Fiber Smart NETWORKS

ROME
ROBOTIC OPTICAL ENGINE®

NMS Provisioning Manual

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ABOUT THIS DOCUMENT

This Guide provides step by step instructions for normal system operations of the Wave2Wave Network Management System. It provides background and instructions for these functions.

The purpose of the Guide is to enable users of the Wave2Wave NMS to operate the system properly.

AUDIENCE

This document is intended for NMS Provisioning Operators and Technicians.

NMS SERVER SOFTWARE VERSION

NMS Server Software version 5.6.2 (this version number is as of this writing – your installed version may differ).

ROME PRODUCT FAMILY INTRODUCTION

The Wave2Wave Automated Fiber Management (ROME) family of connectivity solutions enables facility operators to deliver new fiber based services, design and operate networks efficiently and flexibly, and improve customer service and network performance. Wave2Wave's ROME product line is the first of its kind to deliver the attributes and reliability of a manual optical patch panel while offering the benefits of remote control and automation.

Wave2Wave's ROME product family consists of best-in-class physical layer switch hardware, carrier-grade software and management modules, and supports an open interface for integration with third party applications and management systems.

Efficiently manage the fiber network in a true lights-out fashion. ROME operators can benefit from remotely managing their fiber infrastructure with ROME's remote capabilities, so that all fiber connectivity is centrally managed without the need to urgently send technicians to remote locations.

ROME is well suited to offer benefits in several key application areas, including but not limited to automation of fiber management for Telecom Operators, Hosted Data Centers (DC Operators), Co-Location Management within a Data Center (DC Tenants), Enterprise Data Centers, and Lab automation. In addition to fiber management, ROME offers the ability to test faulty fibers with an externally connected OTDR, and for automating fault recovery to supplement existing protection schemes.

NMS SERVER SOFTWARE

The Wave2Wave Network Management System (NMS) is a powerful Java based, SNMP management system for managing Wave2Wave ROME networks. The Wave2Wave NMS client is an Application that runs on Java-enabled Web browsers connected to a Wave2Wave NMS Server.

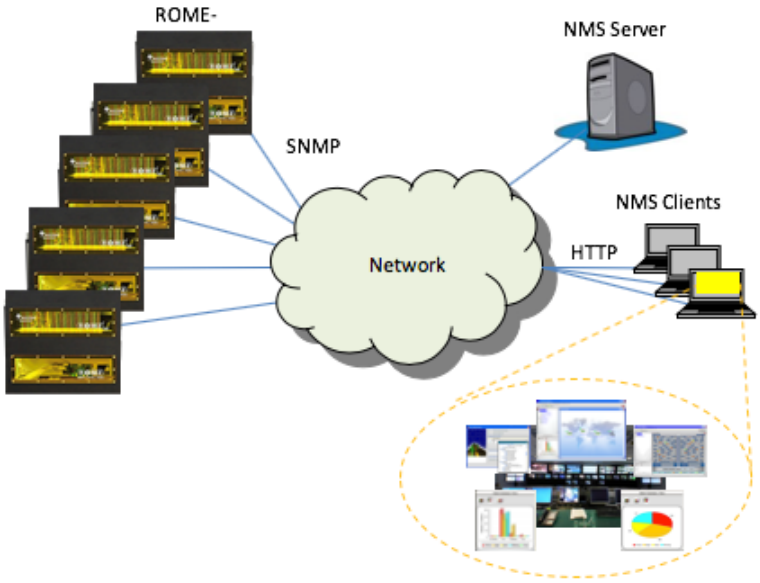


Figure 1. ROME, NMS Server & NMS Client Network Architecture

The NMS Server Software allows for secure remote management of the ROME system through the web enabled GUI client. It provides a complete network element (NE) view of overall ROME topology, and automated fiber connectivity. The user may access the system through either a map view or a tree view. An integrated database maintains accurate connectivity records at all times. The database is automatically updated as connectivity changes are successfully completed, and maintains information relating to system configuration, alarms, users and history logs.

Wave2Wave's NMS Server allows authorized users to remotely manage connectivity of both simplex and duplex Tx/Rx ports on a daily basis. Simplex ports are provisioned by issuing a single

connectivity command via simple point and click entries. Similarly duplex Tx/Rx ports are managed as a single entity, and also only require a single connectivity command while provisioning. The graphical interface makes the task of provisioning ports a simple and intuitive process.

NMS also supports typical administrative functions such as management of users, unit configuration, alarms, logs and connectivity reports. Operators may be assigned one of 6 default user level profiles, where access by the user is accordingly limited by their assigned profile. The 6 default user profiles include, Super User (granted full access without limits), System Administrator (responsible for adding/deleting, configuring and managing ROMEs), Security Administrator (responsible for adding/deleting, configuring and managing users), Technician (installs and services ROMEs, and may also manage connectivity), Provisioning Operator (manages connectivity) and Guest (view privileges only of select screens). In addition the Security Administrator may create new user profiles and tailor them as needed.

The system provides a graphical map and tree view of distributed ROMEs for selection and management of individual units, along with a network wide active alarm summary view. Operators can view a color coded active alarm summary either graphically or in tabular form, as well as alarm history within the alarm log. Historical logs are also available for provisioning operations, system administrative related functions, user security and management related functions, and events. Furthermore, logs may be filtered to quickly isolate specific information required. Reports may be generated from filtered logs and/or connectivity tables, and saved or printed for later viewing and analysis. These reports may be saved in CSV format, so that they can be conveniently organized and analyzed in spreadsheet form, such as within Excel and similar programs.

Software based Value Added Modules (VAMs) provide optional functionality to enhance the standard NMS offering. VAMs are sold separately and are field upgradable at any time. Currently supported VAMs include:

- Partitioning (supported via the NMS): to split an ROME into smaller logical sub-switches, allowing a single ROME to be shared over multiple service providers and co-location tenants.
- Temporary Disconnect (supported via the CLI): to simulate temporary connection interruptions of both simplex and duplex Tx/Rx ports, primarily for Lab Automation applications to determine how specific equipment under test (EUT) react to such events.

To fully automate provisioning management, the Wave2Wave NMS may be integrated with a third party OSS, Workflow Platform, or higher level Network Management System (NMS). In such cases, connectivity work-orders from a higher level system are electronically transmitted to the Wave2Wave NMS and automatically executed. Service activation (connectivity) is confirmed back to the higher level platform to close the work-order. This is accomplished via a Wave2Wave NMS Northbound Application Program Interface (API). Note that integration development is required between the Wave2Wave NMS and any northbound higher level management system to fully automate provisioning operations. Similarly alarms may be passed on to a northbound third party application via SNMP to be displayed in a Central Alarm Management System, and this functionality is supported today.

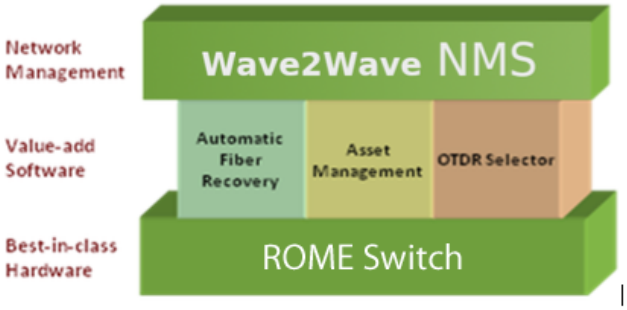


Figure 2. NMS Server Structure

NMS HIGHLIGHTS

- Client/Server architecture
- Web enabled client (no client software installation)
- Full SNMP support for remote management
- Secure communication and storage
- Synchronized authoritative database
- Configuration and connectivity management
- Alarm notification and management
- Server logs and report generation
- Value Added Module support
- Application Program Interface support

CLI SOFTWARE

The ROME supports a text based Command Line Interface (CLI) that is mainly used for installation and service purposes, by qualified and trained technicians while on site, and for running connectivity scripts which is particularly well suited for Lab Automation applications.

CLI capabilities include:

- Control of local switching operations
- Local pre-provisioning testing of fiber
- Local network element configuration and maintenance
- Run connectivity scripts to automate the rearrangement of lab connectivity setups

The CLI supports a local craft terminal interface (via RS232), and a remote Telnet interface (via Ethernet).

ROME HARDWARE

Wave2Wave offers a unique Automated Fiber Management (ROME) product family. The ROME system is a remotely managed all-optical physical layer fiber switch, providing transparent switching independent of protocol and bit rate, and supporting single mode or multimode fiber. The ROME product line utilizes Wave2Wave's passive Latched Optical Coupling (LOC™) technology that was developed specifically to address fiber management applications. The principle of passive LOC™ is to physically couple two optical fibers together without mirrors, lenses, or collimators. Once a physical connection is made, no power is required to maintain a connection, and LOC™ technology delivers superb optical performance similar to a manual patch panel in a carrier-class platform.

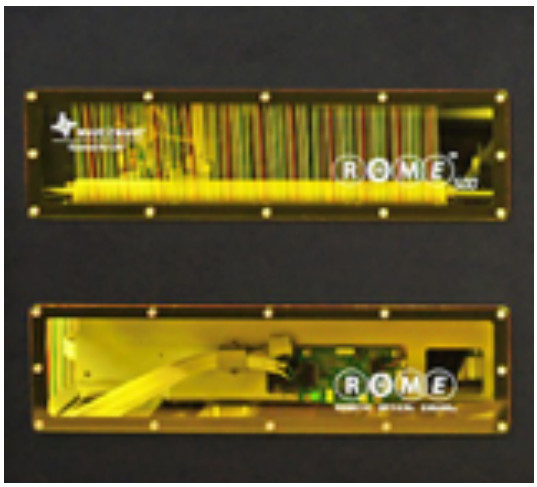


Figure 3. Wave2Wave ROME

ROME transforms the manual fiber infrastructure into a fully automated and managed layer, enabling network operators to remotely provision optical connections while automatically maintaining accurate inventory records, and to recover from fiber and equipment port faults. An externally connected OTDR may be switched through the ROME to any suspect fiber or equipment port in order to quickly test and locate faults.

ROME consists of 5 base models:

- The ROME 500 supports 256 east fibers by 256 west fibers.
- The ROME Mini supports up to 204 fibers in a single matrix.
- The ROME MAX supports up to 2,000 fibers on a full rack.
- The ROME 128 Q supports up to 128 MPO ports.
- The ROME 64 Q supports up to 64 MPO ports.
- Note that expansion for the scalable models is accomplished via combination of software and hardware.

ROME supports passive Latch Optical Coupling (LOC™) that takes the best attributes of a manual optical patch panel including connection performance, reliability and integrity, and adds remote

management capabilities offering incredible ease of use and flexibility to manage fibers, all the while maintaining accurate up-to-date connectivity database records and introducing new revenue generating opportunities. With LOC™, the ROME actually physically couples a matrix of male and female internal optical connectors, where the connection is established with standard LC type ferrules and sleeves. Wave2Wave utilizes Robotic Control Units (RCUs), which are robotic arms, to connect and disconnect the male and female optical connectors. ROME consists of a passive chassis and five Field Replaceable Units (FRUs) modules housing the ROME active components, including the Logical Control Unit CPU Module, DC Power Supply Module, Fan Module, Robotic Control Unit (RCU) Modules (upper and lower RCUs), and Connectors.

Connections are physically and passively latched in place and remain so even if all sources of power are lost, including battery backup, if any. In fact one can physically remove the Logical Control Unit CPU Module, DC Power Supply Module, Fan Module, and Robotic Control Unit (RCU) Modules (upper and lower RCUs) and connections remain physically and passively latched in place. This allows for servicing or replacement of these active modules in the field without any impact on existing connectivity. In the event of an internal fault, ROME generates an appropriate alarm for the given fault to alert the operator that servicing is required. Alarms range from critical, major, minor and warnings, depending on the severity, and are reported by Wave2Wave's NMS and CLI. These alarms may also be sent to a third party alarm management system.

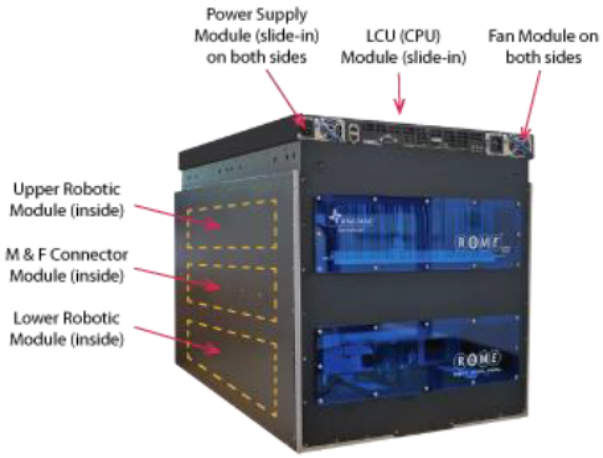


Figure 4. Arrangement of the ROME Field Replaceable Units (FRUs)

LOC™ also offers excellent optical performance due to the physical coupling of the internal optical connectors, with a typical insertion loss of 0.3 dB and return loss of -50 dB. Yet ROME solves the major drawbacks of manual patch panels, including the ability to:

- Remotely manage connectivity
- Automate the bypassing of faulty fibers and equipment ports with standby links and ports, which significantly reduces the recovery time
- Remotely switch an externally connected OTDR to any ROME port in order to quickly test fibers and locate faults
- Avoid hands in the plant, eliminate human errors, reduce ferrule pitting (wear), and dirty optical connector problems

- Maintain an authoritative connectivity database that remains synchronized with the physical connections at all times
- Logically partition an ROME, with the Partitioning VAM, into configurable port ranges, forming smaller logical sub-switches whereby different telecom operators, data center tenants, or lab operators can be given password controlled limited access over only their respective assigned port ranges. This allows the ROME operator to lease portions of an ROME to their respective customers, for additional sources of revenue generation.

NMS HARDWARE REQUIREMENTS

Performance of the Wave2Wave Web NMS depends upon the CPU and memory of the client and server systems. The following tables list the minimum configuration of the **client** and the recommended configuration of the server.

Minimum Client PC Requirements	
Operating System	Windows XP (SP3), Windows Vista or Windows 7
CPU	P-IV or above
RAM	2MB RAM, or above
Hard Disk	520 MB free
Optics	CD-ROM or DVD drive
Network	Ethernet Card
Monitor	Color SVGA (1024x786, 256 colors)

Recommended NMS Server Workstation Configuration	
Operating System	Windows Server 2003 (R2) and Windows Server 2008 (R2)
Machine Type	IBM x3550, Quad-Core Intel® Xeon® Processor E5420 (2.50 GHz, 80 Watts, 1333 FSB) 12MB (2x6MB) Level 2 cache
CPU	Quad-Core Intel® Xeon® Processor E5420 (2.50 GHz, 80 Watts, 1333 FSB) 12MB (2x6MB) Level 2 cache
MAX CPU	1 w/option for 2
CPU BUS	1333 MHz
RAM	4 GB PC2-5300 DDR2 SDRAM (Chipkill) option for 32GB 8 DIMM (6 DIMM)
PCI Slots	1(1) PCI Express x8

Recommended NMS Server Workstation Configuration	
Storage Controller	Integrated SAS Controller Raid 0,1,0 +1 support
Power Supply	670 Watt power supply
Disks Cage	2x1” Hot Swap disks Ultra 320
Optics	Integrated DVD
Network	Gigabit Ethernet - Integrated Wake on LAN
Graphics	ATI RN50 16MB Video: DDR2 RAM type

NEW FEATURES IN VERSION 5.6.2

- Radius User Authentication & Accounting server support
- Improved Alarm Logs and Information
- ROME log collection via NMS

NMS

The NMS is the primary interface for day-to-day management, configuration and provisioning of the ROME. It supports all ROME features and functionality including connectivity, alarms, server logs, reports, queries and tables.

SERVER FEATURES

The NMS Server provides full network view supporting connectivity, operation and maintenance. Partitioning is also supported as a Value Added Module (VAM). Future software modules will allow for OSS or third-party NMS integration, enable clustering of multiple ROME units, logical dual asymmetric systems, logical fiber port grouping, test access functionality, automated fiber recovery from fiber and equipment port faults.

Note:

- Your Wave2Wave NMS server must be running in order to use the NMS Client.
- The NMS starts automatically, when the Server is started.
- Make note of the NMS Server's IP address.

Feature	Explanation
SNMPv2c	Communication with ROME units is based on SNMPv2c.
SNMP Support	The NMS supports SNMP, including Get/Get-Next and Set commands. All communication between NMS and ROME is via SNMP.
Multiple Sessions	Server supports multiple client sessions (5 concurrent licenses).
Audit Trail	All user operations are logged, including security exceptions (failed login, unauthorized client command attempts).

NMS CLIENT

The NMS Client is an install-free application that is fully compatible with Java capable browsers.

NOTE: The browser must support JRE (Java Runtime Environment) V 1.8 or higher. If the JRE is not already installed, you can obtain it at *http://www.java.com/en/download/manual.jsp*). The clients' Applet is embedded into an HTML document that checks for the JRE existence (if it does not exist, the browser automatically downloads the JRE from Sun).

The user must enter a user name and password to start a session.

Starting the NMS Client and Log-in

1. Verify that your Wave2Wave NMS Server is running and that you know its IP address.

2. Verify that you have been given a password by your NMS Security Administrator (you must change this password at your first log-on).

3. Open your browser, enter the IP of your Wave2Wave NMS Server and the port number (*e.g., http://292.193.99.131:9090*). The default port number is 9090 (unless it has been changed. The Wave2Wave Client Login page will open.

   Note: The default port number is 9090

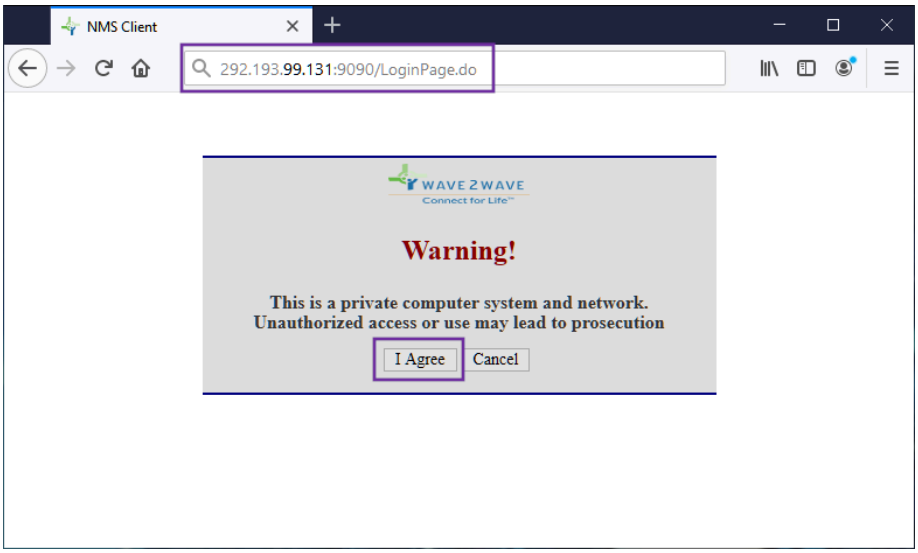


Figure 5. Wave2Wave NMS Client Login Page

4. Click the "**I Agree**" button if you agree to the terms and conditions of use. The **Wave2Wave NMS Authentication** dialog will open.

   Note: By default, Wave2Wave NMS Server runs on port 9090.

5. If Java is not present or is not enabled on your PC the following notice will appear:

Figure 6. Java Web Start

If Java is present, the process will continue to verify you have the latest NMS client software and to automatically update it if needed. After that a login page will be opened (see Figure 7 below).

