has been added for member ports in an NE, you can modify the given attributes of a protection group or swap ports in certain protection group types as shown in the following table.

Protection Group Type	Swap
1+1 Optical	Working and Protection Ports
2-Fiber BLSR/MS-SPRing	East and West Ports
4-Fiber BLSR/MS-SPRing	East Working and Protection Ports West Working and Protection Ports

When modifying a protection group, the type, rate, and member ports of the group cannot be changed.

Deleting protection groups

Deleting a protection group removes it from an NE.

Related tasks

T 323, Add NE Protection Groups explains how to add an NE port protection group.

T 324, View NE Protection Groups explains how to view an existing NE port protection group.

T 325, Modify NE Protection Groups explains how to modify an existing NE port protection group.

T 326, Delete NE Protection Groups explains how to delete an existing NE port protection group.

Protection Switch Management

Overview

In the event of a fiber cut or loss of service, WaveStar SNMS has the ability to maintain and display protection switching status for BWM, 2.5G, and TDM 10G (STM-64) NEs. Protection switch management is currently not supported for OLS 400G NEs; protection switching for this NE type is done at the channel level.

The scope of Protection Switch Management includes the following:

- Retrieve the protection switch status as part of DNO.
- Store data as part of WaveStar SNMS database.
- Update database per autonomous messages. This applies to the protection switch onset, as well as when it is restored back to the original condition.
- Log autonomous messages as part of notification logs.
- Notify user on protection switch status change.
- Display current protection status on demand.
  - On a single or group of NEs
  - By protection group(s) type(s)
- Display history of protection switch status changes
  - On a single group of NEs
  - By protection group(s) type(s)
- Synchronize SNMS Database with NE periodically
  - On demand basis
  - On scheduled basis
  - Autonomously on establishing/re-establishing link

Related information

For instructions on displaying protection switching status, see T 333, Display Protection Switching Status.

Dynamic Network Operations

Introduction

The Dynamic Network Operations (DNO) feature performs two major functions in WaveStar SNMS:

- Subnetwork discovery
- Database synchronization

Subnetwork discovery

The DNO feature retrieves the internal configurations of NEs and external connectivity relationships. This allows the system to discover all NEs in a subnetwork as well as the trails between NEs where available. As a result, the subnetwork topology (NEs and trails) is automatically displayed on the Map window as soon as it is discovered.

When the subnetwork discovery aspect of DNO is executed on a per-NE basis, the neighbors of the target NE are also discovered. The system uses the DNO feature to query the SONET Directory Service (SDS) to discover these node types. When subnetwork discovery is initiated with the SDS, the system queries the DSA of the chosen SDS for discovering NEs, then sends commands to neighboring NEs for discovering trails.

Database synchronization

The DNO feature synchronizes the system database with current configuration data from the NEs. The information that DNO gathers from NEs includes:

- NE parameters
- NE equipment inventory
- NE port parameters
- NE port protection groups
- NE cross-connections
- NE tributary reservation data (for WaveStar BWM NEs only)
- Optical associations (OLS 400G NEs only)

As part of subnetwork discovery, the system retrieves an NE's current equipment configuration and stores this information in the system database. NE equipment data can include bays, shelves, and circuit packs.

For certain NEs, such as the WaveStar BWM, you can select an NE and any single bay or shelf within the NE through the Network Element Explorer on the Manual DNO window, and then invoke DNO to retrieve the NE's current equipment configuration for that bay or shelf to update the system database. For a single bay or shelf, you can update the database for equipment or NE port

parameters. This simplifies DNO when bays and shelves are added to an existing WaveStar NE such as the BWM.

Log-Based Synchronization (OLS 400G only)

The Log-Based Synchronization method (LBS) is used for WaveStar SNMS database synchronization when the EMS loses communication with the NE. LBS retrieves the NE log data that contains the history of the database change notifications. Using this, the EMS database can be resynchronized locally instead of sending TL1 retrieval commands to the NE database to synchronize data.This allows a more efficient DNO operation.

The LBS method applies only to OLS 400G and runs automatically under the following conditions:

- The communication to the target NE was lost and restored again.
- Control of the log-based DNO has been enabled.

NOTE:
The automatically triggered DNO operation can be enabled or disabled by setting a parameter in a configuration flat file. The setting of this control is primarily intended for the EMS customer engineer, and is not recommended for the EMS user.

Once the LBS is enabled, it consists of the following steps:

1. Record the last notification before the link went down.
2. Retrieve the NE History Log that contains the database change notifications.
3. Determine the usability of the NE Log for recovery of the lost notifications.
4. Assure the chronological order of the retrieved logged notifications.
5. Update database based on both logged and received real-time notifications.

Ways to initiate DNO

There are three ways that the DNO feature is initiated in the system:

- Automatically—The DNO subnetwork discovery/database synchronization process is initiated automatically when an NE is discovered or added manually to the WaveStar SNMS database.
- Manually—The DNO subnetwork discovery/database synchronization process is executed for the NE, when you request it. When you request a manual DNO for an aggregate, DNO is executed for all NEs in the aggregate.

- Scheduled—You can schedule DNO to be performed for one or more NEs on a daily, weekly, or monthly basis.

DNO options

You can invoke DNO to perform automatic subnetwork discovery or database synchronization for one or more of the following: NE parameters, equipment inventory, port parameters, port protection groups, cross-connections, reservations. You can also invoke DNO to perform subnetwork discovery and resynchronize the system database for all data types.

Related tasks

See the following tasks in the *User Tasks* section:

- T 327, Manually Initiate DNO
- T 622, Schedule DNO

Software Management

Introduction

The WaveStar SNMS Software Management feature provides a set of functions that automates the process of transferring NE software from Digital Access Tape (DAT) or CD-ROM to the WaveStar SNMS host machine, and downloading, activating, and copying software to NEs. The Software Management functions assist you in doing a generic software upgrade of a given NE type in the network by providing the ability to download NE software to NEs. The Software Management features also provides backup and restore functions to protect against NE data loss. Software management functions can be peformed on demand or scheduled to be performed at a later time.

Software management functions

The following functions are provided:

Executables

- NE Software Transfer (Import Software to the EMS)
- NE Software Download
- NE Software Copy (OLS 400G only)
- NE Software Activate
- NE Software Delete

Data

- NE Software Backup
- NE Software Restore

Software Release Information

- View software release descriptive information

Ways to perform software management functions

Some of the Software Management functions can be performed either on-demand or scheduled. Scheduled tasks are set up to be performed once or periodically at a certain time. As with other scheduled tasks, you can specify the number of times to retry a failed or incomplete Software Management activity, as well as the time interval between attempts.

The following table indicates how the various Software Management functions can be performed.

Table 4-2. Methods of Performing Software Management Functions

Software Management Function	On-Demand	Scheduled
NE Software Transfer	✓	
NE Software Download	✓	✓
NE Software Copy	✓	✓
NE Software Activate	✓	✓
NE Software Delete	✓	
NE Software Backup	✓	✓
NE Software Restore	✓	

Related information

For details about how to schedule Software Management functions, see the following tasks:

- T 623, Schedule NE Data Backup
- T 624, Schedule NE Software Download
- T 625, Schedule NE Software Copy
- T 626, Schedule NE Software Activation
- T 627, Modify a Scheduled Task
- T 628, Delete a Scheduled Task

Software transfer via removable media

For file transfer from Digital Access Tape (DAT), the WaveStar SNMS hosts are configured so that all the user has to do is physically mount the tape and then use the WaveStar SNMS application to transfer the files to the WaveStar SNMS file system. For file transfer from CD-ROM, the user must both physically load the CD-ROM and use UNIX utilities to mount the file system for the CD-ROM. Once the CD-ROM has been inserted and mounted, a user can use the EMS GUI application to transfer the files from the CD-ROM to the EMS file system.

NOTE:
It is also possible to use other commonly available tools and applications to get software files into the EMS file system (for example, use file transfer software, such as File Transfer Protocol (FTP), to transfer software to WaveStar SNMS over a network).

Viewing descriptive information for an NE software release

Prior to transferring a new software release or after the software transfer, WaveStar SNMS provides a function for viewing descriptive information for all software releases that are currently maintained on the WaveStar SNMS host machine for a given NE type.

Maximum number of software releases on WaveStar SNMS host

The maximum number of software releases for a given NE type than can reside on the WaveStar SNMS host machine varies with the host type.

The following table shows the maximum number of NE software release copies by host type.

Table 4-3. Maximum Number of NE Software Copies by Host Type

Host Type	Number of NE Software Release Copies Per NE Type
K580	3
K460	3
K360	2
K380	3

If the host limit is exceeded, and you attempt to transfer a new software release, WaveStar SNMS informs you of this and instructs you to delete at least one of the existing software releases. You can use the NE Software Delete function to do this. See T 341, Delete NE Software for instructions on how to delete NE software from WaveStar SNMS.

Related Information

T 337, Import Software to the EMS describes how to import NE software from DAT or CD-ROM to the WaveStar SNMS host for eventual downloading to for an NE type.

NE software download

The Software Download function allows you to download a specific software release from the WaveStar SNMS host to a specified NE. Software downloads are done by specifying the NE type and the software release to download. Software downloads are performed by WaveStar SNMS via an IAO-LAN interface using File Transfer Access Method (FTAM) protocol.

Verifying software downloads

When a software download is performed WaveStar SNMS checks if the release identified for the download is older than or the same version currently running on the NE, or if it is a release that is not supported by WaveStar SNMS. If any of these conditions occur, WaveStar SNMS informs you of this, and asks if you want to proceed with the software download anyway. You have the option of continuing with the software download or cancelling it. WaveStar SNMS informs you of the status of the download. If the software download fails for some reason, WaveStar SNMS issues an error message.

Maximum number of software downloads

The number of simultaneous software downloads allowed by WaveStar SNMS is 4.

The WaveStar NE Software Download Process

The following figure illustrates the software download/activation process for WaveStar NEs.

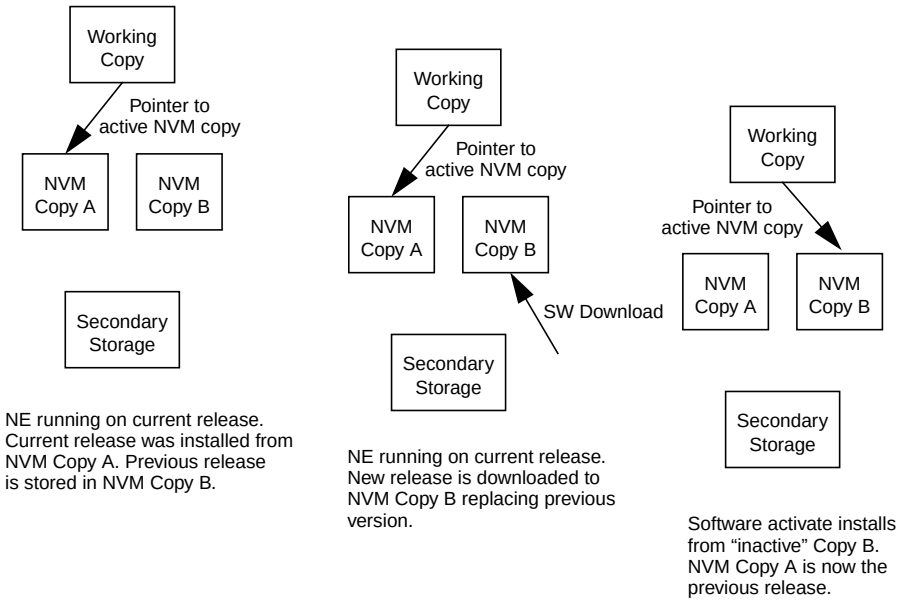


Figure 4-1. WaveStar NE Software Download/Activation Process

When software is downloaded from WaveStar SNMS to a WaveStar NE, it replaces the non-working copy in the NE's Non-Volatile Memory (NVM). When you perform a software download and click the Apply button on the Software Download to NE window, the currently non-working release is activated and becomes the active version. The software release that it replaces in working memory remains in the NVM and becomes the previous software version.

Related information

T 338, Download NE Software describes how to use the Software Download function.

NE software copy

The Software Copy function allows you to copy software from a Lucent Technologies NE to one or more Lucent Technologies NEs of the same type.

Verifying software copies

When a software copy is performed, WaveStar SNMS checks if the release identified for the copy is older than or the same version currently running on the destination NE(s). If either of these conditions occur, WaveStar SNMS informs you of this, and asks if you want to proceed with the software copy anyway. You have the option of continuing with the software copy or cancelling it. WaveStar SNMS informs you of the status of the copy. If the software copy fails for some reason, WaveStar SNMS issues an error message.

Maximum number of software copies

The maximum number of simultaneous software copies from a given source NE allowed is 4.

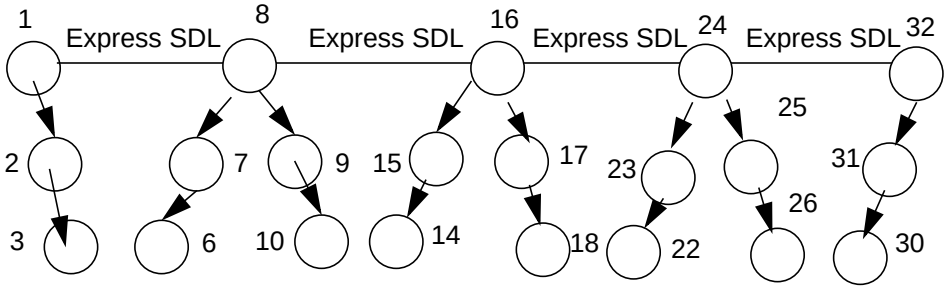
The maximum number, in total, of simultaneous remote copies within an open or closed ring of NEs allowed is 8.

WaveStar SNMS software upgrade process

The process of upgrading NEs with the latest software through WaveStar SNMS is a combination of the Software Download and Software Copy functions requested by the user that are executed by the system in a certain order or sequence.

The software upgrade process is performed on one open or closed ring of NEs at a time.

Refer to the following figure that shows a sample 32 node open ring configuration when following the sequence of events for a software upgrade by WaveStar SNMS.



1. WaveStar SNMS downloads the software to all NEs within the open or closed ring that have the Express Software Download (SDL) terminated.
2. One all software downloads in step 1 are completed, WaveStar SNMS remote copies the software from the NEs downloaded in step 1 to those NEs' neighbors.
3. Once all remote copies in step 2 are completed, WaveStar SNMS remotely copies the software from the NEs that have just received the remote copies from the source NEs in step 2 to those NEs' neighbors.

   The express software downloads are terminated are nodes 1, 8, 16, 24, and 32.

   The process continues until all NEs contain the desired software load.
4. NEs should then have the active/inactive partition swapped and reset, starting from the NE furthest away and working towards the NE connected to WaveStar SNMS.

Related information

T 339, Copy Software from NE to NE describes how to use the Software Copy function.

NE software activate

The Software Activate function allows you to activate a specific software release on an NE. When new software is downloaded to an NE, it is placed in “standby” until it is activated; it then replaces the old software.

Software activation for the WaveStar NEs

WaveStar NEs maintain two copies of software in Non-Volatile Memory (NVM), one of which corresponds to the installed and working software and the other is typically the previous version that was replaced by the current working version. When a new version is downloaded using the Software Download function, it replaces the old version in the NE’s NVM. When a software activation is performed, the new software release is installed from the NVM and current running version becomes the standby version in NVM.

Verifying software activations

When a software activation is performed, WaveStar SNMS checks if the software being activated is the same as the current version, older than the current version, or is currently not supported by ITM SNC. If either of these conditions exist, WaveStar SNMS informs you of this, and asks if you want to continue with the software activation anyway. You have the option of continuing with the software activation or cancelling it.

Software activation failures

When WaveStar SNMS is unable to complete an on-demand request to activate NE software on one or more NEs because some of the NEs rejected the software activation request, WaveStar SNMS displays an error message for each failed NE request.

Loss of communications

When WaveStar SNMS loses its connection to the NE as a result of a software activation request, and determines that the activation request was unsuccessful upon re-establishment of the connection with the NE, a failure message is logged in the Activity Log and WaveStar SNMS issues a failure message in the status bar for failed on-demand requests.

Related information

T 340, Activate NE Software describes how to use the Software Activate function.

NE software delete

The Software Delete function allows you to delete a specific software release from WaveStar SNMS for an NE type.

When software is deleted from WaveStar SNMS, it is not recoverable. The only way to get the software back into WaveStar SNMS is to reload it from a tape on CD-ROM. WaveStar SNMS informs you of this prior to actually deleting the software. You have the option of continuing with the software deletion anyway or cancelling the deletion.

Related task

T 341, Delete NE Software describes how to use the NE Software Delete function.

NE data backup

The NE Software Backup feature lets you perform an on-demand backup of an NE's provisioning data. The provisioning data includes port parameters and cross-connections.

To avoid unnecessary redundant backups of NE data that has not changed since the last backup, WaveStar SNMS checks the selected NE to make sure a backup is necessary. If there is no change in the NE's configuration status since the last backup, a backup is not necessary and you are informed of this and given a choice of performing the backup anyway or cancelling it. If you choose to do a backup anyway, all data is backed up.

Storage of backup data

NE backup data is stored in flat ASCII files with header information, including the NE type, software release, NE's TID, equipment/slot information, the ID of the user performing the backup, date/time of the backup, and the system release that created the backup.

Simultaneous backups

The number of simultaneous NE backups (either on-demand or scheduled) that can be performed depends on the WaveStar SNMS host type. The following table indicates the number of simultaneous backups that can be performed by host type.

Table 4-4. Simultaneous NE Backups Allowed by Host Type

Host	NE Simultaneous Backups
K580 (6 CPU)	6
K580 (4 CPU)	6
K580 (2 CPU)	6
K460	6
K360/K380	4

If you attempt to perform more than the maximum number of simultaneous backups than can be performed for the WaveStar SNMS host type, the new backup is not accepted and WaveStar SNMS informs you that no more backups can be performed at the current time.

Backups/Restorals for the WaveStar NEs

Some of the WaveStar NEs and NCCs have both a primary NVM that mirrors the current working memory configuration and a local secondary storage device that provides a local memory backup and restore capability. WaveStar SNMS supplements the local memory backup and restore, by both managing the local backup and restore capability and providing additional capabilities to back up and restore NE configuration data to/from WaveStar SNMS as is done for other NE types.

The WaveStar NEs Memory Backup and Restore Process

The following figure illustrates the basic memory backup and restoral scheme for the WaveStar NEs.

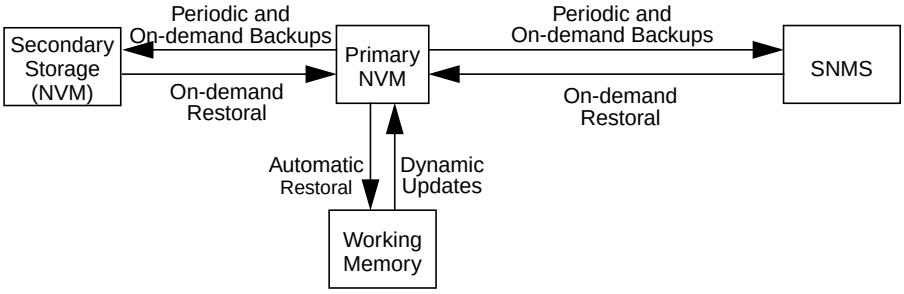


Figure 4-2. The WaveStar NEs Memory Backup and Restore Process

Data transfers between the NE's primary NVM and secondary storage use local file system copy functions. WaveStar SNMS allows you to choose whether to back up the NE data to WaveStar SNMS memory or the NE's local secondary storage.

Alarms present during backups

If an on-demand NE backup is performed on an NE with alarms present, you are informed of this and given a choice of proceeding with the backup anyway or cancelling it.

Related task

T 342, Back Up NE Data describes how to use the NE Software Backup function.

NE data restore

The NE Restore function allows you to restore NE data that was backed up using the NE Backup function.

When a backup or restore is in progress, WaveStar SNMS prevents the execution of any command that may change the settings of NE parameters until the backup or restore is completed.

When a restore is requested, WaveStar SNMS compares the NE type, software release, and equipment of the NE with the data in the selected backup file. If the NE type or software release does not match, a message is issued and you are given the option of continuing with the restore anyway.

Regular restore

WaveStar SNMS peforms a regular restore. This means that the system restores all backup data from the selected NE file, including parameters set to the default settings.

Restoring NE backup data

The files that are created by the NE Backup function are accessible through the NE Restore function. WaveStar SNMS stores up to seven files for each NE. When seven backup files exist and another backup file is created, the oldest backup file is removed.

Verifying NE restorals

WaveStar SNMS keeps you informed about the status of the NE restoral in progress. If the restoral fails for some reason, WaveStar SNMS informs you of the problem via a pop-up message window.

Related Information

T 343, Restore NE Data describes how to use the NE Restore function.

Date/Time Synchronization

Introduction

Periods of time when an NE is out of service, as during a software upgrade, can cause the NE's date/time setting to be out of sync with the WaveStar SNMS host and the other NEs in the network. Lack of date/time synchronization can create problems in determining the order in which alarms occurred on the network.

WaveStar SNMS uses the Network Time Protocol (NTP) to ensure the accuracy of its internal clock. WaveStar SNMS, in turn, provides centralized remote date/time synchronization between its internal clock and those of its managed NEs. Synchronization can be performed on a single NE, on an aggregate of NEs, or on all of the NEs in a user's Target Group. Synchronization can be performed on demand or set up on a periodic schedule using the SNMS Scheduler. The transition from standard time to daylight savings time is also supported as a user selected option.

NE time zone

As part of the date/time synchronization feature, WaveStar SNMS can take into account whether the NE is located in a different time zone from the system host.

Related information

Network Element Administration provides details about setting the NE's time zone when adding or modifying an NE.

Standard time and daylight savings time

You can use the Spring Forward/Fall Back option to have WaveStar SNMS automatically make time adjustments for Daylight Savings Time (Spring Forward) and standard time (Fall Back) when doing date/time synchronization for an NE, a group of NEs, an aggregate, or all NEs under system control, 20 NEs at a time or more, depending on system load. The Spring Forward/Fall Back option can be enabled or disabled, as needed. This option is enabled, by default. If the option is disabled for an NE, the NE's time is always set to standard time.

NOTE:
The Spring Forward/Fall Back option should be set by the system administrator.

Related information

T 329, Enable/Disable Fall Back and Spring Forward in the *User Tasks* section explains how to set the Fall Back/Spring Forward option.

Ways to perform date/time synchronization

NE Date/time synchronization can be performed in three ways:

- Scheduled—NE date/time synchronization can be scheduled to be performed on a daily, weekly, or monthly basis. A scheduled date/time synchronization will only be done if the time difference between the NE and the system host is more than 15 seconds.
- Automatically—You can have the system automatically perform date/time synchronization on an NE when it is manually added or autodiscovered by the system, or when communications between the NE and the system host are lost and then regained. Automatic date/time synchronization will be performed on an NE only if the time difference between the NE and system host is more than 15 seconds, or the drift threshold set via the Set Date/ Time Synchronization Drift window. The drift threshold is the maximum time difference allowed (in seconds) between the NE and the EMS host before date/time synchronization is performed automatically. Automatic date/time synchronization can be enabled or disabled; the default is enabled.

NOTE:
Automatic date/time synchronization should be enabled/disabled by the WaveStar SNMS system administrator or a user with a privileged login.

- Manually—Date/time synchronization can be performed on demand for an NE, a group of NEs, an aggregate, or all NEs under system control, up to 20 NEs at a time or more, depending on system load.

Related information

Scheduling Tasks provides additional information about scheduling NE date/time synchronizations.

T 619, Enable/Disable Automatic Date/Time Synchronization describes how to enable/disable automatic date/time synchronization.

T 620, Set Drift Threshold for Date/Time Synchronization describes how to set the drift threshold for automatic date/time synchronization.

T 328, Set NE Date/Time Synchronization describes how to manually initiate date/ time synchronization.

Performance Management

5

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Background

Introduction

The Performance Management features of the system allows users to collect Performance Monitoring (PM) data from certain NE types. Users can specify the NEs from which PM data is collected. The collected PM data can be viewed online through the GUI or exported to external systems for analysis and report generation.

Objectives

This chapter provides background and introductory information about Performance Management functions in the WaveStar SNMS system. It includes available features and references to specific task-related instructions. After learning the information in this chapter, the user should be able to do the following:

- Enable the Performance Management feature for PM data collection.
- Set the threshold PM parameters for data collection
- Administer the storing of PM data.
- View PM data.
- Generate PM data reports.
- Administer PM parameters.

Related tasks

For related tasks, see the series 400 (Performance Management) tasks in the *User Tasks Manual* or look up individual tasks in the Task Index.

Related information

For related information, see Chapter 3, Fault Management.

Performance Management

Introduction

The Performance Management feature allows the system to retrieve, store, and export Performance Monitoring (PM) data from OLS 400G R.2.0 (and later), BWM R.1.3 (and later) SDH interfaces, and from TDM 10G (STM-64) SDH interfaces. The system retrieves intermediate and terminal path SONET/SDH bin and line PM data from BWM R. 2.0 NEs. This feature also allows you to retrieve, store, and export PM data from FT-2000 LCT R. 4.0 NEs. The PM feature, which is enabled or disabled through the GUI, allows you to initiate performance monitoring of managed NEs. PM data can be collected from none, some, or all NEs in the network. You can specify, on a per-NE basis, the type(s) of interfaces from which to collect PM data for analysis. PM data can be turned on or off for each NE and can be collected in 15-minute and/or 1-day time intervals. PM data can be viewed online through the GUI or exported to an external reports system for more sophisticated reports and analysis.

The system also supports remote administration of performance parameters and thresholds through the Cut-Through feature. For the OLS 400G CMISE protocol, the system provides GUI windows to configure OLS 400G performance parameters and thresholds. Performance exceptions are logged from the NEs as Threshold Crossing Alerts (TCAs) each time the administered threshold for these events is exceeded.

Enabling the PM feature

The PM feature must be globally enabled before PM data can be collected from NEs. If the PM feature is not enabled globally, PM data cannot be collected even if PM data collection is turned on for an NE.

When the PM feature is globally enabled, the system periodically polls each NE that has PM data collection enabled for PM data.

Related task

T 400, Enable/Disable the PM Feature describes how to globally enable or disable the PM feature through the GUI.

PM data collection

PM data collection can be enabled or disabled for an NE. You can also select the type of PM data to be collected (15-minute, 1-day, or both) for each port type on the NE, or disable PM data collection for a port type.

NEs are normally polled every two hours. Data polling is done by the system in such a way as to avoid overwhelming the network with PM data traffic.

Loss of communications

If connectivity is lost to an NE during PM data polling, upon re-establishing the connection, the system resumes data collection, and polls for the oldest PM data not yet collected, based on the value of the *OLDEST_TO_POLL* variable, *.pm_global* file, found in the */snc/.pm* directory, which can be changed by the system administrator.

For example, if the value of the *OLDEST_TO_POLL* variable is set to four hours and connectivity between an NE and the system is lost for three hours, the system resumes polling for PM data that is up to four hours old if it has not already been collected.

Suspension of PM data collection

PM data collection is suspended during an alarm storm. WaveStar SNMS resumes PM data collection after the alarm storm has subsided.

Initialization of PM data registers

For the selected NE, the PM feature allows you to reset the digital PM registers for:

- All current 15-minute digital PM data (Bin A)
- All current 1-day digital PM data (Bin B)
- Both 15-minute and 1-day current PM data

NOTE:
This option only applies to OLS 400G NEs.

Setting the start time for 1-day PM data collection

For the selected NE, the PM feature allows you to view and then reset (if necessary) the hour of the start time for collection of 1-day PM data.

NOTE:
This option only applies to OLS 400G NEs.

Related task

T 401, Enable/Disable PM Data Collection describes how to enable or disable PM data collection for one or more port (data) types on an NE. It also describes how to reset the start time for collection of 1-day PM data, if needed.

Storing PM data

The system stores collected PM data in the WaveStar SNMS database. Each PM database record contains a:

- TID and AID of the NE from which the PM data was collected
- 15-minute or 1-day PM data indicator
- NE interface type from which PM data was collected
- time/date of PM data collection
- validity of PM data
- type of PM data
- value of PM data
- PM threshold exceeded indicator (in other words, whether the PM data collection exceeded the established threshold during PM data collection). **Note:** this variable is not applicable to OLS 400G NEs.

The PM data collected can be invalid if the NE date/time was reset during PM data collection or if the NE PM data register overflowed during the collection interval.

PM data can be stored in the system for 1 to 30 days. The default retention period for 15-minute data is 30 days. The default retention period for 1-day data is 30 days. The data retention period for both 15-minute and 1-day PM data can be specified through the Global PM Management option on the GUI.

PM files are kept for the set retention period, unless the files have to be overwritten due to insufficient data storage space. The system automatically deletes any PM data file when it is older than the retention period or there is a lack of storage space. If there is a lack of data storage space, the system deletes PM data files, starting with the oldest file first, until the storage problem is resolved.

When PM data is deleted, WaveStar SNMS puts an entry into the Alarm Log indicating that PM data has been deleted.

Deleting an NE from WaveStar SNMS

Any PM data associated with an NE is removed from the WaveStar SNMS database when that NE is deleted from WaveStar SNMS.

Related task

T 400, Enable/Disable the PM Feature explains how to specify the data retention period for either time interval.

Viewing PM data

The system allows you to view the the “raw” PM data which is either stored in the WaveStar SNMS database or not yet collected from the NE. You can specify which PM data to view using selection criteria such as:

- Current or historical PM data
- Date/time of historical PM data
- The type of PM data (15-minute or 1-day)
- The NE interface type

The date is specified for 1-day data. The date and time of day is specified for 15-minute data.

Related Task

T 403, View PM Data describes how to view PM data online through the GUI.

Generating PM data reports

PM data collected by the system can be automatically downloaded by Lucent Technologies’ Integrated Transport Management Dynamic Network Analyzer (ITM-DNA), an external PC-based system which can produce various types of user-defined reports. The downloaded PM data that is stored in the ITM-DNA database can be used to generate reports in a variety of formats, including tabular reports, line graphs, and bar graphs.

Types of PM data

The system can be set up to collect PM data from specific NE interfaces and the Optical Translator Unit (OTU). PM data can be collected from one or more of the following interfaces:

- Optical Channel—OLS 400G
- Optical Line—OLS 400G
- Supervisory Channel—OLS 400G
- Optical Channel Port Signal (OTPS)—OLS 400G
- STM16—BWM R. 1.3
- STM4—BWM R. 1.3
- STM1—BWM R. 1.3
- T3—BWM R. 1.3
- STM64—BWM R. 2.0
- VC3—BWM R. 2.0
- VC4—BWM R. 2.0
- VC4/4C—BWM R. 2.0

- OC192—BWM R. 2.0
- OC48—BWM R. 2.0
- OC3—BWM R. 2.0
- STM64—10G (STM-64)
- STM16—10G (STM-64)
- STM1—10G (STM-64)

Refer to the NE hardware documentation for details about the types of PM data that can be generated from each of these interfaces.

NE PM data administration

The PM Data Administration window on the GUI allows you to administer three categories of NE PM data related to the OLS 400G:

- digital PM threshold settings
- analog PM threshold settings
- baseline value calculations

NOTE:
PM threshold values can only be provisioned for an OLS 400G NE through the PM Data Administration window. For other NE types, PM threshold values must be set by issuing TL1 commands via the Cut-Through window.

Digital PM data threshold settings

For the selected NE, the PM data administration feature allows you to retrieve and set the 15-minute and/or 1-day threshold values for PM data collection for the specific parameters listed on the GUI window.

Analog PM data threshold data settings

For the selected NE, the PM data administration feature allows you to display and change the high and low threshold values for signal power received and/or transmitted for the various interfaces.

Recalculation of baseline signal power

The PM data administration feature allows you to set, in the NE, the current baseline value of NE facilities associated with analog PM parameters. To establish the reference point for the high and low threshold values for signal power, the PM feature allows you to recalculate (set) the current baseline value for the signal power received, transmitted, or both. This may be required, for example, when a new NE is brought into service.

Related task

T 402, Administer PM Data describes how to display and provision digital PM data threshold values for the selected NE facility type/interface, how to display and set high and low threshold values for analog PM data parameters, and how to recalculate the current baseline value for analog signal parameters, if needed.

Administering PM parameters

Some of the parameters that are used by the system to manage the PM feature, such as the data retention period or the age of the data collected during polling, can be manually changed by the system administrator by editing the value of the corresponding variable in the *.pm_global* file, which is found under */snc/.pm*.

The following table shows the PM variables that can be edited, with their default values.

Table 5-1. PM Feature Variables

Variable	Description	Default Value
PM_COLLECT_STATUS	The current global setting of the PM feature. Value is On or Off.	Off
RETENTION_FOR_PM	The global data retention period for 15-minute PM data.	2 (days)
RETENTION_FOR_DAY	The global data retention period for 1-day PM data.	30 (days)
PM_POLLING_FREQ	The frequency that the system polls the NEs for PM data in a session. Allowed value is 2 to 6 (hours).	2 (hours)
PM_OLDEST_TO_POLL	The age of the oldest PM data that can be collected by the system from the NEs.	4 (hours)
PM_MAX_FILE_POLL	The maximum number of PM data reports for which the system can poll NEs in one session.	user-defined
TOTAL_FILE_SYSTEM	The total number of system host machines for which PM data is being collected.	1

Exception reporting

The system provides exceptions by logging Threshold Crossing Alerts (TCAs) received from the NEs. TCAs, in the form of report events, are generated every time an administered performance threshold is exceeded in the NE. In addition, the system EPT Threshold capability flags the TCA rate when it exceeds the system threshold.

TCAs and alarms are stored in the WaveStar SNMS database and are available for online queries through the Network Alarm/Event Log.

Security Management

6

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Background

Introduction

The Security Management features of the system allow administrative control over user access to managed NEs and the functions that a user can perform. There are also functions for administering user and NE passwords.

Objectives

This chapter provides background and introductory information about Security Management functions in the WaveStar SNMS system. It includes available features and references to specific task-related instructions.

After learning the informtion in this chapter, the user should be able to do the following:

- Change user and NE passwords.
- Set up users and their level of access to NEs, functions, and commands in WaveStar SNMS.

Related tasks

For related tasks, see the series 500 tasks or look up individual tasks in the Task Index.

Related information

For related information, see Chapter 7, Administration.

Password Administration

Introduction

The WaveStar SNMS GUI provides functions for administering user passwords and NE passwords.

Changing an EMS user's password

The Change Password function is the only Administration function that is available to the EMS application user. An EMS user password can be changed at any time. The system verifies that the old password entered matches the one stored in its database for the user.

The first time a user ID (login) is used to log into WaveStar SNMS, the system enforces that the default password must be changed to a new password, and displays the Change Password window for changing it.

Passwords must be changed after a certain period of time (as defined by the system administrator via the Global Security Provisioning window). If a password is about to expire, and a user attempts to log into the system, a pop-up window advises that the password is about to expire and allows the user to change the password at this point. If the expiration period is reached, and the user does not change the password before attempting to log into the system, system access is denied.

WaveStar SNMS maintains a history of password usage. If a user attempts to change the password to one previously used, the system advises that a different password must be specified.

An EMS user login, however, can only be changed by the WaveStar SNMS administrator. See Users for additional information about changing EMS user logins.

Related task

T 500, Change Your User Password describes how to change your password.

Global password administration

NEs have default login/passwords that are defined at the manufacturer prior to shipment. The NE login/password is required by the EMS user to gain access to the NE. The system GUI allows you to modify an individual NE's primary and backup password through the Add/Modify an NE window or via Cut-Through mode. However, if the network has a large number of NEs, this can be a very time-consuming process.

The Global Password Administration feature, which is available only for Lucent Technologies NEs, through the GUI, allows you to change the primary and/or backup passwords for a number of NEs at the same time. This feature allows global password change for:

- Individual NEs (by TID)
- All NEs
- NEs by type
- Aggregate (collection of NEs)

Changes to the primary and/or backup NE passwords are sent to the selected NE(s) and the local WaveStar SNMS database is automatically updated with the password information.

The global password update process can be aborted at any time while the Global Password Administration window is open.

Only one person can use the Global Password Administration feature at a time.

Related task

T 501, Globally Administer NE Passwords describes how to use the Global Password Administration feature for changing NE passwords.

Network Security

Introduction

The WaveStar SNMS system provides network security by allowing an administrator to define users and the extent of their access to NEs in the network and capability of performing certain functions and commands through the system.

Levels of access are defined by:

- User/password administration and NE/command access
- Command Groups
- Target Groups
- NE login administration

Users

A user is identified by a login and password and is provided access to the functions and features of the system as defined by the system administrator.

A user ID is defined for each user that accesses the system. The user ID (login) assigned to each user must be unique and contain 3-10 alphanumeric characters with no white spaces. When a user logs into WaveStar SNMS, the user ID is validated with the current password. If a user fails to log in with a valid user ID/ password combination after a number of times (as defined by the administrator), the user ID is automatically disabled and prohibited from logging into WaveStar SNMS. An “Invalid Login” message is displayed, an alarm is issued, and the user ID session is terminated.

Each user ID (login) is allowed to establish one user session. If a user ID is currently logged into WaveStar SNMS, a second session cannot be established using the same login.

The WaveStar SNMS system administrator can create, delete, and modify users (by user login) and their access permissions. Before any user can access the system, the user must be assigned a login and appropriate Target Group and Command Group access permissions.

The administrator can also copy the login group settings, Command Group, and Target Group settings from an existing user to a newly defined one.

When a user login is created by the administrator, it is initially set up with the following default values:

- User ID Login Type—GUI
- Password—no default password, must be entered by the administrator
- Command Group—Empty

- Target Group—Empty
- Date Representation—North American

Date Format

All user IDs are assigned a date format which defines how calendar date information for that login is displayed in the GUI. The date formats are:

- North American—*mm-dd-yyyy*
- International—*dd-mm-yyyy*

where:

mm represents the month [01-12]

dd represents the day [01-31]

yyyy represents the year [1969-2068]

The default date format is North American. All pre-defined logins default to North American date format.

Changing a user's login

To change a user's login, the system administrator must first delete the user and then re-enter the user in the system with a new login.

User management

WaveStar SNMS has a number of built-in security features to inhibit or prevent unauthorized user access to the system and to monitor user activity.

Through GUI functions, an WaveStar SNMS administrator or a user with a privileged login can:

- terminate an active user login's session
- enable or disable user logins
- set a limit of the number of failed login attempts before preventing a user from logging into WaveStar SNMS
- set the password aging interval for user logins
- issue a warning notice to users when their password is about to expire
- maintain a history of previously used passwords
- set the session timeout interval for logins
- set the expiration period for user logins

- specify the message that is issued when a user successfully logins into WaveStar SNMS
- view all currently active user login sessions

Alarms and user logins

WaveStar SNMS generates a Minor alarm when any of the following conditions occur:

- a user ID is automatically disabled due to excessive failed login attempts
- a user ID is deleted due to lack of use
- a password change for a user ID is unsuccessful

Any of the above conditions may indicate a possible threat or attempted breach of system security. A Minor alarm is generated against the application itself (TID=EMS) which can only be accessed by the EMS system administrator.

Related tasks

T 502, Add a User describes how to add a user's login/password and define NE/ command access permissions.

T 503, Modify a User describes how to change a user login's settings and access permissions.

T 504, Delete a User describes how to delete a user login from the system.

T 514, Terminate User Session describes how to terminate one or more active user login sessions.

T 515, Enable/Disable User Logins describes how to enable or disable user logins from being able to log into WaveStar SNMS.

T 516, Display Logged In Users describes how to display users that are currently logged into WaveStar SNMS.

T 517, Globally Provision Login/Password Parameters describes how to set certain security parameters for user logins and passwords, such as the password aging interval and the number of unsuccessful login attempts allowed.

Command groups

A Command Group, also known as a user class, is a collection of EMS and NE commands that a specified user is allowed to enter through the system GUI. Each user is assigned to one and only one Command Group.

The system has a set of pre-defined Command Groups:

- Maintenance Command Group—This Command Group allows access to all Maintenance and Performance Management Category commands with Authorization Level 4 or less. (For an explanation of Authorization Levels, see the NE logins (OLS 400G NEs only) section in this chapter.) This group of commands allows a user to view and modify all NE Maintenance information.
- Provisioning Command Group—This Command Group allows access to all Provisioning Category command with Authorization Level 4 or less. This group of commands allows a user to view and modify all NE provisioning information.
- Report-Only Command Group—This Command Group allows access to all categories of commands with Authorization Level 2 or less. (For an explanation of Authorization Levels, see the NE logins (OLS 400G NEs only) section in this chapter.) This restricts a user to only being allowed to view NE information but not change it.
- General Command Group—This Command Group allows access to all categories of commands with Authorization Level 3 or less. This allows a user to view and modify most NE information.
- Privileged Command Group—This Command Group allows a user access to all categories of commands with Authorization Level 4 or less. (For an explanation of Authorization Levels, see the NE logins (OLS 400G NEs only) section in this chapter.) This allows a user to view and modify almost all NE information, except for Administrator functions.
- All Command Group—This Command Group allows access to all commands, including Administrator functions supported by the NE. This is the super-user NE Command Group and is automatically assigned to the *snc* and *snms* logins; other user IDs may be assigned to this command group. It is usually reserved for the EMS administrator.
- None—This Command Group is set up with no commands.

The WaveStar SNMS system administrator can add, modify, or delete Command Groups. Additional Command Groups can be defined as needed by the administrator.

The system administrator can also copy the contents of an existing Command Group to a newly defined one.

Related tasks

T 505, Add a Command Group describes how to add a Command Group.

T 506, Modify a Command Group describes how to change a Command Group once it has been created.

T 507, Delete a Command Group describes how to delete a Command Group from the system.

Target groups

A Target Group is a collection of NEs that a user can access. Together with Command Groups, Target Groups define user permissions and provide network security. Each user is assigned to one and only one Target Group.

The system has two pre-defined Target Groups:

- All Targets—provides access to all NEs in the network
- None—denies access to any NEs

The WaveStar SNMS administrator can add, modify, or delete Target Groups. Additional Target Groups can be defined as needed by the system administrator.

The system administrator can also copy the contents of an existing Target Group to a newly defined one.

Related tasks

T 508, Add a Target Group describes how to add a Target Group.

T 509, Modify a Target Group describes how to change a Target Group once it has been created.

T 510, Delete a Target Group describes how to delete a Target Group from the system.

NE logins (OLS 400G NEs only)

WaveStar SNMS allows an administrator or a user with a privileged login to administer user logins that are used to log directly into an OLS 400G NE. The level of NE access and the type of activities available to an NE login can be defined.

WaveStar SNMS allows you to define:

- NE logins
- Passwords for NE logins
- User Privilege Codes—a listing of exact permission levels to access functionality provided by the NE
- Temporary NE logins with an expiration date

- Copy of settings (User Privilege Codes) from another login (**Note: this does not include the ability to copy the login or password from another NE login**.)
- Password Aging/Expiration Time—the length of time (in days) that a password for an NE login can be used before it has to be changed to a new one

User privilege codes

When adding or modifying an NE login or copying another NE login's settings, a User Privilege Code is used to indicate the level of access to NE functions. A User Privilege Code is a combination of the Function Category and Authorization Level allowed.

The Functional Categories are as follows:

- **Maintenance (M)** - This Functional Category contains all of the Fault Management-related functions/features.
- **Provision (P)** - This Functional Category contains all of the Configuration Management-related functions/features.
- **Performance Management (PM)** - This Functional Category contains all of the Performance Management-related functions/features.
- **Security (S)** - This Functional Category contains all of the EMS Security and Administration-related functions/features.

Each Functional Category has Authorization Levels consistent with NE privileges. The Authorization Levels are as follows:

- 1 - Empty (Lowest)
- 2 - Reports Only
- 3 - General
- 4 - Privileged
- 5 - Super User (Highest)

NOTE:
The User Privilege Code on Super User NE logins cannot be modified.

The combination of a Functional Category and Authorization constitutes a User Privilege Code for a specific set of features.

Each NE must have at least one NE login with a Super User Authorization Level, to support any management task that may be required in the NE.

Example: user privilege code

The User Privilege Code “M3” indicates that an NE login is authorized to execute all Maintenance Category functions with Authorization Level 3 or less. Therefore, the user logging into an NE with this User Privilege Code is allowed to use the following EMS features:

- Cut-Through
- TL1 Macro Builder
- TL1 Broadcaster
- View Alarm Monitoring Statistics
- View Alarm Severity Assignment Profiles
- Resynchronize Alarms
- View Protection Switch Messages
- Provision Alarm Provisioning

Functions available by authorization level/functional category

The following table shows the functions/features that can be performed for each Authorization Level by Functional Category.

Table 6-1. **Functions Available By Authorization Level/Functional Category**

Auth. Level	Maintenance (M)	Provision (P)	Performance Management (PM)	Security (S)
1	CUT-THROUGH, TL1 MACRO BUILDER, TL1 BROADCASTER	CUT-THROUGH, TL1 MACRO BUILDER, TL1 MACRO SCRIPTS, TL1 BROADCAST	CUT-THROUGH, TL1 MACRO BUILDER, TL1 MACRO SCRIPTS, TL1 BROADCASTER	CHANGE PASSWORD, VIEW USER PREFERENCES
2	VIEW ALARM MONITORING STATISTICS, VIEW ALARM SEVERITY PROFILES, MODIFY ALARM SEVERITY PROFILES	RING UTILIZATION, VIEW CROSS CONNECT, VIEW EQUIPMENT, VIEW PATH, VIEW PROVISION NE, VIEW PROVISION PORT	VIEW PM DATA	COPY POSITIONS, COPY PREFERENCES, MOVE NODE, RESTORE MAP SETTINGS, RESTORE POSITIONS, RESTORE PREFERENCES, SAVE MAP SETTINGS, SAVE POSITIONS, SAVE PREFERENCES, VIEW ALL CMDRSP LOGS, VIEW LOGS

Table 6-1. **Functions Available By Authorization Level/Functional Category**

Auth. Level	Maintenance (M)	Provision (P)	Performance Management (PM)	Security (S)
3	FILTER ALARMS RESYNCHRONIZE ALARMS, VIEW PROTECTION SWITCH MESSAGES, PROVISION ALARM PROVISIONING	ADD CROSS CONNECT, ADD PATH, COPY PATH, CREATE OPTICAL ASSOCIATION, DELETE CROSS CONNECT, DELETE OPTICAL ASSOCIATION, DELETE PATH, MANUAL DNO, MODIFY CROSS CONECT, MODIFY OPTICAL ASSOCIATION, MODIFY PATH, PROVISION EQUIPMENT, PROVISION NE, PROVISION PORT, PROVISION PROTECTION GROUPS		AUTO DNO, AUTO DTSYNC, BACKUP NE, MANUAL DNO, MANUAL DTSYNC, SCHEDULE BACKUP, SCHEDULE DNO, SCHEDULE DTSYNC, SPRING FALL CHANGE
4	ALL ALARM MONITORING, ENABLE FULL ALARM MONITORING, ENABLE PARTIAL ALARM MONITORING, PROVISION PROTECTION SWITCH	ESTABLISH EQUIPMENT, REMOVE EQUIPMENT	GLOBAL PM MGMT, NE PM MANAGEMENT	ADD AGGREGATE, ADD GNE ASSOCIATION, ADD NE, ADD SUBNET, ADD TRAIL, CHANGE AGGREGATE CONTENTS, DATE TIME MANAGEMENT, DELETE AGGREGATE, DELETE GNE ASSOCIATION, DELETE NE, DELETE SUBNET, DELETE TRAIL, GLOBAL PASSWORD ADMIN. MODIFY AGGREGATE, MODIFY GNE RNE ASSOCIATION, MODIFY NE MODIFY SUBNET, NE SW ACTIVATE, NE SW COPY, NE SW DELETE, NE SW DOWNLOAD, NE SW TRANSFER, PROVISION DSA, RESTORE NE, RETRY INTERVALS, SCHEDULE SW ACTIVATE, SCHEDULE SW COPY, SCHEDULE SW DOWNLOAD, SWITCH ACTIVE GNE, VIEW DESCRIPTIVE INFORMATION

Table 6-1. **Functions Available By Authorization Level/Functional Category**

Auth. Level	Maintenance (M)	Provision (P)	Performance Management (PM)	Security (S)
5				ADD COMMAND GROUP, ADD TARGET GROUP, ADD USER, DELETE COMMAND GROUP, DELETE TARGET GROUP, DELETE USER, MODIFY COMMAND GROUP, MODIFY TARGET GROUP, MODIFY USER,

TL1 commands available by authorization level/functional category

A User Privilege Code also defines the TL1 commands that can be issued to the NE when an NE login is added or modified.

The Functional Categories defined for TL1 commands are:

- **Maintenance (M)** - This Functional Category contains all the Fault Management-related features.
- **Provision (P)** - This Functional Category contains all the Configuration Management-related features.
- **Performance Management (PM)** - This Functional Category contains all the Performance Management-related features.
- **Security (S)** - This Functional Category contains all NE Security and Administration-related features.
- **Test Access (T)** - This Functional Category contains all the Test Access-related features (applies to Wavestar BWM NEs only).

The Authorization Levels for issuance of TL1 commands are:

- 1 - Minimal (Lowest)
- 2 - Reports Only
- 3 - General
- 4 - Privileged
- 5 - Super User (Highest)

The following table shows the TL1 commands that can be issued for WaveStar NEs for each Authorization Level by Functional Category.

Table 6-2. **WaveStar Network Element TL1 Commands by Authorization Level/Functional Category**

Auth. Level	Maintenance (M)	Provision (P)	Performance Management (PM)	Security (S)	Test (T)
1	ACT-USER, CANC-USER, RTRV-ALM, RTRV-ALM-ENV, RTRV-ASAP-ASGNMT, RTRV-ASAP-PROF, RTRV-CMD-STAT, RTRV-COND, RTRV-FLT-ISLT, RTRV-FLT-STATE, RTRV-LRBK, RTRV-OW, RTRV-PROTN-GRP, RTRV-SYNCN	ACT-USER, CANC-USER, RTRV-rr, RTRV-EQPT	ACT-USER, CANC-USER, RTRV-TCA-ASGNMT, RTRV-TCA-PROF	ABT-CMD, ACT-USER, CANC-USER, ED-PID, RTRV-EQPT, RTRV-FECOM, RTRV-FECOM-LAN, RTRV-HDR, RTRV-MAP-NEIGHBOR, RTRV-MAP-NETWORK, RTRV-NE, RTRV-PRMTR-DATA, RTRV-PRMTR-SFTWR, RTRV-STATE-EQPT, RTRV-ULS, RTRV-ULS-DCC-L3, RTRV-ULSDCC-L4	ACT-USER, CANC-USER, RTRV-TACC
2	RTRV-BSW, RTRV-BSW-PORT, RTRV-MAP-RING, TEST-ALM, TEST-LED, TEST-TRMSN	RTRV-CRS, RTRV-RSVN, RTRV-STATE-EQPT, RTRV-TMSLT	RTRV-PM-rr	RTRV-AO, RTRV-LOG-ALM, RTRV-LOG-NTFCN, RTRV-LOG-PROTNSW, RTRV-LOG-USER, RTRV-MAP-RING, RTRV-NE-SECU	CONN-TACC, DISC-TACC
3	ALW-ALM, ALW-MSG, DLT-ASAP-PROF, ED-ASAP-PROF, ENT-ASAP-PROF, INH-ALM, INH-MSG, OPR-EXT-CONT, OPR-LPBK, RLS-EXT-CONT, RLS-LPBK, SET-ATTR-ALM, SET-ATTR-CONT, SET-ATTR-ENV, SET-OW, SET-SYNCN	CNVT-CRS-TPY, DLT-CRS, DLT-EQPT, DLT-RSVN, ED-CRS, ED-rr, ED-EQPT, ED-RSVN, ENT-CRS, ENT-EQPT, ENT-ROLL, ENT-RSVN	INIT-REG	ALW-NVM-MIRROR, DLT-ULSDCC-L4, ED-NE, ENT-FECOM, ENT-FECOM-LAN, ENT-ULS, ENT-ULS-DCC-L3, ENT-ULSDCC-L4, INH-NVM-MIRROR, RTRV-SECU-USER, SET-SID	CHG-ACCMD, CHG-TACC, ENT-TSTPT, RLS-TSTPT
4	DLT-PROTN-GRP, ED-PROTN-GRP, ED-STATE-EQPT, ENT-PROTN-GRP, OPR-PROTNSW, OPR-SNCNSW, RLS-PROT-NSW, RLS-SNCNSW, RMV-EQPT, RST-EQPT	ED-RDL	DLT-TCA-PROF, ED-TCA-PROF, ENT-TCA-PROF	APPLY, CPY-MEM, CPY-NVM, ED-DAT, ED-EQPT, ED-NE-SECU, ED-STATE-EQPT, INIT-EQPT, INIT-SYS, RMV-LINK, RST-LINK	
5				CANC-USER-SECU, DLT-USER-SECU, ED-USER-SECU, ENT-USER-SECU, RTRV-LOG-SECU	

Related tasks

T 511, Add an NE Login describes how to add an NE login to WaveStar SNMS.

T 512, Modify an NE Login describes how to modify an existing NE login in WaveStar SNMS.

T 513, Delete an NE Login describes how to delete an NE login from WaveStar SNMS.

Administration

7

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Background

Introduction

Certain functions in the WaveStar SNMS system should be performed by the WaveStar SNMS system administrator. These administrative activities include:

- Setting up the network model and WaveStar SNMS GUI Map window to reflect the physical network
- Automatic date/time synchronization of the WaveStar SNMS host with its managed network elements
- Scheduling certain administrative and maintenance activities for WaveStar SNMS

Objectives

This chapter provides background and introductory information about Administration functions in the WaveStar SNMS system. It includes available features and references to specific task-related instructions.

After learning the information in this chapter, the user should be able to do the following:

- Set up the network model and WaveStar SNMS GUI Map window to reflect the physical network.
- Perform automatic date/time synchronization of the WaveStar SNMS host with its managed network elements.
- Schedule certain administrative and maintenance activities for WaveStar SNMS.

Related tasks

For related tasks, see the series 600 tasks or look up individual tasks in the Task Index.

Related information

For related information, see Chapter 5, Security Management.

Network Element Administration

Introduction

The WaveStar SNMS system administrator inputs subnetwork and network element information so the GUI Map window reflects the physical network. With this information, the WaveStar SNMS application constructs a network model, which is its working view of the physical network.

Subnetworks

A subnetwork is a group of interconnecting and interrelated network elements. The most common connotation is a SONET subnetwork, in which the network elements have Data Communications Channel (DCC) connectivity. For Dense Wavelength Division Multiplexer (DWDM) NEs, this connectivity is established through the NE's Supervisory Channel.

The Network Model

Creating a network model allows the Element Management System (EMS) to communicate with the network and each of its components. When network elements are configured through the EMS configuration windows, the network model is assembled dynamically by the EMS Dynamic Network Operations (DNO) feature.

Network elements

A network element (NE) is the basic telecommunications entity managed by WaveStar SNMS. An NE is a grouping of physical equipment that provides communications services over a network. An NE is both a node in a larger network of NEs and a complex network system itself. The software in an NE must manage both the physical (equipment) components of the NE and the network system provided by the NE.

NEs can be added, modified, or deleted through the WaveStar SNMS GUI. When any NE changes to the network are made, DNO must be run to update the WaveStar SNMS database. For information about the DNO feature, refer to the Dynamic Network Operations section.

Types of NEs

NEs vary by size, equipage, function, communications protocol supported, signalling/transmission rates, interoperability, number and types of physical/electrical interfaces (ports), and cross-connection capabilities.

The NE/device types supported by this EMS include:

- Lucent Technologies WaveStar OLS 400G
- Lucent Technologies WaveStar Bandwidth Manager (BWM)

- Lucent Technologies WaveStar 2.5G
- Lucent Technologies WaveStar TDM 10G (STM-64)
- Lucent Technologies AllMetro
- Lucent Technologies FT-2000 Large Capacity Terminal (LCT)
- Lucent Technologies Network Communications Controller (NCC)

Data communications interfaces

The WaveStar SNMS communication interface is partitioned into two parts: one that connects with NEs (southbound) and one that connects with external OSs (northbound).

Northbound communications

he northbound communication provides external OS to NEs communications over an Intra-Office Local Area Network (IAO-LAN) environment. Northbound communications support X.25 and TCP/IP connectivity as well as asynchronous interfaces.

Southbound communications

The southbound interface supports Open System Inteconnect (OSI) over TCP/IP, X.25, and OSI-based connections to NEs.

WaveStar NEs support X.25, OSI , an OSI over TCP/IP-based network interface (via a transport bridge), or a direct TCP/IP interface with WaveStar SNMS.

WaveStar SNMS supports concurrent X.25 and OSI-based communications with NEs. Depending on the NE types, the communications can be either X.25 or over an OSI/LAN, but not at the same time, to the same subnetwork.

X.25-based communications

WaveStar SNMS supports both X.25 direct and X.25 network connections to FT-2000 LCT NEs. While direct X.25 connectivity is supported, WaveStar SNMS to NE communications are generally done through an NE in a subnetwork serving as the Gateway Network Element (GNE), over an X.25 Packet Switched Network (PSN). The customer chooses the type of link concentration equipment which forms the X.25 PSN necessary for communications with the GNEs. ITM SNC supports a TL1 over X.25 southbound interface that uses an assigned GNE to provide the protocol conversion from TL1 over an X.25 short stack to encapsulated TL1 over the 7-layer OSI stack using the SONET DCC.

Gateway network element

A Gateway Network Element (GNE) is an NE that acts as the “gateway” or intermediary node for establishing communications between ITM SNC and the other NEs in a subnetwork. The GNE has X.25-based communications with the WaveStar SNMS host. When a message is received from the WaveStar SNMS

host, the GNE sets up OSI associations with its associated NEs and forwards the addressed message to the intended NE. The GNE is also used by WaveStar SNMS to autodiscover all NEs in the OSI-based subnetwork with DCC connectivity.

User-Definable Virtual Circuits

When you add a GNE using WaveStar SNMS, or delete an NE and re-add it back into the WaveStar SNMS host database as a GNE, you can select up to three supported three X.25 virtual circuits (VCs) for communications between the host machine and the GNEs.

Each of the VC connections may be set up as a permanent virtual circuit (PVC) or switched virtual circuit (SVC). You can also specify the purpose of each VC. The recommended configuration is two VCs—one for autonomous messages and one for command/response messages.

When the choice is to use three VCs, a separate VC can be configured for:

- command/response messages
- autonomous maintenance messages and alarm messages
- autonomous database change messages and provisioning commands/ responses

Either or both the autonomous maintenance message and autonomous database change/provisioning functions may share the command/response VC.

Cost-effective SVCs (instead of PVCs) can be configured for non-critical command/response functions.

The GNE maps its OSI associations to each of the subtending NEs so that they use the same VCs for the same functions as are used for the GNE. For example, if one VC is used form command/response messages to the GNE and another VC is used for autonomous messages from the GNE, those same VCs are used for messages to and from the NEs.

X.25 Subnetwork Discovery

When a GNE is added to the database and DNO is performed on the GNE, WaveStar SNMS sends a TL1 RTRV-NEIGHBOR command (or its NE--based equivalent) to the GNE to discover any NEs that are connected to the GNE. If the GNE reports connections to any NEs that are not currently in the WaveStar SNMS database, WaveStar SNMS adds the NEs under *that* GNE and queries the newly discovered NEs recursively until all NEs with DCC connectivity are discovered to complete the network topology.

Any NEs that are not disovered through the DNO process or non-Lucent Technologies NEs must be manually added to the WaveStar SNMS database to complete the network model.

Non-managed devices

NEs that are not managed by WaveStar SNMS are treated as “non-managed devices” and are added during the autodiscovery process to complete the network model and to avoid repeated attempts by WaveStar SNMS to log into these NEs. If WaveStar SNMS automatically discovers a non-managed device by identifying a discovered NE with an NE type that is not on the managed NE list in its database, the system stops any further login attempts and displays it on the Map window with a default icon (or any shape selected by the user via the Preferences option) for non-managed devices without any further processing.

Dual GNEs

WaveStar SNMS can support a second, optional physical connection to a subnetwork for added reliability. For each subnetwork of NEs, a WaveStar SNMS administrator can add multiple GNEs and then identify a GNE association, consisting of a primary and secondary GNE pair of compatible GNEs, which operate in an active/standby arrangement. The secondary GNE takes over communications with the EMS host if there is a loss of communications with the primary GNE. WaveStar SNMS monitors the status of its X.25 links and virtual circuit connections to each GNE. WaveStar SNMS automatically transfers communications to the standby GNE whenever an X.25 link to the active GNE is down.

The WaveStar SNMS administrator can also manually switch the active and standby GNEs.

The backup GNE in an association cannot have any RNEs assigned to it. If there are RNEs assigned to the backup GNE, they must be reassigned to another GNE in the subnetwork before designating the GNE as a backup in a GNE assocation.

GNE association management

The WaveStar SNMS administrator can add or delete GNE associations as needed. The administrator can also manually swap the primary GNE and secondary GNE in the association.

Deletion of GNE associations

The WaveStar SNMS administrator can remove the association (relationship) between GNEs. To delete either GNE in a GNE association, the administrator must delete the association first. When a GNE association is deleted, the RNEs in the subnetwork remain connected to the currently active GNE.

Related tasks

T 612, Add a GNE Association describes how to add a GNE association.

T 613, Switch Primary/Secondary GNEs describes how to switch the active and standby status of the GNEs in an association.

T 614, Delete a GNE Association describes how to delete a GNE association.

Multiple active GNEs

WaveStar SNMS also supports multiple active GNEs (or multiple primary/secondary GNE associations) to avoid potential data traffic congestion in large X.25-based subnetworks with up to 256 NEs. Functions in the WaveStar SNMS GUI allow an administrator to manually add multiple GNEs to a subnetwork and then manually reassign the NEs in the subnetwork to GNEs for load balancing. A GUI function alllows an administrator to display the GNE/RNE relationships and move RNEs between GNEs of a subnetwork to redistribute the data traffic load.

Related Tasks

T 608, Add a Subnetwork Name/Alias describes how to create a subnetwork name and alias. Once a subnetwork has been created, you can assign one or more GNEs to it.

T 609, Modify a Subnetwork Alias describes how to change a subnetwork's alias.

T 610, Delete a Subnetwork Name/Alias describes how to delete a subnetwork name and alias.

T 611, Associate Remote Network Elements with Gateway Network Elements describes how to view GNE/RNE associations and how to reassign RNEs to a another GNE in the same subnetwork.

OSI-based communications

The WaveStar SNMS IAO-LAN interface provides an OSI standard, higher-speed communcations path to NEs. It enables the reduction of performance bottlenecks by providing faster communications between the EMS and NEs. The OSI/LAN interface provides up to three high bandwidth communication paths, or OSI associations, to NEs. This communication model is based on the standard 7 layer OSI stack reference model.

For increased system availability, WaveStar SNMS supports IAO-LAN redundancy. WaveStar SNMS is connected to a subnetwork of NEs via two separate IAO-LAN connections/hubs. Both connections are active. In the event that one IAO-LAN connection fails, WaveStar SNMS detects the failure and automatically switches to the other connection.

OSI-Connected NEs and subnetwork discovery

When any NE with a direct OSI/LAN connection to WaveStar SNMS is manually added to the WaveStar SNMS database, it can be used as the “seed NE” through which WaveStar SNMS can automatically discover NEs in the subnetwork to complete the network model. When the NE is added and DNO is executed, the EMS issues a command to the NE and discovers all Lucent Technologies NEs and other devices connected to the network. WaveStar SNMS obtains the NE type from the device; in some cases, the device may be a router or similar equipment not managed by WaveStar SNMS.

WaveStar BWM NEs are either autodiscovered through the SONET Directory Services (SDS) feature or manually added to the WaveStar SNMS database.

Any NEs that are not disovered through the DNO process or non-Lucent Technologies NEs must be manually added to the WaveStar SNMS database to complete the network model.

The EMS can send messages to NEs that are not part of the same network as the “seed NE” by virtue of the TARP method of broadcasting messages and routing tables that are contained in each NE.

Non-managed devices

NEs that are not managed by WaveStar SNMS are treated as “non-managed devices” and are added during the autodiscovery process to complete the network model and to avoid repeated attempts by the EMS to log into these NEs. If WaveStar SNMS automatically discovers a non-managed device by identifying a discovered NE with an NE type that is not on the managed NE list in its database, the system stops any further login attempts and displays it on the Map window with a default icon (or any shape selected by the user via the Preferences option) for non-managed devices without any further processing. If a Directory Services Agent (DSA) is defined for SONET Directory Services (SDS), any of the PF2000 NEs (such as DDM-2000 or FT-2000) not managed by WaveStar SNMS can be registered with the DSA with an NE type of “T5GW” in the local or remote Directory Information Base (DIB) if T5 Gateways exist in the network. WaveStar SNMS changes the NE type to “Non-managed device” if the NE is discovered. For more details about the SDS feature, refer to the SONET directory services section in this chapter.

TCP/IP-based communications

WaveStar SNMS supports OSI connections with NEs over a TCP/IP backbone network. In OSI over TCP/IP communications, a Network Communication Controller (NCC) device or OLS 400G NE is required to perform OSI protocol conversion, as a transport bridge, for messages/responses handled to/from the EMS and the NEs. The AllMetro NE supports a direct TCP/IP interface with WaveStar SNMS, so no transport bridge is needed. Further details about

WaveStar SNMS communications with AllMetro NEs are provided in the Direct TCP/IP communications section.

If a WaveStar NE has a direct OSI/LAN connection with the EMS and is not communicating over a TCP/IP network, a transport bridge is not needed.

Network communication controller

A Network Communication Controller (NCC) is an Intel Pentium-based single-board computer running Microsoft Windows NT. It has no video display, keyboard, or mouse. The system is equipped with an on-board hard disk drive as the primary Non-Volatile Memory (NVM), and a removable PCMCIA disk for use in loading software, backup, and restore. An NCC uses a single 10BaseT LAN connection for both OSI and TCP/IP.

In other cases, the NCC is a single board computer residing in a Multi-Function Server (MFS) shelf. The MFS shelf comprises a card cage supporting 8-12 single board computers (SBCs) in a vertical slot arrangement, with shared power supplies, shared fan unit(s), and one alarm unit. Only power, ground, and fault/ alarrm signals cross segments.

An NCC can be provisioned to serve two main functions:

- Directory Services Agent (DSA) for SONET Directory Services (SDS)
- Transport bridge for TCP/IP to OSI protocol conversion for OSI-connected WaveStar NEs communicating with WaveStar SNMS over a TCP/IP backbone network

An NCC can be designated as a DSA and/or transport bridge.

Security management

The NCC has basic local security features similar to an NE. It has user logins, passwords, privileges, a user activity log, and detection of security violations.

Function activation

Each NCC can handle a variety of functions that can be provisioned through the GUI or via the CIT by a system administrator. These functions include:

- T1.245 DSA
- T1.245 Registration Manager (RM)
- TCP/IP transport bridge
- MFS Alarm Monitor
- Notification of directory additions/deletions

Directory system agent

SONET Directory Services (SDS) provides for name/address resolution for WaveStar NEs communicating with WaveStar SNMS through an OSI or OSI over TCP/IP network. An NCC provisioned as the Directory Services Agent (DSA) or the EMS-based DSA provides the directory of NEs to WaveStar SNMS.

Before WaveStar SNMS can communicate with the NE, the NSAP address of the NE's system controller is provisoned through the Craft Interface Terminal (CIT), and the NE is registered in the T1.245 directory. The NCC serving as the DSA or the EMS-based DSA stores the T1.245 directory. If an NCC is serving as the DSA, it also performs the Registration Manager (RM) function. If the DSA is EMS-based, and an OLS 400G is present, the 400G can be provisioned to have RM functionality. WaveStar SNMS, acting as the Directory User Agent (DUA), obtains the address information from the DSA for sending and receiving commands/ responses, instead of requiring manual provisioning of this information.

Transport bridge

An NCC or OLS 400G defined as a transport bridge allows associated NEs and WaveStar SNMS to communicate over a TCP/IP backbone network by performing TCP/IP to OSI protocol conversion in both directions. The selected NE or NCC bridges connection layers of OSI running over TCP/IP between the upper and lower layers of the OSI protocol stack.

If WaveStar SNMS has a direct OSI/LAN connection or an OSI/LAN to a Wide Area Network (WAN) connection with a WaveStar NE, transport bridges are not needed.

When a transport bridge is added to the network, it is set up to communicate via OSI over TCP/IP.

In the environment where transport bridges are needed, at least one transport bridge should be manually added, or, if the NCC/OLS 400G is autodiscovered when the DNO process is run, should be defined as a transport bridge via the Modify NE window in the GUI before the NEs it supports are added to the WaveStar SNMS database.

Port configuration for transport bridges

WaveStar SNMS uses a calling port number when initiating communcations with the transport bridge and a listening port number as a responder from the transport bridge. These two port numbers are configurable during installation time (via the installation script) so the system can keep track of these port numbers in case the NE changes these numbers in the future.

Primary and secondary transport bridges

During the subnetwork discovery process, WaveStar SNMS automatically assigns NEs to a single primary transport bridge if the Routing Domain of each device's Network Service Access Point (NSAP) address is the same as that of the transport bridge. A secondary transport bridge can be manually assigned through the WaveStar SNMS GUI added to provide transport bridge redundancy. If communications are lost with the primary transport bridge, a secondary transport bridge can be designated to take over automatically.

NOTE:
In a large network of OLS 400G NEs, detection and automatic switchover to a secondary transport bridge may take a long time. If this is the case, tuning some of the "watchdog" (keep alive) function parameters may aid in detecting failure and performing automatic transport bridge switches earlier. The system's "watchdog" function periodically checks on the health of each NE managed by WaveStar SNMS by sending a keep-alive message at the application level. The following watchdog parameters can be modified by editing the UNIX file */snc/etc/CM_Server.cfg*:

WDTIME—The frequency used to send watchdog requests. By making this number smaller, communication failures can be detected earlier, but increases the system activity if there are many NEs. If this number is too large, the system takes a long time to discover network and NE problems.

WDRETRYTIMES—This sets a retry interval for re-establishing an association in the event of communication failures. The default number of attempts is 3. The default is 0 minutes for the first attempt, and 3 minutes between the second and subsequent (user-specified) number of retries. Setting this parameter to 0 (minutes) invokes the system to detect failures earlier, but if the system becomes slow at some point, the watchdog function could timeout and the system will disconnect from the NE.

WDTIMEOUT—This parameter controls how long to wait for a watchdog response.

WDLOOKBACK—This parameter controls the time interval for the system to send a keep alive message to the NE to check on its health if there has been no active communication with the NE in this user-specified period. The default for this parameter is 10 minutes. This parameter should always be less than the WDTIME parameter. If there has been communication with the NE during the interval specified, no watchdog request is sent, the system considers the connection with the NE healthy and waits for the next specified watchdog interval.

A primary and secondary transport bridge can be initially assigned to the NE through the Add an NE window in the WaveStar SNMS GUI. Reassignment of

transport bridges to NEs can be done through the Management Transport Bridges window in the WaveStar SNMS GUI. See T 601, Add a Network Element—OSI Communications and T 618, Manage Transport Bridges in the *User Tasks* section for instructions on how to select and reassign transport bridges.

NOTE:
A primary transport bridge must be reassigned manually to NEs to invoke an actual switch of the transport bridge. The switch of a primary transport bridge may cause the link from WaveStar SNMS and the target NE to go down and up, which can trigger automatic alarm re-synchronization.

Assigning transport bridges

When an NCC or OLS 400G is added to WaveStar SNMS, it can be designated as a transport bridge. If the NCC or 400G is added as a transport bridge, its IP address is required.

When a WaveStar NE is added, and it communicates with WaveStar SNMS over a TCP/IP backbone network, a primary (and, if desired, secondary) transport bridge needs to be assigned.

Managing transport bridges

Once all of the NEs and transport bridges have been added and/or defined and the network is brought up, the WaveStar SNMS system administrator can reassign NEs to transport bridges as needed to load balance the OSI over TCP/IP data traffic. WaveStar SNMS switches traffic for the target NE(s) to the newly assigned transport bridge(s) once the reassignment(s) is made.

The Manage Transport Bridges function is available as an Administration menu option in the WaveStar SNMS GUI.

Related tasks

T 601, Add a Network Element—OSI Communications describes how to add a WaveStar BWM and designate transport bridges. It also explains how to designate a transport bridge.

T 618, Manage Transport Bridges describes how to reassign NEs to transport bridges, as needed, and to change the automatic assignment or primary and secondary (backup) transport bridges, as needed.

Direct TCP/IP communications

In a ring of AllMetro NEs, each NE has an IP address and a direct TCP/IP connection to WaveStar SNMS. Therefore, every NE in the ring can be accessed in the same way through the network and each NE could serve as a gateway network element for routing messages on behalf of the other NEs in the ring to/from WaveStar SNMS. However, a single AllMetro NE in the ring can be

designated as the GNE for the subnetwork, via the Add/Modify an NE window in the GUI. An AllMetro GNE supports a TID/NSAP mapper to allow for routing of messages to other NEs, and WaveStar SNMS uses TIDs in messages to designate the destination NEs. NSAP addresses are used within the OSI-based Supervisory channels between NEs in an AllMetro ring.

