RADview-SC/TDMoIP

Network Management System

Service Center for TDMoIP Applications

IPmux-14

Publication 12/06

Contents

Chapter 1. Introduction

1.1 IPmux-14 Overview 1-1
1.2 RADview-SC/TDMoIP IPmux-14 Overview 1-1
Overview of the RADview FCAPS Model 1-2
Overview of the IPmux-14 Management Functions 1-2

Chapter 2. Installation and Setup

2.1 Pre-configuring IPmux-14 for Network Management 2-1
Configuring the IP Parameters 2-1
Configuring the Manager List 2-2
2.2 Connecting IPmux-14 to the Management Station 2-3
2.3 Launching RADview IPmux-14 2-3
2.4 Using the GUI 2-4
Selecting the Device or a Port 2-5
Status Indicators 2-5
Common Dialog Buttons 2-6
System Level Menu Options 2-7
Port Level Menu Options 2-8

Chapter 3. Configuration Management

3.1 Setting the System Parameters 3-2
Configuring System Parameters 3-2
Configuring System Information 3-3
Configuring the Serial Port 3-4
Maintaining the Manager List 3-6
Configuring the System Clocks 3-10
Configuring VLAN Parameters 3-12
Configuring the Static MAC Table 3-14
Configuring Quality of Service (Rate Limitation) 3-16
Deleting the LAN Table 3-17
3.2 Setting the Operational Parameters 3-18
Configuring IPmux-14 Ports at the Physical Layer 3-18
Assigning Timeslots to Bundles 3-23
Managing Bundle Connections 3-25
3.3 Additional Tasks 3-29
Displaying Ethernet Interface Information 3-29
Resetting IPmux-14 to the Default Configuration 3-30
Polling the Agent 3-30
Resetting IPmux-14 3-30

Chapter 4. Configuring Typical Applications

4.1 Configuring the IPmux-11 and IPmux-14 Units 4-2
Configuring the Host IP Parameters 4-2
Configuring the Manager List 4-3
4.2 Connecting IPmux-14 to the Management Station 4-3

4.3 Configuration Sequence 4-4
4.4 Creating Circuits 4-5
Creating a Mesh Service Circuit 4-5
Creating a Normal Service Circuit 4-14

Chapter 5. Security Management

5.1 Setting Management Access Authorizations 5-1
5.2 Unix Users and Permissions 5-2

Chapter 6. Performance Management

6.1 Introduction 6-1
6.2 Setting the Polling Interval 6-1
6.3 Viewing Bundle Statistics 6-2
6.4 Viewing Bundle Current Statistics 6-3
6.5 Viewing Bundle Intervals Statistics 6-5
6.6 Viewing E1/T1 Port Current Statistics 6-6
6.7 Viewing Port Intervals Statistics 6-8
6.8 Viewing Ethernet Port Statistics 6-10

Chapter 7. Fault Management

7.1 Monitoring Object Status 7-1
Masking Traps 7-1
Viewing Active Alarms 7-3
Viewing the History Log 7-4
Clearing the History Log 7-5
Viewing Self Test Results 7-6
7.2 Performing Loopback Tests 7-7

Chapter 1

Introduction

This chapter provides an overview of the IPmux-14 device and the RADview Service Center TDMoIP IPmux-14 functions, and contains the following sections:

- IPmux-14 Overview
- RADview-SC/TDMoIP IPmux-14 Overview
- Overview of the RADview FCAPS Model
- Overview of the IPmux-14 Management Functions

1.1 IPmux-14 Overview

IPmux-14 offers a solution for extending traditional E1/T1 or serial data services transparently over packet switched networks (PSNs) such as IP, Ethernet, and MPLS networks. The device converts the data stream coming from its four TDM ports or its serial data port into configurable-sized packets that are extended over the Fast Ethernet network port, and vice versa. IPmux-14 offers end-to-end synchronization for voice/leased line applications. IPmux-14 also features two Fast Ethernet user ports for data (Ethernet) connectivity to the IP/Ethernet network. Management is performed locally from a terminal, or remotely via Web, Telnet, or SNMP.

1.2 RADview-SC/TDMoIP IPmux-14 Overview

IPmux-14 includes an SNMP agent that enables full management from the network via SNMP, for example, by means of RADview network management stations. In addition, IPmux-14 includes the following additional management capabilities via both out-of-band and inband communication:

- Supervision terminal (ASCII terminal or a PC running a terminal emulation program), connected either directly or through a modem or any other type of full-duplex data link. This terminal can perform all of the IPmux-14 supervision and configuration functions, including preliminary system configuration.
- Telnet, from any host capable of IP communication with IPmux-14 (out-of-band using SLIP or PPP, or inband over IP). The functions available via Telnet are similar to those available from a supervisory terminal.
- Web browsers, using ConfiguRAD. ConfiguRAD is a user-friendly Web-based element management system that is embedded in IPmux-14 and provided at no extra cost. ConfiguRAD can be accessed from any standard Web browser.

This manual discusses configuration via RADview, RAD's SNMP-based network management application for PC or Unix. To configure IPmux-14 via ASCII terminal, Telnet, or Web browser, see the IPmux-14 Installation and Operation Manual.

Overview of the RADview FCAPS Model

RADview provides a complete solution for monitoring and controlling IPmux-14. The RADview solutions conform to ITU-T Telecommunication Management Network (TMN) recommendations for SNMP management systems, known as the FCAPS model:

- **Fault management** – detects and correlates faults in network devices, isolates faults and initiates recovery actions.
- **Configuration management** – tracks configuration changes, configures, installs and distributes software and configuration files over the network.
- **Accounting management** – collects accounting data and generates network usage reports.
- **Performance management** – continuously monitors network performance (QoS, CoS) and resource allocation.
- **Security management** – controls and restricts access to network resources.

Overview of the IPmux-14 Management Functions

Table 1-1 lists the operations that you can perform via RADview, and their locations in this manual.

Table 1-1. Management Functions

Operation	Location in User's Manual
Configuration	*Chapter 3*
• System Parameters	
• System Information	
• Serial Port Parameters	
• Manager List	
• System Clocks	
• VLAN Parameters	
• Configuring the Static MAC Table	
• Configuring Quality of Service (Rate Limitation)	
• Deleting the LAN Table	
• Configuring E1/T1 Ports	
• Configuring the Ethernet Ports	
• Assigning Timeslots to Bundles	
• Creating Bundle Connections	
• Removing Bundle Connections	
• Displaying Ethernet Interface Information	
• Displaying Bundle Connection Information	
• Resetting IPmux-14 to the Default Configuration	
• Polling the Agent	
• Resetting IPmux-14	

Operation	Location in User's Manual
Security • Telnet and Web Access	*Chapter 5*
Peformance • Setting the Polling Interval • Viewing Bundle Statistics • Viewing Bundle Current Statistics • Viewing Bundle Intervals Statistics • Viewing E1/T1 Current Port Statistics • Viewing Port Intervals Statistics • Viewing Ethernet Port Statistics	*Chapter 6*
Fault • Masking Traps • Viewing Active Alarms • Viewing the History Log • Clearing the History Log • Viewing Self Test Results • Performing Loopback Tests	*Chapter 7*

Chapter 2

Installation and Setup

This chapter describes how to configure IPmux-14 for management and connect it to the management station, and includes the following sections:

- Pre-configuring IPmux-14 for network management
  - Configuring the IP parameters
  - Configuring the manager list
- Connecting IPmux-14 to the management station
- Launching RADview IPmux-14 element manager
- Using the GUI
  - Selecting the device or a port
  - Status Indicators
  - Common dialog buttons
  - System level menu options
  - Port level menu options.

2.1 Pre-configuring IPmux-14 for Network Management

To remotely administer IPmux via a network management station (NMS), it is necessary to first configure some basic IPmux-14 parameters via an ASCII terminal session to the IPmux-14 control port. The following steps are required:

1. Configuring the host IP parameters (IP address, IP mask, default gateway)
2. Defining the network management station in the manager list.

For more detailed information about configuring IPmux-14 for network management, see Chapter 4 of the IPmux-14 Installation and Operation Manual.

Configuring the IP Parameters

The IPmux host IP parameters may be assigned automatically via DHCP or they may be configured manually.

➤ **To manually configure the host IP parameters:**

1. Display the Host IP menu (Configuration > System > Host IP).
2. Disable the DHCP mechanism.
3. Save the changes.

4. Enter the new host IP parameters for IPmux:
   - Host IP address
   - IP mask
   - Default gateway.
5. Save the changes.

```
Configuration>System>Host IP
1. IP address                          ... (192.168.10.1)
2. IP mask                             ... (255.255.255.0)
3. Default gateway                     ... (0.0.0.0)
4. DHCP                                     (Disable)
5. DHCP Status                         >

>

Please select item <1 to 5>
ESC-prev.menu; !-main menu; &-exit                        1 Mngr/s
```

Figure 2-1. Configuring the Host IP Parameters for IPmux-14

Configuring the Manager List

➤ **To configure the Manager List:**

1. Display the Manager List menu (Configuration > System > Management > Manager list).
2. Enter the IP address of the network management station.
3. Save the changes.

```
Configuration>System>Management>Manager list
1. Manager IP address             ... (192.168.10.100)
2. Link up/down trap                  (Disable)
3. Alarm trap                         (Disable)
4. VLAN tagging                       (Disable)

>

Please select item <1 to 5>
ESC-prev.menu; !-main menu; &-exit                        1 Mngr/s
```

Figure 2-2. Configuring the Manager List

2.2 Connecting IPmux-14 to the Management Station

IPmux-14 can be managed by a network management station (NMS) that is located on the LAN (hub or switch) connected to the one of the unit's Ethernet ports.

➤ **To connect IPmux-14 to the network management station:**

1. Connect a network management station to the LAN (hub or switch).
2. Connect one of IPmux-14's Ethernet ports to the LAN.

2.3 Launching RADview IPmux-14

The RADview IPmux-14 Element Manager application can be opened from the SNMPc Management Console (PC version), HPOV (Unix version), or Network Elements Tree windows. A separate RADview IPmux-14 Element Manager window can be opened for each IPmux-14 unit.

Note *In order to launch the Element Manager, you must first ensure that the server is running and start the client. If it is not already in the NMS database, you must also add the IPmux-14 object to the NMS as a managed element. For additional details on launching and using RADview please refer to the RADview-SC/TDMoIP User's Manual.*

➤ **To open the IPmux-14 Element Manager from the SNMPc Management Console window (PC version):**

- Double-click the IPmux-14 icon located in the map view.

  The RADview IPmux-14 Element Manager window appears.

➤ **To open the IPmux-14 Element Manager from the EMS HPOV window (Unix version):**

- Select the IPmux-14 icon located in the map view and then click the zoom icon (

).

  The RADview IPmux-14 Element Manager window appears.

2.4 Using the GUI

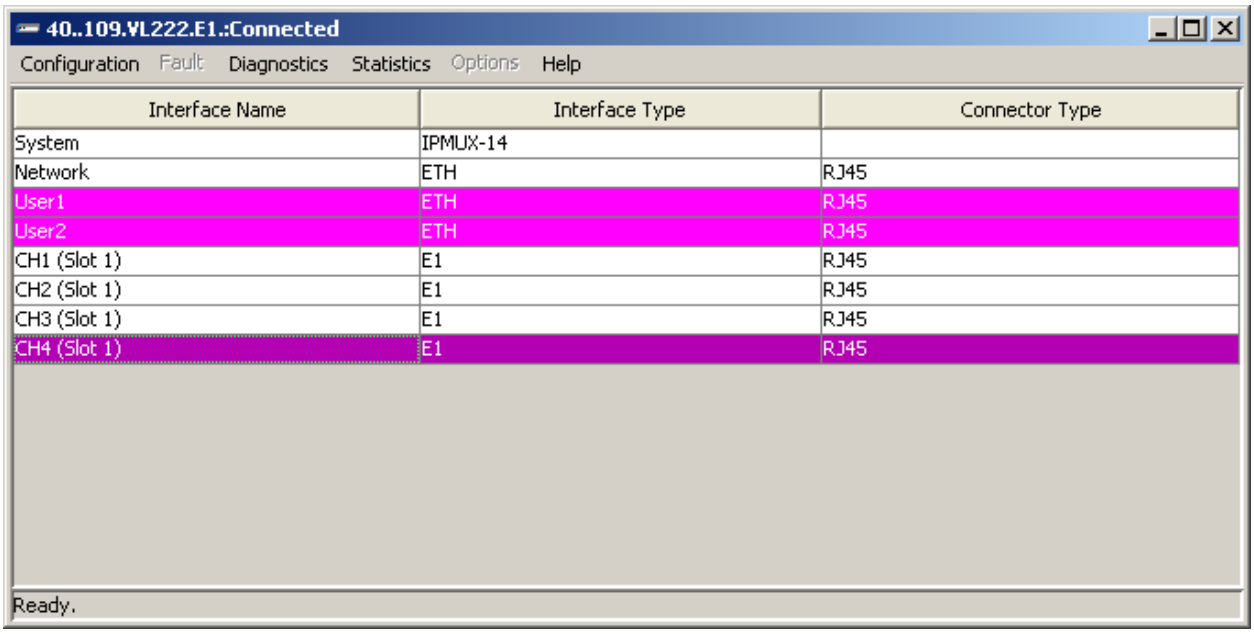

Figure 2-3. Element Manager – IPmux-14

The RADview IPmux-14 Element Manager window provides a dynamically updated representation of the IPmux-14 network element, allowing you to monitor and manage the IPmux-14 device. The Element Manager window displays the device hardware configuration, represented as a list of rows, showing the existing slots and ports. IPmux-14 is managed by selecting a row and then selecting the desired function from the menus. In many cases, this will open a sub-window or dialog box, allowing further selection and manipulation.

The status of each port is indicated by the background color of its row, according to the following table.

Table 2-1. Element Manager Port Status Colors

Row Color	Status
White/Gray	Normal
Purple	Fail
Blue	Test

Each row in the Element Manager window contains three columns:

- The Object column (Interface Name) represents the system or slot object.
- The Interface Type column represents the type of interface port installed in this slot.
- The Connector Type column represents the type of physical connector on this port.

Selecting the Device or a Port

By selecting a row, you can manipulate or manage the selected system or port. When selected, a light blue frame is displayed around the selected window, and the background color of the selected row is dark gray. Only one row can be selected at a time.

There are two IPmux-14 user interface object levels:

- System (whole device) – contains all of the parameters and functions that are common to the whole device.
- Port – contains all of the parameters and functions of the selected port.

➤ **To select the entire device (system):**

- In the Element Manager window, click the **System** row.

➤ **To select a port:**

- In the Element Manager window, click the row of the desired port.

Status Indicators

At the top of the window, the title bar displays <element name>**:**<status>, where status is either **Connected** or **Disconnected**, according to the current connectivity of the network element to the NMS.

At the bottom of the Element Manager window, there is also a communications status bar. Sometimes, congestion in the network handling the management traffic causes significant delays during polling, transfer of large data tables, etc. When feasible, a progress bar is used to inform the operator of the ongoing process status. Otherwise, a message is displayed in the status bar at the bottom of the screen, according to the following table.

Table 2-2. Element Manager Status Bar Messages

Message	Status
Working...	Displayed from the moment when a request is sent to the network element (IPmux-14), until data is received or a certain time expires (around 5 seconds).
Waiting...	Displayed while the RADview station waits more than a few seconds for the network element response, but less than the time-out time.
Interrupted	When all attempts to communicate with network element failed (time-out), or when the response was an SNMP error.
Ready	Displayed after the process has been successfully completed.

Common Dialog Buttons

Function buttons, located in a sub-window or dialog box, each initiate the execution of an operation. The most common buttons, and their respective functions, are listed in the following table.

Table 2-3. Common Dialog Buttons

Button	Function
Set	Confirm and activate the selections made in the dialog box and close the box.
Apply	Confirm and activate the selections made in the dialog box without closing the box.
Cancel	Cancel the selections made in the dialog box and close the box.
Close	Close the dialog box without any other effect.
OK	Confirm the message displayed in an information box, and close the box.
Add	Open a new dialog box that is used to add a new item to the list or table displayed in the dialog box.
Change	Open a new dialog box that is used to change an item selected in the list or table displayed in the dialog box.
Delete	Delete a selected item from the list or table displayed in the dialog box.
Refresh	Poll the managed unit to retrieve again the information needed to display the current dialog box. This action updates the displayed information.

System Level Menu Options

The following tables list the RADview tasks that are available on the system level.

Table 2-4. System Management Options

Tasks – Configuration	Dialog Box and Parameter Location	Path
Configuring System Information	System Information dialog box See *Configuring System Information*	Configuration ➥System Info…
Configuring System Parameters	System Parameters dialog box See *Configuring System Parameters*	Configuration ➥System Parameters…
Viewing Bundle Connection Table	Bundle Connection Table See *Configuring Bundles*	Configuration ➥Bundle ➥Bundle ConnectionTable…
Configuring VLAN Parameters	VLAN Configuration dialog box See *Configuring VLAN Parameters*	Configuration ➥VLAN Configuration…
Configuring the Static MAC Table	Static MAC Table dialog box See *Configuring the Static MAC Table*	Configuration ➥MAC Table…
Configuring Quality of Service (Rate Limitation)	Rate Limitation dialog box See *Configuring Quality of Service (Rate Limitation)*	Configuration ➥QoS ➥Rate Limitation…
Configuring the System Clocks	System Clocks dialog box See *Configuring the System Clocks*	Configuration ➥Clocks…
Deleting LAN table	Delete LAN Table dialog box See *Deleting LAN Table*	Configuration ➥System Commands ➥Delete LAN Table
Restoring default configuration	Default Configuration dialog box See *Resetting IPmux-14 to the Default Configuration*	Configuration ➥System Commands ➥Default Configuration
Resetting the IPmux-14 device	Reset Agent dialog box See *Resetting IPmux-14*	Configuration ➥System Commands ➥Reset
Polling the Agent	See *Polling the Agent*	Configuration ➥System Commands ➥Poll Agent
Tasks – Fault	**Dialog Box and Parameter Location**	**Path**
Viewing active alarms	Active Alarm List See *Viewing Active Alarms*	Fault ➥Alarms…
Viewing the history log	System Log Buffer See *Viewing the History Log*	Fault ➥History Log ➥List…
Clearing the history log	See *Clearing the History Log*	Fault ➥History Log ➥Clear
Viewing self test results	Self Test Results dialog box	Diagnostics

Tasks – Configuration	Dialog Box and Parameter Location	Path
	See *Viewing Self Test Results*	➥Self Test Results…
Tasks – Options	**Dialog Box and Parameter Location**	**Path**
Establishing link between IPmux-14 and manager	Manager List dialog box See *Maintaining Manager List*	Options ➥Manager List…
Masking traps	Masking Traps dialog box See *Masking Traps*	Options ➥Masking Traps…
Setting Telnet and Web Access	Access dialog box See *Enabling or Disabling Telnet and Web Access*	Options ➥Access…
Tasks – Statistics	**Dialog Box and Parameter Location**	**Path**
Setting polling interval	Polling Interval dialog box See *Setting the Polling Interval*	Statistics ➥Polling Interval…
Viewing bundle statistics	Bundle Statistics dialog box See *Viewing Bundle Statistics*	Statistics ➥Bundle Statistics…

Port Level Menu Options

The following tables list the RADview tasks that are available on the port level.

Table 2-5. Port Level Management Options

Tasks – Configuration	Dialog Box and Parameter Location	Path
Viewing Interface Information (for Ethernet only)	Interface Information dialog box See *Viewing Ethernet Interface Information*	Configuration ➥Interface Info…
Configuring port parameters	Interface Parameters dialog box See *Configuring the E1/T1 Ports, Configuring the Ethernet Ports, Configuring the Serial Port*	Configuration ➥Parameters…
Configuring bundles	Bundle dialog box See *Configuring Bundles*	Configuration ➥Bundles…
Tasks – Diagnostics	**Dialog Box and Parameter Location**	**Path**
Initiate a loopback	Loopback State dialog box See *Performing a Loopback Test*	Diagnostics ➥Loopback…
Tasks – Statistics	**Dialog Box and Parameter Location**	**Path**
Ethernet Interface		
Viewing Ethernet interface statistics (only for Ethernet)	Interface Statistics dialog box See *Viewing Ethernet Port Statistics*	Statistics ➥Interface Statistics…
E1/T1 Interface		
Viewing current statistics	Port Current Statistics dialog box See *Viewing Current Statistics*	Statistics ➥Current…
Viewing intervals statistics	Port Intervals Statistics dialog box See *Viewing Intervals Statisitics*	Statistics ➥Intervals …

Chapter 3

Configuration Management

This chapter describes how to configure IPmux-14 on all levels, including system and port, and contains the following sections:

- Setting the System Parameters
  - Configuring System Parameters
  - Configuring System Information
  - Configuring the Serial Port
  - Maintaining the Manager List
  - Configuring the System Clocks
  - Configuring VLAN Parameters
  - Configuring the Static MAC Table
  - Configuring Quality of Service (Rate Limitation)
  - Deleting the LAN Table
- Setting the Operational Parameters
  - Configuring IPmux-14 Ports at the Physical Level
    - Configuring the E1/T1 Ports
    - Configuring the Ethernet Ports
  - Assigning Timeslots to Bundles
  - Managing Bundle Connections
    - Creating Bundle Connections
    - Removing Bundle Connections
- Additional Tasks
  - Displaying Ethernet Interface Information
  - Displaying Bundle Connection Information
  - Resetting IPmux-14 to the Default Configuration
  - Polling the Agent
  - Resetting IPmux-14

3.1 Setting the System Parameters

Configuring System Parameters

The **System Parameters** command enables you to view and set major system parameters for the IPmux-14 device. You can configure parameters such as the Default Gateway, DHCP Client Mode, Aging Time, and Transmit Clock Source, and the External Clock User Quality.

➤ **To set system parameters for the selected IPmux device:**

1. Select **Configuration > System Parameters…**

   The System Parameters dialog box appears. System Parameters differ, depending on the different port combinations. *Table 3-1* describes the different system parameters.