6. Click the "**Get Java**" button at the top right (

). You will be directed to a Java download site:

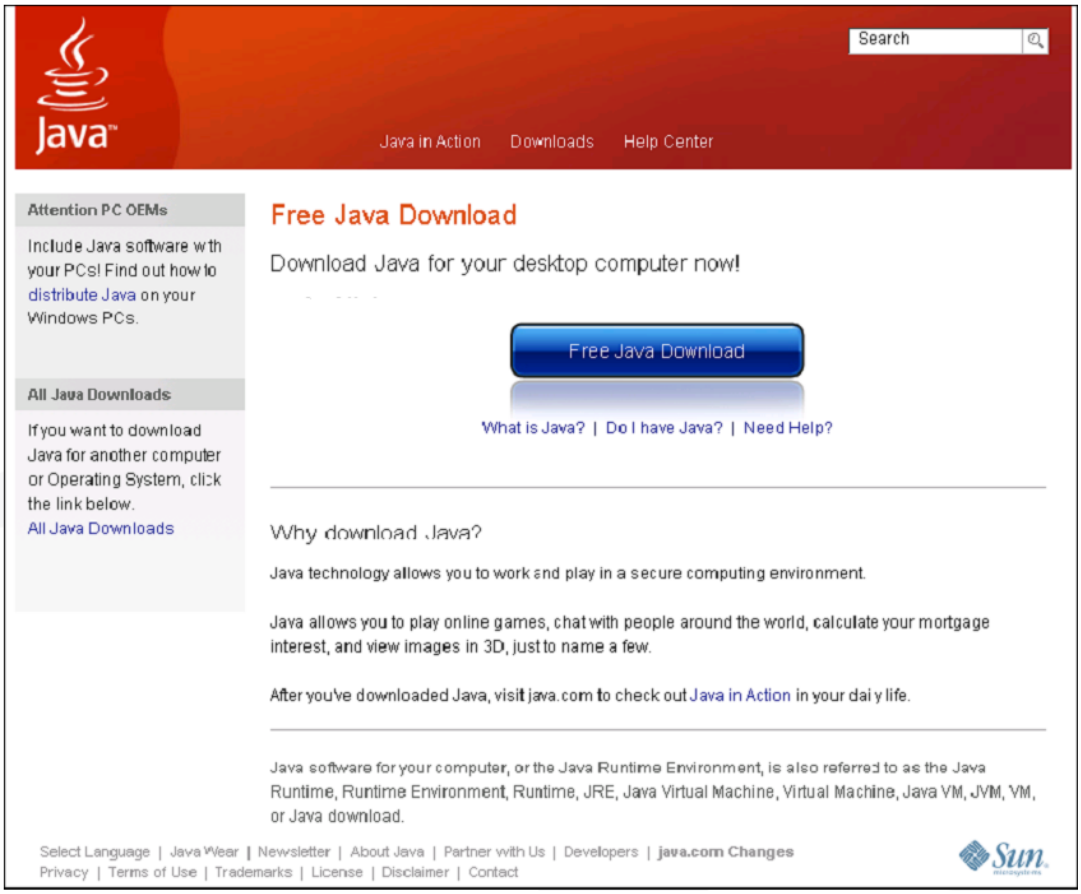


Figure 7. Java Download

7. Download and install Java, then restart the NMS Client.

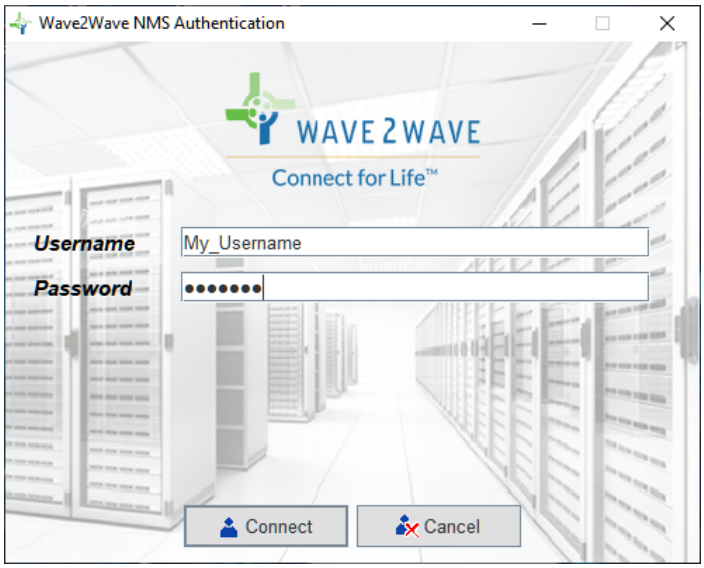


Figure 8. Wave2Wave Authentication

8. Enter the **User ID** and **Password** in their respective fields.

9. Click **Connect**. The NMS client will open (refer to the section: NMS Client Main Window). If you do not have login permission, contact your Security Administrator. The browser returns to the site from which you contacted the NMS server.

   Note: The browser can be closed. It is no longer required for operating the Wave2Wave NMS client.

10. To **quit** the client, click **File > Exit**.

LOGON TROUBLESHOOTING

Logging on to the Wave2Wave NMS is generally trouble free. However, if you experience a problem, please refer to the System Administrator Manual.

NMS CLIENT MAIN WINDOW

The Wave2Wave Manager Main window provides access to all viewing and configuration options. It is comprised of the following:

- Menu Bar
- Tool Bar
- Tree View
- Alarm Summary
  - Tabular
  - Bar Graph
  - Pie Graph
- Display Panel
  - Map Views
  - Alarms
  - Logs

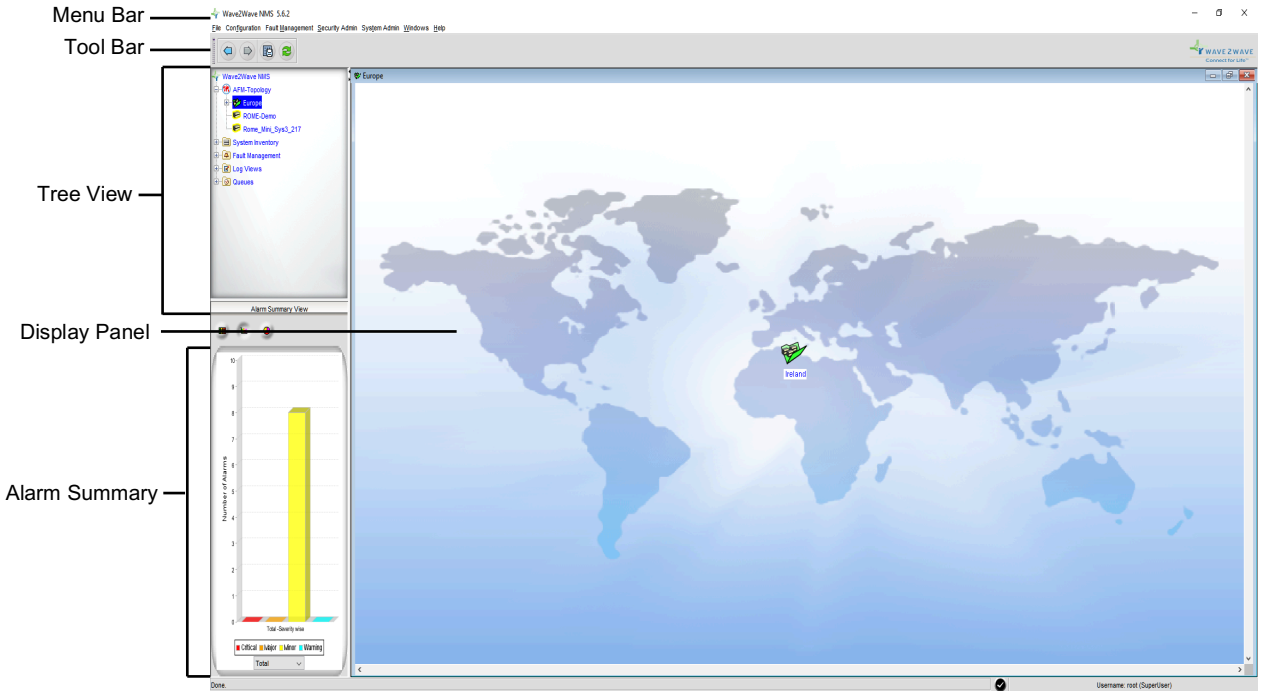


Figure 9. Wave2Wave NMS Client (with 4 ROMEs and 1 Map Added)

NMS Client Menu Bar

The Menu Bar accesses system-wide Views and functionality. For example, the "Add Map" function adds a map *to the system*. The Server Log (accessed via the Menu Bar) displays data for the system server, etc., Similar information and functionality for individual ROME units is accessed from the Tree View (see *Tree View, page 18*).

The Client Menu Bar is organized (in terms of functionality) as shown in the table below. Explanations are given in relevant sections of this Guide.

Note: The *Tree View* accesses Views and functionality for individual ROMEs. The *Menu Bar* accesses *system-wide* Views and functionality.

File	Configuration	Fault Management	Security Admin	Sys Admin
• Exit	• Preferences	• Active Alarms • Alarm Log	• Change Own Password • User Administration • Logged Users • Security Log • Security Settings • SMTP Settings	• Add ROME • Delete ROME • Add Map • Delete Map • Server Log • System Admin Log • Provisioning Log • Scheduling Log

Windows	Help
• Cascade • Tile Horizontal • Tile Vertical	• NMS User Guide • System Administration Guide • Security Administration Guide • About Wave2Wave NMS

NMS Client Tool Bar

The Toolbar icons and their respective functions are listed below.

Note: Icons are context sensitive. Icons are visible only in Views that support the specific functionality.

Icon	Description
	Previous - Go backward, one map Forward - Go forward, one map
	Save Map (saves the current location of an ROME or of a submap on the selected Map).
	Refresh Views

Viewing Panes

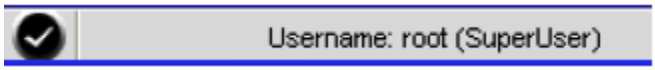
This section lists the NMS Client viewing panes and gives a brief explanation of their use.

Pane	Explanation
Tree View (see *Tree View Network Topology*)	Top left pane. Displays the entire ROME network and the status of the elements (e.g., OK, Alarm, etc).
The following Views can be accessed from the Tree View. See corresponding sections of the Help or the Manual for more information.	

Fault Management Views • Active Alarms • Alarm Log	**Log Views** • Server Log • System Administrator • Provisioning Log • Security Log (Security Administrator only) • Scheduled Log	**Provisioning Views** • Matrix View ♦ Ports ♦ Connections
Alarm Summary Views	Alarm Summaries are located directly under the Topology Tree. They provide immediate access to basic Fault Management operations and Alarms.	
Display Panel (Views)	This display panel is used to display most Views (including the Map View).	

Notes:

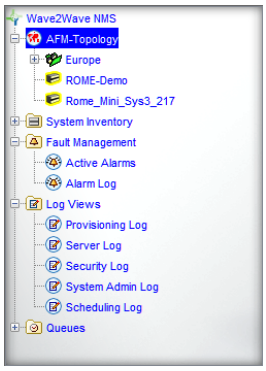
- Additional functionality is available from the Tree pane and from the Tool & Menu Bars.
- The Username and the User Group(s) are displayed on the bottom right corner of the NMS screen.


Username: root (SuperUser)

Tree View (Network Topology)

The topology Tree View lists all **ROMEs and Maps** starting from the **root** "ROME-Topology". The map displayed in the view always **corresponds** to the item selected in the **Tree** (and shows all defined **ROME elements** and the **status** of each).

For example, if you have selected the **"Hong_Kong" map** in the **Tree View**, the Hong Kong map will be **displayed** in the **Map View** of the display panel, together with all ROME **network elements** defined in the same map.

Element	Explanation
Organization of ROME items	ROME systems are user organized under the root directory or under map names (e.g., Hong Kong, New York, Toronto, etc.).
 **Figure 10. Tree View: Options**	Each item in the tree is represented by an icon and color by severity (see System States, *page 27*). 1. Click an ROME unit to display the Port Matrix and the applicable provisioning menus.
	Each **object** shown in the **Tree view** (ROMEs, Maps) is color coded according to the Alarm status of the ROME. For example, a map containing an ROME with a Critical Active Alarm will be shown as RED. **Note**: A map icon is always colored with the color of the *highest* Alarm state in the Map.

Element	Explanation
Right Click on an:	Right-click on any item in the Tree View or on the Map.. A **context sensitive** configuration **menu** will **open**, as shown below.
ROME	**The following information can be accessed from the Tree:** **Faults** Active Alarms - Displays the ROME's currently Active Alarms Alarm Log - Displays the ROME's Alarm Log **Configuration** System Settings - Opens the ROME's Configuration Dialog Time Settings - SNMP Settings - Inventory - Lists the ROME's SNMP internal, hardware, firmware, software, etc., modules **Provisioning** Matrix View - Displays the ROME's Matrix View **ROME Operations** **Reset** - Resets the ROME database **Fetch ROME Logs** - Collects all the ROME logs **Refresh** - Refreshes the map **Move** - Moves the ROME to another map **Delete** - Deletes the ROME
Map	**Add ROME** - Opens the Add ROME dialog **Add Map** - Opens the Add Map dialog **Delete ROME** - Deletes the selected ROME **Edit Map** - Opens the Edit Map dialog **Delete Map** - Deletes the selected empty Map **Note**: Only NMS System Administrators and Super Users can edit ROMEs and Maps.

NOTE: When an item in the Tree View is selected, the corresponding information is displayed in the Display pane.

Map View

The map view is used to display the **physical location** of your ROME units. In addition a map can be used to contain other maps. For example, the map of Europe could contain a sub-map of sub regions such as Ireland**,** and so on.

Double click on any sub-map **icon** on the map to display the actual underlying **sub-map**.

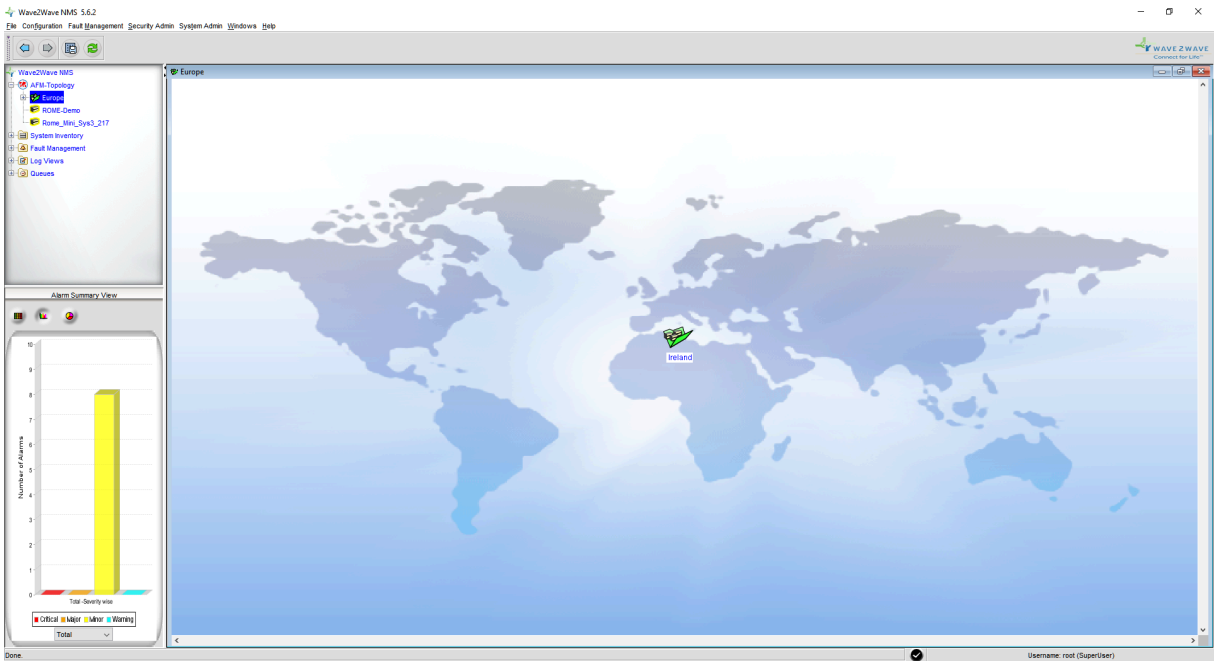


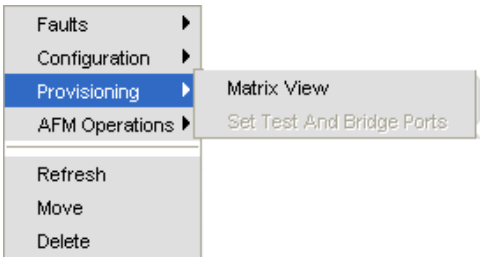
Figure 11. Main Map with a Sub-Map

PROVISIONING

Provisioning refers to the adding and deleting of connections. All authorized users (i.e., Super Users, System Administrators, Technicians and Provisioning operators) are able to provision an ROME.

Maintenance and Configuration of ROME devices can generally be done by Super Users, System Administrators and Technicians.

PROVISIONING VIEWS

View	Explanation
	
Matrix View	Displays the Matrix View (can connect/disconnect and Lock/Unlock) all ROME ports for the selected ROME.

Physical and Logical Matrix Views

To further help the user better manage simplex and duplex fiber ports, the NMS offers both a Physical Matrix View and Logical Matrix View of the ROME ports and connectorized panels. These views are selectable from within the Matrix View as a tab selection, allowing the user to alternate between views quickly and easily.

The Physical Matrix View displays all ports at the individual fiber level, making it easy to manage individual fibers. Therefore, the Physical Matrix View shows a duplex paired port as two individual ports, one port for the Tx fiber and the other for the Rx fiber. Different port icons are used to represent simplex ports and duplex ports, so even if duplex ports are shown as individual ports, the user can still distinguish simplex ports from duplex ports:

Simplex port icon representation within the Physical Matrix View

(Rx port) **and**

(Tx port)

Duplex port icon representation within the Physical Matrix View

The screen view below shows an example of the Physical Matrix View.

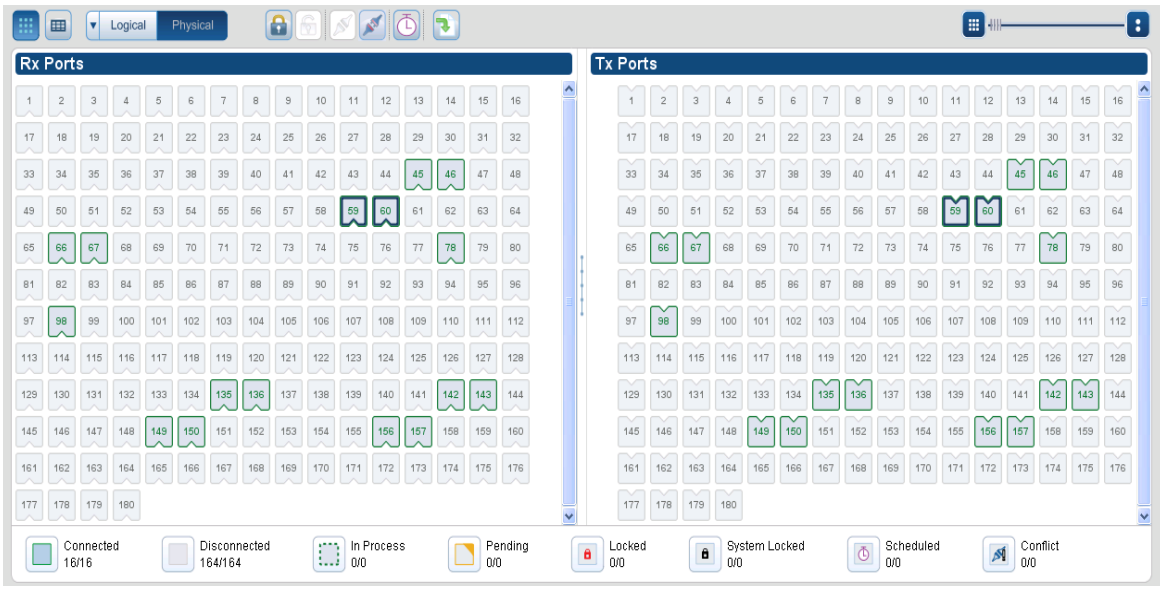


Figure 12. Physical Matrix View

The Logical Matrix View is designed to simplify day-to-day connectivity management of both simplex and duplex paired ports. This view matches the actual connectorized panel layout, showing a simplex fiber termination as an individual fiber port and a duplex paired fiber termination as a duplex Tx/Rx paired port, with both the Tx and Rx fibers managed as a combined single entity (in the duplex case). The screen view below shows an example of the Logical Matrix View.