When an AllMetro NE is manually added to the WaveStar SNMS database, you can specify whether the NE communicates through direct TCP/IP connection with the system or via a GNE.

All of the GNE provisioning that applies to X.25-connected NEs is also available for AllMetro GNEs, such as primary/backup GNE associations and multiple GNE designations in the same subnetwork for load balancing assignment of NEs (see the X.25-based communications section). A major difference is that WaveStar SNMS does not automatically identify a discovered AllMetro GNE because each NE in an AllMetro ring of NEs can have an IP address and perform as a GNE. The AllMetro GNE(s) must be manually added as such to the WaveStar SNMS database or modified to be designated as a GNE.

T 602, Add a Network Element—TCP/IP Communications describes how to add a GNE for NEs with a direct TCP/IP interface with WaveStar SNMS.

T 608, Add a Subnetwork Name/Alias describes how to create a subnetwork name and alias. Once a subnetwork has been created, you can assign one or more GNEs to it.

T 609, Modify a Subnetwork Alias describes how to change a subnetwork's alias.

T 610, Delete a Subnetwork Name/Alias describes how to delete a subnetwork name and alias.

T 611, Associate Remote Network Elements with Gateway Network Elements describes how to view GNE/RNE associations and how to reassign RNEs to a another GNE in the same subnetwork.

NE application services

All NEs, with the exception of the WaveStar OLS 400G, are managed by WaveStar SNMS through the issue and receipt of alarm, provisioning, and autonomous event messages in the form of TL1 commands.

The WaveStar OLS 400G sends and receives requests from the WaveStar SNMS application using Common Management Information Service Element (CMISE) application service requests in Common Management Information Protocol (CMIP) message format.

TL1 messages

For TL1-based communications, southbound TL1 command/responses from the EMS to the NEs are handled by the TL1 Manager.

CMISE/CMIP messages

For NEs that use CMISE services, such as the WaveStar OLS 400G, messages that are exchanged between the NE and WaveStar SNMS must be “mapped” to their Management Functional Area (MFA) service/request through the QA Adaptor process.

The Connection Manager process

The Connection Manager (CM) process centralizes the functions of sending, receiving, and routing messages, and managing the connections needed for responses and autonomous messages going in, and coming from, the CMISE and TL1 Southbound subsystems.

The Gateway process

The Gateway process receives requests from the Connect Manager and forwards them to the QA Adaptor process.

The Q-Adaptor process

For CMISE messages, the Q-Adaptor process identifies the object class or attribute contained in the CMISE message and translates it into the TID or AID of the NE or Alarm Issuing Point (AIP) and forwards the command to the NE. Responses from the NE to the EMS are also handled.

SONET directory services

WaveStar SNMS supports the SONET Directory Services (SDS) feature. This feature allows WaveStar SNMS to obtain directory/addressing information about a new NE through an intermediate device or “agent” with a centralized directory of NE data as soon as the NE is discovered, rather than having to contact the NE directly.

Components of the SDS feature

There are various processor roles performed by an NE, the EMS (WaveStar SNMS), or an NCC in the exchange of directory information during the SDS process. The various processor roles are:

- **Directory Services Agent (DSA)**—The DSA accesses the T1.245 Directory (the centralized directory of NE addressing information) on behalf of a “user”. In this case, the “user” is an NE registering with the T1.245 Directory or the EMS querying the T1.245 Directory.

- **Directory User Agent (DUA)**—The DUA represents the “user” during interactions with a DSA. In this case, the “user” is an NE registering with the T1.245 Directory or the EMS querying the T1.245 Directory.
- **Directory Information Base (DIB)**—A DIB is the set of information managed by the T1.245 Directory. Information is stored in the DIB as a tree structured database.
- **Registration Agent (RA)**—The RA is an application process that determines, from the Registration Manager (RM) process, the address of the appropriate DSA for registering with a T1.245 Directory, plus its T1.245 Directory DIB Prefix. The DIB Prefix is a sort of “area code” for locating and identifying the addresses of NEs in the T1.245 Directory. Via its associated DUA, the RA initiates registration with the appropriate DSA for entry into the T1.245 Directory.
- **Registration Manager (RM)**—The RM communicates with RAs in its OSI Level 1 area to provide the RA with the address of the appropriate DSA with which to register, plus its T1.245 DIB Prefix.

The DUA uses Directory Access Protocol (DAP) to contact the designated DSA to obtain directory information.

Designated DSA

An NCC or the WaveStar SNMS application itself can serve as the DSA. The DSA accesses the T1.245 Directory (DIB) for NE directory information.

Whether the T1.245 Directory with the DIB Prefix information resides in an NCC or WaveStar SNMS itself depends on which is going to be provisioned to serve as a DSA. The SDS process varies, depending on whether an NCC or the EMS itself is serving as the DSA. The processing details for each are provided in the SDS with an NCC as DSA and SDS with WaveStar SNMS as DSA sections that follow.

The WaveStar SNMS administrator has two choices for designating a DSA:

- An NCC with DSA functionality enabled
- An EMS-based DSA in the same WaveStar SNMS application

Overwriting NE directory information by SDS

If the NE directory information returned by the designated DSA (in response to an SDS query by WaveStar SNMS) includes an NE that has already been manually added to the WaveStar SNMS T1.245 DIB, WaveStar SNMS overwrites the Local DIB information for that NE with the directory information obtained by the DSA process.

The RA function

WaveStar SNMS currently does not support the RA function, which means that the DSA must be selected manually through the WaveStar SNMS GUI. T 629, Provision DSA describes how to select an NCC or WaveStar SNMS client server with the DSA function enabled to serve as the designated DSA.

SDS with an NCC as DSA

This section describes how SDS works with an NCC serving as the DSA for obtaining NE directory information. The process described assumes an OSI-based network of NEs. However, the process would be similar in a TCP/IP-based network.

The process is as follows:

1. At least one NCC is installed and brought into service with DSA functionality enabled, using TL1 commands issued to the NCC through a Communications Interface Terminal (CIT). The T1.245 DIB is set up with its T1.245 DIB Prefix information and the DSA address information in the RM process, which resides in the NCC.
2. WaveStar SNMS is installed and brought into service with DSA disabled through an option in the installation program (for more details about intallation procedures, refer to the *WaveStar SNMS Operations, Administration and Maintenance Guide*). It is provisioned with the T1.245 DIB Prefix information which is used to query the designated DSA.
3. A user adds the NCC/DSA into WaveStar SNMS using the Add an NE window in the GUI.
4. A user selects the NCC/DSA using the Provision DSA window in the WaveStar SNMS GUI to be used by WaveStar SNMS to obtain directory information from the T1.245 Directory.

NOTE:
The NCC/DSA must be manually selected through the GUI because WaveStar SNMS does not currently provide RA functionality.

5. As NEs are brought into service, the RM process in the NCC recognizes that a new NE has been added to the OSI Level 1 area.
6. The NCC, serving as the RM, communicates with the RA in the new NE and provides the NE's RA process with the appropriate DSA address.
7. The RA in the new NE uses its DUA process to communicate, using DAP, to communicate with the DSA/NCC and send the directory data to the NCC/DSA.

8. The DSA process in the NCC registers the NE in the NCC's T1.245 Directory (DIB). The NCC issues a REPT-DBCHG message to WaveStar SNMS, indicating that there has been a change to the DIB.
9. The DUA in WaveStar SNMS contacts the DSA/NCC using DAP and retrieves the directory information to store in its Local DIB.

The NCC/DSA periodically checks whether any new NEs have been discovered (registered) in the T1.245 DIB. If it discovers a new NE, the NCC/DSA notifies WaveStar SNMS that there has been an update to the T1.245 Directory. WaveStar SNMS, serving as a DUA, queries the NCC/DSA for the updated information. The NCC/DSA retrieves the updated information and sends it to WaveStar SNMS to store in its Local DIB. The EMS Local DIB contains the NEs from the NCC's T1.245 DIB which are associated with the EMS's DIB Prefix, as well as any NEs that have been manually added through the GUI.

NCC-based DSA alarms

Alarms generated by the NCC/DSA are the same as alarms generated by any other NE and are shown in the alarm summary for the NCC.

SDS with WaveStar SNMS as DSA

This section describes how SDS works when the designated DSA is the application residing in the WaveStar SNMS application itself and the T.1245 DIB containing directory information for registered NEs resides on the WaveStar SNMS host. The process described assumes an OSI-based network of NEs.

The process is as follows:

1. WaveStar SNMS is installed and brought into service. During installation, the WaveStar SNMS DSA is activated. The T1.245 Directory (DIB) residing with the WaveStar SNMS application is provisioned with the DIB Prefix information used to query the EMS-based DSA process for directory information. T 630, Add a DIB Prefix describes how to add a DIB Prefix to the EMS-based T1.245 Directory (DIB).
2. The EMS-based DSA will be the default in the Provision DSA window in the WaveStar SNMS GUI to be used to obtain directory information about trhe NEs from the T1.245 Directory.
3. The administrator must provision one NE in an OSI Level 1 area serving as the RM with the EMS-based DSA address and the T1.245 DIB Prefix of the NE. WaveStar SNMS does not support RM functionality.
4. As NEs are brought into service, the RM process in an NE recognizes that a new NE has been added to the OSI Level 1 area.
5. The RM process in the designated Level 1 NE communicates with the RA application in the newly added NE(s) and provides the NE's RA process with the appropriate DSA address(es) (DIB Prefix) and the T1.245 DIB Prefix of the DSA for registration.

6. The RA in the new NE uses the DUA functionality co-resident in the NE to communicate with the DSA application in WaveStar SNMS to register the NE in the EMS-based T1.245 Directory (DIB).
7. The DUA in WaveStar SNMS contacts the DSA process in the EMS using DAP and sends the directory information to store in the WaveStar SNMS Local DIB.

The DSA process in the WaveStar SNMS application periodically checks whether any new NEs have been discovered (registered) in the T1.245 DIB. If it discovers a new NE, the DSA process detects the the DIB change and notifies the other apppropriate subsystems in the application that there has been a change in the T1.245 DIB. WaveStar SNMS then queries the DSA process for the newly discovered NE(s) in the DIB using the T1.245 DIB Prefix in its directory. The information is sent to the DUA process of the EMS to update the EMS Local DIB. The Local DIB contains NE information discovered through the SDS process as well as any NEs that have been manually added through the WaveStar SNMS GUI.

Related tasks

T 630, Add a DIB Prefix describes how to add a DIB Prefix to the EMS-based DIB.

T 631, Modify a DIB Prefix describes how to modify DIB Prefix information in the EMS-based DIB.

T 632, Delete a DIB Prefix describes how to delete a DIB Prefix from the EMS-based DIB.

Manually adding NEs into the T1.245 directory

NEs can be manually added to the WaveStar SNMS T1.245 DIB. NE information can also be modified or deleted from the EMS-based DIB.

Related tasks

T 633, Add an NE to DIB describes how to manually add an NE and associated directory information (address, DIB Prefix) to the EMS-based T1.245 DIB.

T 634, Modify an NE in DIB describes how to modify NE information in the EMS-based T1.245 DIB.

T 635, Delete an NE from the DIB describes how to delete an NE from the DSA-based DSA T1.245 DIB.

EMS-based DSA and the Add an NE window

If the EMS-based DSA process is enabled, the Add an NE window in the GUI is disabled. In this case, NEs and associated directory information must be manually

added into the WaveStar SNMS T1.245 DIB. FT-2000 LCT and AllMetro NEs are not added to the T1.245 DIB through this process, but can be manually added through the GUI using the Add an NE window.

Subnetwork discovery and SDS

This section provides a high-level overview of the WaveStar SNMS Subnetwork Discovery and SDS capabilities. This section also provides a series of examples of how WaveStar SNMS can discover NEs that communicate withWaveStar SNMS via a variety of interfaces.

There are three methods that WaveStar SNMS can use to discover the subnetwork of NEs it manages:

- Discovery via SDS
- Discovery via Subnetwork Dynamic Network Operations (DNO)
- Manual addition of NEs

Under the SDS scenario, NEs automatically register with the SDS Directory Services Agent (DSA), are registered via another NE using T5GW functionality, or are manually added to the DSA. The DSA functionality can be located in a WaveStar Network Communications Controller (NCC) NE or in WaveStar SNMS itself.

The following table describes the DSA registration capabilities of each NE type supported by WaveStar SNMS. Note that these NE capabilities to register with a DSA apply to both an NCC-based and WaveStar SNMS-based DSA. Using its Directory User Agent (DUA) functionality, WaveStar SNMS queries the DSA to discover the NEs. WaveStar SNMS then logs into each discovered NE, inventories the NE via DNO, and discovers the network topology via Subnetwork DNO.

NE Type	Automatically Registers with DSA?	Manual Registration
BWM R. 1.1/1.2	No	Yes
BWM R. 1.3/2.0	Yes	Yes
NCC R. 1.0/3.0	Yes	Yes
OLS 400G R. 2.0/ 3.0	Yes	Yes
2.5G R. 2.0	Yes*	Yes

NE Type	Automatically Registers with DSA?	Manual Registration
10G (STM-64) R. 1.0	No	Yes
AllMetro OLS	No	No
FT-2000 LCT R. 4.0	No	No

* Requires Registration Manager (RM) from another NE

Under the Subnetwork DNO scenario, the user manually adds one NE per subnetwork to WaveStar SNMS and WaveStar SNMS then automatically discovers the other NEs via its Subnetwork DNO capability. After the first NE is manually added to WaveStar SNMS, the system logs into that NE, inventories the NE via DNO, and discovers its neighbors via Subnetwork DNO. WaveStar SNMS then logs into the neighbors of the first NE, logs into those NEs, and repeats the process until all NEs within the subnetwork are discovered. This method does not work currently with BWM NEs because they do not return the System Controller NSAP to WaveStar SNMS. Thus, WaveStar SNMS must use TARP to obtain the proper NSAP address. Since TARP does not work with a TCP/IP network, WaveStar SNMS is unable to log into BWM NEs discovered via Subnetwork DNO.

Under the Manual Addition scenario, the user manually adds NEs to WaveStar SNMS via the Add an NE window in the GUI. As NEs are added, the user either can manually trails between the NEs or can invoke Subnetwork DNO to automatically discover trails.

It is possible to use a combination of each of the above three scenarios to fully discover all of the NEs managed by WaveStar SNMS.

Southbound Communications

Southbound communications refers to the interface between WaveStar SNMS and the NEs it manages. The type of Southbound communications interface used can affect the WaveStar SNMS Subnetwork Discovery procedures.

WaveStar SNMS supports four types of Southbound interfaces

- Pure (7-layer) Open System Interconnection (OSI)
- OSI over Transmission Control Protocol/Internet Protocol (TCP/IP)
- Pure TCP/IP
- X.25

The following table indicates, by NE type, the interfaces supported to an operations system (OS).

NE Type	Pure OSI	OSI over TCP/IP	Pure TCP/IP	X.25
BWM R1.1 to 2.0	Yes	Yes*	No	No
NCC R.1.0/3.0	Yes	Yes	No	No
OLS 400G R.2.0 to 3.0	Yes	Yes*	No	No
2.5G R. 2.0	Yes	Yes*	No	No
10G (STM-64) R. 1.0	No	Yes*	No	No
AllMetro OLS	No	No	Yes	No
2.5G_10G	Yes (NE R. 3.0)		Yes (NE R. 3.0)	No
FT-2000 LCT R. 4.0	No	No	No	Yes

* Requires an external transport bridge (such as an NCC with Transport Bridge capability enabled)

Subnetwork Discovery Examples

The following subsections describe the steps needed for WaveStar SNMS to discover a subnetwork of NEs under various scenarios related to the type of Subnetwork Discovery coupled with the Southbound interface type.

SDS Discovery Using WaveStar SNMS-based DSA via OSI Southbound Interface

For the purposes of this example, it is assumed that each NE in the subnetwork can automatically register with the DSA.

1. Using the NE Craft Interface Terminal (CIT), NEs are configured with the minimum system configuration, including the NSAP address.
2. WaveStar SNMS-based DSA is activated during installatIon and the Directory Information Base (DIB) Prefix is provisioned. The WaveStar SNMS-based DSA is provisioned as the designated DSA for this WaveStar SNMS application using the Provision DSA window in the GUI.
3. The OSI Data Communications Network (DCN) is provisioned and WaveStar SNMS is connected to one or more NEs in each NE subnetwork.
4. One Registration Manager (RM) in an NE is activated per OSI Level 1 area. The RM is provisioned with the DSA address of WaveStar SNMS (the WaveStar SNMS NSAP address) and the same DIB Prefix as provisioned in WaveStar SNMS.

5. The RM communicates with the Registration Agent (RA) functionality in each of the NEs in its OSI Level 1 area, and provides them with the DSA address (the WaveStar SNMS NSAP) and the DIB Prefix. Each NE registers with the WaveStar SNMS-based DSA under the DIB Prefix provided by the RM. Each NE registers with information including its TID and NSAP address.
6. The WaveStar SNMS DUA queries the WaveStar SNMS-based DSA for all NEs under the DIB Prefix provisioned within WaveStar SNMS. The WaveStar SNMS-based DSA responds with information on each NE that has registered the appropriate DIB Prefix.
7. WaveStar SNMS establishes an association with each discovered NE and logs into each NE. Upon successful login, WaveStar SNMS inventories the NE using DNO and discovers the neighbors of the NE via Subnetwork DNO. The NE neighbor information is used to automatically discover trails between the NEs because the DSA information does not include any network topology information.

SDS Discovery Using NCC-Based DSA via OSI Southbound Interface

For the purposes of this example, it is assumed that each NE in the subnetwork can automatically register with the DSA.

NOTE:
The TDM 10G (STM-64) currently cannot automatically register with the DSA. You must manually add these NEs to the T1.245 directory; the WaveStar SNMS database is periodically resynched with the NE information in the T1.245 directory. OLS 400G NEs can be autodiscoverd through an NCC-based DSA if the NCC is also serving as a transport bridge in an OSI over TCP/IP backbone network or if they communicate via straight OSI with no OLS 400G NE serving as a transport bridge.

1. Using the NE CIT, NEs are configured with the minimum system configuration, including the NSAP address.
2. The DSA function is enabled in one NCC NE in the subnetwork. A DIB Prefix is provisioned in the NCC-based DSA, where this DIB Prefix is the same as the one used by the WaveStar SNMS DUA (see step 4).
3. The OSI DCN is provisioned and WaveStar SNMS is connected to one or more NEs in each NE subnetwork.
4. The NCC with DSA enabled is manually added to WaveStar SNMS using the Add an NE window in the GUI. This NCC is also designated as DSA for this WaveStar SNMS application by the user via the Provision DSA window in the GUI. WaveStar SNMS is provisioned with the same DIB Prefix as used in the NCC DSA.

5. One RM in an NE is activated per OSI Level 1 area. The RM is provisoned with the DSA address of the NCC with DSA enabled (the NCC NSAP address) and the same DIB Prefix as provisioned in the NCC DSA.
6. The RM communicates with the RA functionality in each of the NEs in the its OSI Level 1 area, and provides them with the DSA address (the NcC NSAP) and DIB Prefix. Each NE registers with the NCC-based DSA under the DIB Prefix provided by the RM. Each NE registers with information, including its TID and NSAP address.
7. The NCC sends WaveStar SNMS a *REPT-DBCHG* TL1 message indicating that there has been a change to the NCC-based DSA (specifically, one or more new NEs have registed with the NCC-based DSA).
8. The WaveStar SNMS DUA queries the NCC-based DSA for all NEs under the DIB Prefix provisioned within WaveStar SNMS. The NCC-based DSA responds with information on each NE that has registered under the appropriate DIB Prefix.
9. WaveStar SNMS establishes an association with each discovered NE and logs into each NE. Upon successful login, WaveStar SNMS inventories the NE using the DNO and discovers the neighbors of the NE via Subnetwork DNO. The NE neighbor information is used to automatically discover trails between the NEs because the DSA information does not include any network topology information.

SDS Discovery Using WaveStar SNMS-Based DSA Via OSI Over TCP/IP Southbound Interface

The RM in BWM R. 1.1 through R. 1.3 NEs cannot be provisioned with both the NSAP address of the transport bridge and the IP address of WaveStar SNMS. If a BWM NE is set up as an RM, BWM NEs registration will only work with WaveStar SNMS-based DSA if they communicate through straight OSI (with no transport bridge).

NOTE:
The TDM 10G (STM-64) currently cannot be automatically register with the DSA. You must manually add these NEs to the T1.245 directory; the WaveStar SNMS database is periodically resynched with the NE information in the T1.245 directory.

1. Using the NE CIT, NEs are configured with the minimum system configuration, including the NSAP address.
2. The transport bridge function is enabled in one or more OLS 400G or NCC NEs in the subnetwork.

3. WaveStar SNMS-based DSA is activated during installation and the DIB Prefix is provisioned. The WaveStar SNMS-based DSA is provisioned as the designated DSA for thisWaveStar SNMS application via the Provision DSA window in the GUI.
4. The TCP/IP DCN is provisioned and WaveStar SNMS is connected to one or more transport bridge NEs in each NE subnetwork.
5. At least one of the transport bridge NEs is manually added to WaveStar SNMS using the Add an NE window in the GUI.
6. One RM in an NE is activated per OSI Level 1 area. The RM provisioned with the DSA address of WaveStar SNMS (the WaveStar SNMS IP address and a transport bridge NE NSAP address) and the same DIB Prefix as provisioned in WaveStar SNMS.
7. The RM communicates with the RA functionality in each of the NEs in its OSI Level 1 area and provides them with the WaveStar SNMS-based DSA address and the DIB Prefix. Each NE registers, via a transport bridge, with the WaveStar SNMS-based DSA under the DIB Prefix provided by the RM. Each NE registers with information including its TID and NSAP address.
8. The WaveStar SNMS DUA queries the WaveStar SNMS-based DSA under the DIB Prefix provided by the RM. Each NE registers with information including its TID and NSAP address.
9. WaveStar SNMS establishes an association with each discovered transport bridge NE and adds that NE to a list of transport bridge NEs.
10. For non-transport bridge NEs, WaveStar SNMS automatically assigns a primary transport bridge to each NE using the rule that the NE should be in the same Routing Domain as its transport bridge. WaveStar SNMS establishes an association with each discovered NE, via its primary tranport bridge, and logs into each NE. Upon successful login, WaveStar SNMS inventories the NE using DNO and discovers the neighbors of the NE via Subnetwork DNO. The NE neighbor information is used to automatically discover trails between the NEs because the DSA information does not include any network topology information.
11. The user can manually change primary transport bridge assignments in WaveStar SNMS via the GUi for load-balancing purposes. For reliability purposes, the user can also manually add a secondary transport bridge to some or all of the NEs. It is noted that WaveStar SNMS does not automatically assign secondary transport bridges to any NEs.

Subnetwork DNO Discovery Via OSI Over TCP/IP Southbound Interface (No DSA)

This scenario cannot be used to automatically discover BWM NEs because the NSAP address reported for BWM NE neighbors is the NSAP address of the BWM input/output (I/O) shelf, not of the BWM System Controller; thus, WaveStar SNMS is not able to log into BWM NEs discovered as a neighbor of the NE. Because

WaveStar SNMS cannot log into the BWM NEs discovered in this manner, these BWM NEs have a non-communicating NE status (shown on the WaveStar SNMS GUI network map as an NE icon color of magenta) and the Subnetwork DNO process is halted.

1. Using the NE CIT, NEs are configured with the minimum system configuration, including the NSAP address.
2. The transport bridge function is enabled in one or more OLS 400G or NCC NEs in the subnetwork.
3. The TCP/IP DCN is provisioned and WaveStar SNMS is connected to one or more transport bridge NEs in each NE subnetwork.
4. One NE in each subnetwork is manually added to WaveStar SNMS via the Add an NE window in the GUI. This includes manual assignment of a primary transport bridge to the NE.
5. WaveStar SNMS establishes an association via the primary transport bridge with that NE and logs into the NE. Upon successful login, WaveStar SNMS inventories the NE using DNO and discovers the neighbors of the NE via Subnetwork DNO.
6. WaveStar SNMS assigns a primary transport bridge NE to each NE neighbor of the first NE using the rule that the NE should be in the same Routing Domain as its transport bridge, establishes an association via the primary transport bridge with each NE, and logs into each NE. Upon successful login, WaveStar SNMS inventories the NEs and invokes Subnetwork DNO again to find new NE neighbors.
7. If an NE neighbor of the first NE is a transport bridge, WaveStar SNMS adds that NE to the list of transport bridge NEs.
8. The process continues until no new NE neighbors are discovered via the Subnetwork DNO process.
9. The user can manually change primary transport bridge assignments in WaveStar SNMS via the GUI for load-balancing purposes. For reliability purposes, the user can also manually add a secondary transport bridge to some or all of the NEs. Note that WaveStar SNMS does not automatically assign secondary transport bridges to any NEs.

Subnetwork DNO Discovery Via Pure TCP/IP Southbound Interface (No DSA)

This scenario currently applies only to AllMetro NEs.

1. Using the NE CIT, NEs are configured with the minimum system configuration, including the NSAP address.
2. The pure TCP/IP DCN is provisioned and WaveStar SNMS is connected to one or more NEs in each NE subnetwork.
3. One NE in each subnetwork is manually added to WaveStar SNMS using the Add an NE window in the GUI, including the NE's IP address. This NE is defined as a Gateway Network Element (GNE).
4. WaveStar SNMS establishes an association with the GNE and logs into the GNE. Upon successful login, WaveStar SNMS inventories the GNE using DNO and discovers the neighbors of the GNE via Subnetwork DNO.
5. WaveStar SNMS associates these NE neighbors (called Remote Network Elements [RNEs]) with the GNE, establishes an association via the GNE with each neighbor of the GNE and logs into each RNE. Upon successful login, WaveStar SNMS inventories the RNEs and invokes Subnetwork DNO again to find new NE neighbors.
6. The process continues until no new NE neighbors are discovered via the Subnetwork DNO process.

To simplify the above scenario, a single GNE is assumed per subnetwork. For reliability purposes, multiple GNEs can be assigned to each subnetwork where some RNEs communicate with WaveStar SNMS via one GNE and other RNEs communicate with WaveStar SNMS via another GNE. If one GNE loses communications with WaveStar SNMS, the RNEs using that failed GNE can communicate using the other GNE.

Subnetwork DNO Discovery Via X.25 Southbound Interface (No DSA)

This scenario currenly only applies to FT-2000 LCT NEs.

1. Using the NE CIT, NEs are configured with the minimum system configuration, including the NSAP address.
2. The X.25 DCN is provisioned and WaveStar SNMS is connected to one or more NEs in each NE subnetwork. This WaveStar SNMS-to-NE connection can be via X.25 Permanent Virtual Circuits (PVCs) or X.25 Switched Virtual Connections (SVCs).
3. One NE in each subnetwork is manually added to WaveStar SNMS via the Add an NE window in the GUI, including assignment of one or more PVCs or SVCs to the NE. This NE serves as the GNE.

4. WaveStar SNMS uses an SVC or PVC to communicate with the GNE and logs into the GNE. Upon successful login, WaveStar SNMS inventories the GNE using DNO and discovers the neighbors of the GNE via Subnetwork DNO.
5. WaveStar SNMS associates these NE neighbors (called Remote Network Elements [RNEs]) with the GNE, establishes an association via the GNE with each neighbor of the GNE and logs into each RNE. Upon successful login, WaveStar SNMS inventories the RNEs and invokes Subnetwork DNO again to find new NE neighbors.
6. The process continues until no new NE neighbors are discovered via the Subnetwork DNO process.

NSAP address entry

The following table lists the NSAP address fields, indicates field defaults, character widths, and which fields are editable in the GUI.

Field Name	Notes	NE(s)	Default	Octet Size	Editable?
AFI	Area Format Identifier.	All	0x39	1	Yes
IDI + pad	Initial Domain Part.	All	0x840 0xF	2	Yes
DFI	Domain Format Identifier. Specifies format for rest of address.	All	0x80	1	Yes
Operator ID		All	0x000000	3	Yes
Reserved	Currently not used. Reserved for future use.	All	0x0000	2	No
Routing Domain	NSAP unique Routing Domain within an administrative domain.	NCC,BWM, OLS 400G	0x0000	2	Yes

Field Name	Notes	NE(s)	Default	Octet Size	Editable?
Area	NSAP Area Identifier. Identifies NEs in the same area.	All	0x0000	2	Yes
System ID	System Identifier. This field is used to guarantee that NSAP address is globally unique.	All	no default	1	Yes
SEL	NSAP Selector. Used to differentiate multiple NSAP addresses associated with same End System.	All	0x1D*	1	No

*The value of the SEL field is 1D hex when TP4 is run over CLNP.

The System ID field is not defaulted, but is mandatory.

NOTE:
All of the NSAP address fields, except for the Reserved and SEL fields, are editable on the Add a Network Element to the DIB window in the GUI.

Non-managed devices

NEs that are not managed by the EMS are treated as “non-managed devices” and are added as such in the WaveStar SNMS database after the autodiscovery process to complete the network model and to avoid repeated attempts by the EMS to log into these NEs.

PF-3000/PF-2000 interworking

WaveStar SNMS supports and recognizes mixed networks consisting of both WaveStar NEs (also referred to as the “PF-3000” class of NEs) and the “PF-2000” class of NEs, which include the DDM-2000 OC-3, DDM-2000 OC-12, FT-2000 and FiberReach. WaveStar SNMS does not manage the PF-2000 class of NEs, but recognizes them to provide a more comprehensive view of a customer’s network.

The type of mixed network currently supported by WaveStar SNMS is based on a subnetwork of WaveStar NEs and another subnetwork of PF-2000/FLM NEs.

WaveStar SNMS is able to support OSI or OSI over a TCP/IP backbone for the WaveStar NEs while supporting OSI for the PF2000 NEs.

A group of PF2000 NEs can be discovered through a “sponsor” WaveStar NE when it is manually added to the WaveStar SNMS database or when the PF2000 NEs are registered in the DSA through the SDS feature.

When WaveStar SNMS discovers a “sponsor” WaveStar NE, it issues the TL1 command RTRV-MAP-NEIGHBOR to obtain information about NEs and trails in the associated group of PF-2000 NEs. The WaveStar NE’s response to the RTRV-MAP-NEIGHBOR command contains only neighbor PF-2000 NE NSAPs (for OSI-connected NEs). The PF-2000 NEs’ response to the RTRV-MAP-NEIGHBOR command may contain the TIDs and NSAPs of the neighbor NEs. There is no neighbor port ID information passed by the PF-2000 NEs for constructing trails between the WaveStar NE and PF-2000 NEs.

If the PF-2000 NEs are registered in the DSA as a “T5GW” NE type (provided T5 Gateways exist in the network), WaveStar SNMS discovers the NEs from the DSA, recognize them as the “T5GW” NE type, and change the NE type to “Non-managed device”.

PF-2000 NEs discovered through a WaveStar NE or through the DSA are treated as non-managed devices and placed on the Map to complete the network topology. The WaveStar SNMS user can manually add trails between WaveStar NEs and non-managed PF-2000 NEs on the Map window, but WaveStar SNMS does not attempt to log into these NEs and no alarm/event information is collected.

Adding NEs

The following table shows the information that must be identified before adding an NE to the EMS, by communication type.

Table 7-1. Required Information for Adding an NE

OSI-Connected NE	OSI over TCP/IP	X.25 (via GNE)	X.25 GNE	TCP/IP (via GNE)	TCP/IP GNE
TID	TID	TID	TID	TID	TID
Alias (optional)	Alias (optional)	Alias (optional)	Alias (optional)	Alias (optional)	Alias (optional)
NE Type	NE Type	NE Type	NE Type	NE Type	NE Type
Valid NE login/ password	Valid NE login/ password	Valid NE login/ password	Valid NE login/ password	Valid NE login/ password	Valid NE login/ password

OSI-Connected NE	OSI over TCP/IP	X.25 (via GNE)	X.25 GNE	TCP/IP (via GNE)	TCP/IP GNE
Valid backup NE login/ password	Valid backup NE login/password	Valid backup NE login/ password	Valid backup NE login/password	Valid backup login/ password	Valid backup login/ password
Number and Type of OSI Associations	Number and Type of OSI Associations	GNE TID	X.25 interface	GNE TID	IP address
NSAP Address	NSAP Address		Subnetwork		Subnetwork
	Primary and secondary transport bridges		Remote NE Login/Password • same as GNE • default for RNEs • default for GNE type		Remote NE Login/ Password • same as GNE • default for RNEs • default for GNE type
	IP address for transport bridge				

Selecting communications for an NE type

The following table shows which communication types are available for each NE type. The communication type is selected in the Communicate Via field on the Add/Modify an NE window in WaveStar SNMS.

NE Type	Available Communication Type (Communicate Via Field on Add/Modify an NE window)
FT-2000 LCT	PSN, GNE
OLS 400G	OSI, OSI over TCP/IP*
BWM	OSI, OSI over TCP/IP*
2.5G	OSI, OSI over TCP/IP*
TDM 10G (STM-64)	OSI, OSI over TCP/IP*
AllMetro	GNE, TCP/IP

* A transport bridge is needed for protcol conversion between TCP/IP and OSI using the RFC 1006 method. An NSAP address is needed for the OSI portion of the connection.

Running DNO and manually adding NEs

DNO must be run to update the WaveStar SNMS database with complete information about a newly added NE. When manually adding an NE, WaveStar SNMS prompts if you want to perform DNO on the newly added NE to update the database. You can run DNO immediately, initiate DNO manually, or schedule DNO to be performed at a later time, to update the database for the added NE.

Related tasks

T 600, Add a Network Element—X.25 Communications and T 601, Add a Network Element—OSI Communications describe how to add an NE that communicates with the EMS through an X.25 interface or over an OSI/LAN, respectively.

T 602, Add a Network Element—TCP/IP Communications and T 603, Add a Gateway Network Element—X.25 Communications describe how to add an AllMetro (TCP/IP) GNE and an FT-2000 LCT (X.25) GNE, respectively.

T 327, Manually Initiate DNO describes how to manually initiate DNO.

T 621, Schedule NE Date/Time Synchronization describes how to schedule DNO for an item.

Modifying NEs

Some of an existing NE's parameters can be modified in the WaveStar SNMS database. The following table shows which fields can be modified, by NE communications type.

Table 7-2. Modify NE Fields

OSI-Connected NEs	OSI over TCP/IP-connected NEs	X.25-connected NEs	TCP/IP-connected NEs
Alias	Alias	Alias	Alias
NE logins/ passwords	NE logins/ passwords	NE logins/ passwords	NE logins/ passwords
Time zone	Time zone	Time zone	Time zone
number of OSI associations	number of OSI associations		
	Transport bridge setting		
NSAP address (except for Reserved and SEL fields)			

Related Task

T 604, Modify a Network Element describes how to modify an NE.

Deleting NEs

An NE should be deleted only when it is to be physically removed from the network. To “hide” an NE from a group of users, you can remove the NE from the users’ Target Groups. Removing an NE from a Target Group causes the NE to be removed from the Map window, Alarm Summary window, and other windows that are used by the Target Group users, but the NE remains in the EMS database and is accessible to other Target Groups.

If you are deleting an NE designated as the GNE for a group of NEs, and the GNE currently has remote network elements (RNEs) assigned to it, you must first delete all RNEs from the WaveStar SNMS database or reassign all of the associated RNEs to another GNE in the same subnetwork before deleting the GNE.

Related task

T 605, Delete a Network Element describes how to delete an NE.

T 611, Associate Remote Network Elements with Gateway Network Elements describes how to reassign RNEs to a different GNE in the same subnetwork, as needed.

Automatic date/time synchronization

The NE date/time synchronization feature sets up the NE's date/time to match the date/time of the WaveStar SNMS host. The WaveStar SNMS system administrator, or a user with a privileged login, can enable or disable the Automatic Date/Time Synchronization feature. When this feature is enabled, the system performs date/time synchronization automatically when:

- An NE is added to the network or an NE is autodiscovered by WaveStar SNMS for the first time
- Re-establishing communications with the NE after the communications link is down

Automatic date/time synchronization changes the date/time on the NE only if the time difference between the NE and WaveStar SNMS is more than 15 seconds.

This feature can be enabled or disabled through the GUI. It is enabled, by default.

Related task

T 619, Enable/Disable Automatic Date/Time Synchronization describes how to enable/disable automatic date/time synchronization.

Aggregates

An aggregate is a collection of related NEs that is user-defined as needed to streamline system monitoring and other management functions. Aggregate definition allows a large number of NEs to be concisely displayed and monitored on the Map window's graphical representation of the network. Aggregates can "own" or contain other aggregates. All users using the same GUI client server can share aggregates. User access to certain NEs are defined by Target Groups. For more details, see Chapter 6, Security Management.

Aggregates can be displayed on the Map pane display and can be expanded on the Map window pane or Subnetwork Explorer whenever necessary to display all of its members. You can generate aggregate-specific alarm summaries, alarm logs, and command/response logs.

Aggregate management

Aggregates can be added, modified, or deleted. To create an aggregate, you assign a name and an alias to the aggregate and then add NEs or other aggregates to the newly created one, using functions on the WaveStar SNMS GUI.

Aggregate alarms

The color shown in the center of an aggregate icon displayed on the Map window pane or Subnetwork Explorer indicates the highest severity alarm of a member NE or aggregate. If any member NE has the Alarm Throttling feature enabled, and the number of alarms has passed the Alarm Throttling level, then the color in the the icon reflects the level of alarms being throttled, with the last known highest severity alarm color shown in the aggregates's border.

Related tasks

T 615, Add an Aggregate describes how to add an aggregate and how to add or change the members of the aggregate.

T 616, Modify an Aggregate describes how to change an aggregate's alias.

T 617, Delete an Aggregate describes how to delete an aggregate and reassign its members to another aggregate.

Trails

Trails are physical links between NEs or aggregates. They are represented graphically on the Map window pane display of the network as solid lines between the NE/aggregate symbols.

Autodiscovery of trails

Most optical trails between identical Lucent Technologies NEs are configured automatically by the DNO feature and autodiscovered when the network topology is displayed on the Map window after DNO is run. Creation of the network model —identifying the NEs, deriving the trails between them, and retrieving the internal configuration information—is performed automatically by WaveStar SNMS through communication with the NEs.

User-defined trails

If the DNO process does not automatically discover trails between NEs, the trails must be manually entered through the GUI. User trails can be manually added between any two trail termination points (TTPs) on any type of NE. Generally, there are many more TTPs on all NE types than those for which trails are automatically discovered. For an OLS 400G, a trail can only be manually added to another 400G.

Trails between managed and non-managed NEs

If there is DCC connectivity between a managed WaveStar NE and an NE/device not managed by the EMS (for example, a DDM-2000), the trail can still be add manually even if the AIDs of the non-managed device are not known or available to WaveStar SNMS.

Deletion of trails

Autodiscovered trails cannot be deleted manually. Autodiscovered trails are deleted automatically if the link is physically disconnected in the network. User-defined trails have to be manually deleted through the GUI. However, if an NE at one end of a user-defined trail is deleted, the trail is removed from the Map window display but remains in the WaveStar SNMS database. In this case, the trail should be deleted; otherwise, the related NE information may still appear on the View Trail List window.

Trail alarms

Trails can generate alarms. When Access Identifiers (AIDs) for equipment in the NE are provided by WaveStar SNMS or selected when a trail is manually added, WaveStar SNMS receives alarms from the trail. Trail alarm data is available through the Trail Alarm Summary window and the Trail Alarm List.

Trail alarm data is not available for trails manually added between a managed NE and an NE not managed by WaveStar SNMS.

Related tasks

T 606, Add a Trail describes how to manually add a trail.

T 607, Delete a Trail describes how to manually delete a trail.

Scheduling Tasks

Introduction

Many of the administrative functions that are performed on demand can also be scheduled to be done periodically, and/or a specific time through the GUI.

Tasks that can be scheduled

The following tasks can be scheduled:

- DNO
- NE Date/Time Synchronization
- NE Software Download
- NE Software Activate
- NE Software Copy (OLS 400G only)
- NE Backup

Scheduling methods

Tasks can be scheduled to be performed periodically (daily, weekly, monthly, once every *x* months) or as a one time event.

NE software downloads, NE software copies, and NE software activations are scheduled as one time events. DNOs, NE date/time synchronizations, and NE backups are scheduled to be performed periodically.

Retrying scheduled tasks

The Scheduler software allows you to specify the number of times to automatically retry a scheduled task that did not complete or failed due to loss of communications with the NE or some other reason.

You can also specify the timer interval between retries. The retry interval timer starts on receipt of the failure response by the scheduled task server for the task type. The system attempts to complete the failed scheduled task the number of specified times.

Each failed scheduled task is logged in a task-specific error log in the *$SCHLOG* directory.

Scheduling simultaneous tasks

The number of tasks that can be scheduled simultaneously depends on the task type and the WaveStar SNMS host server size.

If the number of tasks that you schedule to be performed in the same timeframe exceeds the maximum number allowed, WaveStar SNMS informs you of the next available timeslot for scheduling the task. The system calculates the next available timeslot based on the number of tasks already scheduled and the process duration of each task type. The process duration can vary with the NE type for which the task is being performed. For example, a DNO for most NE types takes approximately 30 minutes. Depending on the size and equipage of an NE, however, a DNO can take up to 180 minutes.

Modifying and deleting scheduled tasks

You can also modify and delete scheduled tasks. However, if a scheduled task is already in progress, you cannot modify it.

For scheduled software downloads and DNOs, if you attempt to delete a task that is already in progress, a warning message is issued, asking if you want to continue with the deletion. If you indicate that you want to delete the in-progress job, the job is terminated and is removed from the scheduled list.

CAUTION:
Deleting scheduled DNO requests can result in database discrepancies between the EMS database and the network configuration.

Related information

For specific information on scheduling tasks, refer to the following tasks in the *User Tasks Manual*:

- T 621, Schedule NE Date/Time Synchronization
- T 622, Schedule DNO
- T 623, Schedule NE Data Backup
- T 624, Schedule NE Software Download
- T 625, Schedule NE Software Copy
- T 626, Schedule NE Software Activation
- T 627, Modify a Scheduled Task

WaveStar SNMS Logs

8

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Background

Introduction

WaveStar SNMS keeps track of certain information regarding system performance and actions. This information is stored in logs, and may be filtered and viewed by the user. The process of collecting, storing, and displaying this information is called Log Management. The following logs are maintained:

- **Network Alarm/Event Log—**This log stores a history of all the alarms and events received from the network elements as a result of unexpected behaviors by an NE.
- **Network Notifications Log—**This log stores notifications from NEs on database changes, protection switching, and other NE-related activities.
- **Network Command/Response Log—**This log stores all commands and responses, except retrieval commands and responses (for example, RTRV-rr) that are originated from and received by SNMS. The user ID information and user interface information (GUI, cut-through, TCP/IP, or dial-up) are also logged.
- **WaveStar SNMS Alarm Log—**This log stores alarms originated by system on all system hardware and/or software-related unexpected behaviors detected by WaveStar SNMS itself.
- **WaveStar SNMS Activity Log—**This log displays information on selected WaveStar SNMS activities for one or more users.

Log Management provides the following four functions:

- **Logging—**logs messages and data into the WaveStar SNMS database or a flat file.
- **Browsing—**provides GUI functionality for the user to browse the messages and data.
- **Filtering—**filters log data to provide only desired data.
- **Purging—**purges old log messages from the WaveStar SNMS database or temporal log files generated by system modules.

Objectives

This chapter provides background and introductory information about the WaveStar SNMS logs. It includes available features and references to specific task-related instructions.

After learning the information in this chapter, the user should be able to do the following:

- Use the Network Alarm/Event Log to obtain a history of all alarms and events generated by NEs as a result of unexpected behaviors.

- Use the Network Notifications Log to obtain information on database changes, protection switching, and other NE-related activities.
- Use the Network Command/Response Log to review all commands and responses that originate from or received by WaveStar SNMS.
- Use the Wave Star SNMS Alarm Log to obtain information on all system hardware-related and/or software related alarms.
- Use the Wa veStar SNMS Activity Log to obtain information about all user and system-related activities.

Related tasks

For related tasks, see the series 700 tasks or look up individual tasks in the Task Index.

WaveStar SNMS Logs

Introduction

This section provides information about each of the WaveStar SNMS system logs and how they gather information. See the 700 series of tasks in the *User Tasks Manual* for instructions on how to display and use each of the logs.

Network alarm/ event log

Use the Network Alarm/Event Log to view, save, and print important alarm and event information. WaveStar SNMS logs and stores various alarms and non-alarm events as listed in the appropriate NE documentation.

NOTE:
Clear messages for an OLS 400G NE are always shown as alarms in the log.

The user can filter the Network Alarm/Event Log on certain parameters, including start date/time, end date/time, TID, aggregate, EPT, alarm/event type, and severity. The maximum number of days for which alarm/event data can be displayed is 45.

Related information

See T 700, Display and Use the Network Alarm/Event Log for instructions on using the Network Alarm/Event Log.

Network notifications log

WaveStar SNMS logs the following notifications/events in the Network Notifications Log:

- The completion (or noncompletion) of an automatic database backup (from primary NVM to secondary)
- Any change in the WaveStar SNMS database
- The autonomous removal from service of an administrative or data link
- Automatic and manual (user-initiated) equipment protection switches, synchronization mode switches, and system timing reference switches.

The user can filter the Network Notification Log on certain parameters, including start date/time, end date/time, TID, aggregate, and notification type. The maximum number of days for which network notification data can be displayed is 45.

Related information

See T 701, Display and Use the Network Notifications Log for instructions on using the Network Notifications Log.

Network command/ response log

All commands that are formulated by internal subsystems as a result of a user operation from the GUI are logged to the Command/Response Log. (The one exception is retrieval commands, which are left out for performance reasons.) WaveStar SNMS provides a user interface parameter for each logged command from all interface types. The possible values for the parameter are GUI, cut-through, TCP/IP, and dial-up.

The system administrator is allowed access to all commands/responses, while users are able to view self-originated commands and responses. The commands are displayed in the order they were received by WaveStar SNMS, each command followed by its response. (If a command did not receive a response, the display indicates this with the entry “time out.”)

The user can filter the Network Command/Response Log on certain parameters, including start date/time, end date/time, TID, and aggregate. The system administrator can filter on these same parameters, plus two more - command interface and user login ID. The maximum number of days for which network command/response data can be displayed is 7.

Related information

See T 702, Display and Use the Network Command/Response Log for instructions on displaying and using the Network Command/Response Log.

WaveStar SNMS alarm log

WaveStar SNMS logs the following system failures to the WaveStar SNMS Alarm Log:

- 802.3 LAN interface failure
- Disk I/O failure
- Informix EDR agent failure
- File system filling to over 85%
- File system full (over 97%)
- Database space filling to over 85%
- Database space full (over 97%)

The following table shows the system failure information logged by WaveStar SNMS to the Alarm Log.

Table 8-1. System Failure Information in WaveStar SNMS Alarm Log

Parameter	Values	Description
Alarm/Event Type	Alarm	for alarms only
Alarm ID	1 - 999999	WaveStar SNMS assigned alarm identification number
Date of Occurrence	YYYY-MM-DD (month-day)	
Time of Occurrence	HH:MM:SS (hours:minutes:seconds)	
Category	Equipment/ Processing Error	
Alarm Issue Point	<=20 characters	LAN/Disk IO/File System/Database
Effect on Service	NSA	
Severity	CR/MJ/CL	
Probable Cause	Text String (see WaveStar SNMS alarm list)	condition type
Description	Text String (see WaveStar SNMS alarm list)	description of the failure conditions

The user can filter the WaveStar SNMS Alarm Log on the start date/time and end date/time parameters. The maximum number of days for which alarm log data can be displayed is 45.

Related information

See T 703, Display and Use the Alarm Log for instructions on displaying and using the WaveStar SNMS Alarm Log.

EMS activity log

All user activities that are executed through the GUI as well as system activities are stored in the EMS database and logged in the EMS Activity Log. By using the Log Management feature, the Activity Log can be browsed by the user and the information saved and printed.

The user can filter the Activity Log on certain parameters including start date/time, user, activity type, and selected activity. The maximum number of days for which activity can be displayed is seven.

The activities are listed in the order they were received by WaveStar SNMS with the requested information.

Related information

See T 704, Display and Use the Activities Log for instructions on displaying and using the EMS Activity Log.

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WaveStar SNMS User Tasks

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The following table lists the tasks that can be performed in WaveStar SNMS by NE type/release.

Table 1: WaveStar SNMS R3.1 User Tasks[a]

Task	BWM	2.5G	10G (STM -64)	OLS 400G	All-Metro	LCT[b]
Task 100 - Log Into WaveStar SNMS	x	x	x	x	x	x
Task 101 - Log Out of WaveStar SNMS	x	x	x	x	x	x
Task 102 - Select an Item in the Subnetwork Explorer	x	x	x	x	x	x
Task 103 - Expand or Collapse an Item in the Subnetwork Explorer	x	x	x	x	x	x
Task 104 - Select an Item in the Map Pane	x	x	x	x	x	x
Task 105 - Move an Item on the Map Pane	x	x	x	x	x	x
Task 106 - Expand or Collapse an Aggregate on the Map Pane	x	x	x	x	x	x
Task 107 - Move an NE to the TOP Aggregate Level	x	x	x	x	x	x
Task 108 - Zoom the Map View	x	x	x	x	x	x
Task 109 - Find a Network Element	x	x	x	x	x	x
Task 110 - Clear Status Messages	x	x	x	x	x	x
Task 111 - Modify User Preferences	x	x	x	x	x	x
Task 112 - Save Preferences/Map Positions	x	x	x	x	x	x
Task 113 - Restore Preferences/Map Positions	x	x	x	x	x	x
Task 114- Copy Preferences/Map Positions	x	x	x	x	x	x
Task 200 - Activate the Alarm Browser	x	x	x	x	x	x
Task 201 - Access the Alarm Summary	x	x	x	x	x	x
Task 202 - Access the Alarm List	x	x	x	x	x	x

Table 1: WaveStar SNMS R3.1 User Tasks[a]

Task	BWM	2.5G	10G (STM -64)	OLS 400G	All-Metro	LCT[b]
Task 203 - Acknowledge/Unacknowledge Alarms	x	x	x	x	x	x
Task 204 - Acknowledge/Unacknowledge Alarm Groups	x	x	x	x	x	x
Task 205 - Acknowledge/Unacknowledge All Alarms	x	x	x	x	x	x
Task 206 - Acknowledge/Unacknowledge All Alarms for an NE	x	x	x	x	x	x
Task 207- Display Trail Alarms	x	x	x	x	x	x
Task 208 - Monitor Alarms	x	x	x	x	x	x
Task 209 - View Throttled Alarm Statistics	x	x	x	x	x	x
Task 210 - Resynchronize Alarms	x	x	x	x	x	x
Task 211 - Enable/Disable Audible Alarms	x	x	x	x	x	x
Task 212 - Quiet the Audible Alarm	x	x	x	x	x	x
Task 213 - Enable/Disable the Alarm Indicator	x	x	x	x	x	x
Task 214 - View an ASAP	1.2+	2.0+	x	2.0+	N/A	N/A
Task 215 - Add an ASAP	1.3+	N/A	2.0+	2.0+	N/A	N/A
Task 216 - Modify an ASAP	1.2+	2.0+	1.0+	2.0+	N/A	N/A
Task 217 - Delete an ASAP	3.0+	N/A	N/A	2.0+	N/A	N/A
Task 218 - Assign ASAP to AID	1.2+	2.0+	1.0+	2.0+	N/A	N/A
Task 219 - View ASAP Assignments	1.2+	2.0+	1.0+	2.0+	N/A	N/A
Task 220 - Provision Environmental Alarms	N/A	N/A	N/A	2.0+	1.0+	N/A
Task 221 - Provision Alarm Delays	1.2+	2.0+	x	2.0+	N/A	N/A
Task 222a - Provision Alarm Indicators and Autonomous Alarm Messages	N/A	N/A	N/A	2.0+	N/A	N/A

Table 1: WaveStar SNMS R3.1 User Tasks[a]

Task	BWM	2.5G	10G (STM -64)	OLS 400G	All-Metro	LCT[b]
Task 222b - Provision Autonomous Alarm Messages	1.2+	2.0+	x	2.0+	1.0+	N/A
Task 223 - Automatically Throttle Alarms	x	x	x	x	x	x
Task 224 - Filter Alarms	x	x	x	x	x	x
Task 225 - Display the Transient Condition Event Browser	x	x	x	x	x	x
Task 300 - Perform Cut-Through Commands	x	x	x	N/A	x	x
Task 301 - Build TL1 Commands	x	x	x	N/A	x	x
Task 302 - Broadcast TL1 Commands	x	x	x	N/A	x	x
Task 303 - Display Provisioning Window	x	x	x	x	x	x
Task 304 - Provision System Parameters	x	x	x	x	x	x
Task 305 - Provision NE Ports	x	x	x	x	x	x
Task 306 - Provision NE Equipment Information	x	x	x	x	x	x
Task 307 - Establish WaveStar Equipment	x	x	x	x	x	x
Task 308 - Remove WaveStar Equipment	x	x	x	x	x	x
Task 309 - View NE Equipment	x	x	x	x	x	x
Task 310 - View NE Equipment Details	x	x	x	x	x	x
Task 311 - View NE Equipment Lists	x	x	x	x	x	x
Task 312 - Display the NE Cross-Connection Window	x	x	x	N/A	N/A	x
Task 313 - Display Ports on the NE Cross-Connection Window	x	x	x	N/A	N/A	x
Task 314 - View NE Cross-Connections—Textual	x	x	x	N/A	N/A	x

Table 1: WaveStar SNMS R3.1 User Tasks[a]

Task	BWM	2.5G	10G (STM -64)	OLS 400G	All-Metro	LCT[b]
Task 315 - Add a Single NE Cross-Connection	x	x	x	N/A	N/A	x
Task 316 - Add a Roll Cross-Connection	x	x	x	N/A	N/A	x
Task 317 - Add an NE Multi-Cast Cross-Connection	x	x	x	N/A	N/A	N/A
Task 318 - Delete NE Cross-Connections—Graphical	x	x	x	N/A	N/A	x
Task 319 - Delete an NE Cross-Connection—Textual	x	x	x	N/A	N/A	x
Task 320 - Modify NE Cross-Connections—Graphical	x	x	x	N/A	N/A	x
Task 321 - Modify NE Cross-Connections—Textual	x	x	x	N/A	N/A	x
Task 322 - Show/Hide NE Cross-Connection Lines	x	x	x	N/A	N/A	x
Task 323 - Establish/Add NE Protection Groups	x	x	x	N/A	N/A	N/A
Task 324 - View NE Protection Groups	x	x	x	N/A	N/A	N/A
Task 325 - Modify NE Protection Groups	x	x	x	N/A	N/A	N/A
Task 326 - Delete NE Protection Groups	x	x	x	N/A	N/A	N/A
Task 327 - Manually Initiate DNO	x	x	x	x	x	x
Task 328 - Set NE Date/Time Synchronization	x	x	x	x	x	x
Task 329 - Enable/Disable Fall Back and Spring Forward	x	x	x	x	x	x
Task 330 - Add a Reservation (sts1/vc3)	x	N/A	N/A	N/A	N/A	N/A
Task 331 - Modify a Reservation (sts1/vc3)	x	N/A	N/A	N/A	N/A	N/A
Task 332 - Delete a Reservation (sts1/vc3)	x	N/A	N/A	N/A	N/A	N/A

Table 1: WaveStar SNMS R3.1 User Tasks[a]

Task	BWM	2.5G	10G (STM -64)	OLS 400G	All-Metro	LCT[b]
Task 333 - Display Protection Switching Status	x	x	x	N/A	x	N/A
Task 334 - Display the Optical Associations Manager Window	N/A	N/A	N/A	2.0+	x	N/A
Task 335 - Add an Optical Association	N/A	N/A	N/A	2.0+	1.0+	N/A
Task 336 - Delete an Optical Association	N/A	N/A	N/A	2.0+	1.0+	N/A
Task 337 - Import Software to the EMS	N/A	x	x	2.0+	x	N/A
Task 338 - Download Software	N/A	x	x	2.0+	N/A	N/A
Task 339 - Copy Software from NE to NE	N/A	N/A	N/A	2.0+	N/A	N/A
Task 340 - Activate NE Software	N/A	x	x	2.0+	N/A	N/A
Task 341 - Delete NE Software	N/A	x	x	2.0+	N/A	N/A
Task 342 - Backup NE Data	N/A	x	x	2.0+	N/A	x
Task 343 - Restore NE Data	N/A	x	x	2.0+	N/A	x
Task 400 - Enable/Disable the PM Feature	x	N/A	x	x	N/A	x
Task 401 - Enable/Disable PM Data Collection	x	N/A	x	x	N/A	x
Task 402 - Administer PM Data	x	N/A	x	x	N/A	x
Task 403 - View PM Data	x	N/A	x	x	N/A	x
Task 500 - Change Your User Password	x	x	x	x	x	x
Task 501 - Globally Administer NE Passwords	x	x	x	x	x	x
Task 502 - Add a User	x	x	x	x	x	x
Task 503 - Modify a User	x	x	x	x	x	x
Task 504 - Delete a User	x	x	x	x	x	x

Table 1: WaveStar SNMS R3.1 User Tasks[a]

Task	BWM	2.5G	10G (STM -64)	OLS 400G	All-Metro	LCT[b]
Task 505 - Add a Command Group	x	x	x	x	x	x
Task 506 - Modify a Command Group	x	x	x	x	x	x
Task 507 - Delete a Command Group	x	x	x	x	x	x
Task 508 - Add a Target Group	x	x	x	x	x	x
Task 509 - Modify a Target Group	x	x	x	x	x	x
Task 510 - Delete a Target Group	x	x	x	x	x	x
Task 511 - Add an NE Login	N/A	N/A	N/A	2.0+	N/A	N/A
Task 512 - Modify an NE Login	N/A	N/A	N/A	2.0+	N/A	N/A
Task 513 - Delete an NE Login	N/A	N/A	N/A	2.0+	N/A	N/A
Task 514 - Terminate User Session	x	x	x	x	x	x
Task 515 - Enable/Disable User Logins	x	x	x	x	x	x
Task 516 - Displayed Logged In Users	x	x	x	x	x	x
Task 517 - Globally Provision Login/Password Parameters	x	x	x	x	x	x
Task 600 - Add a Network Element—X.25 Communications	N/A	N/A	N/A	N/A	N/A	x
Task 601 - Add a Network Element—OSI Communications	x	x	x	x	N/A	N/A
Task 602 - Add a Gateway Network Element—X.25 Communications	N/A	N/A	N/A	N/A	N/A	x
Task 603 - Add a Network Element—TCP/IP Communications	N/A	N/A	N/A	N/A	x	N/A
Task 604- Modify a Network Element	x	x	x	x	x	x
Task 605 - Delete a Network Element	x	x	x	x	x	x
Task 606 - Add a Trail	x	x	x	x	x	x
Task 607 - Delete a Trail	x	x	x	x	x	x

Table 1: WaveStar SNMS R3.1 User Tasks[a]

Task	BWM	2.5G	10G (STM -64)	OLS 400G	All-Metro	LCT[b]
Task 608- Add a Subnetwork Name/Alias	N/A	N/A	N/A	N/A	x	x
Task 609 - Modify a Subnetwork Alias	N/A	N/A	N/A	N/A	x	x
Task 610 - Delete a Subnetwork Name/ Alias	N/A	N/A	N/A	N/A	x	x
Task 611 - Associate Remote NEs with GNEs	N/A	N/A	N/A	N/A	x	x
Task 612 - Add a GNE Association	N/A	N/A	N/A	N/A	x	x
Task 613 - Switch Primary/Secondary GNEs	N/A	N/A	N/A	N/A	x	x
Task 614 - Delete a GNE Association	N/A	N/A	N/A	N/A	x	x
Task 615 - Add an Aggregate	x	x	x	x	x	x
Task 616 - Modify an Aggregate	x	x	x	x	x	x
Task 617 - Delete an Aggregate	x	x	x	x	x	x
Task 618 - Manage Transport Bridges	x	x	x	2.0+	N/A	N/A
Task 619 - Enable/Disable Automatic Date/Time Synchronization	x	x	x	x	x	x
Task 620 - Set Drift Threshold for Date/ Time Synchronization	x	x	x	x	x	x
Task 621 - Schedule NE Date/Time Synchronization	x	x	x	x	x	x
Task 22 - Schedule DNO	x	x	x	x	x	x
Task 623 - Schedule NE Data Backup	N/A	x	x	2.0+	x	x
Task 624 - Schedule NE Software Download	N/A	x	x	2.0+	x	N/A
Task 625 - Schedule NE Software Copy	N/A	N/A	N/A	2.0+	N/A	N/A
Task 626 - Schedule NE Software Activation	N/A	x	x	2.0+	N/A	N/A
Task 627 - Modify a Scheduled Task	x	x	x	x	x	x

Table 1: WaveStar SNMS R3.1 User Tasks[a]

Task	BWM	2.5G	10G (STM -64)	OLS 400G	All-Metro	LCT[b]
Task 628 - Delete a Scheduled Task	x	x	x	x	x	x
Task 629 - Provision DSA	x	x	x	x	N/A	N/A
Task 630 - Add a DIB Prefix	x	x	x	x	N/A	N/A
Task 631 - Modify a DIB Prefix	x	x	x	x	N/A	N/A
Task 632 - Delete a DIB Prefix	x	x	x	x	N/A	N/A
Task 633 - Add an NE to DIB	x	x	x	x	N/A	N/A
Task 634 - Modify an NE in DIB	x	x	x	x	N/A	N/A
Task 635 - Delete an NE from the DIB	x	x	x	x	N/A	N/A
Task 636 - Reset NE	N/A	N/A	N/A	x	N/A	N/A
Task 637 - Update System	N/A	N/A	N/A	2.0+	1.0+	N/A
Task 700 - Display and Use the Network Alarm/Event Log	x	x	x	x	x	x
Task 701 - Display and Use the Network Notifications Log	x	x	x	x	x	x
Task 702 - Display and Use the Network Command/Response Log	x	x	x	x	x	x
Task 703 - Display and Use the EMS Alarm Log	x	x	x	x	x	x
Task 704 - Display and Use the EMS Activities Log	x	x	x	x	x	x

a. If the task is applicable from the NE 1st Release, then a "x" is shown under the task for that NE. If the task is applicable from a later release, then the Release # with "+" is shown to indicate that the task is applicable from that Release onwards. (for example, "2.0+" means from Release 2 onwards). "N/A" indicates that a task is not applicable to an NE type.

b. LCT Release is R4.0.

Task Series 100

Using the GUI

Log Into WaveStar SNMS

100

Background

When to use

Use this procedure to log into the WaveStar SNMS Graphical User Interface (GUI).

Before you begin

Before you begin this task for the first time, you must have obtained a user ID and initial password from your system administrator.

When you log into WaveStar SNMS for the first time with a new user login, you must change your password from the default password given for the login. A pop-up window is displayed, indicating that you must change your password before being allowed to log into WaveStar SNMS. You are given the option of continuing the session or exiting the system at this point. If you choose to continue the login session, the Change Password window is displayed, prompting you to change your password from the default password. The system validates your new password. If it is valid, the system re-displays the Login window to re-enter your user ID and your new password.

Related information

For related information, see T 101, Log Out of WaveStar SNMS.

Instructions

Task Complete the following steps to start up and log into WaveStar SNMS.

Step	Action	Reference
1	Start an instance of the GUI. This displays the Login window.	
2	If you are logging into WaveStar SNMS for the first time with a new user ID, use the procedure SE 100-1: Logging Into WaveStar SNMS for the First Time on page 100-3. If not, skip to step 3.	SE 100-1
3	Enter your User ID. Press the Tab key.	
4	Enter your password.	
5	Double-click the Login button. A dialog window is displayed, indicating authorization.	
6	Close the dialog window by clicking the Close button. The Map window is displayed. **Stop! End of Task.**	

SE 100-1: Logging Into WaveStar SNMS for the First Time

Procedure

Use the following procedure when you log into WaveStar SNMS for the first time:

1. Start an instance of the GUI. This displays the Login window.
2. Type in your user ID (which you must initially obtain from your system administrator).
3. Press the Tab key and type in the password initially obtained from your system administrator (this is the default password).
4. Double-click the Login button. The system verifies your user ID and password.

   A pop-up window is displayed, advising your that you must change your password before continuing with the session and asking if you want to change your password at this point to continue.

   To change your password from the default one and continue with the session, choose Yes.

   To stop at this point, choose No.
5. Choose Yes. The Change EMS Password window is displayed.

NOTE:
The Cancel button is always disabled on this window.

6. Enter your old password in the Old Password field and enter your new password in the New Password field.

NOTE:
Your new password must differ from the old password by at least three characters. A valid password is 6-10 characters. A password must include at least two non-alphabetic characters and at least one special character (!#$%^&*()-+_=?). The following special characters are not permitted (:,;).

7. Re-enter your new password in the Confirm Password field.
8. After entering your new password, click the OK button on the Change EMS Password window. If the new password is invalid or a mismatch for your user ID, a message is displayed, indicating that the new password entered is invalid.

   Click the OK button and enter a different password. After entering a new password, click the OK button again.

If your new password is valid and accepted by the system, a message is displayed, indicating that password change is successful. Click the OK button again.

The Login window is re-displayed.

9. Enter your user ID and the new password.
10. Double-click the Login button. A dialog window is displayed, indicating authorization.
11. Close the dialog window by clicking the Close button. The Map window is displayed.

Log Out of WaveStar SNMS

101

Background

When to use

Use this procedure to log out of WaveStar SNMS.

Before you begin

Before you begin this task, make sure any processes you have been performing on the system have finished running. Otherwise, results of these processes may be uncertain.

Related information

For related information, see T 100, Log Into WaveStar SNMS .

Instructions

Task

Complete the following steps to log out of SNMS.

Step	Action
1	Select **File** from the main menu bar on the Map window. A sub-menu is displayed.
2	Select **Exit** from the File menu. The GUI session is terminated. **Stop! End of Task.**

Select an Item in the Subnetwork Explorer

102

Background

When to use

Use this procedure to select an item on the Subnetwork Explorer portion of the Map window.

Before you begin

Before you begin this task, locate the item (NE, aggregate, DSA, or non-managed device) to be selected on the Subnetwork Explorer portion of the Map window.

Related information

For related information, see T 109, Find a Network Element.

Instructions

Task

Complete the following steps to select an item on the Subnetwork Explorer portion of the Map window.

Step	Action	Result
1	Position the mouse pointer on the item to be selected in the Subnetwork Explorer portion of the Map window.	
2	Click the left (select) mouse button. **Stop! End of Task.**	The selected item is highlighted.

Expand or Collapse an Item in the Subnetwork Explorer

103

Background

When to use

Use this procedure to expand or collapse an item (such as an aggregate) in the Subnetwork Explorer portion of the Map window.

Before you begin

Before you begin this task, locate the item to be expanded or collapsed in the Subnetwork Explorer portion of the Map window.

Related information

For related information, see T 109, Find a Network Element.

Instructions

Task

Complete the following steps to expand or collapse an item in the Subnetwork Explorer portion of the Map window.

Step	Action
1	Position the mouse pointer over the item to be expanded or collapsed in the Subnetwork Explorer portion of the Map window.
2	Click the left (select) mouse button on the plus (“+”) or minus (“-”) sign next to the item to expand (“+”) to show the lower levels of the equipment hierarchy, or to collapse (“-”) and revert back to the display of the item itself. **Stop! End of Task.**

Select an Item on the Map Pane

104

Background

When to use

Use this procedure to select an item or group of items on the Map pane display portion of the Map window.

Before you begin

Before you begin this task, locate the item(s) to be selected on the Map pane portion of the Map window.

Related information

For related information, see T 109, Find a Network Element.

Instructions

Task

Complete the following steps to select a single item or group of items on the Map pane portion of the Map window.

Step	Action	
1	TO: Select a single NE or aggregate on the Map pane. Select a group of NEs or aggregates on the Map pane.	POSITION THE MOUSE POINTER: On the NE or aggregate and click the left (select) mouse button. The selected item is highlighted. Over a portion of the background adjacent to the items to be selected. Click the select (left) mouse button, hold the button, and drag the mouse pointer over the items to be selected. An outlined box appears over the selected area. As items are selected, they change color. Release the mouse button. The items are selected.
2	To deselect a selected item in the Map pane, position the mouse pointer over the TID of the selected item and click the select (left) mouse button, or simply position the mouse cursor in another area of the Map pane and click the select (left) mouse button. The selected item is deselected. To deselect a group of items, position the mouse pointer within the boxed region and single-click the select (left) mouse button. Any item that is already selected in the box becomes deselected. **Stop! End of Task.**	

Move an Item on the Map Pane

105

Background

When to use

Use this procedure to move a single item (NE or aggregate) or group of items on the Map pane portion of the Map window.

Before you begin

Before you begin this task, locate the item(s) to be moved on the Map pane.

Related information

For related information, see T 109, Find a Network Element.

Instructions

Task

Complete the following steps to move a single item or group of items on the Map pane portion of the Map window.

Step	Action	Action
1	TO: Move a single item (NE or aggregate) on the Map pane display. Move a group of items on the Map pane display. **Stop! End of Task.**	DO THIS: Position the mouse pointer over the item you want to move. Press and hold the select (left) mouse button. Drag the item to the new position. Release the select (left) mouse button. Select a group of items by positioning the mouse pointer in a area of the background adjacent to the items, clicking and holding the select (left) mouse button while dragging the mouse pointer over the items to select them, and releasing the left mouse button. Position the mouse pointer over one of the selected icons, press and hold the select (left) mouse button, and drag the items to their new position. Release the select (left) mouse button.

Expand or Collapse an Aggregate on the Map Pane

106

Background

When to use

Use this procedure to expand or collapse an aggregate on the Map pane portion of the Map window.

Before you begin

Before you begin this task, locate the aggregate to be expanded or collapsed on the Map pane portion of the Map window.

Related information

For related information, see T 109, Find a Network Element.

Instructions

Task

Complete the following steps to expand or collapse an aggregate on the Map pane portion of the Map window.

Step	Action	
1	TO ... Expand the aggregate and show its member NEs.	DO THIS ... Position the mouse pointer over the aggregate icon. Click the select (left) mouse button to select the aggregate. Click the right (menu) mouse button. A pop-up menu is displayed. Choose **Expand** from the pop-up menu. The aggregate is expanded to show the member NEs. **OR** Position the mouse cursor on the aggregate name in the subnetwork explorer or the aggregate icon in the Map pane and double-click the select (left) mouse button. The aggregate is expanded to show the member NEs. **Note:** click the select (mouse) button anywhere else on the Map pane to deselect an aggregate icon or member NE.
	Collapse an expanded aggregate	Position the mouse cursor on one of the member NE icons and double-click the select (left) mouse button. The aggregate is collapsed and the aggregate symbol replaces the member NEs on the Map pane display. **OR** Select one of the member NE icons and click the right (menu) mouse button. A pop-up menu is displayed. Choose **Collapse** from the pop-up menu. The aggregate is collapsed and the aggregate symbol replaces the member NEs on the Map pane display.
	Stop! End of Task.	

Move an NE to the TOP Aggregate Level

107

Background

When to use

Use this procedure to move an NE out of an aggregate to the TOP aggregate level in the Map window, which includes all NEs.

Before you begin

Before you begin this task, make sure the aggregate is expanded in the Subnetwork Explorer or Map pane portion of the Map window to show the NE to be moved out of the aggregate.

Related information

For related information, see T 103, Expand or Collapse an Item in the Subnetwork Explorer and T 106, Expand or Collapse an Aggregate on the Map Pane.

Instructions

Task

Complete the following steps to move an NE out of an aggregate and return it to the TOP aggregate level in the Map window.

Step	Action	Reference
1	Expand the aggregate.	
2	Position the mouse pointer over the NE.	
3	Click the select (left) mouse button to select the NE.	
4	Click the right (menu) mouse button. A pop-up menu is displayed.	
5	Choose **Return to TOP** from the displayed pop-up menu. The NE is brought to the TOP aggregate level and is taken out of the aggregate. **Stop! End of Task.**	

Zoom the Map View

108

Background

When to use

Use this procedure to zoom in or zoom out on the Map window.

Before you begin

Before you begin this task, display the Map window.

Related information

For related information, see T 100, Log Into WaveStar SNMS.

Instructions

Task

Complete the following steps to zoom the Map window view.

Step	Action
1	Select **View** from the main menu bar on the Map window. This displays a pull-down menu.
2	■ To make the Map pane show fewer map items in the same size space, single click on Zoom In on the pull-down menu. ■ To make the Map pane show *more* in the same size space, single click on Zoom Out on the pull-down menu.
3	To reset the Zoom level to zero (which is the default), single click on Zoom Reset on the pull-down menu. You can also zoom in, zoom out, and reset the zoom by using the Zoom In, Zoom Out, and Zoom Reset buttons on the Map window toolbar. **Stop! End of Task.**

Find a Network Element

109

Background

When to use

Use this procedure to find an NE on the Map pane or Subnetwork Explorer portion of the Map window.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see Chapter 2, The WaveStar SNMS Graphical User Interface.