2. Configure the desired parameters.

3. Click <**Set**> to implement the changes.

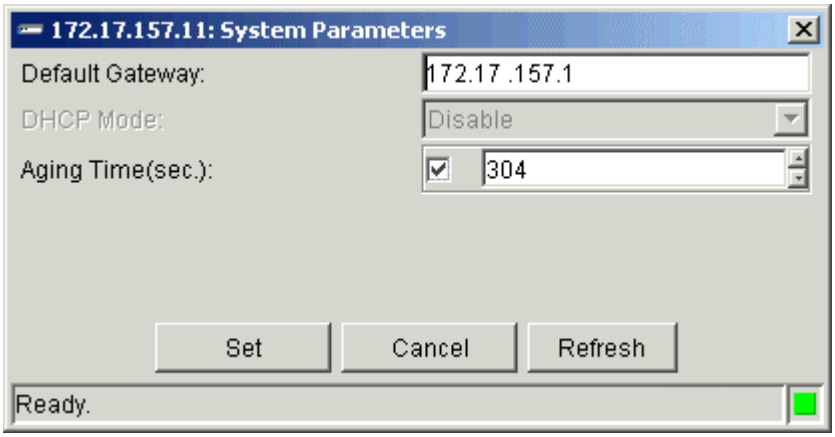

Figure 3-1. System Parameters Dialog Box

Table 3-1. System Parameters

Parameter	Possible Values / Remarks
Default Gateway	**IP Address**
DHCP Mode	DHCP Client Mode **Enabled -** Enables DHCP Client action for IPmux-14 **Disabled -** Disables DHCP Client action for IPmux-14
Aging Time (sec.)	Aging Time, in seconds **Checked**, **Unchecked** **16..4080** (Default is **120**) ***Note:*** *When the checkbox is checked, the Aging Time parameter is enabled and its value can be changed.*

Parameter	Possible Values / Remarks
Transmit Clock Source	Source of the transmit clock **Internal** - Local clock source is used **External** - Recovered from the other interface network and used for data transmission on this interface **Loopback** - Transmit clock recovered from received data **Adaptive** - Adaptive clock regeneration ***Note:*** *Field is disabled if an activate circuit is connected.*
External Clock User Quality	Allows the user to mark the quality level of the clock **ST1** - Stratum-1 PRC (Primary Reference Clock) Rec. G.811 (0x10) **ST2** - Stratum-2 SSU-T (Sync. Source Unit-Transit) Rec. G.812 Transit (0x70) **ST3** - Stratum-3 SSU-L (Sync. Source Unit Local) Rec. G.812 Local (0xA0) **ST3E** - Stratum-3 Enhanced Clock (0xD0) ***Note:*** *This field only appears for IPmux-14 hardware version 2.0 and above.* The quality is encoded according to SSM (Synchronization Status Messages) encoding. The binary bits in positions 8765---- of the byte are encoded in the following manner (Bit 8 is the left-most and most significant bit (MSB); bit 5 is the least significant bit (LSB)): **Bit No.** **8765 Description** 0010 - Stratum-1 / PRC (Primary Reference Clock) Rec. G.811 0100 - Stratum-2 / SSU-T (Sync. Source Unit-Transit) Rec. G.812 Transit 1000 - Stratum-3 / SSU-L (Sync. Source Unit Local) Rec. G.812 Local

Configuring System Information

The **System Info** command enables you to view and set system information for the IPmux-14 device. This information is useful for identifying multiple IPmux-14 units and for tracking their locations and administrative contacts. You can also use the System Information dialog box for setting the system Date and Time and for viewing the DHCP client status.

➤ **To set system information for the selected IPmux device**:

1. Select **Configuration > System Info…**

   The System Information dialog box appears.

2. Enter the required settings. You can change the **Name, Contact, Location, Date,** and **Time** fields.

3. Click <**Set**> to implement the changes.

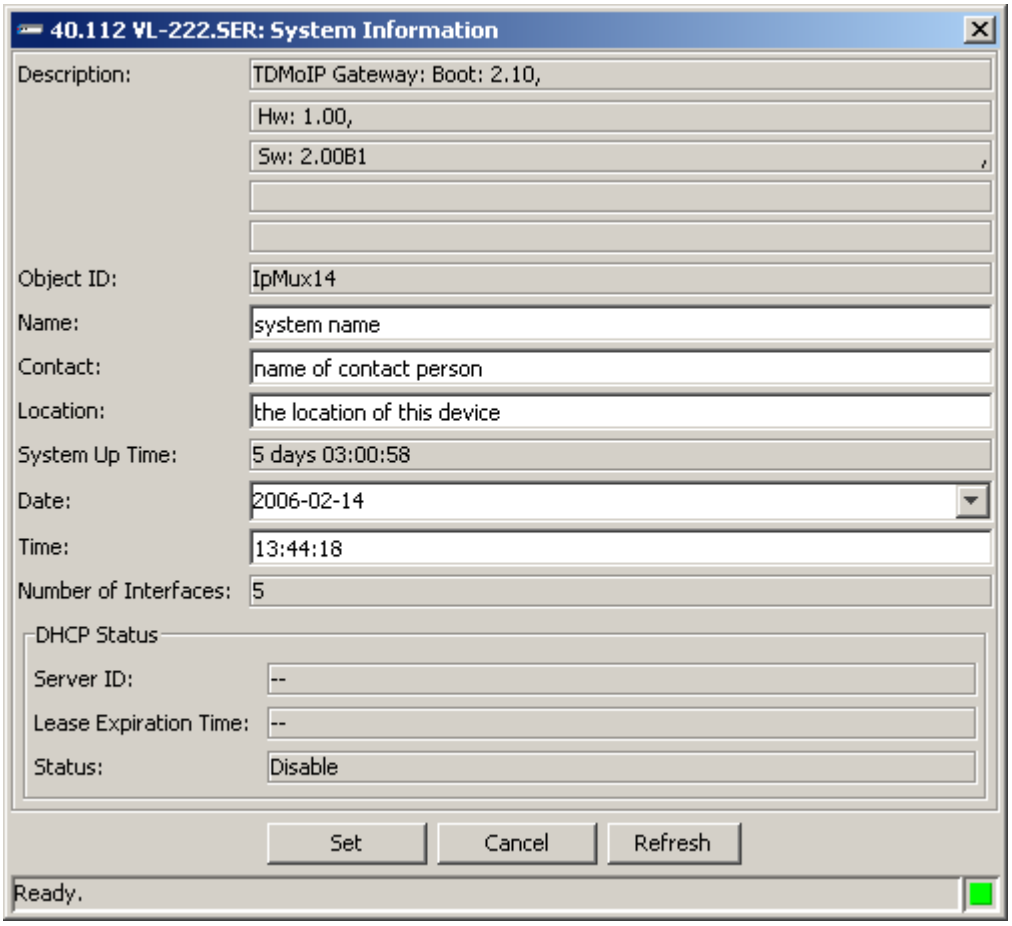

Figure 3-2. System Information Dialog Box

Configuring the Serial Port

The Serial Port Interface **Parameters** command enables you to configure the various settings of the IPmux-14 serial port.

➤ **To configure the serial port:**

1. Click the serial port.
2. Select **Configuration > Parameters...**

   The serial port Interface Parameters dialog box appears
3. Configure the desired parameters and click **Set**.
4. If a confirmation dialog box appears, click **OK**.

Note *Changing the Interface Type causes IPmux-14 to reset.*

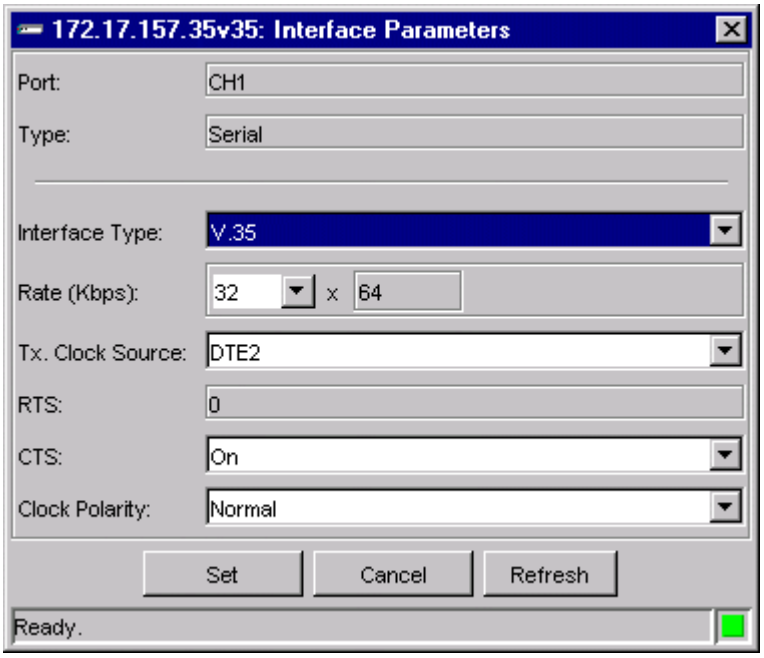

Figure 3-3. Serial Interface Parameters Dialog Box – Serial Port

Table 3-2. Serial Interface Parameters

Parameter	Possible Values / Remarks
Interface Type	The type of serial interface **RS-530 (EIA-530)** **V.35** **X.21** **RS-232** **RS-449** ***Note:*** *If a bundle is defined over the serial interface then the Interface Type field is grayed out and cannot be changed until the bundle is removed.*
Rate (Kbps)	Data rate of the serial interface calculated as N (Speed) × 64 kbps (Multiplier) **1..32 x 64** ***Note:*** *If a bundle is defined over the serial interface then the Rate field is set to* ***1 x 64*** *and is grayed out and cannot be changed until the bundle is removed.*

Parameter	Possible Values / Remarks
Tx. Clock Source	Transmit clock source **DCE – Adaptive** - Clock is recovered from the IPmux-14 network interface and sent to the user's equipment connected to the data port **DCE – Internal** - Clock is received from the internal oscillator and sent to the user's equipment connected to the data port **DTE1 – Adaptive** - IPmux-14 supplies the receive clock to the user equipment connected to the data port and accepts the user transmit clock. The clock is recovered according to the received data flow rate at the IPmux-14 data port. **DTE1 – Internal** - IPmux-14 supplies the receive clock to the user equipment connected to the data port and accepts the user transmit clock. The local clock source (internal oscillator) signal is sent to the user equipment connected to the data port. **DTE2** - Clock is provided by the user's equipment connected to the serial data port When Interface Type is set to **X.21**: **DCE – Adaptive** **DCE – Internal**
RTS	Request to Send signal-line status **Off (0)** **On (1)** ***Note:*** *RTS is applicable only when Tx Clock Source is set to* ***DTE2****; otherwise, the RTS parameter is not displayed.*
CTS	Clear to Send **On** - Always ON **= RTS** - CTS follows RTS ***Note:*** *When Interface Type is set to* ***X.21*** *the CTS parameter is not applicable, and is not displayed.*
Clock Polarity	Clock Polarity **Normal** **Invert**

Maintaining the Manager List

In order to remotely configure IPmux-14, the IP address of the NMS must be listed in the Manager List. The **Manager List** command enables you to display and configure the Manager List, where you designate the destination NMS stations for SNMP traps.

➤ **To display the manager list:**

- Select **Options > Manager List...**

  The Manager List appears.

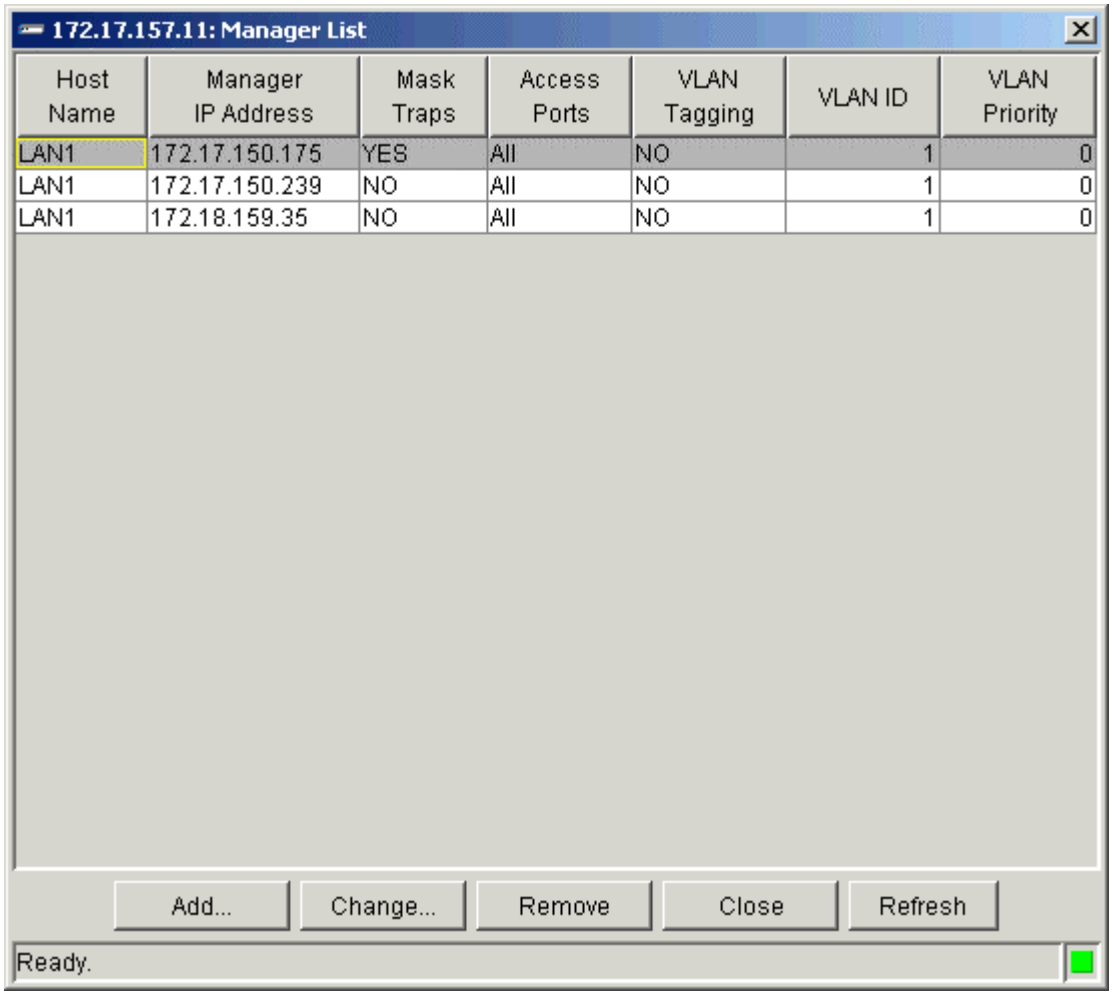

Figure 3-4. Manager List Dialog Box

Table 3-3. Manager List Parameters

Parameter	Possible Values/Remarks
Host Name	**LAN1**
Manager IP Address	IP address of the Network Management System
Mask Traps	Indicates whether or not traps are masked by the system. **Yes, No**
Access Ports	Defines from which port this manager can configure the device. Values differ according to the ports combination. **All** For IPmux-14, when VLAN Tagging for the User1 and User2 ports (in Ethernet Interface Parameters) are set to **Double Tag**, the following values may be selected: **Doubled Tagging** - **Network**, **User1**, **User2**
VLAN Tagging	**Yes, No**
VLAN ID	**1..4094**
VLAN Priority	**0..7**

➤ **To add an entry to the manager list:**

1. In the Manager List, click <Add...>
   The Add Manager dialog box appears (*Figure 3-5*).
2. Enter the required settings.
3. Click <**Set**> to implement the changes.

Note *This option is not available if there are already ten managers.*

Figure 3-5. Add Manager Dialog Box

Table 3-4. Add Manager Parameters

Parameter	Possible Values/Remarks
Host Name.	**LAN1**
Manager IP Address	IP address of the NMS
Access Ports	Defines from which port this manager can configure the device. Values differ according to the ports combination. **All**
VLAN	
VLAN Tagging	**Yes, No**
VLAN ID	**1...4094**
VLAN Priority	**0..7**

Parameter	Possible Values/Remarks
Mask Traps	
None	When checked, disables the other Mask Trap options.
Link Up/Link Down	**Yes** (checked), **No** (unchecked)
Alarm Status	When checked, the trap is enabled.

➤ **To change an entry in the Manager List:**

1. Select an entry in the **Manager List** and click <**Change…**>
   The Change Manager dialog box appears (*Figure 3-6*).
2. Change the desired parameters.
3. Click <**Set**> to implement the changes.

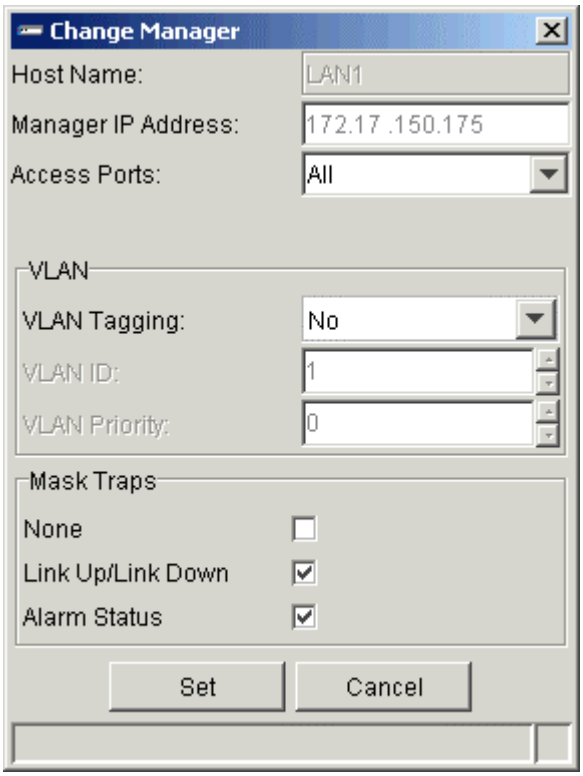

Figure 3-6. Change Manager Dialog Box

➤ **To remove an entry from the Manager List:**

1. Select a row from the **Manager List** (*Figure 3-4*) and click <**Remove**>**.**
   A message appears, warning about possible disconnection of the manager.
2. Click <**OK**>.

Configuring the System Clocks

The **System Clocks** command enables you to configure the Master and Fallback clocks that keep the IPmux-14 communications lines synchronized with external devices. You can also use this command to mark the Clock Quality (Stratum) Level.

➤ **To configure the system clocks:**

1. Select **Configuration > Clocks…**
2. The **System Clocks** Dialog Box appears.
3. Configure the desired parameters and click **Set**.

Note *Master and Fallback clocks cannot be set to the same port.*

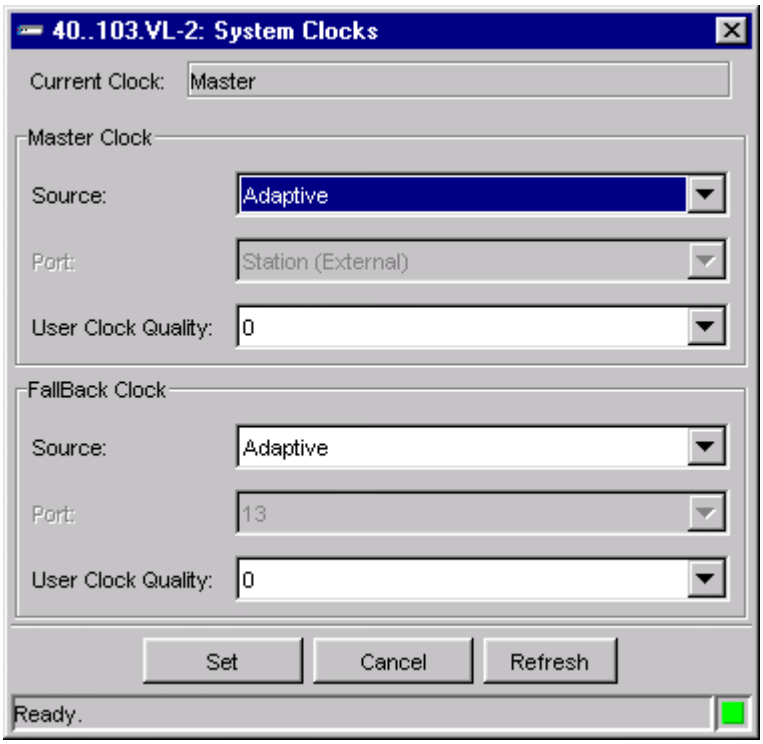

Figure 3-7. System Clocks Dialog Box

Table 3-5. System Clocks Parameters

Parameter	Possible Values / Remarks
Connect Clock	Indicates the current source of the system clock (read only). **Master** **Fallback**
Master Clock	
Source	**Adaptive** **Internal** **Rx**
Port	**Station (External)** **Port1..Port4**

Parameter	Possible Values / Remarks
User Clock Quality	Set this field to mark the quality level of the clock. **ST1** - Stratum-1 Clock (0x10) **ST2** - Stratum-2 Clock (0x70) **ST3** - Stratum-3 Clock (0xA0) **ST3E** - Stratum-3 Enhanced Clock (0xD0) ***Note:*** *This field only appears for IPmux-14 hardware version 2.0 and above.* The quality is encoded according to SSM (Synchronization Status Messages) encoding. The binary bits in positions 8765---- of the byte are encoded in the following manner (Bit 8 is the left-most and most significant bit (MSB); bit 5 is the least significant bit (LSB)): **Bit No.** **8765 Description** 0010 - Stratum-1 / PRC (Primary Reference Clock) Rec. G.811 0100 - Stratum-2 / SSU-T (Sync. Source Unit-Transit) Rec. G.812 Transit 1000 - Stratum-3 / SSU-L (Sync. Source Unit Local) Rec. G.812 Local
Fallback Clock	
Source	**Adaptive** **Internal** **Rx**
Port	**Station (External)** **Port1..Port4**
User Clock Quality	Set this field to mark the quality level of the clock. **ST1** - Stratum-1 Clock (0x10) **ST2** - Stratum-2 Clock (0x70) **ST3** - Stratum-3 Clock (0xA0) **ST3E** - Stratum-3 Enhanced Clock (0xD0) ***Note:*** *This field only appears for IPmux-14 hardware version 2.0 and above.* The quality is encoded according to SSM (Synchronization Status Messages) encoding. The binary bits in positions 8765---- of the byte are encoded in the following manner (Bit 8 is the left-most and most significant bit (MSB); bit 5 is the least significant bit (LSB)): **Bit No.** **8765 Description** 0010 - Stratum-1 / PRC (Primary Reference Clock) Rec. G.811 0100 - Stratum-2 / SSU-T (Sync. Source Unit-Transit) Rec. G.812 Transit 1000 - Stratum-3 / SSU-L (Sync. Source Unit Local) Rec. G.812 Local

Configuring VLAN Parameters

The **VLAN Configuration** command enables you to configure the list of virtual LANs (VLANs). A VLAN is a logical (virtual) network of devices that behave as if they are on the same physical LAN segment, even if they are physically connected to different network segments. In addition, multiple VLANs can co-exist on the same switching hardware, providing a form of logical network segmentation.