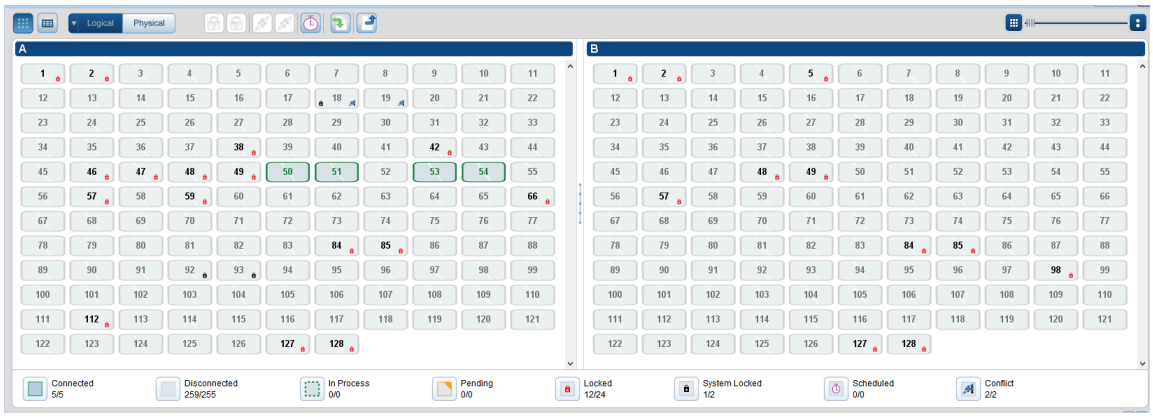


Figure 13. Logical Matrix View

Basic Connectivity Management within the Matrix View

Connectivity is managed with simple mouse clicks on the Matrix View graphical interface.

To connect one simplex port to another, simply click on both simplex ports to be connected and press the connect button. To disconnect a simplex port from another, simply click on one of the connected simplex ports (the other mated simplex port will be automatically selected) and press disconnect.

To connect one duplex port to another, simply click on both duplex ports to be connected and press the connect button. Both the Tx and Rx fibers of one port will be connected to the Rx and Tx fibers respectively of the other port (note that the Tx of one port connects to the Rx of the other port, and vice versa). To disconnect a duplex port from another, simply click on one of the connected duplex ports (the other mated duplex port will be automatically selected) and press disconnect. The Tx and Rx fibers of one duplex port will be disconnected from the Rx and Tx fibers respectively of the other duplex port. The Provisioning section of the NMS Provisioning User Manual provides further details on managing connectivity, locking and unlocking ports and scheduled provisioning operations.

Matrix View

The Matrix View is the default and main view; it is used to view, connect, disconnect, Lock and Unlock ROME ports (*see corresponding sections*).

The number of ports viewed is dependent on the following:

- The ROME model purchased.
- The number of ports configured for your license. (see examples below -- Figure 14 and Figure 15)
- Your user permissions (refer to the Security Administration manual).

To access the *Matrix* View:

1. Select an ROME in the Tree View, or double-click the ROME on the Map.
2. Click the **Matrix View** icon ( ).
3. Select the **Physical** tab to open the Physical Matrix View.

   —or—
4. Select the **Logical** tab to open the Logical Matrix View.

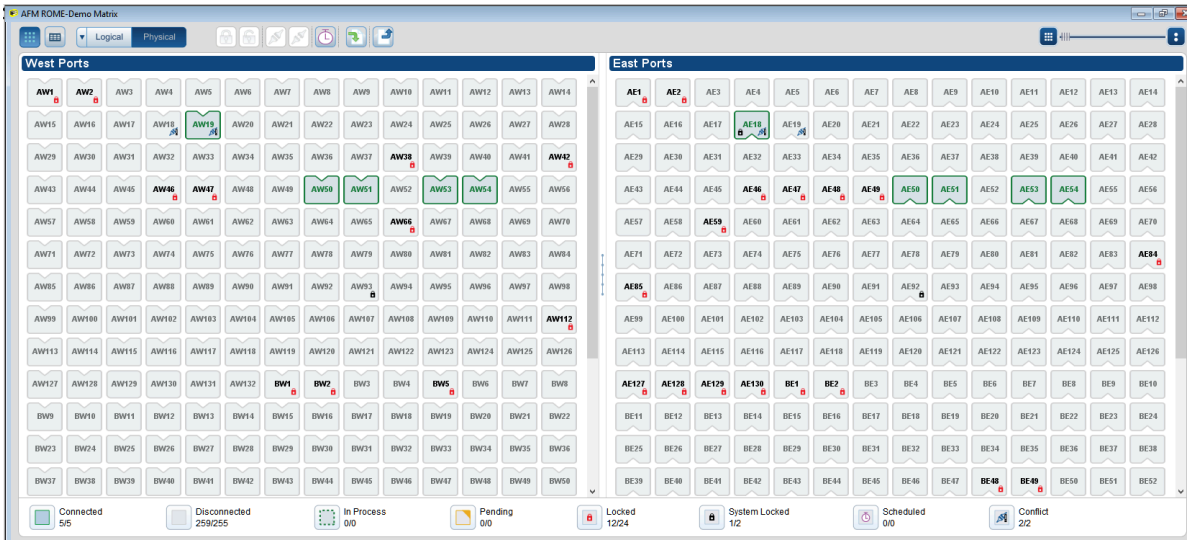


Figure 14. Physical Matrix View

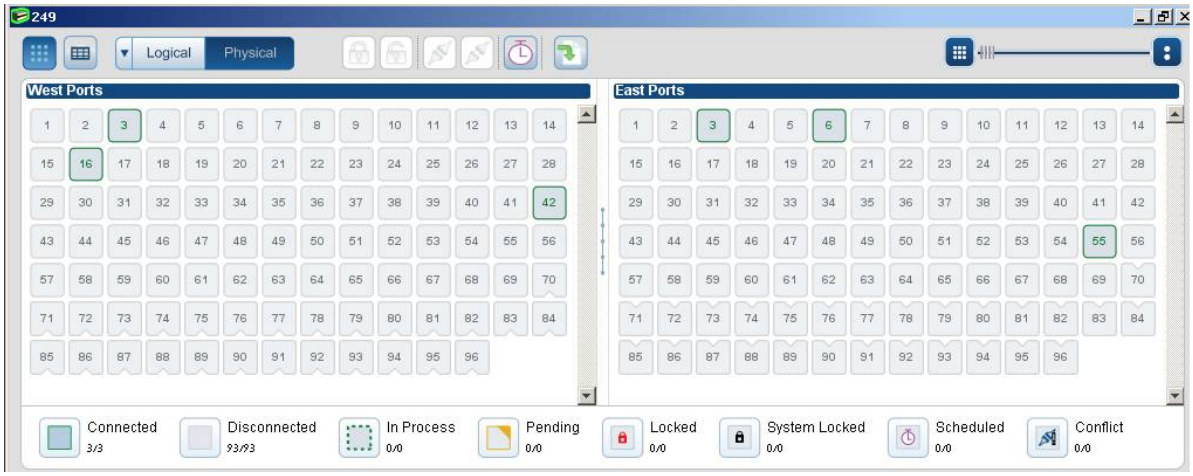


Figure 15. Physical Matrix View (96x96 Ports)

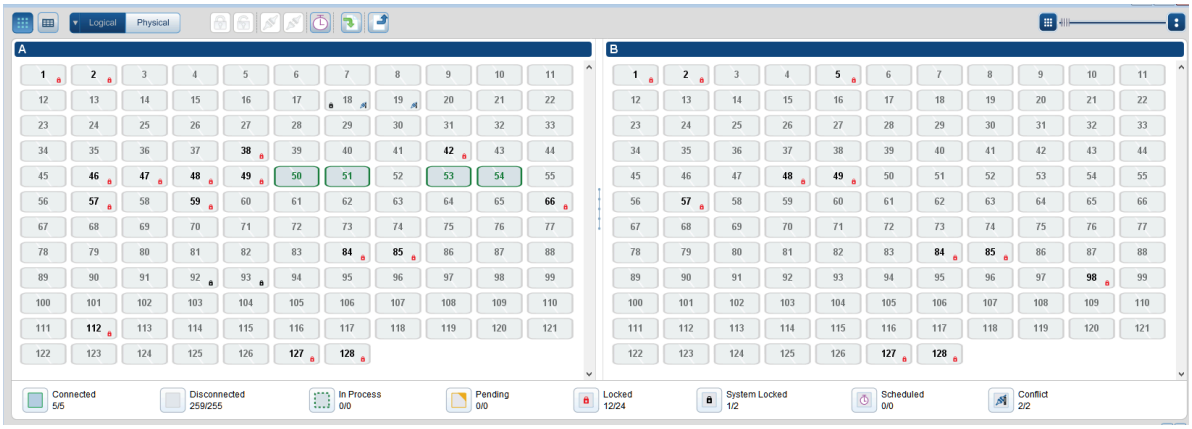
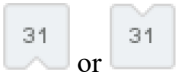


Figure 16. Logical Matrix

Port Types

Icon	Name	Explanation
	Physical Port	This is a Single Physical port. It can be connected to only one other Single Physical port.
	Logical Port (physical representation)	This is a representation of a Logical port in a Physical matrix. When selected, its paired port is also selected. Logical Ports stand for Transmit/Receive (Tx/Rx) ports and are therefore composed of a pair of Physical ports. It is impossible to perform provisioning operations over either Tx or Rx alone! Whenever one of them is selected, its pair will be selected as well. A Logical port can be connected only to another Logical port.
	Logical Port (Logical	This is a representation of a Logical port in a Logical matrix A Logical port can be connected only to another Logical port of the same size.

Matrix Flagging Legend

Icon	Name	Explanation
1/2	Counters	Each icon is accompanied by two counters, indicating the total ports in the specific status (Left/Right)
	Locked	This port is Locked by an authorized user (e.g., in order to protect the port from accidental connect or disconnect) and cannot be connected or disconnected unless Unlocked.
	System Locked	This port is Locked and cannot be used. The system automatically Locks this port in order to prevent damage to the physical components. This status can be cleared only by a technician, after resolving the issue.
	In Process	The connect/disconnect action is being processed / is completing.
	Pending	The connect/disconnect action is in the queue and will be processed as soon as possible, generally, as soon as another action is completed – if it is in line, within the pending list..
	Connected	This port is connected to another. Click on the port - the partner port on the other side will be highlighted.
	Scheduled	An operation has been scheduled for this port.

	Disconnected	This port is not connected to any other nor awaiting a connection.
	Conflict	This status is applicable for Duplex ports only. Conflict indicates a status where the Tx side is connected and Rx side is disconnected, or vice-versa. Note that this flag appears momentarily during the connect/disconnect process of Logical ports. **This is OK**. Only when the status remains permanent, does this indicate a problem.

Matrix View Toolbar

The following functions are available from the toolbar above the Matrix. Functions that are not applicable are disabled.

Icon	Name	Explanation
	Matrix	View the ports in matrix format. Two matrix views are available: Logical and Physical (see page 27).
	Ports Table	View the ports in table format. Two port views are available: Logical and Physical (see page 27).
	Connect	Connect the selected ports (see page 37).
	Disconnect	Disconnect the selected (connected) ports (*see page 38*).
	Lock	Lock the selected (Unlocked) port/s (*see page 35*).
	Unlock	Unlock the selected (Locked) port/s (*see page 35*).
	Schedule	Schedule a provisional operation on the selected ports (*see page 40*).
	Load Port Data from File	Load a *.csv* file containing Names and Additional Information of ports of the selected ROME. The *.csv* file may contain data for all or some of the ports (*see page 47*).

Matrix View – Additional Accessories

Tool	Name	Explanation
	Zoom	Zoom Matrix in/out.

Divider

Each one of the various parts of the Wave2Wave NMS interface can be expanded or contracted.

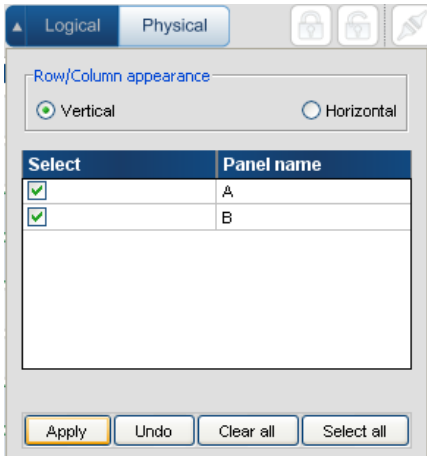
- By dragging anywhere along the divider up, down or sideways – the curser becomes vertical (or horizontal) and two-arrowed. Double-clicking brings the divider to the default (middle) position.

or

- By clicking the UP or DOWN arrow, to maximize one of the views and minimize the other, or vice-versa.

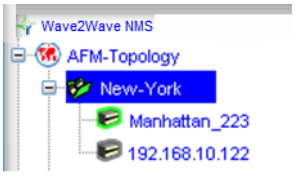
Matrix/Table View Modes

Following are the available viewing modes:

Mode	Icon	Explanation
Physical		This matrix/table displays all the available physical ports. A Logical port is displayed as the number of physical ports it represents.
Logical		This matrix/table displays only the Logical ports. Each Logical port represents the number of physical ports according to the configuration.
Vertical Horizontal		The Logical Matrix/Table can be displayed across the selected Panels, laid out, vertically or horizontally. Additionally, you can choose to view only selected panels

System States

In addition, the following system states are displayed in the tree View and on the map, beside the faulty site.

State	Tree	Map	Details
Operational			The ROME is operational
Call Tech			**Service Engineer Required** The detected fault requires the attention of a Service Engineer
Technician			**Servicing in Progress** There is no communication with the system; it is being serviced by a Service Engineer.
No Communication			No network communication between the NMS server and the ROME.
Offline			The ROME has been identified in the network, but there is no SNMP communication with it.
Pause			The ROME has detected extreme environmental conditions (e.g., temperature or earthquake) and therefore, in order to protect itself, has suspended all mechanical activity. The ROME will automatically resume normal operation when conditions return to normal.
Safe Reset	 		The ROME is in the process of a procedural Restart. Upon the completion of the Restart process the ROME will automatically return to normal operation. During Restart, the ROME may transit through the Offline state and the No Communication state.

State	Tree	Map	Details

Ports Table View

This View displays a sequential list of all ports in the selected ROME as well as the status of various port parameters, e.g., Locked/Unlocked, Partner Port, etc.

Two Table views are available (as in the Matrix view):

- Physical Ports View
- Logical Ports View.

For additional information, see Matrix View, page 23.

To access the Ports Table View:

1. Select an ROME in the Tree View.
2. Click the **Port Table View** icon ( ) to open the View.
3. Select the **Physical** view.

   —or—
4. Select the **Logical** view.

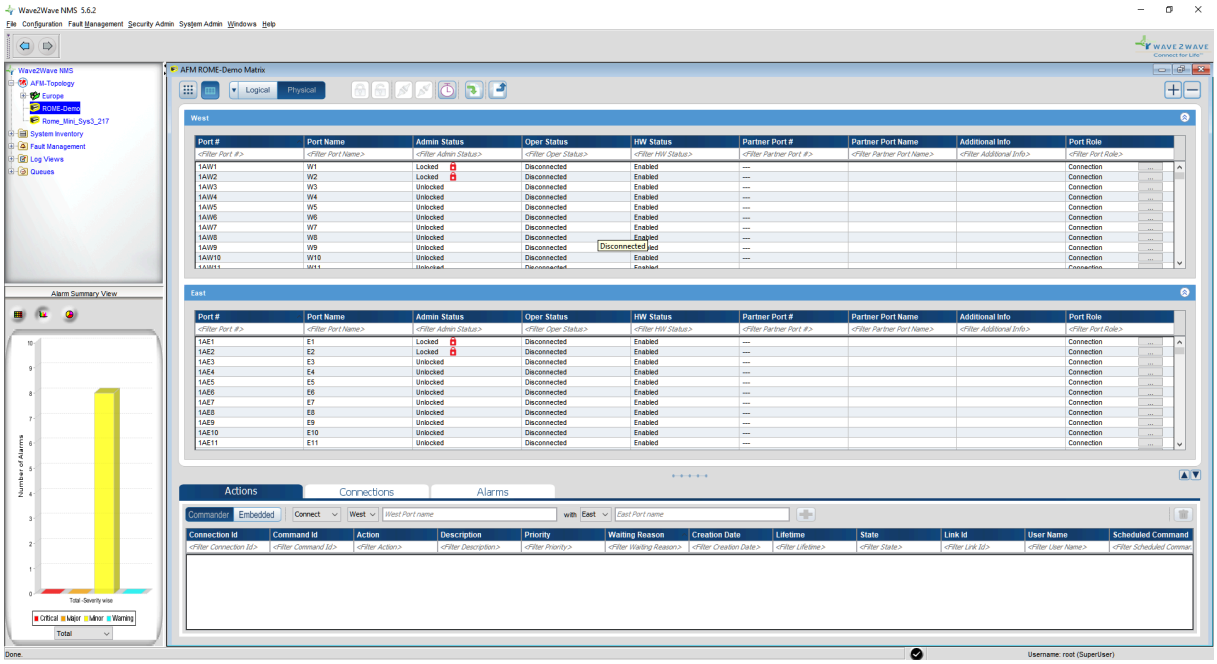


Figure 17. Physical Ports Table

In addition to the functions available via the toolbar (see *Matrix View , page 26*), the following function is available:

1. [...] (see page 31). Add/Edit the **Name** and **Additional Information** of the selected port.

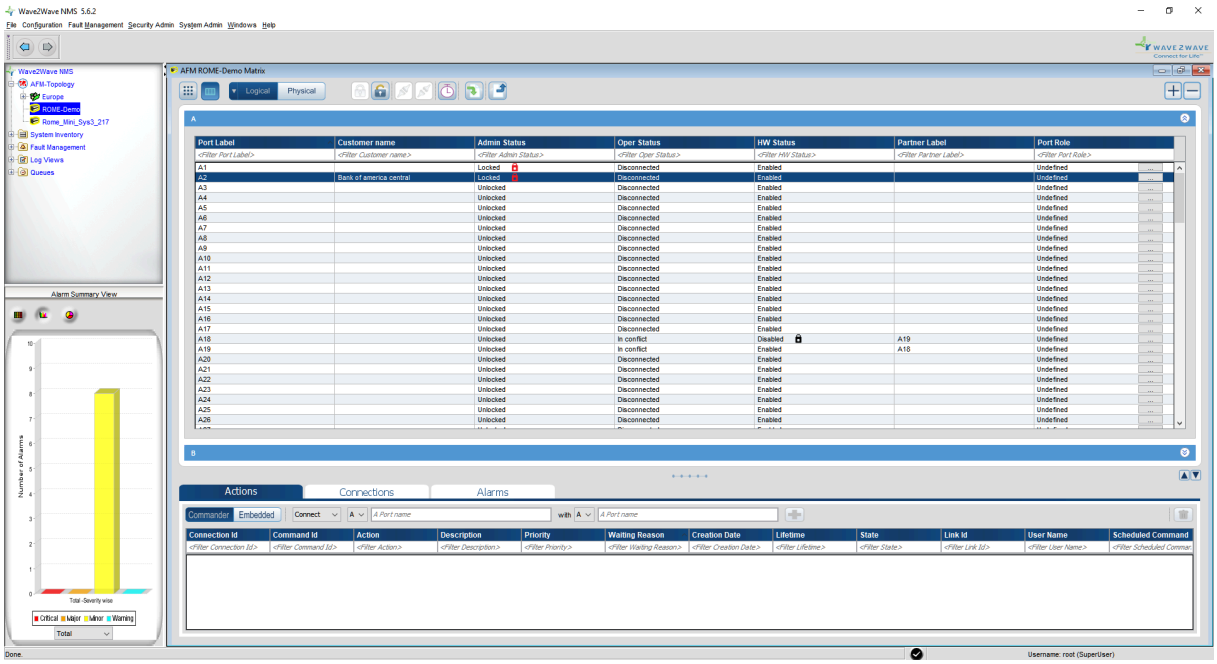


Figure 18. Logical Ports Table

Edit Ports Name and Additional Information

You can add / edit the **Name** of any port (e.g., “My_Customer”, “Brooklyn”, “East_End”, etc) from the Ports Table View. This may be used to enter a unique port ID or facility ID number. In addition, you can add a short note as “**Additional Information”**. This information is displayed as part of the Ports View.

1. Open the Ports Table View.
1. Click [...]. The Edit Port dialog will open.
2. Enter/edit the Name and/or the Additional Info and click OK. The information will now be displayed in the applicable column of that port.

Note: The field "Additional Info" can be used as a filter parameter if desired.

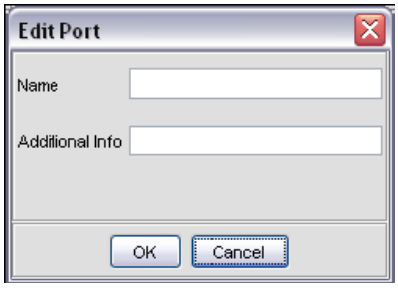


Figure 19. Edit Port

Note: Port names can be edited only from the Table View.