Instructions

Task

Complete the following steps to find an NE in the Map pane or Subnetwork Explorer portion of the Map window.

Step	Action	Result
1	Select **View** from the main menu bar on the Map window.	The View sub-menu is displayed.
2	Select **Find an NE** from the View sub-menu.	The Find an NE window is displayed.
3	Enter the TID and/or Alias of the NE in the appropriate field(s). **NOTE:** An asterisk(*) can be used as a wildcard character to represent 0 or more characters of the TID/Alias.	
4	Click the OK or Apply button. **Stop! End of Task.**	The Map pane display is repositioned to show the NE and the NE is highlighted in the Map pane and Subnetwork Explorer portions of the Map window. If more than one match is found, the item which is found first is indicated in the Subnetwork Explorer portion of the Map pane. If the NE is contained in an unexpanded aggregate, the aggregate is expanded and the NE is highlighted on the Map pane.

Clear Status Messages

110

Background

When to use

Use this procedure to clear status messages that are displayed in the status bar on the Map window.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see Chapter 2, The WaveStar SNMS Graphical User Interface.

Instructions

Task

Complete the following steps to clear status messages from the status bar in the Map window.

Step	Action	Result
1	Select **View** from the main menu bar on the Map window.	The View menu is displayed.
2	Select **Clear Status Line** from the View menu. **NOTE:** The status bar message can also be cleared by clicking the Clear Message Line button on the Map window toolbar. **Stop! End of Task.**	The message in the status bar area of the Map window is cleared.

Modify User Preferences

111

Background

When to use

Use this procedure to change the characteristics of the Map window display, such as NE (node) size, NE labels, trail lines, and alarm color display.

Before you begin

Before you begin this task, view the Map pane display to see the current characteristics of the Map view before changing any of them. Be aware that preferences are saved on a per-user basis.

To perform this task, access the Map window.

Related information

For related information, see T 112, Save Preferences/Map Positions, T 113, Restore Preferences/Map Positions, and T 114, Copy Preferences/Map Positions, and the following *User Reference* sections:

- The Map window
- Map preferences

Instructions

Task Complete the following steps to modify user preferences.

Step	Action	
1	Select **View** from the main menu bar on the Map window. The View menu is displayed.	
2	Select **Preferences** from the View menu. The View Preferences window is displayed.	
3	TO CHANGE THE...	SELECT THE TAB...
	■ NE size or thickness of trail lines between NEs	■ Nodes & Lines
	■ Size, content, or alignment of map item labels	■ Labels
	■ Colors associated with alarms and/or cross-connections	■ Colors
	■ Shapes used to represent NEs, aggregates, EMS host, DSA, and non-managed devices on the Map window	■ Shapes
	■ Alarm severity level displayed in the Map and Alarm Notification windows(Critical/Major/Minor for SONET, Prompt/Deferred for SDH)	■ Fault
	■ tooltips help on/off setting	■ Other
	■ date format for items on the Map window, alarm lists, and tallies	■ Other
	■ display of Bidirectional Line Switched Ring (BLSR) Protected Port Groups on the Cross-Connect View window (**Note: the BLSR display option is currently not supported**).	■ Other

Continued on next page

Step	Action (Contd)
4	When the selected panel of options is displayed on the View Preferences window, change the display characteristics as needed. ■ To change the shape for an item in the Shapes panel, double-click on the current shape in the scroll list. A pop-up window is displayed, showing the shapes available for selection. Click on the desired shape. The changed shape is displayed next to the Map item in the scroll list. ■ To change the color indications for alarms and cross-connections on the Map window through the Colors panel, double-click on the item in the Colors scroll-bar list to display a palette of colors. Click on the desired color box in the palette to select it. The color selected is applied to the item.
5	Click one of the following buttons to adjust your preference settings: ■ Save—saves the changes made to user preferences on each panel, to be applied each time the Map window is brought up ■ Restore—restores the saved values for the user ■ Get Defaults—retrieves and displays the system defaults for the preferences category, overriding the displayed settings
6	Click the Apply button to apply the changes to the Map window display or click the OK button to apply the changes to the Map window display and close the View Preferences window. **Stop! End of Task.**

Save Preferences/Map Positions

112

Background

When to use

Use this procedure to save user preferences for the Map pane display and/or positions of map items on the Map pane display for the next time you log onto the system and access the Map window.

Before you begin

Before you begin this task, you should use the Preferences option to select the appearance or position of Map items on the display or accept the system defaults.

To perform this task, access the Map window.

Related information

For related information, see the following *User Reference* sections:

- The Map window
- Map preferences

Instructions

Task

Complete the following steps to save user preferences and/or map item positions.

Step	Action	
1	Select **File** from the main menu bar on the Map window. The File menu is displayed.	
2	Select **Save** from the File menu. A sub-menu is displayed.	
3	TO SAVE... ■ User preferences ■ Map item positions ■ User preferences and Map item positions	CHOOSE... ■ Preferences ■ Positions ■ Both
4	A message is displayed in the status bar area, indicating that your selections have been saved. **Stop! End of Task.**	

Restore Preferences/Map Positions

113

Background

When to use

Use this procedure to restore previously saved user preferences for the Map pane display and/or Map item positions.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see the following *User Reference* sections:

- The Map window
- Map preferences

Instructions

Task

Complete the following steps to restore user preferences and/or map item positions.

Step	Action	
1	Select **File** from the main menu bar on the Map window. The File menu is displayed.	
2	Select **Restore** from the File menu. A sub-menu is displayed.	
3	TO RESTORE... ■ User preferences ■ Map item positions ■ User preferences and map item positions	CHOOSE... ■ Preferences ■ Positions ■ Both
4	A message is displayed in the status bar area, indicating that the system default settings have been restored. **Stop! End of Task.**	

Copy Preferences/Map Positions

114

Background

When to use

Use this procedure to copy the user preferences and/or Map item positions saved by another user.

Before you begin

Before you begin this task, be aware that map item positions can only be copied from a user who shares the same Target Group of NEs.

To perform this task, access the Map window.

Related information

For related information, see the following *User Reference* sections:

- The Map window
- Map preferences

Instructions

Task

Complete the following steps to copy another user's preferences and/or Map item positions.

Step	Action	Action	Reference
1	Select **File** from the main menu bar on the Map window. The File menu is displayed.		
2	Select **Copy** from the File menu. A sub-menu is displayed.		
3	TO COPY A USER'S... ■ Preferences ■ Map item positions ■ Preferences and Map item positions	CHOOSE... ■ Preferences ■ Positions ■ Both	
4	The Choose a User window is displayed.		
5	Choose a user and click the OK button. If you are copying map item positions, the new positions are applied to your Map pane display once a user is chosen. If you are copying another user's preferences, the View Preferences window is displayed. Make any changes as necessary to the other user's preferences before applying them. When you are finished making necessary changes, click the OK button.		T 111, Modify User Preferences
6	A message is displayed in the status bar area, indicating that the copy from another user is completed. **Stop! End of Task.**		

Task Series 200

Fault Management

Activate the Alarm Browser

200

Background

When to use

Use this procedure to activate the alarm browser. This allows you to capture alarm, event, and clear messages that are forwarded to network surveillance OSs for NEs in your Target Group, and displays them in the Log Browser window on your workstation screen.

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task Complete the following steps to activate the alarm browser.

Step	Action
1	Select **Fault** from the main menu bar on the Map window. This displays a pull-down menu.
2	From the pull-down menu, select **Alarm Browser**. This displays the Log Browser window.
3	To save the output from this window to a file, do the following, a. Click on **File** on the menu bar on the Log Browser window and then select **Save As**. A pop-up window is displayed. b. Select the PC drive where the file folder resides in which to store the file output by clicking the down arrow next to the “Look In” field on the window. Select the drive. c. Select and open the file folder for the saved output file by double-clicking on the folder in the scrollable list on the pop-up window. d. Type a name for the output file in the File name field. e. Click the Save button. The output is saved to the named file. **NOTE:** To view the saved output file, use the Wordpad application.
4	When you are finished viewing the log information, access the **File** pull-down menu from the menu bar and select **Close**. **Stop! End of Task.**

Access the Alarm Summary

201

Background

When to use

Use this procedure to access the Alarm Summary window, which contains NE/ aggregate alarm summary information, as well as Trail Alarm summary information. This summary information includes the number of critical, major, and minor alarms for each NE and trail.

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task Complete the following steps to access the Alarm Summary.

Step	Action
1	Select an NE on the Map pane on the Map window to see an alarm summary for a specific NE. **OR** Select no NEs at this point to see an alarm summary for all NEs in your Target Group.
2	Select **Fault** from the main menu bar on the Map window. This displays a sub-menu.
3	From the sub-menu, select **Alarm Summary**. This displays the Alarm Summary window. The Alarm Summary window contains two sections - the NE/Aggregate Alarm Summary table and the Trail Alarm Summary table. **NE/Aggregate Alarm Summary Table —** Each line in this table provides, for the listed TID, a color code indicating the highest severity alarm for the NE/aggregate, as well as a count of the Critical, Major, and Minor alarms for SONET or Prompt and Deferred alarms for SDH, and count of Standing Condition (SC) events (shown under the “NA” category) for the NE/aggregate. For the NEs listed, you can initiate cut-throughs, access the Alarm List, define the level of alarms to be monitored/displayed, provision the NE system parameters and port,and display equipment. To access these tasks, point to an NE’s summary line with the mouse, click the left mouse button to select it, and then click the menu mouse button. A pop-up menu appears, from which you can select the desired operation. **NOTE:** For specific information about an operation (such as provisioning NE ports), look up the related task in the Task Index. **Trail Alarm Summary Table —** This table lists a count of critical, major, and minor alarms for the AIDs that terminate the trail between two NEs. A color code indicates the highest severity alarm for the trail.
4	When you are finished viewing the alarm summary information, access the **File** pull-down menu from the menu bar and select **Close**. **Stop! End of Task.**

Access the Alarm List

202

Background

When to use

Use this procedure to access the alarm list, which contains a line of information about each active alarm or standing condition (SC) event in an NE or aggregate. An SC event requires a clear command from the NE to indicate that the condition no longer exists. You can sort the list by alarm severity and age, age alone, condition, data/time logged, or acknowledged vs. unacknowledged. You can also use the list to acknowledge and unacknowledge alarms (see Related information below).

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task Complete the following steps to access the alarm list.

Step	Action
1	Position the mouse pointer over the NE or aggregate for which you want a list of alarms and press the menu (right) mouse button. A sub-menu appears.

Step	Action (Contd)
2	Select **Alarm List** from the sub-menu. The Alarm List window is displayed. Each row on the window represents an alarm in the selected NE. The default sort order is occurrence date and time. You can change the sort order by clicking on the column head of the desired sort, choosing **View** from the menu bar on the Alarm List window, which brings up a sub-menu, and the choosing **Sort** from the displayed sub-menu, which brings up the Sort window. Select the sort criteria for each level of sort by clicking the down arrow next to each field to display a drop-down list, and then select the field on which to sort, and then choose to sort by the selected field in either Ascending or Descending order. See the Sorting Tables section in Chapter 2, The WaveStar SNMS Graphical User Interface. (The Alarm List window can also be displayed from the Alarm Summary window by positioning the mouse cursor on the NE's TID on the Alarm Summary window, single-clicking the left mouse button to select the NE/TID, right-clicking the menu mouse button to display a pop-up menu, and the chooseing **Alarm List** from the pop-up menu.) The Alarm List window provides the following data for each alarm for the selected NE: ■ Color—a color code associated with the alarm severity ■ Alarm ID—an identifying code for the alarm ■ TID—the TID of the NE that originated the message or target TID that receives a command. ■ AID—the Access Identifier, or address, of the equipment component or facility. If this is part of an SLC NBS (Narrow Band Shelf), an asterisk (*) appears. ■ Ack—the user ID of the user that acknowledged the alarm ■ Severity—Critical, Major, or Minor ■ SA/NSA—whether the problem is service affecting (SA) or non-service affecting (NSA) ■ Date/Time of OCC—the date/time the alarm occurred ■ Date/Time of Log DateTime—the date/time the alarm was logged by the EMS ■ Condition—a code that indicates the type of failure or status condition ■ SLA—the Signal Level Affected (category) **NOTE:** To display details about a specific alarm or event shown in the Alarm list, position the mouse button on the alarm listing for which you want additional details, and double click the select mouse button. This displays the Alarm Text window, containing specific information about the alarm or event.

Step	Action (Contd)
3	To save the output from this window to a file, do the following, a. Click on **File** on the menu bar on the Alarm List window and then select **Save As**. A pop-up window is displayed. b. Select the PC drive where the file folder resides in which to store the file output by clicking the down arrow next to the "Look In" field on the window. Select the drive. c. Select and open the file folder for the saved output file by double-clicking on the folder in the scrollable list on the pop-up window. d. Type a name for the output file in the File name field. e. Click the Save button. The output is saved to the named file. **NOTE:** To view the saved output file, use the Wordpad application.
4	When you are finished viewing the alarm list information, access the **File** pull-down menu from the menu bar and select **Close**. **Stop! End of Task.**

Acknowledge/Unacknowledge Alarms

203

Background

When to use

Use this procedure to acknowledge or unacknowledge single alarms, one at a time.

Before you begin

Before you begin this task, determine the alarm(s) to be acknowledged or unacknowledged.

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task

Complete the following steps to acknowledge or unacknowledge single alarms, one at a time.

Step	Action
1	Display the Alarm List window (see T 202, Access the Alarm List).
2	Left click on the row representing the alarm you want to acknowledge or unacknowledge.
3	Select Fault from the menu bar near the top of the Alarm List window. This displays a sub-menu.
4	Select **Acknowledge Selected** or **Unacknowledge Selected** from the displayed sub-menu, as appropriate. (If you wish to acknowledge or unacknowledge *all* the alarms in the list, select **Acknowledge All in List** or **Unacknowledge All in List**, as appropriate.) **NOTE:** If an alarm is not yet acknowledged, there is no entry in the Ack field on that line. If it is already acknowledged, the Ack field contains the acknowledger's userid. **Stop! End of Task.**

Acknowledge/Unacknowledge Alarm Groups

204

Background

When to use

Use this procedure to select and then acknowledge or unacknowledge a group of alarms.

Before you begin

Before you begin this task, determine the alarms to be acknowledged or unacknowledged.

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task

Complete the following steps to select and then acknowledge or unacknowledge a group of alarms.

Step	Action
1	Display the Alarm List window (see T 202, Access the Alarm List).
2	Using the mouse, select each row that contains an alarm you want to include in the group to be acknowledged or unacknowledged. To select multiple continuous rows, hold the Contro key down and drag the mouse pointer over the desired lines. To select multiple non-continuous lines, hold the Shift or Control key down and right click each line to be included. (Unacknowledged alarms contain no entry on their rows in the **Ack** column. Acknowledged alarms contain, in the **Ack** column, the login ID of the person who acknowledged the alarm.) Select as many rows of acknowledged or unacknowledged alarms as desired.
3	Select **Fault** from the menu bar at the top of the Alarm List window. This displays a sub-menu.
4	Choose **Acknowledge Selected** or **Unacknowledge Selected**, as appropriate. (Or to acknowledge or unacknowledge *all* alarms in the list [without having to choose individual alarms], select **Acknowledge All in List** or **Unacknowledge All in List**, as appropriate.) **Stop! End of Task.**

Acknowledge/Unacknowledge All Alarms

205

Background

When to use

Use this procedure to acknowledge all unacknowledged alarms on the Alarm List window or to unacknowledge all acknowledged alarms on the Alarm List window.

Before you begin

Before you begin this task, you should make certain that you do want to acknowledge or unacknowledge these alarms.

Related information

For related information, see Chapter 3, Fault Management and T 202, Access the Alarm List.

Instructions

Task

Complete the following steps to acknowledge or unacknowledge all alarms.

Step	Action
1	Display the Alarm List window (see T 202, Access the Alarm List).
2	Select **Fault** from the menu bar at the top of the Alarm List window. This displays a sub-menu.
3	From the sub-menu, choose **Acknowledge All in List** (to acknowledge all unacknowledged alarms in the Alarm List window) or **Unacknowledge All in List** (to unacknowledge all acknowledged alarms in the Alarm List window), as appropriate. (Unacknowledged alarms contain no entry in the Ack field on their rows. Acknowledged alarms contain, in the Ack field, the userid of the alarm acknowledger.) **Stop! End of Task.**

Acknowledge/Unacknowledge All Alarms for an NE

206

Background

When to use

Use this procedure to acknowledge or unacknowledge all alarms for a selected NE or aggregate.

Before you begin

Before you begin this task, you should make certain that you do want to acknowledge or unacknowledge these alarms.

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task

Complete the following steps to acknowledge or unacknowledge all alarms for a selected NE or aggregate.

Step	Action
1	On the Map pane portion of the Map window, use the mouse to select the NE or aggregate for which you want to acknowledge all unacknowledge alarms or unacknowledge all acknowledged alarms. **OR** Select no NE at this point.
2	Select **Fault** from the main menu bar at the top of the Map window. This displays a sub-menu.
3	Select **Alarm Acknowledgement** from the displayed sub-menu. This displays another sub-menu containing the choices **Acknowledge** and **Unacknowledge**.
4	From the displayed sub-menu, select **Acknowledge** to acknowledge all unacknowledged alarms for an NE, or **Unacknowledge** to unacknowledge all acknowledged alarms for an NE. If you did not choose an NE in step 1, the Choose an NE/Aggregate window is displayed. To obtain a listing of just NEs, click the Network Elements radio button. To obtain a listing of aggregates, click the Aggregates button. Double-click the on the item in the list (network element or aggregate) and click the OK button. Alarms are acknowledged or unacknowledged for the selected NE or aggregate or NEs. **Stop! End of Task.**

Display Trail Information

207

Background

When to use

Use this procedure to display information for the selected trail. The following information can be obtained for the selected trail:

- Trail Alarm Summary—displays a count of the major, minor, and minor alarms generated by a trail
- Trail Alarm List—displays a list of alarms generated by a trail
- Trail List—displays the TIDs of the NEs connected by a trail and the origination and termination port AIDs of the trail

The trail information that can be obtained by selecting the trail on the Map window and then selecting one of the above options via a pop-up window.

Before you begin

Before you begin this task, determine the trail for which you wish to display trail information and the type of information you want to display.

Be aware that alarm data for manually added trails between NEs managed by WaveStar SNMS and non-managed devices is not available.

Related information

For related information, see T 201, Access the Alarm Summary and Chapter 3, Fault Management.

Instructions

Task Complete the following steps to display trail information.

Step	Action
1	On the Map window, position the mouse pointer on the trail for which you want to display trail alarm data and click the right (menu) mouse button. A pop-up menu is displayed. **NOTE:** When the mouse cursor is positioned on the trail line, a small note is displayed naming the trail if it is a single trail, or the phrase "Multiple" if the line represents multiple trails.
2	Choose one of the following options from the displayed pop-up menu: ■ **Trail Alarm Summary**—to display the Trail Alarm Summary ■ **Trail Alarm List—**to display the Trail Alarm List ■ **Trail List**—to display the Trail List **NOTE:** You can also access the Trail List by choosing **View** from the main menu bar on the Map window and then choosing **Trail List** from the View sub-menu. The Choose a Trail window is displayed. To choose a specific trail for display, double-click on the trail in the window list and click the OK button. To obtain a listing of all trails, click the word ALL in the window list and click the OK button. The Trail List window for your choice is displayed. The Trail List for an NE can also be displayed by positioning the mouse cursor on the NE in the Map window, right-clicking to display a pop-up menu, and selecting **Trail List** from the pop-up menu. The window containing the chosen trail information is displayed.

Step	Action (Contd)
3	If you chose the **Trail Alarm Summary** or **Trail Alarm List**, and you want to save the displayed output to a file, do the following: a. Click on **File** on the menu bar of the window and then select **Save As**. A pop-up window is displayed. b. Select the PC drive where the file folder resides in which to store the file output by clicking the down arrow next to the "Look In" field on the window. Select the drive. c. Select and open the file folder for the saved output file by double-clicking on the folder in the scrollable list on the pop-up window. d. Type a name for the output file in the File name field. e. Click the Save button. The output is saved to the named file. **NOTE:** To view the saved output file, use the Wordpad application. If you chose the **Trail List**, click the Close button on the Trail List window to close it. **Stop! End of Task.**

Monitor Alarms

208

Background

When to use

Use this procedure to limit the amount of autonomous messages and Critical autonomous messages that should be monitored for an NE. See the Related Information below for more information about alarm monitoring.

Before you begin

Before you begin this task, determine what type of alarm monitoring you want to accomplish.

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task

Complete the following steps to monitor alarms.

Step	Action
1	Select **Fault** from the main menu bar. This displays a sub-menu.
2	Select **Alarm Monitoring** from the sub-menu. This displays another sub-menu.
3	Select one of the following sub-menu options: ■ **All Messages**—This message allows all autonomous messages to be accepted from the NE. ■ **Throttled**—This option allows only Critical messages to be accepted from the NE, even if the alarm throttle level set in the Administer NE menu has not been reached or if automatic alarm throttling is displayed. Selecting either of the above options displays the Choose an NE/ Aggregate window.
4	Click on the Network Elements radio button to limit the list to NEs. Click the Aggregates radio button to limit the list to aggregates.
5	Double click on the TID of the NE or aggregate alias for which you want to change the alarm monitoring status and then click the OK button. (Alarm monitoring status of the NE is displayed on the Map: if **Throttled** is selected, the NE icon changes back and forth from grey to the color of the highest severity alarm; but if **All Messages** is selected, the NE icon displays only the color of the highest severity alarm.) **Stop! End of Task.**

View Throttled Alarm Statistics

209

Background

When to use

Use this procedure to view throttled alarm statistics for an NE. This window indicates the time of the last alarm message received.

Before you begin

Before you begin this task, determine the NE for which you want to view the throttled alarm statistics.

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task

Complete the following steps to view throttled alarm statistics for NEs.

Step	Action
1	Select an NE on the Map pane portion of the Map window. **OR** Select no NE at this point.
2	Select **Fault** from the main menu bar on the Map window. This displays a sub-menu.
3	Select **Alarm Monitoring** from the displayed sub-menu. This displays another sub-menu.
4	Select **Statistics** from the displayed sub-menu. If you did select an NE in step 1, the Choose an NE/Aggregate window is displayed. To obtain a list of NE on this window, click the Network Elements radio button To obtain a list of aggregates on this window, click the Aggregates radio button. For this function, click the Network Elements radio button to list NEs. Double-click on the NE in this list to select it and click the OK button. A pop-up window is displayed, showing the number of autonomous messages and alarms that have been generated for the selected NE since the time and date of the last reporting interval. Click the OK button on the pop-up window to close it. **Stop! End of Task.**

Resynchronize Alarms

210

Background

When to use

Whenever any loss of NE communications occurs, use this procedure to update the alarm list and autonomous message log from the network elements in the subnetwork. The system automatically resynchronizes alarms whenever the communications status with an NE changes from *down* to *up*, but this procedure allows you to perform this function any other time, as desired.

NOTE:
Alarm resynchronization does not work unless the NE is in an unthrottled state. Before resynchronizing alarms for an NE, the user should disable the automatic/manual alarm throttling control for the NE.

The alarm resynchronization process does not clear the existing GUI display and alarm tally/list during the resynchronization process, but rather retains the existing alarms until the resynchronization is complete. The system can distinguish between:

- standard alarms that already exist in the GUI and alarm/tally list displays
- new alarms, and
- alarms that are cleared by the NE between resynchronizations.

This allows the system to incrementally update the GUI display and alarm tally/list to accurately indicate the subnetwork status to the user.

Before you begin

Before you begin this task, be aware that alarms cannot be resynchronized on non-communicating NEs.

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task

Complete the following steps to resynchronize alarms on demand.

Step	Action
1	Position the mouse cursor on the NE and click the menu (right) mouse button. A pop-up menu is displayed. **OR** Select no NE at this point.
2	If you selected an NE right-clicked the mouse to obtain a pop-up menu, select **Resynchronize Alarms** from the pop-up menu. If you did not select an NE on the Map window in step 1, choose **Fault** from the main menu bar on the Map window. The Fault sub-menu is displayed. Choose **Resynchronize Alarms** from the Fault sub-menu. The Choose an NE/Aggregate window is displayed. Click the Network Elements radio button on this window to list NEs. Click the Aggregates radio button on this window to list aggregates. Double-click on the item (network element, aggregate) in the list to select it and click the OK button. The system resynchronizes the alarms for the selected NE/aggregate. **Stop! End of Task.**

Enable/Disable Audible Alarms

211

Background

When to use

Use this procedure to enable and disable the audible alarm feature.

Before you begin

Before you begin this task, be sure that you do want to change the current status of the audible alarm feature.

Turn up the volume on your PC's audio control if you decide to enable the Audible Alarms feature to clearly hear audible alarms or standing condition (SC) events.

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task

Complete the following steps to enable or disable the audible alarm feature.

Step	Action
1	On the Map window, select **Fault** from the main menu bar. This displays a sub-menu.
2	Select **Audible Alarms** from the displayed sub-menu. This displays another sub-menu. ■ If the audible alarm feature is currently enabled, a mark appears next to the Audible menu item on the displayed sub-menu. If desired, click on Audible to disable audible alarms. ■ If the audible alarm feature is currently disabled, the mark does *not* appear next to the Audible menu item on the displayed sub-menu. If desired, click on Audible to enable audible alarms. **NOTE:** Another way to enable or disable the Audible Alarm feature is to click on the Audible Alarms button on the Map window toolbar. If the Audible Alarms feature is currently enabled, clicking on it until a red slash appears across this button disables the Audible Alarms feature. Clicking on it again enables the Audible Alarms feature. **Stop! End of Task.**

Quiet the Audible Alarm

212

Background

When to use

Use this procedure to quiet the audible alarm when it is sounding. When the audible alarm is enabled and an alarm occurs, it sounds for a short duration (about five seconds) and repeats every minute. Each time the audible alarm sounds, the sound corresponds to the highest level alarm received. Once the user quiets the alarm, it does not sound again until another alarm is received.

Before you begin

Before you begin this task, be sure that you do want to quiet the audible alarm and that you have noted the latest alarms.

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task

Complete the following steps to quiet the audible alarm.

Step	Action
1	On the Map window, select **Fault** from the main menu bar. This displays a sub-menu.
2	Select **Audible Alarms** from the displayed sub-menu. This displays another sub-menu.
3	Select **Quiet Current Alarms** from the displayed sub-menu. The system quiets the current alarms. (The alarms still need to be acknowledged.) **Stop! End of Task.**

Enable/ Disable the Alarm Indicator

213

Background

When to use

Use this procedure to enable or disable the system's alarm indicator function. Disabling the alarm indicator causes nodes and aggregates not to flash when alarms are received. Enabling alarm indicators turns this function back on.

NOTE:
Remember that disabling the alarm indicator function stops alarmed nodes and aggregates from flashing, but it does *not* acknowledge alarms.

Before you begin

Before you begin this task, make sure you do want to enable or disable the alarm indicator function, as appropriate.

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task

Complete the following steps to enable or disable the alarm indicator function for all NEs.

Step	Action
1	On the Map window, select **View** from the main menu bar. This displays a sub-menu.
2	Select **Alarm Indications** from the displayed sub-menu. This displays another sub-menu.
3	On the displayed sub-menu, there will be a bullet mark next to either **All Enabled** or **All Disabled**. The one with the bullet is the current state. You can change the state by clicking with your mouse pointer. For example, if the bullet is currently next to **All Enabled** and you want to disable the alarm indicator function, click **All Disabled**. The system moves the bullet and makes the change to the feature. **Stop! End of Task.**

View an ASAP

214

Background

When to use

Use this procedure to view an existing Alarm Severity Assignment Profile (ASAP) for a Profile Type in an NE.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see T 215, Add an ASAP, T 216, Modify an ASAP , T 217, Delete an ASAP , T 219, View ASAP Assignments , and the following section in the *User Reference* section*:*

- Alarm severity assignment profile management

Instructions

Task Complete the following steps to view an existing ASAP.

Step	Action
1	Select an NE from the Map window. **OR** Select no NEs at this point.
2	Select **Fault** from the main menu bar on the Map window. The Fault menu is displayed.
3	Select **Alarm Severity Assignment Profiles** from the Fault menu. If you did not select an NE in Step 1, the Choose an NE/Alarm Severity Profiles is displayed. Select an NE by double-clicking on the item and click the OK button. The Alarm Severity Assignment Profile Management window is displayed. This window consists of an explorer, which allows you to view and select the Profile Type under the selected NE, and five action buttons to the right of the explorer: ■ Add ■ Modify ■ Delete ■ View ■ Assignments
4	Click on the plus (+) sign next to the NE TID in the explorer to expand and view the Profile Types for that NE.
5	Click on a Profile Type to select it. The Profile Type is highlighted.
6	Click on the plus (+) sign next to the Profile Type in the explorer to expand and view the Profile Names under that Profile Type.
7	Choose a Profile Name under a Profile Type. The chosen Profile Name is highlighted.
8	Click on the View button. The View an Alarm Severity Assignment Profile window is displayed, showing the probable causes (alarm states) for the selected Profile Type and the current alarm severity levels for each probable cause. **Stop! End of Task.**

Add an ASAP

215

Background

When to use

Use this procedure to add a new Alarm Severity Assignment Profile (ASAP) for a Profile Type in the chosen NE. To add a new ASAP, the alarm severity settings of the default ASAP for the selected Profile Type are copied over to a new Profile Name. The newly created ASAP will have the same alarm severity settings as the default ASAP unless they are changed. Once it is created, the new ASAP, which is identified by its Profile Name, can be assigned to an entity (AID) in the NE.

Before you begin

Before you begin this task, be aware that WaveStar SNMS will prevent you from adding a new ASAP for a Profile Type if the maximum number of allowable ASAPs for that Profile Type in the NE has been exceeded.

To perform this task, access the Map window.

Related information

For related information, see T 214, View an ASAP , T 216, Modify an ASAP , T 217, Delete an ASAP , T 218, Assign ASAP to AID, T 219, View ASAP Assignments , and the following section:

- Alarm severity assignment profile management

Instructions

Task Complete the following steps to add a new ASAP.

Step	Action
1	Select an NE from the Map window. **OR** Select no NEs at this point.
2	Select **Fault** from the main menu bar on the Map window. The Fault menu is displayed.
3	Select **Alarm Severity Assignment Profiles** from the Fault menu. If you did not select an NE in Step 1, the Choose an NE/Alarm Severity Profiles is displayed. Select an NE by double-clicking on the item and click the OK button. The Alarm Severity Assignment Profile Management window is displayed. This window consists of an explorer, which allows you to view and select the Profile Type under the selected NE, and five action buttons to the right of the explorer: ■ Add ■ Modify ■ Delete ■ View ■ Assignments
4	Click on the plus (+) sign next to the NE TID in the explorer to expand and view the Profile Types for that NE.
5	Click on the plus (+) sign next to the Profile Type in the explorer to expand and view the Profile Names under that Profile Type.
6	Click on the default profile under the selected Profile Type. The default profile is highlighted.
7	Click on the Add button. The Add an Alarm Severity Assignment Profile window is displayed, showing the default alarm severity levels in the default profile for the Profile Type chosen.
8	To create an ASAP for a Profile Type other than the one originally chosen, click the down arrow next to the Profile Type field and select a Profile Type. Otherwise, leave the original Profile Type chosen in the Profile Type field.

Continued on next page

Step	Action (Contd)
9	Enter a name for the new ASAP in the Profile Name field. The Profile Name can be 1-24 characters (A-Z, a-z, 0-9, -). **NOTE:** The Profile Name entered becomes the suffix of the complete profile name; the system adds a prefix based on the Profile Type chosen.
10	If desired, make changes to the alarm severity level settings for the new ASAP. To change a alarm severity level for a probable cause, click the appopriate radio button. For example, if the current alarm severity level is CR (for Critical), and you want to change it to MJ (Major), click the MJ radio button in the row for the probable cause.
11	Click the Apply button activate your choices, or click the OK button to activate your choices and close the window. The new ASAP is created. **Stop! End of Task.**

Modify an ASAP

216

Background

When to use

Use this procedure to modify an existing Alarm Severity Assignment Profile (ASAP) for a Profile Type.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see T 214, View an ASAP , T 215, Add an ASAP, T 217, Delete an ASAP , T 218, Assign ASAP to AID, T 219, View ASAP Assignments , and the following section:

- Alarm severity assignment profile management

Instructions

Task Complete the following steps to modify an existing profile.

Step	Action
1	Select an NE from the Map window. **OR** Select no NEs at this point.
2	Select **Fault** from the main menu bar on the Map window. The Fault menu is displayed.
3	Select **Alarm Severity Assignment Profiles** from the Fault menu. If you did not select an NE in Step 1, the Choose an NE/Alarm Severity Profiles is displayed. Select an NE by double-clicking on the item and click the OK button. The Alarm Severity Assignment Profile Management window is displayed. This window consists of an explorer, which allows you to view and select the Profile Type under the selected NE, and five action buttons to the right of the explorer: ■ Add ■ Modify ■ Delete ■ View ■ Assignments
4	Click on the plus (+) sign next to the NE TID in the explorer to expand and view the Profile Types for that NE.
5	Click on the plus (+) sign next to the Profile Type in the explorer to expand it.
6	Choose a Profile Name for the profile to be modified. The Profile name is highlighted.
	Continued on next page

Step	Action (Contd)
7	Click on the Modify button. The Modify an Alarm Severity Assignment Profile window is displayed, showing the the current alarm severity levels for each probable cause in the selected Profile Type and Profile Name.
8	Make changes to the alarm severity level(s) for the probable cause(s), as needed. To change a alarm severity level for a probable cause, click the appropriate radio button. For example, if the current alarm severity level is CR (for Critical), and you want to change it to MJ (Major), click the MJ radio button in the row for the probable cause.
9	Click the OK button. The changes are made to the selected ASAP. **Stop! End of Task.**

Delete an ASAP

217

Background

When to use

Use this procedure to delete an Alarm Severity Assignment Profile (ASAP) for a Profile Type in an NE.

Before you begin

Before you begin this task, make sure that the ASAP to be deleted is not assigned to an AID in an NE. If it is, remove the ASAP assignment from the NE's AID. Also, you cannot delete the default ASAP for a Profile Type in an NE.

To perform this task, access the Map window.

Related information

For related information, see T 214, View an ASAP , T 215, Add an ASAP, T 216, Modify an ASAP , T 218, Assign ASAP to AID, T 219, View ASAP Assignments, and the following section:

- Alarm severity assignment profile management

Instructions

Task Complete the following steps to delete an ASAP.

Step	Action
1	Select an NE from the Map window. **OR** Select no NEs at this point.
2	Select **Fault** from the main menu bar on the Map window. The Fault menu is displayed.
3	Select **Alarm Severity Assignment Profiles** from the Fault menu. If you did not select an NE in Step 1, the Choose an NE/Alarm Severity Profiles is displayed. Select an NE by double-clicking on the item and click the OK button. The Alarm Severity Assignment Profile Management window is displayed. This window consists of an explorer, which allows you to view and select the Profile Type under the selected NE, and five action buttons to the right of the explorer: ■ Add ■ Modify ■ Delete ■ View ■ Assignments
4	Click on the plus (+) sign next to the NE TID in the explorer to expand and view the Profile Types for that NE.
5	Click on the plus (+) sign next to the Profile Type in the explorer to expand it. The explorer shows the list of ASAPs available for that Profile Type.
6	Click on the Profile Name of the ASAP to be deleted. The ASAP is highlighted. The five action buttons to the right of the explorer are enabled.
7	Click the Delete button. A pop-up window is displayed, asking if you really want to delete the selected profile.
8	Choose Yes to delete the profile. **Stop! End of Task.**

Assign ASAP to AID

218

Background

When to use

Use this procedure to associate an Alarm Severity Assignment Profile (ASAP) with one or more AIDs in an NE. You have the option of either assigning the default ASAP or an ASAP that you have created to an NE's AID.

Before you begin

Before you begin this task, add the new ASAP (if it has not already been created) or modify the existing ASAP to be associated with the NE's AID(s). Also, use the Assignments button on the Alarm Severity Assignment Profile Management window to view the NE entity(ies) currently assigned to an ASAP (Profile Name).

To perform this task, access the Map window.

Related information

For related information, see T 214, View an ASAP , T 215, Add an ASAP, T 216, Modify an ASAP , T 217, Delete an ASAP , and the following section:

- Alarm severity assignment profile management

Instructions

Task

Complete the following steps to assign an ASAP to one or more AIDs in an NE.

Step	Action
1	Select **Configuration** from the main menu bar on the Map window. The Configuration menu is displayed.
2	Select **Provision** from the Configuration menu. The Choose an NE window is displayed.
3	Double-click on the NE in the list to select it.
4	Click the OK button. The Provisioning window is displayed. The alternate way to access the Provisioning window is to position the mouse pointer on the NE in the Map window and click the left (select) mouse button to select it. The selected NE is highlighted. Then, click the right (menu) mouse button to display a pop-up menu, and select **Provision** from the pop-up menu.
5	In the Network Element Explorer portion of the Provisioning window, expand the NE equipment hierarchy until the desired AID is displayed.
6	Click on the AID to choose it. The AID is highlighted.
7	Click the Provision button. The Provisioning panel of the window is displayed.
8	Click the down arrow next to the ASAP field in the Provisioning panel to display a drop-down list of available ASAPs for the AID. The default ASAP for the AID is highlighted and displayed, by default.
9	Select the ASAP to be assigned to the AID.
10	Click the Apply button. A pop-up message is displayed, advising you that the parameter change may affect service and asks whether you want to proceed with the change. The ASAP is assigned to the chosen AID.
11	Choose Yes. The Status Dialog window is displayed, showing that the ASAP assignment request is being processed. Click the Close button on the Status Dialog window to close it.
12	To make additional ASAP assignments, repeat Steps 6-11. **Stop! End of Task.**

View ASAP Assignments

219

Background

When to use

Use this procedure to view the entities to which the chosen Alarm Severity Assignment Profile (ASAP) is assigned.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see T 214, View an ASAP , T 215, Add an ASAP, T 216, Modify an ASAP , T 217, Delete an ASAP , and the following *User Reference* section*:*

- Alarm severity assignment profile management

Instructions

Task

Complete the following steps to view the entity assignments (by AID) for the selected Profile Type and ASAP.

Step	Action
1	Select an NE from the Map window. **OR** Select no NEs at this point.
2	Select **Fault** from the main menu bar on the Map window. The Fault menu is displayed.
3	Select **Alarm Severity Assignment Profiles** from the Fault menu. If you did not select an NE in Step 1, the Choose an NE/Alarm Severity Profiles is displayed. Select an NE by double-clicking on the item and click the OK button. The Alarm Severity Assignment Profile Management window is displayed. This window consists of an explorer, which allows you to view and select the Profile Type under the selected NE, and five action buttons to the right of the explorer: ■ Add ■ Modify ■ Delete ■ View ■ Assignments
4	Click on the plus (+) sign next to the NE TID in the explorer to expand and view the Profile Types for that NE.
5	Click on the plus (+) sign next to the Profile Type in the explorer to expand it.
6	Choose a Profile Name for the profile to be viewed. The Profile name is highlighted.
7	Click on the Assignments button. The Alarm Severity Assignment Profile Assignments window is displayed, showing the entity(ies), by AID, for the selected Profile Type and profile.
8	Click the Close button to close the window. **Stop! End of Task.**

Provision Environmental Alarms

220

Background

When to use

Use this procedure to assign alarm severity levels for environmental alarms generated by miscellaneous discretes (scan points) on the NE, by choosing an Alarm Severity Assignment Profile (ASAP) and a message to be displayed.

Before you begin

Before you begin this task, create an ASAP for the environmental alarm Profile Type of the NE if you want to use an ASAP other than the NE's default ASAP.

Be aware that this function is only available for AllMetro and OLS 400G NEs.

To perform this task, access the Map window.

Related information

For related information, see T 214, View an ASAP , T 215, Add an ASAP, T 216, Modify an ASAP , T 217, Delete an ASAP , and the following *User Reference* section:

- Alarm severity assignment profile management

Instructions

Task

Complete the following steps to set up severity levels for the chosen NE's environmental alarms and an alarm message to be displayed (if needed).

Step	Action
1	Select **Fault** from the main menu bar on the Map window. The Fault menu is displayed.
2	Select **Alarm Provisioning** from the Fault menu. The Fault Management Administrative Settings window is displayed. This window is divided into three tabbed panels: ■ Miscellaneous Discretes ■ Alarm Delays ■ Office Alarms & Messages
3	Click on the Miscellaneous Discretes panel tab, if this panel of the window is not already displayed.
4	In the Miscellaneous Discretes Explorer portion of the window, click on the NE to select it. The NE's TID is highlighted.
5	Click on the plus (+) sign next to the TID in the explorer to expand and display the environmental "scan points" (discretes) for the NE.
6	Click on a scan point (discrete) in the list to select it. If necessary, use the scroll bar to the right of the displayed items in the explorer to find the desired scan point (discrete). The selected discrete is highlighted.
7	Choose an ASAP by clicking the down arrow next to the Environmental ASAP Name field to display a list of available ASAPs and clicking on an ASAP to select it.
8	If needed, enter alarm message text for the selected scan point in the Alarm Message field. The alarm message can contain 1-26 alphanumeric characters. Spaces and periods are allowed. This step is optional. **Stop! End of Task.**

Provision Alarm Delays

221

Background

When to use

Use this procedure to set alarm generation and clearing delays for NEs. Setting an alarm delay invokes the system to only send an alarm notification when an alarm causing event continues to be present for the specified alarm delay period. Setting a clearing delay invokes the system to only clear an alarm when the alarm causing event has been absent for the specified clearing delay period.

Before you begin

Before you begin this task, be aware that the OLS 400G NE only supports alarm generation and clearing delays for facility alarms.

To perform this task, access the Map window.

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task

Complete the following steps to set alarm generation and clearing delays for an NE.

Step	Action
1	Select **Fault** from the main menu bar on the Map window. The Fault menu is displayed.
2	Select **Alarm Provisioning** from the Fault menu. The Fault Management Administrative Settings window is displayed. This window is divided into three tabbed panels: ■ Miscellaneous Discretes ■ Alarm Delays ■ Office Alarms & Messages

Step	Action (Contd)
3	Click on the Alarm Delays panel tab. The Alarm Delays panel is displayed.
4	Choose an NE from the Network Elements list by clicking on the NE's TID. The NE is highlighted.
5	Set values for the following fields, as needed: ■ Alarm Delay Facility/(for AllMetro NEs only)Incoming Signal —use the spinner buttons next to this field to select an alarm delay period for facility alarms (or incoming signal alarms for AllMetro NEs). The available values are 0 (seconds) or between 10 and 60 (seconds). The available values for an Alarm Delay for Incoming Signals (AllMetro NEs only) are 0-120 (seconds). The value of this field must be less than or equal to the value of the Clear Delay Facility field. The default value is 0, if no other value is selected. ■ Clear Delay Facility/(for AllMetro NEs only)Incoming Signal —use the spinner buttons next to this field to select a clear delay period for facility alarms (or incoming signal alarms for AllMetro NEs). The available values are 0-60 (seconds). The available values for a Clear Delay for Incoming Signals (AllMetro NEs only) are 0-120 (seconds). The default value is 0, if no other value is selected. ■ Alarm Delay Equipment—use the spinner buttons next to this field to select an alarm delay period for equipment alarms. The available values are 0-60 (seconds). The value of this field must be less than or equal to the values of the Clear Delay Facility and the Clear Delay Equipment fields. The default value is 0, if no otther value is selected. ■ Clear Delay Equipment—use the spinner buttons next to this field to select a clear delay period for equipment alarms. The available values are 0-60 (seconds). The default value is 0, if no other value is selected. **Stop! End of Task.**

Provision Alarm Indicators and Autonomous Messages

222

Background

When to use

Use this procedure to enable or disable audio/visual alarm indicators and allow or inhibit autonomous messages for specific NEs in your network.

Before you begin

Before you begin this task, be sure that the Alarm Indicator and/or Audible Alarm feature(s) is enabled if you want to enable either alarm indicator for an NE.

Be aware that the ability to allow or inhibit autonomous messages is only for the current WaveStar SNMS login session, not for all login sessions for the NE. The ability to allow or inhibit autonomous messages is currently only available for OLS 400G NEs.

Related information

For related information, see the following:

- Chapter 3, Fault Management
- T 211, Enable/Disable Audible Alarms
- T 213, Enable/Disable the Alarm Indicator

Instructions

Task

Complete the following steps to provision audio/visual indicators and receipt of autonomous messages for an NE.

Step	Action
1	Select **Fault** from the main menu bar on the Map window. The Fault menu is displayed.
2	Select **Alarm Provisioning** from the Fault menu. The Fault Management Administrative Settings window is displayed. This window is divided into three tabbed panels: ■ Miscellaneous Discretes ■ Alarm Delays ■ Office Alarms & Messages
	Continued on next page

Step	Action (Contd)	
3	Click on the Office Alarms & Messages panel tab. The Office Alarms & Messages panel is displayed.	
4	Choose an NE from the Network Elements list by clicking on the NE's TID. The NE is highlighted.	
5	TO ...	CLICK ...
	■ enable audio/visual alarm indicators for alarms on the chosen NE	■ the Enabled radio button in the Office A/V Alarms portion of the panel
	■ disable audio/visual alarm indicators for alarms on the chosen NE	■ the Disabled radio button in the Office A/V Alarms portion of the panel
	■ inhibit the receipt of autonomous messages from the chosen NE	■ the Inhibit radio button in the Autonomous Messages portion of the panel
	■ allow the receipt of autonomous messages from the chosen NE	■ the Allow radio button in the Autonomous Messages portion of the panel
	Stop! End of Task.	

Automatically Throttle Alarms

223

Background

When to use

Use this procedure to set up automatic alarm throttling for an NE. When this feature is enabled, alarms (except for Critical Alarms) will be automatically throttled when the number of alarms exceeds the set alarm threshold.

Before you begin

Before you begin this task, access the Map window.

The following table shows the relationship of automatically throttling alarms using this procedure to manually throttling alarms for an NE and whether alarm throttling is enabled for the NE.

Manual Throttling	Auto Alarm Throttling	Alarm Throttling for the NE is:
ON	ON	ON
ON	OFF	ON
OFF	ON	ON (if threshold exceeded)
OFF	OFF	OFF

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task Complete the following steps to automatically throttle alarms for an NE.

Step	Action	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.	
2	Select **Fault** from the Administration menu. The Fault sub-menu is displayed.	
3	Select **Alarm Throttling** from the Fault sub-menu. The Automatic Alarm Throttling window is displayed.	
4	Click on the NE TID in the explorer portion of the window to select it. If the NE is under an aggregate, click on the plus (+) sign next to the aggregate in the explorer to expand the aggregate and select the NE.	
5	TO ... Enable automatic alarm throttling for the selected NE Disable automatic alarm throttling for the select NE	DO THIS... Click the Enabled button under the “Set Alarm Throttling to” portion of the window and select a alarm threshold by moving the threshold arrow to the left or right until the desired threshold number is shown in the box. Click the Disabled button under the “Set Alarm Throttling to” portion of the window.
6	Click the Apply button to activate your choice(s) or click the OK button to activate your choice(s) and close the window. **Stop! End of Task.**	

Filter Alarms

224

Background

When to use

Use this procedure to switch between the filtered and unfiltered view of alarms on the Map window, Alarm List, and alarm tallies (the Alarm Notifcation window). When the alarm filtered state is on (the filtered view), alarms or events that are filtered out by the system's alarm filtering methods (Alarm Aging, Event-Per-Time Filtering for the TC Event Browser, Symptomatic Alarm Filtering) are not shown in the Map window, Alarm List, and alarm tallies. When the alarm filtered state is off (the unfiltered view), all alarms and events, including those that would normally be filtered out by the system's various filtering methods, are shown in the Map window, Alarm List, alarm tallies, and TC Event Browser (for TC events that exceed the to the EPT count parameter set). An unfiltered view of alarms is the default. If the WaveStar SNMS GUI becomes flooded with symptomatic alarms, you can enable this option to filter such alarms out of the Map window, Alarm List, and alarm tallies. When you change this option, you must log out and then log back to reflect the change in the filtered or unfiltered state.

Before you begin

Before you begin this task, determine whether you want a filtered or unfiltered view of alarms and events in the network.

Related information

For related information, see Chapter 3, Fault Management.

Instructions

Task

Complete the following steps to choose a filtered or unfiltered view of alarms in the Map window, Alarm List, and alarm tallies.

Step	Action	
1	Select **Fault** from the main menu bar. The Fault menu is displayed.	
2	TO.... Obtain a filtered view of alarms in the network Obtain an unfiltered view of alarms in the network	DO THIS... Select the Filter Alarms option in the Fault menu to place an “x” before the option Select the Filter Alarms option to remove the “x” before the option (if there is an “x” there and the filtered view is activated). When the Filter Alarms option is changed, a pop-up window is displayed with the message “You must first log out and log back into the EMS”. A message is also displayed in the Map window status bar “User Preferences Saved Successfully”. This indicates that the change to the Alarm Filtering state has been saved for when you log out and log back into WaveStar SNMS.
3	Log out of WaveStar SNMS and then log back in to obtain the new view of alarms in the network. **Stop! End of Task.**	

Task Series 300

Configuration Management

Perform Cut-Through Commands

300

Background

When to use

Use this procedure to initiate a TL1 cut-through session from the Map window and perform enhanced cut-through commands via the Cut-Through window.

Before you begin

Before you begin this task, you must have already displayed the Map window and determined the NE for which you want to initiate a cut-through session.

The Cut-Through feature is not supported for OLS 400G NEs.

Related information

For related information, see the following:

- T 301, Build TL1 Commands
- T 302, Broadcast TL1 Commands
- Chapter 4, Configuration Management

Instructions

Task

Complete the following steps to initiate and perform cut-through.

Step	Action
1	Position the mouse pointer over the NE to which a cut-through is required and press the menu mouse button. A pop-up menu appears.
2	Select Cut-Through from the pop-up menu. The Cut-Through window and the Cut-Through Output window are displayed. (If the NE is unavailable for any reason, a message identifying the cause of the error is displayed in a pop-up window.)
3	At the Cut-Through window, type the appropriate TL1 command into the Cut-Through Command field. If desired, select the displayed Command by double-clicking on the command and the desired AID from the list by single-clicking on it to save typing time. See your NE documentation for detailed command information. (You can select the Clear Command Area button any time to clear the Cut-Through Command field and start over.) **NOTE:** The AID list for an NE displayed in the AID scroll list may not be complete. You may have to select a similar AID from the list to populate the Cut-Through Command field and then manually edit the AID to make it the correct one.
4	After completing your entry in the Cut-Through Command field, select the Send Command Now button. The command is echoed to the Cut-Through Output window and the command output appears there. **Stop! End of Task.**

Build TL1 Commands

301

Background

When to use

Use this procedure to create a TL1 command file to assist in performing maintenance and provisioning activities on one or more NEs (such as download of standard configuration), without having to manually enter a set of TL1 command strings. This feature both reduces the amount of manual entry needed to create TL1 command strings and allows for the reuse, at a later time, of the commands built on the same NE or other NEs of the same type.

Before you begin

Before you begin this task, you must have already determined the TL1 commands you wish to build.

Related information

For related information, see the following:

- T 300, Perform Cut-Through Commands
- T 302, Broadcast TL1 Commands
- Chapter 4, Configuration Management.

Instructions

Task Complete the following steps to build TL1 commands.

Step	Action
1	On the Map window, select **File** from the main menu bar. This displays a pull-down menu.
2	Select **TL1 Macro Scripts** from the displayed pull-down menu. This displays a sub-menu.
3	Select **TL1 Macro Builder** from the displayed sub-menu. This displays the Macro Builder/Broadcaster window. Select the Macro Builder tab if it is not already selected.
4	TL1 command files can only be built for one NE type at a time, so first specify the NE type by clicking the down arrow adjacent to the NE Type field (directly below the Manage TL1 Macro Files heading) and select an NE.
5	Next type the appropriate TL1 command(s) into the Macro File Commands area at the lower left of the window. Press the Return key between commands, typing each new command on the next available line in the Macro File Commands area. If desired, select from the displayed Command List by double-clicking on the command and from the AID List by single-clicking on the AID to save typing time. To enter multiple commands from the Command List, click on the end of a command string and press the Return key before entering the next command. This will access the next available command line. See your NE documentation for detailed TL1 command information.

Continued on next page

Step	Action (Contd)
6	When you have completed your macro file commands, select Save/Save As. This displays the Save As window.
7	In the Save As window, save the contents of the Macro File Command lines as a new macro file (by typing the new macro file name into the Save As field) or to an existing macro file name, overwriting the contents of the file (by selecting one from the displayed list). Don't forget to use the radio buttons to indicate whether the file should be **Accessible by all** or **Accessible by owner only**.
8	The following list shows how to use remaining items on the TL1 Macro Builder window: ■ Clear Command(s)—click this button to clear the current entries in the Macro File Command area. ■ Owner—displays the macro file owner's login ID. ■ File Properties—indicates whether the displayed macro file is Accessible By All or Accessible by Owner Only. This value can be changed (by owners) via the Save As screen, which is displayed by clicking the Save/Save As button. ■ Put Into Command Area—select this button to put the contents of the selected macro file into the command line text area. ■ View Macro—use this button to view the contents of the selected macro file. ■ Delete Macro—click this button to delete the selected macro file (for owners only). **Stop! End of Task.**

Broadcast TL1 Commands

302

Background

When to use

The broadcast TL1 commands feature allows you to perform maintenance and provisioning activities (such as download of standard configuration) on one or more NEs, utilizing the TL1 command files created by the TL1 macro builder feature, and broadcasting those files to multiple NEs of the same type. This feature saves you time by performing similar tasks on multiple NEs in one step, and by reducing the manual entry required in the creation of TL1 command strings.

Before you begin

Before you begin this task, you must have already determined the TL1 commands you wish to broadcast, or know the name of the TL1 macro file you are going to use.

Related information

For related information, see the following:

- T 300, Perform Cut-Through Commands
- T 301, Build TL1 Commands
- Chapter 4, Configuration Management

Instructions

Task Complete the following steps to broadcast TL1 commands.

Step	Action
1	On the Map window, select **File** from the main menu bar. This displays a pull-down menu.
2	Select **TL1 Macro Scripts** from the displayed pull-down menu. This displays a sub-menu.
3	Select **TL1 Macro Broadcaster** from the displayed sub-menu. This displays the Macro Builder/Broadcaster window.
4	Specify the NE type for the broadcast; select All NEs, NEs by Type, or NEs by TID from the **Where to Broadcast** block at the top middle of the Broadcaster window. Specify the parameters of the broadcast further by highlighting NEs in the Available Network Elements list (on the left side of the window) and clicking the single right arrow (**>**) to move them to the Chosen Network Elements list (on the right side). *The NEs placed in the Chosen Network Elements list on the right will be the ones to receive the broadcast.* (You can use the double arrows to move all current choices between the two lists.)
5	Next type the name of the macro file (to be broadcast to the NEs selected in the Chosen Network Element list) into the field in the Macro File to Broadcast block (or simply select a macro file from the displayed list by double clicking on it).
6	Select the Broadcast Macro button to ask the system to perform the broadcast. The following list shows how to use the remaining buttons on the Broadcaster window: ■ View Macro - use this button to view the macro file, which you may want to do before executing it. ■ Abort Broadcast - use this button to stop the execution of the TL1 commands at any time while the broadcast window is active. When this button is chosen, the system stops sending out the next command in the macro file to the NE(s) currently being broadcast to. Once the abort is completed, the system displays a message. ■ Close - click this button any time before clicking the Broadcast Macro button to remove the Broadcast window from your screen . **Stop! End of Task.**

Display the Provisioning Window

303

Background

When to use

Use this procedure to display the Provisioning window. The Provisioning window is the main system window used to modify information about system, port, and equipment parameters.

Before you begin

Before you begin this task, be aware that you must perform DNO on the NE before provisioning NE system parameters, port parameters, or creating cross-connections to update the database with the latest configuration data.

To perform this task, access the Map window.

Related information

For related information, see Chapter 4, Configuration Management.

Instructions

Task

Complete the following steps to display the Provisioning window, in order to perform network element, port, and line provisioning.

Step	Action
1	From the main menu bar on the Map window, select **Configuration**. This displays a sub-menu.
2	Select **Provision** from the displayed sub-menu. This displays the Choose an NE window.
3	Use the mouse to select an NE on the Choose an NE window. (Double click on the desired NE and then click the OK button.) This displays the Provisioning window. **Stop! End of Task.** **NOTE:** The Provisioning window can be displayed in similar fashion from the Alarm Summary, Equipment View, and Cross-Connection windows.

Provision System Parameters

304

Background

When to use

Use this procedure to display the windows used to provision NE system parameters.

Before you begin

Before you begin this task, determine specifically what type of system provisioning you want to accomplish.

Related information

For related information, see Chapter 4, Configuration Management.

Instructions

Task

Complete the following steps to display the windows used to provision system parameters.

Step	Action
1	Display the Provisioning window as described in T 303, Display the Provisioning Window.
2	Use the mouse to select the TID from the Network Element Explorer portion of the window. Then click the Provision button. This displays the system parameters (for your selection) in the Provisioning area of the window. (Parameters that have no value reported for them, and which therefore do not apply to the current operation, are not shown in the provisioning panel.)
3	Make your provisioning changes in the Provisioning section of the window using the available fields and your selected values.
4	Click Apply to enter your changes. **Stop! End of Task.**

Provision NE Ports

305

Background

When to use

Use this procedure to display the windows used to provision NE ports.

Before you begin

Before you begin this task, determine specifically what type of port provisioning you want to accomplish.

Related information

For related information, see Chapter 4, Configuration Management.

Instructions

Task

Complete the following steps to display the windows used to provision port parameters.

Step	Action
1	Display the Provisioning window as described in T 303, Display the Provisioning Window.
2	Expand the explorer tree if it has not already been expanded.
3	Use the mouse to select the port from the Network Element Explorer portion of the window. (Click on the plus [+] signs to display available circuit packs.) Then click the Provision button. This displays the port attributes (for your selection) in the Provisioning area of the window. Use the tabs to go to the specific port attribute to provision.
4	Make your provisioning changes in the Provisioning section of the window. **Stop! End of Task.**

Provision NE Equipment Information

306

Background

When to use

Use this procedure to display and provision NE equipment parameters on the Provisioning window.

Related information

For related information, see Chapter 4, Configuration Management.

Instructions

Task

Complete the following steps to display and provision equipment parameters.

Step	Action
1	From the main menu bar on the Map window, select **Configuration**. This displays a sub-menu.
2	Select **Provision** from the displayed sub-menu. This displays the Choose an NE window.
3	Use the mouse to select an NE on the Choose an NE window. (Double click the desired NE and then click the OK button.) This displays the Provisioning window.
4	In the Network Element Explorer part of the Provisioning View window, select the equipment for which you want to provision parameters. Click the plus (+) sign to display circuit packs. Select a slot number. Click the Provision button. Make the required changes in the Provisioning part of the window. Click the Apply button. Your changes are entered. When you have completed all your provisioning, click the Close button to remove the Provisioning window from your screen. **Stop! End of Task.**

Establish WaveStar Equipment

307

Background

When to use

Use this procedure to manually establish (manually pre-provision) new bays, shelves, and circuits packs for WaveStar BWM NEs. In the BWM, bays, shelves, and circuit packs can be added and removed.

Before you begin

Before you begin this task, decide what equipment you want to establish.

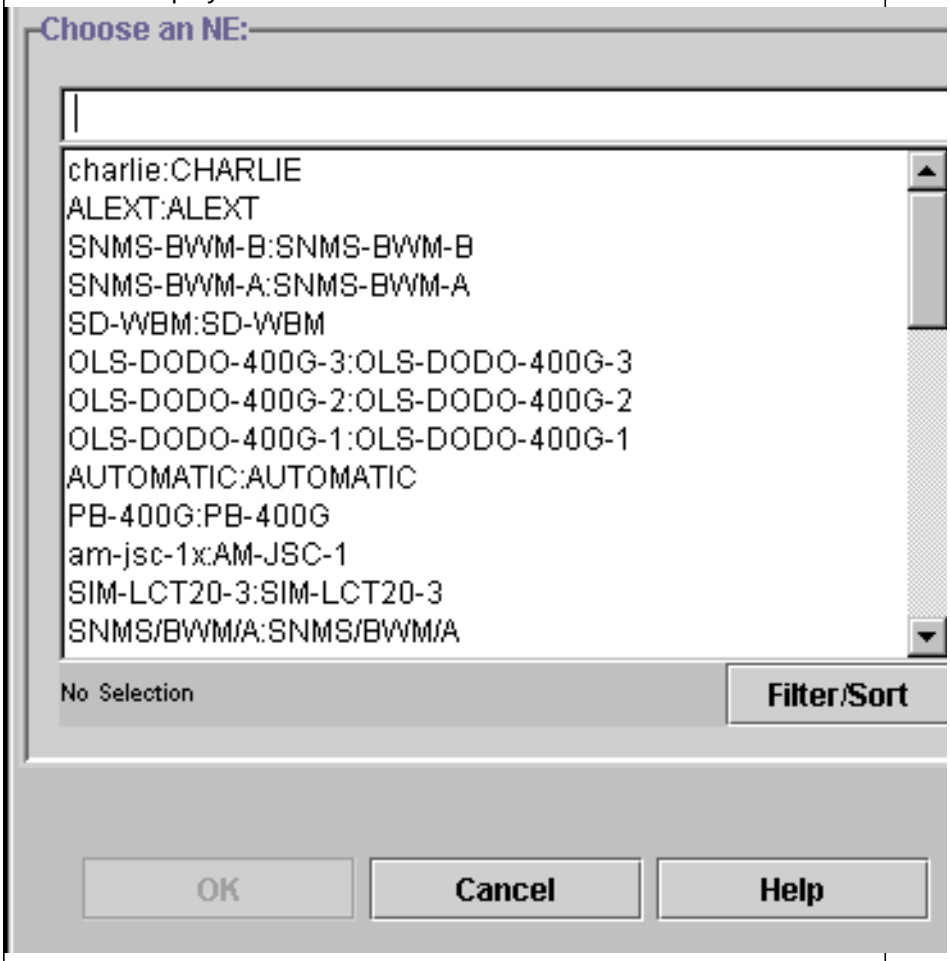
Related information

For related information, see the following

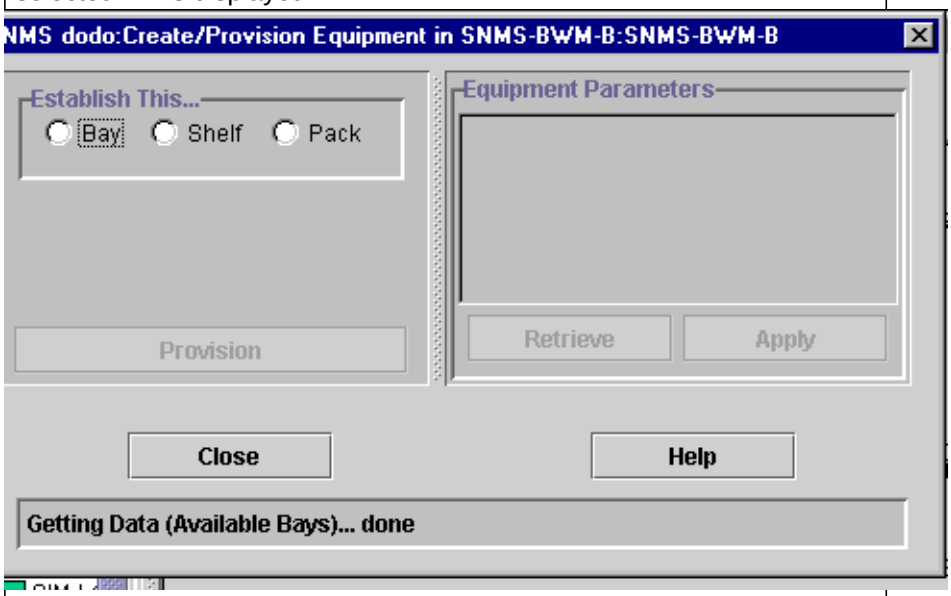
- T 310, View NE Equipment Details
- Chapter 4, Configuration Management

Instructions

Task Complete the following steps to establish WaveStar equipment.

Step	Action
1	From the main menu bar on the Map window, select **Configuration**. This displays a sub-menu.
2	Select **Establish** from the displayed sub-menu. The Choose an NE window is displayed. 
3	Double-click on an NE in the list to select it.

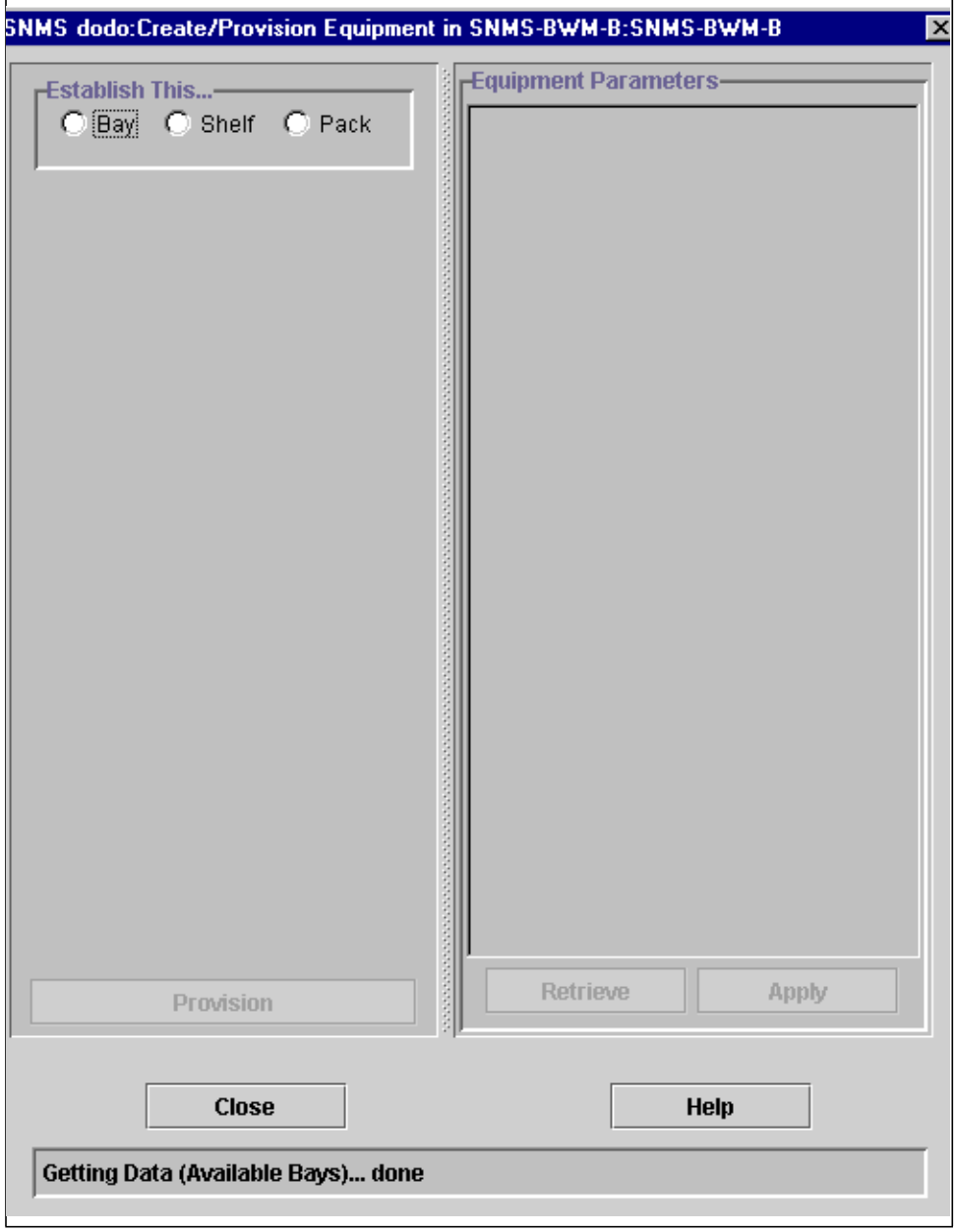
Step	Action (Contd)
4	Click the OK button. The Create/Provision Equipment window for the selected NE is displayed.

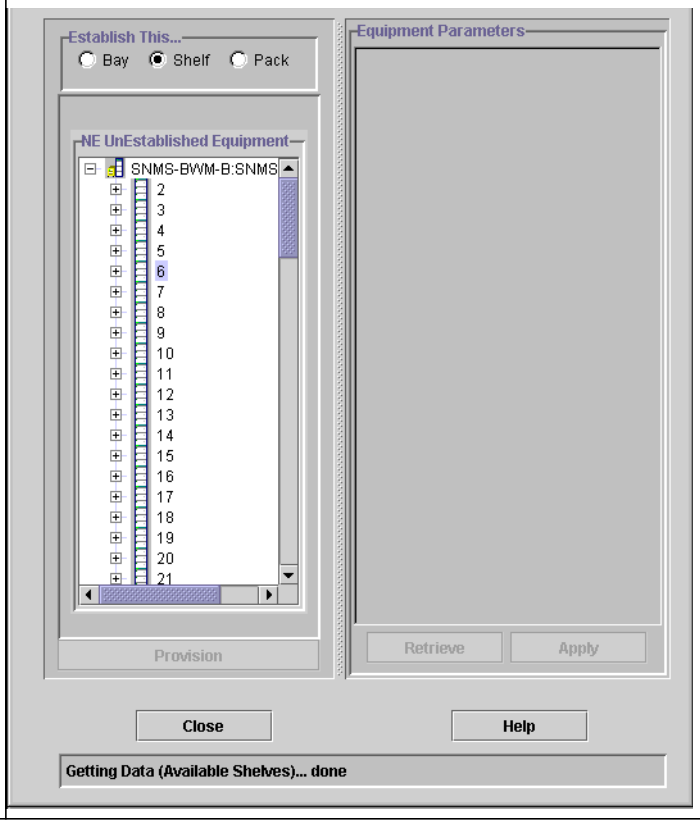


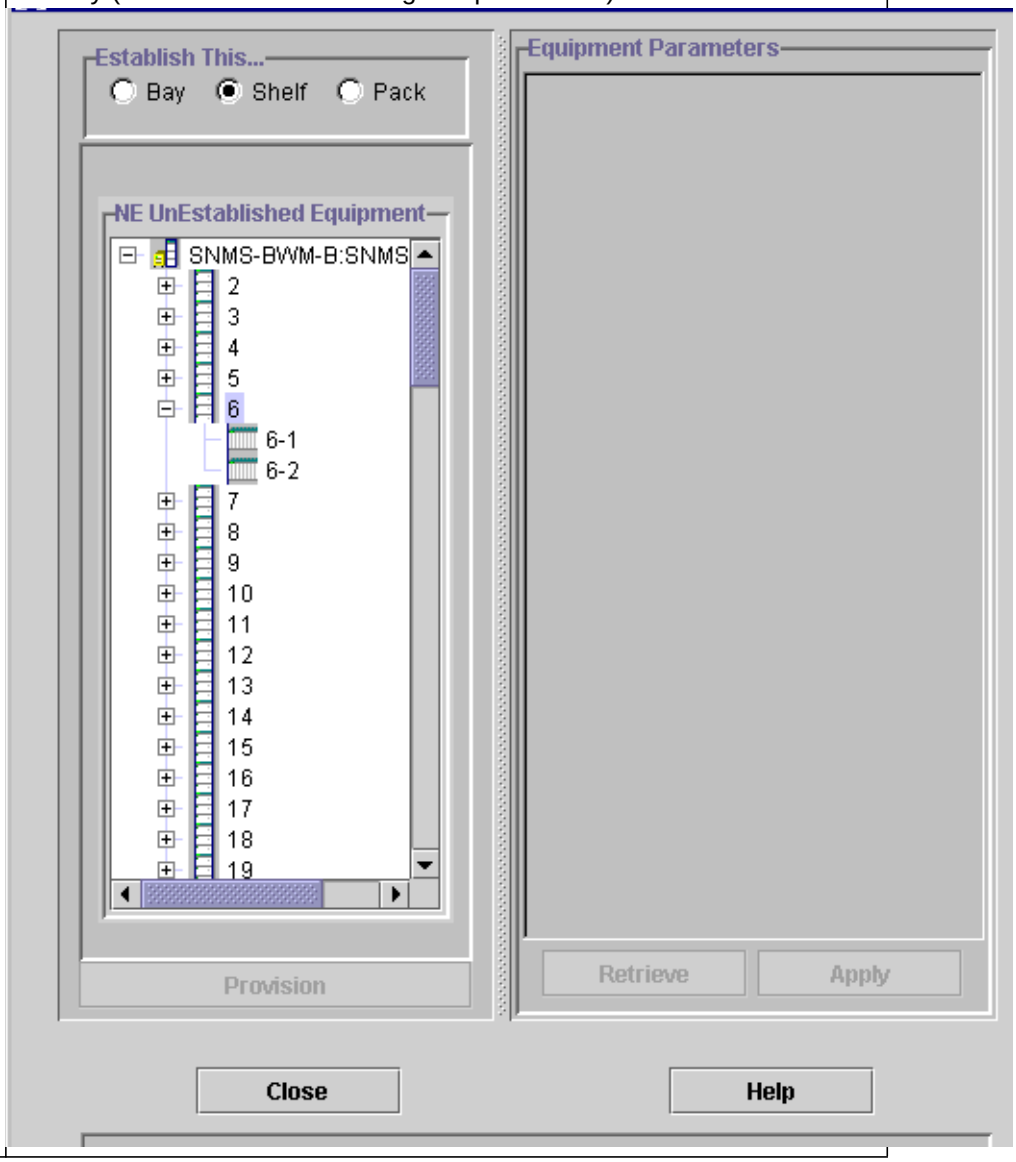
The window initially consists of a section called “Establish this” and three radio buttons labeled Bay, Shelf, and Pack, and an explorer portion that will be unpopulated when the window is initially displayed.