➤ **To configure VLAN parameters:**

- Select **Configuration > VLAN Configuration…**

  The VLAN Configuration dialog box appears.

Table 3-6 lists the VLAN Configuration parameters.

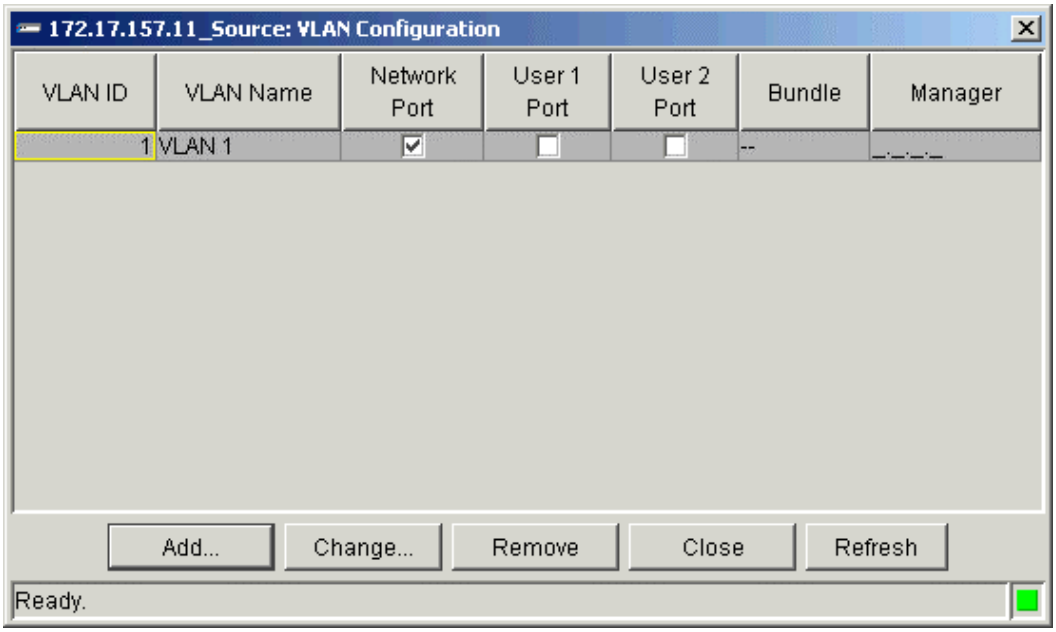

Figure 3-8. VLAN Configuration Dialog Box

Table 3-6. VLAN Configuration Parameters

Parameter	Possible Values / Remarks
VLAN ID	**1..4094**
VLAN Name	The name of the VLAN
Network Port	**Yes, No**
User 1 Port	**Yes, No**
User 2 Port	**Yes, No**
Bundle	**No** **1** **1..64**
Manager	**No** **IP Address**

You have the following options:

- **Add** – Add a new VLAN
- **Change** – Change parameters of a VLAN
- **Remove** – Remove a VLAN
- **Close** – Apply VLAN Parameters and close the dialog box
- **Refresh** - Poll the device and display the latest values in the dialog box.

➤ **To add a new VLAN:**

1. Click **Add.**

   The Add VLAN dialog appears.

2. Configure the desired parameters.
3. Click **Set**.

   The VLAN is added and the screen is refreshed.

Note

- *The **Add** button will be disabled if there are already 16 VLANs in the table.*
- *The VLAN ID must be different from any already in the table.*

➤ **To change parameters of a VLAN:**

1. Click the row of a VLAN, to select it.
2. Click **Change.**

   The Change VLAN dialog appears.

3. Configure the desired parameters.
4. Click **Set**.

   The VLAN parameters are changed.

➤ **To remove a VLAN:**

1. Click the row of a VLAN to select it.
2. Click **Remove**.

   A warning message appears: “Removing VLAN may disconnect the Agent for 30 seconds“.

3. Click **OK**.

   The VLAN is removed.

Note

*The **Remove** button is only enabled for disconnected VLANs; if the selected VLAN is used by a bundle or a Manager, then the **Remove** button will be disabled.*

➤ **To apply the VLAN parameters:**

1. Click **Close.**

   A warning message may appear: “Changing the User VLAN Tagging may disconnect Agent for 30 seconds”.

2. If a warning message appears, click **OK.**

   The parameters are saved to the Agent.

Configuring the Static MAC Table

The **Mac Table** command enables you to manually configure Virtual (VLAN) Bridged Local Area Networks, port-based VLANs (per IEEE 802.1Q), where VLAN membership of a data frame is determined based upon the bridge port on which the frame is received and the frame's destination MAC address. The mappings of Received Bridge Ports and destination MAC Addresses to VLAN IDs are stored in the Static MAC Table.

➤ **To configure the Static MAC Table:**

- Select **Configuration > MAC Table…**

  The Static MAC Table dialog box appears.

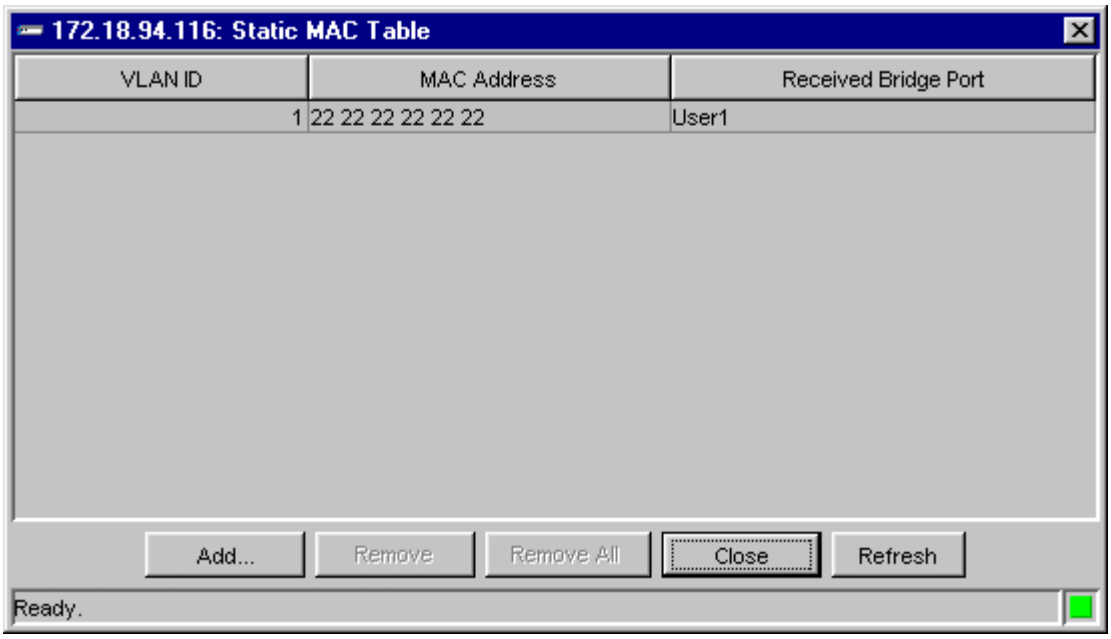

Figure 3-9. Static MAC Table Dialog Box

Table 3-7. Static MAC Table Parameters

Parameter	Possible Values / Remarks
VLAN ID	**1..4094**
MAC Address	The destination MAC address in a frame to which this entry's filtering information applies
Received Bridge Port	The port number of the port from which a frame must be received in order for this entry's filtering information to apply **User1** **User2** **Network**

You have the following options:

- **Add** – Add a new entry to the table
- **Remove** – Remove an entry to the table
- **Remove All** – Remove an entry to the table

➤ **To add a new entry:**

1. Click **Add.**

   The Static MAC Table: Add Entry dialog box appears (see *Figure 3-10).*

2. Configure the desired parameters. The Add Entry parameters are the same as the parameters for the Static Mac Table (see *Table 3-7*).

3. Click **Apply**.

   The new entry is added to the table.

4. Click **Close**.

   The Add Entry dialog closes and the Static MAC Table dialog box displays the updated table.

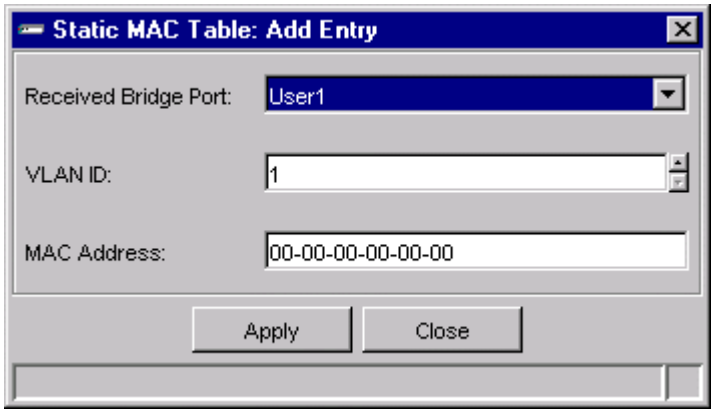

Figure 3-10. Static MAC Table: Add Entry Dialog Box

➤ **To remove entries:**

1. Select the rows of entries you wish to remove from the table.
2. Click **Remove**.

   A confirmation message appears.

3. Click **OK**.

   The entries are removed from the table.

➤ **To remove all entries from the Static MAC Table:**

1. Click Remove All.

   A confirmation message appears.

2. Click **OK**.

   All of the entries are removed from the table.

Configuring Quality of Service (Rate Limitation)

The **Rate Limitation** command enables you to configure rate limits for IPmux-14, in order to maintain Quality of Service (QoS) during times of high network traffic. You can select Ingress Rate Boundaries to define the rate limiting ranges for the ingress traffic. The actual data rate of the incoming traffic is selected from the rates limited by the boundaries. These boundaries are applied to the regular and flooded Rate Limits. You can also select regular or flooded Rate Limits, to be applied to all frames.

➤ **To configure Quality of Service (Rate Limitation):**

1. Select **Configuration > QoS > Rate Limitation…**

   The Rate Limitation dialog box appears.

2. Configure the desired parameters and click **Set**.

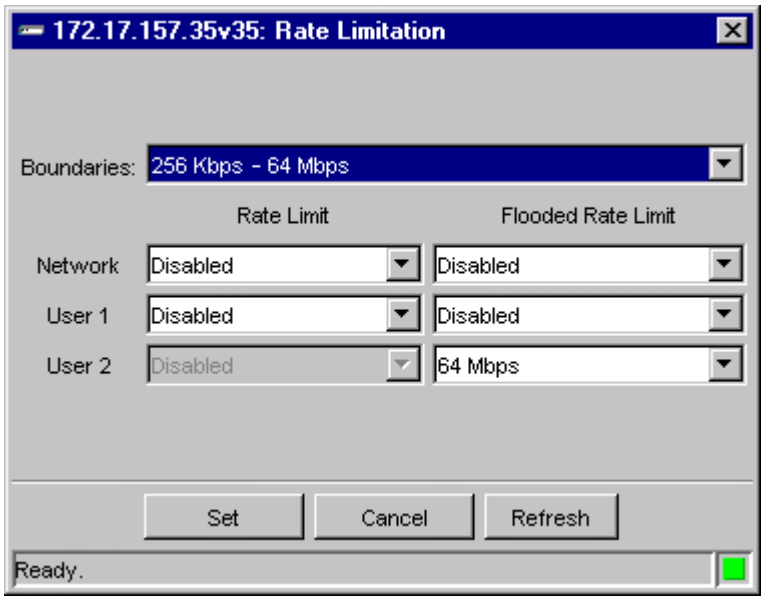

Figure 3-11. Rate Limitation Dialog Box

Table 3-8. Rate Limitation Parameters

Parameter	Possible Values / Remarks
Boundaries	Defines the valid ranges of ingress rate **256 Kbps – 64 Mbps** **5 Mbps – 80 Mbps** **25 Mbps – 50 Mbps**
Rate Limit	The maximum rate permitted to transfer via this port (per Ethernet port: Network/User1/User2) For Network ports: **Disable**, **256 Kbps**, **512 Kbps**, **1 Mbps**, **2 Mbps**, **3 Mbps**, **3.5 Mbps**, **4 Mbps**, **4.5 Mbps**, **5 Mbps**, **8 Mbps**, **10 Mbps**, **16 Mbps**, **20 Mbps**, **25 Mbps**, **40 Mbps**, **50 Mbps**, **80 Mbps** For User1/User2 ports, when Boundaries is set to **256 Kbps – 64 Mbps**: **Disable**, **256 Kbps**, **512 Kbps**, **1 Mbps**, **2 Mbps**, **4 Mbps**, **8 Mbps**, **16 Mbps**, **32 Mbps**, **64 Mbps**

Parameter	Possible Values / Remarks
	For User1/User2 ports, when Boundaries is set to **5 Mbps – 80 Mbps**: **Disable**, **5 Mbps**, **10 Mbps**, **20 Mbps**, **40 Mbps**, **80 Mbps** For User1/User2 ports, when Boundaries is set to **25 Mbps – 50 Mbps**: **Disable**, **25 Mbps**, **50 Mbps**
Flooded Rate Limit	The maximum rate permitted to transfer broadcast, multicast, and unicast flooded frames via this port (per Ethernet port:Network/User1/User2) When Boundaries is set to **256 Kbps – 64 Mbps**: Disable, 256 Kbps, 512 Kbps, 1 Mbps, 2 Mbps, 4 Mbps, 8 Mbps, 16 Mbps, 32 Mbps, 64 Mbps When Boundaries is set to **256 Kbps – 64 Mbps**: Disable, 5 Mbps, 10 Mbps, 20 Mbps, 40 Mbps, 80 MbpsIf When Boundaries is set to **25 Mbps – 50 Mbps**: Disable, 25 Mbps, 50 Mbps ***Note:*** *In IPmux-14, this parameter only applies when Rate Limit is set to* ***Disable****.*

Note

- *Changing the Boundaries parameter automatically changes the set of values that may be selected for the User1 and User2 ports in the Rate Limit and Flooded Rate Limit combo-boxes. For Network ports, it only changes the set of values that may be selected in the Flooded Rate Limit combo-box. When the set of selectable values for a combo-box is automatically changed, its parameter value is set to* ***Disable****.*
- *For user ports (User1, User2), Flooded Rate Limit is only available when Rate Limit is set to* ***Disable****. If Rate Limit is not set to* ***Disable****, then Flooded Rate Limit is grayed out, and its value is not used.*
- *If Flooded Rate Limit is not set to* ***Disable*** *then Rate Limit is grayed out, and its value is not used.*

Deleting the LAN Table

The **Delete LAN table** command deletes all learned addresses from the MAC table. This command is useful when a device has been moved and the cached MAC information is invalid. Normally, the Aging Time expires outdated MAC addresses and automatically deletes them from the LAN table.

➤ **To delete the LAN Table:**

1. Select **Configuration > System Commands > Delete LAN Table.**

Figure 3-12. Delete LAN Table Dialog Box

2. Click <**OK**> to confirm.

   The Dynamic (MAC) LAN Table is deleted.

3.2 Setting the Operational Parameters

Configuring IPmux-14 Ports at the Physical Layer

Configuring the E1/T1 Ports

The E1/T1 Interface **Parameters** command enables you to configure the various parameters of the E1/T1 port (the port's software configuration). The parameters vary according to the port type.

➤ **To display or configure E1/T1 parameters:**

1. Click an E1/T1 port.
2. Select **Configuration > Parameters...**

   The E1 or T1 Interface Parameters dialog box appears (see *Figure 3-13* and *Figure 3-14*).

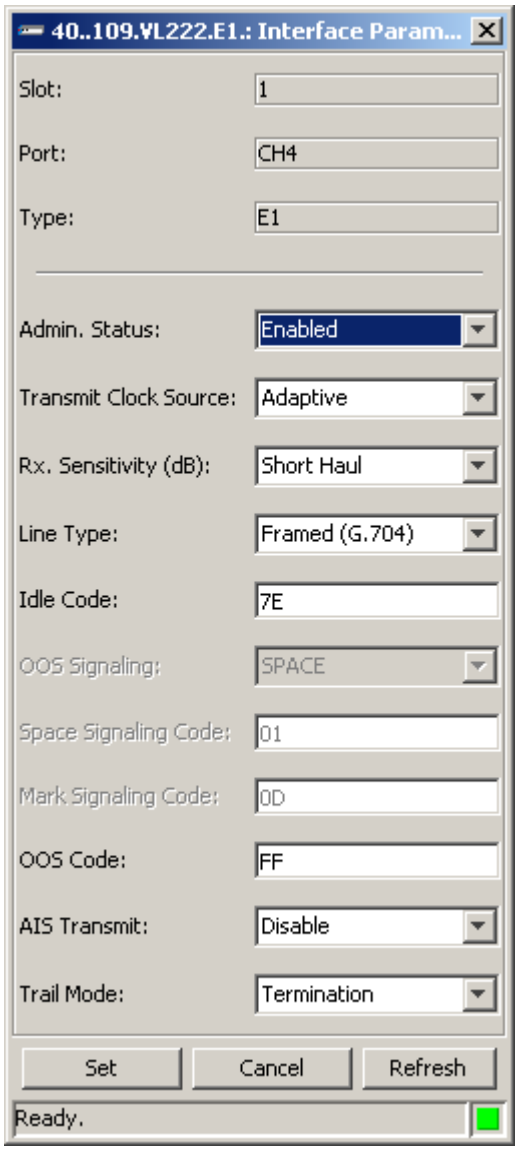

Figure 3-13. E1 Interface Parameters Dialog Box

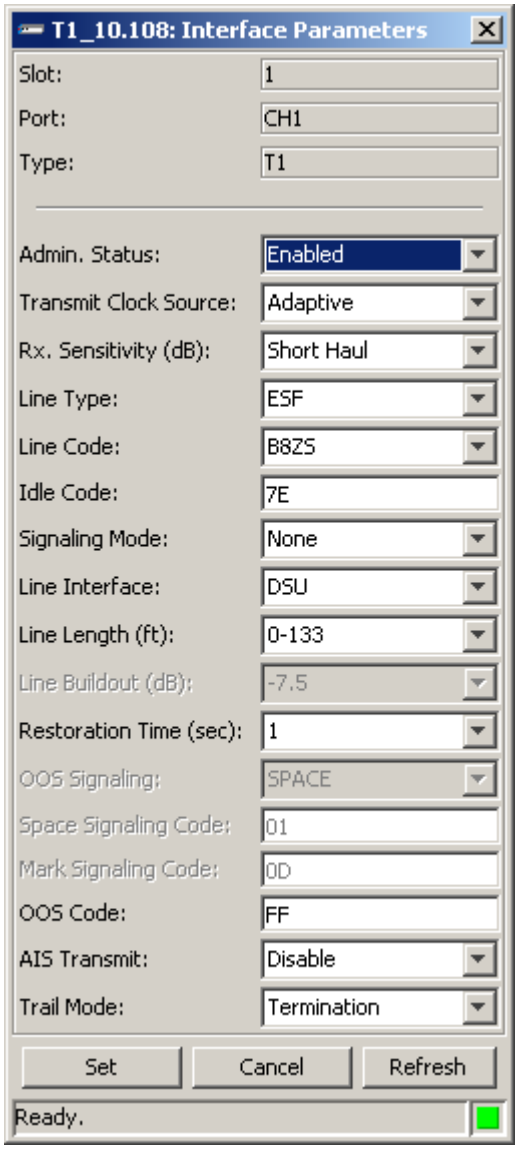

Figure 3-14. T1 Interface Parameters Dialog Box

Table 3-9. E1/T1 Interface Parameters

Parameter	Possible Values / Remarks
Port	**E1, T1**
Admin Status	**Enable, Disable**
Transmit Clock Source	Source of the transmit clock **Adaptive** - Adaptive clock regeneration **Loopback** - Transmit clock recovered from received data **Internal** - Local clock source, either the internal clock or an external clock that is directly attached to IPmux-14 **System** - Recovered from the other interface network and used for data transmission on this interface. This option is only available when the external clock is operational.