Examples of Ports Display Across Various Matrix Views

Following is an example of how port selection (a duplex pair of ports – 59 and 60) is represented in the various views:

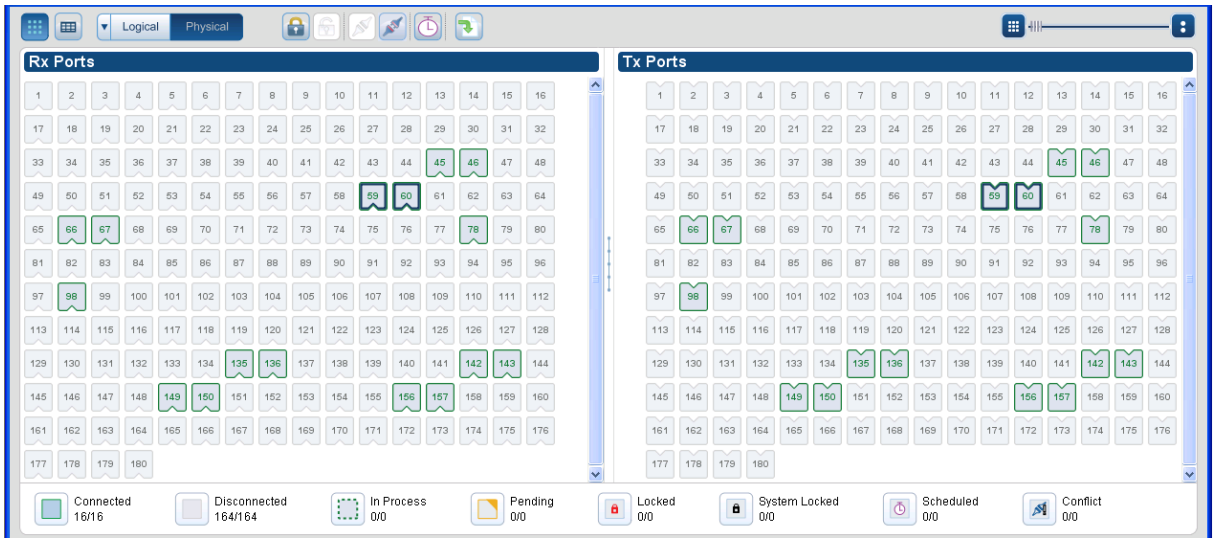


Figure 20. Physical Matrix Presentation

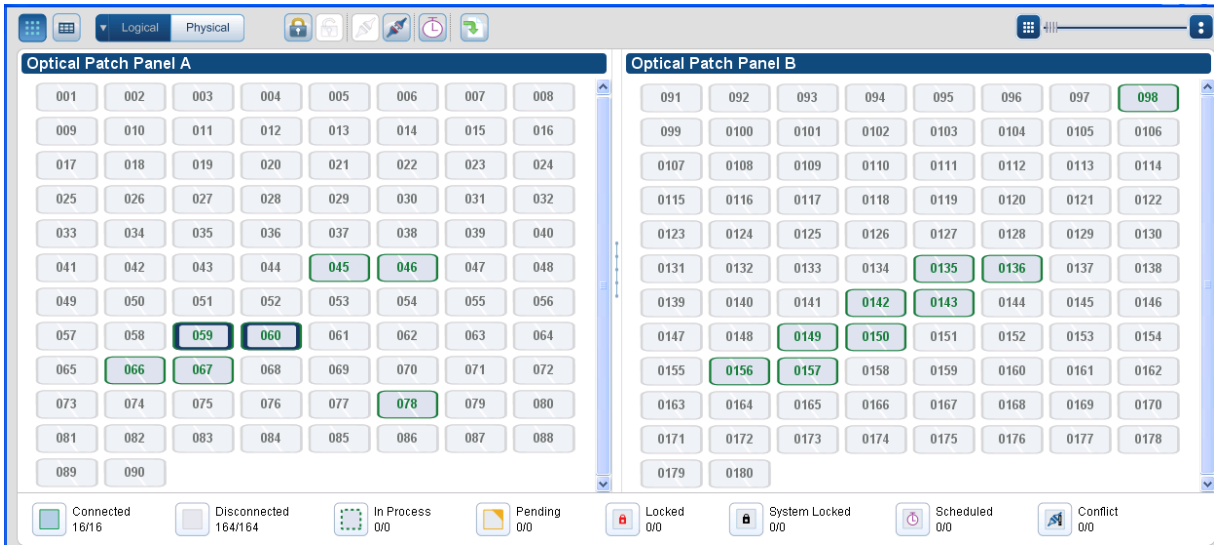


Figure 21. Logical Matrix Presentation

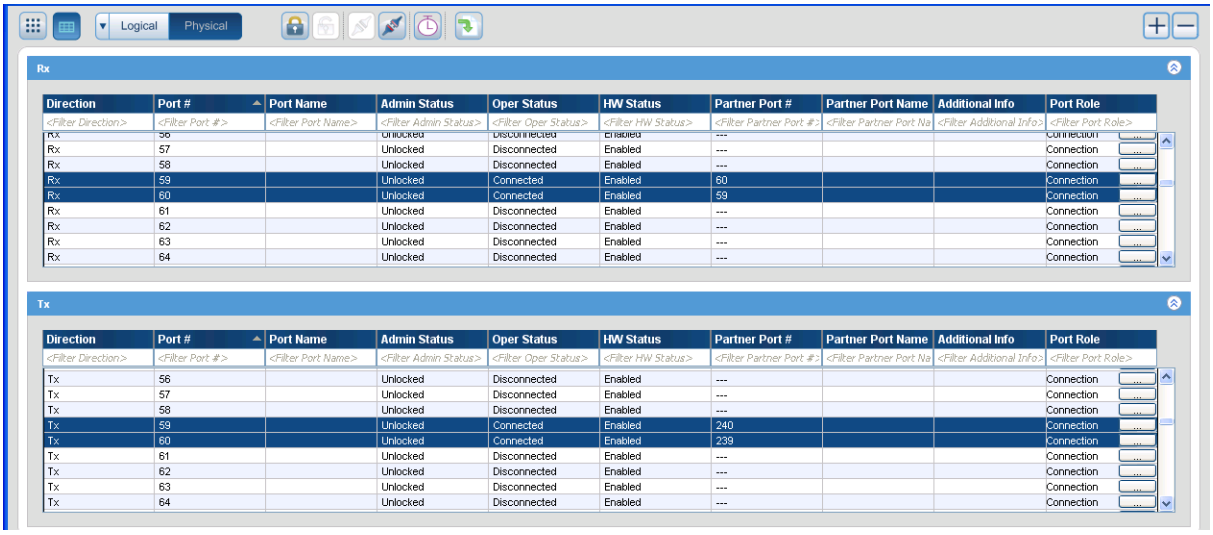


Figure 22. Physical Ports Table Presentation

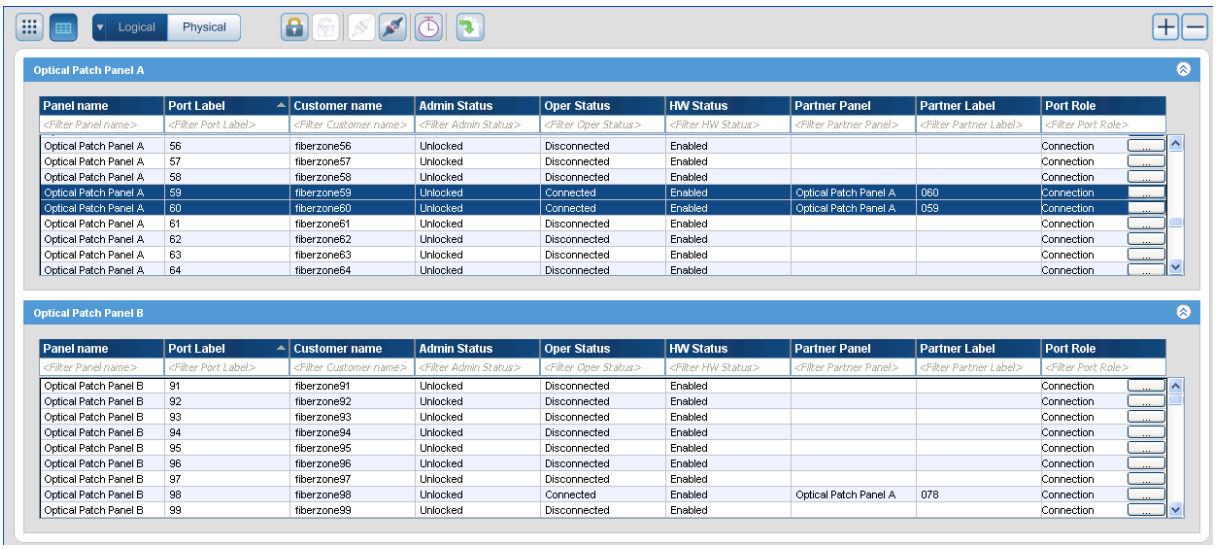


Figure 23. Logical Ports Table Presentation

Connections Views

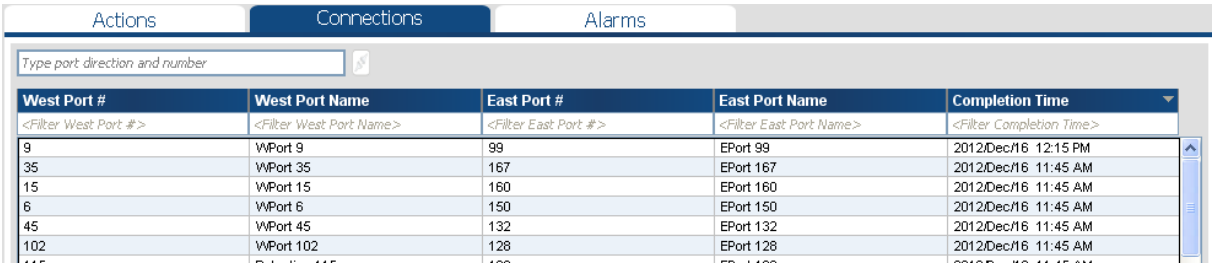
The following ROME connections views are available:

- All current connections (Connections Tab)
- Actions tab – Commander: Commands that are waiting for execution from the NMS server – *See page 35*.
- Actions tab – Embedded: Up to 256 commands (executed and pending) that are stored in the ROME – *See page 34*.

Viewing The Connections Tab

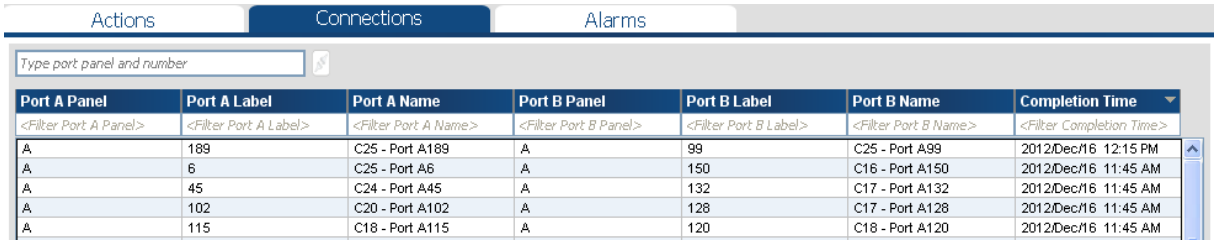
To view the active connections of the selected ROME, perform the following:

1. Select an ROME in the Tree View, or double-click an ROME on the map.
2. Select the Connections tab to display a list of the connected ports in the selected ROME, and the time they were connected. The ports presentation in the list changes according to the Matrix type (Logical / Physical).



West Port #	West Port Name	East Port #	East Port Name	Completion Time
<Filter West Port #>	<Filter West Port Name>	<Filter East Port #>	<Filter East Port Name>	<Filter Completion Time>
9	WPort 9	99	EPort 99	2012/Dec/16 12:15 PM
35	WPort 35	167	EPort 167	2012/Dec/16 11:45 AM
15	WPort 15	160	EPort 160	2012/Dec/16 11:45 AM
6	WPort 6	150	EPort 150	2012/Dec/16 11:45 AM
45	WPort 45	132	EPort 132	2012/Dec/16 11:45 AM
102	WPort 102	128	EPort 128	2012/Dec/16 11:45 AM

Figure 24. Connections Tab – Physical View



Port A Panel	Port A Label	Port A Name	Port B Panel	Port B Label	Port B Name	Completion Time
<Filter Port A Panel>	<Filter Port A Label>	<Filter Port A Name>	<Filter Port B Panel>	<Filter Port B Label>	<Filter Port B Name>	<Filter Completion Time>
A	189	C25 - Port A189	A	99	C25 - Port A99	2012/Dec/16 12:15 PM
A	6	C25 - Port A6	A	150	C16 - Port A150	2012/Dec/16 11:45 AM
A	45	C24 - Port A45	A	132	C17 - Port A132	2012/Dec/16 11:45 AM
A	102	C20 - Port A102	A	128	C17 - Port A128	2012/Dec/16 11:45 AM
A	115	C18 - Port A115	A	120	C18 - Port A120	2012/Dec/16 11:45 AM

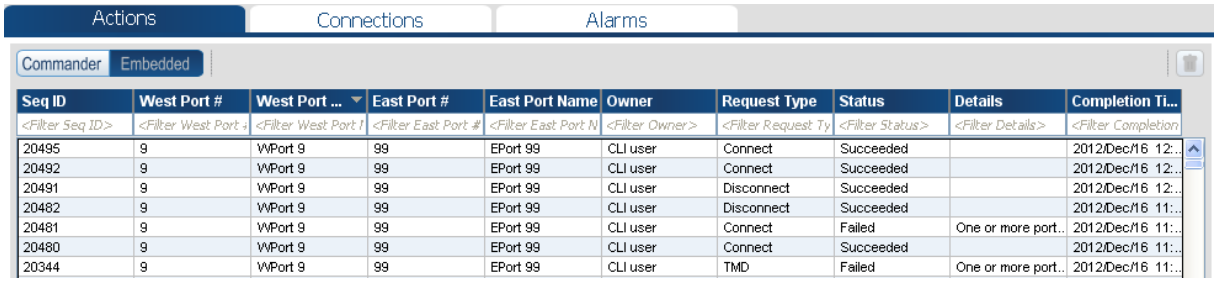
Figure 25. Connections Tab – Logical View

3. The list can be filtered and sorted, as detailed on Filtering Matrix Logs, page 60 and Sorting Logs, page 65.
4. It is also possible to disconnect ports from this view. See page 39.

Viewing The Connection Queue

To view the connections queue of the selected ROME, perform the following:

1. Select the **Actions** Tab.
2. Click the **Embedded** button.



Seq ID	West Port #	West Port ...	East Port #	East Port Name	Owner	Request Type	Status	Details	Completion Ti...
<Filter Seq ID>	<Filter West Port #	<Filter West Port I	<Filter East Port #	<Filter East Port N	<Filter Owner>	<Filter Request Ty	<Filter Status>	<Filter Details>	<Filter Completion
20495	9	WPort 9	99	EPort 99	CLI user	Connect	Succeeded		2012/Dec/16 12:..
20492	9	WPort 9	99	EPort 99	CLI user	Connect	Succeeded		2012/Dec/16 12:..
20491	9	WPort 9	99	EPort 99	CLI user	Disconnect	Succeeded		2012/Dec/16 12:..
20482	9	WPort 9	99	EPort 99	CLI user	Disconnect	Succeeded		2012/Dec/16 11:..
20481	9	WPort 9	99	EPort 99	CLI user	Connect	Failed	One or more port..	2012/Dec/16 11:..
20480	9	WPort 9	99	EPort 99	CLI user	Connect	Succeeded		2012/Dec/16 11:..
20344	9	WPort 9	99	EPort 99	CLI user	TMD	Failed	One or more port..	2012/Dec/16 11:..

Figure 26. Actions Tab – Embedded

The Embedded view shows the table that is stored in the ROME. It can keep up to 256 commands – some have been executed (succeeded or failed), and some are pending execution. The pending list represents commands that had already been sent to the ROME.

The Commander (see page 39) view shows all the command s that were initiated by the NMS and are waiting for execution

Most of the time only the executing command appears in BOTH lists

The list can be filtered and sorted, as detailed on Filtering Matrix Logs, page 60 and Sorting Logs, page 65.

Additionally, you can delete an entry with a status that is not being processed (that is: Pending; Succeeded or Failed), by selecting it, and clicking .

Note: A pending provision that was deleted from this queue will not be performed.

Lock / Unlock Ports

Ports can be Locked and Unlocked by System Administrators, Technicians and Provisioning Operators. This is done in order to prevent a critical port from being used or disconnected by mistake – until it is Unlocked. You can Lock/Unlock ports via the Matrix View and via the Ports View.

Note: When selecting an Unlocked port, only the Lock function is enabled, and vice-versa

Note: If the port selected is connected to another port - the Unlock function operation will Unlock both of the connected ports.

Note: Lock/Unlock can be done over a single physical port, provided it is unconnected, otherwise the port it is connected to will be locked/unlocked too.

Note: Lock/Unlock can be done over a single Logical port, provided it is unconnected => 1 Logical port (that is, 2 or more physical ports) is Locked.

1. Open the **Matrix** View or the **Ports Table View**.
2. Select the **Port** to Lock or Unlock.
3. Click the or button. The NMS Locks or Unlocks the ports.

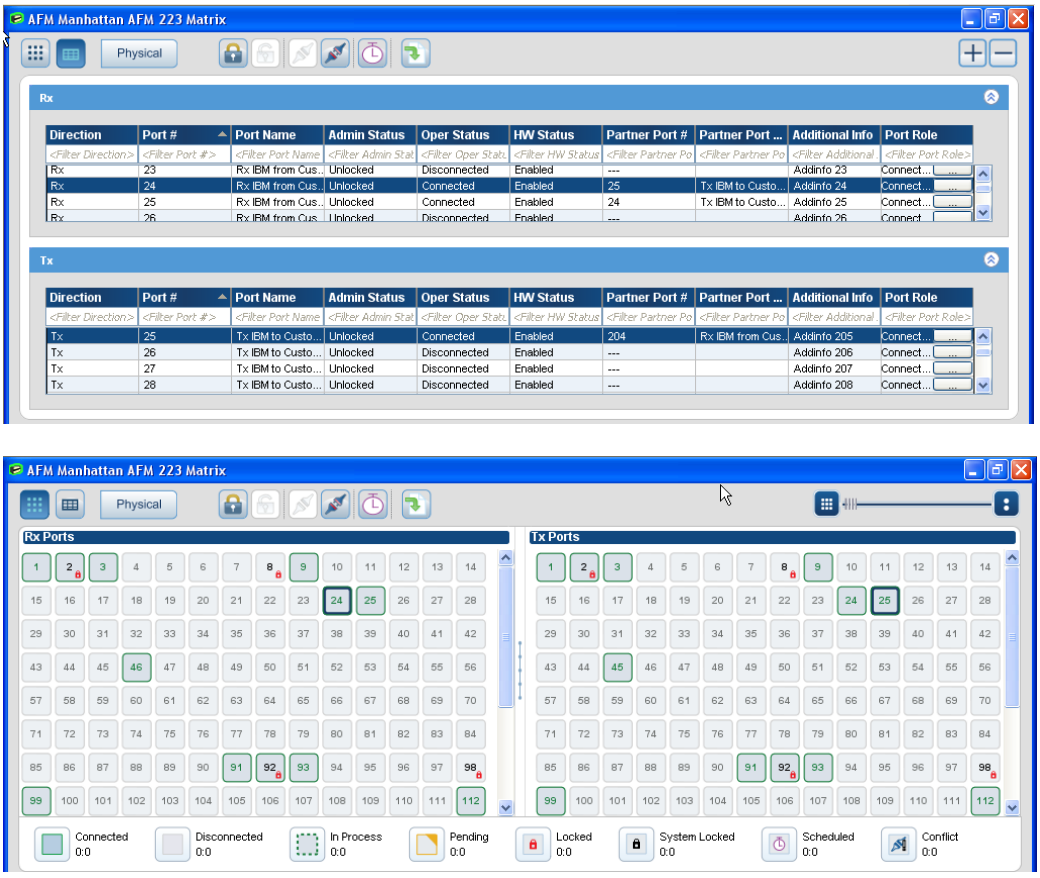


Figure 27. Lock / Unlock Connected Ports

Connect / Disconnect Ports

ROME ports can be connected / disconnected from the each of the following views.

This was designed in order to allow each user to perform provisioning operations in a fashion that suits that user's preferences.