NOTE:
You may need to expand the window to see the explorer portion when it is populated. To expand the window, position the mouse cursor on the lower right hand corner of the window, and then click and hold the left mouse button to resize the window in order to display all components of the window, including the explorer when it is populated (when it is resized, the window should look similar to the following sample window):

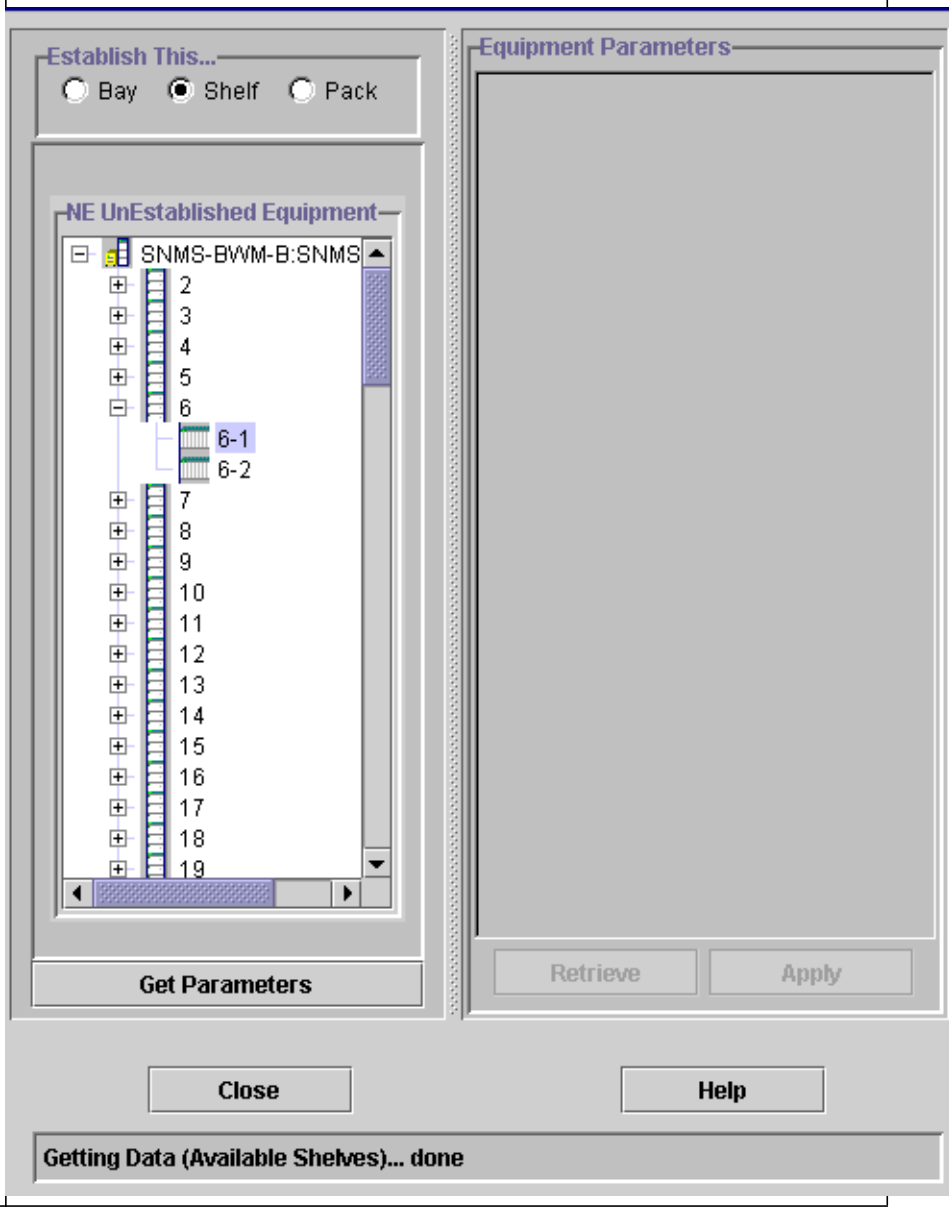
Step	Action (Contd)

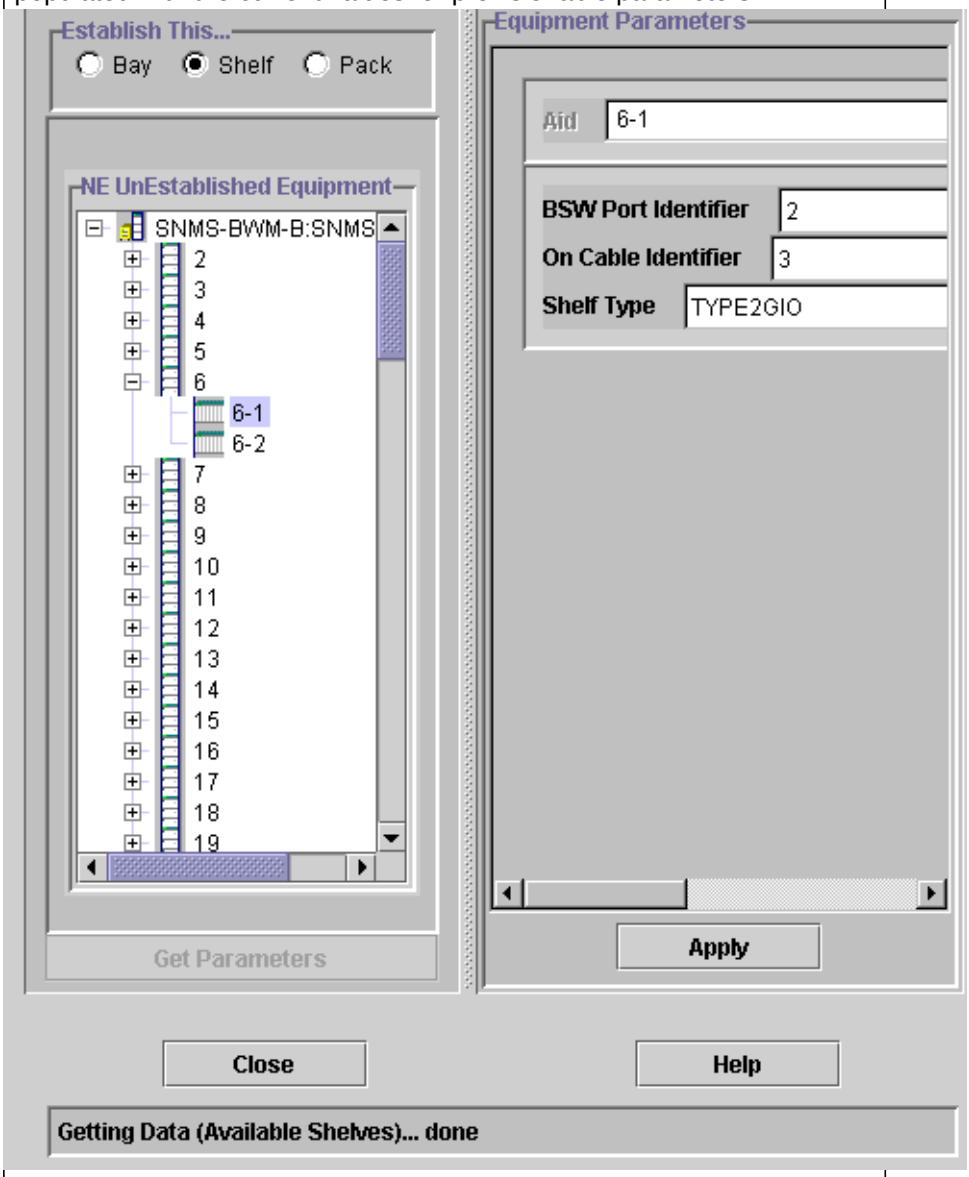


Step	Action (Contd)
5	Select one of the three radio buttons near the top left of the window to establish equipment for a Bay, Shelf, or Pack. ■ **Bay**—When you select this radio button, the Explorer section (just below the radio buttons) contains the available data on all bays, including the AIDs of all bays that have not yet been established. *You can choose a bay to establish.* ■ **Shelf**—When you select this radio button, the Explorer section (just below the radio buttons) contains the available data on all bays, including the AIDs of all bays that have not yet been established and the corresponding shelf AIDS for those bays. It also contains the AID of each bay that does not have all shelves established in it, and the AID of the shelf or shelves that are not established. *You can choose a shelf to establish.* ■ **Pack**—When you select this radio button, the Explorer section (just below the radio buttons) contains the available circuit pack data, including the AIDs of *existing* bays and *existing* shelves. Under the shelves are displayed only those slots for which no circuit pack has been established. Within the slot is displayed the type of circuit packs that are legal types for that slot AID. *You can choose a circuit pack type within the slot.* As an example, let's assume that you have clicked the **Shelf** radio button to establish a new shelf in the NE. The explorer portion of the window would contain the bays of the NE, as shown in the following sample window: 

Step	Action (Contd)
6	Click the plus (+) sign next to the AID of the equipment above the component you want to establish, to expand the explorer tree until the AID of the equipment component to be established is displayed. In the example shown in this procedure, you would click the plus (+) sign next to the associated bay, to expand and show the associated shelves in the bay (as shown in the following sample window). 

Step	Action (Contd)
7	Single-click on the equipment AID (in this case, the shelf AID) in the explorer to select it. Selecting the AID enables the Get Parameters button.



Step	Action (Contd)
8	Click the Get Parameters button. The right hand portion of the panel is populated with the current values for provisionable parameters. .  Additional parameter information may have to be entered before the equipment is established. The correct parameter labels are displayed and are populated with their default values, which are updatable. Enter or change the equipment parameters. **NOTE:** The equipment AID field should not be modified. The label next to this field is greyed out, indicating that this field cannot be modified.

Step	Action (Contd)
9	Click the Apply button. The equipment is established. If there is a problem with the request to establish equipment, a pop-up error message is displayed, indicating the nature of the problem. **Additional Information:** When the type of circuit pack being provisioned on a Universal I/O shelf is a Switching Interface (SWIF) circuit pack, the BSW Port Identifier must be provisioned in such a manner that no two SWIF circuit pack pairs both have the same identifier. SWIF circuit packs are paired based on their slot AIDs. Each pair of circuit packs share a single BSW Port ID, so if there is already a circuit pack in one slot of the slot pair, then the other circuit pack should have the same BSW Port ID defaulted in the provisioning window. When the circuit pack being provisioned is the first one in the current slot pair, the list of possible values for the BSW Port Identifier parameter includes only those values that are not already assigned to a slot pair. When the circuit pack being provisioned is the second one in the current slot pair, the list of possible values includes only the value already chosen for the first circuit pack provisioned in the slot pair. When provisioning I/O shelves, the list of possible values for the ON Cable Pair parameter is a list of only those values that are not currently assigned to another shelf in this BWM. **Stop! End of Task.**

Remove WaveStar Equipment

308

Background

When to use

Use this procedure to remove WaveStar NE equipment. In the BWM, bays, shelves, and circuit packs can be added and removed.

Before you begin

Before you begin this task, decide what equipment you want to remove.

Related information

For related information, see the following:

- T 307, Establish WaveStar Equipment
- Chapter 4, Configuration Management

Instructions

Task

Complete the following steps to remove WaveStar equipment.

Step	Action
1	From the main menu bar on the Map window, select **Configuration**. This displays a sub-menu.
2	Select **Remove** from the displayed sub-menu. The Choose an NE window is displayed.
3	Double-click on the NE in the list to select it.
4	Click the OK button. The Removing Equipment window is displayed. This window allows you to choose existing equipment from the explorer tree and to remove that equipment provisioning from the network element.
5	To remove the undesired equipment, first select it with the mouse. ■ select a circuit pack, or ■ select an *empty* bay or shelf.
6	After selecting the undesired equipment with the mouse, click the Remove button. If the removal is allowed, the system displays a confirmation window to which you should reply Yes. **NOTE:** If you try to remove a bay/shelf that is not empty, the system displays a message window explaining that the bay/shelf is not empty and cannot be removed. You must first empty the bay/shelf before removing it (if that is still desired).

View NE Equipment

309

Background

When to use

Use this procedure to display and view NE equipment on the Equipment Configuration window.

Before you begin

Before you begin this task, determine the equipment you want to view.

Related information

For related information, see the following:

- T 310, View NE Equipment Details
- Chapter 4, Configuration Management

Instructions

Task

Complete the following steps to display and view various NE equipment components on the Equipment Configuration window.

Step	Action
1	Select the NE in the Map pane portion of the Map window.
2	Select **Configuration** from the main menu bar on the Map window. This displays a sub-menu.
3	Select **Equipment** from the displayed sub-menu. This displays the Equipment View window, containing equipment information for the selected NE. The Equipment View window allows you to view and/or "drill down" through a network element to view its various constituent parts via the graphical representation (the network element view panel), or to select a component (shelf, bay, slot) for viewing via the hierarchical representation (the network explorer panel). In addition, you can access certain features via a pop-up menu that is available in both panels. Following are the navigational conventions to use to view equipment information for the selected NE. **View Panel** *Single Left Click*—selects the component both here and in the explorer. *Double Left Click*—shows the contents of the component in the view panel, and indicates that it is selected. Shows the component as selected in the explorer and its subtending components (if there are any). *Single Right Click*—indicates that the component is selected, and shows the pop-up menu. **Explorer List Item** *Single Left Click*—selects the explorer component and the view component. If the component selected has contents, it shows the content in the view panel. Does not show/hide subtending explorer components. *Double Left Click*—same as single left click on explorer list item, but does show/hide subtending components in the explorer. *Single Right Click*—indicates that the component is selected, and shows the pop-up menu. **Explorer plus or minus sign** *Single Left Click*—shows/hides subtending components. **Stop! End of Task.**

View NE Equipment Details

310

Background

When to use

Use this procedure to view details of a single component inside a network element.

Before you begin

Before you begin this task, determine the NE for which you want to display equipment details.

Related information

For related information, see the following:

- T 309, View NE Equipment
- Chapter 4, Configuration Management

Instructions

Task

Complete the following steps to display NE equipment details.

Step	Action
1	Select a component in the NE explorer part of the Equipment View Window. (See Related information earlier in this task for instructions on displaying the Equipment View.)
2	Select **View** from the menu bar. This displays the View menu.
3	Select **Equipment Details** from the View menu. This displays the Equipment Details window, containing the requested information. Click the Close button on the window to close the window. **NOTE:** Right clicking on the desired component in the Equipment View window also displays a sub-menu from which Equipment Details can be selected. If the component selected for details is a populated slot (with a circuit pack installed) then details for both the slot and circuit pack are displayed in Equipment Details. **Stop! End of Task.**

View NE Equipment Lists

311

Background

When to use

Use this procedure to access the list of a given component's subtending equipment. When you request an equipment item from either the drop-down or pop-up menu, WaveStar SNMS provides a list of equipment for the selected item and its subtending equipment. The lists can be saved and printed.

Before you begin

Before you begin this task, determine the equipment for which you want to display equipment lists.

Related information

For related information, see the following:

- T 309, View NE Equipment
- Chapter 4, Configuration Management

Instructions

Task

Complete the following steps to view NE equipment lists.

Step	Action
1	Select a component in the NE explorer part of the Equipment View Window. (See Related information earlier in this task for instructions on displaying the Equipment View.)
2	Select **View** from the menu bar. This displays the View menu.
3	Select **Equipment List** from the View menu. This displays the equipment list for the selected component. The list contains information about the NE equipment, at the level you requested. The information is textual and listed in name/value pairs. **NOTE:** Right clicking on the desired component in the Equipment View window also displays a sub-menu from which Equipment List can be selected. If the component selected for listing is a populated slot (with a circuit pack installed) then information for both the slot and circuit pack are displayed in the Equipment List. **Stop! End of Task.**

Display the NE Cross-Connection Window

312

Background

When to use

Use this procedure to display the NE Cross-Connection window. This window provides access to all NE cross-connection features.

Before you begin

Before you begin this task, determine the cross-connection types you want to work with.

Related information

For related information, see the following:

- T 314, View NE Cross-Connections—Textual
- Chapter 4, Configuration Management

Instructions

Task

Complete the following steps to display the cross-connection window and gain access to all cross-connection features.

Step	Action
1	Select **Configuration** from the main menu bar on the Map window. This displays a sub-menu.
2	Select **Cross-Connection** from the displayed sub-menu. This displays the Choose an NE window.
3	Choose the network element you want to work with by double clicking on it in the Choose an NE window and then clicking the OK button. This displays the Cross-Connection window. **NOTE:** You can also access the Cross-Connection window by positioning the mouse cursor on an NE in the Map window and clicking the right mouse button to display a pop-up menu and then selecting **Cross Connection** from the pop-up menu. The Cross-Connection window consists of a menu bar, a toolbar, a status bar, a subnetwork explorer, and a main view. This window is used for all cross-connection operations, including viewing, adding, modifying, and deleting. These operations are all described in separate tasks. **Stop! End of Task.**

Display Ports on the NE Cross-Connect Window

313

Background

When to use

Use this procedure to display port information on the NE Cross-Connect window.

Before you begin

Before you begin this task, determine the ports to be displayed and display the Cross-Connect window.

Related information

For related information, see the following:

- T 312, Display the NE Cross-Connection Window
- Chapter 4, Configuration Management

Instructions

Task

Complete the following steps to display port information in the Cross-Connect window.

Step	Action	Reference
1	Display the Cross-Connect window.	See T 312, Display the NE Cross-Connection Window in the *User Tasks* section

Continued on next page

Step	Action (Contd)	Reference
2	Using the Network Element explorer portion of the window: a. Expand an item in the explorer tree (using the mouse) and locate the port group that contains the tributaries/ports to display in the main view area. b. Right click to see the pop-up menu of the selected tributary. Choose either top, bottom, left, or right to apply the tributary in the the top, bottom, left, or right portion of the Main View of the Cross-Connect window.	See Chapter 4, Configuration Management in the *User Reference* section
3	In the Main View of the window, use the left/right or up/down scroll arrows next to the expanded/ selected tributary block in the Main View to move the display to the next group of tributaries within the selected tributary block. Choose the appropriate scroll arrows to change the view of a group of tributaries. To remove tributary blocks from the Main View, position the mouse cursor on the tributary block and click the left mouse button. Then click the right mouse button to display a small pop-up window with the word “Clear”. Select “Clear” to clear the block from the window. **Stop! End of Task.**	

View NE Cross-Connections—Textual

314

Background

When to use

Use this procedure to view a textual version list of existing cross-connections.

Before you begin

Before you begin this task, display the Cross-Connection window.

Related information

For related information, see the following:

- T 312, Display the NE Cross-Connection Window
- Chapter 4, Configuration Management

Instructions

Task

Complete the following steps to display a textual version list of existing cross-connections.

Step	Action	
1	Display the Cross-Connection window as described in T 312, Display the NE Cross-Connection Window.	
2	In the explorer area of the Cross-Connection window, use your mouse to select the NE TID, a bay, a shelf, a circuit pack, or a port group.	
3	TO.... List all cross-connections for a particular bay, shelf, circuit pack, or port group	DO THIS... Position the mouse cursor on the particular entity in the Explorer portion of the Cross-Connection window and click the select (left) mouse button to select it.
	List all cross-connections for the NE	Position the mouse cursor on the NE's TID in the Explorer portion of the Cross-Connection window and click the select (left) mosue button to select it.
4	Select **View** the main menu at the top of the Cross-Connection window. This displays a sub-menu.	

Step	Action (Contd)
5	Select **List Cross-Connections** from the displayed sub-menu.
6	To display all cross-connections for the selected entity, choose **All Cross Connections** from the displayed sub-menu. This displays the Cross-Connection List window. Some general information about this window follows: ■ This list shows all the cross-connections and reservations in the selected element. ■ Headers displayed above each list differ from NE to NE, but the first three headers are always Source AID (From), Destination AID (To), and Cross-Connection Type. ■ BWM NE cross-connections also contain two additional headers: Source Protection Switch Status and Destination Protection Switching Status. If there is a protection switch active on the line it will appear here in one or both of these columns. ■ An asterisk at the beginning of a BWM row indicates that the row contains information about a reservation.
7	If desired, select another element from the explorer area of the Cross-Connections window to change the information in the Cross-Connection List window for the new selection. Also if desired, select a row in the list and then click the Delete or Modify button to display the windows used to delete and modify cross-connections, respectively. **Stop! End of Task.**

Add a Single NE Cross-Connection

315

Background

When to use

Use this procedure to add new NE cross-connections.

Before you begin

Before you begin this task, determine the NE and the elements for which you want to add cross-connections.

Prior to creating cross-connections, make sure that the associated ports have been provisioned correctly. See T 305, Provision NE Ports.

There are several ways to access the Cross-Connection window besides the method described in this procedure. Other ways to access the Cross-Connection window:

A. From the Map Main Menu

1. Choose the network element to work with in the Map.
2. Choose **Configuration** from the main menu.
3. Choose **Cross Connection** from the sub-menu.
4. The Cross Connection Window is displayed.

B. Equipment View Window Menu

1. Choose **Configuration** from the equipment view main menu.
2. Choose **Cross Connection** from the sub-menu.
3. The Cross-Connection Window is displayed.

C. Equipment View Pop-Up Menu

1. Right click over the equipment whose cross connection window is to be displayed.
2. Choose **Cross Connection** from the popup menu.
3. The Cross-Connection Window is displayed.

Related information

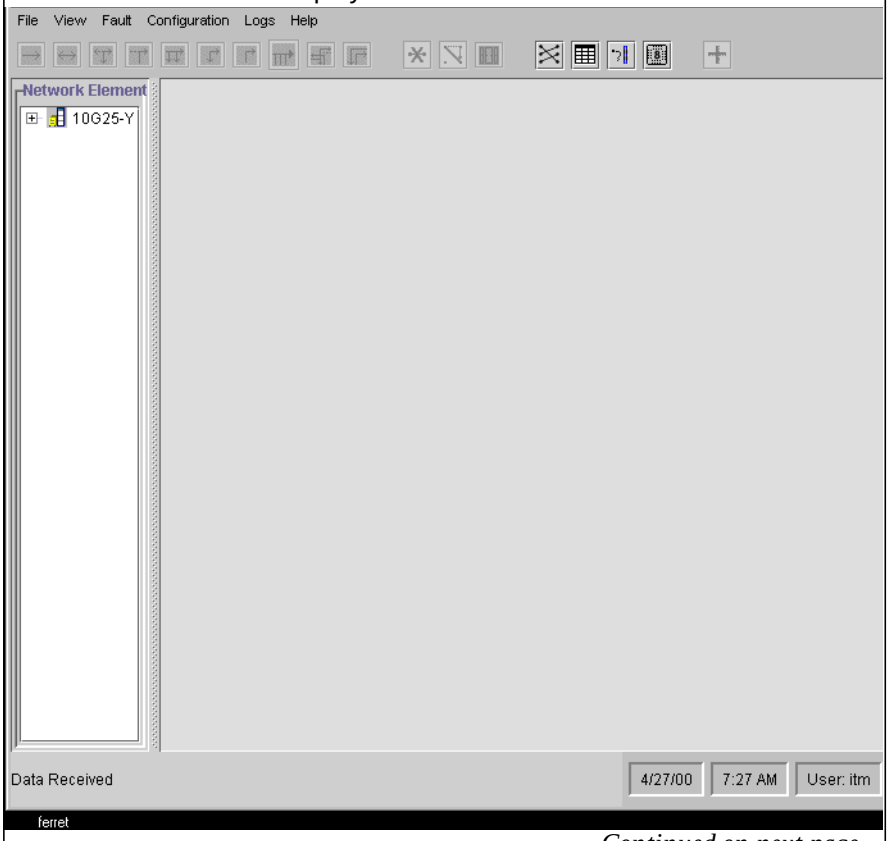
For related information, see Chapter 4, Configuration Management.

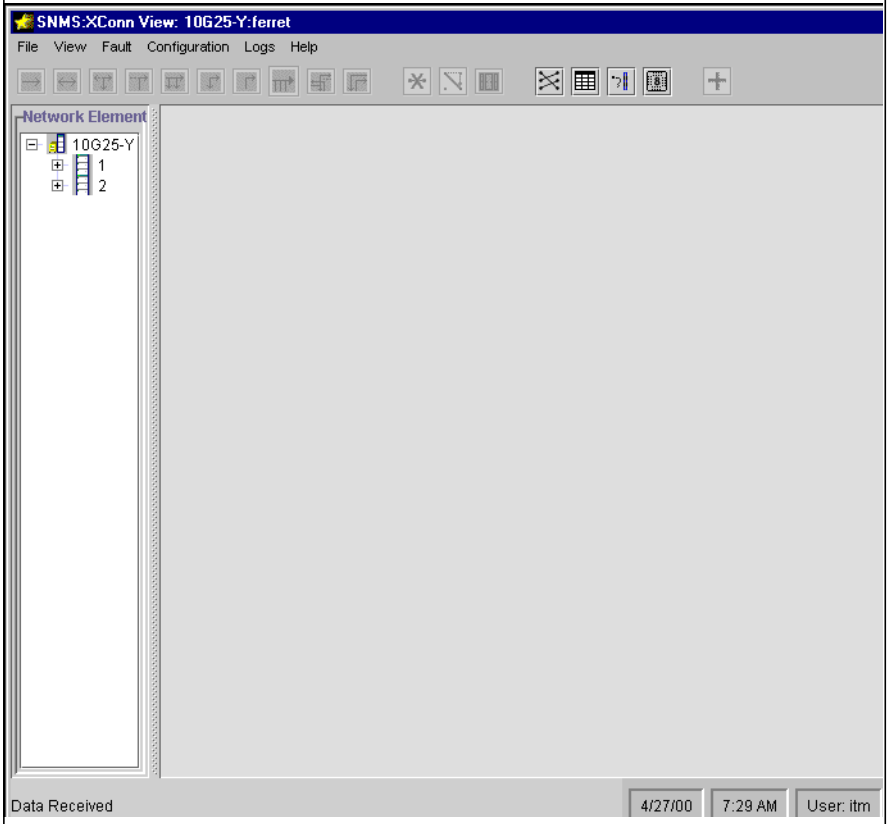
Instructions

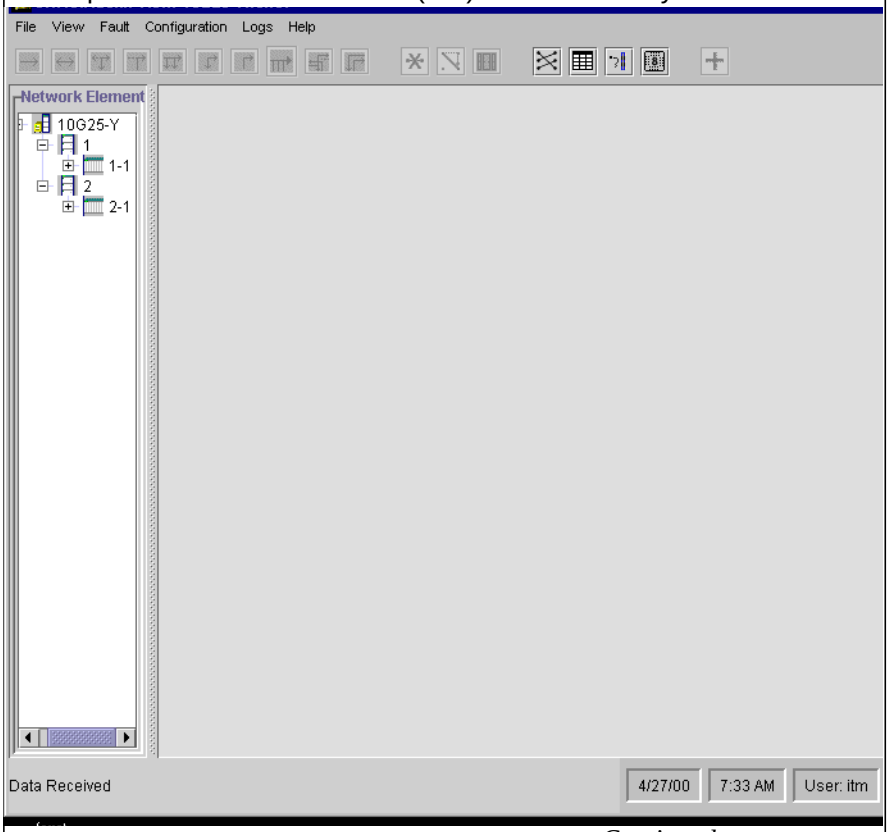
Task

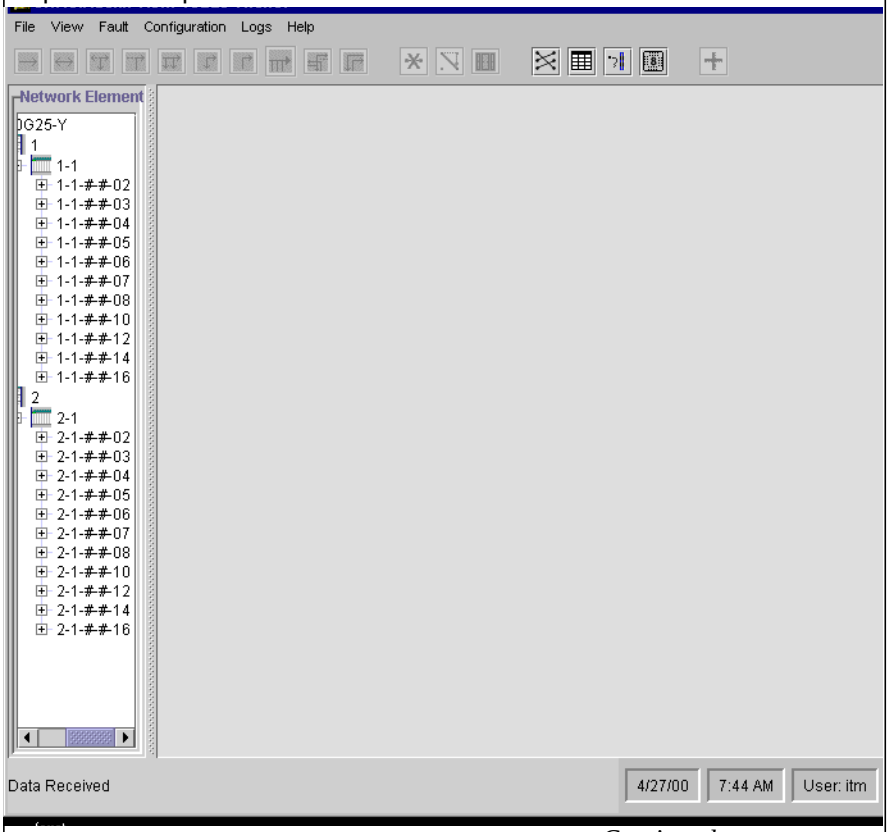
Complete the following steps to add a single new cross-connection.

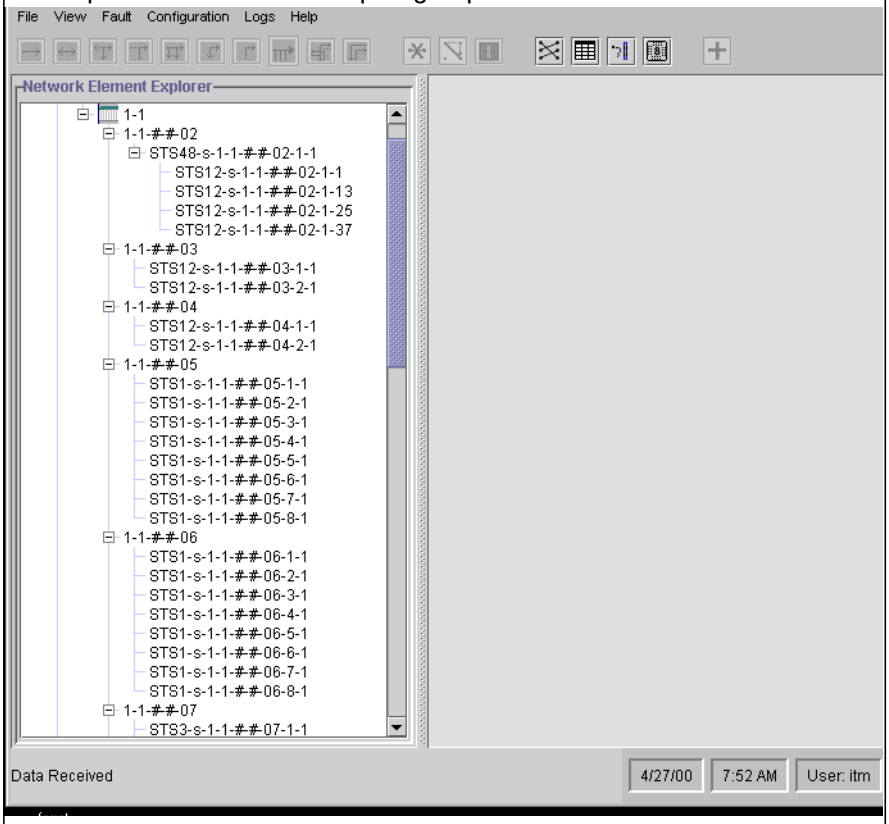
The screen examples shown in this procedure are for illustration purposes. The specific information displayed on the Cross-Connection window will vary by NE type.

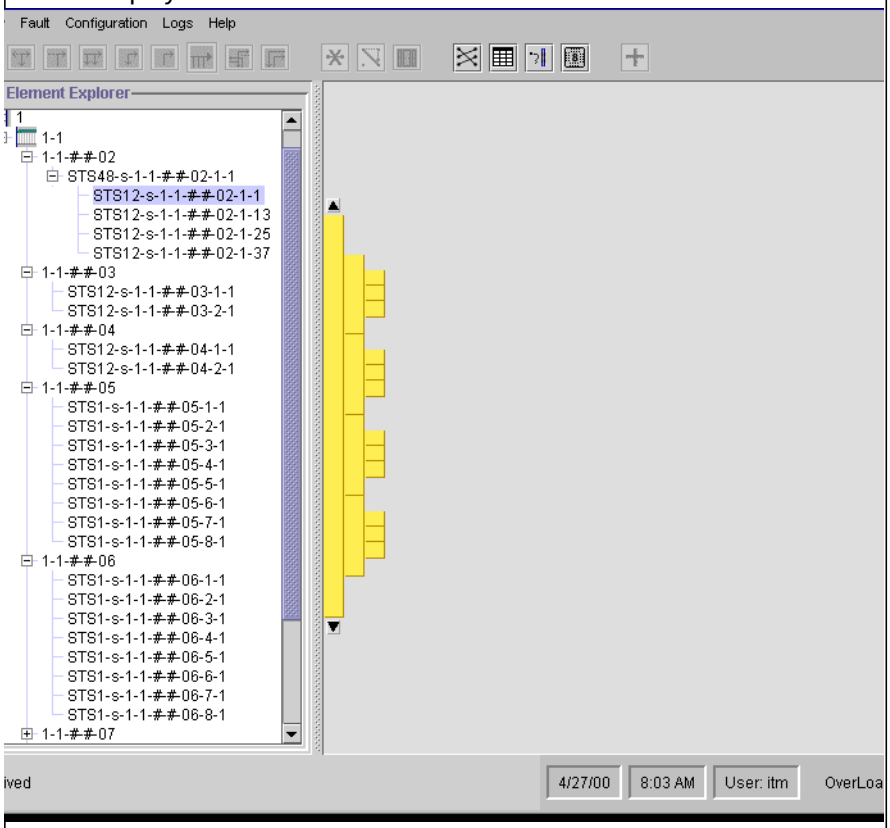
Step	Action
1	Position the mouse cursor on the NE in the Map pane portion of the Map window and click the menu (right) menu mouse button. A pop-up menu is displayed.
2	Choose **Cross Connection** from the pop-up menu. The Cross-Connection window is displayed.  *Continued on next page*

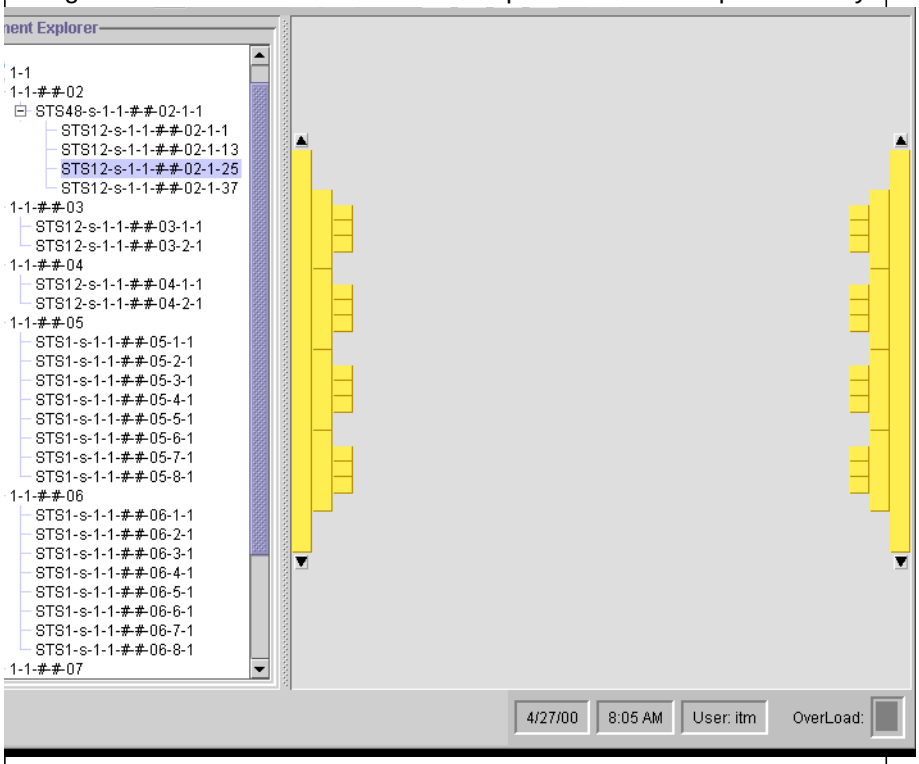
Step	Action (Contd)
3	Position the mouse cursor on the NE's TID displayed in the left portion of the window below the Network Element Explorer heading. Press the left mouse button twice to highlight the TID. The explorer tree is expanded to show the bay(s) below the TID.  **NOTE:** You can also expand any item in the Network Element Explorer by clicking the plus (+) sign next to the item. To collapse the item, click the minus (-) sign next to it. If items in the explorer are partially obscured, place the mouse cursor on the pane edge between the right side of the explorer and Main View, click and hold the left mouse button, and drag the edge to the right until the explorer items can be seen clearly. *Continued on next page*

Step	Action (Contd)
4	Position the mouse cursor on the bay displayed in the explorer tree. Press the select (left) mouse button twice to highlight the bay and expand the explorer tree to show the shelf(ves) beneath the bay.  *Continued on next page*

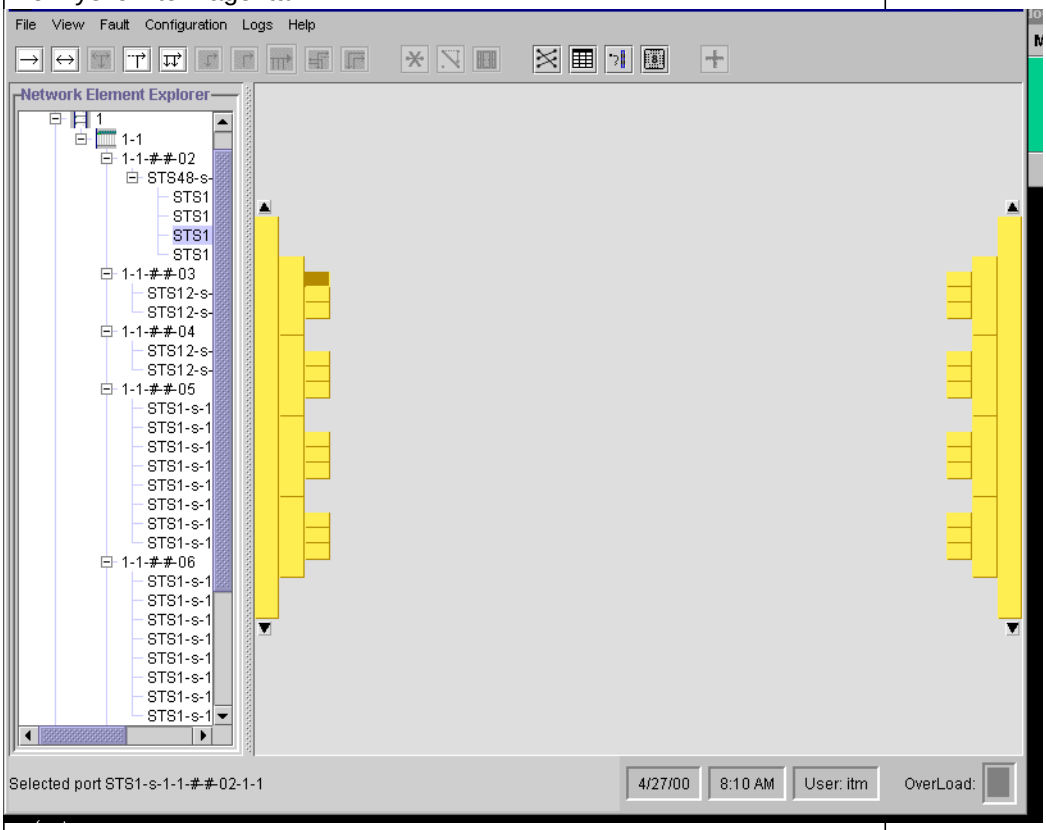
Step	Action (Contd)
5	Position the mouse cursor on the shelf displayed in the explorer tree. Press the select (left) mouse button twice to highlight the shelf and expand the explorer tree to show the slots beneath the shelf.  *Continued on next page*

Step	Action (Contd)
6	Position the mouse cursor on the slot displayed in the explorer tree. Press the select (left) mouse button twice to highlight the slot and expand the explorer tree to show the port groups beneath the slot. 
7	Repeat steps 4-6 for all bays, shelves, slots, and port groups that need to be displayed. *Continued on next page*

Step	Action (Contd)
8	Expand and display the desired source port tributary in the Main View of the Cross-Connect window. There are two ways to do this: ■ Position the mouse cursor on the port in the explorer to be expanded and click the menu (right) mouse button to display a drop-down menu of positions. Select the position for the tributary block from the drop-down menu list (left, right, top, or bottom). ■ Position the mouse cursor on the port in the explorer, click and hold the select (left) mouse button and drag the selected port into the left, right, top, or bottom portion of the Main View of the Cross-Connect window. The tributary block for the selected port is displayed in the Main View.  **NOTE:** To remove a tributary block from the Main View, position the mouse cursor on the tributary block and click the left mouse button. Then click the right mouse button. A single option, “Clear”, is displayed in a pop-up window. Move the mouse cursor over the word “Clear” in the pop-up window to select it. The tributary block is cleared from the Main View. *Continued on next page*

Step	Action (Contd)
	When a port tributary is displayed in the Main View of the Cross-Connection window, and you position the mouse cursor on the tributary block, a message is displayed next to the tributary address in the status bar identifying it as a “Source” or “Destination” tributary. The “Source” and “Destination” literal displayed in the status bar is used to indicate whether the tributary could act as a “Source” or “Destination” , or both, for additional cross-connections.
9	Select the destination port tributary using one of the methods described and position it on the top, bottom, left, or right portion of the Main View, using one of the methods described in step 8 for the source port tributary.  **NOTE:** Do not place the destination tributary on top of a previously selected/positioned source tributary block. *Continued on next page*

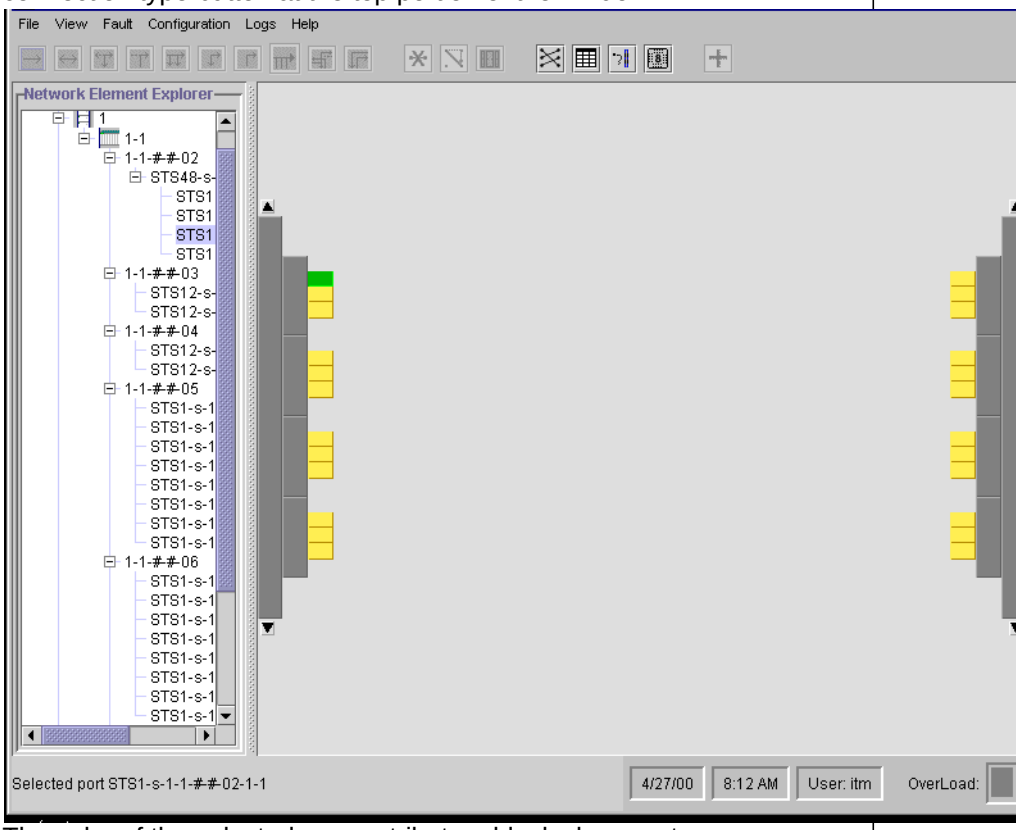
Step	Action (Contd)
10	Move the mouse cursor to the source tributary block on the Main View and click the select (left) mouse button to select the source tributary for the cross-connection. The color of the selected tributary block changes from yellow to magenta.



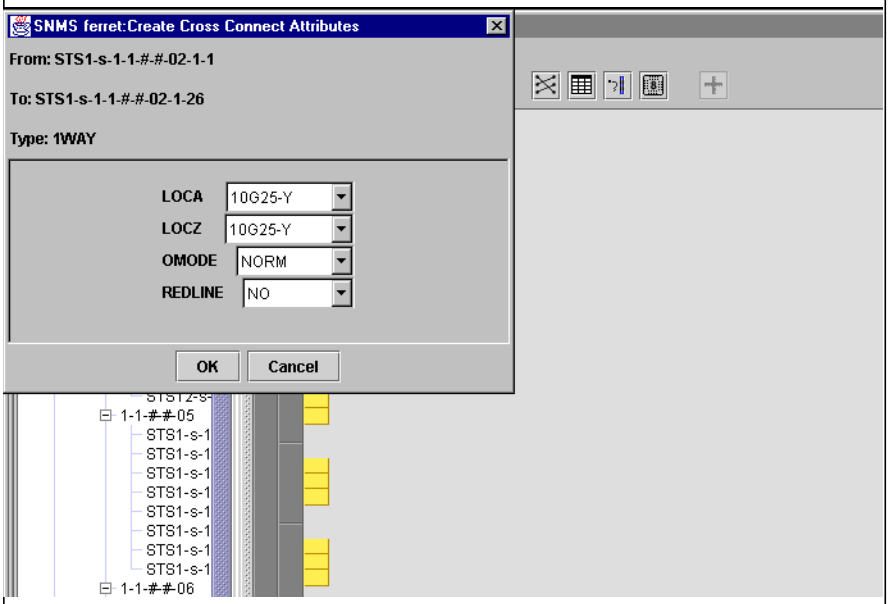
NOTE:
If necessary, click the arrow keys located next to the tributary blocks displayed to scroll and locate the tributary you want to use. When you position the cursor on a tributary block, the status bar indicates the tributary address and whether the tributary is available to be used as a source or destination, or both.

The available cross-connection type buttons are enabled at the top toolbar portion of the window above the Main View and Network Element Explorer. If a specific type of cross-connection is not possible for the source tributary selected, these cross-connection type buttons are greyed out.

Continued on next page

Step	Action (Contd)
11	Select the cross-connection type by clicking on the appropriate cross-connection type button at the top portion of the window.  The color of the selected source tributary block changes to green.
12	Move the mouse cursor and position it on the destination port tributary block. *Continued on next page*

Step	Action (Contd)
13	Click the select (left) mouse button on the destination port tributary block to select it.



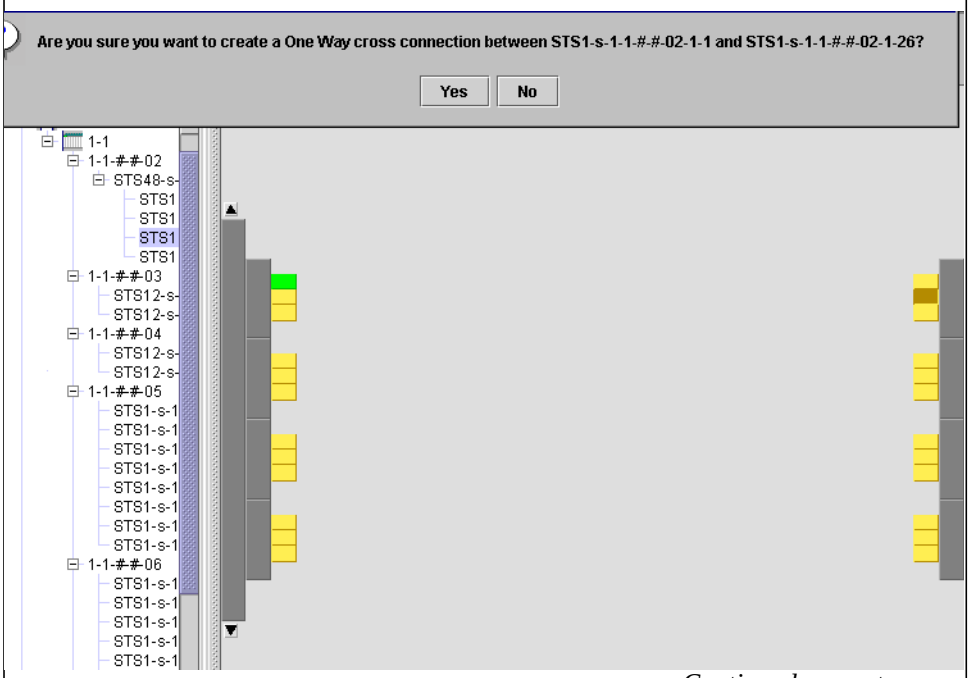
In some cases (for example, for 2.5G NEs), a Cross-Connect Attributes window is displayed for selecting certain attributes for the cross-connection, such as LOCA node, LOCZ node, OMODE (originating mode), and Redline status. If necessary, change any/all of the attributes displayed on this window by clicking the down arrow next to the respective field to display a drop-down list of choices, select the choice from the list, and then click the OK button on the Cross-Connect Attributes window to activate your choice(s) or the Cancel button to cancel the attribute changes and the current cross-connection operation for the previously selected source/destination tributaries.

NOTE:
If you click the Cancel button on the Cross-Connect Attributes window (if one is displayed) at this point, you will have to select the source tributary, the cross-connection type, and the destination tributary again.

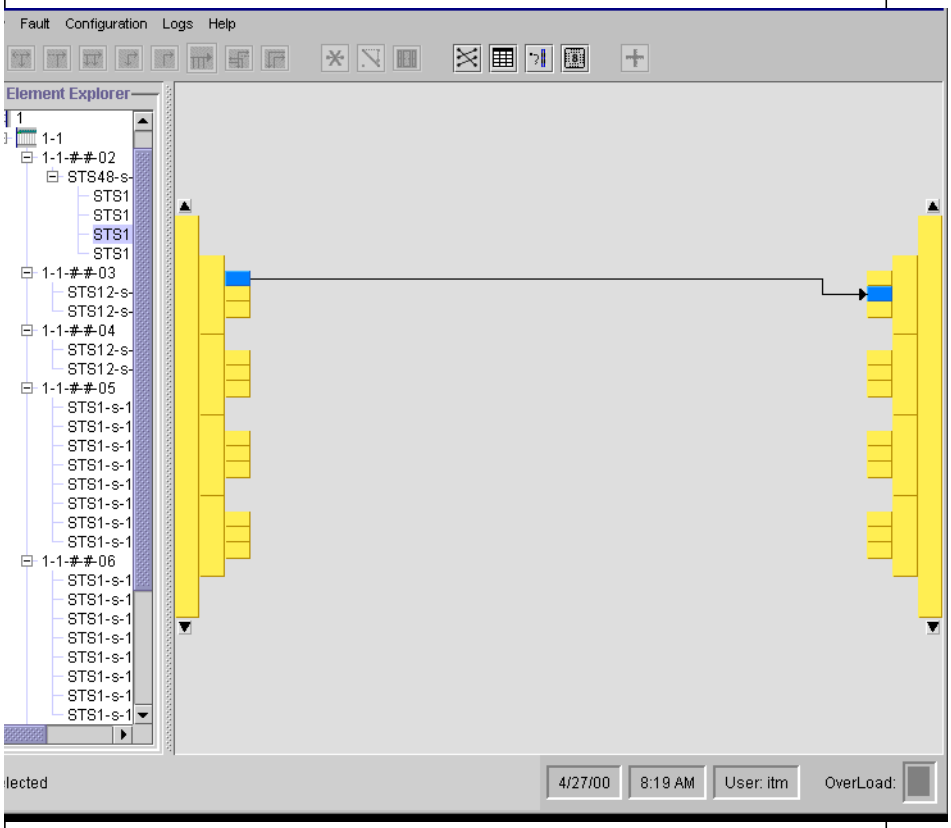
Next, a pop-up question dialog window is displayed, asking if you are sure that you want to create the selected type of cross-connection between the selected source and destination tributaries. Choose Yes to iniitiate the cross-connection or No to cancel the cross-connection operation.

Continued on next page

Step	Action (Contd)



Continued on next page

Step	Action (Contd)
14	Choose Yes to create the cross-connection. The line of the newly created cross-connection momentarily changes to orange. When the cross-connection has been established, the line and arrows of the created cross-connection change color from orange to black and the colors of the tributary blocks change to blue, indicating that the cross-connection has been made.  **Stop! End of Task.**

Add a Roll Cross-Connection

316

Background

When to use

Use this procedure to add a roll cross-connection. A roll refers to the operation of moving the input of an existing leg of a one-way or two-way point-to-point cross-connection from the current input tributary to a new input tributary, while leaving the output tributary unchanged.

Before you begin

Before you begin this task, determine the existing cross-connection for which you want to create a roll cross-connection.

Related information

For related information, see Chapter 4, Configuration Management.

Instructions

Task

Complete the following steps to roll a cross-connection.

Step	Action
1	Display the Cross-Connection window, as described in T 312, Display the NE Cross-Connection Window.
2	Select the existing cross-connection for the roll by single-clicking on it.
3	Click the Modify button. The Create Cross-Connect Attribute window is displayed, with the current information for the selected cross-connection.
4	Click the Change (Roll) button.
5	A pop-up window is displayed, prompting you to select a new input (source) tributary for the roll. Click the Close button to close this window. Select the new input tributary (source) for the roll.
6	A pop-up window is displayed, asking if you really want to perform the roll operation for the selected cross-connection. Choose Yes. The cross-connection is rolled to the new source tributary. **Stop! End of Task.**

Add an NE Multi-Cast Cross-Connection

317

Background

When to use

Use this procedure to add a new multi-cast cross-connection. This is accomplished via the Add a Multi-Cast Cross-Connection window, which allows you to choose the number of destination AIDs for a multi-cast cross-connection.

Before you begin

Before you begin this task, determine the NE and the elements for which you want to add a multi-cast cross-connection.

Related information

For related information, see Chapter 4, Configuration Management.

Instructions

Task

Complete the following steps to add a new multi-cast cross-connection.

Step	Action
1	Display the ports for which you want to add a multi-cast cross-connection, as described in T 313, Display Ports on the NE Cross-Connect Window.
2	Single click on a high or low speed tributary at the appropriate signal rate for the new multi-cast cross-connection.
3	Choose the multi-cast button from the group of cross-connection buttons at the top of the Cross-Connections window (if tooltips help is enabled, positioning the mouse pointer over the button will indicate the correct button). This displays the Add a Multi-Cast Cross-Connection window.
4	In the Total Number of Destinations in this NE field on the Add a Multi-Cast Cross-Connection window, enter the number of drops to be included in the cross-connection.
5	In the main view area of the Cross-Connections window, click on each port/tributary that is to be a drop for the new multi-cast cross-connection. Notice that as each drop is specified, it is added to the Chosen Destinations area of the Add a Multi-Cast Cross-Connection window. (If necessary, you can remove a previously selected AID from the Chosen Destinations area by selecting it with the mouse and then clicking the nearby Remove AID button.) After you have specified the last drop, click the Done button.
6	After you complete the Add a Multi-Cast Cross-Connection window and click the Done button, the system asks you to specify additional information for the cross connection, if any is needed. Specifically, for the purposes of a multi-cast cross-connection, a destination TID must be present for each and every destination that you specified. To get this information the system displays the Additional Cross-Connection Information window. Type the additional requested information into this window and click OK.
7	The system displays the Cross-Connection Confirmation window. Click the Yes button to send the new cross-connection command to the NE. **Stop! End of Task.**

Delete NE Cross-Connections—Graphical

318

Background

When to use

Use this procedure to delete a selected cross-connection using the graphical representation.

Before you begin

Before you begin this task, you must determine the cross-connection to be deleted and display it.

Related information

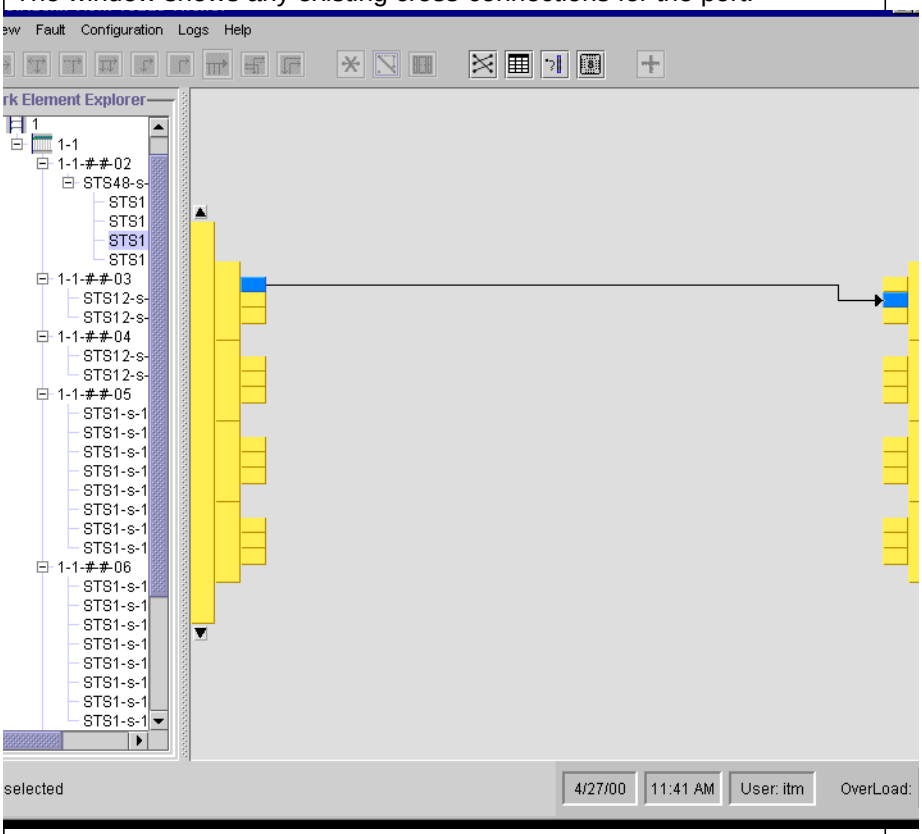
For related information, see the following:

- T 319, Delete an NE Cross-Connection—Textual
- Chapter 4, Configuration Management

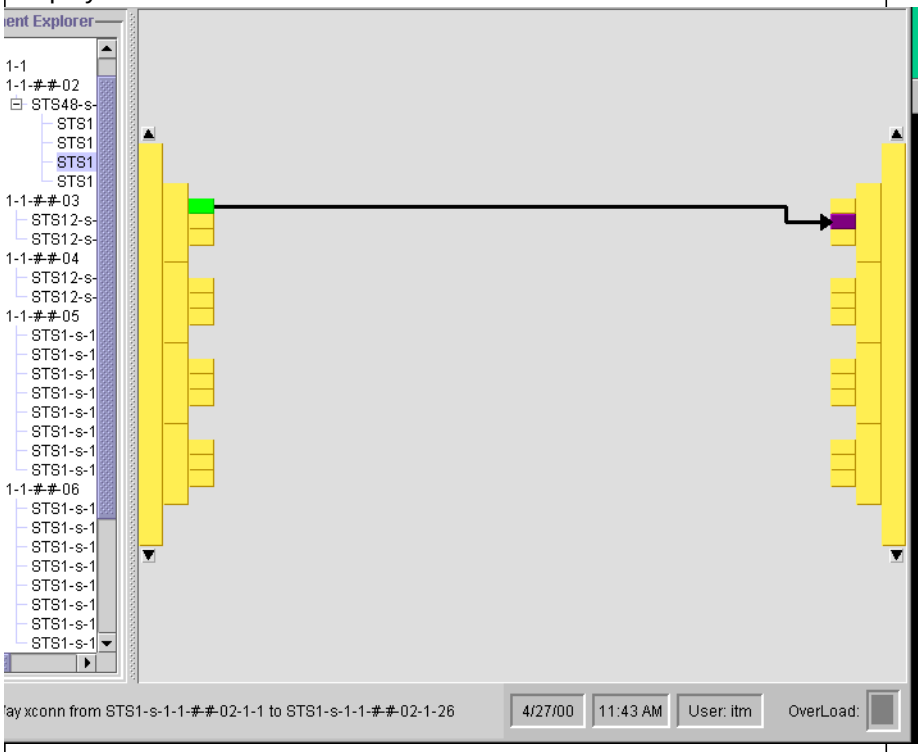
Instructions

Task Complete the following steps to delete a cross-connection.

Step	Action
1	Position the mouse cursor on the NE in the Map pane portion of the Map window and click the menu (right) menu mouse button. A pop-up menu is displayed. Choose **Cross Connection** from the pop-up menu. The Cross-Connection window is displayed. **NOTE:** To obtain a texual list of all existing cross-connections on the NE, while on the Cross-Connection window, click on the NE's TID in the explorer portion of the window, choose **View** from the Cross-Connection window menu bar, then choose **List Cross Connections** and then choose **All Cross Connections**. A pop-up window is displayed, providing a textual list of cross-connections. A listing of all existing cross-connections for an NE entity (such as a bay, shelf, slot, or port), can be obtained by selecting entity in the explorer, choosing **View** from the Cross-Connection window menu bar, choosing **List Cross Connections** from the View menu, and then choosing **All Cross Connections** from the displayed sub-menu to display a textual list of all existing cross-connections for the selected entity. To select a cross-connection from the list, position the mouse cursor on the cross-connection and click the select (left) mouse button. You can then click the Modify button on this window to modify the cross-connection or click the Delete button to delete it. In both cases, a pop-up question dialog is displayed, asking if you really want to perform the operation. Choose Yes to perform the operation or No to cancel the operation.
2	Double-click on the TID of the NE in the Network Element Explorer portion of the window (or click the plus sign next to the NE TID) to expand and show the bay, shelf, slot, and port that contains the cross-connection to be deleted. If the equipment hierarchy is not expanded to show all components down to port level, double-click on the bay, shelf, slot, and circuit pack in successive order until the explorer tree expands to show the desired port.
3	Position the mouse cursor on the port in the explorer tree and click the left mouse button to select it. The port is highlighted in the explorer.

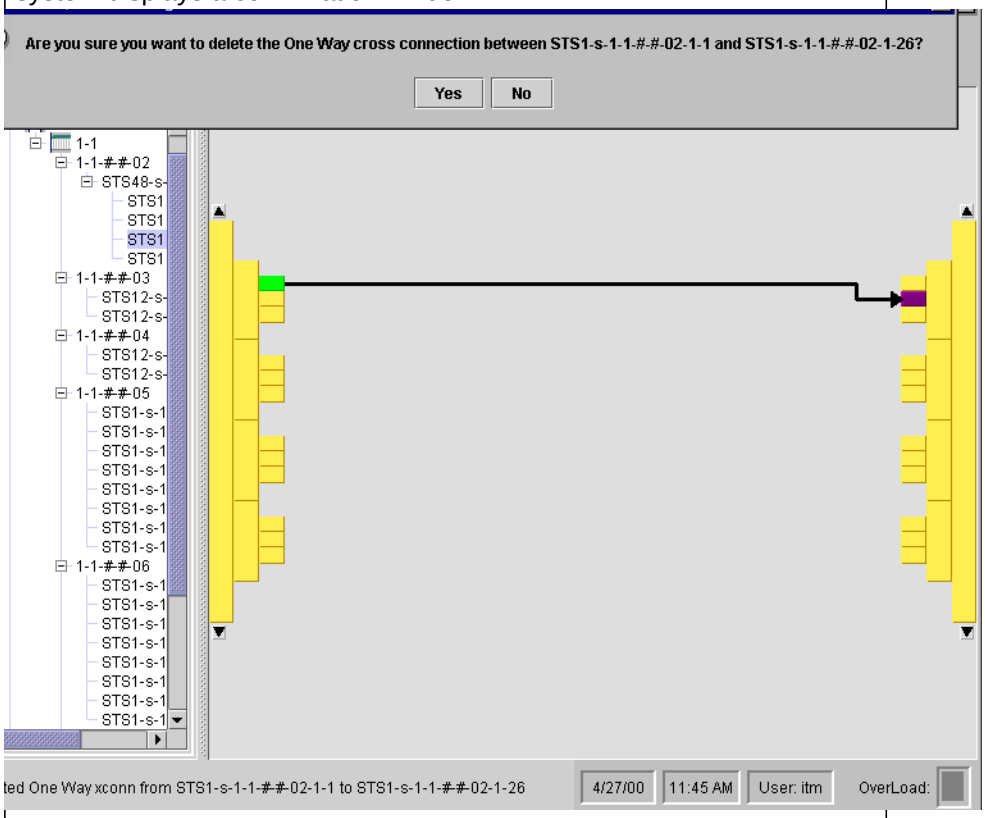
Step	Action (Contd)
4	Click the right mouse button to display a drop-down list and select the position to place the associated tributaries in the Main View of the Cross-Connection window. The other way to do this is to click and hold the left mouse button and drag the port into the left, right, or bottom position to display the associated tributaries in the Main View. The window shows any existing cross-connections for the port.  **NOTE:** If the cross-connection is not displayed, click the Show/Hide toolbar button to show the cross-connection. If there are multiple cross-connections, position the mouse cursor over one of the cross-connections and click the right mouse button to display a listing of the existing cross-connections. Then select the desired cross-connection.

Step	Action (Contd)
5	On the Cross-Connection window, position the mouse cursor on the line that represents the cross-connection and click the left mouse button. The line of the selected cross-connection becomes thicker and the color displayed is black.



NOTE:
The line of the selected cross-connection becomes thicker and the color is black. If you want to delete a two-way cross-connection, each leg of the two-way cross-connection must be deleted, one at a time. To select the leg of the two-way cross-connection to be deleted, position the mouse cursor on the cross-connection line and click the right mouse button to display a listing of the cross-connection legs, select the leg to be deleted, and go to Step 6 to follow the rest of this procedure. This step must be repeated to select the other leg of the two-way cross-connection for deletion.

Also, the request to remove a red-lined cross-connection will be denied.

Step	Action (Contd)
6	Click the Delete button on the Cross-Connection window toolbar. The system displays a confirmation window. 
7	Select Yes in the confirmation window to delete the cross-connection. **Stop! End of Task.**

Delete an NE Cross-Connection—Textual

319

Background

When to use

Use this procedure to delete a selected cross-connection using the Cross-Connections List window, which lists the cross-connections textually rather than graphically.

Before you begin

Before you begin this task, you must determine the cross-connection to be deleted and display it as described in T 314, View NE Cross-Connections—Textual.

Related information

For related information, see the following:

- T 318, Delete NE Cross-Connections—Graphical
- Chapter 4, Configuration Management

Instructions

Task

Complete the following steps to delete a cross-connection textually.

Step	Action
1	Display cross-connections on the Cross-Connection List window, as described in the task T 314, View NE Cross-Connections—Textual.
2	Use your mouse to select the cross-connection to be deleted.
3	Press the Delete key or click the Delete button. The system displays a confirmation window. **NOTE:** The following three scenarios will cause a cross-connection deletion request to be *denied*: ■ a request to remove a red-lined cross-connection ■ a request to remove a cross-connection from a tributary used in a loop-back cross-connection ■ a request to remove a cross-connection from a tributary used in a test access connection.
4	If you are certain you want to delete the cross-connection indicated for deletion in the cross-connection window, click the Yes button. The system deletes the indicated cross-connection. **NOTE:** Upon successful deletion of a cross-connection, all reference to that cross-connection, in any window in the GUI, is removed. **Stop! End of Task.**

Modify NE Cross-Connections—Graphical

320

Background

When to use

Use this procedure to modify cross-connections graphically via the Cross-Connections window. Use this procedure to modify certain parameters for the cross-connection, such as the redline status or source/destination node. For example, if you modify the redline parameter and enable redlining, it means that the cross-connection is prohibited from being deleted until you change the redline status from Yes to No in the associated Attributes window.

Before you begin

Before you begin this task, determine the cross-connection you need to modify and the modification you need to make.

The screen examples shown in this procedure are for illustration purposes. The specific information displayed on the Cross-Connection window will vary by NE type.