Parameter	Possible Values / Remarks
User Clock Quality	Marks the quality level of clock **ST1** - Stratum-1 Clock (0x10) **ST2** - Stratum-2 Clock (0x70) **ST3** - Stratum-3 Clock (0xA0) **ST3E** - Stratum-3 Enhanced Clock (0xD0) ***Note:*** *This field only appears for IPmux-14 hardware version 2.0 and above.* The quality is encoded according to SSM (Synchronization Status Messages) encoding. The binary bits in positions 8765---- of the byte are encoded in the following manner (Bit 8 is the left-most and most significant bit (MSB); bit 5 is the least significant bit (LSB)): **Bit No.** **8765 Description** 0010 - Stratum-1 / PRC (Primary Reference Clock) Rec. G.811 0100 - Stratum-2 / SSU-T (Sync. Source Unit-Transit) Rec. G.812 Transit 1000 - Stratum-3 / SSU-L (Sync. Source Unit Local) Rec. G.812 Local
Rx Sensitivity	Determines the maximum attenuation of the receive signal that can be compensated for by the interface receive path **Long Haul** - -32 dB **Short Haul** - -10 dB
Line Type	Line type affects the number of bits per second that the link can reasonably carry. It also affects the interpretation of the port performance statistics. For E1 ports: **Framed (G.704), Framed-CRC, Framed-MF, Framed-CRC-MF** **Unframed (G.703) -** Use when the data being transmitted is unframed. For T1 ports: **ESF** - Extended SuperFrame **D4** - AT&T D4 format **Unframed -** Use when the data being transmitted is unframed. ***Note:*** *Line Type is grayed out and can't be changed when a bundle is defined over the selected interface.*
Line Code (only applicable for T1 ports)	Type of Zero Code Suppression used on the link **B7ZS, B8ZS, AMI**
Idle Code (not applicable when the Line Type is unframed)	Byte pattern of the data transmitted in the E1/T1 Framer idle timeslots **0** to **FF**
Signaling Mode (only applicable for T1 ports)	Type of signaling used on the link **None, Robbed Bit**
Line Interface	T1 device operation mode **DSU, CSU** ***Note:*** *Only applicable for T1 ports*
Line Length (feet)	**0-133, 134-266, 267-339, 400-533, 534-655** ***Note:*** *Only applicable for T1 ports with Line Mode DSU*

Parameter	Possible Values / Remarks
Line Buildout (dB)	Transmit line gain for T1 CSU line mode **0, -.5, -5, -2.5** ***Note:*** *Only applicable for T1 ports* with *CSU Line Mode*
Restore Time (sec)	Used to change the sync. Algorithms to reduce the time required for the port to return to normal operation after a RED (LOF - loss of frame synchronization) alarm. **1, 10** ***Note:*** *Only applicable for T1 ports. Not applicable when the Line Type is Unframed.*
OOS Signaling	Defines the value to be sent as a signal after alarm detection: **Space** - Both A and B signaling bits are forced to '0' during out-of-service periods **Mark** - Both A and B signaling bits are forced to '1' during out-of-service periods **Space_Mark** - A and B bits are forced to '0' for 2.5 seconds; then they are switched to '1' until out-of-service condition disappears **Mark_Space** - A and B bits are forced to '1' for 2.5 seconds; then they are switched to '0' until out-of-service condition disappears
Space Signaling Code	Space Signaling Code – value to be sent as a signal during the first 2.5 seconds after alarm detection E1, T1-ESF: **1..F** T1-SF(D4): **1..4**
Mark Signaling Code	Trunk conditioning signal value after alarm detection E1, T1-ESF: **1..F** T1-SF(D4): **1..4**
OOS Code	Trunk conditioning data pattern to be sent upon a DS0 fail ***Note:*** *When Line Type is set to* ***Unframed****, OOS Code is grayed out and its value cannot be changed.*
AIS Transmit	**Enable, Disable**
Trail Mode	Enables the end-to-end transfer of TDM OAM in framed mode, when theirTDMoIP Payload Format is set to **V2**. **Termination** - Trail mode is disabled **Extension** - Trail mode is enabled

Configuring the Ethernet Ports

The Ethernet Interface **Parameters** command enables you to configure the various parameters of the Ethernet port (the port's software configuration).

➤ **To set configuration parameters for the Ethernet interface:**

1. Click the User or Network Ethernet port.
2. Select **Configuration > Parameters...**

   The Ethernet Interface Parameters dialog box appears (*Figure 3-15*).

Note *The User Ethernet rate is the smaller value of User Rate Limit and (100–TDMoIP traffic).*

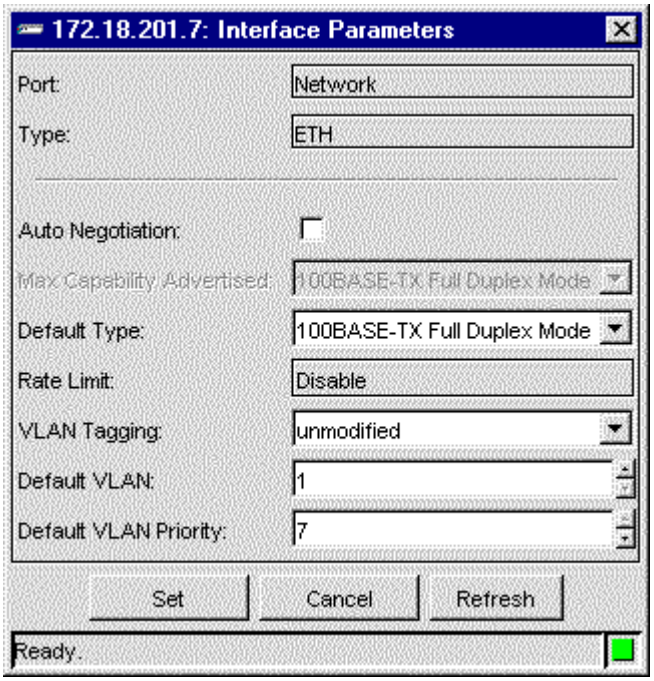

Figure 3-15. Interface Parameters Dialog Box – Network/User Port

Table 3-10. Ethernet Interface Parameters

Parameter	Possible Values / Remarks
Port	**User, Network**
Type	**ETH**
Auto Negotiation	**Checked** (enabled)**, Unchecked** (disabled) ***Note:*** *Disabled for fiber optic Ethernet interface.*
Max Capability Advertised	Defines the maximum capabilities of the interface. Only applicable when autonegotiation is enabled. **10BASE-T half duplex mode, 10BASE-T full duplex mode, 100BASE-TX half duplex mode, 100BASE-TX full duplex mode** ***Note****: Working in half duplex mode is not optimal and might cause communication problems.* *Disabled for fiber optic Ethernet interface.*
Default Type	**10BASE-T half duplex mode, 10BASE-T full duplex mode, 10BASE-TX half duplex mode, 10BASE-TX full duplex mode** Only applicable when autonegotiation is disabled
Rate Limit (Kbps)	**Disable, 256, 512, 1000, 2000, 4000, 8000, 16000, 20000, 32000, 40000, 64000, 80000** ***Note:*** • *The Rate Limit parameter is read-only.* • ***2000, 40000,*** *and* ***80000*** *are only available for the Network Port.* • ***32000*** *and* ***64000*** *are only available for the User Port.*

Parameter	Possible Values / Remarks
VLAN Tagging	VLAN Tagging **Unmodified, Tag, Double Tag, Untag** ***Note:*** • ***Double Tag*** *is not available for the Network Port.* • *For the User1 port of IPmux-14, setting VLAN Tagging to* ***Double Tag*** *automatically sets the User2 port to* ***Double Tag*** *as well. Setting the User2 port to* ***Double Tag*** *has no effect on the User1 port VLAN Tagging.*
Default VLAN	Default VLAN
Default VLAN Priority	**0..7** When Rate Limit is 32000: **2..7** When Rate Limit is 64000: **4..7**

Note

When ***Auto Negotiation*** *is disabled and* ***Max Capability Advertised*** *is different from the capabilities of the LAN, for example, when Max Capability is 100BaseT full duplex, while the LAN is in 10BaseT half duplex, the NMS will disconnect.*

Assigning Timeslots to Bundles

Bundles are groups of timeslots. The Bundle Table displays the details of each bundle in the upper section of the table, and a representation of each timeslot with the bundle assigned to it in the lower section of the table. Each bundle can be assigned to multiple timeslots, but each time slot can only have one bundle assigned to it.

The **Bundles** command enables you to assign timeslots to bundles, and to remove the timeslot assignments from bundles.

➤ **To view bundles for an E1/T1 port:**

1. Click an E1/T1 port.
2. Select **Configuration > Bundles...**

   The Bundles Table appears.

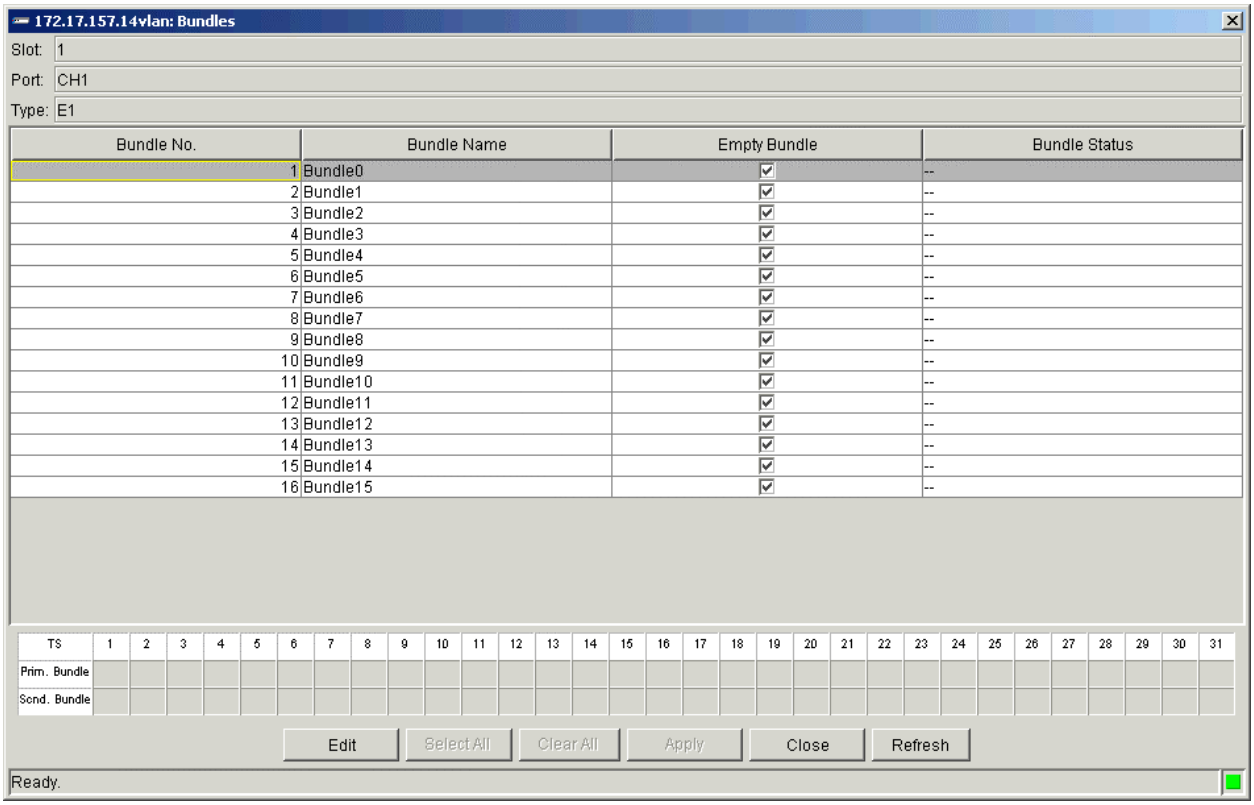

Figure 3-16. Bundles Table – Port Level

Table 3-11. Bundle Configuration Table Parameters – Port Level

Parameter	Possible Values/Remarks
Bundle No.	Bundle Number
Bundle Name	Name of the selected bundle
Empty Bundle	When checked, indicates the bundle has not been assigned to any TSs (timeslots)
Bundle Status	Status of the bundle **Connected, Disabled, Remote Fail, Local Fail, Unavailable, Validation Fail**, **Sequence Error**, **Buffer Underflow**, **Buffer Overflow**
Time Slots	The timeslots and the bundles assigned to them. Timeslots with bundles assigned to them are marked with a dark blue box, while unassigned timeslots are marked with a gray box. A T1 port has 24 timeslots that can be assigned to a bundle; an E1 port has 31 (without MF) or 30 (with MF).

➤ **To select an available timeslot:**

1. Select a bundle from the **Bundles Table** and click **Edit…**
2. Click the square beneath the timeslot number.
   Selected timeslots appear yellow.
3. Click <**Apply**>.

➤ **To select all available timeslots for the selected bundle:**

- Click <**Select All**>.

➤ **To remove all selected timeslots from the selected bundle:**

- Click <**Clear All**>.

Note *You cannot edit a bundle that has already been used to define a connection in the Bundle Connection Table (Figure 3-18). To edit such a bundle, first delete the bundle from the Bundle Connection Table (Figure 3-18), and then return to the Bundle Table to select new parameters.*

Managing Bundle Connections

Bundles are groups of timeslots. The **Bundle Connection Table** command displays the detailed technical parameters of each bundle in the system. Although you can use the Element Manager to view the bundle connections and to remove them, complete management of bundle connections is accomplished using the Service Center map. For information on managing bundle connections using the Service Center map, refer to Chapter 5 of the RADview SC/TDMoIP System Manual.

Creating Bundle Connections

For information on creating and managing bundle connections using the Service Center map, refer to Chapter 5 of the RADview SC/TDMoIP System Manual. For examples, see *Creating Circuits*, in this manual.

Removing Bundle Connections

For information on removing bundle connections using the Service Center map, refer to Chapter 5 of the RADview SC/TDMoIP System Manual. In cases where a circuit is broken, you may use the Bundle Connection Table to manually remove a bundle connection.

➤ **To display the bundle connection table:**

- Select **Configuration > Bundle Connection Table…**

  The Bundle Connection Table appears.

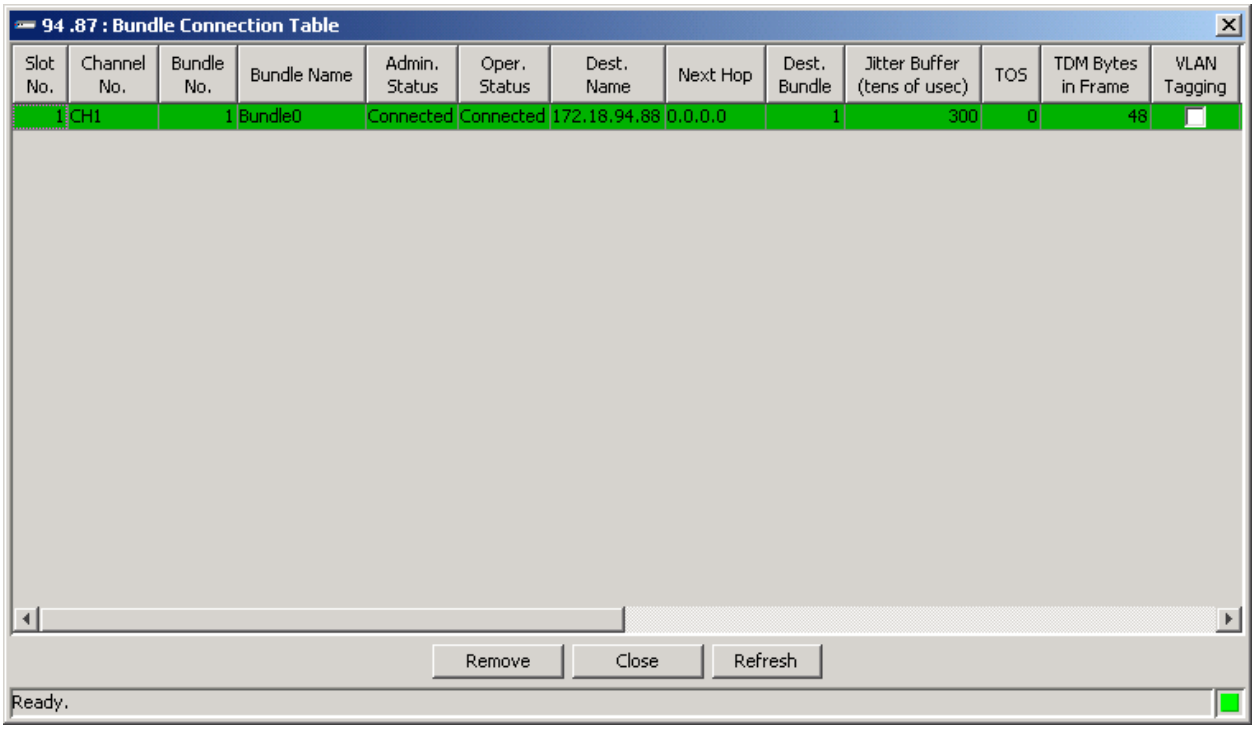

Figure 3-17. Bundle Connection Table (left side)

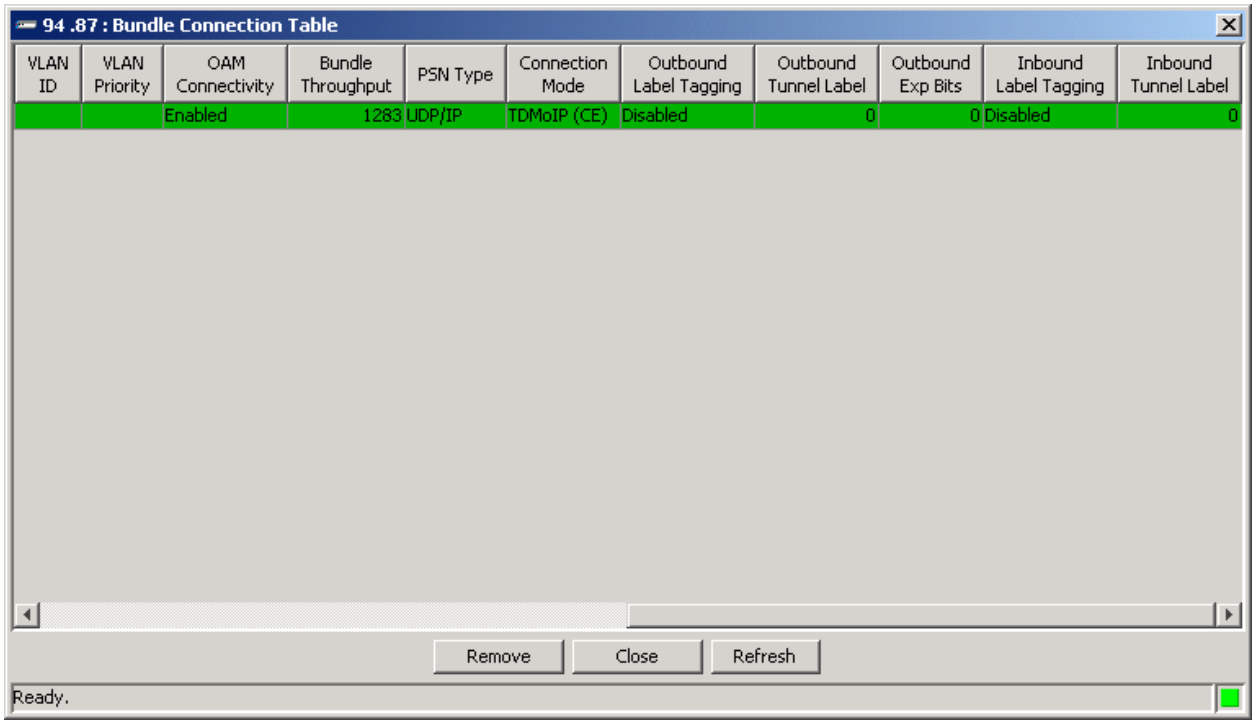

Figure 3-18. Bundle Connection Table (right side)

Table 3-12. Bundle Connection Table Parameters

Parameter	Possible Values/Remarks
Slot No.	**1**
Channel No.	**1..4**
Bundle No.	**1..31** ***Note:*** *A maximum of 16 bundles is allowed*
Bundle Name	Bundle name of the selected channel. The Table displays one bundle name per line.
Admin. Status	**Connected** **Disconnected** - Frames will not be sent through this channel.
Oper Status	**Connected, Disabled , Remote Fail, Local Fail, Unavailable, Validation Fail, Standby**, **Sequence Error**, **Buffer Underflow**, **Buffer Overflow**
Dest. Name	Logical name or IP address of the destination IPmux
Next Hop	IP address to which the Ethernet frame will be sent when the Dest. Name IP is not in the device subnet
Dest. Bundle	Bundle number in the destination IPmux device **1..496**
Jitter Buffer (tens of μsec)	Depth of the jitter buffer (per-link, elastic buffer, whose size is configurable in units of 10 micro seconds (μs). E1: **0..37..3200** T1: **0..37..2400**
ToS	IP ToS (Type of Service) assigned to this channel: **0..255** Configures the IP ToS field in the IP frames transmitted by the device. Configures the entire byte – not only the 3 ToS bits. ToS assignment applies to all TDM packets leaving IPmux.
TDM Bytes in Frame	UDP payload (one-eight) length enabling reduction of Ethernet throughput. E1/T1: **48..1440** (steps of 48) ***Note:*** *Applicable only when Connection Mode is* ***TDMoIP (CE)****.*
VLAN Tagging	**No, Yes**
VLAN ID	VLAN ID **1..4094**
VLAN Priority	VLAN priority **0..7**
OAM Connectivity	**Disabled** **Enabled**
Bundle Thoughput	Throughput in bps
PSN Type	Bundle encapsulation **MPLS/ETH** - Multi-Protocol Label Switching / Ethernet **UDP/IP**
Connection Mode	**TDMoIP (CE)** - Time Division Multiplexing over the Internet Protocol, Circuit Emulation **HDLC** - High Level Data Link Control

Parameter	Possible Values/Remarks
Outound Label Tagging	Outbound labels: **Disabled, Enabled** ***Note:*** *Available only when PSN Type is MPLS/ETH.*
Outbound Tunnel Label	MPLS transmit label: **0..1048576** ***Note:*** *Available only when PSN Type is MPLS/ETH.*
Outbound EXP Bits	The MPLS Network priority (EXP bits) used for this bundle **0..7**
Inbound Label Tagging	Inbound labels: **Disabled, Enabled** ***Note:*** *Available only when PSN Type is MPLS/ETH.*
Inbound Tunnel Label	MPLS receive label: **0..1048576** ***Note:*** *Available only when PSN Type is MPLS/ETH.*

➤ **To remove a bundle:**

1. Select a bundle in the **Bundle Connection Table**.
2. Click <**Remove**>

   A warning message appears.