- Physical Matrix View
- Logical Matrix View (if you are configured to work in Logical mode)
- Physical Ports Table
- Logical Ports Table (if you are configured to work in Logical mode)
- Physical **Connection** Tab

- Logical **Connection** Tab (if you are configured to work in Logical mode)
- Physical **Actions** Tab > **Commander**
- Logical **Actions** Tab > **Commander** (if you are configured to work in Logical mode)

Before connecting the required ports, select the required ROME from the tree view; then, proceed to the view of your preference.

Connect Ports via the Physical Matrix View

This View is *color coded*. Ports are colored according to their *connection status*.

For further information on this toolbar, refer to **Matrix Flagging Legend**, page 25.

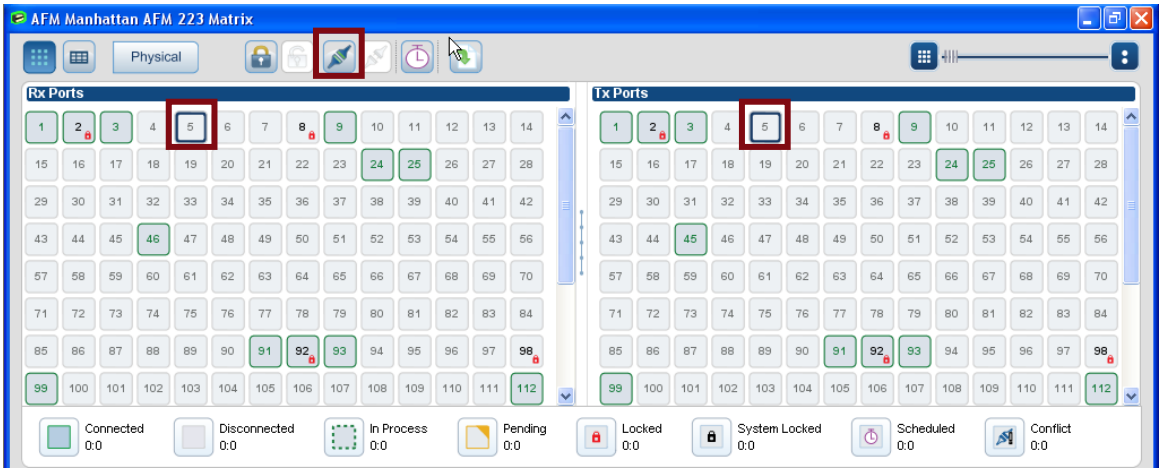


Figure 28. Matrix View

1. Click the **Left** port. The port will be highlighted.
2. Connect the **Right** port. The port will be highlighted.
3. Click . A **Confirmation** dialog will open.
4. Click **Yes** to connect the two ports.

Viewing a Connected Port's "Partner Port"

1. **Select** a ***Connected port***. It will be highlighted; its ***Partner port*** will also be highlighted, as follows.

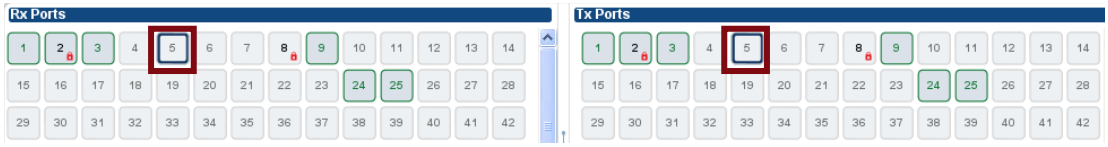


Figure 29. Matrix View: Connected Port (left) and Partner Port (right)

Disconnect Ports via the Matrix View

1. Select a connected port, as above.
2. Click . A **Confirmation** dialog will open. Click **Yes** to disconnect the ports.

Connect/Disconnect Ports via the Actions Tab

This Tab enables you to connect or disconnect ports by using their names.

1. Select the **Actions** tab.

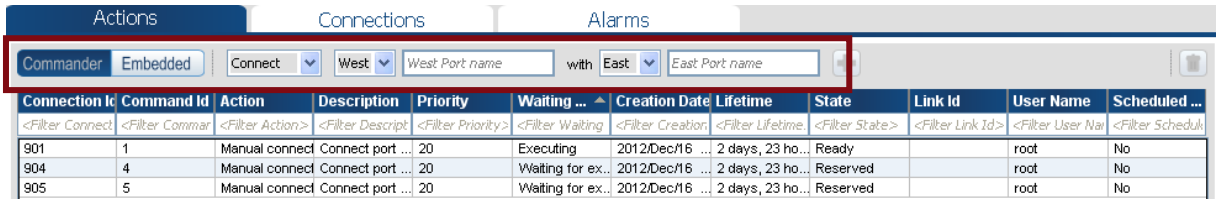


Figure 30. Actions Tab – Commander (Physical)

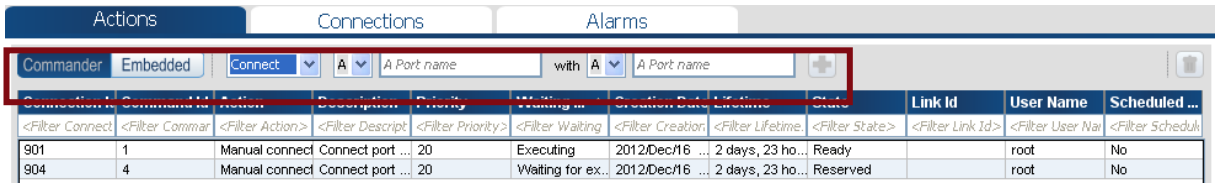


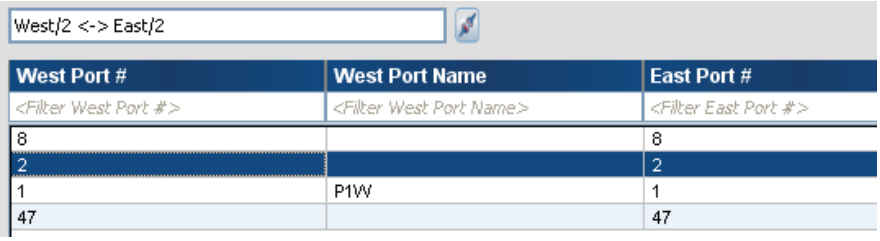
Figure 31. Actions Tab – Commander (Logical)

The list can be filtered and sorted, as detailed on Filtering Matrix Logs, page 60 and Sorting Logs, page 65.

Note: The displayed parameters are slightly different between the Physical and Logical

2. Ensure that the **Commander** button is selected.
3. Select the **Connect** or **Disconnect** function.
4. Type the port names or numbers you want to connect or disconnect. The Commit Operation button becomes enabled. In any case that an illegal pair of ports is selected, this icon remains disabled, and you can see the tooltip for further information (by hovering over the icon with the cursor).
5. Click to perform the operation.

Disconnect Ports via the Connections View



1. Open the **Connections** tab.
2. Click the **Embedded** button.
3. Click the row containing the **Port/Partner Port pair** to disconnect.

   or

   Type the port direction and number.

   The definitions of the connected ports are displayed in the field

4. Click . A **Confirmation** dialog will open.
5. Click **Yes** to disconnect the ports.

Pending Provisioning Requests

Pending Provisioning requests are those requests that were issued, but remained queued, usually due to hardware constraints. For example, the most usual case is due to a number of Connect/Disconnect commands being sent in sequence; because each action takes about 35 seconds, they will most likely be queued.

Authorized users can view all pending connections as well as operations that are in the process of being executed. They appear in Tree View, under **Pending Commands** view for all ROMEs, or in the **Actions Tab** > **Commander** for a specific (the selected) ROME

Cancelling a Pending Provisioning Request – Any user with Provisioning permissions can cancel any pending connect / disconnect operations.

Via the Actions Tab

1. Open the **Connections** tab.
2. Click the **Embedded** button.

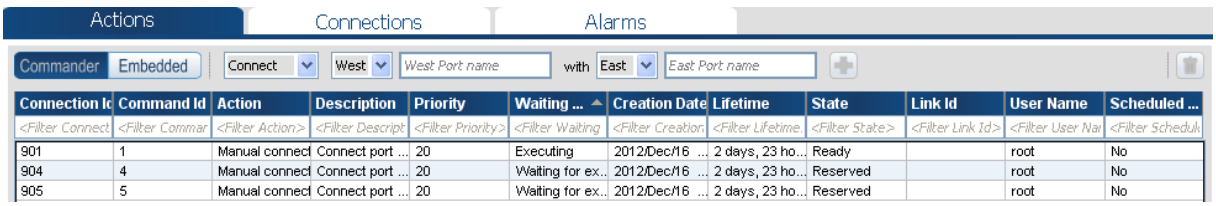


Figure 32. Pending Provisioning Requests Via the Actions Tab

The Commander view displays a queue of pending provisioning requests for the selected ROME. This list reflects the commands that were sent to the embedded, and were either executed or are still pending.

The list can be filtered and sorted, as detailed on Filtering Matrix Logs, page 60 and Sorting Logs, page 65.

Note that that the displayed parameters are slightly different between the Physical and Logical

Via the Tree View

1. In the Tree View, select Pending Requests.

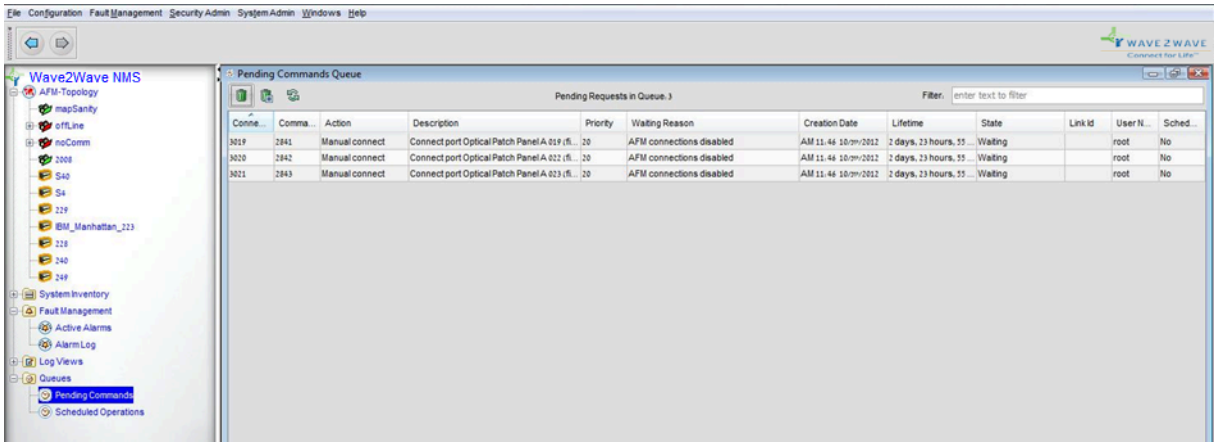


Figure 33. Pending Provisioning Requests Via the Tree View

2. The list displays a queue of pending provisioning requests for the selected ROME.
3. The list can be sorted, as detailed on Sorting Logs*, page 65*, and filtered, by entering the filtering text in the **Filter** field.

SCHEDULING A PROVISIONING OPERATION

The NMS enables you to schedule provisioning operations on the ports of the ROME, such as connecting, disconnecting, Locking and Unlocking ROME ports.

Each operation can be scheduled in the NMS GUI using the **Schedule** button, as described below, or by loading a CSV batch file of operations, as described in the *Loading a Batch File of Scheduled Operations* section on page 47.

Manual Scheduling

It is possible to Schedule either by Logical or by Physical ports (depending on the ROME configuration).

Scheduling is available from each one of the following views:

- Physical matrix view

- Physical Ports table view
- Logical matrix view
- Logical Ports table view

Additionally:

- When you click from one of the Logical views, then the Scheduling dialog will be opened in the Logical Display Mode.
- When you click from one of the Physical views, then the Scheduling dialog will be opened in the Physical Display Mode.
- Ports selected in the Matrix or Port List prior to clicking , will be automatically populated into the Ports section in the Scheduling dialog.

To manually schedule a provisioning operation, perform the following:

1. Select an ROME in the Tree View.
2. Click the **Matrix View** icon ( ) to open the View, as shown below –

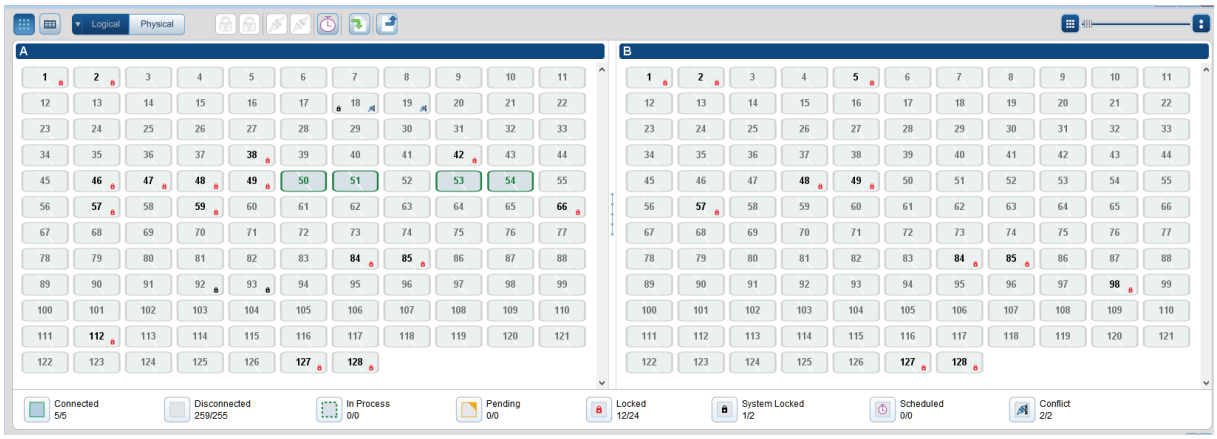


Figure 34. Matrix View

3. You can now click the **Schedule** button ( ) to display the following window or select the port(s) for which to schedule an operation, and then click the **Schedule** button to display the following window.

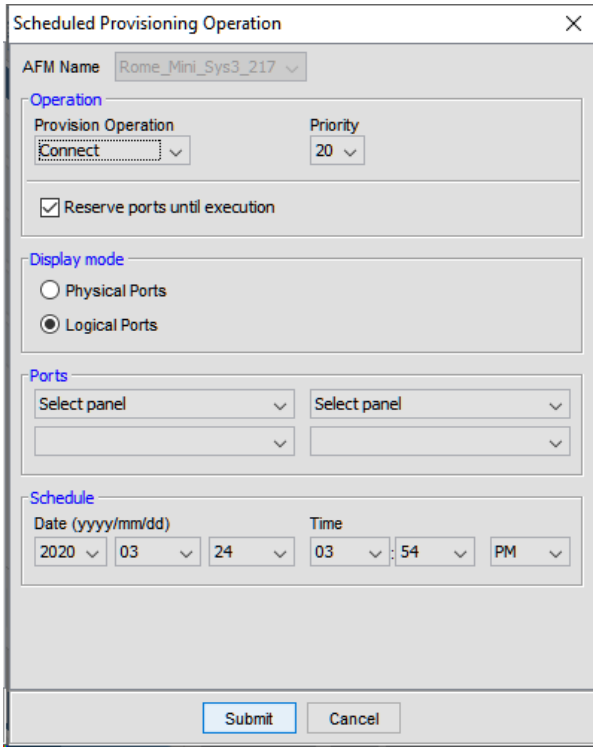


Figure 35. Scheduled Provisioning Operation Window

4. The Scheduled Provisioning Operation window enables you to define the scheduling operation to be performed and the schedule for which to perform it. Fill out the field of this window as follows:

   - **ROME Name:** Specifies the name of the ROME that was selected in the Tree View. This is the ROME on which the operations are to be performed. This is a read-only field.
   - **Provision Operation:** Specifies the operation to be performed on the port: **Connect**, **Disconnect**, **Lock** or **Unlock**.
   - **Priority:** Specifies the priority (order) in which **Connect** and **Disconnect** operations are performed when multiple commands are scheduled to be executed at the same time. Operations with the lowest Priority number have the highest priority. The default priority is **20**. This field does not apply to **Lock** and **Unlock** operations, because multiple Lock/Unlock operations can be performed simultaneously.
   - **Reserve ports until execution:** Checking this option defines the default value of the **Reserve ports until execution** field in the **Scheduling** tab of the Preferences window. This option specifies whether each port, for which a scheduling operation has been added, is Locked until execution. The port is Locked as soon as the scheduling operation has been created. This prevents other scheduling operations from being executed on the same port.
   - **Display Mode**: Specifies which display mode you will be using to define the ports. **Physical Ports** displays the naming conventions used in the Physical Matrix, and **Logical Ports** displays the naming conventions used in the Logical Matrix.

- **Left Port #/ Right Port #:** Specifies the port on which to perform the operation defined in this window. Both port fields must be specified for a Connect and Disconnect operation. Only one port needs be specified for a Lock and Unlock operation. If you selected a port(s) in the panels shown in the Matrix View before clicking the **Schedule** button, then these port numbers automatically appear in these fields. The name of the direction of these ports is determined by the label defined in the **Provisioning** tab in the Preferences window, as described on page 21.
- **Schedule:** Specifies the time scheduled for the operation to be executed. This field must specify a date in the future according to the time on the NMS client's computer. The maximum number of days ahead that can be scheduled is displayed on the bottom of this window; this maximum is defined in the **Max Scheduling time** field in the **Scheduling** tab of the Preferences window.

Note: The system does not limit the user from using historical date and time. Using a historical date or time causes the command to be executed immediately.

5. Click **Submit**. A confirmation window may be displayed asking you to confirm the scheduled operation, as shown below:

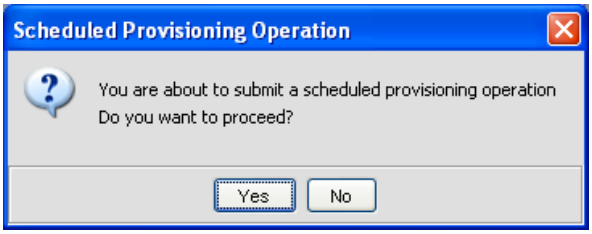


Figure 36. Scheduled Provisioning Confirmation Window

6. Click **Yes** to confirm.

The port for which this operation is scheduled then appears in the Matrix View as follows:

Figure 37. Scheduled Operation Icon

Viewing the Scheduling Queue

You can display the operations waiting in the scheduling queue to be executed by selecting the **Queues** > **Scheduled Operations** branch in the Tree View. A list of all the operations scheduled for future execution are then displayed, as shown below:

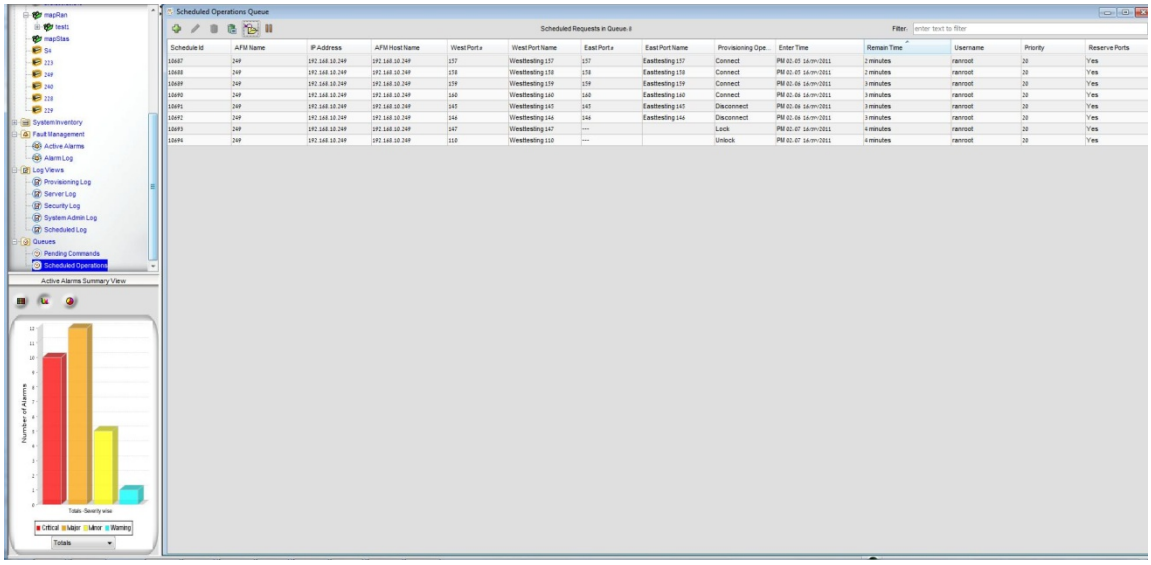


Figure 38. Scheduled Operations

Each row represents a single scheduled operation that was scheduled manually (one at a time), as described above, or was loaded from a batch file (which typically loads many operations). You can filter the display of rows using the **Filter** field.