Related information

For related information, see

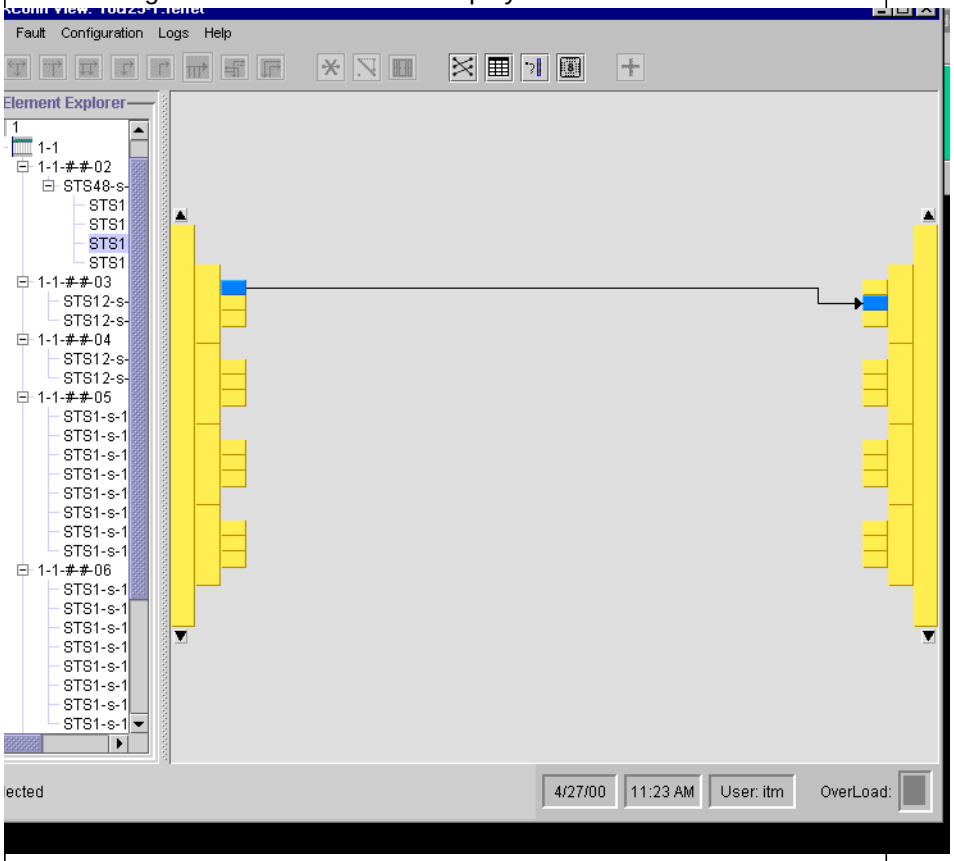
- T 321, Modify NE Cross-Connections—Textual
- Chapter 4, Configuration Management

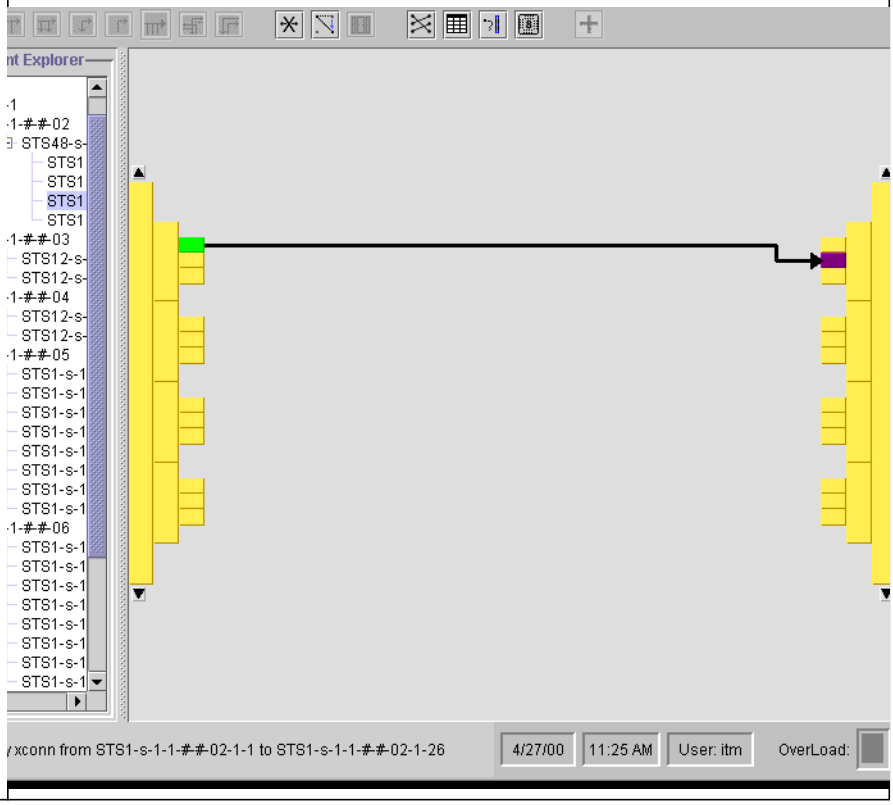
Instructions

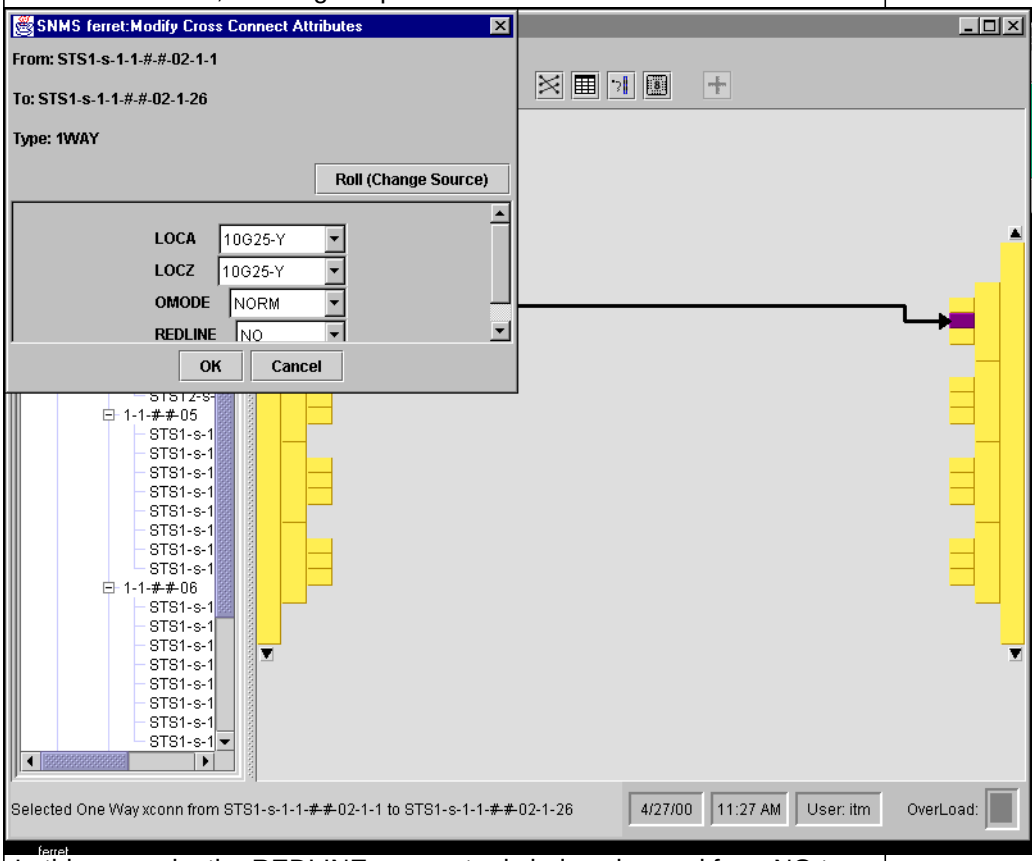
Task

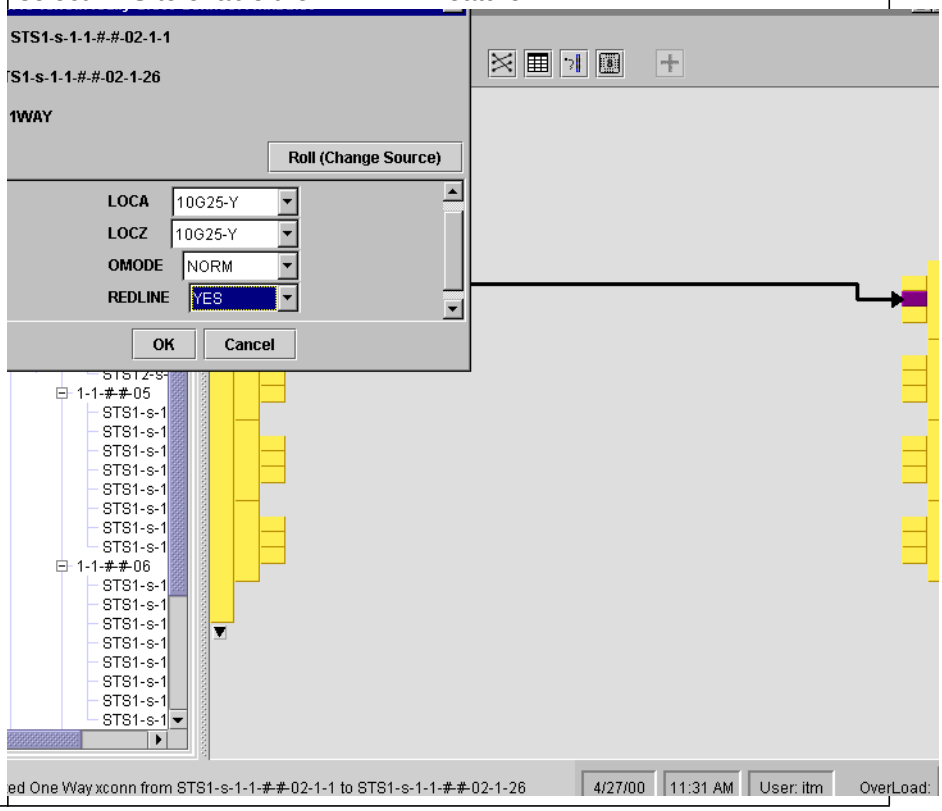
Complete the following steps to modify cross-connections graphically via the Cross-Connections window.

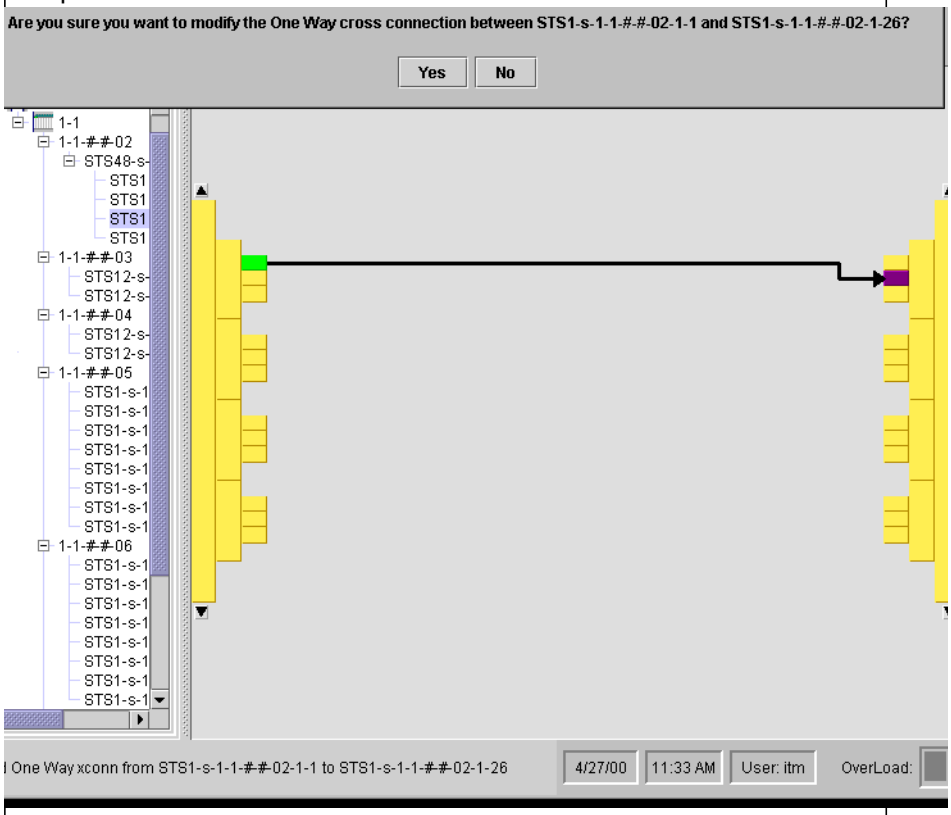
Step	Action
1	Position the mouse cursor on the NE in the Map pane portion of the Map window and click the select (left) mouse button to select it. The NE is highlighted in the Map window.
2	Click the menu (right) menu mouse button. A pop-up menu is displayed. Choose **Cross Connection** from the pop-up menu. The Cross-Connection window is displayed.
3	Double-click on the TID of the NE in the Network Element Explorer portion of the window to expand and show the bay, shelf, slot, circuit pack, and port that contains the cross-connection to be deleted. If the equipment hierarchy is not expanded to show all components down to port level, double-click on the bay, shelf, and slot in successive order until the explorer tree expands to show the desired port.
4	Position the mouse cursor on the port in the explorer tree and click the left mouse button to select it. The port is highlighted in the explorer.

Step	Action (Contd)
5	Click the right mouse button to display a drop-down list and select the position to place the associated tributaries in the Main View of the Cross-Connection window. The other way to do this is to click and hold the left mouse button and drag the port into the left, right, or bottom position to display the associated tributaries in the Main View. The existing cross-connections are displayed in the window.  **NOTE:** If the existing cross-connection(s) is not displayed, click the Hide/Show button on the Cross-Connection window toolbar to display it. To expand the view of the Network Element Explorer to see any obscured tributary AIDs, position the mouse cursor next to the bar between the right edge of the Explorer and the tributary block display in the Main view, click the left mouse button and drag the border to the right.

Step	Action (Contd)
6	Position the mouse cursor on the line of the cross-connection to be modified and click the select (left) mouse button to select it. The cross-connection lines become thicker and the color is black. 

Step	Action (Contd)
7	Click the Modify button on the toolbar part of the window. **NOTE:** If you are not sure which button is the Modify button, move the cursor to each button until the tooltips help is displayed to indicate that it is the Modify button. Then click the button. A Cross-Connection Attributes window is displayed for the selected cross-connection, showing the parameters that can be modified.  In this example, the REDLINE parameter is being changed from NO to YES to redline the cross-connection and prohibit it from being deleted.

Step	Action (Contd)
8	To change the REDLINE parameter, click the down arrow next to the REDLINE field in the Attributes window to display a drop-down list and select YES to enable the REDLINE feature. 

Step	Action (Contd)
9	After making all necessary parameter changes, click the OK button in the Cross-Connect Attributes window. A question dialog window is displayed, asking if you really want to modify the parameters for the cross-connection. 
10	Choose Yes to modify the cross-connection. In this example, the REDLINE status of the cross-connection was changed. When the modification is completed, The color red will be displayed on the cross-connection line to indicate that the cross-connection is redlined (prohibited from being deleted, until the REDLINE status is changed again to NO, to disable redlining). **Stop! End of Task.**

Modify NE Cross-Connections—Textual

321

Background

When to use

Use this procedure to modify cross-connections textually via the Cross-Connections List window.

Before you begin

Before you begin this task, determine the cross-connection you need to modify and the modification you need to make.

Related information

For related information, see the following:

- T 320, Modify NE Cross-Connections—Graphical
- Chapter 4, Configuration Management

Instructions

Task

Complete the following steps to modify cross-connections textually via the Cross-Connections List window.

Step	Action
1	Display the Cross-Connections List window as described in T 314, View NE Cross-Connections—Textual.
2	Choose a cross-connection to modify and select **Modify**. This displays the Additional Cross-Connection Information window, with the current information for the selected cross-connection.
3	Type the required changes into the displayed window and click the Done button. This displays the Cross-Connection Confirmation window.
4	Make sure you have entered the desired changes and then click the Yes button. The system modifies the selected cross-connection per the entered changes. **Stop! End of Task.**

Show/Hide NE Cross-Connection Lines

322

Background

When to use

Use this procedure to show or hide the cross-connection lines that graphically represent cross-connections on the Cross-Connections window.

Before you begin

Before you begin this task, determine whether you want to show or hide cross-connection lines.

Related information

For related information, see the following:

- T 312, Display the NE Cross-Connection Window
- Chapter 4, Configuration Management

Instructions

Task

Complete the following steps to show or hide cross-connection lines on the Cross-Connections window.

Step	Action		Reference
1	Display the Cross-Connections window.		T 312, Display the NE Cross-Connection Window
2	TO SHOW/HIDE ALL LINES…	TO SHOW/HIDE A SINGLE LINE…	
	Either click the show/hide button on the toolbar or select **View** from the menu bar and then **Show Cross Connection Lines** from the sub-menu. **NOTE:** If cross-connection lines were showing they will now be hidden, and vice versa. **Stop! End of Task.**	a. Display ports as described in T 313, Display Ports on the NE Cross-Connect Window. b. Click on an AID representation (building block) that indicates that it contains a cross-connection. The desired cross-connection line is displayed.	

Add NE Protection Groups

323

Background

When to use

Use this procedure to add a port protection group to an NE.

Before you begin

Before you begin this task, make sure that you have identified the NE to which you want to add a protection group. Be aware that only certain types of protection are supported for a given transmission interface (rate) and NE type. For details about the types of protection supported for a given transmission interface (rate) and NE type, see the Protection Groups section in Chapter 4, Configuration Management .

To perform this task, access the Map window.

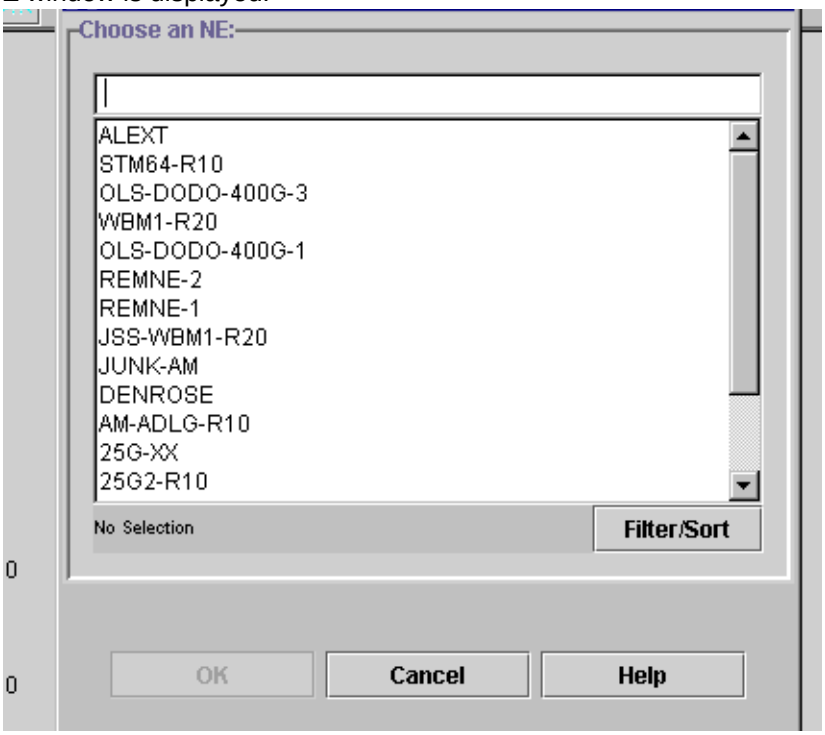
Related information

For related information, see the T 324, View NE Protection Groups, T 325, Modify NE Protection Groups, T 326, Delete NE Protection Groups, and the Protection Groups section in Chapter 4, Configuration Management.

Instructions

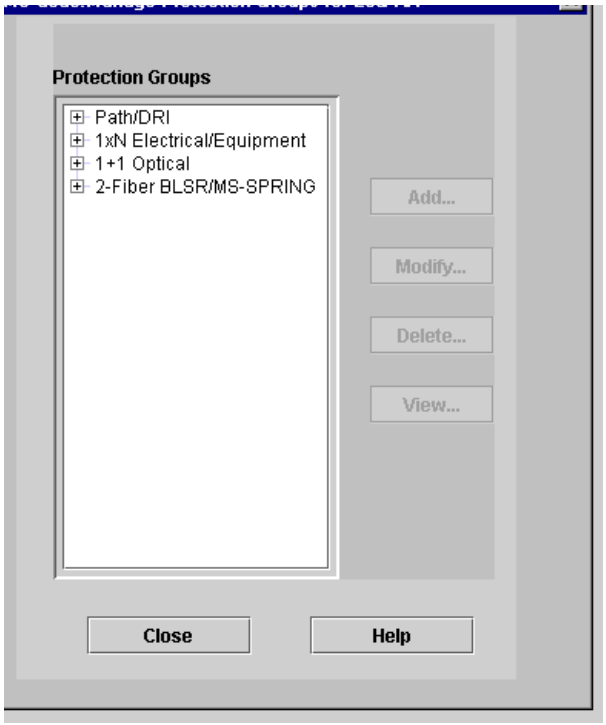
Task

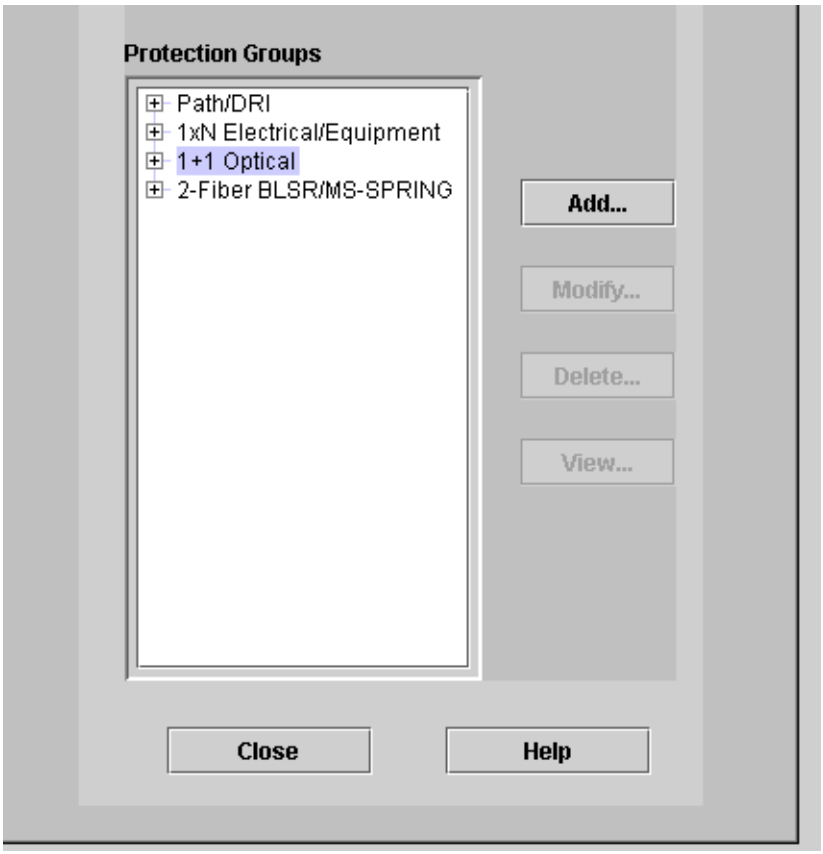
Complete the following steps to create protection groups on the Protection Provisioning window.

Step	Action
1	Select **Configuration** from the main menu bar on the Map window. The Configuration menu is displayed.
2	Select **Protection Groups** from the Configuration menu. The Choose an NE window is displayed. 

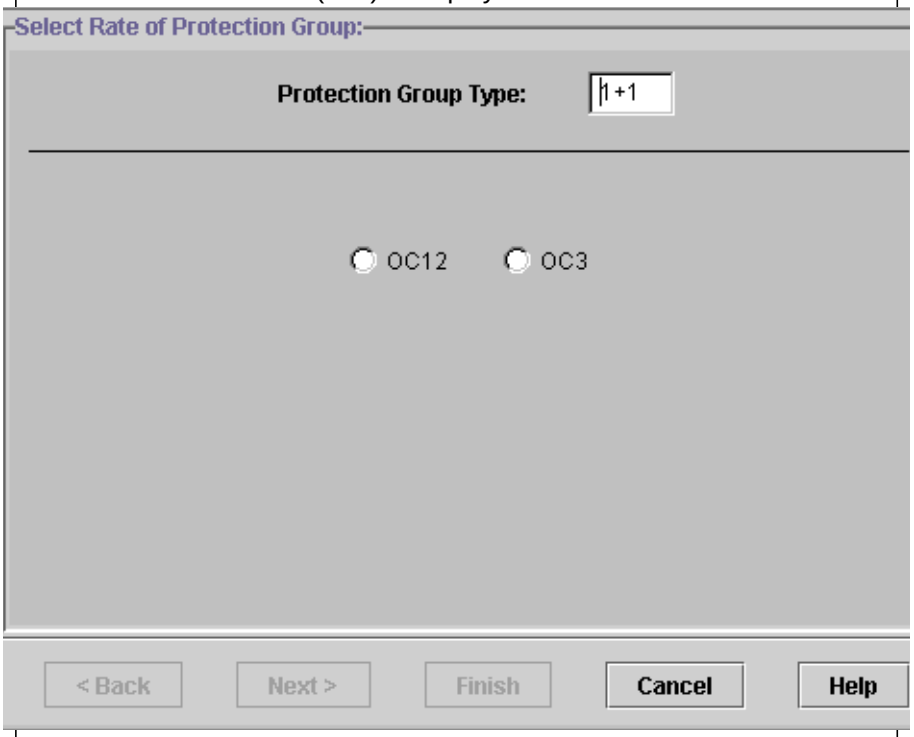
Continued on next page

Step	Action (Contd)
3	Double-click on the NE to select it.

Step	Action (Contd)
4	Click the OK button. The Protection Provisioning Manager window is displayed for the selected NE.  The Protection Provisioning Manager window has an explorer that shows the available protection group types and port protection groups created for each type. To display existing protection groups for a protection group type, click the plus (+) sign next to the protection group type. The explorer expands the list to show existing protection groups for a type, if any. If there are no existing protection groups for a given type, the explorer tree shows “No protection Groups”. To collapse the listing, click the minus (-) sign next to the protection group type. The window also has a series of buttons: ■ Add—click this button to add a new protection group. ■ Modify—click this button to modify an existing protection group. ■ Delete—click this button to delete an existing protection group. ■ View—click this button to view the member ports and attributes of an existing protection group. ■ Close—click this button to close the Protection Provisioning Manager window. ■ Help—click this button to display online help for this window.

Step	Action (Contd)
5	Single-click on the protection group type to select it. The Add button is enabled. 

Step	Action (Contd)
6	Click the Add button. The Add Protection Group wizard window to select a transmission interface (rate) is displayed.
7	Select the rate by clicking on the appropriate radio button. The Next button is enabled.



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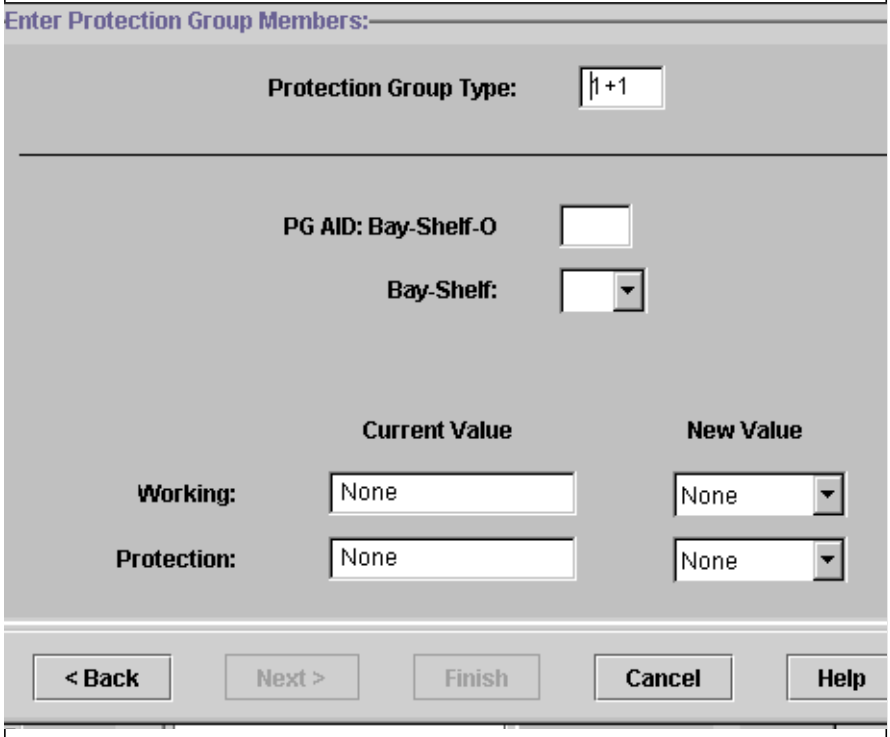
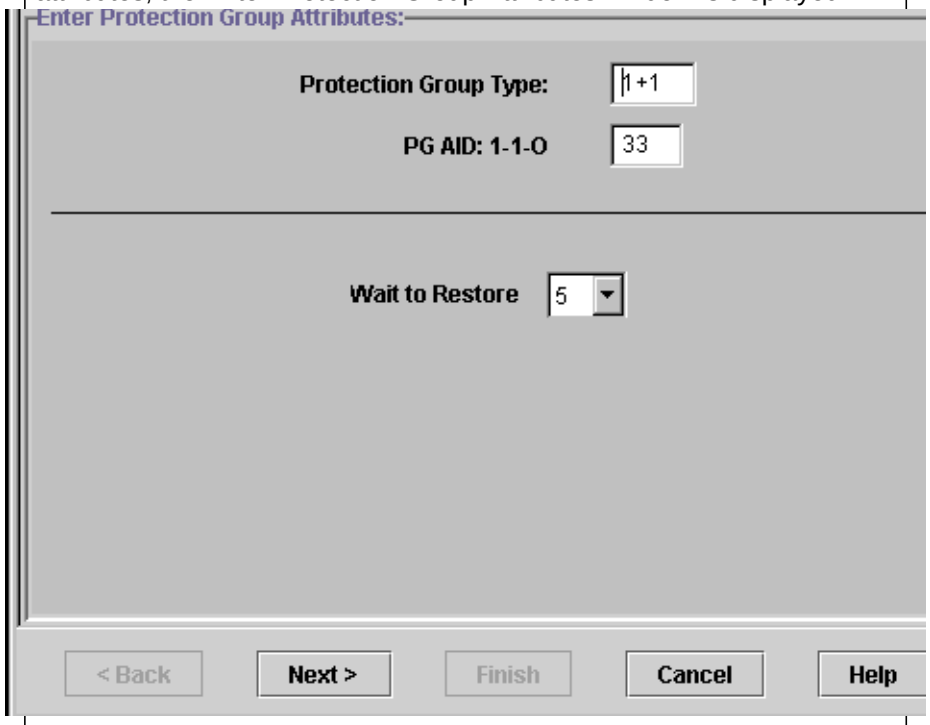
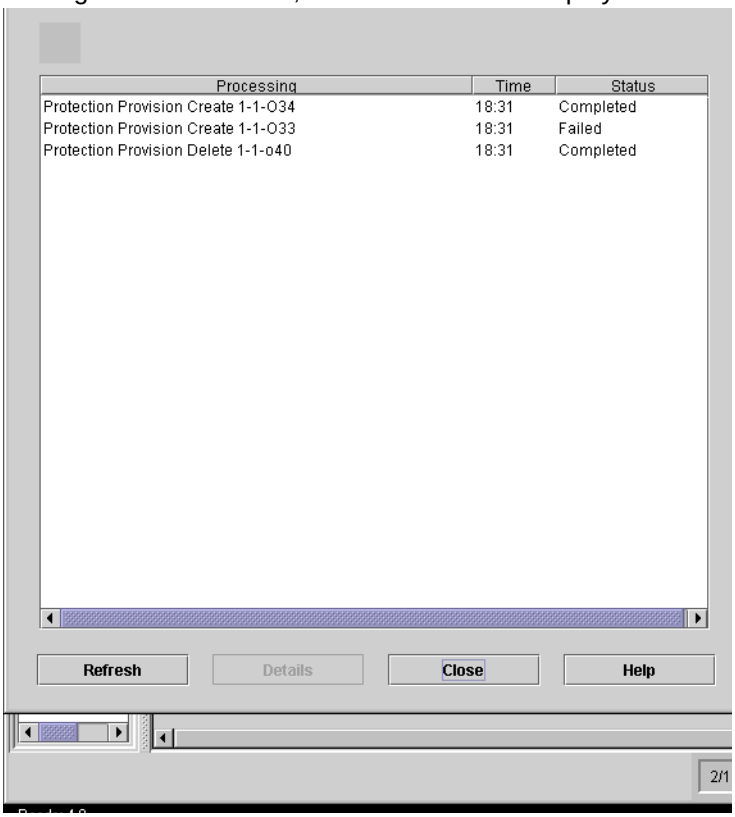
Step	Action (Contd)
8	Click the Next button. The Add Protection Group wizard window to identify the protection group and select the member ports is displayed.
	
	The Protection Group Type is displayed at the top of the window.
9	If this is 2-Fiber BLSR/MSPRing or 4-Fiber BLSR/MSPRing protection group, a Protection Group Name field is displayed. Enter the protection group name (this field is optional). If this is another type of protection group, skip to step 10.

Continued on next page

Step	Action (Contd)
10	Click the down arrow next to the Bay-Shelf field to display a drop-down list of bays and shelves. Select the bay/shelf for the port protection group. The bay and shelf selected becomes part of the Protection Group ID displayed on the window and is later used to identify the protection group. The Protection Group (PG) ID (identifier) is derived from the information you provide. The format for the PG AID is {BayAID}{ShelfAID}{Entity Type Qualifier}{Protection Group AID}, where the {Entity Type Qualifier} is: T - 2 Fiber F - 4 Fiber O - 1+1 Optical
11	Enter the Protection Group (PG) AID number(00-99) in the field next to the PG AID label. This number is used to uniquely identify a protection group of the same type provisioned on the same shelf. This field is required.
12	In the portion of the window labelled Current Value and New Value, select the member ports for the protection group. Depending on the protection group type chosen, the member ports may be labelled “East/ West” (2-Fiber BLSR/MSSPRing), “Working/Protection” (1+1 Optical, 1xN Electrical), or “East Working/East Protection, West Working/West Protection” (4-Fiber BLSR/MSSPRing). The system enforces that the ports selected are on the same shelf and the same tranmission rate you selected. Mixing of SONET and SDH rates is not allowed by the system. **NOTE:** At any point on this window, you can click the Back button to go back to the previous wizard window to change the rate for the protection group. However, if you do this, the current selections you have made on this wizard window to identify the protection group and select the member ports will be removed.
13	To select the first port, click the down arrow under the New Value column to display a list of available ports for the selected bay/shelf. Click on a port in the displayed drop-down list.
14	To select the next port, click the down arrow under the New Value column to display a list of available ports for the selected bay/shelf. The system only displays a list of ports that are on the same bay/shelf as the first (reference) port chosen and the rate chosen on the previous wizard window. The system enforces that the working and protection ports are the same rate.

Step	Action (Contd)
15	After selecting the member ports, click the Next button. A window is displayed, informing you that the protection group is in the process of being created for the network element. When the process is finished, the text in the window informs you that the protection group has been successfully created in the network element. To view or modify any additional attributes for the protection group, click the Next button. Go to step 16. If you are finished at this point, click the Finish button. Go to step 17.

Step	Action (Contd)
16	If you clicked the Next button on the previous window to change attributes, the Enter Protection Group Attributes window is displayed.  Wait to Restore—this field is used to select the amount of time (seconds) to wait before switching back to the working port when it becomes available again. Click the down arrow next to this field to display a list of choices. Click on the choice in the list to select it. If you are finished changing the protection group attribute(s), click the Next button. A window is displayed, indicating whether you changed any attributes and asking if you would like to view the protection group (members, attributes, identifier). Click the Next button to view the protection group created, or click the Finish button. Go to step 17.

Step	Action (Contd)
17	After clicking the Finish button, a status window is displayed showing  whether the protection group was successfully created. If it was not successfully created, this is indicated on the status window. If the protection group was not successfully created, it may be that the protection group already exists or another problem with the NE or selections made. Click the Refresh button to clear the status window or click the Close button to close it. **Stop! End of Task.**

View NE Protection Groups

324

Background

When to use

Use this procedure to select an NE's port protection group and view all member ports and current attribute settings.

To perform this task, access the Map window.

Befoe you begin

Before you begin this task, determine the NE and protection group to be viewed. To perform this task, access the Map window.

Related information

For related information, see T 323, Add NE Protection Groups, T 325, Modify NE Protection Groups, T 326, Delete NE Protection Groups, and the Protection Groups section in Chapter 4, Configuration Management.

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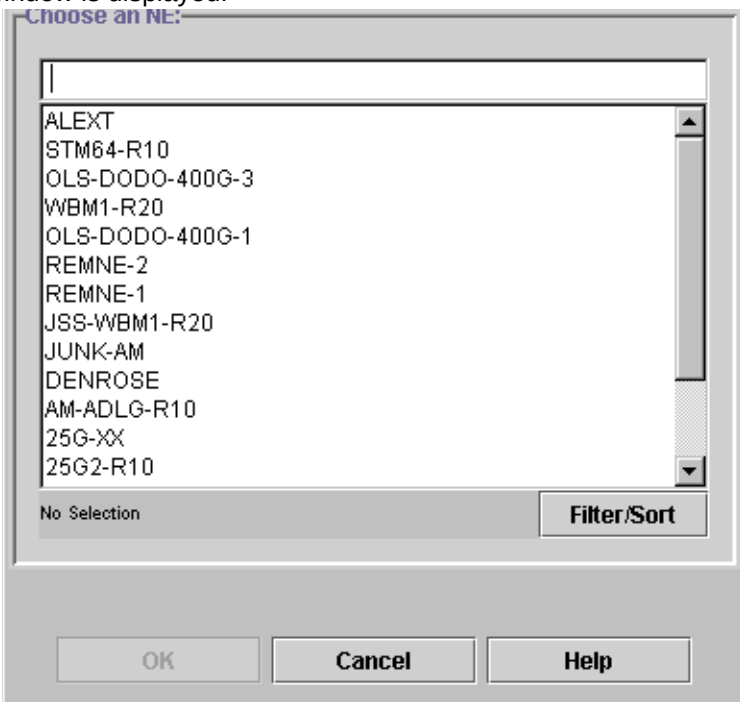
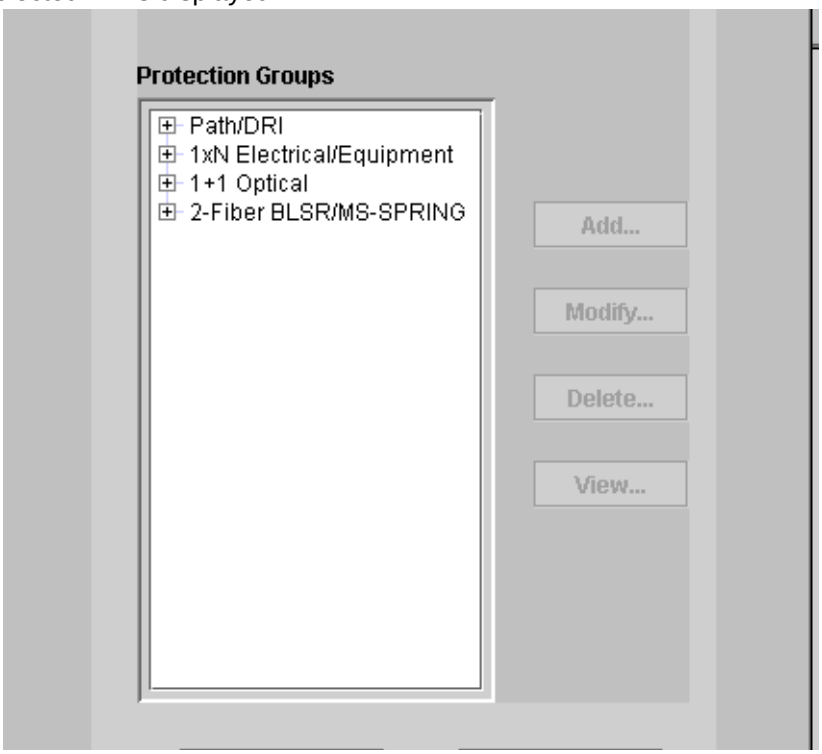
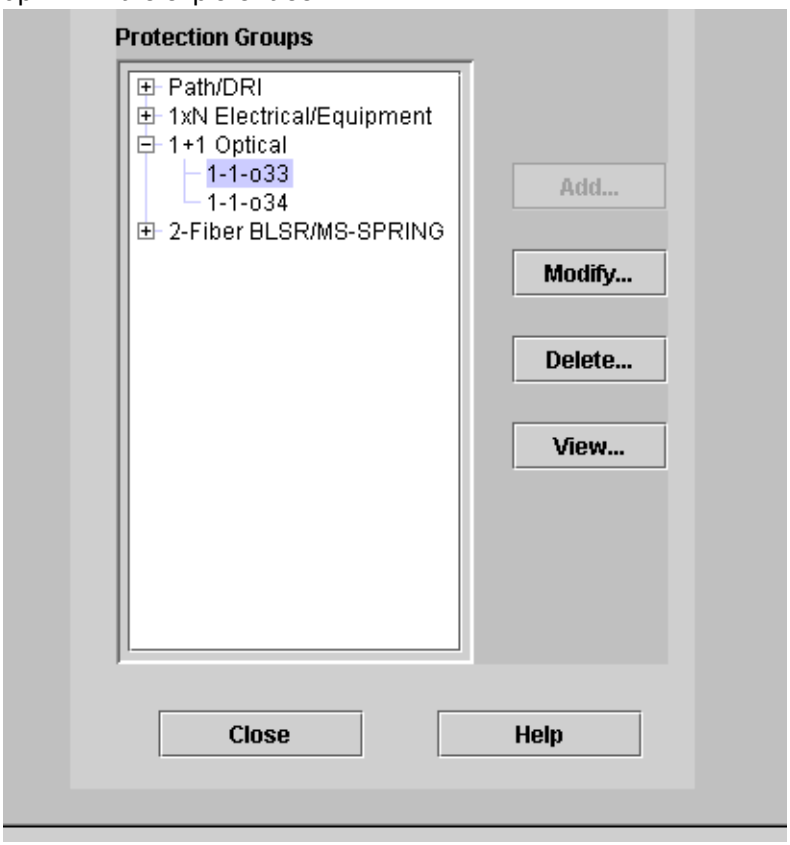
Instructions

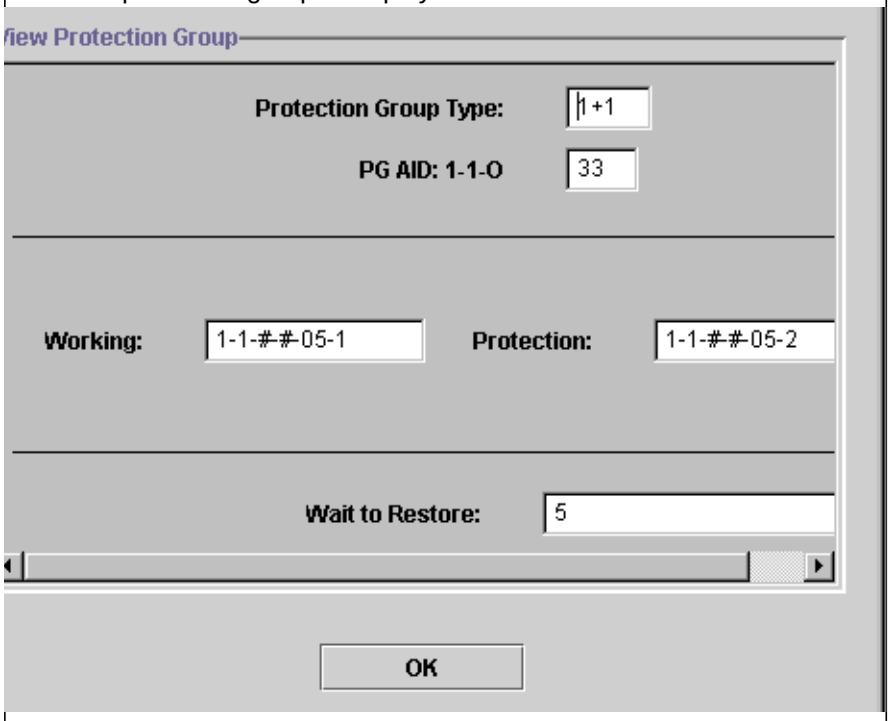
Task

Complete the following steps to display protection groups on the Protection Provisioning window.

Step	Action
1	Select **Configuration** from the main menu bar on the Map window. The Configuration menu is displayed.
2	Select **Protection Groups** from the Configuration menu. The Choose an NE window is displayed. 
3	Double-click on the NE to select it.

Step	Action (Contd)
4	Click the OK button. The Protection Provisioning Manager for the selected NE is displayed. 
5	In the explorer portion of the window, click on the plus (+) sign next to the protection group type under which is the protection group you want to view. The explorer expands to show the existing protection groups under the type selected.

Step	Action (Contd)
6	Select the protection group to be viewed by clicking on its protection group AID in the explorer tree. 

Step	Action (Contd)
7	Click the View button. The View Protection Group window for the selected protection group is displayed.  This window shows the Protection Group Type, protection group (PG) AID, member ports and their value (assignment), and the current setting of any provisionable attributes.
8	Click the OK button to close the window. The Protection Provisioning Manager window remains on the screen. Click the Close button to close this window. **Stop! End of Task.**

Modify NE Protection Groups

325

Background

When to use

Use this procedure to modify NE protection groups. WaveStar SNMS allows you to swap the function of existing member ports (for example, swap the East and West ports or Working and Protection ports) and to change any attributes associated with the protection group.

Before you begin

Before you begin this task, determine the NE and protection group to be modified. To perform this task, access the Map window.

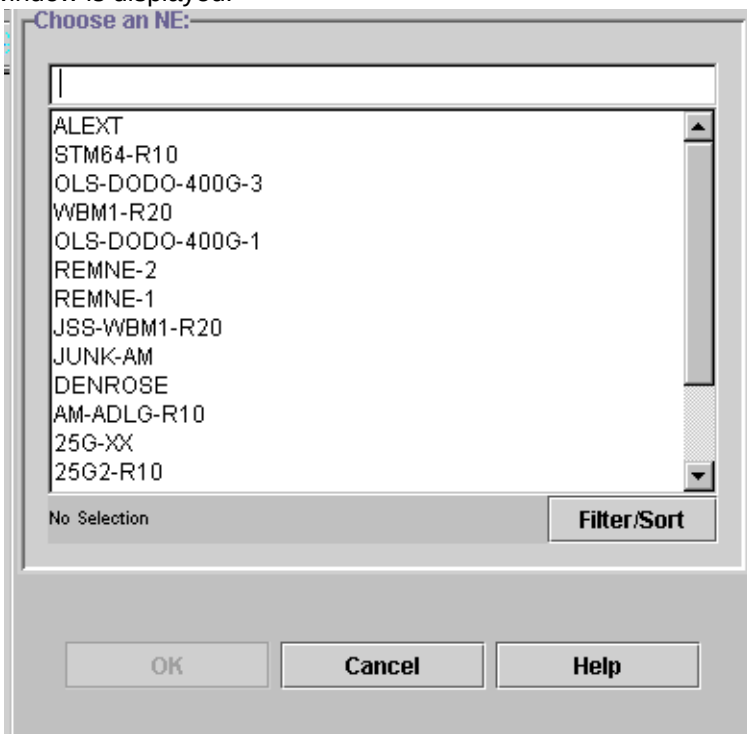
Related information

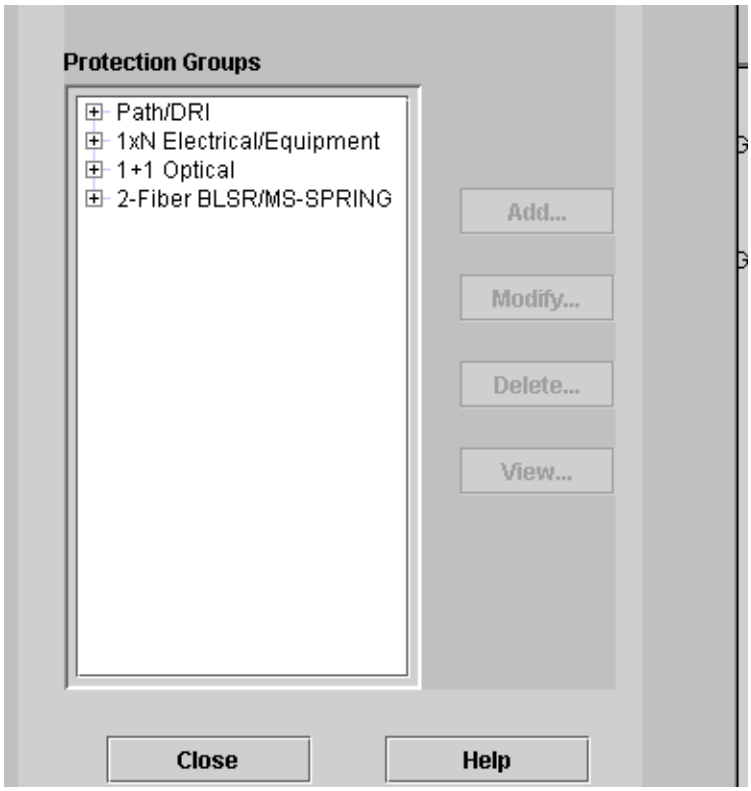
For related information, see T 323, Add NE Protection Groups, T 324, View NE Protection Groups, and the Protection Groups section in Chapter 4, Configuration Management.

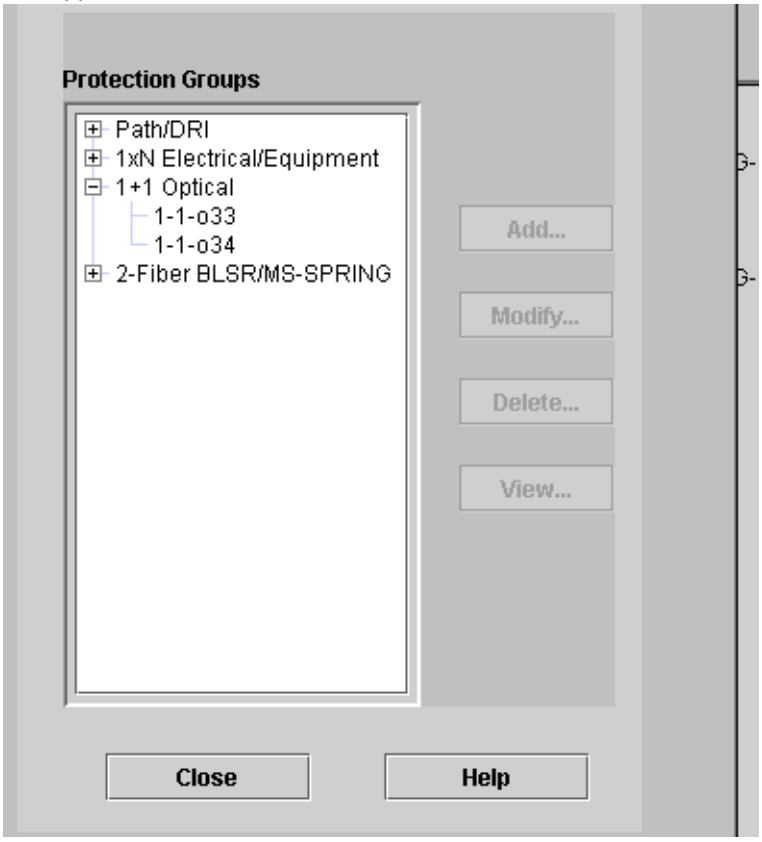
Instructions

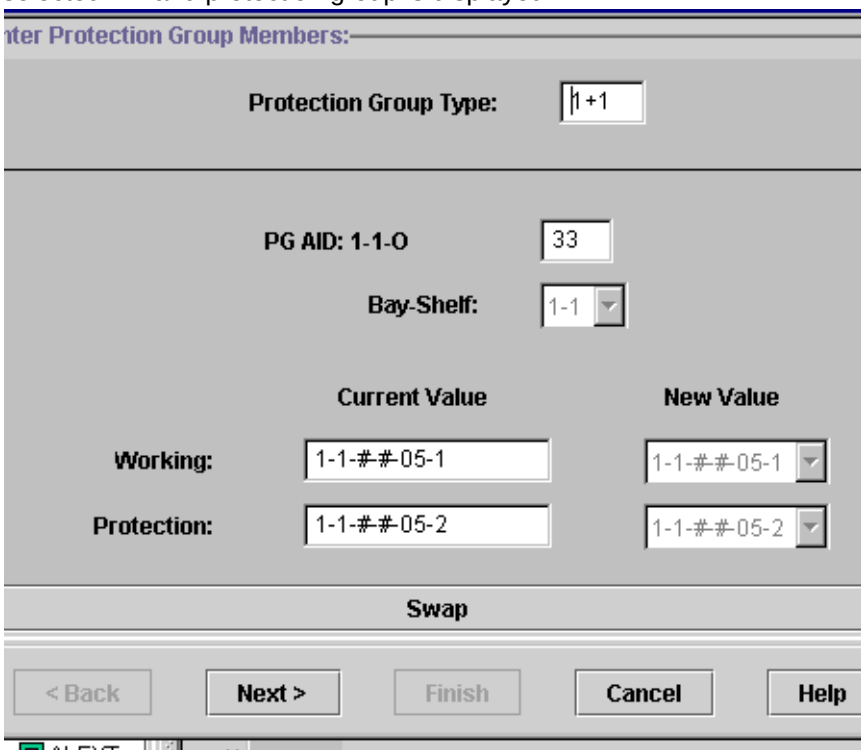
Task

Complete the following steps to modify protection groups on the Protection Provisioning window.

Step	Action
1	Select **Configuration** from the main menu bar on the Map window. The Configuration menu is displayed.
2	Select **Protection Groups** from the Configuration menu. The Choose an NE window is displayed. 
3	Double-click on the NE to select it.

Step	Action (Contd)
4	Click the OK button. The Protection Provisioning Manager is displayed for the selected NE. 

Step	Action (Contd)
5	Click on the plus sign (+) next to the protection group type of the protection group to be modified in the explorer portion of the window. The explorer expands to show a list of existing protection groups for the selected type. 

Step	Action (Contd)
6	Single-click on the protection group (identified by its Protection Group ID) in the list. Your selection is highlighted and the Modify button is enabled.
7	Click the Modify button. The Protection Group wizard window for the selected NE and protection group is displayed.  The top of this window shows the Protection Group Type, Protection Group (PG) AID, and bay/shelf of the protection group (all of which cannot be modified). The bottom portion of the window shows the current value (assignment) of each member port and a display-only New Value field for each port.
8	Click the Swap button to swap the value (port assignment) of, depending on the NE and protection group type selected, the Working and Protection or East and West ports. 4-Fiber BLSR/MS-SPRing protection groups allow you to swap the value of the East Working/East Protection and West Working/West Protection port assignments.

Delete NE Protection Groups

326

Background

When to use

Use this procedure to delete an existing port protection groups from an NE. Deleting a protection group removes all member ports from the group.

Before you begin

Before you begin this task, determine the NE and the protection group to be deleted. Be aware that removing protection groups with existing cross-connections or reservations is not permitted.

To perform this task, access the Map window.

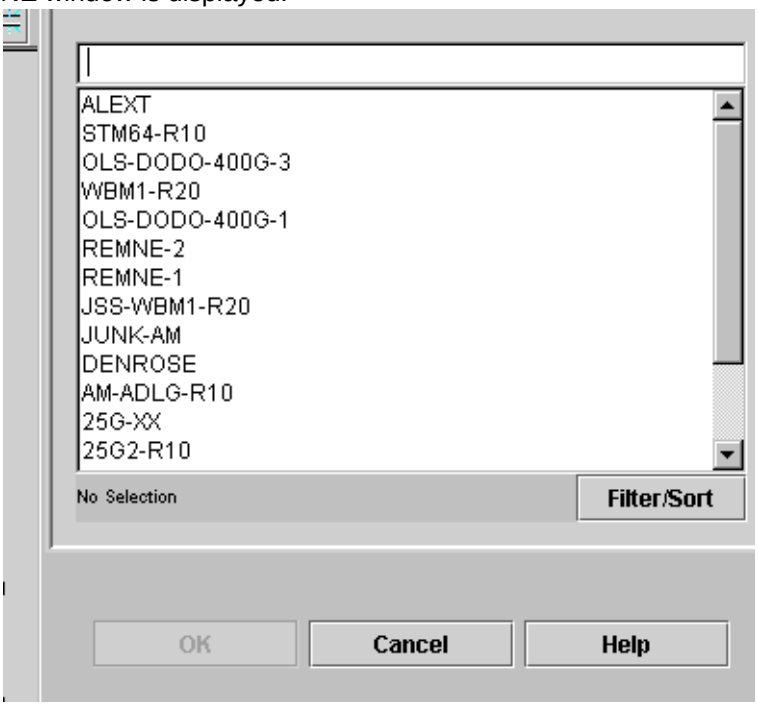
Related information

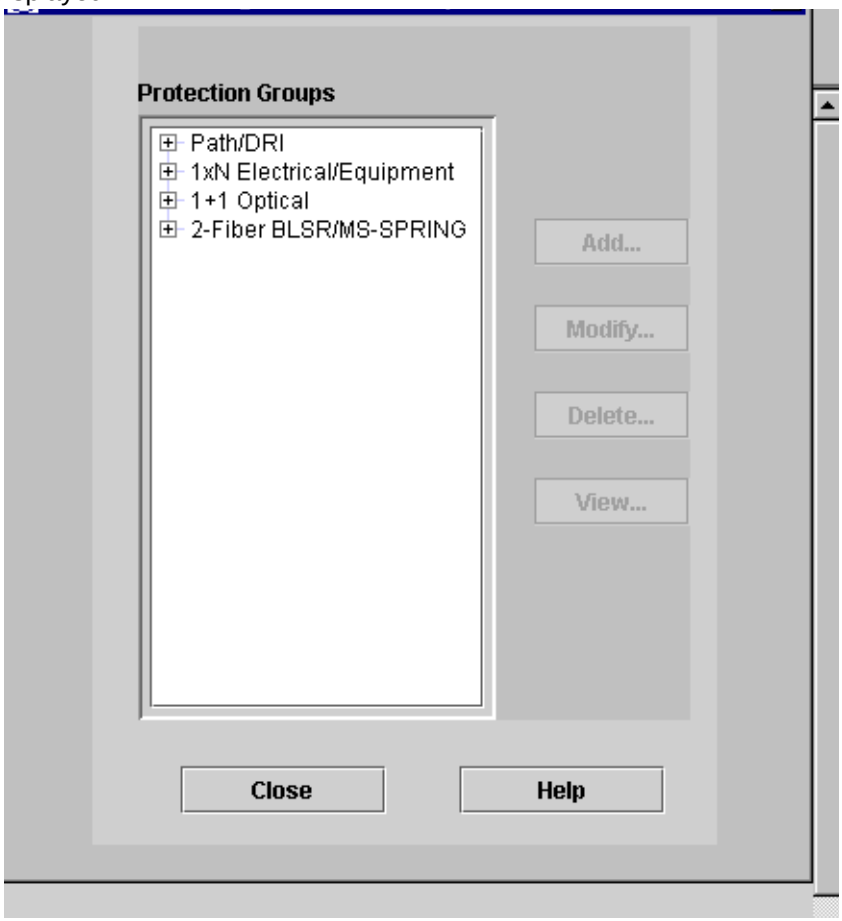
For related information, see T 323, Add NE Protection Groups, T 324, View NE Protection Groups, and the Protection Groups section in Chapter 4, Configuration Management.

Instructions

Task

Complete the following steps to delete protection groups on the Protection Provisioning window.

Step	Action
1	Select **Configuration** from the main menu bar on the Map window. The Configuration menu is displayed.
2	Select **Protection Groups** from the Configuration menu. The Choose and NE window is displayed. 
3	Double-click on the NE to select it.

Step	Action (Contd)
4	Click the OK button. The Protection Provisioning Manager window is displayed. 
5	In the explorer portion of the window, click on the plus (+) sign next to the protection group type to expand the explorer and show the list of protection group AIDs under that type.
6	Select the protection group ID of the port protection group to be deleted by single-clicking on it. Your selection is highlighted and the Delete key is enabled.
7	Click the Delete key. A pop-up window is displayed, asking if you really want to remove the port protection group.

Step	Action (Contd)
8	Choose Yes to remove the protection group.
9	Select a port group AID of the NE protection group to be deleted.
10	Click the Remove button. A pop-up window is displayed, asking if you really want to remove the network element protection group. Choose Yes to remove the protection group. A status window is displayed, showing the progress of the deletion. If the deletion is successfully completed, the status is shown as “Completed” on the status window. **Stop! End of Task.**

Manually Initiate DNO

327

Background

When to use

Use this procedure to manually initiate DNO for one or more NEs or an aggregate. For a WaveStar BWM or WaveStar OLS 400G, you can perform a DNO for all configuration data, or on any single bay or shelf. You can specify that all information be included in the DNO update, or just port, cross-connection, port protection group, subnetwork, NE parameters, or equipment information.

Before you begin

Before you begin this task, you must be logged into WaveStar SNMS.

Related information

For related information, see T 100, Log Into WaveStar SNMS and the following section:

- Dynamic Network Operations

Instructions

Task Complete the following steps to manually initiate DNO.

Step	Action	
1	IF … ■ you are performing DNO on a single NE, group of NEs, or aggregate ■ you are performing DNO on a single bay or shelf	THEN … ■ select one or more NEs or an aggregate. ■ select the bay or shelf on the Network Element Explorer
2	Access the DNO function (as appropriate) through: ■ The Map window Configuration menu—select **DNO** from the Configuration menu on the main menu bar of the Map window. The Choose an NE/Aggregate window is displayed. Double-click on the NE(s)/aggregate(s) for which you want to perform DNO. Click the OK button. ■ The NE's or aggregate's pop-up menu—position the mouse cursor over the NE/aggregate icon on the Map pane or Subnetwork Explorer, and click the menu (right) mouse button. A pop-up menu is displayed. Select **DNO** from the pop-up menu. ■ The Equipment View window (for the chosen NE/aggregate)—Select **Configuration** from the main menu. A sub-menu is displayed. Select **DNO** from the sub-menu. ■ The Cross-Connection window (for the chosen NE/aggregate)—select **Configuration** from the main menu. A sub-menu is displayed. Select **DNO** from the sub-menu. The Manual DNO window is displayed. **NOTE:** If the DNO channel is down, a message is displayed in the status bar of the window, indicating that you cannot perform a DNO at this time. Click the Close button to close the window.	

Continued on next page

Step	Action (Contd)	
3	IF ARE INITIATING DNO FOR…	THEN …
	all configuration data	click on the radio button labeled “All Information” . **NOTE:** If you choose “All Information” for a bay or shelf, WaveStar SNMS performs DNO for ports, port protection groups, cross-connections, and equipment.
	you are initiating DNO for a selected data type	click on the radio button labeled “Only the following...” and choose one of the following data types: ■ Port Parameters ■ Cross Connections/ Reservations ■ Port Protection Group ■ NE Parameters ■ Equipment ■ Subnetwork ■ Optical Associations **NOTE:** For a single bay or shelf, DNO can be performed for just Port Parameters, Cross-Connections, or Equipment. **NOTE:** When you perform DNO the first time on an NE, the system does database synchronization on all data types, even if you choose only one data type.

Step	Action (Contd)
4	Click the Apply button to initiate DNO and select the next data type for update, or click the OK button to initiate DNO and close the window. The DNO process is started. **NOTE:** To obtain DNO status for an NE before or after initiating DNO, click on the GetStatus button. When the DNO is completed, a message is displayed on the window's status bar, indicating whether the DNO is successful or if there are any errors. **CAUTION:** *For certain NE types, such as the BWM and OLS 400G, DNO command requests for some data may result in DENY messages but the DNO process will continue, resulting in a "COMPLETED" status even though all data has not been updated in the database. In this case, your system administrator may have to check the ERRORLOG file in the $oamlog directory to check the NE responses to the DNO process.* If DNO cannot be performed for the selected NE(s), the system issues a message. If you choose to perform DNO on all NEs in your Target Group, or for an NCC with the DSA function enabled, a pop-up window is displayed, informing you that the DNO process may take a long time and affect system performance. You can choose to perform DNO or stop the process. Choose **Yes** to perform DNO anyway or **No** to stop the DNO process. **Stop! End of Task.**

Set NE Date/Time Synchronization

328

Background

When to use

Use this procedure to manually initiate date/time synchronization for a single NE, a group of NEs, an aggregate, or all NEs under WaveStar SNMS control.

Before you begin

Before you begin this task, you must take into account whether the NE(s) being set with the date/time synchronization feature are located in the same or a different time zone as the WaveStar SNMS host. You can also select to have WaveStar SNMS automatically make adjustments for Daylight Savings Time (Spring Forward) and standard time (Fall Back) before doing date/time synchronization for the selected NE(s).

Related information

For related information, see T 600, Add a Network Element—X.25 Communications,T 601, Add a Network Element—OSI Communications, T 329, Enable/Disable Fall Back and Spring Forward, and the following *User Reference* section:

- Date/Time Synchronization

Instructions

Task Complete the following steps to manually perform date/time synchronization..

Step	Action		Reference
1	Select **Configuration** from the main menu bar on the Map window. The Configuration menu is displayed.		
2	Select **Date/Time Synchronization** from the Configuration menu. A sub-menu is displayed.		
3	Select **Manual** from the sub-menu. The Choose an NE/Aggregate window is displayed.		
4	TO... ■ display a list of NEs ■ display a list of aggregates	CLICK... ■ the NEs radio button ■ the Aggregates radio button	
Continued on next page			

Step	Action (Contd)	Reference
5	Double-click on the NE or aggregate to select it for date/time synchronization. To perform date/time synchronization on all NEs, scroll to the top of the Choose an NE/ Aggregate window and double-click on the word ALL in the list.	
6	Click the OK button. The Manual Date/Time Synchronization window is displayed.	
7	Click the OK button to initiate date/time synchronization for the NE(s) or aggregate. Date/Time synchronization is initiated. A pop-up window is displayed, showing the status of the date/time synchronization. The status is as follows: ■ Completed—date/time synchronization is completed for the selected NE(s) or aggregate. ■ Incompleted—The command to perform date/time synchronization may be completed but the time difference between the host and NE is greater than the drift threshold set. **Stop! End of Task.**	T 620, Set Drift Threshold for Date/ Time Synchronization

Enable/Disable Fall Back and Spring Forward

329

Background

When to use

Use this procedure to enable or disable the Spring Forward (Daylight Savings Time) and Fall Back (standard time) feature to make automatic time adjustments in date/time synchronization for the selected NE(s)/aggregate(s).

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see T 328, Set NE Date/Time Synchronization, T 619, Enable/Disable Automatic Date/Time Synchronization, and the following *User Reference* section:

- Date/Time Synchronization

Instructions

Task

Complete the following steps to enable or disable the Spring Forward/Fall Back time adjustment feature.

Step	Action	Reference
1	Select one or more NEs/aggregates from the Map window. **OR** Select no NEs/aggregates to use this feature for all NEs in your Target group.	SE 329-1
2	Select **Configuration** from the main menu bar on the Map window. The Configuration menu is displayed.	
3	Select **Date/Time Synchronization** from the Configuration menu. A sub-menu is displayed.	

Step	Action (Contd)		Reference
4	Select **Spring/Fall Change** from the displayed sub-menu. If you have not yet selected the NE(s)/aggregate(s), the Choose an NE/Aggregate window is displayed. Select the NE(s)/aggregate(s) on which to use the Spring Forward/ Fall Back feature and click the OK button. The Fall Back and Spring Forward Status window is displayed.		
5	IF ... ■ you want to enable the Spring Forward/Fall Back feature for the selected NE(s) ■ you want to disable the Spring Forward/Fall Back feature for the selected NE(s)	THEN ... ■ Click the “Enable FB/SF for above NEs” button. ■ Click the “Disable FB/SF for above NEs” button.	
6	Click the OK button to activate your choices. **NOTE:** If Daylight Savings Time is already in effect for an NE, and you disable Spring Forward/Fall Back for an NE, requiring a date/time synchronization, a pop-up window is displayed, asking if you want to automatically initiate date/time synchronization for the NE(s). Choose Yes to initiate automatic date/time synchronization for the NE or No to skip date/time synchronization for the NE. **Stop! End of Task.**		

SE 329-1: Selecting NEs and Aggregates on the Map Pane

Procedure

To select a single NE or aggregate on the Map pane, position the mouse pointer over the NE or aggregate icon and click the select mouse button.

To select a group of NEs or aggregates on the Map pane.

1. Position the mouse pointer over a portion of the background adjacent to the items to be selected.
2. Click the mouse select button and drag the mouse pointer. As you drag the mouse pointer, an outlined box appears over the selected area.
3. Drag the mouse pointer over the NE(s)/aggregate(s) to be selected, enclosing them in the selection box. As items in the Map pane are selected, they change color. Release the mouse select button. The items are selected.

To deselect a selected item in the Map pane, position the mouse pointer over the itme and single-click the mouse select button. To deselect a group of items, position the mouse pointer within the boxed region and single-click the mouse select button. Any item in the box that is already selected becomes deselected.

Add a Reservation

330

Background

When to use

Use this procedure to reserve a tributary on a port for a cross-connection.

Before you begin

Before you begin this task, display the Cross-Connection window and the NE port group of the tributary to be reserved, to make sure there is no existing reservation or cross-connection on the tributary. Any tributary that is being used for a cross-connection is displayed as blue on the Cross-Connect window. Any tributary that has an existing reservation is displayed as dark blue on the Cross-Connect window. The tributary should not be in a port that is part of an NE port protection group and should be in a valid state.

Related information

For related information, see Reservations in the *User Reference* section.

Instructions

Task

Complete the following steps to add a tributary reservation.

Step	Action	Reference
1	Display the Cross-Connection window.	T 312, Display the NE Cross-Connection Window
2	Display the port of the tributary you want to reserve.	T 313, Display Ports on the NE Cross-Connect Window
3	Single-click on the tributary to be reserved to select it.	
4	Click the Reservation toolbar button. The Create Reservation Attributes window is displayed. A list of NE TIDs for the source NE is shown.	
5	Select one of the NEs displayed in the list. Make sure the choice is appropriate for the reservation being made.	
6	Click the OK button. A confirmation window is displayed, asking if you really want to reserve the selected tributary (the AID of the selected tributary is shown). Choose **Yes** to reserve the tributary or **No** to cancel the reservation. If the reservation is successful, the color of the tributary changes to dark blue on the Cross-Connection window. **Stop! End of Task.**	

Modify a Reservation

331

Background

When to use

Use this procedure to modify a tributary reservation. The TID of the source NE can be modified.

Before you begin

Before you begin this task, display the Cross-Connection window and the NE port group of the tributary to be modified, to make sure there is no existing cross-connection on the tributary. Any tributary that is being used for a cross-connection is displayed as blue on the Cross-Connect window.

Related information

For related information, see Reservations in the *User Reference* section.

Instructions

Task

Complete the following steps to modify a tributary reservation.

Step	Action	Reference
1	Display the Cross-Connection window.	T 312, Display the NE Cross-Connection Window
2	Display the port of the reserved tributary you want to modify. The reserved port/tributary will be displayed as dark blue on the Cross-Connection window.	T 313, Display Ports on the NE Cross-Connect Window
3	Single-click on the reserved tributary to be modified to select it.	
4	Click the Modify toolbar button. The Modify Reservation Attributes window is displayed.	
5	Change the source TID of the NE.	
6	Click the OK button. A confirmation window is displayed, asking if you really want to modify the information about the tributary reservation (the AID of the selected tributary is shown). Choose **Yes** to modify the reservation or **No** to cancel the operation. **Stop! End of Task.**	

Delete a Reservation

332

Background

When to use

Use this procedure to remove a tributary reservation.

Before you begin

Before you begin this task, display the Cross-Connection window and the NE port group of the tributary to be deleted, to make sure there is no existing cross-connection on the tributary. Any tributary that is being used for a cross-connection is displayed as blue on the Cross-Connect window.

Related information

For related information, see Reservations in the *User Reference* section.

Instructions

Task

Complete the following steps to delete a tributary reservation.

Step	Action	Reference
1	Display the Cross-Connection window.	T 312, Display the NE Cross-Connection Window
2	Display the port of the tributary with the reservation you want to delete (remove).	T 313, Display Ports on the NE Cross-Connect Window
3	Single-click on the reserved tributary to be deleted. A reserved tributary is displayed in dark blue on the Cross-Connect window.	
4	Click the Delete toolbar button. A confirmation window is displayed, asking if you really want to modify the information about the tributary reservation (the AID of the selected tributary is shown). Choose **Yes** to delete the reservation or **No** to cancel the deletion. If the reservation is sucessfully removed, the color of the tributary changes to yellow on the Cross-Connection window. **Stop! End of Task.**	

Display Protection Switching Status

333

Background

When to use

Use this procedure to display protection switching status.

Related information

For related information, see the Protection Switching Status section in Chapter 4, Configuration Management.

Instructions

Task Complete the following steps to display protection switching status.

Step	Action
1	From the main menu bar of the Map window, select **Configuration**. This displays a sub-menu.
2	Choose **Protection Switch** from the displayed sub-menu. This displays the Choose an NE/Aggregate window. Choose either Network Elements or Aggregates. **NOTE:** A Filtering/Sorting option is also available to the user by clicking on the Filter/Sort button. After setting the parameters for this option, click the Apply button to enter your data and then click the OK button to return to the Choose an NE/Aggregate window.
3	Double click on the desired selection from the list. The OK button becomes enabled.
4	Click the OK button. The Choose Protection Type window is displayed showing the available protection types to select.
5	From the available valid protection types, choose the protection type(s) to be displayed in the Protection Switching Status window. The OK button becomes enabled.
6	Click the OK button. The Protection Switching Status window is displayed with the correct information as indicated by the user.
7	When you have finished viewing the data, click on the Close button. **Stop! End of Task.**

Display the Optical Associations Manager Window

334

Background

When to use

This procedure is used to display the Optical Associations Manager window. This window provides access to all optical associations features.

Before you begin

Before you begin this task, determine which optical associations in the NE you want to work with.