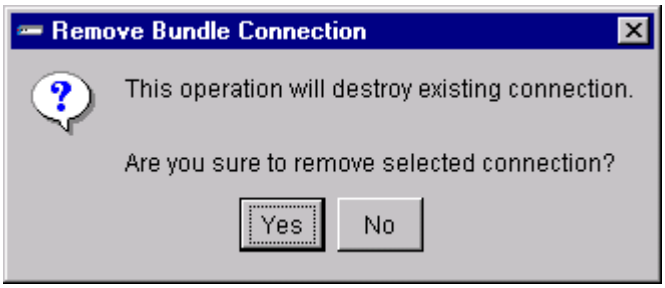

Figure 3-19. Remove Bundle Connection

3. Click <**Yes**> to confirm.

3.3 Additional Tasks

Displaying Ethernet Interface Information

The Ethernet **Interface Information** command enables you to display the various parameters of the Ethernet port. You can use this information as a troubleshooting aid, to ensure that the Ethernet cable is working properly and that the connection is at the appropriate speed at half/full duplex.

➤ **To display information about the Ethernet interface:**

1. Click the Ethernet port.
2. Select **Configuration > Interface Info...**

   The Interface Information table appears.

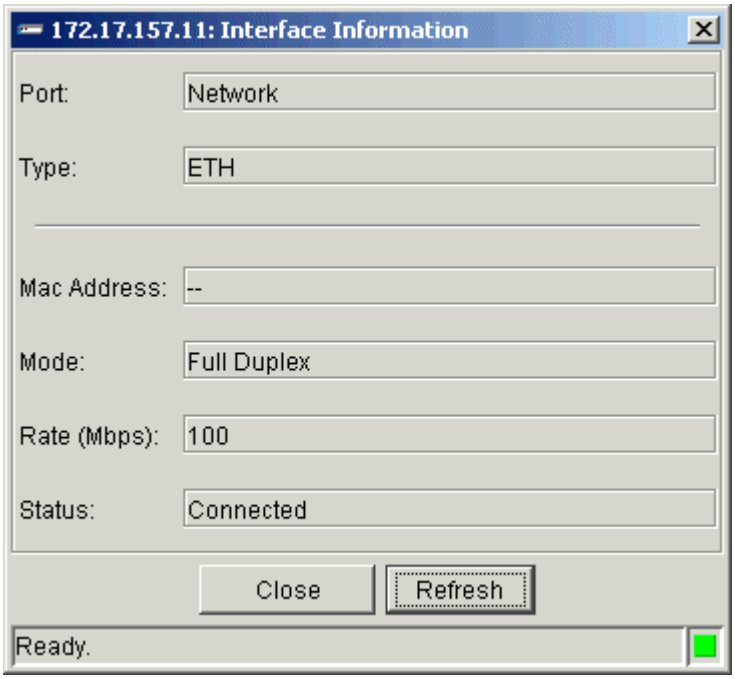

Figure 3-20. Interface Information – Network/User Port

Table 3-13. Interface Information Table Parameters

Parameter	Possible Values / Remarks
Port	**NETWORK, USER**
Type	**ETH**
MAC Address	MAC Address
Mode	Transmission mode: **Full Duplex, Half Duplex**
Rate (Mbps)	Transmission rate: **10, 100**
Status	Status of the link: **Connected, Not Connected**
Interface Type	According to wavelength and laser mode **1300nmSM or 1300nm (single mode/multimode)** ***Note:*** *Only for fiber optic Ethernet interface*

Resetting IPmux-14 to the Default Configuration

The **Default Configuration** command enables you to reset the Agent's configuration back to the factory defaults. Use this command when you wish to reconfigure all of the parameters from a clean starting point. This is useful when IPmux-14's current configuration is completely unsatisfactory, such as when moving a device to another site, or if the configuration database has become corrupted or the device's software has been upgraded.

➤ **To set the selected IPmux-14 to the default configuration:**

1. Select **Configuration > System Commands > Default Configuration**.
   A confirmation message appears (*Figure 3-21*).
2. Click <**OK**> to confirm reset of the default configuration.
   The default configuration replaces the current configuration.

Figure 3-21. Default Configuration Dialog Box

Polling the Agent

RADview periodically and automatically reads (polls) IPmux-14 variables. You can force RADview to immediately poll the Agent and update the display by polling IPmux-14 manually. The **Poll Agent** command is useful if you configure the device NOT to perform periodic polling of the Agent.

➤ **To poll the agent:**

- Select **Configuration > System Commands > Poll Agent**.
  RADview polls IPmux-14 and updates any displayed information.

Resetting IPmux-14

The **Reset** command enables you to reset the Agent's hardware to re-initialize the main board CPU of the IPmux-14 unit. Use this command to reset IPmux-14 in the unlikely event that the device is unresponsive (has locked up) or is behaving erratically.

➤ **To reset IPmux-14:**

1. Select **Configuration > System Commands > Reset**.
   A confirmation message appears (*Figure 3-22*).
2. Click <**OK**> to confirm.
   The Agent's hardware resets; the IPmux-14 unit is re-initialized and its active software is decompressed and loaded into the RAM.

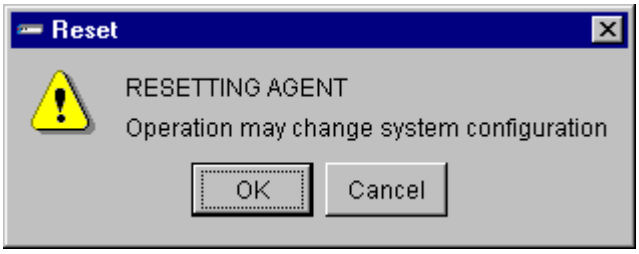

Figure 3-22. Reset Agent Dialog Box

Note *The reset operation implements any changes made to the IPmux-14 configuration.*

Chapter 4

Configuring Typical Applications

This chapter provides detailed instructions for setting up a typical application using two IPmux units, and contains the following sections:

- Configuring the IPmux-11 and IPmux-14 Units
  - Configuring the Host IP Parameters
  - Configuring the Manager List
- Connecting IPmux-14 to the Management Station
- Configuration Sequence
- Creating Circuits
  - Creating a Mesh Service Circuit
    - Defining the E1 Parameters
    - Creating a Circuit
    - Saving the Circuit Parameters
    - Displaying the Circuit Parameters
  - Creating a Normal Service Circuit
    - Defining the E1 Parameters
    - Creating a Circuit
    - Saving the Circuit Parameters
    - Displaying the Circuit Parameters

This chapter provides detailed instructions for configuring an IPmux-14 unit operating opposite an IPmux-11 unit (see *Figure 4-1*).

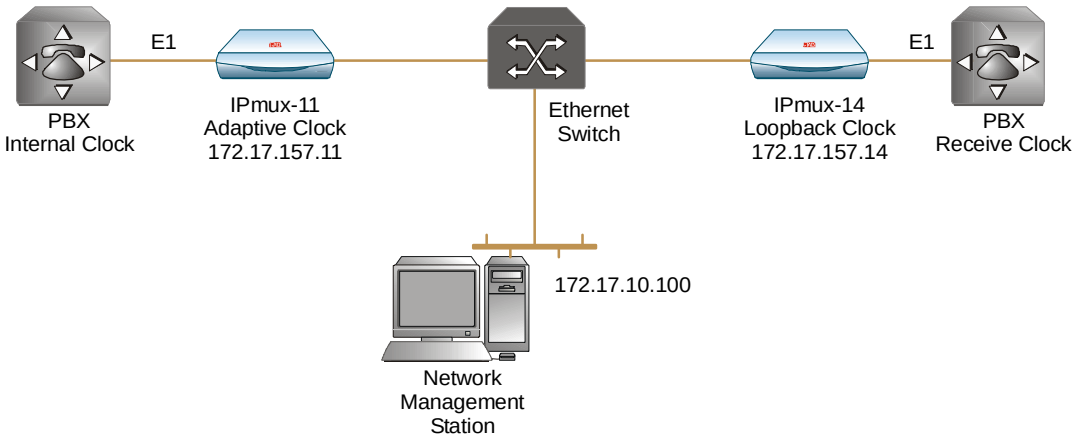

Figure 4-1. IPmux-14, IPmux-11 Units Operating Opposite Each Other

Certain guidelines are relevant to this application. In general, there are four basic configuration steps (described below) that need to be followed when deploying any IPmux unit.

1. IP Configuration – Setting the device host IP address and the manager IP address.
2. Physical layer configuration – Setting the TDM parameters (line type, clocking, etc.) according to the application requirements and topology.
3. Creating a circuit via the Service Center.

Table 4-1. Configuration Summary

Device	E1 Parameters	IP Parameters	Bundle Parameters	Bundle Connection
IPmux-11	• Transmit clock source: adaptive • Line type: Framed G.704 CRC-4 enabled • CAS: disabled	Host IP address: 172.17.157.11	Bundle 1 Timeslots in bundle: 1–10	Bundle 1 of IPmux-11
IPmux-14	• Transmit clock source: Loopback • Line type: Framed G.704 CRC-4 enabled • CAS: disabled	Host IP address: 172.17.157.14	Bundle 1 Timeslots in bundle: 1–10	Bundle 1 of IPmux-14

4.1 Configuring the IPmux-11 and IPmux-14 Units

This section explains how to configure the IPmux units. The configuration procedure is similar for both units, except for defining different host IP addresses, different clocking modes and different destination IP addresses for the bundle connection.

Configuring the Host IP Parameters

The host IP parameters are configured via the terminal application.

➤ **To configure the host IP parameters:**

1. Display the Host IP menu (**Configuration** > **System** > **Host IP**), and configure the IP address and mask of the host:
   - IPmux-11 host IP address – 172.17.157.11
   - IPmux-14 host IP address – 172.17.157.14
2. Save the changes.

```
Configuration>System>Host IP
1. IP address                          ... (172.17.157.11)
2. IP mask                             ... (255.255.255.0)
3. Default gateway                     ... (0.0.0.0)
4. DHCP                        (Disable)
5. DHCP Status                         >
>
Please select item <1 to 5>
ESC-prev.menu; !-main menu; &-exit
1 Mngr/s
```

Figure 4-2. Configuring Host IP Parameters for IPmux-14

Configuring the Manager List

➤ **To configure the manager list:**

1. Display the Manager List menu (**Configuration** > **System** > **Management** > **Manager list**), and enter IP parameters for the network manager station:
   - NMS IP address – 172.17.10.100
   - Manager location – Network-Eth1.
2. Save the changes.

```
Configuration>System>Management>Manager list
1. Manager IP address            ... (172.17.10.100)
2. Manager location              >   (Network-Eth1)
3. Link up/down trap                 (Disable)
4. Alarm trap                        (Disable)
5. VLAN tagging                      (Disable)
>
Please select item <1 to 5>
ESC-prev.menu; !-main menu; &-exit                    1 Mngr/s
```

Figure 4-3. Configuring Network Manager

4.2 Connecting IPmux-14 to the Management Station

IPmux-14 can be managed by a Network Management Station (NMS) that is located on the LAN (hub or switch) connected to the one of the unit's Ethernet ports.

➤ **To connect IPmux-14 to the Network Management Station:**

1. Connect a Network Management Station to the LAN (hub or switch).
2. Connect one of the IPmux's Ethernet ports to the LAN.

4.3 Configuration Sequence

Several basic configuration steps need to be followed when deploying any IPmux unit:

1. IP Configuration – Setting the IPmux-14 host IP address and the manager IP address
2. Physical layer configuration – Setting the TDM parameters (line type, clocking, etc.) according to the application requirements and topology
3. Creating circuits via the Service Center.

IPmux-14 can be managed by a network management station that is located on the LAN connected to the one of the unit's Ethernet ports. In order to establish a proper connection, it is necessary to configure IPmux with a basic configuration.

➤ **To perform the preliminary IPmux-14 configuration:**

1. Connect an ASCII terminal to the IPmux-14 RS-232 control port.
2. Log in as Superuser (su).
3. Assign an IP address to IPmux-14.
4. Assign a subnet mask and a default gateway.
5. You can also enable or disable the IPmux-14 DHCP client.
6. Set read, trap, and read/write communities to public.
7. Set a manager IP address and location.
8. Reset IPmux-14.

Note *Make sure that you save your settings at each configuration screen.*

4.4 Creating Circuits

In the Service Center application, circuits can be created for Mesh and Normal Services. Both processes are outlined below.

Creating a Mesh Service Circuit

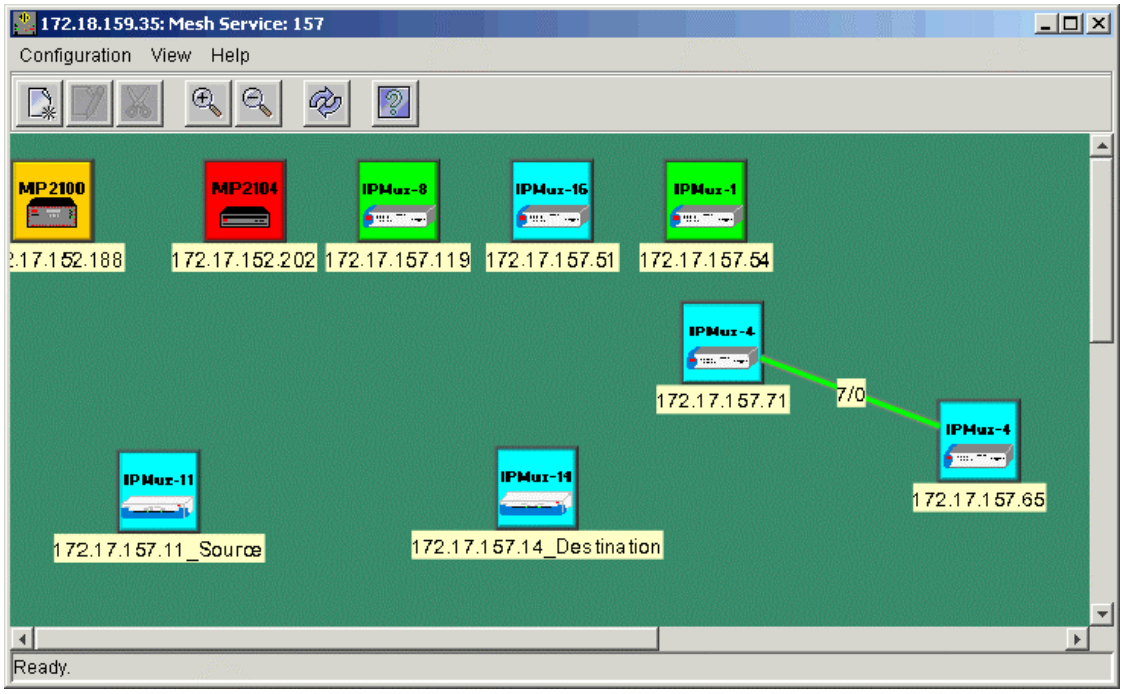

Figure 4-4. Mesh Services Map

Defining the E1 Parameters

➤ **To configure the E1 parameters for the source IPmux-11:**

1. Double click on the desired IPmux-11 source (172.17.157.11) in the Mesh Services Map (*Figure 4-4*).

   The Element Manager appears.

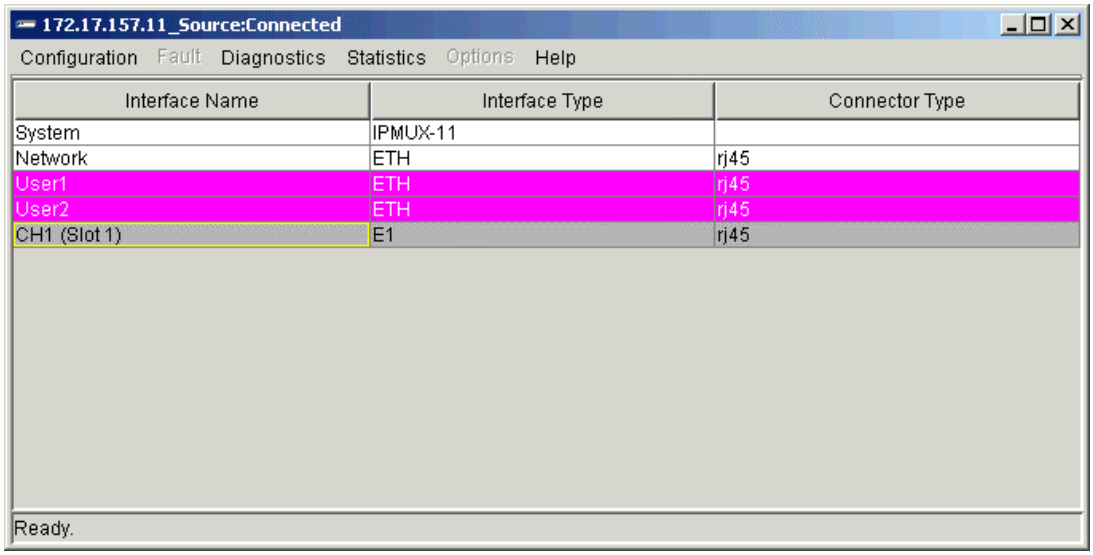

Figure 4-5. IPmux-11 Element Manager

2. Select CH1.
3. From the **Configuration** menu, select **Parameters**...

   The Interface Parameters dialog box appears (*Figure 4-6*).

4. Select the following parameters:
   - Transmit Clock Source = Adaptive
   - Line Type = Framed-CRC.
5. Click <**Set**>.

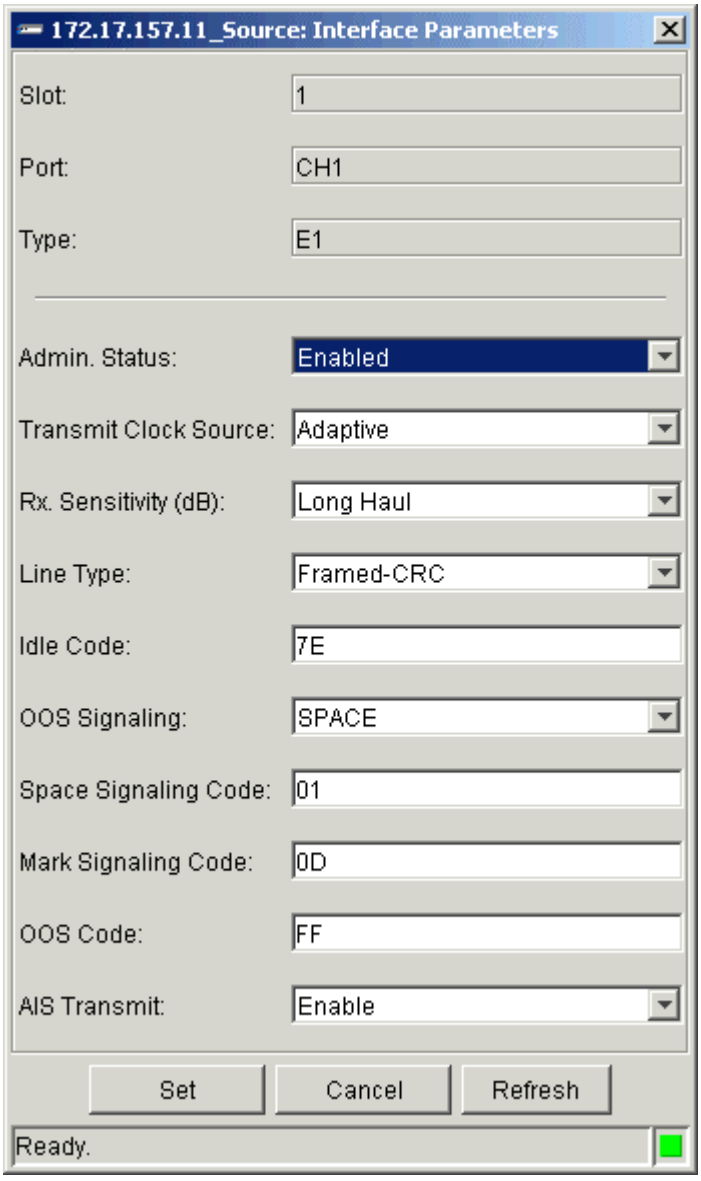

Figure 4-6. IPmux-11 E1 Interface Parameters

➤ **To configure E1 parameters for the destination IPmux-14:**

1. Double click on the desired IPmux-14 destination (172.17.157.11) in the Mesh Services Map (*Figure 4-4*).

   The Element Manager appears.