As each operation is executed at the scheduled time, it is logged along with the name of the user who defined the operation and then removed from the queue. You can view this log by selecting an ROME in the **Tree View** and then selecting **Log Views > Scheduling Log**.

The following describes the columns of the rows in this window:

- **Schedule id:** Specifies a unique ID for each scheduled operation currently in the queue. The order in which the operations appear in the queue is the order in which they will be processed.
- **ROME:** Specifies the name of the ROME on which the operation is to be performed.
- **IP Address/Host Name:** Shows the IP of the ROME on which the operation is to be performed. If the host has a DNS, then the host name is also displayed.
- **Left** (West) **Port #/ Right** (East) **Port #:** Specifies the port on which to perform the operation defined in this window. Both port fields must be specified for a Connect and Disconnect operation. Only one port need be specified for a Lock and Unlock operation.
- **Port Name:** Specifies the name(s) of the port(s) on which to perform the operation.
- **Provisioning Operation:** Specifies the operation to be performed: Connect, Disconnect, Lock or Unlock.

- **Enter Time:** Specifies the time when the operation was defined by clicking the **Submit** button or the time when it was imported from a batch file.
- **Remaining Time:** Specifies the time remaining until this operation is performed. This is a countdown that is refreshed each time the queue display is automatically refreshed.
- **User name:** Specifies the name of the user who defined this operation.
- **Priority:** Specifies the priority (order) in which **Connect** and **Disconnect** operations are performed when multiple commands are scheduled to be executed at the same time. Operations with the lowest Priority number have the highest priority, meaning that Priority **1** operations are executed first. The default priority is **20**. This field does not apply to **Lock** and **Unlock** operations, because multiple such operations can be performed simultaneously.
- **Reserve Ports:** Specifies that this port is Locked until after the scheduled operation has been executed.

Scheduled Provisioning Queue Toolbar

The following describes the tools provided in the Scheduled Provisioning Queue's toolbar:

Add Enables you to add a new scheduled operation.

Edit Enables you to edit a selected operation row in the queue. Only one row can be edited at a time. You can also double-click on a row to edit its operation.

Delete Deletes the selected operation row from the queue.

Delete All Deletes all the operation rows from the queue.

Load Batch File Imports a batch file of operations, as described in the *Loading a Batch File of Scheduled Operations* section on page **Error! Bookmark not defined.**.

Stop/**Play** Stops (pauses) or starts the processing of the queue. When the Play button is clicked after the queue was stopped (paused) for a while, all scheduled operations for which time has passed are executed immediately.

To add an operation:

1. Click the **Add** button to display the following window in which you can define a new operation:

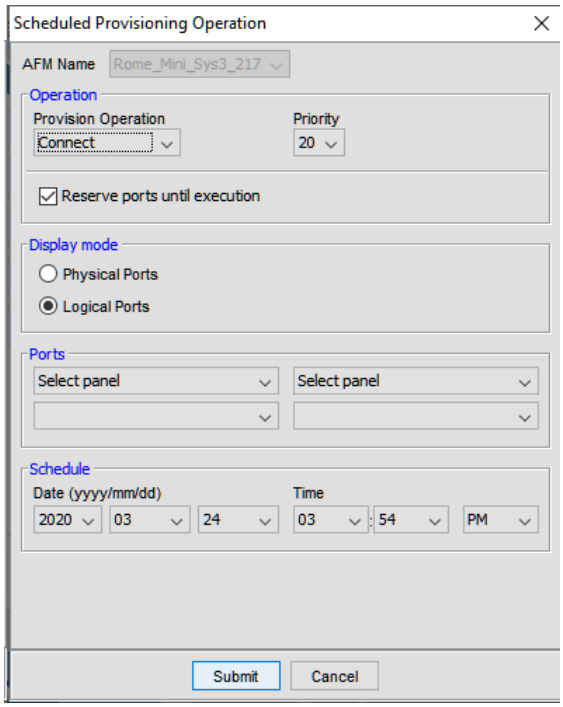


Figure 39. Scheduled Operations

2. In the **ROME Name** field, select the ROME on which to schedule the operations.
3. Fill in the rest of this window and click the **Submit** button, as described on the previous page (see *Manual Scheduling, page 40*).

Loading a Batch File of Scheduled Operations

This option enables you to create multiple scheduling operations by executing a CSV batch file, rather than manually entering this data one field at a time:

To load a CSV batch file of operations:

1. Click the **Help** button to display a sample CSV batch file, which you can also use as a template. Two file formats are available: for Logical Ports and for Physical Ports

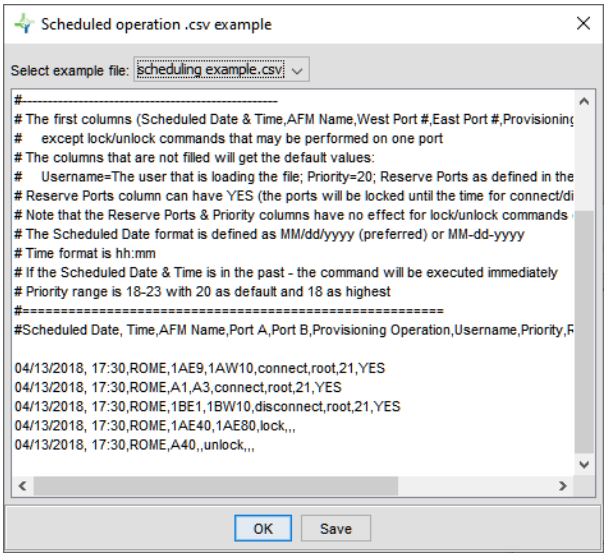


Figure 40. Scheduled Operation Templates

2. Save the desired example.
3. Edit the file as required, and save under a different name.
4. Click the **Load Batch File** button in the Scheduled Provisioning Queue's toolbar. The following window is displayed:

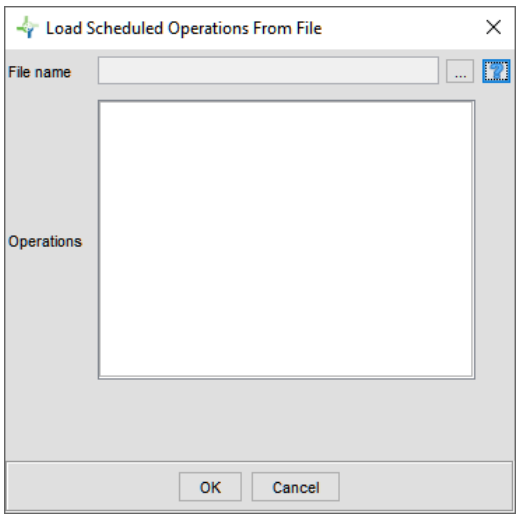


Figure 41. Load Batch File Scheduled Operations

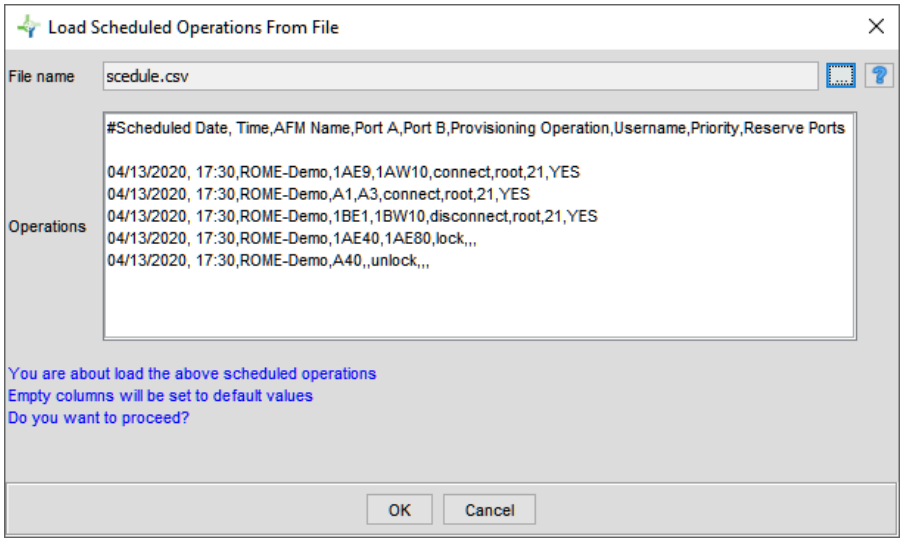


Figure 42. Load Batch File of Scheduled Operations

The following are a few example rows:

```
04/13/2020, 17:30,ROME-Demo,1AE9,1AW10,connect,root,21,YES
04/13/2020, 17:30,ROME-Demo,A1,A3,connect,root,21,YES
04/13/2020, 17:30,ROME-Demo,1BE1,1BW10,disconnect,root,21,YES
04/13/2020, 17:30,ROME-Demo,1AE40,1AE80,lock,,,
04/13/2020, 17:30,ROME-Demo,A40,,unlock,,,
```

The following shows the syntax of the rows in the file:

```
#Scheduled Date, Time,ROME Name,Port A,Port B,Provisioning
Operation,Username,Priority,Reserve Ports
```

The data is as follows – from left to right with comma separators:

- Scheduled Date
- Time
- ROME Name
- `Port A #:` Applies to the ports on the left panel in the Matrix View. Make sure to change the *Label_Name* to be the same as defined in the **Provisioning** tab of the Preferences window. If you want to Lock or Unlock a single port, it is enough to fill in the label of that port only. For example,:

  ```
  04-12-2011, 17:30,ROME-ABC,11,    , Unlock, , ,
  ```

- `Port B #:` Same as for *West Label_Name Port #,* but applies to the ports on the right panel in the Matrix View.
- Provisioning Operation
- Username
- Priority
- Reserve Ports: Set to **True** to Lock the port until after the scheduled operation has been executed.

The format of the Logical file is slightly different, instead of `Port A` **#:** and **East Label_Name Port #:** there are **Port A** and **Port B**. Following is the detailed format:

- Scheduled Date
- Time
- ROME Name
- Port A
- Port B
- Provisioning Operation
- Username
- Priority
- Reserve Ports

The following describes the syntax rules for this file:

- Make sure to specify the precise ROME, direction and port names as they appear in the NMS's GUI, which is described on the previous pages.
- Make sure to specify all the column names in the header line (note that the ports title should be the same as defined in the system preferences).
- Empty rows are skipped.
- The name of the side (direction), which is defined in the Provisioning tab in the Preferences window must be specified according to its current definition.
- Ports that are not stated in the file remain unchanged
- An empty column deletes the current value on this column on the NMS. For example, **1,,addinfo-22** deletes the port name and **1,Rxtesting-1** deletes the information field.
- Lines that start with the "#" symbol are ignored.
- Mandatory fields are: Scheduled Date, Time, ROME Name, Left Port #, East Port # and Provisioning Operation
- Lock/Unlock commands that may be performed over a single port
- If the system preferences definition was changed for the matrix port titles - the column names hereafter should be the same as in the system preferences. For example: If the preferences changes the matrix labels to Rx and Tx instead of West and East the title should be: Rx Port and Tx Port #
- Empty columns will get the following default values:
  - Username=The user who is loading the file
  - Priority=20
  - Reserve Ports as defined at the NMS system preferences
- Reserve Ports column can have YES (the ports will be Locked until the time for connect/disconnect execution) or NO (no Lock)
- Reserve Ports column has no effect on the Lock/Unlock commands (redundant); therefore any value will be ignored
- Priority column has no effect on the Lock/Unlock commands (redundant); therefore any value will be ignored
- The Scheduled Date format is defined as MM/dd/yyyy (preferred) or MM-dd-yyyy
- Time format is hh:mm (24-hour format)
- If the Scheduled Date & Time is in the past – the command will be executed immediately
- Priority range is 18-23 with 20 as default and 18 as highest

The following describes the rules for the Logical file:

- The header should have all the column names as follows: Scheduled Date, Time, ROME Name, PortA, PortB, Provisioning Operation, Username, Priority, Reserve Ports
- Mandatory fields are: Scheduled Date, Time, ROME Name, PortA, PortB, Provisioning Operation
- Lock/Unlock commands that may be performed over a single port
- PortA and PortB column should include the panel name and the port label separated by a hyphen ('-')
- Empty columns will get the following default values:
  - Username=The user that is loading the file
  - Priority=20
  - Reserve Ports as defined in the system preferences
- Reserve Ports column can have YES (the ports will be Locked until the time for connect/disconnect execution) or NO (no Lock)
- Reserve Ports column has no effect for Lock/Unlock commands (redundant) therefore any value will be ignored
- Priority column has no effect for Lock/Unlock commands (redundant) therefore any value will be ignored
- The Scheduled Date format is defined as MM/dd/yyyy (preferred) or MM-dd-yyyy
- Time format is hh:mm (24-hour format)
- If the Scheduled Date & Time is in the past - the command will be executed immediately
- Priority range is 18-23 with 20 as default and 18 as highest

5. Click the **Save** button to save this file and edit it in Excel or any standard text editor, such as: Notepad.

6. Click the **Browse** button to display a file selection window from which you can select the CSV file to load. The file is then displayed in the window, as follows:

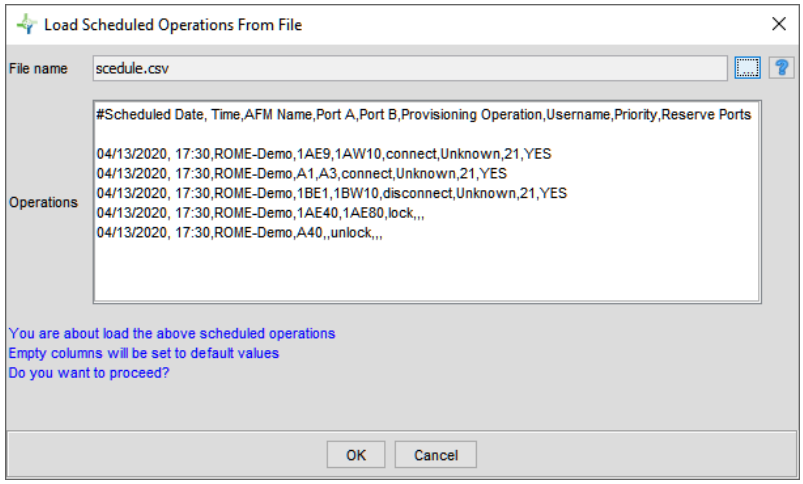


Figure 43. Load Batch File Scheduled Operations – Confirmation

7. Click **OK** to start processing. Syntax errors may be displayed in the window during processing, such as shown below:

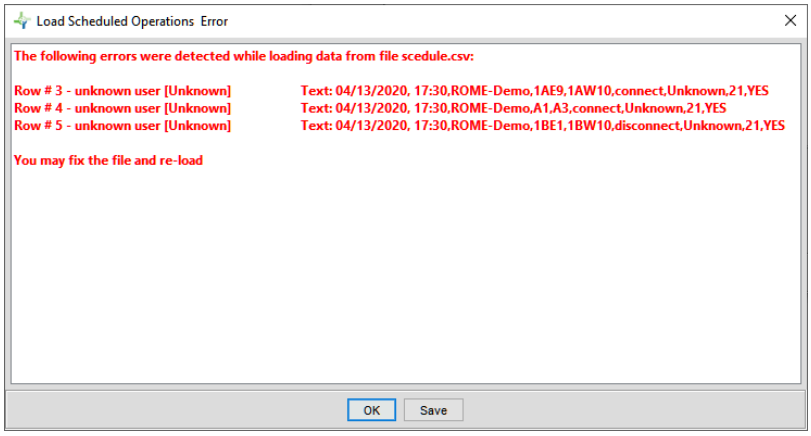


Figure 44. Load Batch File Scheduled Operations – Error Messages

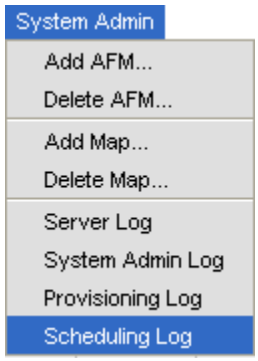
If errors are displayed, then simply click **OK**, edit the file, and reload the file by repeating the procedure described in this section from the beginning.

SCHEDULING LOG

The Scheduling Log lists all scheduled events. These include scheduled commands that were added, deleted, sent to pending queue, etc.

To view the Scheduling Log

1. Go to the **Menu bar.**
2. Click **System Admin > Scheduling Log**.



—or—

3. Go to the Tree View and select **Scheduling Log**.

   The Scheduling Log is displayed:

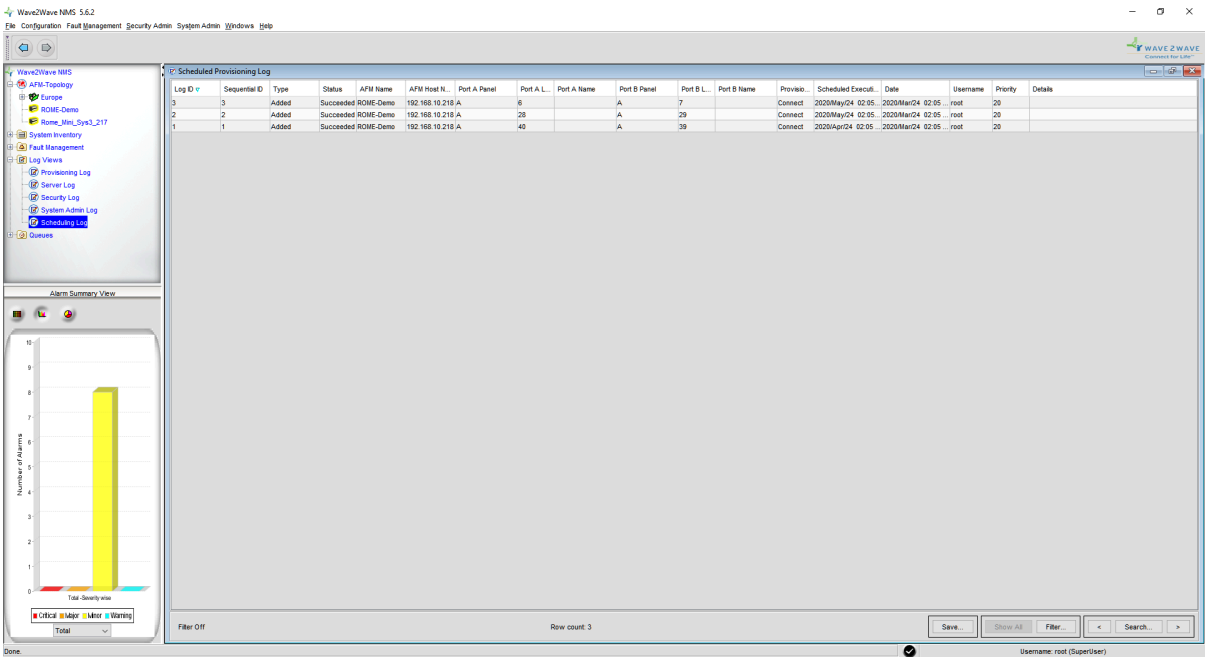


Figure 45. Scheduling Log

FILTERING THE SCHEDULING LOG

To filter the Scheduling Log, perform the following:

1. To open the **Scheduling Log Filter**, open the Scheduling Log and click the **Filter icon** (Filter...) on the Scheduling Log Toolbar (at the bottom of the View). The Scheduling Log Filter dialog appears.