Related information

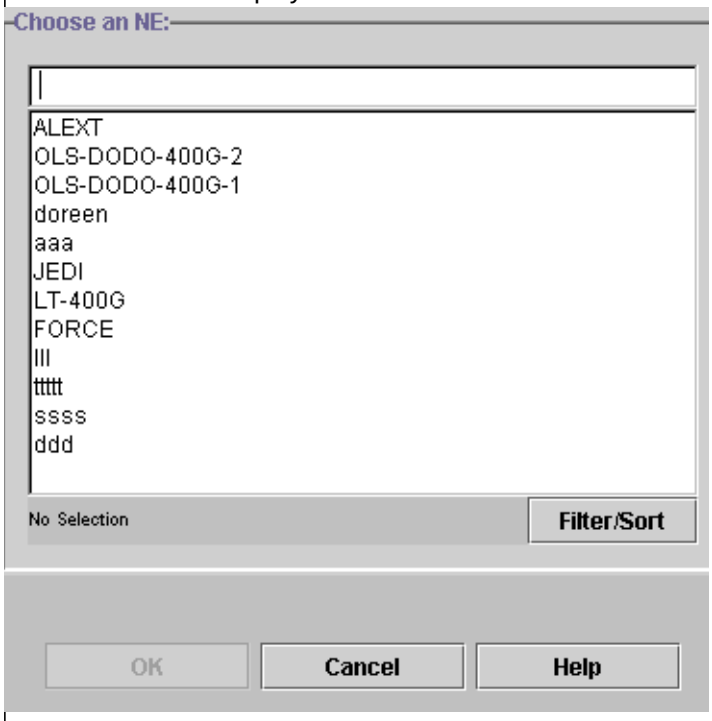
For related information, see T 335, Add an Optical Association or Connection, T 336, Delete an Optical Association, and Chapter 4, Configuration Management.

Instructions

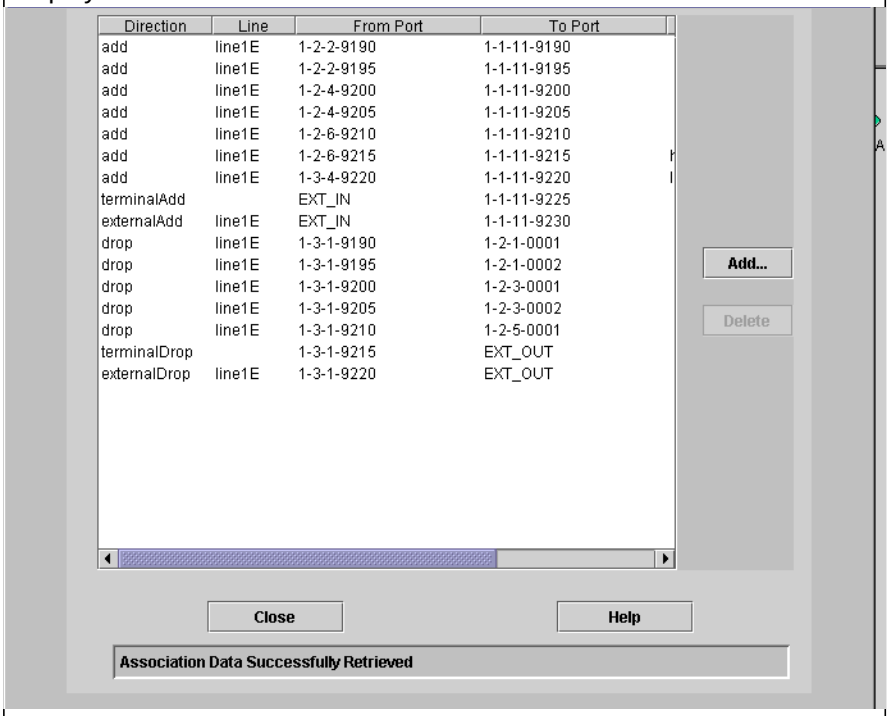
Task

Complete the following steps to display the Optical Associations Manager window and gain access to all optical association features.

Step	Action
1	Select **Configuration** from the main menu bar on the Map window. This displays a sub-menu.
	Continued on next page

Step	Action (Contd)
2	Select **Optical Associations** from the displayed sub-menu. The Choose an NE window is displayed. 
3	Double-click on the NE to select it.

Step	Action (Contd)
4	Click the OK button. The Optical Associations Manager window is displayed.



The Optical Associations Manager window contains all optical associations currently in the network element with Direction, Line, From Port, To Port, Optical Channel Power and Port Location information (for OLS 400G R. 3.0 NEs), or Direction, Line, From Port, To Port, and Verify information (for AllMetro NEs) displayed.

This window provides access to the optical associations operations of adding optical assocations/connections and deleting optical associations. These operations are described in T 335, Add an Optical Association or Connection and T 336, Delete an Optical Association.

Stop! End of Task.

Add an Optical Association or Connection

335

Background

When to use

Use this procedure to add an optical association or connection.

Before you begin

During this task, the user will need to specify the following:

- The association type (for optical associations) or connection type (for optical connections)
- The line on which the association will operate
- The optical channel power level (for OLS 400G R. 3.0 External Add associations only).
- The source and destination port information
- The port location (for OLS 400G R. 3.0 Add or Terminal Drop associations only)
- The Verify parameter (for AllMetro NEs only)

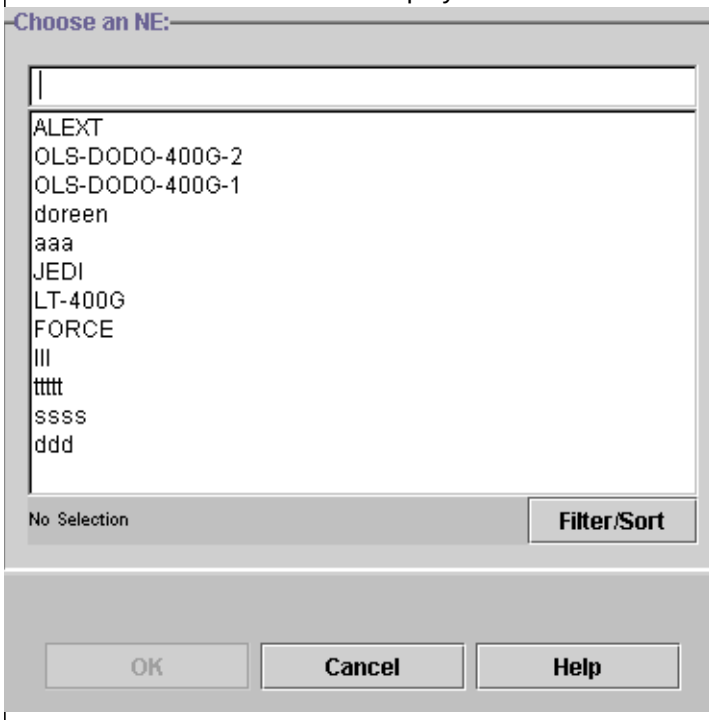
Screen examples shown in this procedure are for illustration purposes. The specific information displayed on a window will vary, based on the NE type.

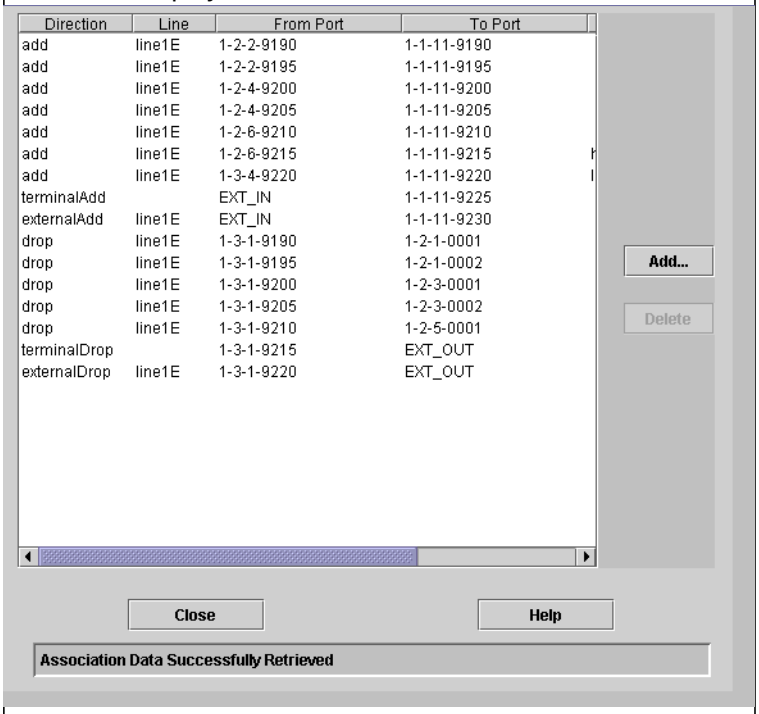
Related information

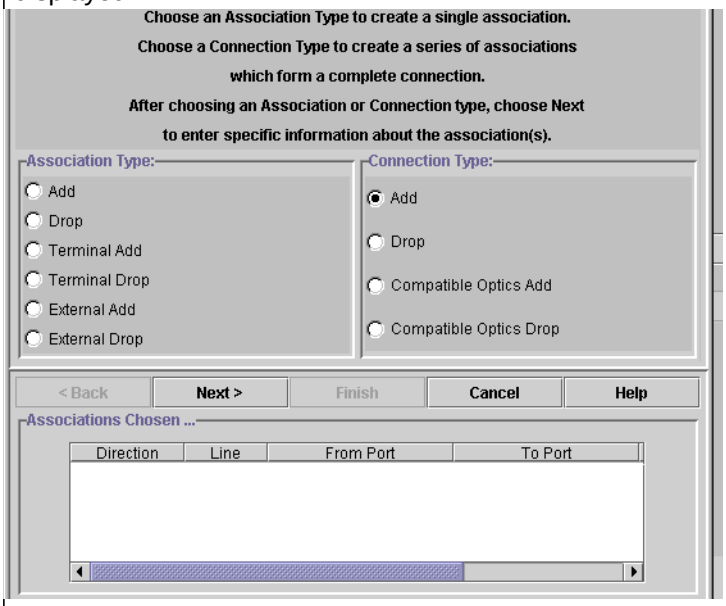
For related information, see T 334, Display the Optical Associations Manager Window, T 336, Delete an Optical Association, and Chapter 4, Configuration Management.

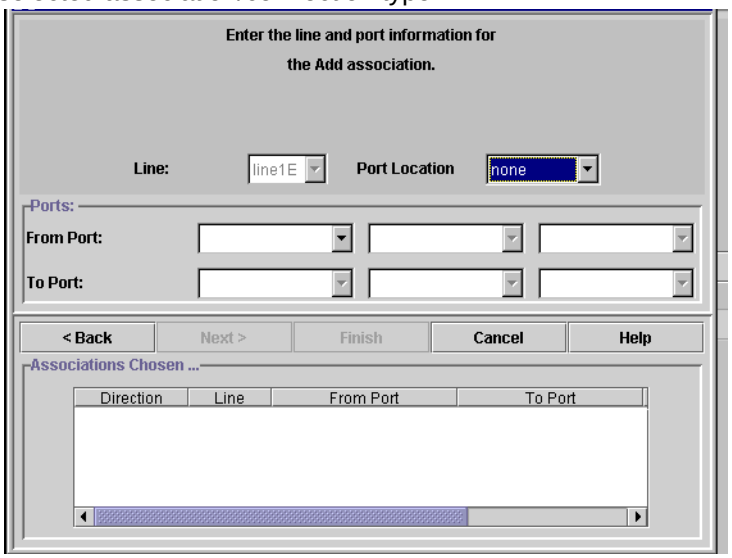
Instructions

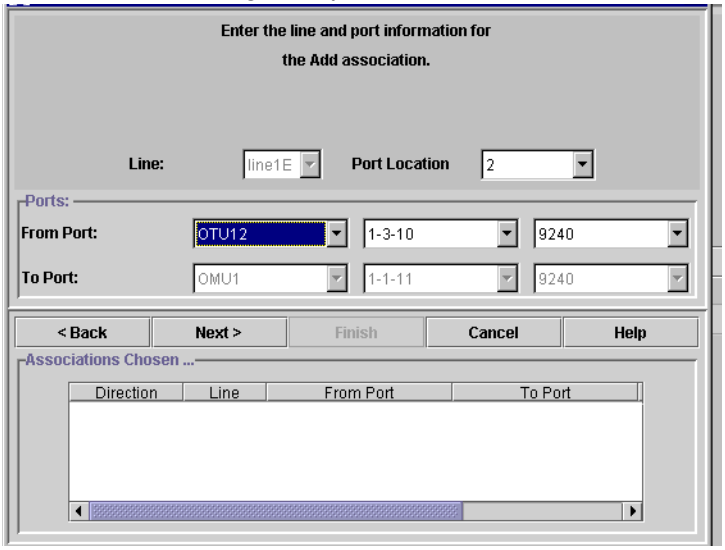
Task Complete the following steps to add or modify an optical association.

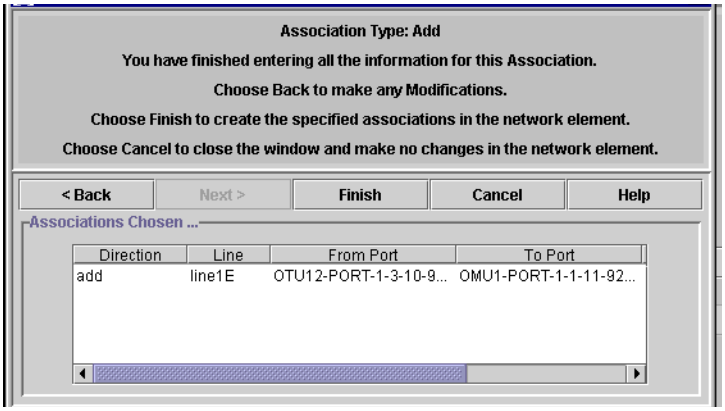
Step	Action
1	Select **Configuration** from the main menu bar on the Map window. This displays a sub-menu.
2	Select **Optical Associations** from the displayed sub-menu. The Choose an NE window is displayed. 
3	Double-click on the NE to select it.

Step	Action (Contd)
4	Click the OK button. The Optical Associations Manager window is displayed.  The Optical Associations Manager window contains all optical associations currently in the network element with Direction, Line, From Port, To Port, Optical Channel Power and Port Location information (for OLS 400G R. 3.0 NEs), or Direction, Line, From Port, To Port, and Verify information (for AllMetro NEs) displayed.

Step	Action (Contd)
5	Click the Add button to add an optical association or connection. The first Add Optical Associations window is displayed.  **NOTE:** The sample window shown is for an OLS 400G NE node type that does not support one or two OTU Thru connections. The association types/connection types shown on this window will vary, depending on the NE type selected.
6	Choose an association type or connection type to be added for the selected NE. The Next button is enabled.

Step	Action (Contd)
7	Click the Next button. The next Add Optical Associations window is displayed to choose line and port information for the selected association/connection type.  The values that you can select in the Line, From Port, and To Port fields are limited to what is compatible with the NE selected, the association/connection type chosen, and the available ports for that association/connection. In many cases, some of these fields are disabled, because the only available choice has already been pre-selected by the system. **NOTE:** The Port Location field is only displayed for OLS 400G R. 3.0 NEs for Add or Terminal Drop associations, and it is an optional field. Some OLS 400G NEs do not require a Port Location to be chosen.

Step	Action (Contd)
8	Choose the port information by clicking the down arrow next to the applicable port field to display a drop-down list of choices. Select a port from the drop-down list. The port information fields consist of the following: ■ The first field is a drop-down list of valid circuit pack types for the source of the association/connection type ■ The second field is a drop-down list of valid bay-shelf-slot level AIDs for the circuit pack type chosen in the first field ■ The third field is a drop-down list of valid frequencies for the circuit pack type and bay-shelf-slot level AIDs chosen for the association/connection type For OLS 400G NE External Add associations, an additional parameter field is displayed at the top of the window: ■ Optical Channel Power Level—Select the optical channel power level by clicking the down arrow next to the field to display a drop-down list. The available choices are high and low. For each port information field, click the down-arrow next to the field to display a drop-down list of available choices. Select a choice from the drop-down list. When completed, the selections on the window should look similar to the following example: 

Step	Action (Contd)
9	Click the Next button. The next Add Optical Associations window is displayed, showing the selected information for the association/connection. 
10	If you want to change any information entered for the association/connection, or enter additional associations/ connections for this NE, click the Back button to go back to the previous windows. If you are finished adding associations/connections at this point, click the Finish button.
11	If you clicked the Finish button in step 10, a status window is displayed. If you entered a multi-association connection, one line per association (not one line per connection) is shown in the status window. If the association/connection addition is successful, a status of “Completed” is shown in the status window indicating that the association/connection has been added. If the operation failed for some reason (for example, the NE lost communications with the system while in the process of adding the association/connection), a status of “Incomplete” is shown in the status window next to the attempted addition. Click the Close button to close the status window. **Stop! End of Task.**

Delete an Optical Association

336

Background

When to use

Use this procedure to delete an optical association.

Before you begin

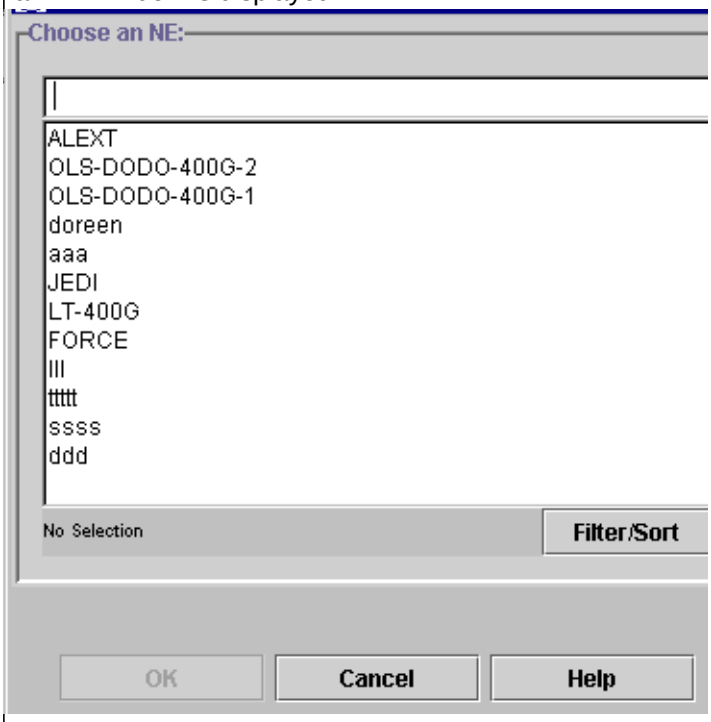
During this task, the user will need to specify the association to be deleted.

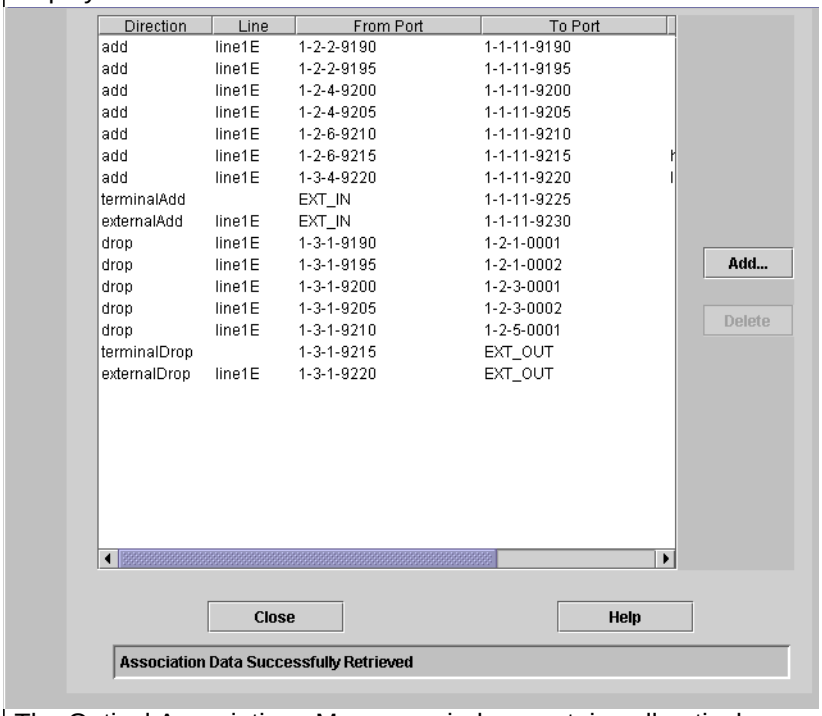
Related information

For related information, see T 334, Display the Optical Associations Manager Window, T 335, Add an Optical Association or Connection, and Chapter 4, Configuration Management.

Instructions

Task Complete the following steps to delete an optical association.

Step	Action
1	Select **Configuration** from the main menu bar on the Map window. This displays a sub-menu.
2	Select **Optical Associations** from the displayed sub-menu. The Choose an NE window is displayed. 
3	Double-click on the NE to select it.

Step	Action (Contd)
4	Click the OK button. The Optical Associations Manager window is displayed.  The Optical Associations Manager window contains all optical associations currently in the network element with Direction, Line, From Port, To Port, Optical Channel Power and Port Location information (for OLS 400G R. 3.0 NEs), or Direction, Line, From Port, To Port, and Verify information (for AllMetro NEs) displayed.
5	Click on the association to be deleted in the list. To select more than one association in the list, press and hold down the Control key while clicking and holding the left (select) mouse button and dragging the mouse cursor down the list until all associations are selected. Then, release the mouse button. The selections are highlighted.
6	Click the Delete button.
7	A message box is displayed asking you to confirm the deletion. Click on Yes to delete the association(s) in the NE. If you do not want to delete the association(s), click on No to return to the Manage Optical Associations window. **Stop! End of Task**.

Import Software to the EMS

337

Background

When to use

Use this procedure to import an NE software release from a Digital Access Tape (DAT) or CD-ROM to the WaveStar SNMS host for eventual downloading to an NE.

Before you begin

Before you begin this task, the DAT must be physically mounted (if the file source is tape) or the CD-ROM must be physically loaded and the file system mounted on the WaveStar SNMS host (if the file source is CD-ROM). If you are importing the NE software from CD-ROM, a special setup procedure must be performed for the WaveStar SNMS host prior to doing the software import; this procedure is explained as part of the task.

To perform this task, access the Map window.

Related information

For related information, see the following section in the *User Reference* section:

- Software Management

Instructions

Task Complete the following steps to transfer NE software to WaveStar SNMS.

Step	Action	Action	Reference
1	IF YOU ARE IMPORTING NE SOFTWARE FROM... ■ CD-ROM ■ DAT	THEN.... ■ a special setup procedure must be performed by the WaveStar SNMS administrator once prior to the NE software transfer. ■ skip to Step 2.	SE 337-1
2	Before importing a software release, you may want to see what software releases are already stored in WaveStar SNMS for the NE type, using the View Software Release Descriptive Information function.		SE 337-2
3	Select **Configuration** from the main menu bar on the Map window. The Configuration menu is displayed.		
4	Select **Software Management** from the Configuration menu. The Software Management menu is displayed.		
5	Select **Import Software to the EMS** from the Software Management menu. The Select NE Type and Drive for Software Transfer window is displayed.		

Step	Action (Contd)	Action	Reference
6	Choose CD Drive or Tape Drive for the media source of the NE software that you want to import to the EMS.		
7	Single-click on the NE type in the NE Type list to select it.		
8	Click the OK button. The system begins a search for the software release on the tape or CD. The status dialog window is displayed, indicating that the software transfer is in progress (working). If the software transfer is successful, the status shown on the window is “Completed”. If the software transfer is not successful, an error message is displayed and the status shown is “Incomplete”.		
9	Click the Close button to close the status dialog window. **Stop! End of Task.**		

SE 337-1: Setting Up the WaveStar SNMS Host for Transferring NE Software from CD-ROM

Procedure

Before NE software can be transferred from CD-ROM onto the WaveStar SNMS host machine, the WaveStar SNMS system administrator must do the following once while configuring the WaveStar SNMS host or installing the host software:

1. Log into the WaveStar SNMS host machine as *root* and enter the following command to find the hardware path to the CD-ROM drive:

   ioscan -fn -C disk

   A response similar to the following is displayed:

```
disk    45  10/8.6.0    sdisk      CLAIMED   DEVICE    SEAGATE ST34371W
/dev/dsk/c3t6d0   /dev/rdsk/c3t6d0

> disk    46  10/8.8.0    sdisk      CLAIMED   DEVICE    SEAGATE    T39173WC
/dev/dsk/c3t8d0   /dev/rdsk/c3t8d0

> disk    30  10/12/5.2.0 sdisk      CLAIMED   DEVICE    TOSHIBA CD-ROM XM-5701TA
/dev/dsk/c4t2d0   /dev/rdsk/c4t2d0
```

2. Locate the output line that contains the hardware path to the CD-ROM drive.

   In the sample output shown in Step 2, the third line of the sample output indicates that the hardware path to the CD-ROM drive is:
   /dev/dsk/c4t2d0

3. Do a symbolic link between the above hardware path and */dev/cdrom* using the following command as *root*:

   ln -s */dev/dsk/c4t2d0 /dev/cdrom*

If the Software Transfer function performed through the GUI is successful, the file system for the CD-ROM drive will be mounted each time the CD-ROM is physically loaded into the drive.

The CD-ROM drive may fail to mount because:

1. The CD is not physically loaded into the drive.
2. The file system for the CD-ROM drive failed to be mounted.

In the latter case, log in as *root (*if not already logged in) and issue the following command:

/etc/mount /dev/dsk/*c4t2d0*/SD_CDROM

To remove the CD-ROM, issue the following command:
/etc/umount /dev/dsk/*c4t2d0*/SD_CDROM

SE 337-2: View NE Software

Procedure

Perform the steps below to see what software releases are already stored in WaveStar SNMS for an NE type.

4. Select **Configuration** from the Map window main menu. The Configuration menu is displayed.
5. Select **Software Management** from the Configuration menu. The Software Management menu is displayed.
6. Select **View Software Release Descriptive Information** from the Software Management menu. The NE Type Selection for Viewing Descriptive Files is displayed.
7. Select the NE type from the NE Type list or type the NE type in the text field.
8. Click the OK button. A description of all the software releases stored in WaveStar SNMS for the selected NE type is displayed.

Download NE Software

338

Background

When to use

Use this procedure to download a selected software release to a specific NE.

Before you begin

Before you begin this task, you must first access the Map window. The software release to be downloaded to the NE must be transferred to WaveStar SNMS from CD-ROM or tape. Be aware that after you download software to an OLS 400G NE, you must perform DNO on the NE before the release software can be activated.

Be aware that for a 2.5G_10G R. 3.0 NE, the WaveStar SNMS software download feature only supports download of an unpacked CD-ROM version of the NE release software.

Related information

For related information, see Transfer NE Software and the following *User Reference* section:

- Software Management

Instructions

Task Complete the following steps to download software to an NE.

Step	Action	Result
1	Select **Configuration** from the main menu bar on the Map window.	The Configuration menu is displayed.
2	Select **Software Management** from the Configuration menu.	The Software Management menu is displayed.

Continued on next page

Step	Action (Contd)	Result
3	Select **Download Software To NE** from the Software Management menu.	The Choose an NE/Aggregate window is displayed.
4	Select an NE by double-clicking on the NE's TID and click the OK button.	The Software Download to NE window is displayed.
5	Select a software release from the Releases Available list and click the Apply button. **NOTE:** You can abort the software download at this point, if necessary, by clicking the Abort button. A pop-up window is displayed, asking if you really want to abort the download. Choose Yes to abort the download or No to continue it. **Stop! End of Task.**	The system verifies that the software release is not the same or older than the version currently running on the NE and is supported by WaveStar SNMS. If there is a problem with the selected release, a pop-up information window is displayed, asking if you want to continue with the software download. Choose: ■ Yes to perform the software download anyway **OR** ■ No to cancel the software download A second pop-up message window is displayed, informing you that the download may take a certain amount of time and asks if you want to proceed with the software download. Choose: ■ Yes to continue with the software download **OR** ■ No to cancel the software download The software download is initiated. The status bar shows when the software download has been completed.

Copy Software from NE to NE

339

Background

When to use

Use this procedure to copy software from one specified NE to one or more other specified NEs on demand.

Before you begin

Be aware that an NE to NE software copy requires that the source NE and destination NE(s) are of the same NE type, and part of the same OSI domain. Thus, once the source NE has been selected, only other NEs of that type and part of the same OSI domain are allowable choices. To perform an software upgrade for this type of NE, the new or ugraded release of executable software must be downloaded to individual NEs.

To perform this task, access the Map window.

Related information

For related information, see Chapter 4, Configuration Management.

Instructions

Task Complete the following steps to copy software from NE to NE.

Step	Action
1	Select **Configuration** from the main menu bar on the Map window. This displays a sub-menu.
2	Select **Software Management** from the sub-menu. This displays another sub-menu.
3	Select **NE To NE Software Copy** from the sub-menu. This displays the Copy Software From NE to NE window. The Source NE list is populated with all the applicable NEs in the user's Target Group that support the NE to NE software copy feature, along with their release version.
4	Double click on the desired source NE. The Available NE(s) list becomes populated with the NEs that are of the same type as the selected source NE. For 400G and AllMetro NEs, the Copy from active partition button and Copy from inactive partition button become enabled. For 400G NEs only, the user must specify which memory partition of the source NE from which the software generic is to be copied (active partition is the default). **NOTE:** A Filtering/Sorting option is also available to the user by clicking on the Filter/Sort button. After setting the parameters for this option, click the Apply button to enter your data and then click the OK button to return to the Copy Software From NE to NE window.
5	Populate the Chosen NE(s) list with NEs from the available NE(s) list by using the arrow push buttons. The OK button becomes enabled. *Continued on next page*

Step	Action (Contd)
6	Click the OK button. The WaveStar SNMS backend process verifies that the NE release version that has been requested for copy, is higher than the release version that is currently running on the NE, and also if the selected release is supported by the EMS. If there is a problem with the selected software release, a warning message is displayed.
7	Once verified, a confirmation pop-up window is displayed, asking if you want to continue with the software copy. Click on Yes to continue with the copy, or click on No to return to the Copy Software From NE to NE window.
8	When the copy is completed, a message notifies the user. **Stop! End of Task**.

Activate NE Software

340

Background

When to use

Use this procedure to activate software that has previously been transferred via software download or software copy.

Before you begin

Be aware that the NE Software Activate function provides the set of allowable NEs for activation and only allows the user to select from among those choices. To activate software on an OLS 400G NE, perform a DNO after the software download is completed.

Be aware that you may lose the NE visability on the Map window for some time as the NE reboots during this process.

To perform this task, access the Map window.

Related information

For related information, see Chapter 4, Configuration Management.

Instructions

Task

Complete the following steps to activate software that has previously been transferred via software download or software copy.

Step	Action
1	Select the desired network element(s) in the WaveStar SNMS map window.
2	Select **Configuration** from the main menu bar on the Map window. This displays a sub-menu.
3	Select **Software Management** from the sub-menu. This displays another sub-menu.
4	Select **Activate NE Software** from the sub-menu. This displays the Activate Software window populated with the selected NE(s) and their currently active software release.
5	Select an NE(s) and click Retrieve Standby Release to retrieve the standby release number of the selected NE(s).The user can also click on Remove From List to remove the chosen NE from the list.
6	Click on OK to initiate the activation of the new release.
7	EMS verifies that the NE release version that has been requested for activation, is higher than the release version that is currently running on the NE, and also if the selected release is supported by the EMS. A warning box appears if there is a problem with the selected software release.
8	Once verified, a dialog box confirms the software release number and NE. Click on Yes to continue with the activation if the information is correct, or click on No to return to the Activate Software window. **Stop! End of Task**.

Delete NE Software

341

Background

When to use

Use this procedure to delete a specific executable software release for an NE type from WaveStar SNMS.

Before you begin

Before you begin this task, access the Map window. The software to be deleted must be transferred to the WaveStar SNMS from CD-ROM or tape.

Related information

For related information, see the Software Management section in Chapter 4, Configuration Management.

Instructions

Task

Complete the following steps to delete a specifc software release for the NE type.

Step	Action	Result
1	Select **Configuration** from the main menu.	The Configuration menu is displayed.
2	Select **Software Management** from the Configuration menu.	The Software Management menu is displayed.
3	Select **Delete Software From the EMS** from the Software Management menu.	The Delete NE Software window is displayed.
		Continued on next page

Step	Action (Contd)	Result
4	Select the NE type from the Select NE Type list.	The Delete Software list shows the available software releases for the selected NE type.
5	Select the software release to be deleted from the Delete Software list by double-clicking on it.	
6	Click the Delete button. **Stop! End of Task.**	A confirmation window is displayed, asking if you want to proceed with the deletion. Choose: ■ Yes to perform the software deletion **OR** ■ No to cancel the software deletion **WARNING:** *When software is deleted from the system, it is not recoverable. The only way to get the software back into the system is to reload it from a tape. Make sure that you want to delete the software release before choosing Yes.*

Back Up NE Data

342

Background

When to use

Use this procedure to back up an NE's provisioning data. The provisioning data includes port parameters and cross-connections. For the WaveStar BWM and NCC, you can use this procedure to choose to back up the NE data to WaveStar SNMS memory or the NE's local secondary memory. For the NCC, you can choose to back up from NCC memory or NCC Directory Services data.

Before you begin

Before you begin this task, determine the NE for which you want to perform a backup. Ensure that there are no alarms present on the NE. You must access the Map window to perform this function.

Related information

For related information, see T 343, Restore NE Data and the following *User Reference* section:

- Software Management

Instructions

Task Complete the following steps to perform an NE backup.

Step	Action	Result
1	Select **Configuration** from the main menu bar on the Map window.	The Configuration menu is displayed.
2	Select **Software Management** from the Configuration menu.	The Software Management menu is displayed.
3	Select **Backup** from the Software Management menu.	The Choose an NE/ Aggregate window is displayed.
4	Double click on the desired NE and click the OK button. IF ... a WaveStar BWM or NCC is selected. For a WaveStar BWM or NCC, select WaveStar SNMS memory or NE Secondary Memory for NE data on the Backup Details window. For an NCC, select NCC Memory or NCC Directory Services data as the backup source. **Stop! End of Task.**	THEN ... the Backup Details window is displayed. A pop-up window is displayed, indicating how long the backup process will take and asking if you want to proceed with the backup. Choose: ■ Yes to perform the NE backup **OR** ■ No to cancel the NE backup

Restore NE Data

343

Background

When to use

Use this procedure to restore NE provisioning data from a specified backup file. You can specify the type of provisioning data to be restored. This option restores all backup data from the selected NE file, including the default settings.

For the NCC, you have the option of restoring data from NCC memory or the Directory Services database.

Before you begin

Before you begin this task, determine the NE to which you want to restore data. You must access the Map window to perform this function.

Related information

For related information, see T 342, Back Up NE Data and the following *User Reference* section:

- Software Management

Instructions

Task Complete the following steps to restore an NE's backup data.

Step	Action	Result	Reference
1	If the NE data being restored is for a 2.5G NE, put the NE in maintenance mode (in other words, enable the maintenance mode parameterusing the Provisioning window in the GUI). If the NE data restore operation is for a different NE type, skip to step 2.		T 304, Provision System Parameters
2	Select **Configuration** from the main menu bar on the Map window.	The Configuration menu is displayed.	
3	Select **Software Management** from the Configuration menu.	The Software Management menu is displayed.	
4	Select **Restore** from the Software Management menu.	A sub-menu is displayed.	
5	Select **Regular Restore** from the sub-menu.	The Choose an NE/ Aggregate window is displayed.	
6	Double click on the desired NE and click the OK button. IF ... an NCC is selected. For an NCC, choose NCC Memory or NCC Directory Services as the source of backup data and click the OK button.	THEN ... the NCC Restore window is displayed. The Select File for Restore window is displayed. For a WaveStar BWM or NCC, the list includes the backup file that is stored in the NE's Non Volatile Memory.	

Step	Action (Contd)	Result	Reference
7	Select a backup file for restoral. To look at a description of the backup data contained in the file before restoring it, click the View Descriptive Files button.		
		Continued on next page	

Step	Action (Contd)	Result	Reference
8	Click the OK button. IF ... you respond Yes to perform the restore anyway	The restore process is started. As part of the restore process, the system performs several validation checks, comparing the software release, equipment, and switch settable parameters in the backup file with the current NE values. If there are discrepancies, a pop-up window is displayed with an error message asking if you want to continue with the restore. Choose: ■ Yes to perform the NE restore anyway **OR** ■ No to cancel the NE restore THEN ... The system continues with the restore. A pop-up message window is displayed, informing you that the restore may take a long time and asking if you want to proceed with the restore. Choose: ■ Yes to perform the NE restore **OR** ■ No to cancel the NE restore	

Step	Action (Contd)	Result	Reference
9	IF ... you respond Yes to perform the restore.	THEN ... The restore is initiated. The system informs you of the restore's progress with a status message. When the restore is completed, an information window appears that notifies you of the completion. If the restore fails, an error message is displayed in a pop-up window, indicating the source of the problem.	

Step	Action (Contd)	Result	Reference
10	If the restore operation has been initiated, wait several minutes while the affected NE turns white on the Map window and then back to its original color (normally green, in the absence of alarms against the NE). **NOTE:** The WaveStar SNMS kicks off a post-restore DNO at the end of the Restore operation, and it can continue after the “Restore Completed” message is displayed. You must wait until the post-restore DNO is completed before proceding to the next step of this procedure. When the NE icon changes back to green, this indicates that the post-restore DNO process has completed. **WARNING:** *Because the NE’s previous database is backed up during inservice mode, once this database is restored, the NE is automatically placed in inservice mode, which occurs with restoral of the previous NE database. In this case, you do not have to use the GUI NE Provisioning window to disable or take the NE out of maintenance mode (if it is a 2.5G NE). The service mode of the NE on the WaveStar SNMS GUI does not reflect the new state of the NE until the DNO is completed. Therefore, there is an interval that WaveStar SNMS treats the NE as still being in maintenance mode before the NE exits maintenance mode.*		
11	Perform a complete manual DNO on the NE. **Stop! End of Task.**		

Task Series 400

Performance Management

Enable/Disable the PM Feature

400

Background

When to use

Use this procedure to globally enable or disable the Performance Monitoring (PM) data collection feature for all supported NEs (OLS 400G, BWM, STM64). When the PM data collection feature is turned on, WaveStar SNMS periodically collects PM data from each NE that has PM data collection activated. When the PM feature is globally disabled, PM data is not collected from any NE.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see Chapter 5, Performance Management.

Instructions

Task Complete the following steps to globally enable or disable the PM feature.

Step	Action	
1	Select **Performance** from the main menu bar on the Map window. The Performance menu is displayed.	
2	Select **Global PM Management** from the Performance menu. The Global PM Data Administration window is displayed.	
3	IF … you want to enable the PM feature	THEN … click on the Collect PM Data box to place a check there and select the retention period for 15-minute and 1-day PM data reports. To select the retention period, move the slider bar for each report type to the left or right. You can set the retention period from 1 to 30 days for each report type. The number displayed to the right of each slider bar shows the setting selected. **NOTE:** Click the Retrieve button to display the current system default retention periods.
	you want to disable the PM feature	click on the Collect PM Data box to remove the check or leave the box blank.
4	Click the Apply button to activate your choices. **Stop! End of Task.**	

Enable/ Disable PM Data Collection

401

Background

When to use

Use this procedure to enable or disable PM data collection for the specified NE and, if PM data collection is enabled, select the PM reporting interval. You can also reset the digital PM data registers and the start time of 1-day PM data collection, if needed (for OLS 400G NEs only).

Before you begin

Before you begin this task, be aware that NE PM data collection will not be performed until the PM feature is globally enabled (see T 400, Enable/Disable the PM Feature). Be aware that PM data collection is suspended during an alarm storm. WaveStar SNMS resumes PM data collection after the alarm storm has subsided.

Related information

For related information, see Chapter 5, Performance Management.

Instructions

Task

Complete the following steps to enable collection of the selected PM data types or disable PM data collection for the entire NE. You may also reset digital PM data registers (bins) and/or the start time of 1-day PM data collection for OLS 400G NEs, if needed.

Step	Action
1	Select **Performance** from the main menu bar on the Map window. The Performance menu is displayed.
2	Select **NE PM Management** from the Performance menu. The Choose an NE window is displayed.
3	Double-click on the NE in the list to select it and click the OK button. The NE PM Data Administration window is displayed. **OR** Select an NE on the Map or Subnetwork Explorer, right-click on the NE to bring up a pop-up menu, select **Performance Management** from the pop-up menu, and select **NE PM Management** to display the NE PM Data Administration window. If the selected NE is an OLS 400G, the NE PM Data Administration window has a Network Element explorer, that can be expanded to show the equipment hierarchy for provisioning and two panels on the right side of the window: ■ EMS PM Data Settings ■ Network Element PM Data Settings **NOTE:** The Network Element PM Data Settings panel is only displayed if the selected NE is an OLS 400G. If the selected NE is not an OLS 400G, only the EMS PM Data Settings panel is displayed.

Continued on next page

Step	Action (Contd)	
4	In the EMS PM Data Settings panel: IF ... ■ you want to collect PM data for the selected PM data type in 15-minute intervals ■ you want to collect PM data for the selected PM data type in 1-day intervals ■ you want to collect both 15-minute and daily PM data for the PM data type ■ collect no PM data (disable PM data collection for the NE)	THEN ... ■ check the Enable 15 Minute PM data collection for this NE box. ■ check the Enable 1-Day PM data collection for this NE box. ■ check both boxes. ■ click both boxes to remove the checks, or leave both boxes blank.
5	IF ... ■ you want to collect PM data from all data types ■ you want to collect PM data from one or more types **NOTE:** Use the Retrieve button to retrieve the previous settings.	THEN ... ■ click the All Facility Types in This NE radio button. ■ click the Only these facility types radio button and then check the data types for PM data.
6	IF ... ■ you only want to enable/disable PM data collection for the NE ■ you also want to reset the digital PM data registers and/or the start time of 1-day PM data collection for an OLS 400G NE	THEN ... ■ click the Apply button to activate your choices. Stop at this point. ■ go to Step 7.
7	Click on the Network Element PM Data Settings panel tab. The Network Element PM Data Settings panel is displayed (if the selected NE is an OLS 400G). The TID of the selected NE should be highlighted in the explorer portion of the window.	

Step	Action (Contd)	
8	Click the Provision button below the explorer portion of the panel. The NE-level PM Data Settings fields are displayed.	
9	TO ... ■ reset the current 15-minute digital PM data registers ■ reset the current 1-day digital PM data registers ■ reset both digital PM data registers	CLICK ... ■ the Reset 15 Minute Bins button ■ the Reset 1 Day Bins button ■ the Reset Both Bins button
10	If you enabled collection of 1-day PM data on the EMS Data Settings panel, the NE's 1 Day PM Data Collection Start Time portion of the panel displays the current start time (hour) for collection of 1-day PM data. To change the start time, click the up/down spinner buttons to change the time (hour). The hour counter uses a 24-hour time format. For example, to change the start of 1-day PM data collection to 1:00 PM, click the up/down spinner buttons until the number **13** is displayed in the hour field. **NOTE:** Use the Retrieve button to retrieve the current settings.	
11	Click the Apply button to activate your choices. **Stop! End of Task.**	

Administer PM Data

402

Background

When to use

Use this procedure to display and provision analog and/or digital PM data parameters for the selected NE interface. For the OLS 400G, this option allows you to provision PM threshold values for the:

- Supervisory Channel
- Optical Line
- Optical Channel
- Optical Translator Unit (OTPS)

Before you begin

Be aware that the PM feature must be globally enabled and the selected NE must have PM data collection activated for one or more PM data types.

PM threshold values can only be provisioned for an OLS 400G NE with this procedure. For other NE types, PM threshold values must be set by issuing TL1 commands via the Cut-Through window.

Related information

For related information, see the following:

- T 401, Enable/Disable PM Data Collection
- T 403, View PM Data
- Chapter 5, Performance Management

Instructions

Task

Complete the following steps to display and provision PM parameters for the selected NE interface.

Step	Action
1	Select **Performance** from the main menu bar on the Map window. The Performance menu is displayed.
2	Select **NE PM Management** from the Performance menu. The Choose an NE window is displayed.
3	Double-click on the NE in the list to select it and click the OK button. The NE PM Data Administration window is displayed. **OR** Select an NE on the Map or Subnetwork Explorer, right-click on the NE to bring up a pop-up menu, select **Performance Management** from the pop-up menu, and select **NE PM Management** to display the NE PM Data Administration window. The NE PM Data Administration window is divided into two parts. The left side of the window contains an NE explorer tree. Depending on the NE type chosen, the NE explorer may contain just a TID at the top part of the hierarchy, or can be expanded to show equipment entities and AIDs for facilities below the NE (TID) level. The right side of the window consists of two panels: ■ EMS PM Data Settings ■ Network Element PM Data Settings **NOTE:** The Network Element PM Data Settings panel is only displayed if the NE is an OLS 400G. The remaining steps in this procedure only apply to an OLS 400G NE. When the PM Data Administration window is first displayed, the NE TID is selected in the explorer tree, the explorer tree is unexpanded (if it is expandable), and the current EMS PM Data settings for the entire NE are shown in the EMS PM Data Settings panel.
4	Click on the Network Element PM Data Settings tab.

Continued on next page

Step	Action (Contd)
5	In the explorer portion of the window, single-click on the plus (+) sign next to the TID of the selected NE to expand the tree and display the equipment entities of the NE. Continue to click and expand levels of the equipment hierarchy until you locate the AID of a PM facility for which you want to display and provision PM parameters. Double-click on the AID of the PM facility in the explorer tree to select it.
6	Click on the Provision button below the explorer tree portion of the window. The PM Data Admin Panel for the selected NE facility is displayed in the right side of the window.
7	Depending on the NE PM facility selected, the PM Data Admin Panel displays some or all the following parameter fields and buttons: ■ Digital PM Threshold Settings—this portion of the panel allows you to set the 15-minute and/or 1 day threshold values for digital PM data collection for the specific parameter. Click on the Get NE Defaults button to retrieve the current defaults from the NE for these parameters. Modify the value(s) as needed. ■ Analog PM Threshold Settings—this portion of the panel allows you to display and change the low and high threshold values for analog PM data for the selected PM facility. Click the Retrieve button to obtain the current settings from the NE. Modify the value(s) as needed. ■ Recalculate Baseline—this portion of the panel allows you to recalculate (set) the baseline value for an analog PM data parameter. Click the down arrow next to the Reason Code field to display a valid list of reason codes for the recalculation (for example, Add a New NE), and select a reason code. Click the Recalculate Xmit button to recalculate the signal power transmitted baseline value. Click the Recalculate Receive button to recalculate the signal power received baseline value. Click the Recalculate Both button to recalculate the baseline value for signal power in both directions. **NOTE:** To obtain the current values from the NE for these fields, click the Retrieve button.
8	Click the Apply button to activate your choices. **Stop! End of Task.**

View PM Data

403

Background

When to use

Use this procedure to view the PM data collected by WaveStar SNMS. You can choose to view either current data from the NE(s) or historical data stored in the WaveStar SNMS database, as well as for what facility type, and whether to show 15-minute or 1-day PM data. The data selected for viewing is shown in table format, sorted and filtered according to your choices.

Before you begin

Before you begin this task, the PM feature must be globally enabled and the selected NE must have PM data collection activated for one or more PM data types.

Related information

For related information, see Chapter 5, Performance Management.

Instructions

Task Complete the following steps to view PM data for a specified NE.

Step	Action
1	Select **Performance** from the main menu bar on the Map window. The Performance menu is displayed.
2	Select **View PM Data** from the Performance menu. The Choose an NE window is displayed.
3	Select an NE and click the OK button. The View PM Data window is displayed. **OR** Select an NE on the Map or Subnetwork Explorer, right-click on the NE to bring up a pop-up menu, select **Performance Management** from the pop-up menu, and select **View PM Data** to display the View PM Data window.
4	Choose to show either current data or historical data by clicking on the appropriate radio button. If you chose historical data, choose the date and time of the data by using the date and time (if you choose 15-minute data, in hours) spinner fields. **NOTE:** If you configured the data retention period on the Global PM Data Administration window for less than 30 days, you can only view the data files that fall within the selected data retention period.
5	Choose one of the NE facility types for viewing by clicking on the appropriate radio button.
6	Choose to show 15-minute or 1-day PM data by clicking on the appropriate radio button.
7	Click the OK button. The PM Data window is displayed, showing the selected PM data in table format. To save the contents of the table to a file on the local system, click the Save button. **Stop! End of Task.**

Task Series 500

Security Management

Change Your User Password

500

Background

When to use Use this procedure to change your user password.

Instructions

Task

Complete the following steps to change your user password.

Step	Action	Action
1	Select **Administration** from the main menu of the Map window. This displays a sub-menu.	
2	Choose **Security** from the displayed sub-menu. This displays another sub-menu.	
3	Choose **Change EMS Password** from the Security menu. (This displays the Change Password window.)	
4	Type your current password into the Old Password field.	
5	Type your desired new password into the New Password field.	
6	Type the same desired new password into the Confirm New Password field.	
7	IF ... the new password entered is invalid you change the password to one previously used	THEN ... the system issues a warning message. You must enter a password that is 6-10 characters, contains at least two non-alphabetic characters, and one special character (!#$%^&*()-+_=?). The following special characters are not permitted (:,;). The system issues a message, advising that you cannot change the password to one previously used and that a different password must be chosen.
8	Select the OK button to enter the password change into the system. **Stop! End of Task.**	

Globally Administer NE Passwords

501

Background

When to use

Use this procedure to change the primary and/or secondary passwords for selected NE(s)/aggregate(s).

Before you begin

Before you begin this task, you must be logged into WaveStar SNMS. The NE(s) or aggregate(s) for which you are changing passwords must already exist in WaveStar SNMS. Be aware that if you are changing passwords for 20 or more NEs at a time, this may degrade system performance. Only one user can use the Global Administer Password function at a time.

Be aware that any changes to the primary/secondary passwords for NEs will affect logging into the NEs from all EMS and CIT interfaces.

The new passwords are updated in the WaveStar SNMS database of the current host after they are changed. Any additional EMS hosts or CIT interfaces have to be updated with the new passwords as well to enable logging into the affected NEs. Before using this feature, make sure that you really want to proceed with changing the primary/secondary passwords.

To perform this task, access the Map window.

Related information

For related information, see the following *User Reference* sections:

- Network Element Administration
- Password Administration

Instructions

Task

Complete the following steps to change the primary and/or secondary passwords for the selected NE(s)/aggregate(s).

Step	Action	
1	Select one or more NEs and/or aggregates on the Map window pane or subnetwork explorer, if you know for which NEs you want to perform this function. **OR** Select no NEs and/or aggregates at this point.	
2	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.	
3	Select **Security** from the Administration menu. The Security sub-menu is displayed.	
4	Select **Global Password Administration** from the Security sub-menu. The Global Password Administration window is displayed.	
5	TO CHANGE THE PASSWORD FOR... ■ one or more NEs ■ one or more aggregates ■ a specific NE of the same type	CLICK THE... ■ Show NEs radio button. ■ Show Aggregates radio button. ■ List by Type radio button. Click the down arrrow for this field to display a list of NE types, then select the NE type.
6	Select the NE(s) or aggregate(s) for which the password(s) will be changed, from the Network Elements/Aggregates list. When you select an NE or aggregate, the item moves from the Network Elements/ Aggregates List to the Chosen NEs list. You can use the arrow push buttons to move NEs/aggregates back and forth between the two lists, as needed.	
7	Enter the new Primary Password for the selected NE(s)/aggregate(s) in the Primary Password field.	
8	Re-enter the new Primary Password in the Re-enter Primary Password field.	

Step	Action (Contd)
9	If desired, enter a new Secondary Password in the Secondary Password field.
10	If a new Secondary Password has been entered, re-enter it in the Re-enter Secondary Password field.
11	To abort the password change operation while it is in progress, click the Abort button. To initiate the password change(s), click the Apply button. To close the window, click the Close button. **NOTE:** If the number of NEs selected is 20 or more, a pop-up message window appears, advising you that the EMS performance may be impacted and asking if you want to continue with the operation. Choose **Y** to continue with the operation or **N** to cancel the operation. A Log Browser window is displayed, showing the status of the operation. This window remains open until you close it. **Stop! End of Task.**

Add a User

502

Background

When to use

Use this procedure to add a user's login and access permissions for WaveStar SNMS. A unique user ID (login) must be defined for each user that accesses WaveStar SNMS.

Before you begin

Before you begin this task, you must have at least one Command Group and one Target Group defined.

To perform this task, access the Map window.

Related information

For related information, see T 508, Add a Target Group , T 505, Add a Command Group , and the following *User Reference* section:

- Users

Instructions

Task Complete the following steps to add a user login.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Security** from the Administration menu. The Security sub-menu is displayed.
3	Select **User Provisioning** from the Security sub-menu. The Manage Users window is displayed, showing the current list of user logins.
4	Click the Add button. The Add a User window is displayed.

Continued on next page

Step	Action (Contd)
5	Fill in the following fields, as needed: ■ Name—This is the user login field. A user login must be unique and contain 3-10 alphanumeric characters with no white spaces. Uppercase and lowercase letters are allowed. No special characters are allowed. Spaces are not allowed. This field is required. ■ Alias—This is an alternate label for the user. A user alias can be 1-20 alphanumeric characters, in any combination. Uppercase and lowercase letters are allowed. Spaces are allowed. This field is required. ■ Password—This is the user's password. A user password can be 6-10 characters. The password must contain at least one alpha character, one numeric character, and one special character. This field is required. ■ Confirm Password—This field is to confirm the user's password. If the entry in this field is not identical to the password entered in the Password field, a pop-up window is displayed with a warning message when the OK button is clicked. This field is required. ■ Copy this user's settings—This field is used to copy another user's Login Type, Command Group, and Target Group settings. Click the down arrow to the right of the field to display a list of users. Select a user login from which to apply settings and then click the Load Settings button. This field is optional, and settings can be modified after these fields have been populated. **Note: this function does not copy a user's preferences for Map display settings.**

Step	Action (Contd)
	■ Login Type—This field is used to specify the type of login. The types are: — GUI—This user ID category is only allowed to access the EMS via the GUI client. Default Command Group = Empty, Default Target Group = Empty — ITM-NM—This user ID category is reserved for the interface between the EMS and ITM-NM. Default Command Group = ALL. This type of login would not be allowed to log in via the GUI. The pre-defined user ID “itm” is defined as ITM-NM. — NMS—This user ID category is reserved for the inteface between the EMS and a generic Network Management System (NMS). Both Fault and Configuration Management functionality are available to this type of user ID. Default Command Group = Privileged, Default Target Group = ALL. This type of login would not be allowed to log in via the GUI. The pre-defined user ID “nms” is defined as NMS. — NMS-CM—This user ID category is reserved fo rthe interface between the EMS and a generic Configuration Management provisioning system. Default Command Group = Provisioning, Default Target Group = ALL. This type of login would not be allowed to log in via the GUI. The pre-defined user ID “opsine” is defined as NMS-CM. — NMS-FM—This user ID category is reserved for the interface between the EMS and a generic Fault Management collection system. Default Command Group = Maintenance, Default Target Group = ALL. This type of login would not be allowed to log in via the GUI. The pre-defined user ID “nma” is defined as NMS-FM. Click the down arrow to the right of the field to display the choices. Select a login type. This field is required. ■ Command Group—This field is used to specify which Command Group the user can access. Click the down arrow to the right of the field to display a list of choices. The choices are: All Commands, No Commands, or a specific Command Group. Select a Command Group for user access. This field is required. ■ Target Group—This field is used to specify which Target Group the user can access. Click the down arrow to the right of the field to display a list of choices. The choices are: All Targets, No Targets, or a specific Target Group. Select a Target Group for user access. This field is required. For OPS/INE and NMA logins, the Target Group must be All Targets.

Step	Action (Contd)
6	Click the OK button. The Status Dialog window is displayed, indicating that the user is being added to WaveStar SNMS. **Stop! End of Task.**

Modify a User

503

Background

When to use

Use this procedure to change a user login's attributes. The Login Type, Alias, Password, Command Group, and/or Target Group can be changed.

Before you begin

Before you begin this task, you must create a user login.

To perform this task, access the Map window.

Related information

For related information, see T 502, Add a User and the following *User Reference* section:

- Users

Instructions

Task

Complete the following steps to modify a user login's attributes.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Security** from the Administration menu. The Security sub-menu is displayed.
3	Select **User Provisioning** from the Security sub-menu. The Manage Users window is displayed, showing the current list of user logins.
4	Select a user login from the list.
5	Click the Modify button. The Modify User window is displayed.
6	Change the Login Type, Password, Alias, Command Group, and/or Target Group fields as desired.
7	Click the OK button. The Status Dialog window is displayed, indicating that the changes to the user login are being made by the system. **Stop! End of Task.**

Delete a User

504

Background

When to use

Use this procedure to delete a user login from WaveStar SNMS.

Before you begin

Before you begin this task, be aware that TL1 Macro Builder Files created by a user remain in WaveStar SNMS. These files must be removed either by the owner of the files (the user) or the system administrator.

To perform this task, access the Map window.

Related information

For related information, see T 502, Add a User, T 301, Build TL1 Commands, and the following *User Reference* section:

- Users

Instructions

Task

Complete the following steps to delete a user.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Security** from the Administration menu. The Security sub-menu is displayed.
3	Select **User Provisioning** from the Security sub-menu. The Manage Users window is displayed.
4	Select the user to be deleted from the list of user logins.
5	Click the Delete button. A pop-up window is displayed, asking if you really want to delete the user.
6	Choose Yes to delete the user. **Stop! End of Task.**

Add a Command Group

505

Background

When to use

Use this procedure to add a Command Group. A Command Group is a set of NE and WaveStar SNMS commands that a user can use. In creating a Command Group, you can copy a set of commands from an existing command group into the new one. Command Groups can also be modified or deleted.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see T 506, Modify a Command Group and the following *User Reference* section:

- Command groups

Instructions

Task Complete the following steps to add a Command Group.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Security** from the Administration menu. The Security sub-menu is displayed.
3	Select **Command Groups** from the Security sub-menu. The Manage Command Groups window is displayed, showing the current list of Command Groups.
4	Click the Add button. The Add a Command Group window is displayed.
5	Fill in the following fields, as needed: ■ Command Group Name—This is the Command Group name. A Command Group name cannot contain spaces. This field is required. ■ Command Group Alias—This is the Command Group alias (alternate label). This field is required. **NOTE:** If you provide an invalid Command Group name or alias, the system informs you with a warning message. ■ Copy settings from this group—This field is used to copy a set of commands from an existing Command Group into the new one. Click the down arrow to the right of the field to display a list of Command Groups. Select a Command Group from which to copy a set of commands and then click the Load Settings button. This field is optional, and the contents of the EMS and NE Command fields can be modified after this information has been copied.

Continued on next page

Step	Action (Contd)
6	Use the push buttons to move commands from the list of available commands in the EMS Commands scroll list to the EMS Commands in This Group list, as needed.
7	Use the push buttons to move commands from the list of available NE commands in the Network Elements Commands scroll list to the NE Commands In This Group list, as needed.
8	Click the Apply button to activate your choices, or click the OK button to activate your choices and close the window. The Status window is displayed, indicating the Command Group is being added to WaveStar SNMS. Click the Close button to close the Status window and return to the Map window. **Stop! End of Task.**

Modify a Command Group

506

Background

When to use

Use this procedure to change a Command Group once it has been created.

Before you begin

Before you begin this task, be aware that the Command Group name or alias cannot be modified.

To perform this task, access the Map window.

Related information

For related information, see T 505, Add a Command Group and the following *User Reference* section:

- Command groups

Instructions

Task

Complete the following steps to modify a Command Group.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Security** from the Administration menu. The Security sub-menu is displayed.
3	Select **Command Groups** from the Security sub-menu. The Manage Command Groups window is displayed, showing the current list of Command Groups.
4	Select the Command Group to be modified from the list.
5	Click the Modify button. The Modify Command Group window is displayed.
6	Change the Copy From Group, EMS Command List, or NE Command List as desired.
7	Click the OK button. The Status window is displayed, indicating that the changes to the Command Group are being made by WaveStar SNMS. Click the Close button to close the Status window and return to the Map window. **Stop! End of Task.**

Delete a Command Group

507

Background

When to use

Use this procedure to delete a Command Group from WaveStar SNMS.

Before you begin

Before you begin this task, be aware that users for the Command Group being deleted must be reassigned to another Command Group. The reassignment is done as part of this task.

To perform this task, you must first access the Map window.

Related information

For related information, see T 505, Add a Command Group and the following *User Reference* section:

- Command groups

Instructions

Task

Complete the following steps to delete a Command Group.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Security** from the Adminstration menu. The Security sub-menu is displayed.
3	Select **Command Groups** from the Security sub-menu. The Manage Command Groups window is displayed, showing the current list of Command Groups.
4	Select the Command Group to be deleted from the list.
5	Click the Delete button. A pop-up window is displayed, asking if you really want to delete the Command Group.
6	Choose Yes to delete the Command Group. The Reassign Users to Command Group window is displayed if any users are assigned to the Command Group.
7	Choose a Command Group from the list to which you want to reassign all users of the Command Group being deleted.
8	Click the OK button. The Command Group is deleted. **Stop! End of Task.**

Add a Target Group

508

Background

When to use

Use this procedure to add a Target Group. A Target Group is a collection of NEs to which a user has access and can execute commands. A user is assigned to one and only one Target Group and can only access the NEs in this group. WaveStar SNMS is initially loaded with two Target Groups: one for all NEs and another with no NEs. Additional Target Groups can be defined as needed by a system administrator or a user with a privileged login. In creating a Target Group, you can copy a set of NEs from an existing Target Group into the new one. Target Groups can also be modified or deleted.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see T 509, Modify a Target Group and the following *User Reference* section:

- Target groups

Instructions

Task Complete the following steps to add a Target Group.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Security** from the Administration menu. The Security sub-menu is displayed.
3	Select **Target Groups** from the Security sub-menu. The Manage Target Groups window is displayed, showing the current list of Target Groups.
4	Click the Add button. The Add a Target Group window is displayed.
5	Fill in the following fields, as needed: ■ Target Group Name—This is the Target Group name. A Target Group name cannot contain spaces. This field is required. ■ Target Group Alias—This is the Target Group alias (alternate label). This field is required. **NOTE:** If you provide an invalid Target Group name or alias, the system informs you with an error message. ■ Copy settings from this group—This field is used to copy a set of NEs from an existing Target Group into the new one. Click the down arrow to the right of the field to display a list of Target Groups. Select a Target Group from which to copy a set of NEs and then click the Load Settings button. This field is optional, and the contents of the Target Group can be modified after this information is copied.
6	Use the push buttons to move NEs from the Network Element list scroll list to the NEs in This Group list, as needed.
7	Click the OK button. The Status window is displayed, indicating that the Target Group is being added to WaveStar SNMS. Click the Close button to close the Status window and return to the Map window. **Stop! End of Task.**

Modify a Target Group

509

Background

When to use

Use this procedure to change a Target Group once it has been created.

Before you begin

Before you begin this task, be aware that the Target Group name or alias cannot be modified. Certain Target Groups cannot be modified or deleted; this is indicated on the Target Group Manager window.

To perform this task, access the Map window.

Related information

For related information, see T 508, Add a Target Group and the following *User Reference* section:

- Target groups

Instructions

Task

Complete the following steps to modify a Target Group.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Security** from the Administration menu. The Security sub-menu is displayed.
3	Select **Target Groups** from the Security sub-menu. The Manage Target Groups window is displayed, showing the current list of Target Groups.
4	Select the Target Group to be modified from the list.
5	Click the Modify button. The Modify Target Group window is displayed.
6	Change the Copy From Group, and/or NEs in This Group fields, as desired.
7	Click the OK button. The Status window is displayed, indicating that the changes to the Target Group are being made by WaveStar SNMS. Click the Close button to close the Status window and return to the Map window. **Stop! End of Task.**

Delete a Target Group

510

Background

When to use

Use this procedure to delete a Target Group from WaveStar SNMS.

Before you begin

Before you begin this task, be aware that users of the Target Group to be deleted must first be reassigned to another Target Group. The reassignment is done as part of this task. Certain Target Groups cannot be modified or deleted; this is indicated on the Target Groups Manager window.

To perform this task, access the Map window.

Related information

For related information, see T 508, Add a Target Group and the following *User Reference* section:

- Target groups

Instructions

Task

Complete the following steps to delete a Target Group.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Security** from the Administration menu. The Security sub-menu is displayed.
3	Select **Target Groups** from the Security sub-menu. The Manage Target Groups window is displayed, showing the current list of Target Groups.
4	Select the Target Group to be deleted from the list.
5	Click the Delete button. A pop-up window is displayed, asking if you really want to delete the Target Group.
6	Choose Yes to delete the Target Group. The Reassign Users to Target Group window is displayed if there are any users assigned to the Target Group.
7	Choose a Target Group from the list to which you want to reassign all users of the Target Group being deleted.
8	Click the OK button. The Target Group is deleted. **Stop! End of Task.**

Add an NE Login

511

Background

When to use

Use this procedure to add an OLS 400G NE login.

Before you begin

Before you begin this task, the NE(s) to which you want to add the OLS 400G NE login must exist in WaveStar SNMS. Be aware that this feature is only available for OLS 400G NEs.

To perform this task, access the Map window.

Related information

For related information, see T 512, Modify an NE Login, T 513, Delete an NE Login, and the following *User Reference* section:

- NE logins (OLS 400G NEs only)

Instructions

Task

Complete the following steps to add an NE login to an OLS 400G NE.

Step	Action	Reference
1	Select an NE on the Map window. **OR** Select no NE at this point.	SE 511-1
2	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.	
3	Select **Security** from the Administration menu. The Security sub-menu is displayed.	
4	Select **NE Login Administration** from the Security sub-menu. If you did not choose an NE in Step 1, the Choose an NE window is displayed. Choose an NE from the list by double-clicking on the NE's TID. The chosen NE is highlighted. Click the OK button. The Manage NE Login window for the chosen NE is displayed, showing the current list of NE logins.	
	Continued on next page	
5	Click the Add button. The Add login window for the chosen NE is displayed.	

Step	Action (Contd)	Reference
6	Fill in the following fields, as needed: ■ Login—This is the NE login. Up to 20 characters are allowed. This field is required. ■ Password—This is the NE login's password. Up to 20 characters are allowed. This field is required. ■ Copy this user's settings—click the down arrrow next to this field to display a list of NE logins from any applicable NE from which to copy login settings; in other words, the User Privilege Code(s) that define the level of NE access for the selected NE login. To load/display the User Privilege Codes for the NE login to be copied from, click the Load Settings button directly below the Copy this user's settings field. This field is optional. **Note: this function does not copy another login or password, which cannot be copied from another user).** ■ Login Type: (Check the Box, if this User is a Temporary User)—Click on this box to place a check in it if the NE login being created is for a temporary user. This field is optional. If this option is selected, enter a date (in MM-DD-YYYY format) in the User ID Expiration Date field. ■ User Privilege Code—This is the User Privilege Code field. Enter one or more User Privilege Codes to specify the level of NE access for this NE login. Enter an ampersand (&) between each User Privilege Code when entering more than one. ■ Passwords will expire after—This is the Password Aging field. Click the up and down arrows on this spinner field to select the number of days after which the specified password will expire. The default is 90 days. If you select 0 or leave the value at 0, the password will not expire for this NE login. This field is required.	
	Continued on next page	

Step	Action (Contd)	Reference
7	Click the Apply or OK button to activate your choices. A status dialog window is displayed, indicating that the NE login request is being processed. When it is finished, the NE login has been added. **Stop! End of Task.**	

SE 511-1: Selecting NEs and Aggregates on the Map Pane

Procedure

To select a single NE or aggregate on the Map pane, position the mouse pointer over the NE or aggregate icon and click the select mouse button.

To select a group of NEs or aggregates on the Map pane.

1. Position the mouse pointer over a portion of the background adjacent to the items to be selected.
2. Click the mouse select button and drag the mouse pointer. As you drag the mouse pointer, an outlined box appears over the selected area.
3. Drag the mouse pointer over the NE(s)/aggregate(s) to be selected, enclosing them in the selection box. As items in the Map pane are selected, they change color. Release the mouse select button. The items are selected.

To deselect a selected item in the Map pane, position the mouse pointer over the itme and single-click the mouse select button. To deselect a group of items, position the mouse pointer within the boxed region and single-click the mouse select button. Any item in the box that is already selected becomes deselected.

Modify an NE Login

512

Background

When to use

Use this procedure to modify the attributes of an OLS 400G NE login. If the same NE login is used for more than one NE, the same changes can be made for every NE using that login.

Before you begin

Be aware that this feature is only available for OLS 400G NEs.

Related information

For related information, see T 511, Add an NE Login, T 513, Delete an NE Login, and the following *User Reference* section:

- NE logins (OLS 400G NEs only)

Instructions

Task

Complete the following steps to modify an NE login for an OLS 400G NE.

Step	Action	Reference
1	Select an NE on the Map window. **OR** Select no NE at this point.	SE 512-1
2	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.	
3	Select **Security** from the Administration menu. The Security sub-menu is displayed.	
4	Select **NE Login Administration** from the Security sub-menu. If you did not choose an NE in Step 1, the Choose an NE window is displayed. Choose an NE from the list by double-clicking on the NE's TID. The chosen NE is highlighted. Click the OK button. The Manage NE Login window for the chosen NE is displayed, showing the current list of NE logins.	
5	Select the NE login to be modified from the list of NE logins.	
6	Click the Modify button. The Modify window for the chosen NE login is displayed.	
7	Change the Password, Password Aging, Copy this user's settings, Login Type, User ID Expiration Date (for the Login Type field), and User Privilege Code fields as desired.	
8	Click the OK or Apply button to activate your choices. A status dialog window is displayed, indicating that your modifications are being processed. When it is finished, the modifications have been applied to the NE login. **Stop! End of Task.**	

SE 512-1: Selecting NEs and Aggregates on the Map Pane

Procedure

To select a single NE or aggregate on the Map pane, position the mouse pointer over the NE or aggregate icon and click the select mouse button.

To select a group of NEs or aggregates on the Map pane.

1. Position the mouse pointer over a portion of the background adjacent to the items to be selected.
2. Click the mouse select button and drag the mouse pointer. As you drag the mouse pointer, an outlined box appears over the selected area.
3. Drag the mouse pointer over the NE(s)/aggregate(s) to be selected, enclosing them in the selection box. As items in the Map pane are selected, they change color. Release the mouse select button. The items are selected.

To deselect a selected item in the Map pane, position the mouse pointer over the itme and single-click the mouse select button. To deselect a group of items, position the mouse pointer within the boxed region and single-click the mouse select button. Any item in the box that is already selected becomes deselected.

Delete an NE Login

513

Background

When to use

Use this procedure to delete an NE login that is being used for an OLS 400G NE .

Before you begin

Before you begin this task, be aware than you cannot delete an OLS 400G NE login with a Super-Use Authorization Code from an OLS 400G NE. Be aware that this feature is only available for OLS 400G NEs.

Related information

For related information, see T 511, Add an NE Login, T 512, Modify an NE Login, and the following section in the *User Reference* section:

- NE logins (OLS 400G NEs only)

Instructions

Task

Complete the following steps to delete an NE login from an OLS 400G NE.

Step	Action	Reference
1	Select an NE on the Map window. **OR** Select no NE at this point.	SE 513-1
2	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.	
3	Select **Security** from the Administration menu. The Security sub-menu is displayed.	
4	Select **NE Login Administration** from the Security sub-menu. If you did not choose an NE in Step 1, the Choose an NE window is displayed. Choose an NE from the list by double-clicking on the NE's TID. The chosen NE is highlighted. Click the OK button. The Manage NE Login window for the chosen NE is displayed, showing the current list of NE logins.	
5	Select the NE login to be deleted from the list of NE logins.	
6	Click the Delete button. A pop-up window is displayed, asking if you really want to delete the NE login.	
7	Choose Yes to delete the NE login. **Stop! End of Task.**	

SE 513-1: Selecting NEs and Aggregates on the Map Pane

Procedure

To select a single NE or aggregate on the Map pane, position the mouse pointer over the NE or aggregate icon and click the select mouse button.

To select a group of NEs or aggregates on the Map pane.

1. Position the mouse pointer over a portion of the background adjacent to the items to be selected.
2. Click the mouse select button and drag the mouse pointer. As you drag the mouse pointer, an outlined box appears over the selected area.
3. Drag the mouse pointer over the NE(s)/aggregate(s) to be selected, enclosing them in the selection box. As items in the Map pane are selected, they change color. Release the mouse select button. The items are selected.

To deselect a selected item in the Map pane, position the mouse pointer over the itme and single-click the mouse select button. To deselect a group of items, position the mouse pointer within the boxed region and single-click the mouse select button. Any item in the box that is already selected becomes deselected.

Terminate User Session

514

Background

When to use

Use this procedure to terminate one or more active user login sessions. When you terminate an active user session, the system gracefully exits out of the current session and does not cause any pending or scheduled tasks to be aborted. The user login that was terminated can start a new login session after the login/password is validated.

Before you begin

Before you begin this task, see if the user is currently on the system via the Display Users window.