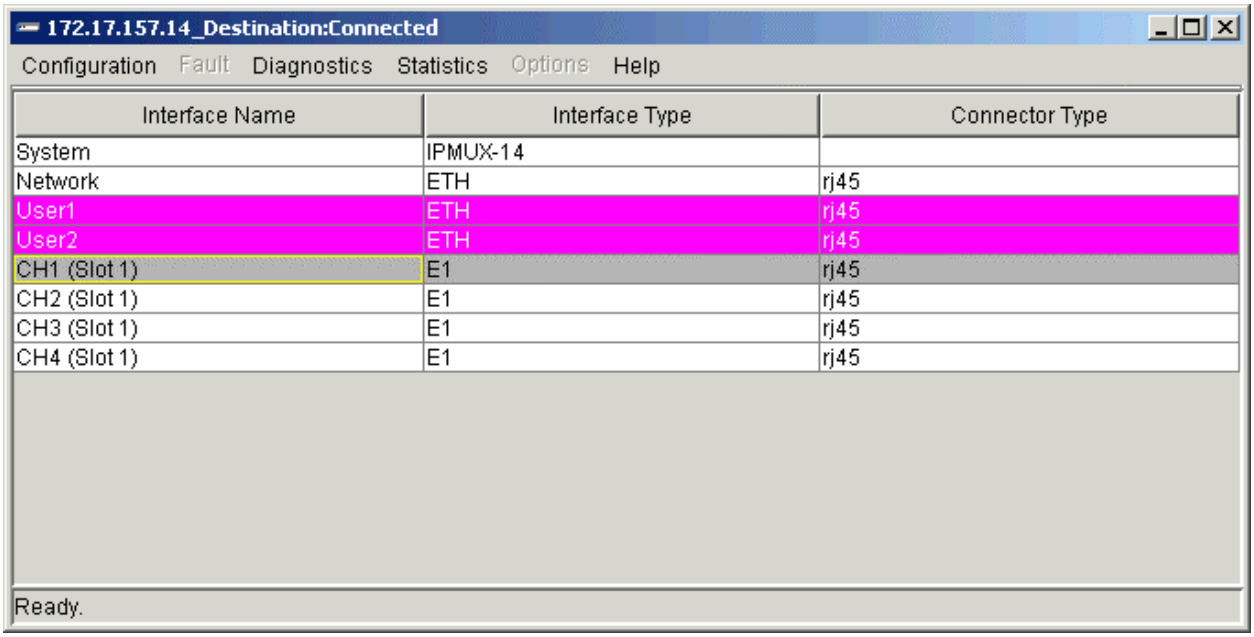

Figure 4-7. IPmux-14 Element Manager

2. Select CH1.
3. From the **Configuration** menu, select **Parameters**...

   The Interface Parameters dialog box appears (*Figure 4-8*).

4. Select the following parameters:
   - Transmit Clock Source = Loopback
   - Line Type = Framed-CRC.
5. Click <**Set**>.

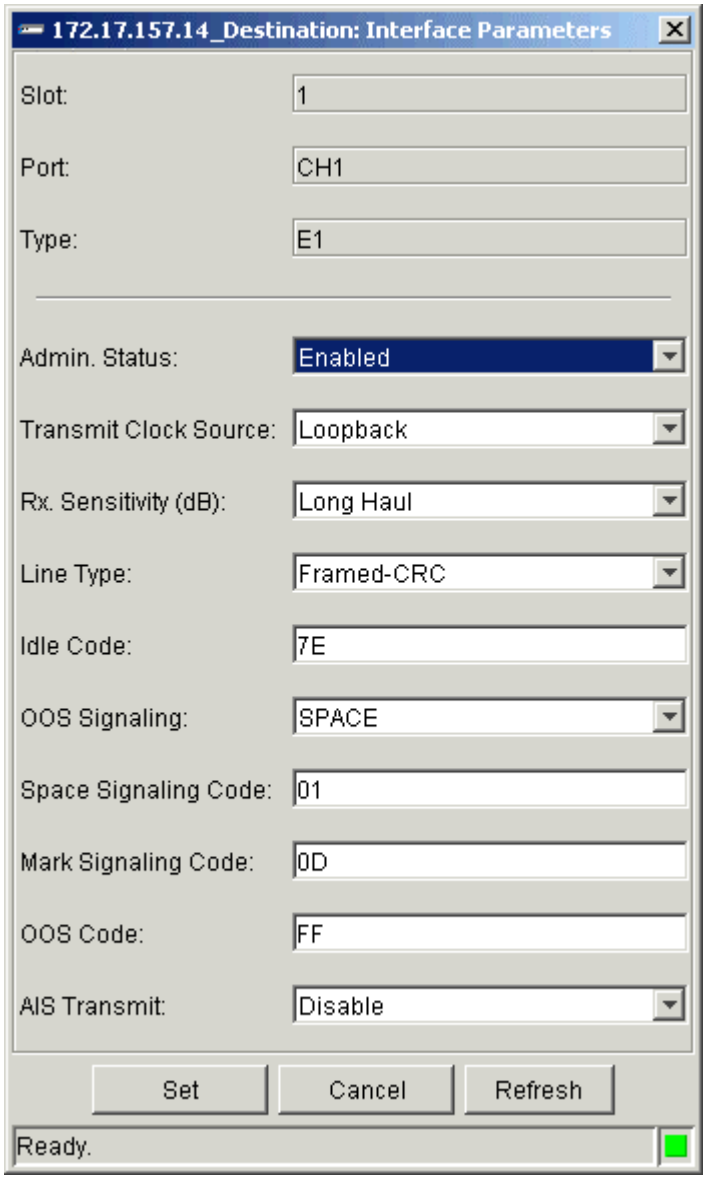

Figure 4-8. IPmux-14 E1 Interface Parameters

Creating a Circuit

➤ **To create a circuit between IPmux-11 (172.12.157.10) and IPmux-14 (172.17.157.14):**

1. On the Services Map, select the source for the circuit. In this example it is the IPmux-14 (172.17.157.10).
2. While holding down the CTRL key, right click the mouse and drag a line between the source IPmux-11 (172.12.157.10) and destination IPmux-14 (172.17.157.14).

   The Manual Circuit Configuration dialog box appears.

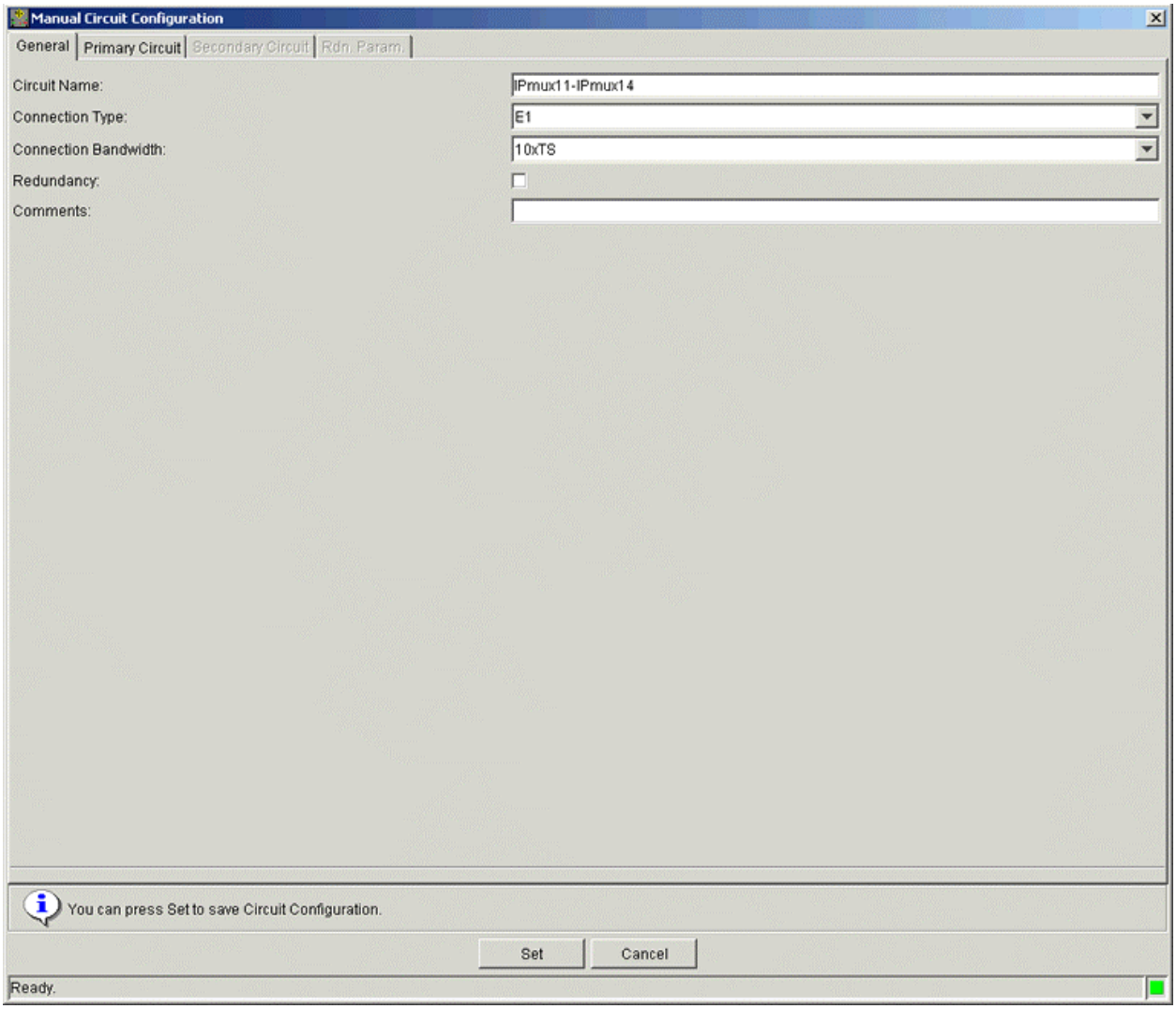

Figure 4-9. Manual Circuit Dialog Box – General Parameters Tab

3. Click on the General tab (*Figure 4-9*) and configure the following parameters:
   - Connection Type = E1
   - Connection Bandwidth = 10xTs

4. Click on the Primary Circuit tab (*Figure 4-9*) and configure the following parameters:
   - Line Type = Framed-CRC
   - TDM Bytes in Frame = 48
   - OAM Connectivity = Enabled (checked).

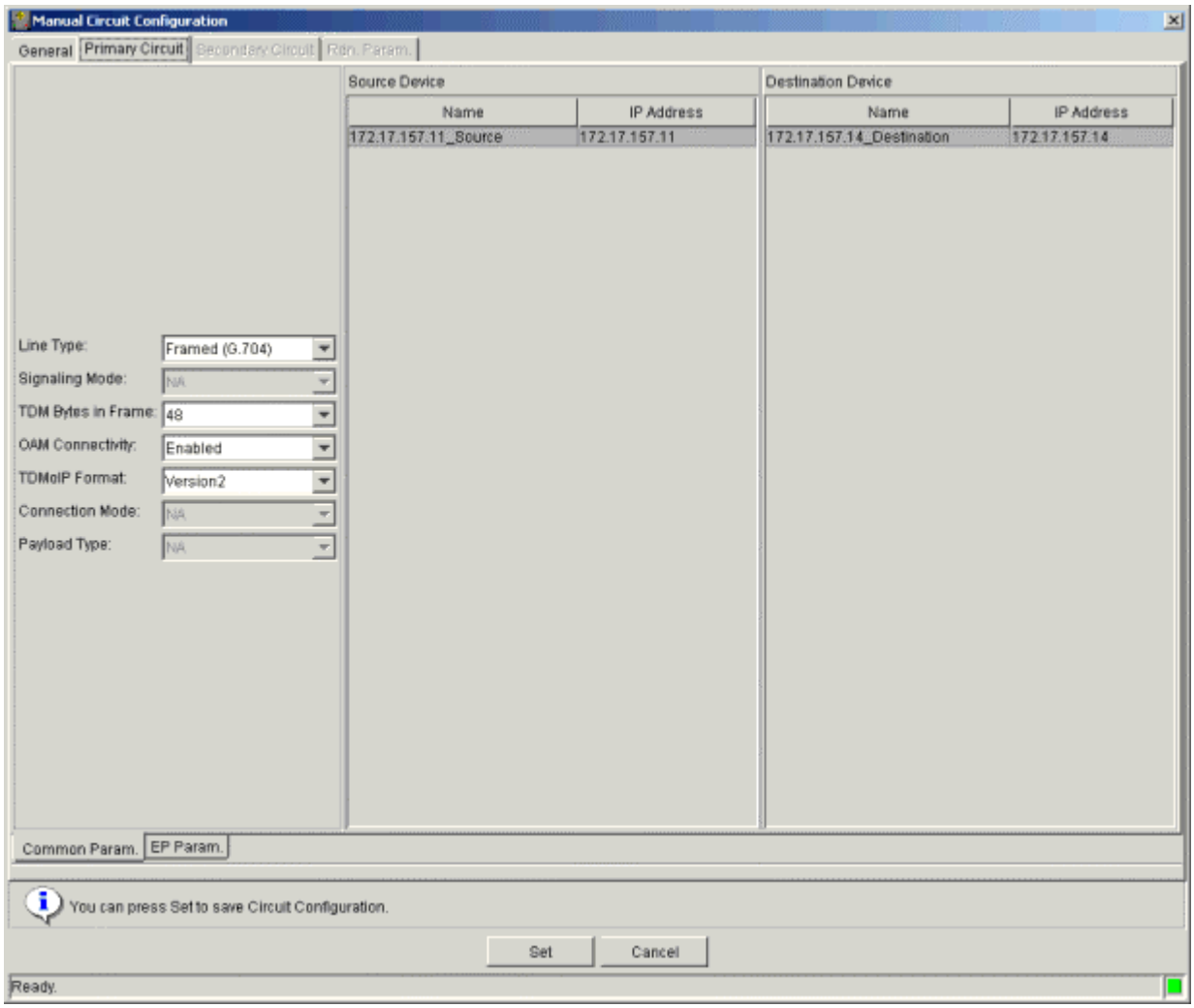

Figure 4-10. Manual Circuit Dialog Box – Primary Circuit Tab

5. Click on the EP Param tab (*Figure 4-11*) and configure the following parameters:
   - Jitter Buffer = 500.

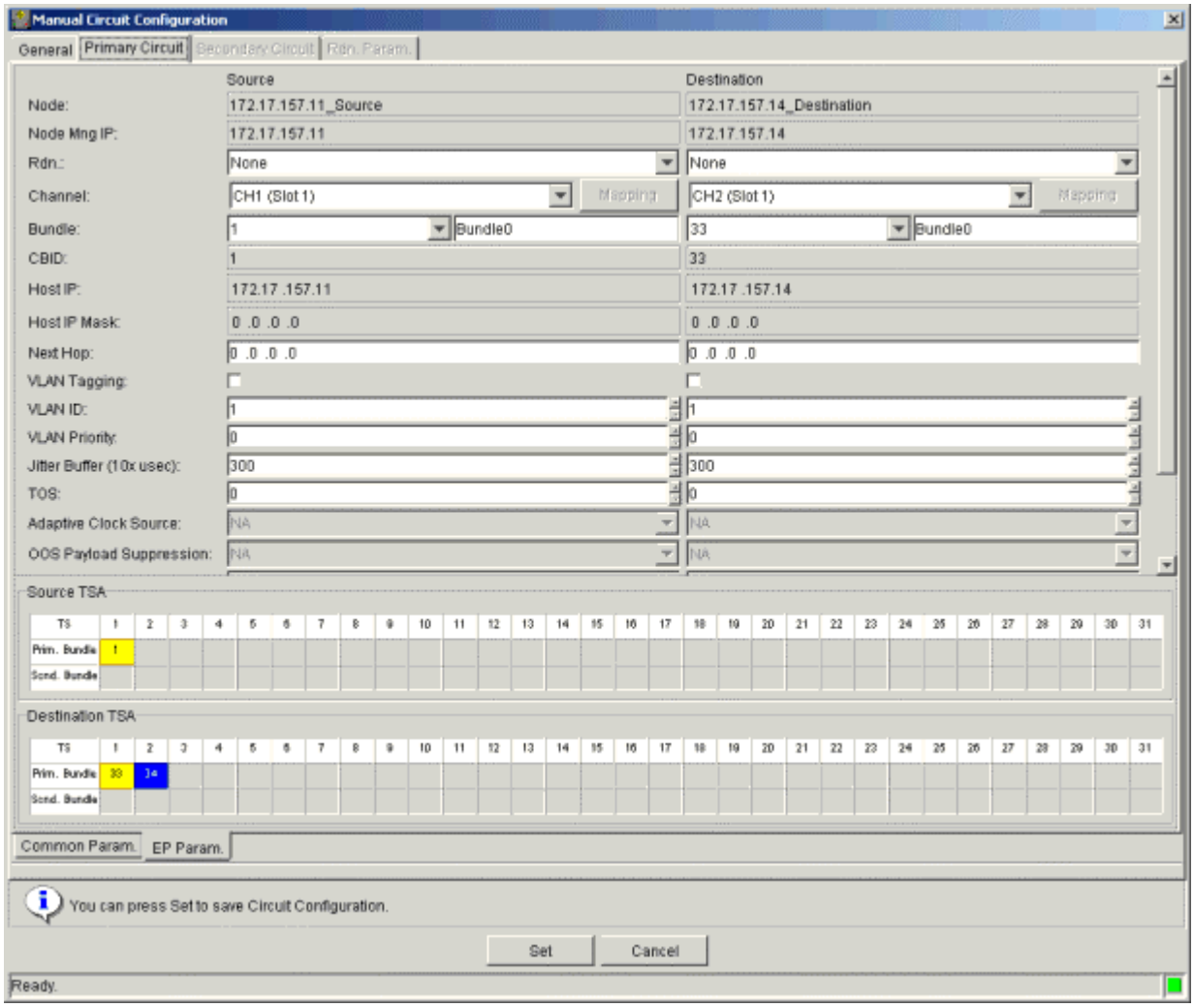

Figure 4-11. Manual Circuit Dialog Box – EP Param Tab

Saving the Circuit Parameters

➤ **To save the circuit parameters:**

1. In the Manual Circuit Dialog Box, click <**Set**>.

   A message appears asking you if you want to create another circuit.

2. Click <**No**>.

   The circuit is created and appears on the Mesh Services Map.

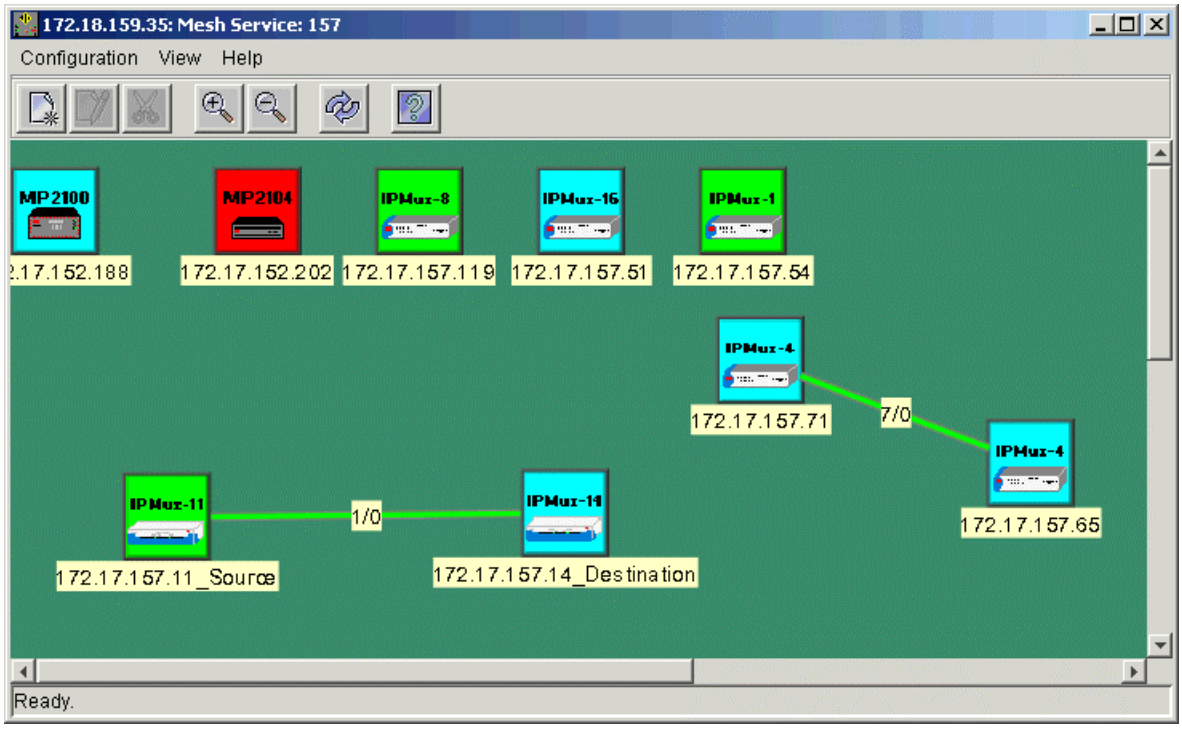

Figure 4-12. Mesh Services Map with Circuit between IPmux-14 and IPmux-14

Displaying the Circuit Parameters

➤ **To display the circuit parameters:**

1. Click on the link in the Services Map (*Figure 4-12*).
2. Right click and select **Circuit List…**

   The Circuit List appears.

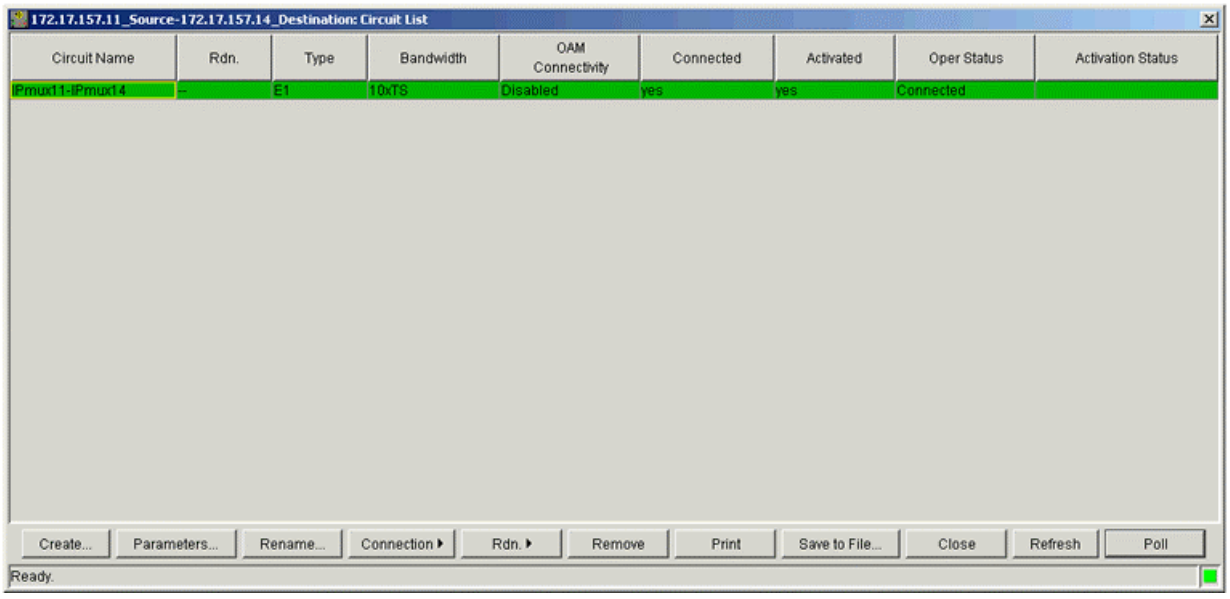

Figure 4-13. Circuit List

3. Click <**Parameters…**>

   The Manual Circuit Parameters dialog box appears.