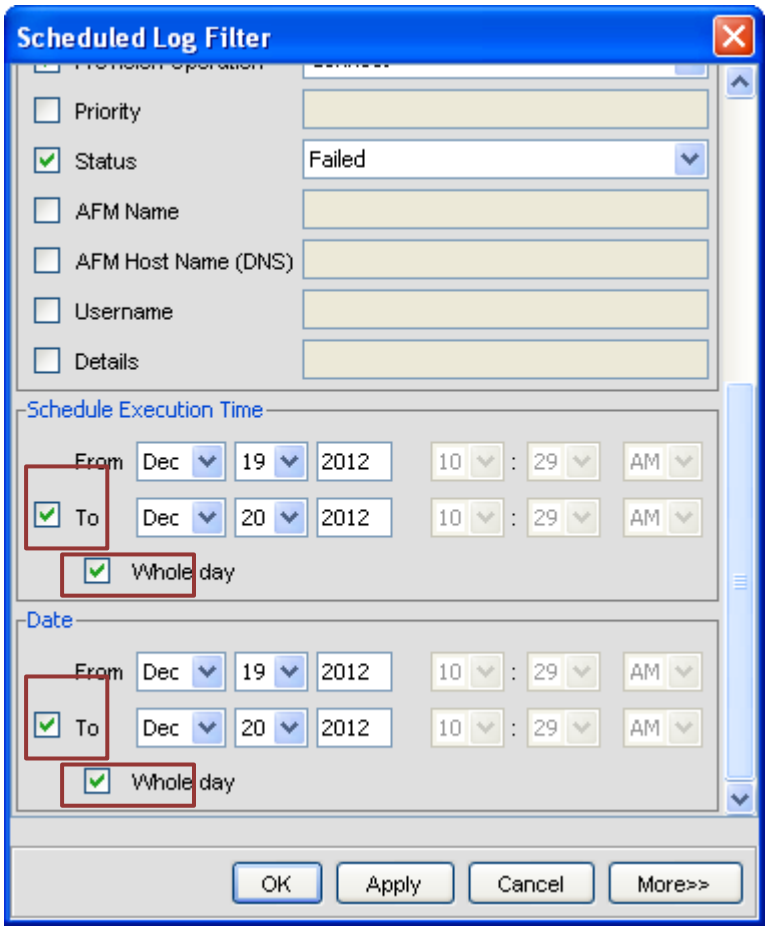


Figure 46. Scheduling Log Filter

2. If required, select any port definition.
3. Select the required **Scheduling Properties**.
4. For Server Properties with a drop down list - select the required field(s).
5. Select the Date/Time properties.
6. Click **Apply** or **OK**. The View will display all information that meets all the filter criteria.

Note: To cancel the filter, click the button labeled Show All Show All. The unfiltered View will be displayed.

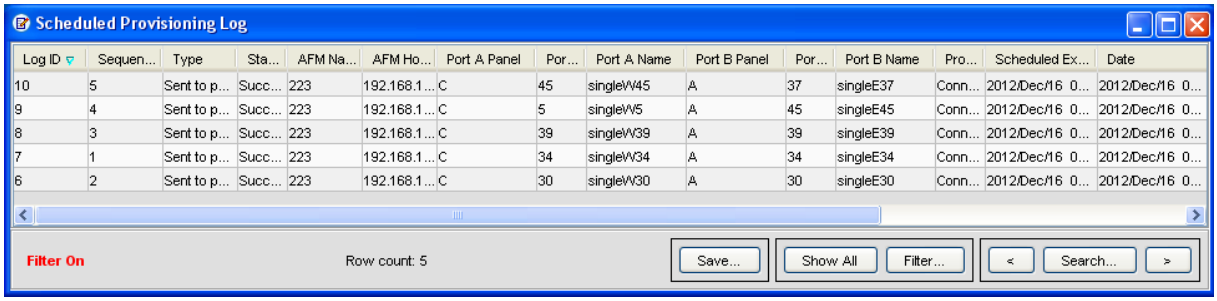


Figure 47. Filtered Scheduling Log

Additionally, it is possible sort the list, by clicking the heading of the desired column (see Sorting Logs, page 65).

LOADING PORT DATA

It is possible to load initial Port data from a *.csv* file (created by the customer).

To load a .csv port data file, perform the following:

1. Select the required ROME in the tree.

2. Click the Load Port Data From File icon in the toolbar ( ).
   The Load Port Data From File dialog is displayed.

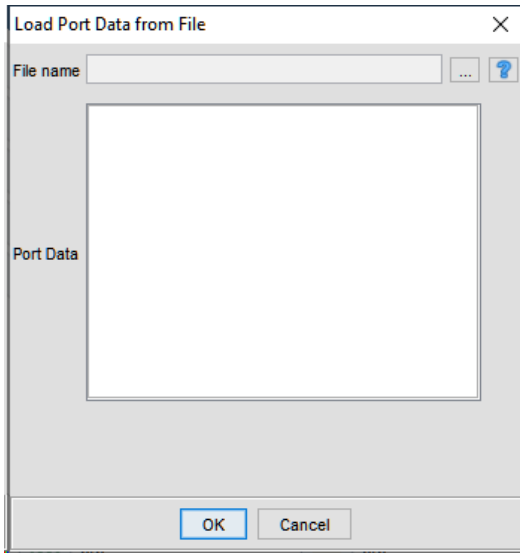


Figure 48. Load Data From File Dialog

3. Click , and browse to the required *.csv* file; then, click **OK**.
   The file updates all the applicable ports.

4. To view an annotated (explained) *.csv* file, click . This file can also be used as a template.

PROVISIONING LOG

The Provisioning Log contains history information related to making connections, disconnections, Locking and Unlocking ports.

To access the Provisioning Log:

For a specific ROME:

1. Select the ROME.
2. Go to **Tree View > Log Views > Provisioning Log.**

For all ROMEs:

3. Click **System Admin > Provisioning Log**

   —or—

4. Go to the Tree Pane and click **Provisioning Log**.

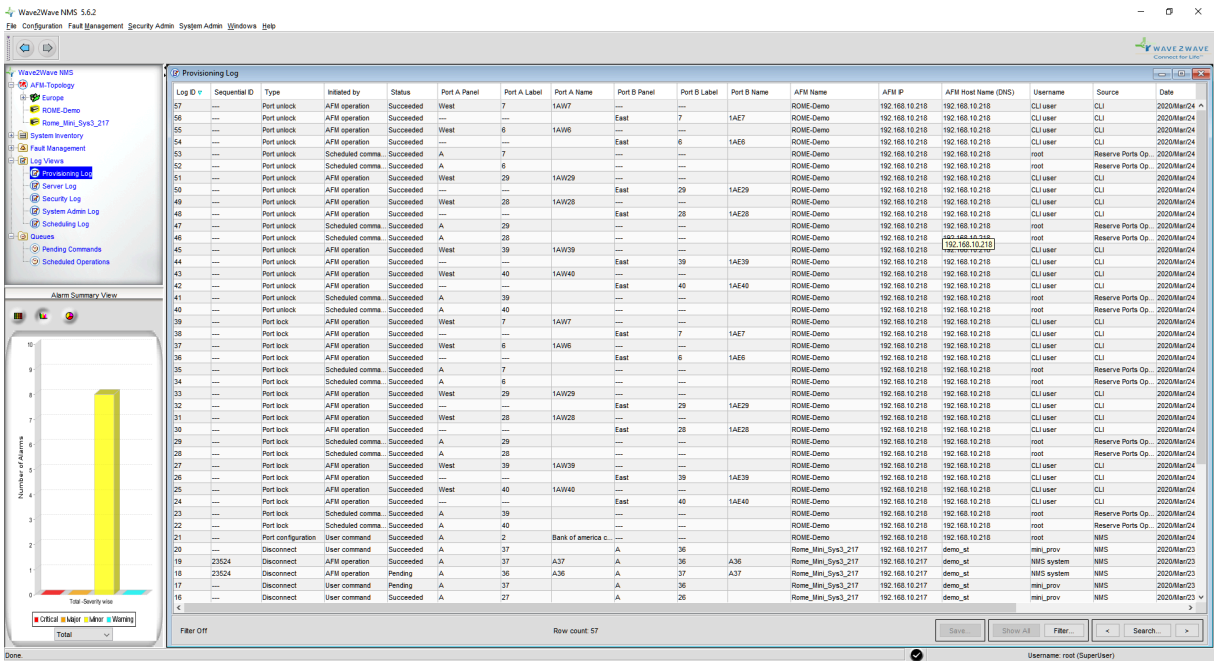


Figure 49. Provisioning Log

SEARCHING PORTS IN LOGS

The View's **Search** function is used to **GoTo** (i.e., to **highlight**) the specific port/s within a **log**. When the Search locates a port, connection, etc., that row of the View is highlighted (see bottom of next page).

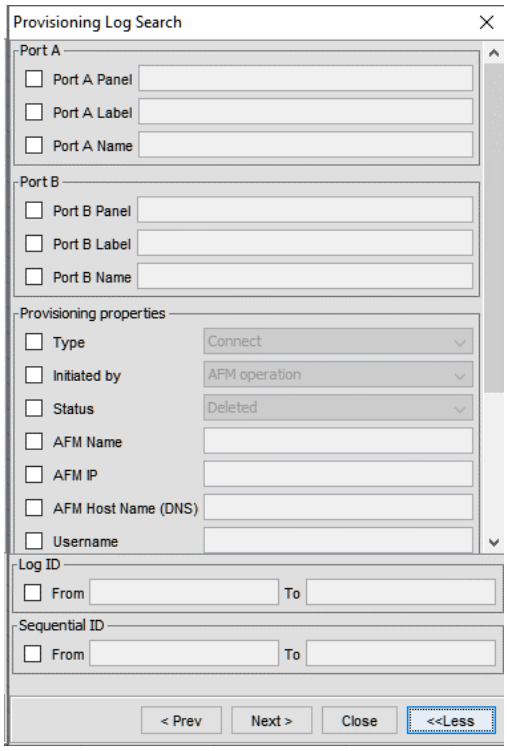


Figure 50. Connection List Search

1. Open the desired log (**Unfiltered** or **Filtered**).
2. Click the button labeled **Search** (

).The **Search** dialog for that View will open.
3. Select the parameter and enter the values.
4. Click **Next** to go to the next port that meets the search criteria (also **highlights** the port).
5. Click **Prev** to go to the previous port that meets the search criteria also **highlights** the port).

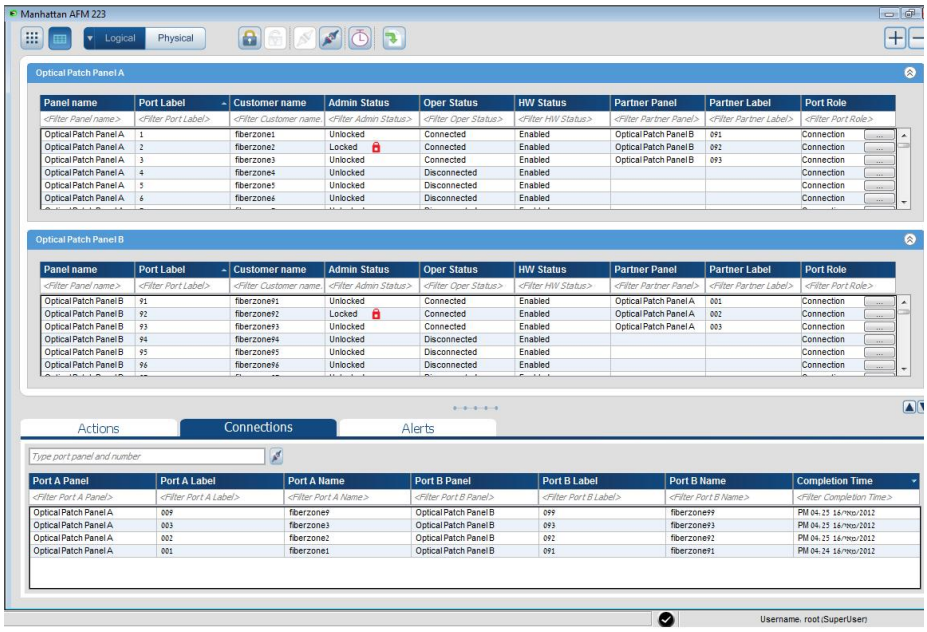


Figure 51. Search by Filtering (Tab View)

In the various Tab views, search is done by filtering. *See page 60.*

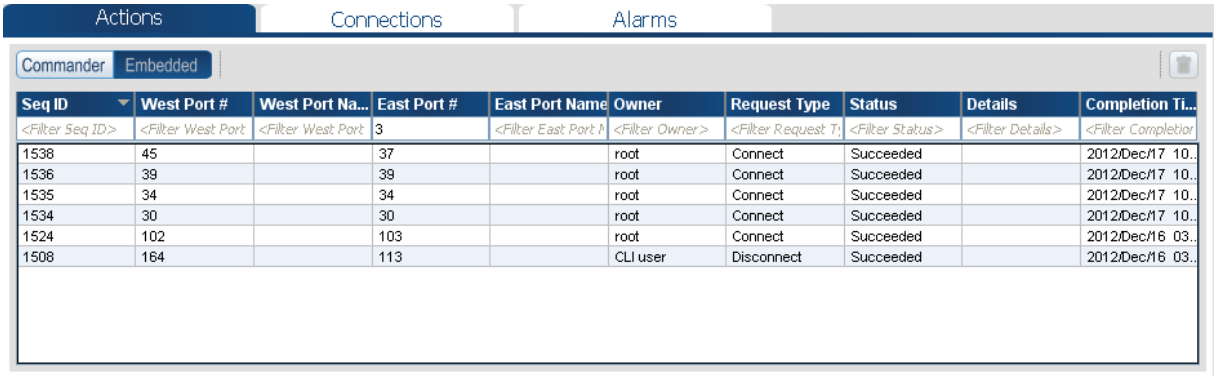
FILTERING LOGS

FILTERING MATRIX LOGS

All the lists displayed under the matrix (i.e., Actions, Connections, Alarms) can be filtered.

To filter a list, start typing the string in the field at the top of the required column. As you type, the list shortens to include only the rows containing that string.

Following is an example, where the filtering string is "3". All the filtered rows contain "3" in that column:



Seq ID	West Port #	West Port Na...	East Port #	East Port Name	Owner	Request Type	Status	Details	Completion Ti...
<Filter Seq ID>	<Filter West Port	<Filter West Port	3	<Filter East Port N	<Filter Owner>	<Filter Request T	<Filter Status>	<Filter Details>	<Filter Completior
1538	45		37		root	Connect	Succeeded		2012/Dec/17 10..
1536	39		39		root	Connect	Succeeded		2012/Dec/17 10..
1535	34		34		root	Connect	Succeeded		2012/Dec/17 10..
1534	30		30		root	Connect	Succeeded		2012/Dec/17 10..
1524	102		103		root	Connect	Succeeded		2012/Dec/16 03..
1508	164		113		CLI user	Disconnect	Succeeded		2012/Dec/16 03..

Figure 52. Filtering Lists

Additionally, it is possible sort the list, by clicking the heading of the desired column (see Sorting Logs, page 65).

FILTERING PROVISIONING LOG AND SCHEDULE LOG

The Wave2Wave NMS enables you to display **subsets** of the data contained in a Log or a View. This is done by **Filtering**. In essence this creates a customized View containing only the information specified.

The following **Log Views** can be filtered. The Filters are context sensitive, and can be customized.

- Provisioning Log
- Schedule Log

Note: The Value Criteria are context dependent and change according to the Filter Criteria.

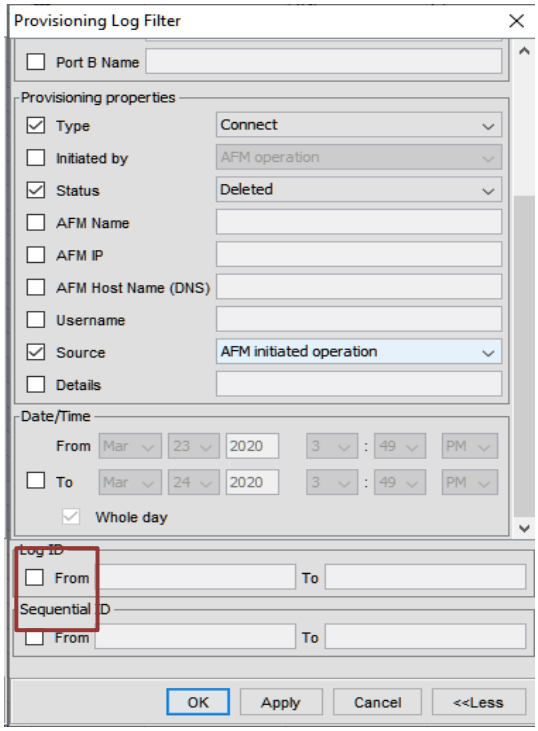


Figure 53. Provisioning Log Filter

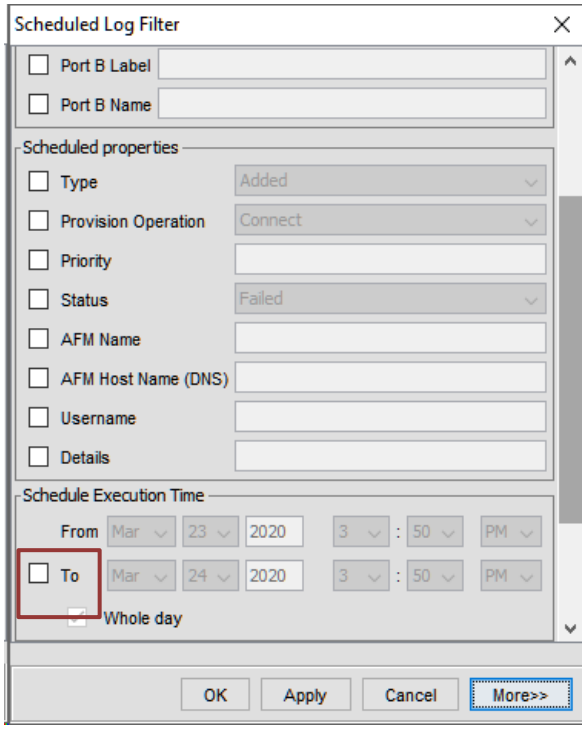


Figure 54. Scheduled Log Filter

Filter Addition – "More"

Click the button labeled "**More**" on any Filter to display the following parameter. To retract, click the button labeled "**Less**".

Note: When activated, the LogID parameter functions when it is displayed and when it is hidden.

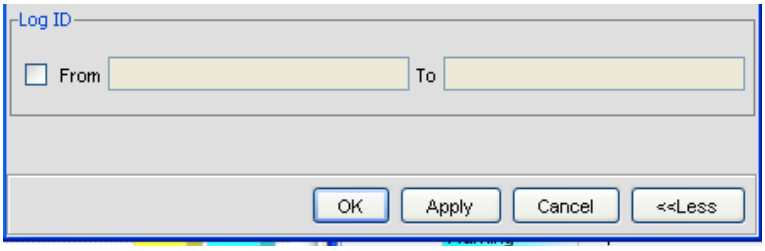


Figure 55. Log Filter

Filtering the Provisioning Log

To filter the Provisioning Log, perform the following:

1. To open the **Provisioning Filter**, open the Provisioning Log and click the **Filter icon** (Filter...) on the Provisioning Log Toolbar (at the bottom of the View). The **Provisioning Log Filter** dialog appears.