To perform this task, access the Map window.

Related information

For related information, see T 516, Display Logged In Users and the following *User Reference* section:

- Users

Instructions

Task

Complete the following steps to terminate one or more active user login sessions.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Security** from the Administration menu. The Security sub-menu is displayed.
3	Select **Terminate User Session** from the Security sub-menu. The Terminate EMS User Sessions window is displayed.
4	Select the user login(s) to be terminated from the Users Currently Logged list and, using the arrow push buttons, move the selected user login(s) to the User Sessions to be Terminated list. You can use the the arrow push buttons to move user logins back and forth between the two lists, as needed.
5	Click the OK button. Active GUI sessions for the user(s) selected are terminated. **Stop! End of Task.**

Enable/Disable User Logins

515

Background

When to use

Use this procedure to enable or disable user logins. Disabling a user login prevents that user from being able to log into WaveStar SNMS. If you disable a user login that is currently on the system, that user's GUI session is automatically terminated. If there is a standing alarm against a user login that has been disabled, re-enabling the user login clears the alarm against it.

Before you begin

Before you begin this task, be aware that the *snc* login and other pre-defined logins may not be disabled. To see if a user is currently on the system, access the Display Users window through the GUI.

To perform this task, access the Map window.

Related information

For related information, see For related information, see T 516, Display Logged In Users and the following *User Reference* section:

- Users

Instructions

Task

Complete the following steps to enable or disable one or more user logins for starting a GUI session.

Step	Action	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.	
2	Select **Security** from the Administration menu. The Security sub-menu is displayed.	
3	Select **Disable/Enable Users** from the Security sub-menu. The Disable/Enable User Sessions window is displayed.	
4	TO ... ■ disable one or more users ■ enable one or more users **NOTE:** You can use the arrow push buttons to move users back and forth between the two lists, as needed.	SELECT ... ■ the user(s) in the Enabled Users list and move the user(s) to the Disabled Users list, using the arrow push buttons. ■ the user(s) in the Disabled Users list and move the user(s) to the Enabled User list, using the arrow push buttons.
5	Click the OK button. If you are disabling one or more users, a pop-up confirmation window is displayed, asking if you really want to prevent the selected user(s) from establishing login sessions. Choose Yes to disable the user(s). If you are enabling one or more users, a pop-up window is displayed indicating that the selected user(s) have been enabled to log into WaveStar SNMS. **Stop! End of Task.**	

Display Logged In Users

516

Background

When to use

Use this procedure to display all users that are currently logged into WaveStar SNMS.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see T 515, Enable/Disable User Logins and the following *User Reference* section:

- Users

Instructions

Task

Complete the following steps to display all users that are currently logged into WaveStar SNMS.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Security** from the Administration menu. The Security sub-menu is displayed.
3	Select **Display Logged-In Users** from the Security sub-menu. The Display Users window is displayed, showing, in table format, a list of users that are currently logged into the system, their user alias, and their login source.
4	Click the Close button to close the window. **Stop! End of Task.**

Globally Provision Login/Password Parameters

517

Background

When to use

Use this procedure to globally administer certain aspects of login/password procedures enforced by WaveStar SNMS, such as the number of login attempts allowed, the login expiration period, the password aging interval, and the password history.

Before you begin

Before you begin this task, make sure that you are the administrator or a user with a privileged login allowed to provision these login/password parameters.

To perform this task, access the Map window.

Related information

For related information, see T 100, Log Into WaveStar SNMS, T 500, Change Your User Password, and the following *User Reference* sections:

- Logging Into WaveStar SNMS
- Password Administration

Instructions

Task

Complete the following steps to globally provision login/password parameters for users logging into WaveStar SNMS.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Security** from the Administration menu. The Security sub-menu is displayed.

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Step	Action (Contd)
3	Select **Global Security Provisioning** from the Security sub-menu. The Global Security Provisioning window is displayed.
4	Fill in the following fields, as needed: ■ Allow user unsuccessful login attempts before disabling login ID—click the up and down arrows on this spinner field to select the number of consecutive failed login attempts before disallowing a user to log into the system. The default is three tries. ■ Delete login IDs after *x* days of user inactivity—click the up and down arrows on this spinner field to select the number of days that a user login is not in use before it expires (in other words, cannot be used to log into the system). The default is 60 days. ■ Prompt users to change passwords every *x* days—click the up and down arrows on this spinner field to select the number of days that a password can be used before it has to be changed. The default is 30 days. ■ Warn users *x* days prior to their password aging—click the up and down arrows on this spinner field to select the number of days prior to passwords expiring that a warning notice is issued. The default is seven days. ■ Remember users' last *x* previous passwords (and don't allow users to use thse previous passwords)—click the up and down arrows on this spinner field to select the number of previous passwords recalled and prohibited from being re-used. The default number is five passwords. ■ Session inactivity timeout interval—click the up and down arrows on this spinner field to select, in minutes, the session inactivity timeout interval before the user's GUI session automatically terminates. The default is 30 minutes. Setting the timeout interval to zero disables session timeout; a GUI session does not automatically terminate. ■ Enter an advisory message that users will see upon login—enter the text advisory message that is displayed to the user upon successfully logging into WaveStar SNMS. **NOTE:** Click the Get Defaults button to retrieve and display the system defaults for the numeric value fields.
5	Click the Apply button to activate your choices, or click the OK button to activate your choices and close the window. **Stop! End of Task.**

Task Series 600

Administration

Add a Network Element—X.25 Communications

600

Background

When to use

Use this procedure to add an X.25-connected NE such as the FT-2000 LCT NE. X.25-connected NEs are either directly connected to WaveStar SNMS or use a Gateway Network Element (GNE) for communications with WaveStar SNMS.

Before you begin

Before you begin this task, verify that the NE that you are adding communicates with WaveStar SNMS using X.25 protocol. Before adding an NE, you must have a Target Identifier (TID), a valid NE login/password, and a valid backup NE login/password. The GNE(s) that provides the communications link for this NE in the subnetwork must be added first.

To perform this task, you must first access the Map window.

Related information

For related information, see T 603, Add a Gateway Network Element—X.25 Communications; T 604, Modify a Network Element; T 605, Delete a Network Element; and Chapter 7, Administration.

Instructions

Task Complete the following steps to add an X.25-connected NE to WaveStar SNMS.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Network** from the Administration menu. A sub-menu is displayed.
3	Select **Network Elements** from the sub-menu. The Manage NEs window is displayed, showing the current list of NEs in your Target Group.
4	Click on the Add button. The Add an NE - General Information panel is displayed. The Add an NE window for X.25-connected NEs is divided into three panels: ■ General NE Information ■ NE Communications Details ■ NE Security There are fields on each panel that are required to add an NE. To access a panel, click the mouse select button on the panel's labeled tab. The General Information panel is displayed initially.
5	Enter the NE's Target Identifier (TID). A TID can be 1-20 alphanumeric characters. Hyphens and lashes ("/") are allowed. This field is required.
6	Enter the NE Alias. An alias can be 1-40 alphanumeric characters. Uppercase and lowercase letters are allowed. Spaces are allowed. This field is optional.
7	Select the NE Type. To do this, click the down arrow to the right of the field to display a drop-down list of choices and select the NE type. This field is required.
	Continued on next page

Step	Action (Contd)
8	Select the NE's time zone by clicking the appropriate radio button. If Other is selected, enter the time difference, in minutes, between the NE time and Greenwich Mean Time (GMT). Specify the time difference, "+" (plus) or "-" (minus), up to five characters. Valid values are -11.0 to 13.00 (the plus "+" is implied). This field is required. If no selection is made, the Time Zone defaults to Same as Host.
9	For the Communicate Via field, click the GNE radio button. This NE is being set up communicate with WaveStar SNMS via a GNE. The default for this NE type is GNE. This field is required.
10	Click on the NE Communications Details tab. The NE Communications Details panel is displayed, showing the current list of GNEs available to provide communications with WaveStar SNMS for the NE being added.
11	Select the GNE for the NE being added. Use the type ahead field and filter/sort function to narrow the listing to the GNE(s) required.
12	Click on the NE Security tab. The NE Security panel is displayed.
13	Enter the primary NE login for the NE being added. The login can be 1-10 characters.
14	Enter the primary NE password for the NE login. An NE password can be 1-10 characters.
15	Re-enter the primary NE password, in the Re-enter Password field, for checking.
16	Enter the backup login for the NE. The backup login can be 1-10 characters.
17	Enter the backup password for the NE. The backup password can be 1-10 characters.
18	Re-enter the backup password, in the Re-enter Backup Pwd field, for checking.
19	Click the Apply button to activate your choices, or click the OK button to activate your choices and close the NE Security panel of the Add/Modify NE window. A message is displayed in the status bar, indicating that the NE is being added to WaveStar SNMS. **Stop! End of Task.**

Add a Network Element—OSI Communications

601

Background

When to use

Use this procedure to add an NE that communicates with WaveStar SNMS over an OSI/LAN interface or OSI over TCP/IP. The WaveStar SNMS IAO-LAN interface provides a higher bandwidth communications path to NEs than possible via X.25. WaveStar SNMS establishes and manages OSI associations to NEs. WaveStar SNMS supports the OSI standard seven-layer protocol stack. OSI-connected NE types include the WaveStar BWM, WaveStar 2.5G, WaveStar OLS 400G, WaveStar TDM 10G (STM-64) and the NCC. When an NCC is added as a transport bridge, it is set up for OSI over TCP/IP communications with WaveStar NEs in the subnetwork. When WaveStar SNMS communicates with OSI-connected NEs over an IAO-LAN interface, one NE can serve as the point of attachment for the EMS to the subnetwork.

Before you begin

Before you begin this task, you should identify the number and types of OSI associations to be used for NE communications with WaveStar SNMS. If a WaveStar NE has been set up in the NCC's directory services for SDS, the NE's NSAP address may be retrieved from the NCC. If the NSAP address cannot be obtained from the NCC providing SDS, or is not available through SDS, then the NE's NSAP address has to be manually entered. NCCs that are serving as transport bridges for TCP/IP to OSI protocol conversion for WaveStar NEs should be added and identified as transport bridges before the WaveStar BWM NEs are added.

To perform this task, access the Map window.

Related information

For related information, see T 604, Modify a Network Element, T 605, Delete a Network Element and the following section in the *User Reference Manual*:

- Network Element Administration

Instructions

Task Complete the following steps to add an OSI-connected NE to WaveStar SNMS.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Network** from the Administration menu. A sub-menu is displayed.
3	Select **Network Elements** from the sub-menu. The Manage NEs window is displayed, showing the current list of NEs in your Target Group.
4	Click on the Add button. The Add an NE - General Information panel is displayed. The Add an NE window for OSI-connected NEs is divided into four panels: ■ General NE Information ■ NE Communications Details (OSI) ■ NE Communications Details (OSI) #2 ■ NE Security There are fields on each panel that are required to an NE. To access a panel, click the mouse select button on the panel's labeled tab. The General Information panel is displayed initially.
5	Enter the NE's Target Identifier (TID). A TID can be 1-20 alphanumeric characters. Hyphens, slashes ("/"), and periods are allowed. This field is required.
6	Enter the NE's Alias. An alias can be 1-40 alphanumeric characters. Uppercase and lowercase letters are allowed. Spaces are allowed. This field is optional.
7	Select the NE Type. To do this, click the down arrow to the right of the field to display a drop-down list of choices and select the NE type. This field is required.
8	Select the NE's time zone by clicking the appropriate radio button. If Other is selected, enter the time difference, in minutes, between the NE time and Greenwich Mean Time (GMT). Specify the time difference, "+" (plus) or "-" (minus), up to five characters. Valid values are -11.0 to 13.00 (the plus "+" is implied). This field is required. If no selection is made, the Time Zone defaults to Same as Host.

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Step	Action (Contd)	
9	IF YOU ARE ADDING... ■ an OSI-connected NE ■ an NCC as a DSA for WaveStar BWM NEs ■ an NCC or OLS 400G as a transport bridge for NEs	THEN CHOOSE TO COMMUNICATE VIA... ■ OSI ■ OSI ■ OSI over TCP/IP
10	Click on the NE Communications Details (OSI) tab. The Communications Details panel for OSI communications is displayed.	
	Fill in the following fields, as needed: ■ Controller #1 NSAP—If NSAP address information was received from the SDS for this NE type, the NSAP address fields are filled in with known information. If information was not received from the SDS or is unavailable, the NSAP address must be entered manually. The Routing Domain part of the NSAP is used to associate NEs with a transport bridge (this field is editable for the transport bridge). See the NSAP address entry section in the Administration chapter for a complete description of the NSAP address fields. ■ This is a Transport Bridge NE—If an NCC or OLS 400G is being added and is serving as a transport bridge for OSI over TCP/IP protocol conversion for NEs, click on this box to place a check in it. Otherwise, leave this box blank. ■ Transport Bridge (Primary and Secondary)—Click on the down arrow next to the Primary Transport field to display a drop down list of nodes available to serve as a transport bridge. Select a node from the list. If a backup transport bridge is needed, click on the arrow next to the Secondary Transport Bridge field, display a drop down list, and select another node. ■ IP Address for Transport Bridge —If the NCC or OLS 400G being added is a transport bridge, enter the IP address. An entry in this field is required for a transport bridge.	
11	Click on the NE Communications Details (OSI) #2 tab. The NE Communications (OSI) #2 panel is displayed.	

Continued on next page

Step	Action (Contd)
12	Fill in the following fields, as needed: ■ Number of OSI Associations—Choose the number of OSI associations for the NE type by clicking the corresponding radio button: **1**, **2**, or **3**. This field is required. The number of available associations varies by NE type: — WaveStar BWM or 2.5G: 3 — NCC: 2 — WaveStar OLS 400G: 1 (default, no change allowed by user) — WaveStar TDM 10G (STM-64): 1 ■ Notification Type—For each OSI association chosen, choose the notification type. Only one notification type can be assigned per association. This field is required. The notification types vary by NE type. If the Notification type All is chosen for an NE type, all other association type choices are disabled. If the notification type All is chosen, after you click the OK or Apply button, a pop-up message window is displayed, advising you that other system responses will be received and could affect performance, and asking if you want to change the association type. Choose Yes to continue or No to change the association type.
13	Click on the NE Security tab. The NE Security panel is displayed.
14	Enter the primary NE login for the NE/NCC being added. The login can be 1-10 characters.
15	Enter the primary NE password for the NE/NCC login. An NE password can be 1-10 characters.
16	Re-enter the primary NE/NCC password, in the the Re-enter Password field, for checking.
17	Enter the backup login for the NE/NCC. The backup login can be 1-10 characters. **NOTE:** The OLS 400G R. 1.0 NE supports only a single super user login via WaveStar SNMS, so no backup login/password can be entered.

Continued on next page

Step	Action (Contd)
18	Enter the backup password for the NE/NCC. The backup password can be 1-10 characters.
19	Re-enter the backup password, in the Re-enter Backup Pwd field, for checking.
20	Click the Apply button to activate your choices, or click the OK button to activate your choices and close the NE Security panel of the Add/Modify NE window. A message is displayed in the status bar, indicating that the NE is being added to WaveStar SNMS. **Stop! End of Task.**

Add a Network Element—TCP/IP Communications

602

Background

When to use

Use this procedure to add an NE with a direct TCP/IP interface to WaveStar SNMS host, such as the AllMetro NE. NEs with a “pure” direct TCP/IP interface can be set up to communicate directly via TCP/IP with the WaveStar SNMS host or through a TCP/IP-connected NE serving as a Gateway Network Element (GNE) for the other NEs in a ring. To provide support in the event of a communications failure, a backup GNE can be assigned to a subnetwork to allow switchover to another GNE.

Before you begin

Before you begin this task, if you are adding a TCP/IP-connected NE as a GNE, the following must be established:

- The GNE’s Target Identifier (TID)
- A valid NE login/password, and a valid backup NE login/password
- The GNE’s IP address
- The number of associations for exchanging messages between the GNE and the other NEs in a ring

Before adding a TCP/IP GNE, you must first create a subnetwork to which it can be assigned.

To perform this task, access the Map window.

Related information

For related information, see T 601, Add a Network Element—OSI Communications; T 608, Add a Subnetwork Name/Alias; T 611, Associate Remote Network Elements with Gateway Network Elements; and Chapter 7, Administration.

Instructions

Task Complete the following steps to add a TCP/IP-connected GNE.

Step	Action
1	Select **Administration** from the main menu bar on the Map window.
2	Select **Network** from the Administration menu. A sub-menu is displayed.
3	Select **Network Elements** from the sub-menu. The Manage NEs window is displayed, showing the current list of NEs in your Target Group.
4	Click on the Add button. The Add an NE - General Information panel is displayed. The Add an NE window for GNEs is divided into three panels: ■ General NE Information ■ NE Communications Details (GNE or TCP/IP) ■ NE Security There are fields on each panel that are required to add a GNE. To access a panel, click the mouse select button on the panel's labeled tab. The General Information panel is displayed initially.
5	Enter the NE's Target Identifier (TID). A TID can be 1-20 alphanumeric characters. Hyphens, slashes ("/"), and periods are allowed. This field is required.
6	Enter the NE's Alias. An alias can be 1-40 alphanumeric characters. Uppercase and lowercase letters are allowed. Spaces are allowed. This field is optional.
7	Select the NE Type. To do this, click the down arrow to the right of the field to display a drop-down list of choices and select the NE type (currently, the only valid selection is **AllMetro)**. This field is required.

Step	Action (Contd)	
8	Select the NE's time zone by clicking the appropriate radio button. If Other is selected, enter the time difference, in minutes, between the NE time and Greenwich Mean Time (GMT). Specify the time difference, "+" (plus) or "-" (minus), up to five characters. Valid values are -11.0 to 13.00 (the plus "+" is implied). This field is required. If no selection is made, the time zone defaults to Same as Host.	
9	In the Communicate Via field of the General Information panel: IF ... The NE is communicating with the WaveStar SNMS host via a GNE The NE is communicating directly with the WaveStar SNMS host via TCP/IP **NOTE:** Each AllMetro NE can have a direct TCP/IP connection to the WaveStar SNMS host and an IP address even if the NE is not serving as a GNE for other NEs in the subnetwork.	 CLICK... the GNE radio button. Go to step 10. the TCP/IP radio button. Go to step 11.
10	If you selected the Communicate Via GNE option in step 9, click on the NE Communications Detail (GNE) panel. Select a GNE from the list on the panel. Skip to step 17.	
11	If you selected the Communicate Via TCP/IP option in step 9, click on the NE Communications Details (TCP/IP) tab. The NE Communications Details (TCP/IP) panel is displayed. This panel is used to enter information about the interface between this GNE, the WaveStar SNMS host and the other NEs in the subnetwork.	
12	The Communication Type defaults to TL1 Only. The other options are currently not available.	
13	Click on the down arrow to the right of the Choose a Subnetwork field to display a list of subnetworks, and select a subnetwork. This field is required.	
14	Enter the NE's IP address. The IP address field is divided into four 3-character fields separated by periods.	

Step	Action (Contd)
15	For NEs discovered under the GNE being added (Discovered Remotes), choose one of the following options (by clicking on that option's radio button): ■ This GNE—the NE login and password entered for this GNE in the NE Security panel will be used to log into the NEs. ■ WaveStar SNMS Default for Remote NEs—the system-wide WaveStar SNMS default NE login and password for the NE type of the Remote Terminal (RT) being discovered will be used to log into the NEs. ■ WaveStar SNMS Default for GNE Type—the system-wide WaveStar SNMS default NE login and password for the NE type of the GNE being added will be used to log into the NEs.
16	Choose the number of associations for the NE type. The AllMetro allows up to three associations. This field is required. Go to step 17.
17	Click on the NE Security tab. The NE Security panel is displayed.
18	Enter the primary NE login for the NE being added. The login can be 1-10 characters.
19	Enter the primary NE password for the NE login. An NE password can be 1-10 characters.
20	Re-enter the primary NE password, in the Re-enter Password field, for checking.

Step	Action (Contd)
21	Enter the backup login for the NE. The backup login can be 1-10 characters.
22	Enter the backup password for the NE. The backup password can be 1-10 characters.
23	Click the Apply button to activate your choices, or click the OK button to activate your choices and close the NE Security panel of the Add/Modify NE window. If you are adding a GNE, the system prompts if you want to run DNO immediately to update the WaveStar SNMS database with complete information about the newly added NE. Choose **Yes** to run DNO or **No** to not perform DNO at this time. **NOTE:** If you are adding more GNEs to the same subnetwork, choose **No** to not perform DNO at this time. A DNO should not be performed until all GNEs in the same subnetwork have been added so new RNEs discovered automatically by WaveStar SNMS via a newly added GNE can be reassigned to another GNE in the same subnetwork, if necessary. See T 611, Associate Remote Network Elements with Gateway Network Elements for details on how to reassign RNEs to another GNE in the same subnetwork. A message in the status bar is displayed, indicating that the NE is being added to WaveStar SNMS. **Stop! End of Task.**

Add a Gateway Network Element—X.25 Communications

603

Background

When to use

Use this procedure to add an FT-2000 LCT Gateway Network Element (GNE) for X.25-based communications between WaveStar SNMS and the NEs in a subnetwork. The GNE establishes communication with the WaveStar SNMS host through a synchronous port over a Packet-Switched Network (PSN). To provide support in the event of a communications failure, a GNE is assigned to a subnetwork to allow switchover to another GNE.

Before you begin

Before you begin this task, the following must be established before adding a FT-2000 LCT GNE:

- The GNE's Target Identifier (TID)
- A valid NE login/password, and a valid backup NE login/password
- The synchronous port that the PSN uses for connectivity to the WaveStar SNMS host
- The PVCs and/or SVCs that are being used for command/response messages, autonomous maintenance/alarm messages, and autonomous database change/ provisioning commands/responses

Before adding a GNE, you must first create a subnetwork to which it can be assigned.

To perform this task, access the Map window.

Related information

For related information, see T 600, Add a Network Element—X.25 Communications; T 608, Add a Subnetwork Name/Alias; T 611, Associate Remote Network Elements with Gateway Network Elements; and Chapter 7, Administration.

Instructions

Task

Complete the following steps to add an X.25-connected GNE.

Step	Action
1	Select **Administration** from the main menu bar on the Map window.
2	Select **Network** from the Administration menu. A sub-menu is displayed.
3	Select **Network Elements** from the sub-menu. The Manage NEs window is displayed, showing the current list of NEs in your Target Group.
4	Click on the Add button. The Add an NE - General Information panel is displayed. The Add an NE window for X.25-connected GNEs is divided into three panels: ■ General NE Information ■ NE Communications Details ■ NE Security There are fields on each panel that are required to add a GNE. To access a panel, click the mouse select button on the panel's labeled tab. The General Information panel is displayed initially.
5	Enter the GNE's Target Identifier (TID). A TID can be 1-20 alphanumeric characters. Hyphens, slashes ("/"), and periods are allowed. This field is required.
6	Enter the GNE's Alias. An alias can be 1-40 alphanumeric characters. Uppercase and lowercase letters are allowed. Spaces are allowed. This field is optional.
7	Select the NE Type. To do this, click the down arrow to the right of the field to display a drop-down list of choices and select the NE type FT-2000 LCT. This field is required.

Continued on next page

Step	Action (Contd)
8	Select the NE's time zone by clicking the appropriate radio button. If Other is selected, enter the time difference, in minutes, between the NE time and Greenwich Mean Time (GMT). Specify the time difference, "+" (plus) or "-" (minus), up to five characters. Valid values are -11.0 to 13.00 (the plus "+" is implied). This field is required. If no selection is made, the time zone defaults to Same as Host.
9	For the Communicate Via field, click the PSN radio button. As a GNE, this NE is being set up to communicate with WaveStar SNMS and other NEs in the subnetwork via a PSN. This field is required.
10	Click on the NE Communications Details (PSN) tab. The NE Communications Detail panel is displayed. This panel is used to enter information about the GNE's X.25 interface.
11	Click on the down arrow to the right of the Choose an X.25 Interface field to display a list of X.25 port names, and select a port. This field is required.
12	Click on the down arrow to the right of the Choose a Subnetwork field to display a list of subnetworks, and select a subnetwork. This field is required.
13	For NEs discovered under the GNE being added (Discovered Remotes), choose one of the following options (by clicking on that option's radio button): ■ This GNE—the NE login and password entered for this GNE in the NE Security panel will be used to log into the NEs ■ EMS Default for Remote NEs—the system-wide WaveStar SNMS default NE login and password for the NE type of the Remote Terminal (RT) being discovered will be used to log into the NEs. ■ EMS Default for GNE Type—the system-wide WaveStar SNMS default NE login and password for the NE type of the GNE being added will be used to log into the NEs.

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Step	Action (Contd)	
14	Choose the Number of Virtual Circuits (VCs) for this GNE by clicking the radio button next to the number. The choices are: 1, 2, or 3. Display of the associated VC fields depends on the number of VCs you choose. For example, if you choose 1 VC to be configured, the Command/Response VC field is enabled. The Autonomous Message & Alarms field and Autonomous DB Change/Command Response 2 fields are disabled. If 1 VC is configured, either or both the Autonomous Message and Autonomous Database Change/Provisoning functions may share the Command/Response VC.	
15	For each configured VC, choose whether it is set up as an SVC or a PVC.	
16	IF... any VC is set up as an SVC a VC is set up as a PVC	THEN... enter the X.121 SVC address in the SVC X.121 Address field. Only one X.121 address is used. Valid SVC X.121 Address values are 1-15 digits and must be greater than 1. enter the PVC Logical Channel Number in the related field. Valid PVC logical channel numbers are 1-999.
17	Click on the NE Security tab. The NE Security panel is displayed.	
18	Enter the primary NE login for the GNE being added. The login can be 1-10 characters.	
19	Enter the primary NE password for the GNE login. An NE password can be 1-10 characters.	
20	Re-enter the primary NE password, in the Re-enter Password field, for checking.	

Continued on next page

Step	Action (Contd)
21	Enter the backup login for the GNE. The backup login can be 1-10 characters.
22	Enter the backup password for the GNE. The backup password can be 1-10 characters.
23	Click the Apply button to activate your choices, or click the OK button to activate your choices and close the NE Security panel of the Add/ Modify NE window. The system prompts if you want to run DNO immediately to update the WaveStar SNMS database with complete information about the newly added NE. Choose **Yes** to run DNO or **No** to not perform DNO at this time. **NOTE:** If you are adding more GNEs to the same subnetwork, choose **No** to not perform DNO at this time. A DNO should not be performed until all GNEs in the same subnetwork have been added so new RNEs discovered automatically by WaveStar SNMS via a newly added GNE can be reassigned to another GNE in the same subnetwork, if necessary. See T 611, Associate Remote Network Elements with Gateway Network Elements for details on how to reassign RNEs to another GNE in the same subnetwork. A message in the status bar is displayed, indicating that the GNE is being added to WaveStar SNMS. **Stop! End of Task.**

Modify a Network Element

604

Background

When to use

Use this procedure to modify an NE.

Before you begin

Before you begin this task, be aware that the TID and Communicate Via fields cannot be modified.

To perform this task, access the Map window.

Related information

For related information, see T 501, Globally Administer NE Passwords, T 600, Add a Network Element—X.25 Communications, T 601, Add a Network Element—OSI Communications, T 602, Add a Network Element—TCP/IP Communications, and Chapter 7, Administration.

Instructions

Task

Complete the following steps to modify an NE.

Step	Action
1	Select **Administation** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Network** from the Administration menu. A sub-menu is displayed.
3	Select **Network Elements** from the sub-menu. The Network Element Manager window is displayed, showing the current list of NEs in your Target Group.
4	Choose the NE to be modified.
5	Click the Modify button. The Add/Modify a Network Element - General Information panel is displayed.
6	Click on the tab of the appropriate panel, and change the NE field(s), as needed.
7	Click the Apply button to activate your choices, or click the OK button to activate your choices and close the Add/Modify a Network Element window. A pop-up window is displayed, asking if you want to perform DNO at this time. Choose Yes to perform DNO or choose No to not perform DNO at this time. A message in the status bar is displayed, indicating that the NE is being modified. **Stop! End of Task.**

Delete a Network Element

605

Background

When to use

Use this procedure to delete an NE.

Before you begin

Before you begin this task, make sure that if the NE is assigned to an aggregate, that you remove it from the aggregate before deleting it. When an NE is deleted, all information related to that NE is immediately removed from the WaveStar SNMS database. Associated trails may also be deleted. Any trail that is deleted as a result of deleting an NE is also removed from any open window that shows the deleted trail (like the Map window pane and the Trail Manager).

If you are deleting a GNE, you must first reassign all RNEs associated with the GNE or delete the RNEs from the WaveStar SNMS database.

To perform this task, access the Map window.

Related information

For related information, see T 600, Add a Network Element—X.25 Communications, T 601, Add a Network Element—OSI Communications, T 602, Add a Network Element—TCP/IP Communications, T 603, Add a Gateway Network Element—X.25 Communications, T 604, Modify a Network Element, and the following *User Reference*sections:

- Deleting NEs
- Deletion of trails

Instructions

Task

Complete the following steps to delete an NE.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Network** from the Administration menu. A sub-menu is displayed.
3	Select **Network Elements** from the sub-menu. The Network Element Manager window is displayed, showing the current list of NEs in your Target Group.
4	Choose the NE to be deleted.
5	Click the Delete button.
6	Click the OK button. A pop-up window is displayed, asking if you really want to delete the chosen NE.
7	Choose Yes. A message in the status bar is displayed, indicating that the NE is being deleted. **Stop! End of Task.**

Add a Trail

606

Background

When to use

Use this procedure to manually add a trail between two NEs. Trails between identical Lucent Technologies NEs may be autodiscovered by the DNO feature and do not have to be manually added. Manually added trails may also be manually deleted.

Before you begin

Before you begin this task, verify that the NEs at either end of the trail are compatible for the connection and that the AIDs at both ends of the trail are using compatible software releases. DNO has to be performed on the NEs at either end of the trail before manually adding a trail.

When you are adding a trail between an NE managed by WaveStar SNMS and a non-managed device (such as a DDM-2000), the AID(s) may not be available for the non-managed device, and, subsequently, will not be displayed in the AID list on the Add a Trail window. The trail can still be added between the managed and non-managed NE.

To perform this task, access the Map window.

Related information

For related information, see T 607, Delete a Trail and the following *User Reference* sections:

- Trails
- Dynamic Network Operations

Instructions

Task

Complete the following steps to manually add a trail.

Step	Action	Result
1	Select **Administration** from the main menu bar on the Map window.	The Administration menu is displayed.
2	Select **Network** from the Administration menu.	The Network sub-menu is displayed.
3	Select **Trails** from the Network sub-menu.	The Trail Manager window is displayed, showing the current list of user-defined trails between NEs.
4	Click the Add button.	The Add a Trail window is displayed. This window consists of: ■ From TID and To TID scroll lists for both NEs ■ From AID and To AID explorers for both NEs The Trail Termination Point (TTP) for either end of the trail consists of the NE's TID and AID.
5	Select the first NE's TID from the From TID list.	The corresponding AIDs for the first NE's TID are displayed in the From AID explorer.
6	Select the second NE's TID from the To TID list.	The corresponding AIDs for the second NE's TID are displayed in the To AID explorer. **NOTE:** If the TID chosen is for a non-managed device, the associated AID list is empty and disabled. The trail can still be added between the managed NE and non-managed device.

Step	Action (Contd)	Result
7	Select a valid AID for the first NE's TID from the From AID explorer.	
8	Select a valid AID for the second NE's TID from the To AID explorer.	
9	Click the Apply button to create the trail, or click the OK button to create the trail and close the window. **Stop! End of Task.**	

Delete a Trail

607

Background

When to use

Use this procedure to manually delete a trail between two NEs. Automatically discovered trails are deleted automatically if one of the NEs at either end is deleted.

Before you begin

Before you begin this task, be aware that if you delete a trail, it is removed from the trail list in any open windows, including the Trail Manager window. The deleted trail is also removed from all open Map windows. Be aware that autodiscovered trails cannot be deleted.

To perform this task, access the Map window.

Related information

For related information, see T 606, Add a Trail and the following *User Reference* sections:

- Trails
- Dynamic Network Operations

Instructions

Task

Complete the following steps to manually delete a trail.

Step	Action	Result
1	Select **Administration** from the main menu bar on the Map window.	The Administration menu is displayed.
2	Select **Network** from the Administration menu.	The Network sub-menu is displayed.
3	Select **Trails** from the Network sub-menu.	The Trail Manager window is displayed, showing the current list of trails between NEs
4	Select a trail to be deleted.	
5	Click the Delete button.	A pop-up window is displayed, asking if you really want to delete the trail.
6	Choose Yes to delete the trail. **Stop! End of Task.**	The Status Dialog window is displayed, indicating that the trail is being deleted.

Add a Subnetwork Name/Alias

608

Background

When to use

Use this procedure to add a subnetwork name and subnetwork alias. Once a subnetwork name and alias is created, you can associate one or more active GNEs with that subnetwork. The Remote Network Elements (RNEs) associated with a GNE become grouped under that subnetwork name/alias. RNEs in a subnetwork can be manually reassigned to another GNE in the same subnetwork.

Before you begin

Before you begin this task, you must add at least one of the network elements that will be part of the subnetwork you are adding. To perform this task, you must first access the Map window.

Related information

For related information, see T 602, Add a Network Element—TCP/IP Communications, T 603, Add a Gateway Network Element—X.25 Communications, and Chapter 7, Administration.

Instructions

Task

Complete the following steps to add a subnetwork name and its alias.

Step	Action	Result
1	Select **Administration** from the main menu bar on the Map window.	The Administration menu is displayed.
2	Select **Network** from the Administration menu.	A sub-menu is displayed.
3	Select **Subnetwork** from the sub-menu.	The Subnetwork Manager window is displayed.
4	Click the Add button to add a new subnetwork name/alias.	The Add a Subnetwork window is displayed.
5	Enter the name of the subnetwork, which is the name of one of the member Network Elements, in the Subnetwork Name field.	
6	Enter the name of the subnetwork alias in the Subnetwork Alias field.	
7	Click the Apply button to add the new information to the WaveStar SNMS datebase, or click the OK button to add the new information and close the window. **Stop! End of Task.**	The Status Dialog window is displayed, indicating that the subnetwork name/alias has been added to the system.

Modify a Subnetwork Alias

609

Background

When to use

Use this procedure to change a subnetwork's alias once it has been created.

Before you begin

Before you begin this task, the subnetwork name/alias being modified must exist in WaveStar SNMS.

To perform this task, access the Map window.

Related information

For related information, see T 608, Add a Subnetwork Name/Alias and Chapter 7, Administration.

Instructions

Task

Complete the following steps to change a subnetwork alias.

Step	Action	Result
1	Select **Administration** from the main menu bar on the Map window.	The Administration menu is displayed.
2	Select **Network** from the Administration menu.	A sub-menu is displayed.
3	Select **Subnetwork** from the sub-menu.	The Subnetwork Manager window is displayed.
4	Select the subnetwork name to be modified from the scroll list.	
5	Click the Modify button.	The Add a Subnetwork window is displayed with the current subnetwork name and alias.
6	Change the subnetwork alias name and click the OK button. **Stop! End of Task.**	The Status Dialog window is displayed, indicating that the subnetwork alias change has been made in the system. All references to the subnetwork are updated to reflect the changes made.

Delete a Subnetwork Name/Alias

610

Background

When to use

Use this procedure to delete a subnetwork name and alias from the WaveStar SNMS database.

Before you begin

Before you begin this task, the subnetwork name/alias must exist in the WaveStar SNMS database. The NE(s) assigned to the subnetwork name being deleted must first be reassigned to another subnetwork by modifying the network element, via the Add/Modify a Network Element window.

To perform this task, access the Map window.

Related information

For related information, see T 608, Add a Subnetwork Name/Alias and Chapter 7, Administration.

Instructions

Task

Complete the following steps to delete a subnetwork name and alias from the WaveStar SNMS database.

Step	Action	Result
1	Select **Administration** from the main menu bar on the Map window.	The Administration menu is displayed.
2	Select **Network** from the Administration menu.	A sub-menu is displayed.
3	Select **Subnetwork** from the sub-menu.	The Subnetwork Manager window is displayed.
4	Select the subnetwork to be deleted.	
5	Click the Delete button. **Stop! End of Task.**	A pop-up message window is displayed, asking if you really want to delete the selected subnetwork. Choose **Yes** to delete the subnetwork. The Status Dialog window is displayed, indicating that the subnetwork name/alias has been deleted. All references to the deleted subnetwork name/alias and subnetwork/NE relationships are updated in WaveStar SNMS.

Associate Remote Network Elements with Gateway Network Elements

611

Background

When to use

Use this procedure to view the Gateway Network Elements (GNEs) in a subnetwork and associated Remote Network Elements (RNEs) and to reassign RNEs to a different GNE in the same subnetwork, as needed.

Before you begin

Before you begin this task, network elements to be reassigned to a different GNE must be initially assigned to a GNE in the subnetwork. The GNEs/RNEs must be given an existing subnetwork name/alias. To perform this task, you must first access the Map window.

Related information

For related information, see T 602, Add a Network Element—TCP/IP Communications, T 603, Add a Gateway Network Element—X.25 Communications, T 607, Delete a Trail, and Chapter 7, Administration.

Instructions

Task

Complete the following steps to view a GNE and its associated RNEs in a subnetwork and, if needed, to reassign RNEs to a different GNE in the subnetwork.

Step	Action	Result
1	Select **Administration** from the main menu bar on the Map window.	The Administration menu is displayed.
2	Select **Network** from the Administration menu.	The Network sub-menu is displayed.
3	Select **GNE Associations** from the Network sub-menu.	A sub-menu is displayed.
4	Select **GNE/RNE** from the sub-menu.	The GNE/RNE Association window is displayed. This window is divided into two parts. It consists of: ■ An explorer tree, which shows the names of all subnetworks in your Target Group (unexpanded) ■ A table which displays the TID and type of each RNE
5	To view GNEs in a subnetwork, double-click on a subnetwork name in the explorer tree to select and expand the subnetwork's associations.	
6	To view RNEs associated with a GNE, select the GNE.	The GNE's associated RNEs are displayed in the table.
7	To reassign an RNE from one GNE to another one in the subnetwork, select the RNE by left-clicking on it in the "Remote NEs" part of the window.	A pop-up window is displayed, with the message "Associate with...".
8	Right-click on the same RNE selected.	A pop-up window is displayed, with the message "Associate with...".

Step	Action (Contd)	Result
9	Click the select (left) mouse button on the “Associate with..” message that is displayed.	A message is displayed in the status bar “Select a GNE within the same subnet to associate this RNE with”.
10	Double-click on a GNE under the same subnetwork in the explorer tree to select it for reassignment of the RNE.	The GNE/RNE reassignment is processed. Messages are displayed in the status bar of the window, indicating the progress of the reassignment and when it is completed.
11	Continue making reassignments as needed.	
12	When you are finished, click the Close button to close the window. **Stop! End of Task.**	

Add a GNE Association

612

Background

When to use

Use this procedure to add a GNE association. A GNE association is a pair of GNEs in the same subnetwork that serve, respectively, as the Primary GNE and Secondary GNE for the other NEs in the subnetwork to communicate with WaveStar SNMS. The Primary GNE initially serves as the point of communications for the other NEs in a subnetwork with WaveStar SNMS. The Secondary GNE is the backup GNE should communications with the Primary GNE fail.

Before you begin

Before you begin this task, you must configure both NEs to be GNEs in the same subnetwork. You must also verify that the Secondary GNE does not have a separate set of Remote Network Elements communicating with it.

To perform this task, access the Map window.

Related information

For related information, see T 602, Add a Network Element—TCP/IP Communications, T 603, Add a Gateway Network Element—X.25 Communications, and Chapter 7, Administration.

Instructions

Task

Complete the following steps to add a GNE association.

Step	Action	Result
1	Select **Administration** from the main menu bar on the Map window.	The Administration menu is displayed.
2	Select **Network** from the Administration menu.	The Network sub-menu is displayed.
3	Select **GNE Associations** from the Network sub-menu.	A sub-menu is displayed.
4	Select **Primary/Secondary** from the sub-menu.	The Primary/Secondary GNE Associations window is displayed. This window shows the current GNE associations (if any exist). An “X” to the left of a GNE in an association indicates that it is the currently active GNE.
5	Click the Add New Association button.	The Add a Primary/Secondary GNE Association window is displayed.
6	Select the Primary GNE from the Primary GNE scroll list.	The GNE(s) available to serve as the Secondary GNE in the association is displayed in the Secondary GNE scroll list.
7	Select the Secondary GNE from the Secondary GNE scroll list.	
8	Click the Apply button to create the association or click the OK button to create the association and close the Add a Primary/Secondary GNE Association window.	The GNE association is added to the GNE Associations list. The Primary GNE in the newly created association becomes the currently active GNE.
9	Close the status window by clicking the Close button.	
10	Click the Close button to close the Primary/Secondary GNE Association window. **Stop! End of Task.**	

Switch Primary/Secondary GNEs

613

Background

When to use

Use this procedure to switch the active and standby status of the GNEs in an association. When a switch is made, the Secondary GNE becomes the active GNE.

Before you begin

Before you begin this task, be aware that a manual switch of the active and standby GNEs may cause temporary loss of communications with the connected NEs, resulting in generation of alarms and/or loss of alarms.

To perform this task, access the Map window.

Related information

For related information, see T 603, Add a Gateway Network Element—X.25 Communications, T 602, Add a Network Element—TCP/IP Communications, and Chapter 7, Administration.

Instructions

Task

Complete the following steps to manually switch the active and standby GNE in a GNE association.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Network** from the Administration menu. The Network sub-menu is displayed.
3	Select **GNE Associations** from the Network sub-menu. A sub-menu is displayed.
4	Select **Primary/Secondary** from the sub-menu. The Primary/Secondary Assocations window is displayed.
5	Select the Primary/Secondary GNE association to be switched. The Status Dialog window is displayed, indicating that the switch is being made. When the switch is made, the “X” moves to the newly active GNE in the association.
6	Click the Close button to close the window. **Stop! End of Task.**

Delete a GNE Association

614

Background

When to use

Use this procedure to delete a GNE association. This procedure is only used to remove the association between two GNEs, not to delete the GNEs from the network. When a GNE association is deleted, NEs in a subnetwork remain connected to the currently active GNE.

Before you begin

Before you begin this task, identify the GNE association to be deleted.

To perform this task, access the Map window.

Related information

For related information, see T 612, Add a GNE Association, T 611, Associate Remote Network Elements with Gateway Network Elements and Chapter 7, Administration.

Instructions

Task

Complete the following steps to delete a GNE association.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Network** from the Administration menu. The Network sub-menu is displayed.
3	Select **GNE Associations** from the Network sub-menu. A sub-menu is displayed.
4	Select **Primary/Secondary** from the sub-menu. The Primary/Secondary Association window is displayed.
5	Select the GNE association to be deleted.
6	Click the Delete button.
7	The Status Dialog window is displayed, indicating that the association has been deleted.
8	Click the Close button to close the window. **Stop! End of Task.**

Add an Aggregate

615

Background

When to use

Use this procedure to add an aggregate. An aggregate is a collection of related NEs/aggregates that are grouped and named for purposes of streamling network monitoring and resynchronization. A new aggregate is created by providing a unique aggregate name and alias and adding NEs or other aggregates to it.

Before you begin

Before you begin this task, identify which NEs and/or aggregates you want to associate with the aggregate being created.

To perform this task, access the Map window.

Related information

For related information, see Chapter 7, Administration.

Instructions

Task

Complete the following steps to create a new aggregate.

Step	Action	Reference
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.	
2	Select **Network** from the Administration menu. The Network sub-menu is displayed.	
3	Select **Aggregates** from the Network sub-menu. The Aggregates sub-menu is displayed.	
4	Select **Add** from the Aggregates sub-menu. The Add a New Aggregate window is displayed.	
5	Fill in the following fields, as needed: ■ Aggregate Name—This is the aggregate name. The Aggregate name can be 1-20 alphanumeric characters. Dashes are allowed. This field is required. The Aggregate name must be unique. ■ Aggregate Alias—This is the aggregate alias (alternate label). The Aggregate alias can be 1-20 alphanumeric characters. Dashes are allowed. This field is optional.	
6	Click the OK button. The new Aggregate is created. **NOTE:** When a new aggregate is created, it is automatically placed into the TOP layer of the Map view. Any NE or aggregate that is placed into the aggregate is removed from the TOP layer. The icon for the new aggregate is displayed in the current Map view and the subnetwork explorer, and is automatically selected.	
7	Add NEs and/or aggregates to the newly created aggregate. **Stop! End of Task.**	SE 615-1

SE 615-1: Add Network Elements/ Aggregates to an Aggregate

Procedure

Perform the steps below to add an NE or aggregate to the parent (owner) aggregate.

1. From the Map window, position the mouse cursor on the aggregate icon on the Map pane and single-click the select mouse button to select the aggregate con, if it is not already selected.
2. Select an NE or aggregate (by pointing at it with the mouse cursor and single-clicking on it with the mouse select button).
3. Drag the NE or aggregate icon into the parent (owner) aggregate.

NOTE:
An NE or aggregate can be moved out of the currrent parent aggregate into the TOP Map view by choosing **Return to Top** in the NE/aggegate's pop-up menu.

Modify an Aggregate

616

Background

When to use

Use this procedure to change an aggregate's alias. To change the contents of an aggregate, use SE-01 in T 615, Add an Aggregate.

Before you begin

Before you begin this task, identify the aggregate to be modified. Be aware that the aggregate name for the Top Level Aggregate (TOP), which is the default parent of all member NEs in the network, cannot be changed.

To perform this task, access the Map window.

Related information

For related information, see T 615, Add an Aggregate and Chapter 7, Administration.

Instructions

Task

Complete the following steps to change the aggregate alias.

Step	Action
1	Select the aggregate to be modified from the Map window or subnetwork explorer. **OR** Select no aggregates at this point.
2	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
3	Select **Network** from the Administration menu. The Network sub-menu is displayed.
4	Select **Aggregates** from the Network sub-menu. The Aggregates sub-menu is displayed.
5	Select **Modify Alias** from the Aggregates sub-menu. If no aggregates were chosen from the Map window or Subnetwork Explorer in Step 1, the Choose an NE/Aggregate window is displayed for selection of the aggregate to be modified. Select the aggregate to be modified and click the OK button. The Modify Aggregate window is displayed with the current aggregate name and/or alias.
6	Change the aggregate alias, as desired.
7	Click the OK button. The Status Dialog box is displayed, indicating that the changes to the aggregate are being made by WaveStar SNMS. **Stop! End of Task.**

Delete an Aggregate

617

Background

When to use

Use this procedure to delete an aggregate from WaveStar SNMS.

Before you begin

Before you begin this task, be aware that NEs/aggregates that are members of the aggregate being deleted must be reassigned to another aggregate or to the TOP aggregate level as part of this task.

To perform this task, access the Map window.

Related information

For related information, see T 615, Add an Aggregate and Chapter 7, Administration.

Instructions

Task

Complete the following steps to delete an aggregate.

Step	Action	Reference
1	Before deleting the aggregate, you may want to move the member NEs out of the aggregate and return them to the TOP level.	SE 617-1
2	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.	
3	Select **Network** from the Administration menu. The Network sub-menu is displayed.	
4	Select **Aggregates** from the Network sub-menu. The Aggregates sub-menu is displayed.	
5	Select **Delete** from the Aggregates sub-menu. The Choose an Aggregate Aggregate/Delete window is displayed. Select the aggregate to be deleted and click the OK button.	
6	The Reassign an Aggregate window is displayed.	
7	Choose an aggregate from the list to which you want to reassign any member NEs/aggregates. You may also choose “Return to TOP” to return the NE(s) to the TOP Level Aggregate, which includes all NEs. **NOTE:** If you are not moving the majority of NEs to a single aggregate, it is recommended that you select the TOP Level Aggregate and modify those aggregates that take the NEs from the deleted aggregate.	
8	Click the OK button. The Status Dialog window is displayed, indicating that the aggregate is being deleted. **Stop! End of Task.**	

SE 617-1: Moving an NE to the TOP Aggregate Level

Procedure

Perform the following steps below to move an NE out of an aggregate to the TOP level.

1. Expand the aggregate by selecting it on the Map window, clicking the right (menu) mouse button to display a pop-up menu, and choosing **Expand**.
2. Select the NE to be moved.
3. When the NE is selected, click the right (menu) mouse button to display a pop-up menu.
4. Choose **Return to TOP**.

   The NE is brought to the TOP aggregate level and is taken out of the aggregate.

Manage Transport Bridges

618

Background

When to use

Use this procedure to reassign NEs to transport bridges as needed to remove NE associations from transport bridges.

Before you begin

Before you begin this task, you must have added NCCs or OLS 400G NEs as designated transport bridges and assigned WaveStar NEs to transport bridges to make changes to assignments. You also must have selected a primary and, if needed, backup transport bridge for each of the WaveStar NEs in your Target Group that require TCP/IP to OSI protocol conversion.

Be aware that only reassignment of a primary transport bridge will cause the actual switch of the transport bridge. The switch of a primary transport bridge may cause the link from WaveStar SNMS and the target NE to go down and up, which can trigger automatic alarm re-synchronization.

To perform this task, access the Map window.

Related information

For related information, see T 601, Add a Network Element—OSI Communications, and Chapter 7, Administration.

Instructions

Task

Complete the following steps to view Transport Bridge assignments for NEs, modify the assignments as needed, and to enable/disable automatic assignment of Primary and Secondary (Backup) Transport Bridges.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Communications** from the Administration menu. The Communications menu is displayed.
	Continued on next page

Step	Action (Contd)	
3	Select **Transport Bridges** from the Communications menu. The Transport Bridges window is displayed. The window consists of two parts: an explorer that shows all transport bridges and the NE(s) using that transport bridge (if any), and a scrollable list of NEs (by TID) in your Target Group.	
4	IF ... you want to view the NEs currently assigned to a transport bridge	THEN ... click on the NCC (transport bridge) in the explorer to expand it, to show the TIDs of NEs assigned to the transport bridge. The letter “B” (in parentheses) after an NE indicates that it is using the transport bridge as a backup.
	you want to assign an NE to a transport bridge	click on the appropriate TID in the Network Elements list to display a pop-up menu. The status bar displays a message, asking you to choose the primary or backup transport bridge. To choose one, click on the name of the transport bridge in the explorer. **NOTE:** No transport bridge can serve as both a primary and backup transport bridge for any NE.
	you want to remove an NE from a transport bridge	click on the NE symbol in the explorer to display a pop-up menu and choose the Remove Association option. The NE is automatically removed and appears on the Network Element List.
	Stop! End of Task.	

Enable/Disable Automatic Date/Time Synchronization

619

Background

When to use

Use this procedure to enable or disable automatic date/time synchronization. When this feature is enabled, WaveStar SNMS automatically sets each NE's date/time to match the WaveStar SNMS host's date/time on establishing communication with an NE for the first time or if the communications link between the WaveStar SNMS host and the NE is down for more than 15 seconds, or the drift threshold specified using the Date/Time Synchronization Drift window. Automatic date/time synchronization takes into account whether the NE is set up in a different time zone than the WaveStar SNMS host. WaveStar SNMS also makes adjustments for Daylight Savings Time and Standard time if the NE has the Fall Back/Spring Forward feature enabled.

Before you begin

Before you begin this task, you must decide if changes to the time zone setting must be made for the NE(s) in the network for date/time synchronization to work properly. You must also check if the Fall Back/Spring Forward feature is enabled (it is enabled, by default). To perform this task, access the Map window.

Related information

For related information, see T 620, Set Drift Threshold for Date/Time Synchronization, T 329, Enable/Disable Fall Back and Spring Forward, and the following *User Reference* section:

- Date/Time Synchronization

Instructions

Task

Complete the following steps to enable or disable automatic date/time synchronization.

Step	Action	
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.	
2	Select **Network** from the Administration menu. The Network sub-menu is displayed.	
3	Select **Date/Time Mgmt** from the Network sub-menu. The Date/Time Management sub-menu is displayed.	
4	Select **Automatic Date/Time Sync** from the Date/Time Management sub-menu. The Automatic Date/Time Sync window is displayed.	
5	IF … you want to enable Automatic Date/Time Synchronization you want to disable Automatic Date/Time Synchronization	THEN … click the Enable button. click the Disable button.
6	Click the OK button. The system processes your choice. When processing is completed, the Status Dialog window is displayed, indicating the change in the automatic date/time synchronization setting. **Stop! End of Task.**	

Set Drift Threshold for Date/Time Synchronization

620

Background

When to use

Use this procedure to set the drift threshold, or the maximum time difference allowed (in seconds) between the NE and the EMS host before date/time synchronization is performed automatically. If the time difference between the NE and EMS host is greater than the drift threshold set here when a communications link that was down has been brought back up, the NE's time zone changes, or there isa daylight savings time adjustment, date/time synchronization is performed automatically.

Before you begin

Before you begin this task, be sure that you make the drift threshold setting before enabling the Automatic Date/Time Synchronization feature.

To perform this task, access the Map window.

Related information

For related information, see T 619, Enable/Disable Automatic Date/Time Synchronization and Chapter 7, Administration.

Instructions

Task

Complete the following steps to set a drift threshold for automatic date/time synchronization.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Network** from the Administration menu. A sub-menu is displayed.
3	Select **Date/Time Mgmt** from the sub-menu. The Date/ Time Management sub-menu is displayed.
4	Select **Set Drift** from the displayed sub-menu. The Set Date/Time Synchronization Drift Cycle window is displayed.
5	Use the up and down spinner buttons next to the NE Drift Threshold field to select a drift value, in seconds, for the time difference between the NE and the EMS host before date/time synchronization is performed automatically.
6	Click the OK button. The system processes your choice. **Stop! End of Task.**

Schedule NE Date/Time Synchronization

621

Background

When to use

Use this procedure to schedule date/time synchronization for an NE.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see T 329, Enable/Disable Fall Back and Spring Forward, T 620, Set Drift Threshold for Date/Time Synchronization, and the following *User Reference* sections:

- Date/Time Synchronization
- Scheduling Tasks

Instructions

Task Complete the following steps to schedule date/time synchronization for an NE.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Schedule** from the Administration menu. A sub-menu is displayed.
3	Select **Date/Time Sync** from the sub-menu. The Schedule Manager window is displayed, showing a list of currently scheduled date/time synchronizations.
4	Click the Add button. The Add a Scheduled Date/Time Sync window is displayed.
5	Choose an NE (by TID) from the Choose an NE scroll bar list by double-clicking on the item. Use the type ahead field and/or filter/sort functions to narrow the list, if necessary.
6	Choose the following Scheduling Options, as needed: ■ Daily—click on this radio button if you want the task to be done on a daily basis. If you schedule the task to be done daily, use the Schedule Time spinner field to select the time of day for the scheduled task. ■ Weekly on...—click on this radio button if you want to task to be done on a weekly basis. If you schedule the task to be done weekly, choose the day of the week by using the spinner field list next to this option. ■ Once every...—click on this radio button if you want the task to be done periodically. If you schedule the task to be done periodically, choose the frequency (every *x* month(s)) and the day of the month it will be done using the spinner field lists next to this option or click the Last Day of the Month checkbox. ■ Schedule Time—click the up and down arrows on this spinner field to select the time of day for the scheduled task. The schedule time is in 24-hour format, in hours:minutes.
7	Click the Apply button to activate your choices, or click the OK button to activate your choices and close the window. **Stop! End of Task.**

Schedule DNO

622

Background

When to use

Use this procedure to schedule a Dynamic Network Operations (DNO) database update for an NE.

Before you begin

Before you begin this task, be aware that DNO cannot be scheduled for a bay or shelf in a WaveStar BWM NE. Unless you are scheduling a DNO for all NE data, you can only specify a database update for one data type. The first time that a DNO is scheduled for an NE, the system does database synchronization for all data types, even if you select only one type for database synchronization.

To perform this task, access the Map window.

Related information

For related information, see the following *User Reference* sections:

- Dynamic Network Operations
- Scheduling Tasks

Instructions

Task Complete the following steps to schedule DNO for an NE.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Schedule** from the Administration menu. A sub-menu is displayed.
3	Select **DNO** from the sub-menu. The Schedule Manager window is displayed, showing a list of currently scheduled DNOs.
4	Click the Add button. The Add a Scheduled DNO window is displayed.
5	Choose an NE (by TID) from the Choose an NE scroll bar list by double-clicking on the item. Use the type ahead field and/or filter/sort functions to narrow the list, if necessary.

Continued on next page

<table>
<tr><th>Step</th><th colspan="2">Action (Contd)</th></tr>
<tr><td>6</td><td>TO SCHEDULE A DNO FOR...
all data types

a specific data type

NOTE:
When you perform DNO the first time on an NE, the system does database synchronization on all data types, even if you choose only one data type.</td><td>CLICK...
The All Information radio button under the DNO Type portion of the window.

Click the “Only the following...” button and then click one of the following radio buttons:
■ Port Parameters
■ Subnetwork
■ Equipment
■ Cross Connections
■ NE Parameters
■ Port Protection Groups
■ Optical Associations

NOTE:
One or more data type buttons may be disabled for a specific NE type.</td></tr>
<tr><td>7</td><td colspan="2">Choose the following Scheduling Options, as needed:
■ Weekly on...—click on this radio button if you want the task to be done on a weekly basis. If you schedule the task to be done weekly, choose the day of the week by using the spinner field list next to this option.
■ Once every...—click on this radio button if you want the task to be done periodically. If you schedule the task to be done periodically, choose the frequency (every x month(s) and the day of the month it will be done using the spinner field lists next to this option or click the Last Day of the Month checkbox.
■ Schedule Time—click the up and down arrows on this spinner field to select the time of day for the scheduled task. The schedule time is in 24-hour format, in hours:minutes.
■ Number of Retries—click the up and down arrows on this spinner field to specify the number of retries for the scheduled task.
■ Retry Interval—If the Number of Retries selected is greater than 1, specify the retry interval, in minutes. Click the up and down arrows on the spinner field to select the time interval.</td></tr>
</table>

Step	Action (Contd)
8	Click the Apply button to activate your choices, or click the OK button to activate your choices and close the window. **Stop! End of Task.**

Schedule NE Data Backup

623

Background

When to use

Use this procedure to schedule backup of an NE's provisioning data.

Before you begin

Before you begin this task, be aware that for WaveStar BWM and NCC NE types, scheduling a backup to the NE's local secondary storage is not allowed. All scheduled backups for these NE types must be to EMS memory. For NCCs, a separate backup can be scheduled for NCC Memory and NCC Directory Services.

To perform this task, access the Map window.

Related information

For related information, see T 627, Modify a Scheduled Task, T 628, Delete a Scheduled Task, and the following sections:

- Software Management
- Scheduling Tasks

Instructions

Task Complete the following steps to schedule an NE software backup.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Schedule** from the Administration menu. A sub-menu is displayed.
3	Select **Software Mgmt** from the sub-menu. The Software Management sub-menu is displayed.
4	Select **Backup** from the Software Management sub-menu. The Schedule Manager window is displayed, showing a list of currently scheduled NE backups.
5	Click the Add button. The Add a Scheduled Software Backup window is displayed.
6	Choose an NE (by TID) from the Choose an NE scroll bar list by double-clicking on the item. Use the type ahead field and/or filter/sort function to narrow the list, if necessary.
7	For Backup Type, click the Regular Backup or Intelligent Backup radio button. **NOTE:** The Intelligent Backup option is disabled for any NE that uses file transferred based memory backup.

Continued on next page

<table>
<tr><th>Step</th><th colspan="2">Action (Contd)</th></tr>
<tr><td>8</td><td>IF THE NE TYPE IS...
an NCC

any other NE type</td><td>CHOOSE....
to back up NCC Memory or NCC Directory Services in the “What to Backup” portion of the window.
skip this step, Go to Step 9.</td></tr>
<tr><td>9</td><td colspan="2">Choose the following Scheduling Options, as needed:
■ Daily—click on this radio button if you want the task to be done on a daily basis. If you schedule the task to be done daily, use the Schedule Time spinner field to select the time of day for the scheduled task.
■ Weekly on...—click on this radio button if you want to task to be done on a weekly basis. If you schedule the task to be done weekly, choose the day of the week by using the spinner field list next to this option.
■ Once every...—click on this radio button if you want the task to be done periodically. If you schedule the task to be done periodically, choose the frequency (every x months) and the day of the month it will be done using the spinner field lists next to this option or click the Last Day of the Month checkbox.
■ Schedule Time—click the up and down arrows on this spinner field to select the time of day for the scheduled task. The schedule time is in 24-hour format, in hours:minutes.
■ Number of Retries—click the up and down arrows on this spinner field to specify the number of retries for the scheduled task.
■ Retry Interval—If the Number of Retries selected is greater than 1, specify the retry interval, in minutes. Click the up and down arrows on the spinner field to select the time interval.</td></tr>
<tr><td>10</td><td colspan="2">Click the Apply button to activate your choices, or click the OK button to activate your choices and close the window.
Stop! End of Task.</td></tr>
</table>

Schedule NE Software Download

624

Background

When to use

Use this procedure to schedule an NE software download.

Before you begin

Before you begin this task, make sure that the software release to be downloaded to the NE has been transferred to the WaveStar SNMS host. Be aware that after a software download is performed on an OLS 400G NE, you must perform DNO on the NE before the release software can be activated.

To perform this task, access the Map window.

Related information

For related information, see T 627, Modify a Scheduled Task, T 628, Delete a Scheduled Task, and the following sections:

- Software Management
- Scheduling Tasks

Instructions

Task Complete the following steps to schedule an NE software download.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Schedule** from the Administration menu. A sub--menu is displayed.
3	Select **Software Mgmt** from the sub-menu. The Software Management sub-menu is displayed.
4	Select **Download Software to NE** from the Software Management sub-menu. The Schedule Manager window is displayed, showing a list of currently scheduled NE software downloads.
5	Click the Add button. The Add a Scheduled Software Download window is displayed.
6	Choose an NE (by TID) from the Choose an NE scroll bar list by double-clicking on the item. Use the type ahead field and/or filter sort function to narrow the list, if necessary. The NE type is displayed in the NE Type field after you choose an NE.
7	Click the down arrow next to the Release field to display a drop-down list of available releases and select the release to download. This field is required.
8	Choose the following Scheduling options, as needed: ■ Date—click the up and down arrows on this spinner field to select the schedule date. Choose Today or the date. This field is required. ■ Schedule Time—click the up and down arrows on this spinner field to select the time of day for the scheduled task. The schedule time is in 24-hour format, in hours:minutes. This field is required. ■ Number of Retries—click the up and down arrows on this spinner field to specify the number of retries for the scheduled task. ■ Retry Interval—if the Number of Retries selected is greater than 1, specify the retry interval, in minutes. Click the up and down arrows on the spinner field to select the time interval.
9	Click the Apply button to activate your choices, or click the OK button to activate your choices and close the window. **Stop! End of Task.**

Schedule NE Software Copy

625

Background

When to use

Use this procedure to schedule an NE software copy from one NE to one or more NEs of the same type.

Before you begin

Before you begin this task, be aware that WaveStar BWM NEs do not support the NE Software Copy feature.

To perform this task, access the Map window.

Related information

For related information, see T 627, Modify a Scheduled Task, T 628, Delete a Scheduled Task, and the following sections:

- Software Management
- Scheduling Tasks

Instructions

Task

Complete the following steps to schedule an NE software copy to one or more NEs.

Step	Action
1	Select **Administration** from main menu bar on the Map window. The Administration menu is displayed.
2	Select **Schedule** from the Administration menu. A sub-menu is displayed.
3	Select **Software Mgmt** from the sub-menu. The Software Management sub-menu is displayed.
4	Select **NE to NE Software Copy** from the Software Management sub-menu. The Schedule Manager window is displayed, showing a list of currently scheduled NE software copy jobs.
5	Click the Add button. The Add a Scheduled Software Copy window is displayed.
6	Choose the TID of the Source NE (the NE to be copied from) from the Source NE list by double-clicking on the item. Use the type ahead field and/or filter/sort function to narrow the list, if necessary.
7	Choose the TID of one or more Destination NEs (to be copied to) from the Destination NE list by clicking on the item. **Note:** The system currently defaults to copying the software from the active partition of the source NE.
8	Choose the following Scheduling options, as needed: ■ Date—click the up and down arrows on this spinner field to select the schedule date. Choose Today or the date. This field is required. ■ Schedule Time—click the up and down arrows on this spinner field to select the time of day for the scheduled task. The schedule time is in 24-hour format, in hours:minutes. This field is required. ■ Number of Retries—click the up and down arrows on this spinner field to specify the number of retries for the scheduled task. ■ Retry Interval—if the Number of Retries selected is greater than 1, specify the retry interval, in minutes. Click the up and down arrows on the spinner field to select the time interval.
9	Click the Apply button to activate your choices, or click the OK button to activate your choices and close the window. **Stop! End of Task.**

Schedule NE Software Activation

626

Background

When to use

Use this procedure to schedule activation of an NE's executable software. When new software is downloaded to an NE, it is placed in "standby" until it is activated; it then replaces the old software. Software activations can be scheduled for more than one NE at a time, up to the limit imposed by the WaveStar SNMS host type.

Before you begin

Before you begin this task, make sure that the software to be activated has already been downloaded to the NE. Be aware that after a software download is performed on an OLS 400G NE, you must perform DNO on the NE before the release software can be activated.

To perform this task, access the Map window.

Related information

For related information, seeT 338, Download NE Software, T 624, Schedule NE Software Download, T 627, Modify a Scheduled Task, T 628, Delete a Scheduled Task, and the following sections:

- Software Management
- Scheduling Tasks

Instructions

Task Complete the following steps to schedule software activation for one or more NEs.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Schedule** from the Administration menu. A sub-menu is displayed.
3	Select **Software Mgmt** from the sub-menu. The Software Management sub-menu is displayed.
4	Select **Activate NE Software** from the Software Management sub-menu. The Schedule Manager window is displayed, showing a list of currently scheduled NE software activations.
5	Click the Add button. The Add a Scheduled Software Activate window is displayed. The window is designed to show the current active and standby software releases for each NE once this information is displayed. **NOTE:** Use the scroll bar to move the window left to right to see the entire contents of the window.
6	Choose an NE (by TID) from the Choose an NE scroll bar list by positioning the mouse cursor on the item and single-clicking on it with the select (left) mouse button.
7	Click the Get Standby Release button to display the standby (currently inactive) release for the NE.

Step	Action (Contd)
8	After displaying the standby release, single-click on the NE (by TID) again in the scroll list.
9	Choose the following Scheduling options, as needed: ■ Date—click the up and down arrows on this spinner field to select the schedule date. Choose Today or the date. This field is required. ■ Schedule Time—click the up and down arrows on this spinner field to select the time of day for the scheduled task. The schedule time is in 24-hour format, in hours:minutes. This field is required. ■ Number of Retries—click the up and down arrows on this spinner field to specify the number of retries for the scheduled task. ■ Retry Interval—if the Number of Retries selected is greater than 1, specify the retry interval, in minutes. Click the up and down arrows on the spinner field to select the time interval.
10	Click the Apply button to activate your choices, or click the OK button to activate your choices and close the window. The Status Dialog window is displayed, indicating that the task schedule request has been processed. Click the Close button to close the status window. **Stop! End of Task.**

Modify a Scheduled Task

627

Background

When to use

Use this procedure to change the parameters of a task for any function that can be scheduled (DNO, NE Date/Time Synchronization).

Before you begin

Before you begin this task, be aware that you cannot modify a scheduled task that is already in progress. You cannot modify another user's scheduled tasks unless you are the system administrator or have a privileged login.

To perform this task, access the Map window.

Related information

For related information, see the Series 600 tasks related to scheduling tasks and the following *User Reference* sections:

- Dynamic Network Operations
- Date/Time Synchronization
- Scheduling Tasks

Instructions

Task

Complete the following steps to modify a scheduled task.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Schedule** from the Administration menu. The Schedule sub-menu is displayed.
3	Select the function of the task to be modified (**DNO**, **Date/Time Sync**). The Scheduler Manager window for the selected function is displayed, showing a list of currently scheduled tasks.
4	Select a task from the list to be modified.
5	Click the Modify button. The appropriate Modify a Scheduled Item window is displayed.
6	Make modifications to the information.
7	Click the Apply button to apply the changes or click the OK button to apply the changes and close the window. **Stop! End of Task.**

Delete a Scheduled Task

628

Background

When to use

Use this procedure to delete a scheduled task for any function that can be scheduled (DNO, NE Date/Time Synchronization).

Before you begin

Before you begin this task, be aware that you cannot delete any scheduled DNO that is already in progress. You cannot delete another user's scheduled tasks unless you are the system administrator or have a privileged login.

To perform this task, access the Map window.

Related information

For related information, see the following *User Reference* sections:

- Dynamic Network Operations
- Scheduling Tasks

Instructions

Task

Complete the following steps to delete a scheduled task.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Schedule** from the Administration menu. The Schedule sub-menu is displayed.
3	Select the function of the task to be deleted (**DNO**, **Date/Time Sync**). The Scheduler Manager window for the selected function is displayed, showing a list of currently scheduled tasks.
4	Choose the item to be deleted, which is identified by TID, from the list.
5	Click the Delete button.
6	A Status Dialog window is displayed, indicating that the selected item is being deleted from the schedule. **Stop! End of Task.**

Provision DSA

629

Background

When to use

Use this procedure to select a Network Communication Controller (NCC) or the WaveStar SNMS-based DSA (if activated) to serve as the DSA from which WaveStar SNMS can gather directory information about WaveStar BWM and OLS 400G NEs in the network.

Before you begin

Before you begin this task, make sure that there are existing NCCs added to the WaveStar SNMS database with the DSA capability enabled or the WaveStar SNMS-based DSA has been activated. The WaveStar SNMS-based DSA is activated during installation. The DSA function for an NCC can be enabled through the Craft Interface Terminal (CIT) of the NCC or through the NE parameters function in the GUI. If the WaveStar SNMS server is being used as the DSA, make sure the DSA capability has been enabled for the server.

To perform this task, access the Map window.

Related information

For related information, see T 601, Add a Network Element—OSI Communications and the following *User Reference* section:

- Network communication controller

Instructions

Task

Complete the following steps to choose the NCC/DSA or WaveStar SNMS-based DSA through which WaveStar SNMS can communicate with the NCC's Directory Information Base (DIB) for NE directory information.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Communications** from the Administration menu. The Communications menu is displayed.
3	Select **Provision DSA** from the Communications menu. The Provision DSA window is displayed.
4	Click the down arrow to the right of the DSA to Monitor field to display a list of NCCs/server (SNMS-based DSA is shown as "Local") with the DSA function enabled. Select a DSA to be used. **NOTE:** If there is no NCC currently in the WaveStar SNMS database with the DSA function enabled or the WaveStar SNMS-based DSA is not activated, a pop-up message window is displayed, advising you that none exist and that you must manually add an NCC/DSA.
5	Click the Apply button to activate your choice, or click the OK button to activate your choice and close the Provision DSA window. **Stop! End of Task.**

Add a DIB Prefix

630

Background

When to use

Use this procedure to add a DIB Prefix to an SNMS-based DSA's T.1245 Directory (DIB) for SONET Directory Services (SDS). NEs that register with the EMS-based DSA are stored in the T1.245 DIB in a tree structure under a DIB Prefix provisioned for the SNMS-based DSA DIB. The DIB Prefix is used by the DUA process in the WaveStar SNMS application to query the DSA for NE directory information contained in the T1.245 DIB. The DIB Prefix consists of a company name, an organization, and zero to six organizational units.

Before you begin

Before you begin this task, make sure that the WaveStar SNMS application has the DSA functionality enabled.

Related information

For related information, see the SONET directory services *User Reference* section.

Instructions

Task

Complete the following steps to add a DIB Prefix to the DSA T1.245 DIB for the SDS feature.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **DSA Management** from the Administration menu. The DSA Manager window is displayed. The DSA Manager window consists of an explorer, which allows you to view the current DIB Prefix(es), with the Prefix composite information, in the DSA DIB, the associated NEs under the DIB Prefix, and the application information for each NE. There is also a text field and a Find button, to do a text string search in the explorer tree. There are four action buttons to the right of the explorer on the window: ■ Add Prefix ■ Add NE ■ Delete ■ Modify
3	Click the Add Prefix button. The Add Prefix window is displayed.
4	Fill in the following fields, as needed: ■ Country—Click the down arrow next to this field to display a drop-down list of Country Codes. Select a Country Code from thedrop-down list. The default is US. This field is required. ■ Organization Name—Enter the Organization name. The Organization name is be 1-40 characters. This field is required. ■ Level 1 to Level 6 fields—These fields are optional. Enter from one to six organization unit names. These fields are related to each other. For example, you cannot enter a Level 2 organization unit name until you have entered a Level 1 organizational unit name.
5	Click the OK button. The DIB Prefix is added to the DSA DIB. **Stop! End of Task.**

Modify a DIB Prefix

631

Background

When to use

Use this procedure to modify a DIB Prefix in the DSA T.1245 DIB for SDS.

Before you begin

Before you begin this task, be sure that there are no NEs registered under the existing DIB Prefix before you modify the prefix information.

Related information

For related information, see the SONET directory services *User Reference* section.