4. Verify that the parameters are correct.

Creating a Normal Service Circuit

Normal Services have Branch and Central Sites. Double-clicking on the Branch and Central Sites opens the site windows. In our example, IPmux-11 is located in the central site and IPmux-14 is located in the branch site.

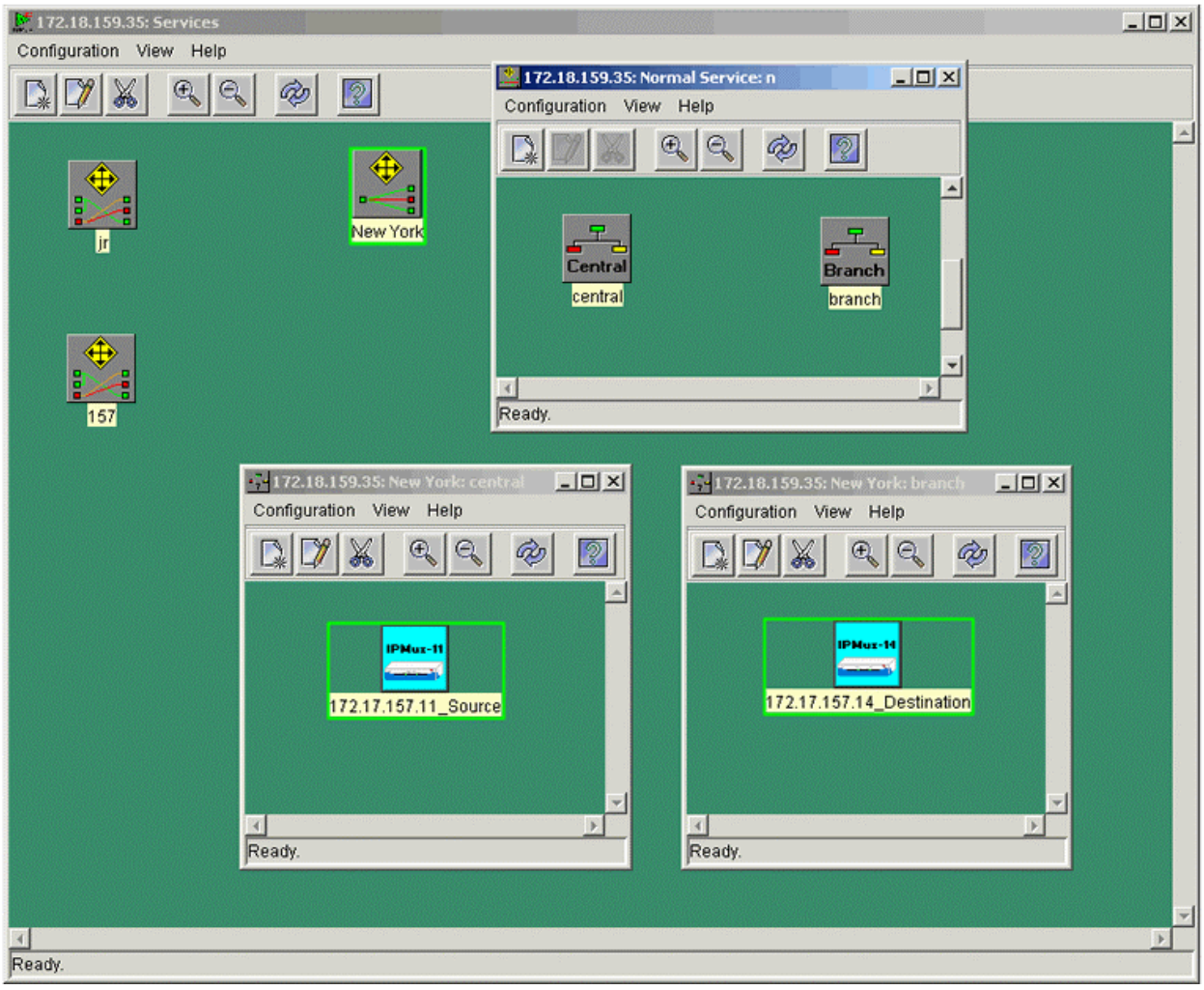

Figure 4-14. Normal Services Map

Defining the E1 Parameters

➤ **To configure the E1 parameters for the source IPmux-14:**

1. Double click on the desired IPmux-11 source (172.17.157.11) in the Central Site (*Figure 4-14*).

   The Element Manager appears.

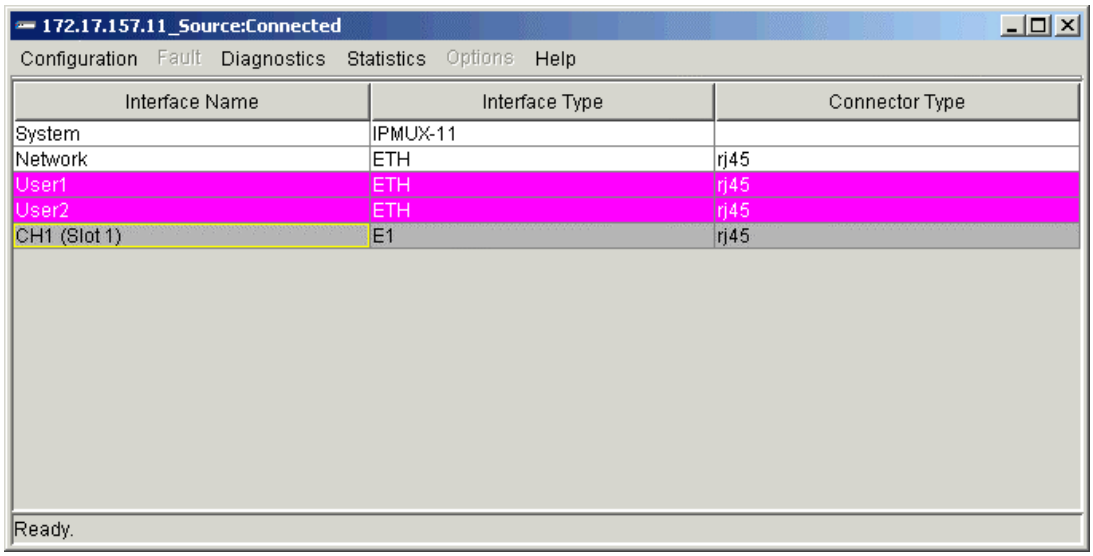

Figure 4-15. IPmux-14 Element Manager

2. Select CH1.
3. From the **Configuration** menu, select **Parameters**...

   The Interface Parameters dialog box appears (*Figure 4-6*).

4. Select the following parameters:
   - Transmit Clock Source = Adaptive
   - Line Type = Framed-CRC.
5. Click <**Set**>.

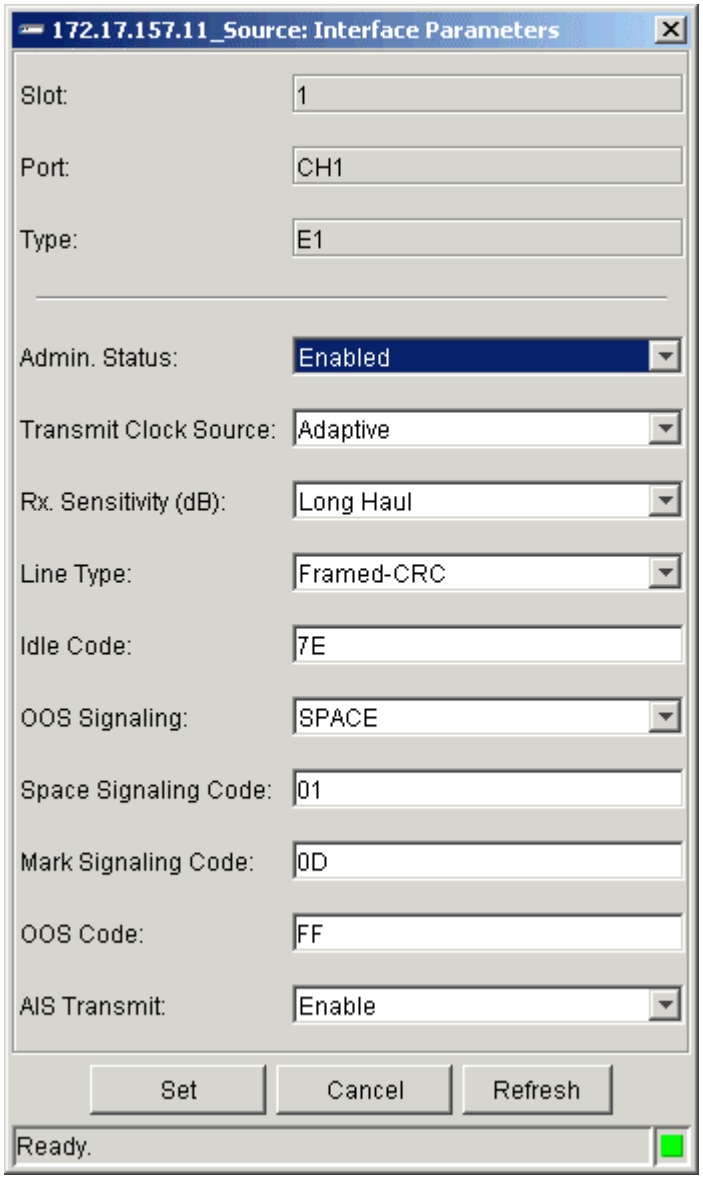

Figure 4-16. IPmux-11 E1 Interface Parameters

➤ **To configure E1 parameters for the destination IPmux-14:**

1. Double click on the desired IPmux-14 destination (172.17.157.11) in the Branch Site (*Figure 4-14*).

   The Element Manager appears.

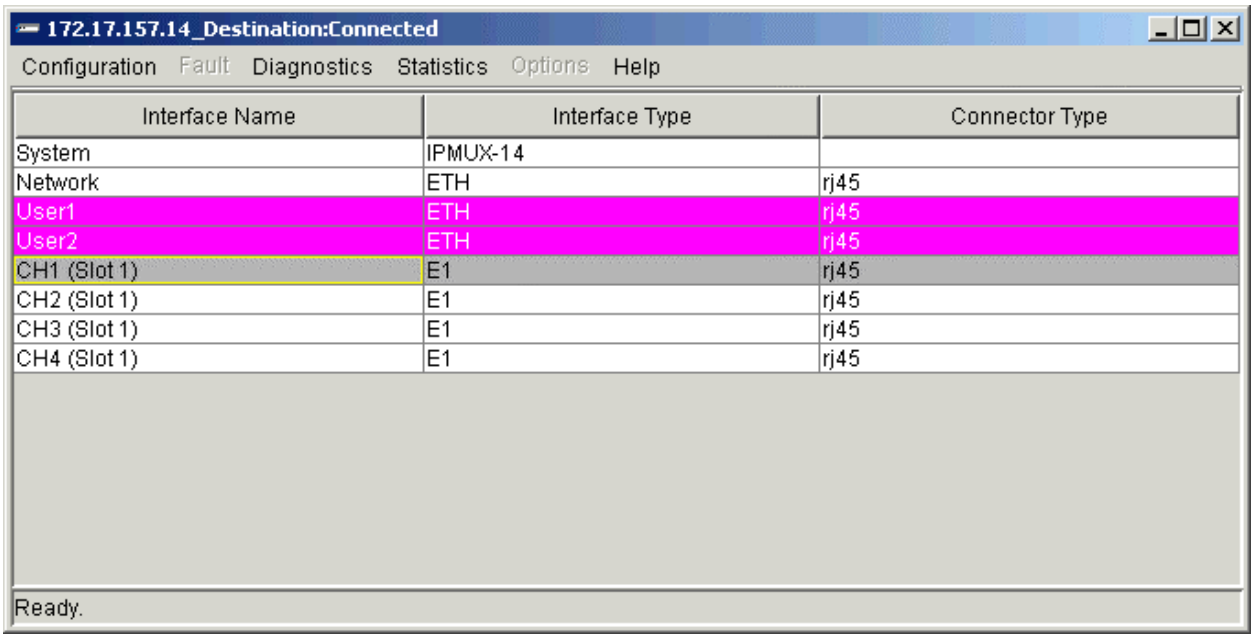

Figure 4-17. IPmux-14 Element Manager

2. Select CH1.
3. From the **Configuration** menu, select **Parameters**...

   The Interface Parameters dialog box appears (*Figure 4-8*).

4. Select the following parameters:
   - Transmit Clock Source = Loopback
   - Line Type = Framed-CRC.
5. Click <**Set**>.

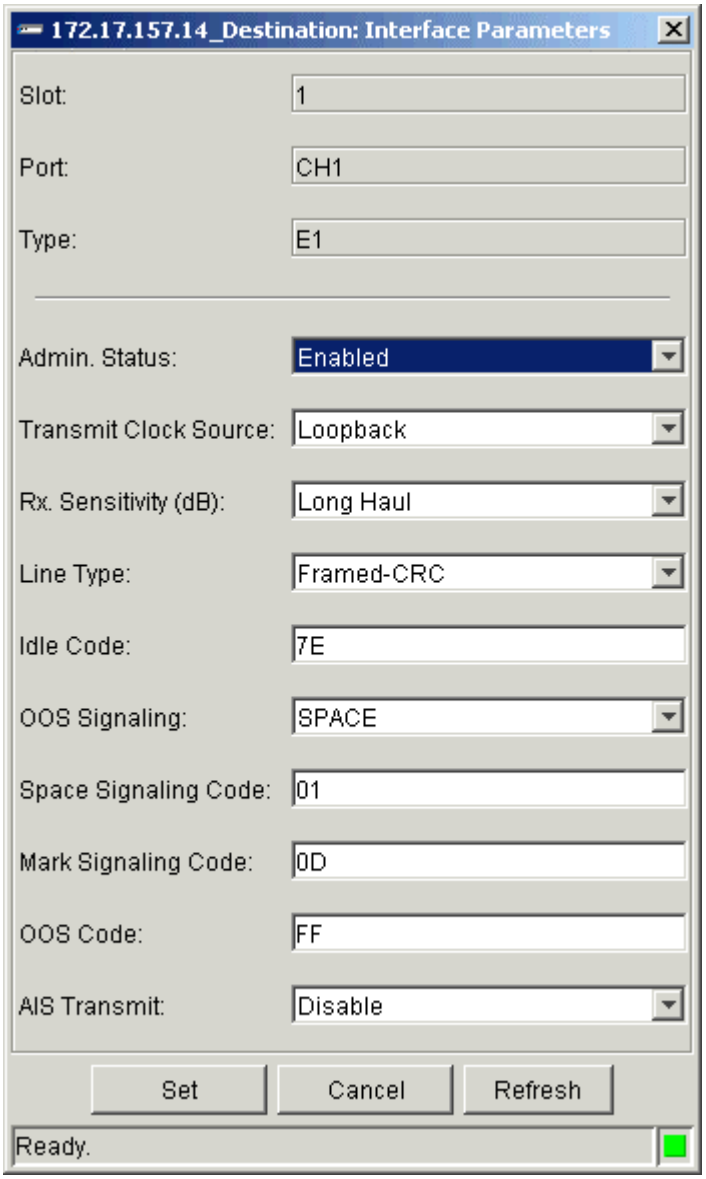

Figure 4-18. IPmux-14 E1 Interface Parameters

Creating a Circuit

➤ **To create a circuit between IPmux-11 (172.12.157.11) and IPmux-14 (172.17.157.14):**

1. On the Central Site, select the source for the circuit. In this example it is the IPmux-14 (172.17.157.11).

2. While holding down the CTRL key, right click the mouse and drag a line between the source IPmux-11 (172.12.157.11) and destination IPmux-14 (172.17.157.14) (located in Branch Site).

   A circuit is created between the two sites and appears with a dotted line.

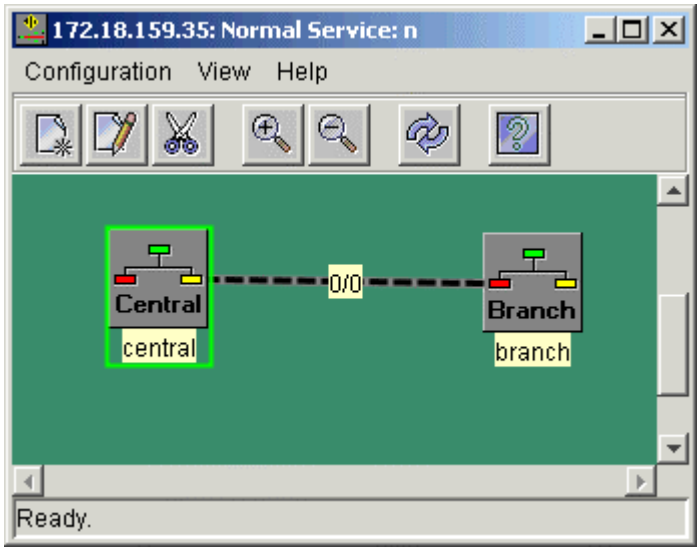

Figure 4-19. Normal Services Circuit Creation

➤ **To configure circuit parameters:**

1. Select the circuit by clicking on its line in the Normal Services Map.
2. Right click and select **Circuit List…**

   The Circuit List dialog box appears.

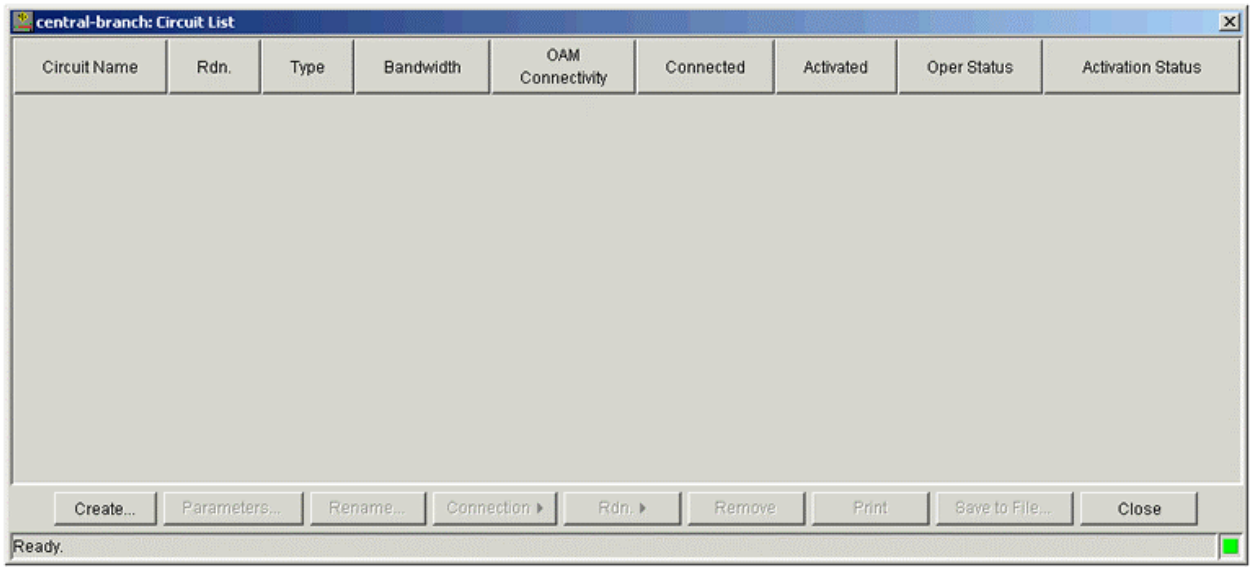

Figure 4-20. Circuit List

3. Click <**Create…**>.

   The Manual Circuit Configuration dialog box appears.