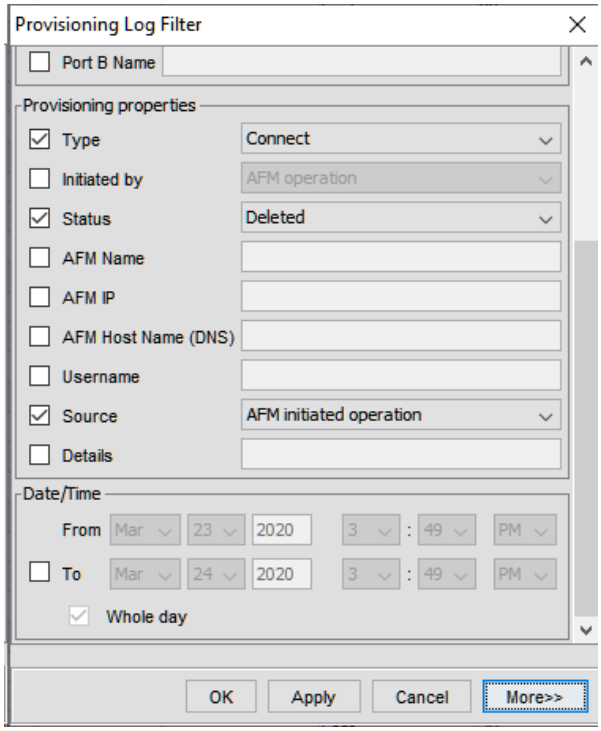
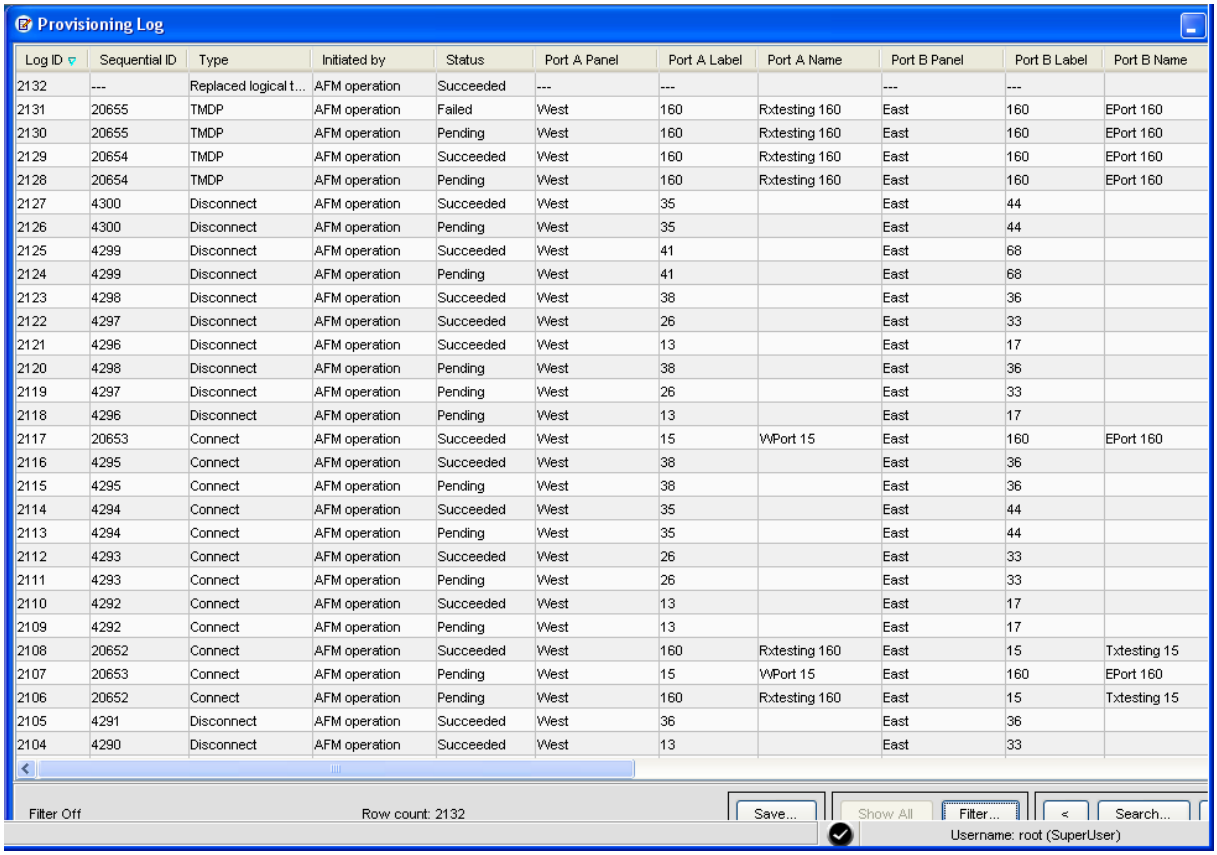


Figure 56. Alarm Log Filter

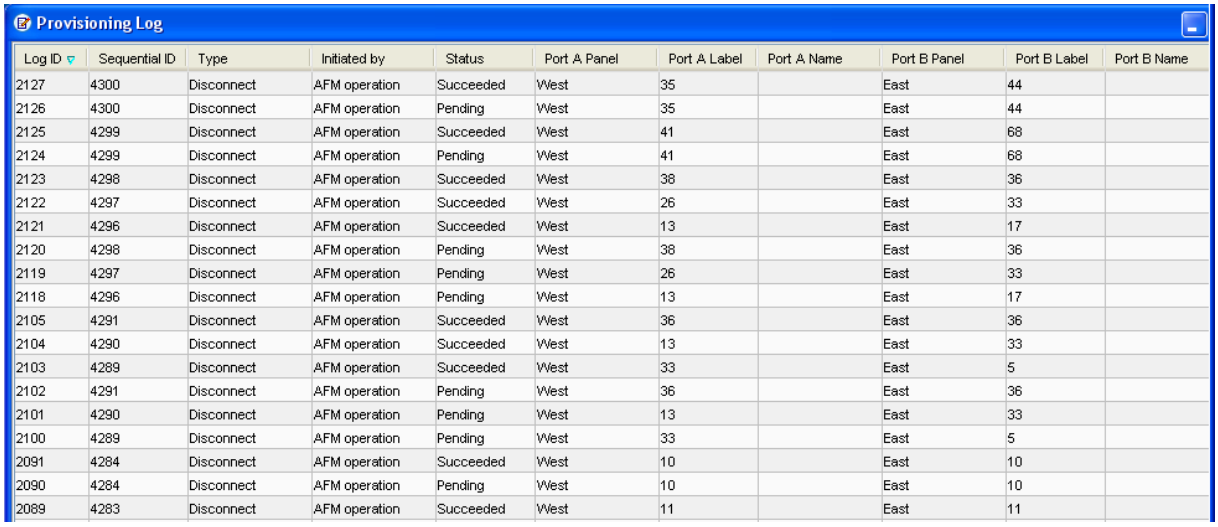
2. Select the required **Provisioning Properties**.
3. For Provisioning Properties with a drop down list - select the required field(s).
4. Select the Date/Time properties.
5. Click **Apply** or **OK**. The View will display all information that meets all the filter criteria.

Note: To cancel the filter, click the button labeled Show All Show All. The unfiltered View will be displayed.



Log ID	Sequential ID	Type	Initiated by	Status	Port A Panel	Port A Label	Port A Name	Port B Panel	Port B Label	Port B Name
2132	---	Replaced logical t...	AFM operation	Succeeded	---	---		---	---	
2131	20655	TMDP	AFM operation	Failed	West	160	Rxtesting 160	East	160	EPort 160
2130	20655	TMDP	AFM operation	Pending	West	160	Rxtesting 160	East	160	EPort 160
2129	20654	TMDP	AFM operation	Succeeded	West	160	Rxtesting 160	East	160	EPort 160
2128	20654	TMDP	AFM operation	Pending	West	160	Rxtesting 160	East	160	EPort 160
2127	4300	Disconnect	AFM operation	Succeeded	West	35		East	44	
2126	4300	Disconnect	AFM operation	Pending	West	35		East	44	
2125	4299	Disconnect	AFM operation	Succeeded	West	41		East	68	
2124	4299	Disconnect	AFM operation	Pending	West	41		East	68	
2123	4298	Disconnect	AFM operation	Succeeded	West	38		East	36	
2122	4297	Disconnect	AFM operation	Succeeded	West	26		East	33	
2121	4296	Disconnect	AFM operation	Succeeded	West	13		East	17	
2120	4298	Disconnect	AFM operation	Pending	West	38		East	36	
2119	4297	Disconnect	AFM operation	Pending	West	26		East	33	
2118	4296	Disconnect	AFM operation	Pending	West	13		East	17	
2117	20653	Connect	AFM operation	Succeeded	West	15	WPort 15	East	160	EPort 160
2116	4295	Connect	AFM operation	Succeeded	West	38		East	36	
2115	4295	Connect	AFM operation	Pending	West	38		East	36	
2114	4294	Connect	AFM operation	Succeeded	West	35		East	44	
2113	4294	Connect	AFM operation	Pending	West	35		East	44	
2112	4293	Connect	AFM operation	Succeeded	West	26		East	33	
2111	4293	Connect	AFM operation	Pending	West	26		East	33	
2110	4292	Connect	AFM operation	Succeeded	West	13		East	17	
2109	4292	Connect	AFM operation	Pending	West	13		East	17	
2108	20652	Connect	AFM operation	Succeeded	West	160	Rxtesting 160	East	15	Txtesting 15
2107	20653	Connect	AFM operation	Pending	West	15	WPort 15	East	160	EPort 160
2106	20652	Connect	AFM operation	Pending	West	160	Rxtesting 160	East	15	Txtesting 15
2105	4291	Disconnect	AFM operation	Succeeded	West	36		East	36	
2104	4290	Disconnect	AFM operation	Succeeded	West	13		East	33	

Figure 57. Unfiltered Log



Log ID	Sequential ID	Type	Initiated by	Status	Port A Panel	Port A Label	Port A Name	Port B Panel	Port B Label	Port B Name
2127	4300	Disconnect	AFM operation	Succeeded	West	35		East	44	
2126	4300	Disconnect	AFM operation	Pending	West	35		East	44	
2125	4299	Disconnect	AFM operation	Succeeded	West	41		East	68	
2124	4299	Disconnect	AFM operation	Pending	West	41		East	68	
2123	4298	Disconnect	AFM operation	Succeeded	West	38		East	36	
2122	4297	Disconnect	AFM operation	Succeeded	West	26		East	33	
2121	4296	Disconnect	AFM operation	Succeeded	West	13		East	17	
2120	4298	Disconnect	AFM operation	Pending	West	38		East	36	
2119	4297	Disconnect	AFM operation	Pending	West	26		East	33	
2118	4296	Disconnect	AFM operation	Pending	West	13		East	17	
2105	4291	Disconnect	AFM operation	Succeeded	West	36		East	36	
2104	4290	Disconnect	AFM operation	Succeeded	West	13		East	33	
2103	4289	Disconnect	AFM operation	Succeeded	West	33		East	5	
2102	4291	Disconnect	AFM operation	Pending	West	36		East	36	
2101	4290	Disconnect	AFM operation	Pending	West	13		East	33	
2100	4289	Disconnect	AFM operation	Pending	West	33		East	5	
2091	4284	Disconnect	AFM operation	Succeeded	West	10		East	10	
2090	4284	Disconnect	AFM operation	Pending	West	10		East	10	
2089	4283	Disconnect	AFM operation	Succeeded	West	11		East	11	

Figure 58. Filtered Log

FILTERING SERVER LOG

To filter the Scheduled Log, perform the following:

1. To open the **Scheduled Log Filter**, open the Server Log and click the **Filter icon** (Filter...) on the Scheduled Toolbar (at the bottom of the View). The **Scheduled Log Filter** dialog appears.

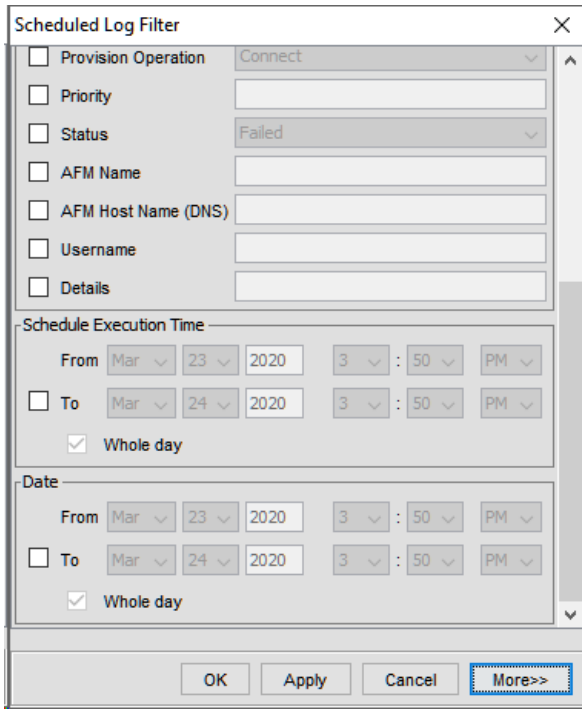


Figure 59. Scheduled Log Filter

2. Select the required **Scheduled Properties**.
3. For Scheduled Properties with a drop down list - select the required field(s).
4. Select the Date/Time properties.
5. Click **Apply** or **OK**. The View will display all information that meets all the filter criteria.

Note: To cancel the filter, click the button labeled Show All (Show All). The unfiltered View will be displayed.

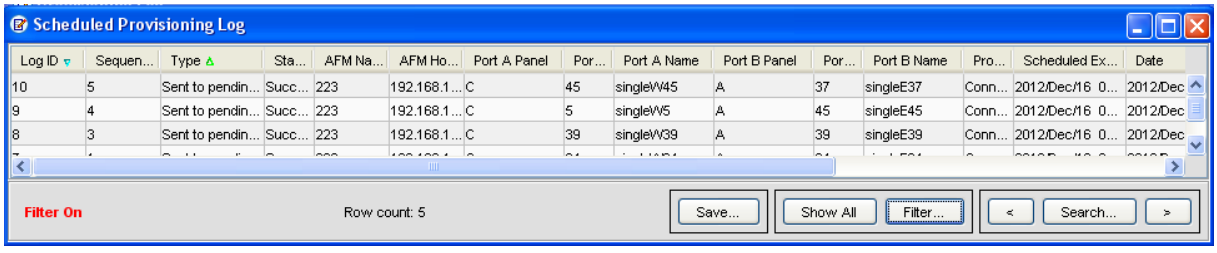


Figure 60. Filtered Server Log

SORTING LOGS

All the logs in the Wave2Wave NMS can be sorted the same way any Windows list is sorted:

Click the heading of the desired column to toggle descending /ascending order.

An arrow pointing downwards indicates that the list is sorted in the descending order.

The following figures show a list sample, sorted according to the Log ID column in descending and ascending order.

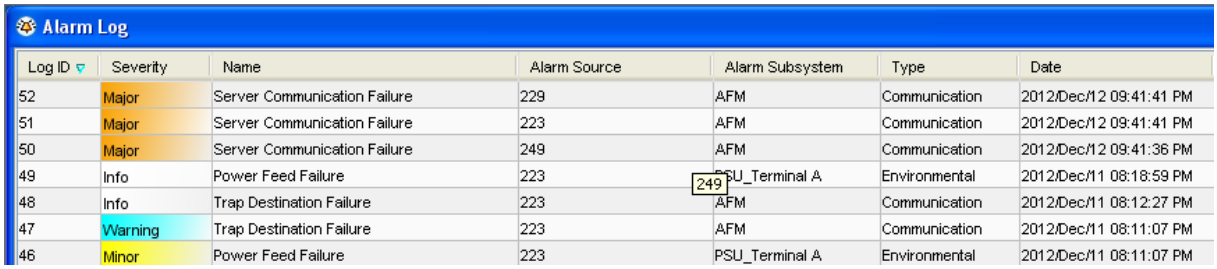


Figure 61. Alarm Log Sorted in Descending Order

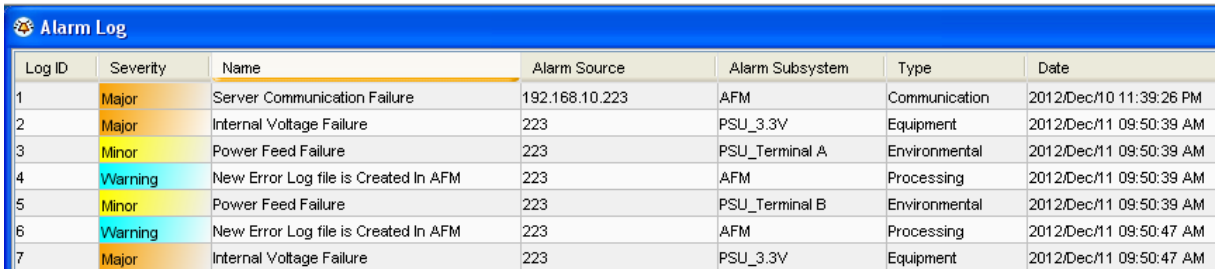


Figure 62. Alarm Log Sorted in Ascending Order

APPENDIX A – UNDERSTANDING SIMPLEX AND DUPLEX LAYOUT

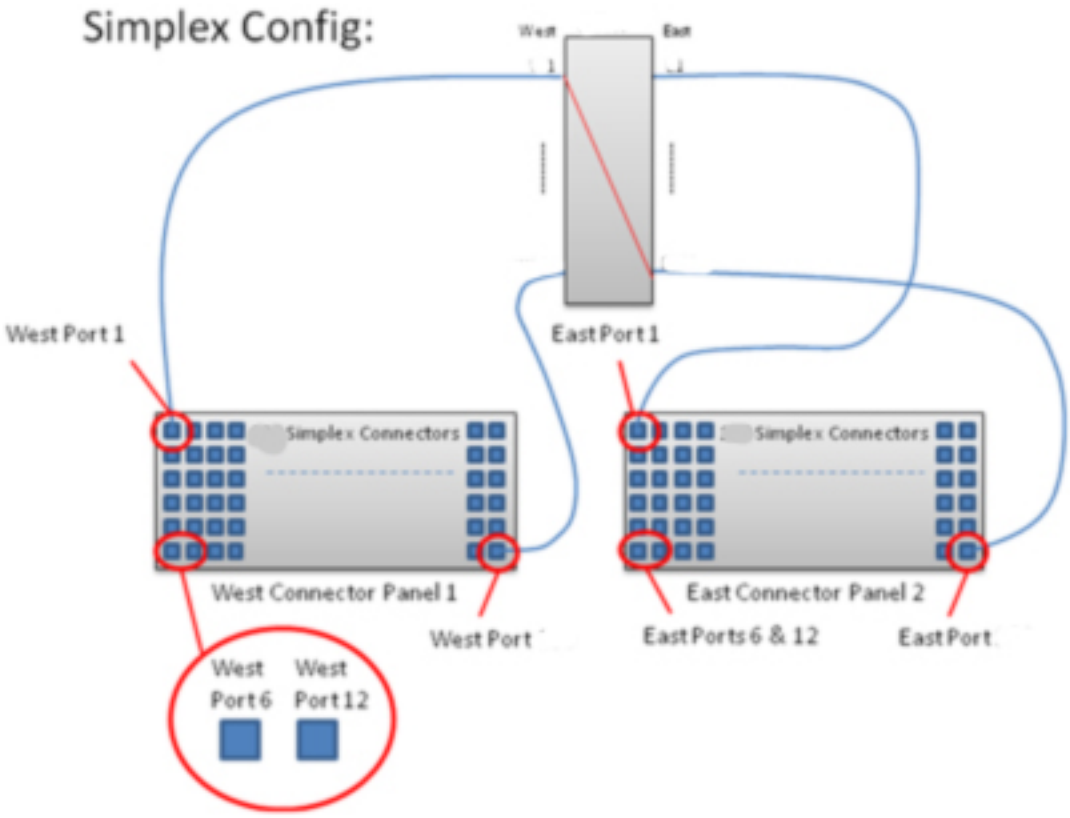
SIMPLEX CONNECTORIZED PANEL LAYOUT DETAILS

Simplex Config Option

The diagram below shows an example of a simplex port connectorized panel layout for the Simplex Config Option, and how it is pre-terminated to the ROME at the factory.

This arrangement consists of a west connectorized panel terminating the 180 fibers within the ROME west fiber bundle, and an east connectorized panel terminating the 180 fibers in the ROME east fiber bundle. The west connectorized panel terminates west simplex ports 1 to 180, while the east connectorized panel terminates east simplex ports 1 to 180. Connectorized panels may be ordered with various connector options, such as LC, SC, ST, etc., depending on customer requirements. This Simplex Config Option provides the user with an ROME supporting [180 west port] by [180 east port] connectivity, where any west port may be internally connected by the ROME to any east port.

Note that the above describes the case for the ROME, ROME-192S, and ROME-96S (unlimited) models (as in the diagram below). In the ROME-96S (limited) model case only one connectorized panel is required, but the 192 port panel version should be used which supports up to [96 fiber port] by [96 fiber port] connectivity.



DUPLEX TX/RX PAIR CONNECTORIZED PANEL LAYOUT DETAILS

There are two main options offered for duplex Tx/Rx paired port connectorized panels, one is referred to as Duplex Config 1 Option and the other as Duplex Config 2 Option. The Duplex Config 1 Option is the more popular of the two options, but both options are available depending on customer specific requirements.

Duplex Config 1 Option

The diagram below shows an example of a duplex Tx/Rx paired port connectorized panel layout for the Duplex Config 1 Option arrangement, and also shows how it is pre-terminated to the ROME at the factory.

This arrangement consists of two connectorized panels. The first connectorized panel is terminated to the first set of 256 Tx/Rx fiber pairs in the first ROME fiber bundle, and the second connectorized panel terminates the second set of 256 Tx/Rx fiber pairs in the second ROME fiber bundle. The first connectorized panel terminates duplex Tx/Rx ports 1 to 128, while the second panel terminates duplex Tx/Rx ports 129 to 256. Connectorized panels may be order with various duplex port connectors, such as LC, SC, ST, etc., depending on customer requirements. This Duplex

Config 1 Option provides the user with an ROME supporting [256 duplex Tx/Rx paired ports], where any duplex port of either of the two panels can be internally connected by the ROME to any other duplex port on either of the two panels. For example duplex port #1 on the first panel may be connected to duplex port #2 also on the first panel, or duplex port #1 on the first panel may be connected to duplex port #100 on the second panel.

Note that the above describes the case for the ROME 500.

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