Instructions

Task

Complete the following steps to modify a DIB Prefix in the DSA's T1.245 Directory (DIB).

Step	Action	Reference
1	Access the DSA Manager window.	T 630, Add a DIB Prefix
2	In the explorer on the window, choose the Country Name or Organization name of the DIB Prefix to be modified.	
3	Click the Modify button. The Add Prefix window is displayed with the prefix information for the current level.	
4	Change the Organization name, and/or organizational unit values, as needed.	
5	Click the OK button. The changes to the DIB Prefix are made in the DSA's DIB. **Stop! End of Task.**	

Delete a DIB Prefix

632

Background

When to use

Use this procedure to delete a DIB Prefix from the DSA DIB.

Before you begin

Before you begin this task, be sure that there are no NEs or Oganizational units set up under the DIB prefix to be deleted.

Related information

For related information, see the SONET directory services *User Reference* section.

Instructions

Task

Complete the following steps to delete a DIB Prefix from the DSA DIB.

Step	Action	Reference
1	Access the DSA Manager window.	T 630, Add a DIB Prefix
2	In the explorer on the window, choose the Organization name of the DIB Prefix to be deleted.	
3	Click the Delete button. The DIB Prefix is deleted from the DSA DIB. **Stop! End of Task.**	

Add an NE to DIB

633

Background

When to use

Use this procedure to add an NE to the T1.245 DIB of an SNMS-based DSA for the SONET Directory Services (SDS) feature.

Before you begin

Before you begin this task, be sure that the DIB Prefix under which the NE will be contained in the T1.245 DIB has been created.

Related information

For related information, see the SONET directory services *User Reference* section.

Instructions

Task Complete the following steps to add an NE to the DSA's T1.245 DIB.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **DSA Management** from the Administration menu. The DSA Manager window is displayed. The DSA Manager window consists of an explorer, which allows you to view the current DIB Prefix(es), with the Prefix composite information, in the DSA DIB, the associated NEs under the DIB Prefix, and the application information for each NE. There is also a text field and a Find button, to do a text string search in the explorer tree. There are four action buttons to the right of the explorer on the window: ■ Add Prefix ■ Add NE ■ Delete ■ Modify
3	Click the Add NE button. The Add a Network Element to the DIB window is displayed.
4	In the explorer portion of the window, click on the Country Code of the DIB Prefix for the NE. Expand the hierarchy under the selected Country Code until the Organizational Unit under which the NE will be stored is displayed.

Step	Action (Contd)
5	Click on the Organizational Unit in the explorer to select it. The selected Organizational Unit is selected. (The NE can be placed under the Organizational unit; this step is optional.)
6	Fill in the following fields, as needed: ■ TID—This is the NE's TID. A TID can be 1-20 characters. This field is required. ■ Vendor Name—This field is used to specify the NE's vendor. The default name used in this field is Lucent Technologies. This field is optional. ■ NE Type—This field is used to specify the NE type. Click the down arrow next to the field to display a list of NE types and choose an NE type. This field is required. ■ IP Address—This field is used to specify the IP address of the NE. The IP address is specified as four groups of 1-3 digit numbers. For octets less than 3 digits, leading zeros must be entered. Each set of numbers is 0-255, inclusive. This field is mandatory if the NE/NCC is serving as a transport bridge; it is optional for all other NE types. ■ NSAP—This field is used to specify the NSAP (presentation) address of the NE, for SDS directory/message routing purposes. Refer to the NSAP address entry section in the Administration chapter of the *User Reference Manual* for information about NSAP address field widths and values. **NOTE:** All of the NSAP address fields, except for the Reserved and SEL fields, are editable on this window. ■ Application Information—This field is used to select the application service/message type used by the NE. Click the CMISE or TL1 radio button. ■ FTAM—Click this box to place a checkbox in it if the NE being added is an NCC or OLS 400G. This indicates that the File Transfer Access Method (FTAM) will be used for backups/restorals of NE memory and downloads of NE executable software. Otherwise, click in the box to remove the check mark, or leave it blank.
7	Click the OK button. The NE is added to the DSA T1.245 DIB. **Stop! End of Task.**

Modify an NE in DIB

634

Background

When to use

Use this procedure to modify an NE's information that is contained in the SNMS-based DSA's T1.245 DIB.

Before you begin

Before you begin this task, make sure that the NE to be modified has been added to the DSA's DIB.

Related information

For related information, see the SONET directory services *User Reference* section.

Instructions

Task

Complete the following steps to modify an NE contained in the DIB.

Step	Action	Reference
1	Access the DSA Manager window.	T 630, Add a DIB Prefix
2	In the explorer portion of the window, expand the DIB Prefix to locate the NE to be modified.	
3	Click on the TID of the NE to be modified in the explorer tree to select it. The selected NE (TID) is highlighted.	
4	Click the Modify button. The Modify a Network Element in the DIB window is displayed with the current NE information.	
5	Modify the NE information, as needed.	
6	Click the OK button. The changes are made to the NE information in the DSA's DIB. **Stop! End of Task.**	

Delete an NE from the DIB

635

Background

When to use

Use this procedure to delete an NE from the DSA DIB.

When an NE is deleted from the DSA DIB, it still exists in the WaveStar SNMS database. When subnetwork discovery is triggered either by performing DNO on the DSA or automatically when the system performs a resynch, the database is updated with the change to the T1.245 DIB.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see the SONET directory services *User Reference* section.

Instructions

Task

Complete the following steps to delete an NE from the DSA DIB.

Step	Action	Reference
1	Access the DSA Manager window.	T 630, Add a DIB Prefix
2	In the explorer portion of the window, select the DIB Prefix under which the NE to be deleted is contained and expand it until the NE is shown in the explorer tree.	
3	Click on the TID of the NE to be deleted in the explorer portion of the window. The TID is highlighted.	
4	Click the Delete button. The NE is deleted from the DSA DIB. **Stop! End of Task.**	

Reset NE

636

Background

When to use

Use this procedure to reset an OLS 400G NE.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see Chapter 7, Administration.

Instructions

Task

Complete the following steps to reset an OLS 400G NE.

Step	Action
1	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
2	Select **Network** from the Administration menu. A sub-menu is displayed.
3	Select **Reset NE** from the displayed sub-menu. The Choose an NE window is displayed.
4	Double-click on the NE in the list to select it.
5	Click the OK button. A pop-up window is displayed, explaining that resetting the NE will cause a disruption of communications between the EMS and NE and is a lengthy process and asks if you want to continue with the reset. Choose Yes to continue with the process of resetting the NE or choose No to cancel the request. **Stop! End of Task.**

Update System

637

Background

When to use

Use this procedure to update the system on OLS 400G R. 2.0 (or later) and AllMetro R. 1.0 (or later) NEs. This function causes all OTU In ports on the NE to be reset to the Auto State.

Before you begin

Before you begin this task, access the Map window.

Related information

For related information, see Chapter 7, Administration.

Instructions

Task

Complete the following steps to update the system on an OLS 400G or AllMetro NE.

Step	Action
1	Select an NE in the Map pane portion of the Map window. **OR** Select no NE at this point.
2	Select **Administration** from the main menu bar on the Map window. The Administration menu is displayed.
3	Select **Network** from the Administration menu. A sub-menu is displayed.
4	Select **Update System** from the displayed sub-menu. If you did not select an NE in step 1, the Choose an NE window is displayed. Double-click on the NE in the list and click the OK button. A pop-up question dialog window is displayed, with the message: “This operation will cause all OTU In ports to reset to the Auto State. Are you sure you wish to continue?” There are two buttons on the pop-up question dialog box: Yes and No.
5	Click the Yes button to perform the NE system update. **Stop! End of Task.**

Task Series 700

WaveStar SNMS Logs

Display and Use the Network Alarm/ Event Log

700

Background

When to use

Use this procedure to display the Network Alarm/Event Log, and to use this log to view and save important system-compiled alarm and event information.

Related information

For related information, see Chapter 8, WaveStar SNMS Logs.

Instructions

Task Complete the following steps to use the Network/Alarm Event Log.

Step	Action
1	Select **Logs** from the main menu bar on the Map window. This displays the sub-menu.

Continued on next page

Step	Action (Contd)
2	Select **Network Alarm/Event** from the displayed sub-menu. This displays the viewing parameters window for the Alarm/Event Log.
3	On the viewing parameters window, select the parameters for which you want to display Alarm/Event Log data: ■ Use the up and down arrows on the **Start Date & Time** and **End Date & Time** spinner fields to adjust the entries in these fields. Network Alarm/Event data will be displayed only for data that falls within the selected parameter values. (If you make no adjustments, the start and end dates default to the current date, the start time defaults to 00:00, and the end time defaults to 15 minutes after the time this window was opened.) ■ To choose to view data related only to selected network elements or only to selected Aggregates, select the **Network Elements** or the **Aggregates** radio button (to the right of **Choose from a list of:**), respectively. If you select the **Network Element** radio button, then a list of NEs appears just below and to the left of the radio button. If you select the **Aggregate** radio button, then a list of aggregates appears instead of NEs. After selecting one of these two radio buttons, you can use the right arrow button (**>**) between the left and right list areas to move selected NEs or aggregates (whichever of the two applies) into the right side “Chosen” list area. The NEs or aggregates you move into this “Chosen” list will be the NEs or aggregates for which later you will be viewing Alarm/Event Log data. ■ Use the **Alarms** and **Events** checkboxes near the lower left of the viewing parameters window to request both alarm and event information or just one of the two. Clicking these checkboxes toggles between placing a check (include this data) and removing the check (do *not* include this data). ■ Select from the **Alarm record options** and/or **Event record options** lists to further specify the type of data you want to display.
4	After you have finished specifying parameters on the viewing parameters window, click the OK button. This closes the window and displays the Log browser window, containing the information that meets your specified parameters. You can use this window to view the log records or save them to a file. **Stop! End of Task.**

Display and Use the Network Notifications Log

701

Background

When to use

Use this procedure to display the Network Notifications Log, and to use this log to view and save important system-compiled network notifications information, including protection switching history.

Related information

For related information, see Chapter 8, WaveStar SNMS Logs.

Instructions

Task Complete the following steps to use the Network Notifications Log.

Step	Action
1	Select **Logs** from the main menu bar on the Map window. This displays a sub-menu.

Continued on next page

Step	Action (Contd)
2	Select **Network Notifications Log** from the displayed sub-menu. This displays the viewing parameters window for the Network Notifications Log.
3	On the viewing parameters window, select the parameters for which you want to display Network Notifications Log data: ■ Use the up and down arrows on the **Start Date & Time** and **End Date & Time** spinner fields to adjust the entries in these fields. Network Notifications data will be displayed only for data that falls within the selected parameter values. (If you make no adjustments, the start and end dates default to the current date, the start time defaults to 00:00, and the end time defaults to 15 minutes after the time this window was opened.) ■ To choose to view data related only to selected network elements or only to selected Aggregates, select the **Network Elements** or the **Aggregates** radio button (to the right of **Choose from a list of:**), respectively. If you select the **Network Element** radio button, then a list of NEs appears just below and to the left of the radio button. If you select the **Aggregate** radio button, then a list of aggregates appears instead of NEs. After selecting one of these two radio buttons, you can use the right arrow button (**>**) between the left and right list areas to move selected NEs or aggregates (whichever of the two applies) into the right side “Chosen” list area. The NEs or aggregates you move into this “Chosen” list will be the NEs or aggregates for which later you will be viewing Network Notifications Log data. ■ Use the **Show these types of log records:** field near the lower part of the viewing parameters window to further specify the type of data wanted.
4	After you have finished specifying parameters on the viewing parameters window, click the OK button. This closes the window and displays the Log browser window, containing the information that meets your specified parameters. You can use this window to view the log records or save them to a file. **Stop! End of Task.**

Display and Use the Network Command/Response Log

702

Background

When to use

Use this procedure to display the Network Command/Response Log, and to use this log to view and save important system-compiled network command/response information.

Related information

For related information, see Chapter 8, WaveStar SNMS Logs.

Instructions

Task Complete the following steps to use the Network Command/Response Log.

Step	Action
1	Select **Logs** from the main menu bar on the Map window. This displays a sub-menu.

Continued on next page

Step	Action (Contd)
2	Select **Network Command/Response** from the displayed sub-menu. This displays the viewing parameters window for the Network Command/ Response Log.
3	On the viewing parameters window, select the parameters for which you want to display Network Command/Response Log data: ■ Use the up and down arrows on the **Start Date & Time** and **End Date & Time** spinner fields to adjust the entries in these fields. Network Command/Response data will be displayed only for data that falls within the selected parameter values. (If you make no adjustments, the start and end dates default to the current date, the start time defaults to 00:00, and the end time defaults to 15 minutes after the time this window was opened.) ■ To choose to view data related only to selected network elements or only to selected Aggregates, select the **Network Elements** or the **Aggregates** radio button (to the right of **Choose from a list of:**), respectively. If you select the **Network Element** radio button, then a list of NEs appears just below and to the left of the radio button. If you select the **Aggregate** radio button, then a list of aggregates appears instead of NEs. After selecting one of these two radio buttons, you can use the arrow button (**>**) between the left and right list areas to move selected NEs or aggregates (whichever of the two applies) into the right side “Chosen” list area. The NEs or aggregates you move into this “Chosen” list will be the NEs or aggregates for which later you will be viewing Network Command/Response Log data. ■ If you belong to a command group that allows you to view other user’s command/response log records (check with your system administrator), then you can click on the More Options button to display an additional viewing parameters window. Click More Options, and then use this additional window to select the users and log record sources you want to include in your viewing parameters. In both cases, select the desired parameters by clicking on them in the left list, and using the right arrow symbol button (**>**) to move the selections to the “Chosen” list. (The current user’s username already appears in the “Chosen” list by default.)
4	After you have finished specifying parameters on one or both of the viewing parameters windows, click the OK button. This displays the Log browser window, containing the information that meets your specified parameters. You can use this window to view the log records or save them to a file. **Stop! End of Task.**

Display and Use the Alarm Log

703

Background

When to use

Use this procedure to display the EMS Alarm Log, and to use this log to view and save important system-compiled alarm information.

Related information

For related information, see Chapter 8, WaveStar SNMS Logs.

Instructions

Task Complete the following steps to use the Alarm Log.

Step	Action
1	Select **Logs** from the main menu bar on the Map window. This displays a sub-menu.
2	Select **Alarms** from the displayed sub-menu. This displays the viewing parameters window for the EMS Alarm Log.
3	On the viewing parameters window, select the time and date parameters for which you want to display EMS Alarm Log data: ■ Use the up and down arrows on the **Start Date & Time** and **End Date & Time** spinner fields to adjust the entries in these fields. Alarm data will be displayed only for data that falls within the selected parameter values. (If you make no adjustments, the start and end dates default to the current date, the start time defaults to 00:00, and the end time defaults to 15 minutes after the time this window was opened.)
4	After you have finished specifying parameters on the viewing parameters window, click the OK button. This closes the window and displays the Log browser window, containing the information that meets your specified parameters. You can use this window to view the log records or save them to a file. **Stop! End of Task.**

Display and Use the Activities Log

704

Background

When to use

Use this procedure to display the Activity Log, and to use this log to view and save important user/system-compiled activity information.

Related information

For related information, see Chapter 8, WaveStar SNMS Logs.

Instructions

Task Complete the following steps to use the Activity Log.

Step	Action
1	Select **Logs** from the main menu bar on the Map window. This displays a sub-menu.
2	Select **Activity** from the displayed sub-menu. This displays the viewing parameters window for the EMS Activity Log.
3	On the viewing parameters window, select the parameters for which you want to display Activity Log data: ■ Use the up and down arrows on the **Start Date & Time** and **End Date & Time** spinner fields to adjust the entries in these fields. Activity data will be displayed only for data that falls within the selected parameter values. (If you make no adjustments, the start and end dates default to the current date, the start time defaults to 00:00, and the end time defaults to 15 minutes after the time this window was opened.) ■ To choose to view data related only to a selected user(s), you can use the arrow button (**>**) between the left and right list areas to move a selected user(s) into the right side “Chosen” list area. The user(s) you move into this “Chosen” list will be the user(s) for which you will be viewing Activity data. ■ You can choose the activity criteria you want to include in your viewing parameters by using the scroll down list to select **All Activities**, **Only Completed Activities**, or **Only Failed Activities**. ■ Select the desired activities from the **Available Activities** list by clicking to highligh the desired activities in the left list, and using the right arrow symbol button (**>**) to move the selections to the “Chosen” list.
4	After you have finished specifying parameters on the parameters windows, click the OK button. This displays the Log browser window, containing the information that meets your specified parameters. You can use this window to view the log records or save them to a file. **Stop! End of Task.**

Glossary

Glossary

Numerics

0×1 Line Operation
: 0×1 means unprotected operation. The connection between network elements has one bidirectional line (no protection line).

1+1 Line Protection
: A protection architecture in which the transmitting equipment transmits a valid signal on both the working and protection lines. The receiving equipment monitors both lines. Based on performance criteria and OS control, the receiving equipment chooses one line as the active line and designates the other as the standby line.

1×N Equipment Protection
: 1×N protection pertains to N number of circuit pack/port units protected by one circuit pack or port unit. When a protection switch occurs, the working signals are routed from the failed pack to the protection pack. When the fault clears, the signals revert to the working port unit.

1xN Multi-Cast Cross-Connection
: Consists of N one-way cross-connections from an input tributary to N output tributaries. 1:N Multi-cast (for N>2) is most commonly associated with providing video services.

A

Absent (ABS)
: Used to indicate that a given circuit pack is not installed.

Access Identifier (AID)
: A technical specification for explicitly naming entities (both physical and logical) of an NE using a grammar comprised of ascii text, keywords, and grammar rules.

Active (ACT)
: Used to indicate that a circuit pack or module is in-service and currently providing service functions.

Active Path
: The path that is currently carrying the service in a circuit that is protected at the path level.

Add/Drop Multiplexer (ADM)
: The term for a synchronous network element capable of combining signals of different rates and having those signals added to or dropped from the stream.

Aggregate
: A user-defined grouping of NEs. It most commonly consists of NEs located in a central office (CO) and the subnetworks to which they belong.

Alarm
: Visible or audible signal indicating that an equipment failure or significant event/condition has occurred.

Alarm Correlation
: The search for a directly-reported alarm that can account for a given symptomatic condition.

Alarm Cut-Off (ACO)
: A button on the user panel used to silence audible alarms.

Alarm Cut-Off and Test (ACO/TST)
: The name of a pushbutton on the user panel used to silence audible alarms.

Alarm Indication Signal (AIS)
: A code transmitted downstream in a digital network that indicates that an upstream failure has been detected and alarmed if the upstream alarm has not been suppressed.

Alarm Severity
: An attribute defining the priority of the alarm message. The way alarms are processed depends on the severity.

Alarm Suppression
: Selective removal of alarm messages from being forwarded to the GUI or to network management layer OSs.

Alarm Throttling
: A feature that automatically or manually suppresses autonomous messages that are not priority alarms.

Alternate Mark Inversion (AMI)
: A line code that employs a ternary signal to convert binary digits, in which successive binary ones are represented by signal elements that are normally of alternative positive and negative polarity but equal in amplitude and in which binary zeros are represented by signal elements that have zero amplitude.

American Standard Code for Information Interchange (ASCII)
: A standard 7-bit code that represents letters, numbers, punctuation marks, and special characters in the interchange of data among computing and communications equipment.

Association
: A logical connection between manager and agent through which management information can be exchanged.

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 utilizes a packet switching and multiplexing technique which allocates bandwidth on demand.

Attribute
Alarm indication level: critical, major, minor, or no alarm.

Autolock
Action taken by the system in the event of circuit pack failure/trouble. System switches to protection and prevents a return to the working circuit pack even if the trouble clears. Multiple protection switches on a circuit pack during a short period of time cause the system to autolock the pack.

Automatic (AUTO)
One possible state of a port or slot. When a port is in the AUTO state and a good signal is detected, the port automatically enters the IS (in-service) state. When a slot is in the AUTO state and a circuit pack is detected, the slot automatically enters the EQ (equipped) state.

Automatic Protection Switch
A protection switch that occurs automatically in response to an automatically detected fault condition.

Autonomous Message
A message transmitted from the controlled Network Element to the ITM-SC which was not a response to an ITM-SC originated command.

B

Backup
The backup and restoration features provide the capability to recover from loss of NE data because of such factors as human error, power failure, NE design flaws, and software bugs.

Bandwidth
The difference in Hz between the highest and lowest frequencies in a transmission channel. The data rate that can be carried by a given communications circuit.

Baud Rate
Transmission rate of data (bits per second) on a network link.

Bidirectional Line
A transmission path consisting of two fibers that handle traffic in both the transmit and receive directions.

Bidirectional Line-Switched Ring (BLSR)
A bidirectional ring in which protection switching is accomplished by switching working traffic into protection time slots in the line going in the opposite direction around the ring.

Bidirectional Ring
: A ring in which both directions of traffic between any two nodes travel through the same network elements (although in opposite directions).

Bidirectional Switch
: Protection switching performed in both the transmit and receive directions.

Bipolar 3-Zero Substitution (B3ZS)
: A line coding technique that replaces three consecutive zeros with a bit sequence having special characteristics accomplishing two objectives: First, this bit sequence accommodates the ones density requirements for digital T3 carrier; Second, the sequence is recognizable at the destination (due to deliberate bipolar violations) and is removed to produce the original signal.

Bipolar 8-Zero Substitution (B8ZS)
: A line coding technique that replaces eight consecutive zeros with a bit sequence having special characteristics accomplishing two objectives: First, this bit sequence accommodates the ones density requirements for digital T1 carrier; Second, the sequence is recognizable at the destination (due to deliberate bipolar violations) and is removed to produce the original signal.

Bit
: The smallest unit of information in a computer, with a value of either 0 or 1.

Bit Error Rate (BER)
: The ratio of error bits received to the total number of bits transmitted.

Bit Error Rate Threshold
: The point at which an alarm is issued for bit errors.

Bit Interleaved Parity-N(BIP-N)
: A method of error monitoring over a specified number of bits (BIP-3 or BIP-8).

Blank (BLK)
: The status of a circuit pack slot that contains a bus extender (blank) circuit pack.

Board Controller Local Area Network (BCLAN)
: The internal local area network that provides communications between the line and board controllers on the circuit packs associated with a high-speed line.

Bridge Cross-Connection
: The setting up of a cross-connection leg with the same input tributary as that of an existing cross-connection leg. This forms a 1:2 bridge from an input tributary to two output tributaries.

Broadband Communications
: Voice, data, and/or video communications at greater than 2 Mb/s rates.

Building Integrated Timing Supply (BITS)
: A single clock that provides all the DS1 and/or composite clock timing reference to all other clocks in that building.

Byte
Refers to a group of eight consecutive binary digits.

C

C-Bit
A framing format used for DS3 signals produced by multiplexing 28 DS1s into a DS3. This format provides for enhanced performance monitoring of both near-end and far-end entities.

Cell Relay
Fixed length cells. For example, ATM with 53 octets.

Central Office (CO)
A building where common carriers terminate customer circuits.

Channel
A sub-unit of transmission capacity within a defined higher level of transmission capacity.

Channel State Provisioning
A feature that allows a user to suppress reporting of alarms and events during provisioning by supporting multiple states (automatic, in-service, and not monitored) for VT1.5 and STS-1 channels.

Circuit
A set of transmission channels through one or more network elements that provides transmission of signals between two points, to support a single communications path.

Clear Channel (CC)
A digital circuit where no framing or control bits are required, thus making the full bandwidth available for communications.

Closed Ring Network
A network formed of a ring-shaped configuration of network elements. Each network element connects to two others, one on each side.

Coding Violation (CV)
A performance monitoring parameter indicating bipolar violations of the signal have occurred.

Collocated
System elements that are located in the same location.

Command Group
An administrator-defined group that defines commands to which a user has access.

Concatenation
A procedure whereby multiple virtual containers are associated one with each other, resulting in a combined capacity that can be used as a single container across which bit sequence integrity is maintained.

Consultative Committee for the International Telephone and Telegraph (CCITT)
International Telephone and Telegraph Consultative Committee — An international advisory committee under United Nations' sponsorship that has composed and recommended for adoption worldwide standards for international communications. Recently changed to the International Telecommunications Union Telecommunications Standards Sector (ITU-TSS).

Co-Resident
A hardware configuration where two applications can be active at the same time independently on the same hardware and software platform without interfering with each others functioning.

Correlation
A process where related hard failure alarms are identified.

Craft Interface Terminal (CIT)
The user interface terminal used by craft personnel to communicate with a network element.

Critical (CR)
Alarm that indicates a severe, service-affecting condition.

Cross-Connection
Path-level connections between input and output tributaries or specific ports within a single NE. Cross-connections are made in a consistent way even though there are various types of ports and various types of port protection. Cross-Connections are reconfigurable interconnections between tributaries of transmission interfaces.

Crosstalk
An unwanted signal introduced into one transmission line from another.

Current Value
The value currently assigned to a provisionable parameter.

Cut-Through
A capability that allows a user to utilize a network element's native command set (CIT or TL1 as appropriate) to communicate with network elements in the ITM SNC domain.

D

Data
A collection of system parameters and their associated values.

Database Administrator
A user who administers the database of the application.

Data Communications Channel (DCC)
The embedded overhead communications channel in the synchronous line, used for end-to-end communications and maintenance. The DCC carries alarm, control, and status information between network elements in a synchronous network.

Data Communications Equipment (DCE)
: The equipment that provides signal conversion and coding between the data terminating equipment (DTE) and the line. The DCE may be separate equipment or an integral part of the DTE or of intermediate equipment. A DCE may perform other functions usually performed at the network end of the line.

Data Terminating Equipment (DTE)
: The equipment that originates data for transmission and accepts transmitted data.

DDM-1000
: Lucent Technologies' Dual DS3 Multiplexer — A digital multiplexer that multiplexes DS1, DS1C, or DS2 signals into a DS3 signal or a 90 Mb/s or 180 Mb/s optical signal.

DDM-2000
: Lucent Technologies SONET-ready network multiplexer that can function as a lightwave terminal. It is designed primarily for loop feeder and interoffice applications that work in existing asynchronous as well as the emerging SONET networks. This equipment multiplexes DS1, DS3, or EC-1 inputs into EC-1, OC-1, OC-3, or OC-12 outputs.

Default
: An operation or value that the system or application assumes, unless a user makes an explicit choice.

Default Provisioning
: The parameter values that are preprogrammed as shipped from 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.

Demultiplexer
: A device that splits a combined signal into individual signals at the receiver end of transmission.

Demultiplexing
: A process applied to a multiplexed signal for recovering signals combined within it and for restoring the distinct individual channels of these signals.

Dense Wavelength Division Multiplexing (DWDM)
: Transmitting two or more signals of different wavelengths simultaneously over a single fiber.

Deprovisioning
: The inverse order of provisioning. To manually remove/delete a parameter that has (or parameters that have) previously been provisioned.

Digital Cross-Connect Panel (DSX)
: A panel designed to interconnect equipment that operates at a designated rate. For example, a DSX-3 interconnects equipment operating at the DS3 rate.

Digital Multiplexer
: Equipment that combines by time-division multiplexing several digital signals into a single composite digital signal.

Digital Signal Levels 0, 1, 3 (DS0, DS1, DS3)
: An ANSI-defined signal or service level corresponding to the following: DS0 is 64 Kb/s, DS1 is 1.544 Mb/s (equivalent to T1), and DS3 is 44.736 Mb/s (equivalent to 28 T1 channels or T3).

Directory Service Network Element (DSNE)
: A designated network element that is responsible for administering a database that maps network element names (TIDs) to addresses [NSAPs (network service access points)] in an OSI subnetwork. There can be one DSNE per ring. A DSNE can also be a GNE.

Dispersion
: Time-broadening of a transmitted light pulse.

Dispersion Shifted Optical Fiber
: 1330/1550 nm minimum dispersion wavelength.

Divergence
: When there is unequal amplification of incoming wavelengths, the result is a power divergence between wavelengths.

Doping
: The addition of impurities to a substance in order to attain desired properties.

Downstream
: At or towards the destination of the considered transmission stream, for example, looking in the same direction of transmission.

Drop and Continue
: A circuit configuration that provides redundant signal appearances at the outputs of two network elements in a ring. Can be used for Dual Ring Interworking (DRI) and for video distribution applications.

Drop-Down Menu
: A menu that is displayed from a menu bar.

DS1 Signal
: Signal with a data rate of 1.544 Mb/s.

DS3 Format
: Specifies the line format of a DS3 interface port, such as M13 or C-bit parity.

DS3 Idle Signal
: A signal that can be applied to any output port that is not cross-connected to an input port. This signal lets downstream network elements know that the facility is operating normally even though it is not sending a normal DS3 signal.

DS3 Signal
: A logical or electrical B3ZS signal with a data rate of 44.736 Mb/s.

DSX-1, 2, 3
: Digital cross-connect used to interconnect equipment, provide patch capability, and provide test access at the DS1, DS2, or DS3 level.

Dual Ring Interworking (DRI)
A topology in which two rings are interconnected at two nodes on each ring and operate so that inter-ring traffic is not lost in the event of a node or link failure at an interconnecting point.

E

Electrical Carrier, Level 1 (EC-1)
An electrical interface signal at the SONET rate of STS-1.

Electromagnetic Compatibility (EMC)
A measure of equipment tolerance to external electromagnetic fields.

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)
Static electrical energy potentially harmful to circuit packs and humans.

Entity
A specific piece of hardware (usually a circuit pack, slot, or module) that has been assigned a name recognized by the system.

Entity Identifier
The name used by the system to refer to a circuit pack, memory device, or communications link.

Equipped (EQ)
Status of a circuit pack or interface module that is in the system database and physically in the frame, but not yet provisioned.

Erbium
A soft rare earth element used in metallurgy and nuclear research.

Erbium Doped Fiber Amplifier (EDFA)
An amplifier that performs by having a light signal pass through a section of erbium-doped fiber and using the laser pump diode to amplify the signal.

Errored Seconds (ES)
A performance monitoring parameter. ES “type A” is a second with exactly one error; ES “type B” is a second with more than one and less than the number of errors in a severely errored second for the given signal. ES by itself means the sum of the type A and type B ESs.

Establish
: A user initiated command, at the WaveStar CIT, to create an entity and its associated attributes in the absence of certain hardware.

Event
: A significant change. Events in controlled Network Elements include signal failures, equipment failures, signals exceeding thresholds, and protection switch activity. When an event occurs in a controlled Network Element, the controlled Network Element will generate an alarm or status message and send it to the management system.

Event Driven
: A required characteristic of network element software system: NEs are reactive systems, primarily viewed as systems that wait for and then handle events. Events are provided by the external interface packages, the hardware resource packages, and also by the software itself.

Externally Timed
: An operating condition of a clock in which it is locked to an external reference and is using time constants that are altered to quickly bring the local oscillator's frequency into approximate agreement with the synchronization reference frequency.

Extra traffic
: Unprotected traffic that is carried over protection channels when their capacity is not used for the protection of working traffic.

F

Facility
: A one- or two-way circuit that carries a transmission signal.

Failures in Time (FIT)
: Circuit pack failure rates per 10^9 hours as calculated using the method described in *Reliability Prediction Procedure for Electronic Equipment*, BellCore Method I, Issue 5, September 1995.

Far End (FE)
: Any other network element in a maintenance subnetwork other than the one the user is at or working on. Also called remote.

Far-End Block Error (FEBE)
: An indication returned to the transmitting node that an errored block has been detected at the receiving node. A block is a specified grouping of bits.

Far-End Receive Failure (FERF)
: An indication returned to a transmitting Network Element that the receiving Network Element has detected an incoming section failure. Also known as RDI.

Fault
: Term used when a circuit pack has a hard (not temporary) fault and cannot perform its normal function.

Fault Management
: Collecting, processing, and forwarding of autonomous messages from network elements.

Fiber Distributed Data Interface (FDDI)
: Fiber interface that connects computers and distributes data among them.

Flash EPROM
: A technology that combines the nonvolatility of EPROM with the in-circuit reprogrammability of EEPROM (electrically-erasable PROM).

Folded Rings
: Folded (collapsed) rings are rings without fiber diversity. The terminology derives from the image of folding a ring into a linear segment.

Forced
: Term used when a circuit pack (either working or protection) has been locked into a service-providing state by user command.

Frame
: The smallest block of digital data being transmitted.

Frame Relay (FR)
: A form of packet switching that relies on high-quality phone lines to minimize errors. It is very good at handling high-speed, bursty data over wide area networks. The frames are variable lengths and error checking is done at the end points.

Framework
: An assembly of equipment units capable of housing shelves, such as a bay framework.

Free Running
: An operating condition of a clock in which its local oscillator is not locked to an internal synchronization reference and is using no storage techniques to sustain its accuracy.

FT-2000 ADR
: Lucent Technologies' OC-48 rate Add/Drop Rings lightwave Terminal for 2-fiber BLSRs. It is designed primarily for interoffice applications. It supports adds, drop, and through connections for DS3/EC-1, OC-3, IS-3, and OC-12.

G

Gateway Network Element (GNE)
: A network element that passes information between other network elements and management systems through a data communication network.

Gateway Network Element (GNE)
A Network Element that provides a means of communication between an OS and remote Network Elements over the SONET DCC.

In a primary/secondary GNE pair:

The active GNE is the GNE (primary or secondary) that is currently serving as the GNE for the subnetwork.

The primary GNE is the first GNE associated with a subnetwork that initially serves as the GNE for the subnetwork.

The secondary GNE is the second GNE that is associated with the primary GNE for a subnetwork, and can take over communications in the event there is a failure in the communications via the primary GNE.

The standby GNE is the GNE (primary or secondary) that is currently serving as the backup GNE for the subnetwork in the event there is a failure in communications via the active GNE.

H

Hard Failure
An unrecoverable nonsymptomatic (primary) failure that causes signal impairment or interferes with critical network functions, such as DCC operation.

High Level Data Link Control (HDLC)
OSI reference model datalink layer protocol.

Holdover
An operating condition of a clock in which its local oscillator is not locked to an external reference but is using storage techniques to maintain its accuracy with respect to the last known frequency comparison with a synchronization reference.

Host
The host is an HP 9000/800 series platform running HP-UX.

Hot Standby
A circuit pack ready for fast, automatic placement into operation to replace an active circuit pack. It has the same signal as the service going through it, so that choice is all that is required.

Human Machine Language (MML)
A standard language developed by the ITU for describing the interaction between humans and dumb terminals.

I

Idle
: An output port not cross-connected to an input port.

Idle Code
: A signal transmitted downstream automatically from an idle output port. It can also be transmitted downstream by a manual command from a cross-connected output port.

Insert
: To physically insert a circuit pack into a slot, thus causing a system initiated restoral of an entity into service and/or creation of an entity and associated attributes.

In-Service (IS)
: A memory administrative state for ports. IS refers to a port that is fully monitored and alarmed.

Integrated Transport Management Network Module (ITM NM)
: Lucent Technologies' integrated network management system that provides a broad end-to-end view of the SONET network.

Integrated Transport Management SubNetwork Controller (ITM SNC)
: Lucent Technologies' SONET element management layer system that provides fault, configuration, and security functions through the use of a GUI.

Intelligent Alarm Filtering
: The filtering of symptomatic alarms and events that are associated with a reported root-cause or symptomatic condition.

Interconnect Signal-3 (IS-3)
: The logical equivalent to an OC-3 signal that uses a proprietary interface that allows short-range operation at a lower cost than an OC-3.

Interface Capacity
: The total number of STS-1 equivalents (bidirectional) tributaries in all transmission interfaces with which a given transmission interface shelf can be equipped at one time. The interface capacity varies with equipage.

InterLATA
: Circuits that cross outside the LATA and to an interexchange carrier.

IntraLATA
: Circuits with both end-points within the LATA.

J

Jitter
: Short term variations of amplitude and frequency components of a digital signal from their ideal position in time.

L

Lead Time
: The time interval between placement of a product order and receipt of the product.

Lightguide Build-Out (LBO)
: An attenuating (signal-reducing) element used to keep an optical output signal strength within desired limits.

Line
: A transmission medium, together with the associated equipment, required to provide the means of transporting information between two consecutive network elements. One network element originates the line signal; the other terminates it.

Line Build Out (LBO)
: An equalizer network that guarantees the proper signal level and shape at the DSX panel.

Line Controller Local Area Network (LCLAN)
: The internal local area network that provides communications between the controlled circuit packs.

Line Protection
: The optical interfaces can be protected by line protection. Line protection switching protects against failures of line facilities, including the interfaces at both ends of a line, the optical fibers, and any equipment between the two ends. Line protection includes protection of equipment failures.

Line Timing
: Refers to a network element that derives its timing from an incoming OC-N signal.

Link
: The mapping between in-ports and out-ports. It specifies how components are connected to one another.

Literal Character
: A letter, digit, or symbol that is entered in a command. The first hyphen in UNIT-{1-64} is a literal character; the braces and the second hyphen are not literal characters.

Local Area Network (LAN)
: A communications network that covers a limited geographic area, is privately owned and user administered, is mostly used for internal transfer of information within a business, is normally contained within a single building or adjacent group of buildings, and transmits data at a very rapid speed.

Location
: An identifier for a specific circuit pack, interface module, interface port, or communications link.

Lockout of Protection
: The WaveStar CIT command that prevents the system from switching traffic to the protection line from a working line. If the protection line is active when a “Lockout of Protection” is entered – this command causes the working line to be selected. The protection line is then locked from any Automatic, Manual, or Forced protection switches.

Lockout State
: The Lockout State shall be defined for each working or protection circuit pack. The two permitted states are: None – meaning no lockout is set for the circuit pack, set meaning the circuit pack has been locked out. The values (None & Set) shall be taken independently for each working or protection circuit pack.

Loopback
: Type of diagnostic test used to compare an original transmitted signal with the resulting received signal. A loopback is established when the received optical or electrical external transmission signal is sent from a port or tributary input directly back toward the output.

Loop Timing
: A special case of line timing. It applies to network elements that have only one OC-N/STM-N interface. For example, terminating nodes in a linear network are loop timed.

Loss Budget
: Loss (in dB) of optical power due to the span transmission medium (includes fiber loss and splice losses).

Loss of Frame (LOF)
: A failure to synchronize to an incoming signal.

Loss of Pointer (LOP)
: A failure to extract good data from a signal payload.

Loss of Signal (LOS)
: The complete absence of an incoming signal.

M

M23-Format
: A standard framing format used for DS3 signals produced by multiplexing 28 DS1s into a DS3 (sometimes referred to as M13 format, without C-bit parity).

Management Functional Area (MFA)

A category of service provided by the Network Management system, such as Fault Management, Configuration Management, Performance Management, or Security Management.

Major
: Indicates a service-affecting failure, main or unit controller failure, or power supply failure.

Maintenance Condition
: An equipment state in which some normal service functions are suspended, either because of a problem or to perform special functions (copy memory) that cannot be performed while normal service is being provided.

Manual Switch State
: A protection group shall enter the Manual Switch State upon the initiation and successful completion of the Manual Switch command. The protection group leaves the Manual Switch state by means of the Clear or Forced Switch commands. 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)
: Allows for exchange of management information between Operations System and Network Elements.

Mid-Span Meet
: The capability to interface between two lightwave network elements of different vendors. This applies to high-speed optical interfaces.

Minor (MN)
: Indicates a non-service-affecting failure of equipment or facility.

Miscellaneous Discrete Interface
: Allows an operations system to control and monitor equipment collocated within a set of input and output contact closures.

Multiplexer
: A device (circuit pack) that combines two or more transmission signals into a combined signal on a shared medium.

Multiplexing
: The process of combining multiple signals into a larger signal at the transmitter by a multiplexer. The large signal is then split into the original smaller signals at the receiver by a demultiplexer.

N

Network Element (NE)
: A node in a telecommunication network that supports network transport services and is directly manageable by a management system.

Network Monitoring and Analysis (NMA)
: An operations system designed by Bellcore which is used to monitor network facilities.

Network Service Access Point (NSAP) Address
: Network Service Access Point Address (used in the OSI network layer 3). An automatically assigned number that uniquely identifies a Network Element for the purposes of routing DCC messages.

Node
: A network element in a ring or, more generally, in any type of network. In a network element supporting interfaces to more than one ring, node refers to an interface that is in a particular ring. Node is also defined as all equipment that is controlled by one system controller. A node is not always directly manageable by a management system.

Non-Preemptible Protection Access (NPPA)
: Non-preemptible protection access increases the available span capacity for traffic which does not require protection by a ring, but which cannot be preempted.

Non-Revertive Switching
: In non-revertive switching, an active and stand-by line exist on the network. 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 stand-by line. This status remains in effect even when the fault clears. That is, there is no automatic switch back to the original status.

Non-Volatile Memory (NVM)
: Memory that retains its stored data after power has been removed. An example of NVM would be a hard disk.

No Request State
: This is the routine-operation quiet state in which no external command activities are occurring.

Not Monitored (NMON)
: A provisioning state for equipment that is not monitored or alarmed.

O

Open Ring Network
: A network formed of a linear chain-shaped configuration of network elements. Each network element connects to two others, one on each side, except for two network elements at the ends which are connected on only one side. A closed ring can be formed by adding a connection between the two end nodes.

Open Systems Interconnection (OSI)
: Referring to the OSI reference model, a logical structure for network operations standardized by the International Standards Organization (ISO).

Operations Interface
: Any interface providing you with information on the system behavior or control. These include the equipment LEDs, user panel, WaveStar CIT, office alarms, and all telemetry interfaces.

Operations Interworking (OI)
: The capability to access, operate, provision, and administer remote systems through craft interface access from any site in a SONET network or from a centralized operations system.

Operations System (OS)
: A central computer-based system used to provide operations, administration, and maintenance functions.

Operations System for Intelligent Network Elements (OPS/INE)
: A Bellcore configuration management operations system.

Operator
: A user of the system with operator-level user privileges.

Optical Carrier N (OC-N)
: An optical carrier signal at the SONET rate of N, where n equals 1, 3, 12, 48, or 192. The basic rate of an OC-1 signal is 51.84 Mb/s, equivalent to an STS-1, with other values of N direct multiples of this basic rate.

Optical Channel
: A OC-N wavelength within an optical line signal. Multiple channels, differing by 1.5µ in wavelength, are multiplexed into one signal.

Optical Demultiplexer Unit (ODU)
: A circuit pack responsible for receiving the optical line signal and separating it into the original number of OC-N/STM-Nsignals.

Optical Line Signal
: A multiplexed optical signal containing multiple wavelengths or channels.

Optical Multiplexer Unit (OMU)
: A circuit pack responsible for combining multiple signals into one signal. The combined signal is called the Optical Line Signal.

Optical Translator (OT)
: A system feature used in conjunction with WaveStar OLS that concatenates multiple OLS terminals, regenerates signals in the 1.3 and 1.5 μ ranges, prevents wavelength blocking via wavelength interchange, provides wavelength add/drop (WAD) capabilities, and establishes open interfaces with multi-vendor signal compatibility.

Optical Translator Port Module (OTPM)
: A circuit pack that can electrically regenerate incoming OC-12/STM-4 and OC-3/STM-1 signals into specific outgoing signals of the same type.

Optical Translator Unit (OTU)
: A circuit pack that can electrically regenerate incoming OC-N/STM-N signals (1.3 or 1.5 μ ranges) into specific outgoing signals of the same type.

Orderwire (OW)
: A dedicated voice-grade line for communications between maintenance and repair personnel.

Original Value Provisioning
: Preprogramming of a system's original values at the factory. These values can be overridden using local or remote provisioning.

Outage
: A disruption of service that lasts for more than one second.

Out-of-Service
: The circuit pack is not providing its normal service function (removed from either the working or protection state) either because of a system problem or because the pack has been removed from service.

P

Packet Assembler/Disassembler (PAD)
: An interface between a device and an X.25 packet-switched network. The PAD converts the protocol used by the device and the X.25 protocol used by the network, allowing terminals to exchange data with other packet mode terminals and hosts.

Packet-Switched Network (PSN)
: An X.25 network that transmits groups of bits as a unit through the network. Packets usually include data and control information such as addressing, identification, and error-control fields.

Parameter
: A variable that is given a value for a specified application. A constant, variable, or expression that is used to pass values between components.

Parity Check
: Tests whether the number of ones (or zeros) in an array of binary bits is odd or even; used to determine that the received signal is the same as the transmitted signal.

Pass-Through
: Paths that are cross-connected directly across an intermediate node in a network.

Path
: A logical connection between the point at which a standard frame format for the signal at the given rate is assembled, and the point at which the standard frame format for the signal is disassembled.

Path Overhead (POH)
: Informational bytes assigned to, and transported with the payload until the payload is demultiplexed. It provides for integrity of communication between the point of assembly of a virtual container and its point of disassembly.

Path Terminating Equipment
: Network elements in which the path overhead is terminated.

Performance Monitoring (PM)
: Measures the quality of service and identifies degrading or marginally operating systems (before an alarm would be generated).

Peripheral Control and Timing Facility Interface (PCTFI)
: A proprietary physical link interface supporting the transport of 21×2 Mb/s signals.

Platform
: A family of equipment and software configurations designed to support a particular application.

Plesiochronous Network
: A network that contains multiple subnetworks, each internally synchronous and all operating at the same nominal frequency, but whose timing may be slightly different at any particular instant.

Polarization Mode Dispersion (PMD)
: Output pulse broadening due to random coupling of the two polarization modes in an optical fiber.

Port (also called Line)
: The physical interface, consisting of both an input and output, where an electrical or optical transmission interface is connected to the system and may be used to carry traffic between network elements. The words “port” and “line” may often be used synonymously. “Port” emphasizes the physical interface, and “line” emphasizes the interconnection. Either may be used to identify the signal being carried.

Port State Provisioning
: A feature that allows a user to suppress alarm reporting and performance monitoring during provisioning by supporting multiple states (automatic, in-service, and not monitored) for low-speed ports.

Preprovisioning
: The process by which the user specifies parameter values for an entity in advance of some of the equipment being present. These parameters are maintained only in NVM. These modifications are initiated locally or remotely by either a CIT or an OS. Preprovisioning provides for the decoupling of manual intervention tasks (for example, install circuit packs) from those tasks associated with configuring the node to provide services (for example, specifying the entities to be cross-connected).

Proactive Maintenance
: Refers to the process of detecting degrading conditions not severe enough to initiate protection switching or alarming, but indicative of an impending signal fail or signal degrade defect.

Protection
: Extra capacity (channels, circuit packs) in transmission equipment that is not intended to be used for service, but rather to serve as backup against equipment failures.

Protection Access
: To provision traffic to be carried by protection tributaries when the port tributaries are not being used to carry the protected working traffic.

Protection Group Configuration
: The members of a group and their roles, for example, working protection, line number, etc.

Protection Path
: One of two signals entering a path selector used for path protection switching or dual ring interworking. The other is the working path. The designations working and protection are provisioned by the user, whereas the terms active path and standby path indicate the current protection state.

Protection State
: When the working unit is currently considered active by the system and that it is carrying traffic. The “active unit state” specifically refers to the receive direction of operation — since protection switching is unidirectional.

Provisioned (PROV)
: Indicating that a circuit pack is ready to perform its intended function. A provisioned circuit pack can be active (ACT), in-service (IS), standby (STBY), provisioned out-of-service (POS), or out-of-service (OOS).

Provisioning
: The modification of certain programmable parameters that define how the node functions with various installed entities. These modifications are initiated locally or remotely by either a CIT or an OS. They may arrive at the node via the IAOLAN, CIT port, or any DCC channel. The provisioned data is maintained in NVM and/or hardware registers.

Q

Quad Optical Translator Unit (QOTU)
: A unit that provides functions similar to an Optical Translator Unit (OTU), except that an QOTU provides the equivalent functionality of four OTUs in a package that is only twice the size of an OTU.

R

Reactive Maintenance
: Refers to detecting defects/failures and clearing them.

Receive-Direction
: The direction towards the Network Element.

Regeneration
: The process of reconstructing a digital signal to eliminate the effects of noise and distortion.

Reliability
: The ability of a software system performing its required functions under stated conditions for a stated period of time. The probability for an equipment to fulfill its function. Some of the ways in which reliability is measured are: MTBF (Mean Time Between Failures) expressed in hours; Availability = (MTBF)/(MTBF+MTTR)(%) [where MTTR = mean time to restore]; outage in minutes per year; failures per hour; percentage of failures per 1,000 hours.

Remote Defect Indication (RDI)
: An indication returned to a transmitting terminal that the receiving terminal has detected an incoming section failure. [Previously called far-end-receive failure (FERF).]

Remote Failure Indication (RFI)
: A signal that alerts upstream STS-1 path terminating equipment that a downstream failure has been alarmed along the STS-1 path. This action prevents multiple alarms from being activated for the same failure and ensures that a technician is dispatched to correct the failure. (Previously called yellow signals.)

Remote Network Element
: Any Network Element that is connected to the referenced Network Element through either an electrical or optical link. It may be the adjacent node on a ring, or N nodes away from the reference. It also may be at the same physical location but is usually at another (remote) site.

Return to Zero
: A code form having two information states (termed zero and one) and having a third state or an at-rest condition to which the signal returns during each period.

Revertive
: A protection switching mode in which, after a protection switch occurs, the equipment returns to the nominal configuration (that is, the working equipment is active, and the protection equipment is standby) after any failure conditions that caused a protection switch to occur, clear, or after any external switch commands are reset. (See “Non-Revertive Switching.”)

Revertive Switching
: In revertive switching, there is a working and protection high-speed line, circuit pack, etc. When a protection switch occurs, the protection line, circuit pack, etc. is selected. When the fault clears, service “reverts” to the working line.

Ring
: A configuration of nodes comprised of network elements connected in a circular fashion. Under normal conditions, each node is interconnected with its neighbor and includes capacity for transmission in either direction between adjacent nodes. Path switched rings use a head-end bridge and tail-end switch. Line switched rings actively reroute traffic over the protection capacity.

Router
: An interface between two networks. While routers are like bridges, they work differently. Routers provide more functionality than bridges. For example, they can find the best route between any two networks, even if there are several different networks in between. Routers also provide network management capabilities such as load balancing, partitioning of the network, and trouble-shooting.

S

Section
: The portion of a transmission facility, including terminating points, between a terminal network element and a line-terminating network element, or two line-terminating network elements.

Section Layer
: The second of the four levels in a standard SONET signal, used to transport an STS frame across a physical medium. This layer uses the photonic layer to form the physical transport.

Self-Healing
: A network’s ability to automatically recover from the failure of one or more of its components.

Server
: Computer in a computer network that performs dedicated main tasks which generally require sufficient performance.

Serving Area
: A user-defined grouping of Network Elements. It most commonly consists of Network Elements located in a central office (CO) and the subnetworks to which they belong.

Severely Errored Seconds (SES)
: This performance monitoring parameter is a second in which a signal failure occurs, or more than a preset amount of coding violations (dependent on the type of signal) occurs.

Service
: The operational mode of a physical entity that indicates that the entity is providing service. This designation will change with each switch action.

Signal-to-Noise Ratio (SNR)
: The relative strength of signal compared to noise.

Signal Rate
: An attribute that defines the bit-rate and format of the signal. The signal rate is defined by the STS-N path-level signal bit-rate and format including the presence or absence of concatenation.

Single-Ended Operations
: Provides operations support from a single location to remote Network Elements in the same SONET subnetwork. With this capability you can perform operations, administration, maintenance, and provisioning on a centralized basis. The remote Network Elements can be those that are specified for the current release.

Single-Mode Fiber (SM)
: An 8-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.

Slot
: A physical position in a shelf designed for holding a circuit pack and connecting it to the backplane. This term is also used loosely to refer to the collection of ports or tributaries connected to a physical circuit pack placed in a slot.

Software Backup
: The process of saving an image of the current network element's databases, which are contained in its NVM, to a remote location. The remote location could be the WaveStar CIT or an OS.

Software Download
: The process of transferring a generic (full or partial) or provisioned database from a remote entity to the target network element's memory. The remote entity may be the WaveStar CIT or an OS. The download procedure uses bulk transfer to move an uninterpreted binary file into the network element.

Software ID
: Number that provides the software version information for the system.

Span
: An uninterrupted bidirectional fiber section between two network elements.

Span Growth
: A type of growth in which one wavelength is added to all lines before the next wavelength is added.

Squelch Map
: This map contains information for each cross-connection in a ring and indicates the source and destination nodes for the low-speed circuit that is part of the cross-connection. This information is used to prevent traffic misconnection in rings with isolated nodes or segments.

Standby
: The circuit pack is in service but is not providing service functions. It is ready to be used to replace a similar circuit pack either by protection or by duplex switching.

Standby Path
: One of two signals entering a constituent path selector, the standby path is the path not currently being selected.

State
: The state of a circuit pack indicates whether it is defective or normal (ready for normal use).

Status
: The indication of a short-term change in the system.

STS-1E
: Now referred to as EC-1. A signal typically carried by coaxial cables from one equipment location to another. The term EC-1 refers to the organization and data rate of the signal and also to the voltage template the signal must conform to and the impedances for which the voltage template is valid.

STS-1
: The basic building block logical signal in the SONET standard with a data rate of 51.84 Mb/s.

Subnetwork
: A group of interconnected/interrelated Network Elements. The most common connotation is a synchronous network in which the Network Elements have Data Communications Channel (DCC) connectivity.

Supervisory Signal
: An optical signal originating with the telemetry circuit pack that is used to communicate maintenance information.

Suppression
: A process where service-affecting alarms that have been identified as an “effect” are not displayed to a user.

Symptomatic Alarm
: An alarm that is not indicative of an actual failure itself, but rather of a secondary manifestation.

Synchronization Messaging
: Synchronization messaging is used to communicate the quality of network timing, internal timing status, and timing states throughout a subnetwork.

Synchronous
: The essential characteristic of time scales or signals such that their corresponding significant instances occur at precisely the same average rate, generally traceable to a single Stratum-1 source.

Synchronous Digital Hierarchy (SDH)
: A hierarchical set of digital transport structures, standardized for the transport of suitable adapted payloads over transmission networks.

Synchronous Network
: The synchronization of transmission systems with synchronous payloads to a master (network) clock that can be traced to a reference clock.

Synchronous Optical Network (SONET)
: The North American standard for the rates and formats that defines optical signals and their constituents.

Synchronous Payload
: Payloads that can be derived from a network transmission signal by removing integral numbers of bits from every frame. Therefore, no variable bit-stuffing rate adjustments are required to fit the payload in the transmission signal.

Synchronous Payload Envelope (SPE)
: The combined payload and path overhead of an STS-1, STS-3c, STS-12c or STS-48c signal.

Synchronous Transport Signal (STS, STS-N)
: The basic logical building block signal for SONET with a rate of 51.84 Mb/s for an STS-1 signal and a rate of N times 51.84 Mb/s for an STS-N signal.

Synchronous Transport Signal, Level N, Concatenated (STS-Nc)
: A concatenated SONET payload signal at the STS-N rate, where N equals 3, 12, or 48. For example, an STS-3c signal is constructed by concatenating three STS-1 signals into a signal that uses a single path overhead, rather than three.

T

T1
: A carrier system that transmits at the rate of 1.544 Mb/s (a DS1 signal).

T2
: A carrier system that transmits at the rate of 6.312 Mbps (a DS2 signal).

T3
: A carrier system that transmits at the rate of 44.736 Mbps (a DS3 signal).

Target Group
: An administrator-defined group that defines to which Network Elements a user has access.

Target Identifier (TID)
: A provisionable parameter that is used to identify a particular Network Element within a network. It is a character string of up 20 characters where the characters are letters, digits, or hyphens (-).

Telemetry Feed-Through
: Operations capability for 4-fiber applications which allows the DCC to go from one OLS End Terminal (one subnetwork) through to the other collocated end terminal (separate subnetwork), thereby extending the OLS operations domain.

Through (or Continue) Cross-Connection
: A cross-connection within a ring, where the input and output tributaries have the same tributary number but are in lines opposite each other.

Threshold-Crossing Alert (TCA)
: A message type sent from a Network Element that indicates that a certain performance monitoring parameter has exceeded a specified threshold.

Through Timing
: Refers to a network element that derives its transmit timing in the east direction from a received line signal in the east direction and its transmit timing in the west direction from a received line signal in the west direction.

Time Division Multiplexing (TDM)
: A technique for transmitting a number of separate data, voice, and/or video signals simultaneously over one communications medium by interleaving a portion of each signal one after another.

Time Slot Assignment (TSA)
: A capability that allows any tributary in a ring to be cross-connected to any tributary in any lower-rate, non-ring interface or to the same-numbered tributary in the opposite side of the ring.

Time Slot Interchange (TSI)
: The ability of the user to assign cross-connections between any tributaries of any lines within a Network Element. Three types of TSI can be defined: Hairpin TSI, Interring TSI (between rings), and Intraring TSI (within rings).

Transaction Language One (TL1)
: A machine-to-machine communications language that is a subset of ITU's human-machine language.

Transmit-Direction
: The direction outwards from the Network Element.

Tributary
: A path-level unit of bandwidth within a port, or the constituent signal(s) being carried in this unit of bandwidth, for example, an STS-1 tributary within an OC-N port.

True Wave™ Optical Fiber
: Lucent Technologies' fiber generally called non-zero dispersion-shift fiber, with a controlled amount of chromatic dispersion designed for amplified systems in the 1550/1310 nm range.

Two-Way Point-to-Point Cross-Connection
: A two-legged interconnection, that supports two-way transmission, between two and only two tributaries.

Two-Way Roll
The operation which moves a two-way cross-connection between tributary i and tributary j to a two-way cross-connection between the same tributary i and a new tributary k with a single user command.

U

Unavailable Seconds (UAS)
In performance monitoring, the count of seconds in which a signal is declared failed or in which 10 consecutively severely errored seconds (SES) occurred, until the time when 10 consecutive non-SES occur.

Upstream
At or towards the source of the considered transmission stream, for example, looking in the opposite direction of transmission.

User Privilege
Permissions a user must perform on the computer system on which the system software runs.

User-to-Network Interface (UNI)
The specifications for the procedures and protocols between a user and the Asynchronous Transfer Mode (ATM) network.

V

Value
A number, text string, or other menu selection associated with a parameter.

Variable
An item of data named by an identifier. Each variable has a type, such as int or Object, and a scope.

Violation Monitor and Removal (VMR)
A provisionable mode for DS3 output that causes parity violations to be monitored and corrected before the DS3 signal is B3ZS encoded.

Virtual
Refers to artificial objects created by a computer to help the system control shared resources.

Virtual Circuit
A logical connection through a data communication (for example, X.25) network.

Virtual Tributary (VT)
A structure designed for transport and switching of sub-STS-1 payloads. There are currently four sizes: VT1.5 (1.728 Mb/s), VT2 (2.304 Mb/s), VT3 (3.456 Mb/s), and VT6 (6.912 Mb/s).

Virtual Tributary Group (VT-G)
A 9-row by 12-column structure (108 bytes) that carries one or more VTs of the same size. Seven VT groups (756 bytes) are byte interleaved with the VT-organized synchronous payload envelope.

Voice Frequency (VF) Circuit
A 64 kilobit per second digitized signal.

Volatile Memory
Type of memory that is lost if electrical power is interrupted.

VT1.5 Tributary
A SONET logical signal with a data rate of 1.728 Mbps. In the nine-row structure of the STS-1 SPE, a VT1.5 occupies three columns. VT-structured STS-1 SPEs are divided into seven VT groups. Each VT group occupies twelve columns of the nine-row structure and, for VT1.5s, contains four VTs per group.

W

Wait-to-Restore (WTR)
Applies to revertive switching operation. The protection group enters the WTR state when all Equipment Fail (EF) conditions are cleared, but the system has not yet reverted back to its working line. The protection group remains in the WTR state until the Wait-to-Restore timer completes the WTR time interval.

Wait to Restore Time (WRT)
Corresponds to the time to wait before switching back after a failure has cleared, in a revertive protection scheme. This can be between 0 and 15 minutes, in increments of one minute.

Wavelength Add/Drop (WAD)
The process of adding and dropping wavelengths to provide more efficient transmission.

Wavelength Division Multiplexing (WDM)
A means of increasing the information-carrying capacity of an optical fiber by simultaneously transmitting signals at different wavelengths.

Wavelength Interchange
The ability to change the wavelength associated with an OC-N signal into another wavelength.

WaveStar™ Optical Line System
Lucent Technologies' lightwave transmission system. Utilizing DWDM technology, the system combines multiple signals of different wavelengths, transmits the resulting signal over a single fiber, and then demultiplexes the signal at the receive end.

Wide Area Network (WAN)
A communication network that uses common-carrier provided lines and covers an extended geographical area.

Wideband Communications
: Voice, data, and/or video communication at digital rates from 64 kb/s to 2 Mb/s.

Working
: Label attached to a physical entity. In case of revertive switching the working line or unit is the entity that is carrying service under normal operation. In case of non-revertive switching the label has no particular meaning.

Working State
: The working unit is currently considered active by the system and that it is carrying traffic.

X

X.25 Interface / Protocol
: The ITU packet-switched interface standard for terminal access that specifies three protocol layers: physical, link, and packet for connection to a packet-switched data network.

X-Terminal
: Workstation that can support an X-Windows interface.

Z

Zero Code Suppression
: A technique used to reduce the number of consecutive zeros in a line-coded signal (B3ZS, B8ZS).

Abbreviations and Acronyms

A

ABN
Abnormal (condition)

ABS
Absent

AC
Alternating Current

ACO
Alarm Cut-Off

ACT
Active

ADM
Add/Drop Multiplexer

ADR
Add/Drop Ring

AGNE
Alarm Gateway Network Element

AID
Access Identifier

AIS
Alarm Indication Signal

AIP
Alarm Issuing Point

AITS
Acknowledged Information Transfer Service: Confirmed mode of operation of the LAPD protocol.

AMI
Alternate Mark Inversion

ANSI
American National Standards Institute

APD
Avalanche PhotoDiode

APS
Automatic Protection Switch

AS&C
Alarm, Status, and Control

APSD
Automatic Power Shutdown

ASCII
American Standard Code for Information Interchange

ASN.1
Abstract Syntax Notation 1

ATM
Asynchronous Transfer Mode

AUTO
Automatic

AVAIL
Available

B

B3ZS
Bipolar 3-Zero Substitution

B8ZS
Bipolar 8-Zero Substitution

BCLAN
Board Controller Local Area Network

BDFB
Battery Distribution and Fuse Bay

BER
Bit Error Rate

BITS
Building Integrated Timing Supply

BLK
Blank

BLSR
Bidirectional Line-Switched Ring

BOC
Bell Operating Company

C

CAC
Circuit Access Code

CCITT
Comité Consultatif International Télégrafique & Téléphonique

CCT
Cross-Connection Type

CDRH
Center for Devices and Radiological Health

CEPT
Conférence Européenne des Administrations des Postes et des Télécommunications

CID
Circuit Identifier

CIT or CIT-PC
Craft Interface Terminal

CL
Clear

CLEI
Common Language Equipment Identifier

CLLI
Common Language Location Identifier

CM
Communications Module

CMIP
Common Management Information Protocol. OSI standard protocol for OAM&P information exchange.

CMISE
Common Management Information Service Element

CO
Central Office

COV
Central Office Video

CP
Circuit Pack

CPE
Customer Premises Equipment

CR
Critical (alarm)

CSMA / CD
Carrier Sense Multiple Access with Collision Detection

CS&O
Lucent Technologies Customer Support and Operations

CSU
Channel Service Unit

CTIP
Customer Training and Information Products

CTS
Customer Technical Support within Lucent Technologies

CV
Coding Violation

D

DACS / DCS
Digital Access Cross-Connect System

dB
Decibels

DC
Direct Current

DCC
Data Communications Channel

DCE
Data Communications Equipment

DCN
Data Communications Network

DPLL
Digital Phase Locked Loop

DRI
Dual Ring Interworking

DRAM
Dynamic Random Access Memory

DRIP
Dual Ring Interworking on Protection

DS0, DS1, DS3
Digital Signal Levels 0, 1, 3

DS-N
Digital Signal, Level N

DS-NE
Directory Service Network Element

DSX
Digital Cross-Connect Frame

DTCU
Distant Terminal Channel Unit

DTE
Data Terminating Equipment

DTMF
Dual Tone Multifrequency

DWDM
Dense Wavelength Division Multiplexing

E

EBER
Equivalent Bit Error Rate

EC
Echo Canceller

EC-1, EC-N
Electrical Carrier, Levels 1 and N

ECI
Equipment Catalog Item

EEPROM
Electrically Erasable Programmable Read-Only Memory

EF
Equipment Fail

EIA
Electronic Industries Association

EM
Event Management

EMC
Electromagnetic Compatibility

EMI
Electromagnetic Interference

EMS
Element Management System

EPROM
Erasable Programmable Read-Only Memory

EPT
Event-per-Time

EQ
Equipped

EQPT
Equipment

ES
Errored Seconds

ESD
Electrostatic Discharge

ESF
Extended Super Frame (DS1 signal format)

ETSI
European Telecommunications Standards Institute

EVT
Event

EXM
Extended Switching Module

F

FCC
Federal Communications Commission

FDA
Food and Drug Administration

FDDI
Fiber Distributed Data Interface

FE
Far End

FEBE
Far End Block Error

FEPROM
Flash EPROM

FIT
Failure in Time

G

GB
Gigabytes

Gb/s
Gigabits per second

GHz
Gigahertz

GNE
Gateway Network Element

GR-XXX
Bellcore General Requirement-XXX

H

HDLC
High-Level Data Link Control

HS
High Speed

HW
Hardware

Hz
Hertz

I

IAF
Intelligent Alarm Filtering

IAO LAN
Intraoffice Local Area Network

ID
Identifier

IEC
International Electrotechnical Commission

IEEE
Institute of Electrical and Electronics Engineers

I/O
Input/Output

INTFC
Interface

IS
In Service

IS-3
Interconnect Signal-3

ISDN
Integrated Services Digital Network

ITCO
Independent Telephone Company

ITM
Integrated Transport Management

ITM-NM
Integrated Transport Management Network Module

ITM SNC
Integrated Transport Management SubNetwork Controller

ITU
International Telecommunications Union

ITU-R
International Telecommunications Union — Radio standardization sector. Formerly known as CCIR: Comité Consultatif International Radio; International Radio Consultative Committee.

ITU-T
International Telecommunications Union — Telecommunication standardization sector. Formerly known as CCITT: Comité Consultatif International Télégrafique & Téléphonique; International Telegraph and Telephone Consultative Committee.

IXC
Interexchange Carrier

K

Kb / s
Kilobits per second

L

LAN
Local Area Network

LATA
Local Access and Transport Area

LBC
Laser Bias Current

LBFC
Laser Backface Currents

LBO
Lightguide Build-Out

LBP
LAN Bridge Port

LCN
Local Communications Network

LCT
Large Capacity Terminal

LEC
Local Exchange Carrier

LED
Light-Emitting Diode

LGX
Lightguide Cross-Connect

LMP
LAN Management Port

LNE
Logical Network Element

LOF
Loss of Frame

LOP
Loss of Pointer

LOS
Loss of Signal

LPBK
Loopback

LS
Low Speed

LTE
Line Terminating Equipment

M

µ
Microns

µm
Micrometer

MB
Megabytes

Mb/s
Megabits per second

MCOND
Maintenance Condition

MDS
Metallic Digital Server

MDSCU
Metallic Digital Server Channel Unit

MEM
Memory

MFA
Management Functional Area

MIPS
Millions of Instructions Per Second

MJ
Major (alarm)

MML
Human-Machine Language

MN
Minor (alarm)

ms
Millisecond

MTBF
Mean Time Between Failures

MTBMA
Mean Time Between Maintenance Activities

MTTR
Mean Time To Repair

N

NA
Not Applicable

NCC
Network Communication Controller

NE
Network Element

NEBS
Network Equipment-Building System

nm
Nanometer (10^{-9} meters)

NMA
Network Monitoring and Analysis System

NMA-F
Network Monitoring and Analysis-Facility

NMON
Not Monitored

NMS
Network Management System

NORM
Normal

NPPA
Non-Preemptible Protection Access

NRZ
Nonreturn to Zero

NSA
Non-Service Affecting

NSAP Address
Network Service Access Point Address (used in the OSI network layer 3)

NTF
No Trouble Found

NVM
Non-Volatile Memory

O

O&M
Operation and Maintenance

OA
Optical Amplifier

OALAN
Overhead Access Local Area Network

OAM&P
Operations, Administration, Maintenance, and Provisioning

OC, OC-N
Optical Carrier

OC-1
Optical Carrier, Level 1 Signal (51.84 Mb/s)

OC-3
Optical Carrier, Level 3 Signal (155.52 Mb/s)

OC-3c
Optical Carrier, Level 3 Concatenated Signal (155.52 Mb/s)

OC-12
Optical Carrier, Level 12 Signal (622.08 Mb/s)

OC-48
Optical Carrier, Level 48 (2488.32 Mb/s) (2.5 Gb/s)

OC-192
Optical Carrier, Level 192 (9953.28 Mb/s) (10 Gb/s)

ODU
Optical Demultiplexing Unit

OI
Operations Interworking

OILU
Optical Line Interface Unit

OLS
Optical Line System

OMU
Optical Multiplexing Unit

OOF
Out-of-Frame

OOS
Out-of-Service

OPS/INE
Operations System for Intelligent Network Elements

ORM
Optical Remote Module

OS
Operations System

OSI
Open Systems Interconnect

OSMINE
Operations Systems Modifications for the Integration of Network Elements

OT
Optical Translator

OTCTL
Optical Translator Controller

OTPM
Optical Translator Port Module

OTU
Optical Translator Unit

OW
Orderwire

P

PAD
Packet Assembler/Disassembler

PCB
Printed Circuit Board

PCM
Pulse Code Modulation

PDH
Plesiochronous Digital Hierarchy

PM
Performance Monitoring

PMD
Polarization Mode Dispersion

POH
Path Overhead

POP
Point of Presence

POTS
Plain Old Telephone Service

PRI
Primary

PROTN
Protection

PROV
Provisioned

PSDN
Public Switched Data Network

PSN
Packet-Switched Network

PSTN
Public Switched Telephone Network

PTE
Path Terminating Equipment

PTY
Parity

PVC
Permanent Virtual Circuit

PWR
Power

PWR ON
Power On

Q

QOS
Quality of Service

QOTU
Quad Optical Translator Unit

QRSS
Quasi-Random Signal Source

R

RAM
Random Access Memory

RCV
Receive

RCVR
Receiver

RDI
Remote Defect Indication

RF
Radio Frequency

RFI
Remote Failure Indication

RPP
Reliability Prediction Procedure

RT
Remote Terminal

RTAC
Regional Technical Assistance Center

RTRV
Retrieve

RTV
Remote Terminal Video

RZ
Return to Zero

S

SA
Service Affecting

SDH
Synchronous Digital Hierarchy

SDS
Standard Directory Service based on ANSI recommendation T1.245

SEC
Secondary

SES
Severely Errored Seconds

SF
Super Frame (DS1 signal format)

SLN
A 12-character circuit pack serial number

SNR
Signal-to-Noise Ratio

SOH
Section Overhead

SONET
Synchronous Optical Network

SPE
Synchronous Payload Envelope

STBY
Standby

STS
Synchronous Transport Signal

STS-1, STS-N
Synchronous Transport Signal, Levels 1 and N

STS-3
Synchronous Transport, Level 3

STS-3c
Synchronous Transport, Level 3 Concatenated Signal

STS-12
Synchronous Transport, Level 12

STS-12c
Synchronous Transport, Level 12Concatenated Signal

SVC
Switched Virtual Circuit

SYNC
Synchronizer

T

TA
Technical Advisory

TABS
Telemetry Asynchronous Byte Serial (Protocol)

TARP
Target Identifiers Address Resolution Protocol

TBD
To Be Determined

TBOS
Telemetry Byte-Oriented Serial (Protocol)

TCA
Threshold-Crossing Alert

TDM
Time Division Multiplexing

THz
Terrahertz (10^{12} Hz)

TID
Target Identifier

TIRKS
Trunks Integrated Records Keeping System

TL1
Transaction Language 1

TR
Technical Requirement

TSA
Time Slot Assignment

TSI
Time Slot Interchange

TSO
Technical Support Organization

TU
Tributary Unit

U

UAS
Unavailable Seconds

UITS
Unacknowledged Information Transfer Service. Unconfirmed mode of LAPD operation.

UNEQ
Path Unequipped

UPSR
Unidirectional Path-Switched Ring

USAM
User-Settable Alarm Monitoring

V

V
Volts

VAC
Volts Alternating Current

VDC
Volts Direct Current

VF
Voice frequency

VM
Violation Monitor

VMR
Violation, Monitor, and Removal

VRT
Virtual Remote Terminal

VT
Virtual Tributary

VT1.5
Virtual Tributary, Level 1.5

VT-G
Virtual Tributary Group

W

WAD
Wavelength Add/Drop

WAN
Wide Area Network

WaveStar™ OLS 40G / 80G / 400G
WaveStar Optical Line System 40G/80G/400G

WBS
Wideband Shelf

WDCS
Wideband Digital Cross-Connect System

WDM
Wavelength Division Multiplexing

X

X.25
An ITU standard defining the connection between a terminal and a public packet-switched network