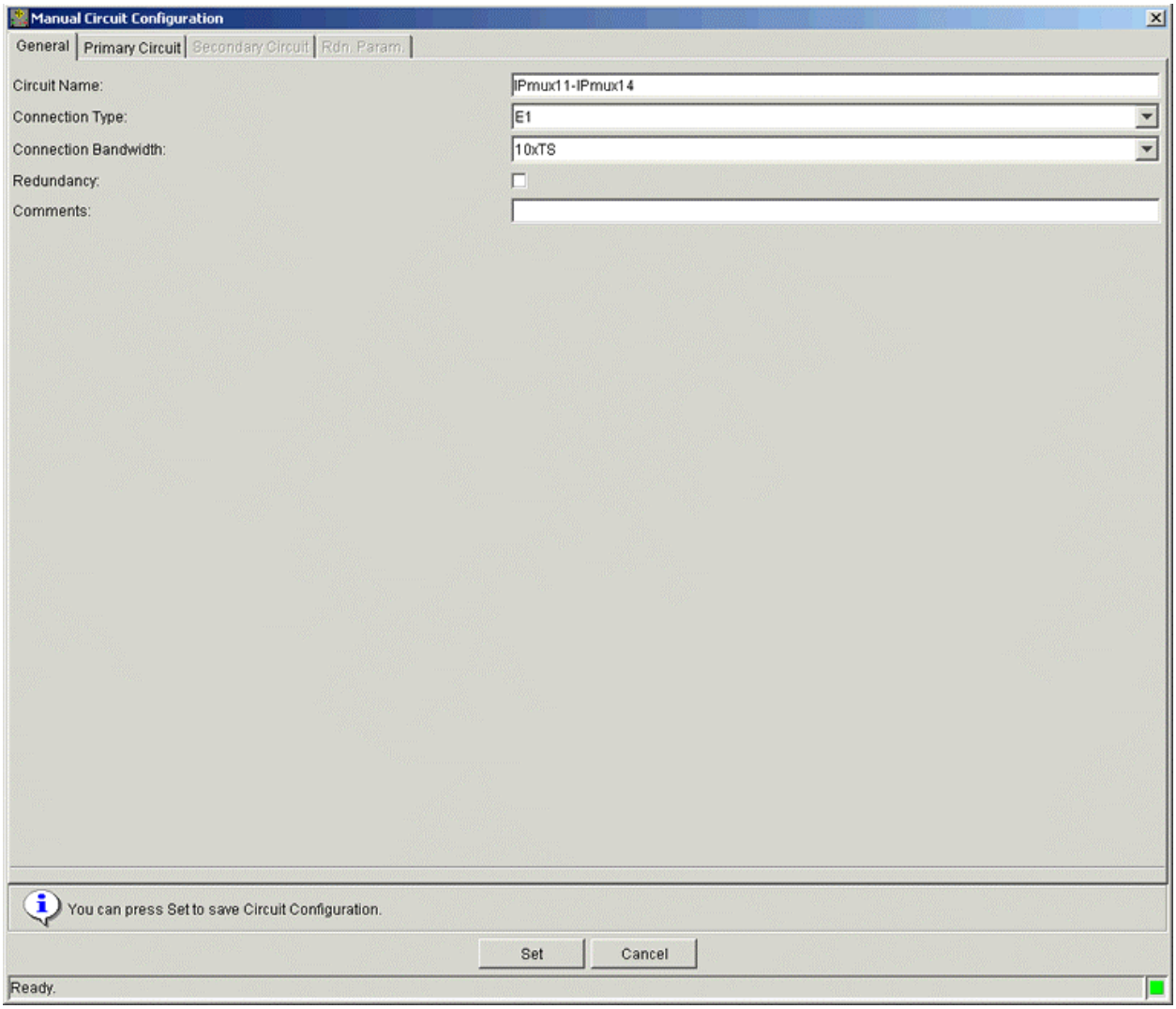

Figure 4-21. Manual Circuit Dialog Box – General Parameters Tab

4. Click on the General tab (*Figure 4-21*) and configure the following parameters:
   - Connection Type = E1
   - Connection Bandwidth = 10xTs.

5. Click on the Primary Circuit tab (*Figure 4-22*) and configure the following parameters:
   - Line Type = Framed-CRC
   - TDM Bytes in Frame = 48
   - OAM Connectivity = Enabled (checked).
6. Select Central and Branch Sites.

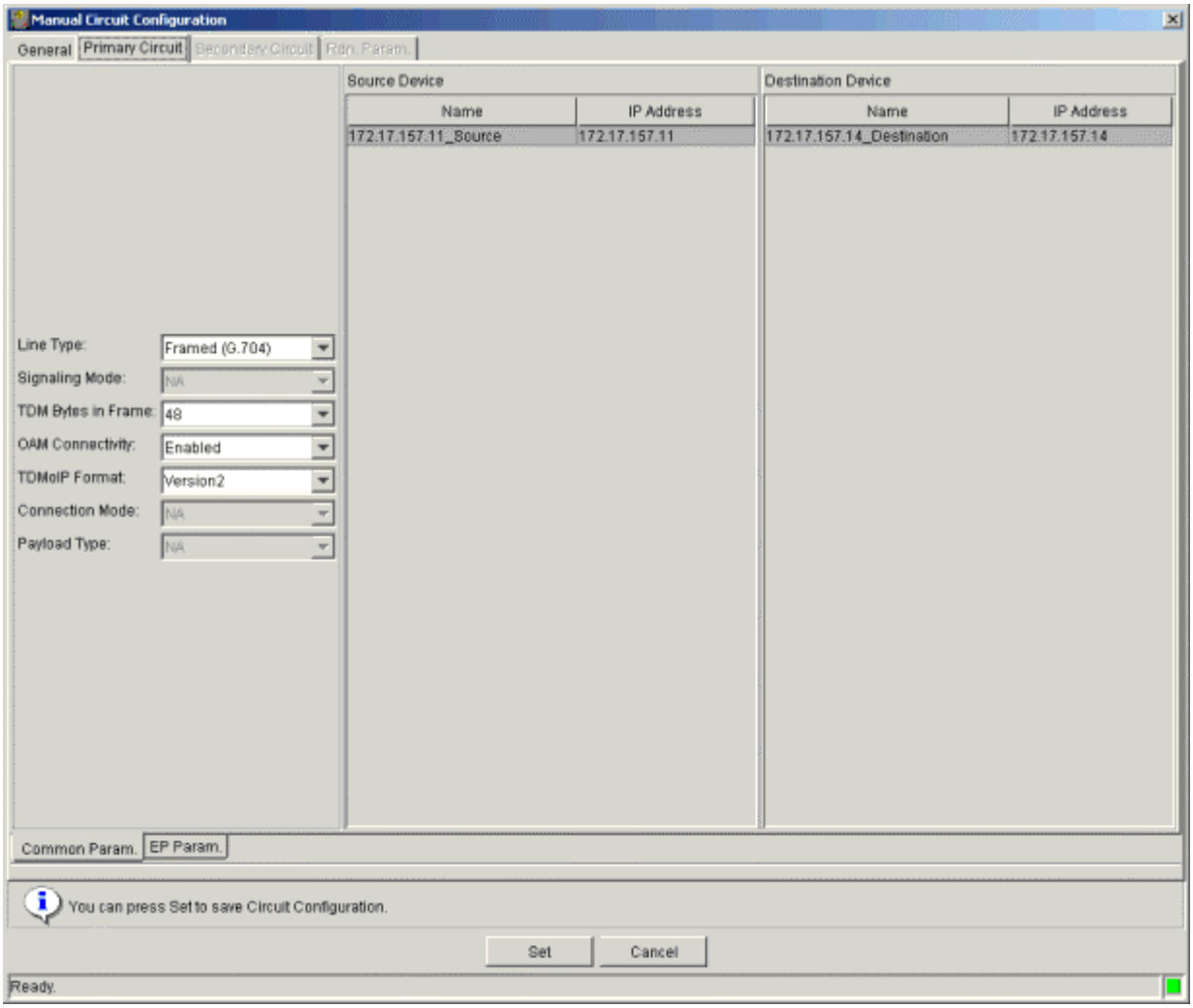

Figure 4-22. Manual Circuit Dialog Box – Primary Circuit Tab

7. Click on the EP Param tab (*Figure 4-23*) and configure the following parameters:
   - Jitter Buffer = 500.

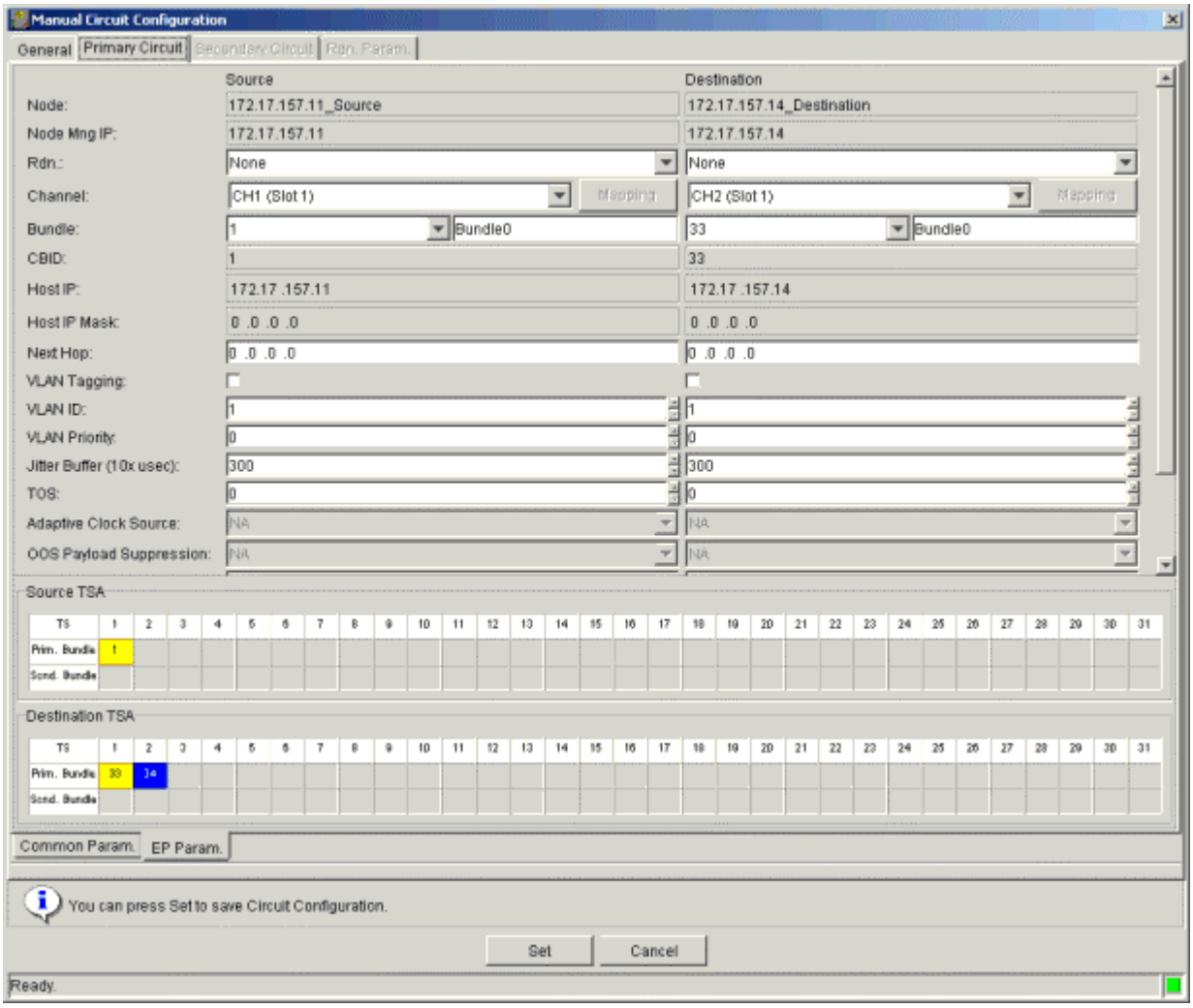

Figure 4-23. Manual Circuit Dialog Box – EP Param Tab

Saving the Circuit Parameters

➤ **To save the circuit parameters:**

1. In the Manual Circuit Dialog Box, click <**Set**>.

   A message appears asking you if you want to create another circuit.

2. Click <**No**>.

   The circuit is created and appears on the Normal Services Map.

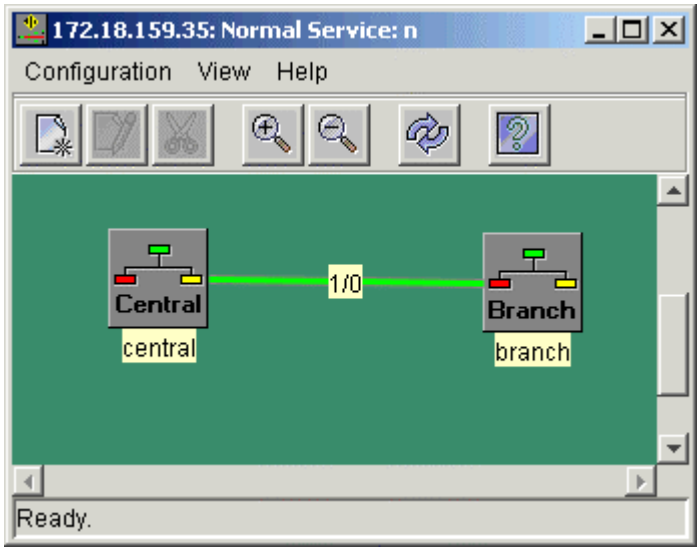

Figure 4-24. Normal Service with Circuit

Displaying the Circuit Parameters

➤ **To display the circuit parameters:**

1. Click on the link in the Services Map (*Figure 4-24*).
2. Right click and select **Circuit List…**

   The Circuit List appears.

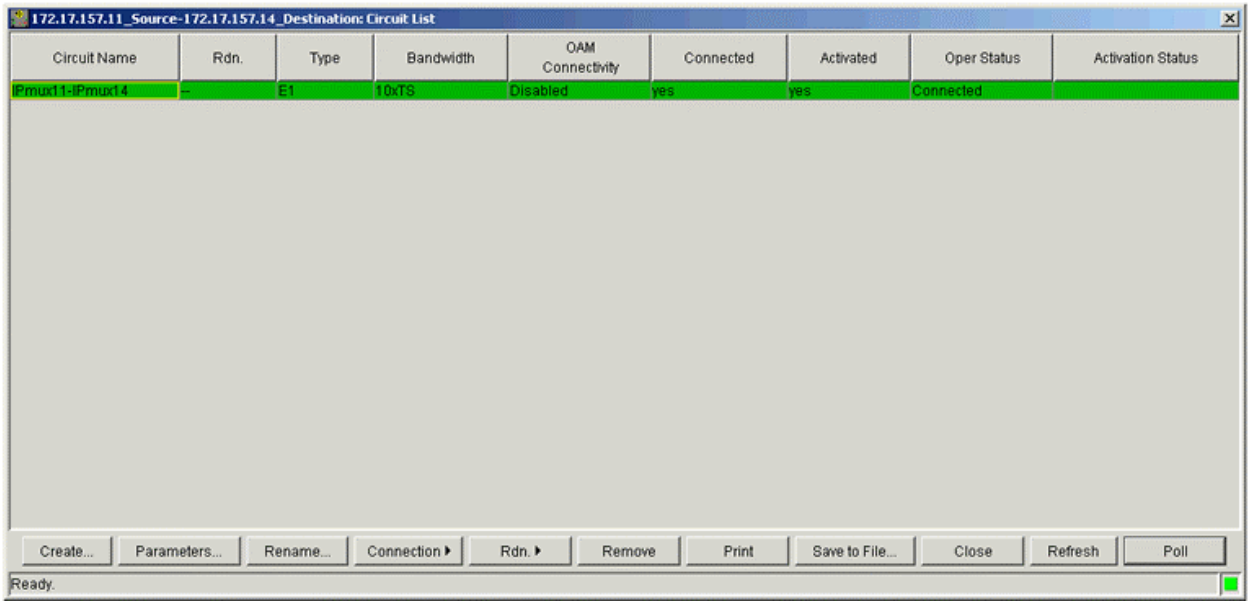

Figure 4-25. Circuit List

3. Click <**Parameters…**>

   The Manual Circuit Parameters dialog box appears.
4. Verify that the parameters are correct.

Chapter 5

Security Management

This chapter discusses how to manage IPmux-14 security, and includes the following sections:

- Setting Management Access Authorizations
- Unix Users and Permissions

5.1 Setting Management Access Authorizations

The **Access** command allows you to enable or disable management via Telnet and Web access. Use this command to tighten security or to enable access, when necessary.

➤ **To enable or disable Telnet and Web access:**

1. Select **Options > Access…**

   The Access dialog box appears (*Figure 5-1*).

2. Configure Telnet and Web access and click <**Set**>.

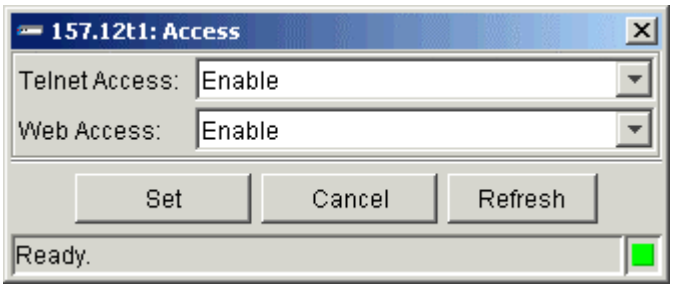

Figure 5-1. Access Dialog Box

Table 5-1. Telnet and Web Access Parameters

Parameter	Possible Values/Remarks
Telnet Access	Enable/Disable accessing the device via Telnet **Disable** - No one is allowed to access the device via Telnet. **Enable** - All users are allowed to access the device via Telnet Access. **Managers Only** - Only manager stations listed in the manager's list are allowed to access the device via Telnet.
Web Access	Enable/Disable accessing the device via Web browser **Disable** - No one is allowed to access the device via Web. **Enable** - All users are allowed to access the device via Web. **Managers Only** - Only manager stations listed in the manager's list are allowed to access the device via Web.

5.2 Unix Users and Permissions

RADview/HPOV, when running on a Unix-based operating system, supports the users and permissions security feature. Only an Administrator can add or remove nodes from the Service Center map. For further details, refer to the chapter on Security in the RADview SC/TDMoIP System Manual.

Chapter 6

Performance Management

This chapter discusses how to monitor IPmux-14 performance.

6.1 Introduction

IPmux-14 continuously collects performance statistics for its various ports and for bundle connections. The collected data enables network administrators to monitor the transmission performance, and thus the quality of service provided to users.

RADview can display Intervals Statistics, information and graphs that aggregate the statistics over 15 minute intervals. RADview can also display Current Statistics, information and graphs displaying a more immediate view of the statistics counters. The Current Statistics window is refreshed periodically, according to the Polling Interval, or manually, whenever you click the **<Poll>** button.

This chapter explains how to perform the following tasks:

- Setting the Polling Interval
- Viewing Bundle Statistics
- Viewing Bundle Current Statistics
- Viewing Bundle Intervals Statistics
- Viewing E1/T1 Port Current Statistics
- Viewing Port Intervals Statistics
- Viewing Ethernet Port Statistics

6.2 Setting the Polling Interval

RADview updates displayed statistical data by polling IPmux-14 at set intervals. The Polling Interval command allows you to set the number of seconds between polls.

➤ **To set the polling interval:**

- Select **Statistics > Polling Interval…**

  The Polling Interval dialog box appears.

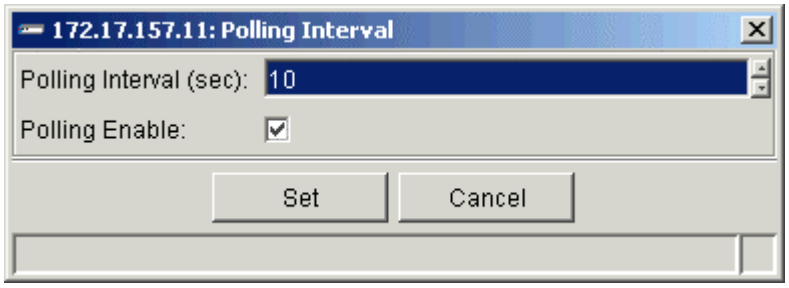

Figure 6-1. Polling Interval

Table 6-1. Polling Interval

Parameter	Possible Values / Remarks
Polling Interval (sec)	Number of seconds between polls
Polling Enable	Selecting the checkbox enables polling when a Statistics dialog box is open. After each poll, RADview automatically updates the information in the dialog box. If polling is disabled, RADview does not automatically update a Statistics dialog box. ***Note:*** *Polling is always enabled when a Statistics graph is open.*

6.3 Viewing Bundle Statistics

The **Bundle Connection Statistics** command enables you to view statistics for all bundle connections. This information is useful for assessing quality of service, for network troubleshooting and planning purposes.

➤ **To display Bundle Connection Statistics:**

- Select **Statistics > Bundle Connection Statistics...**

  The Bundle Statistics dialog box appears.

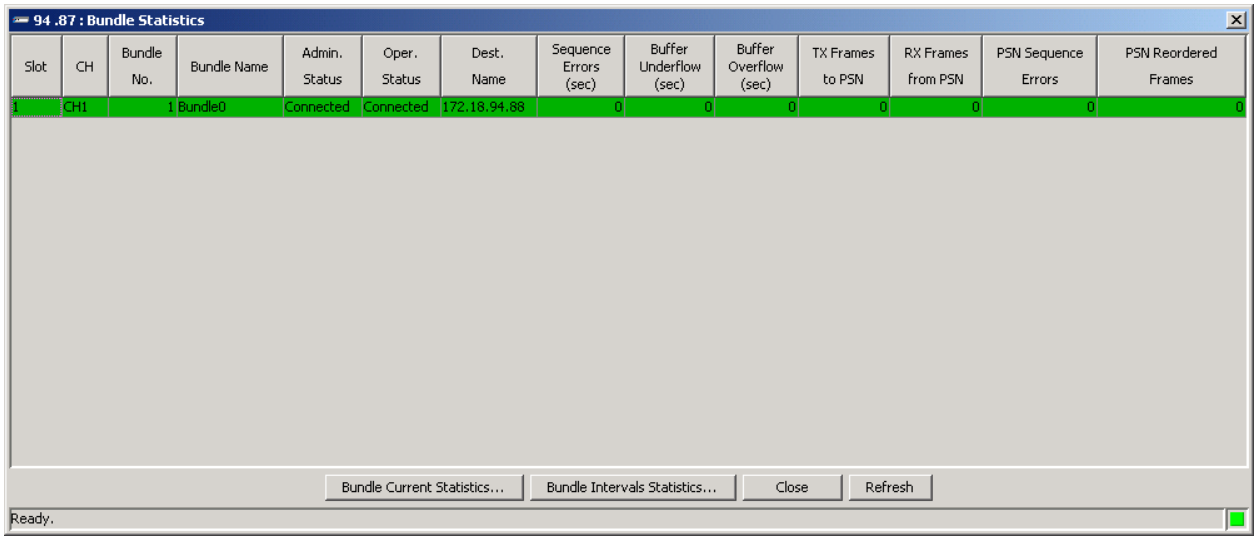

Figure 6-2. Bundle Statistics

Table 6-2. Bundle Statistics

Parameter	Possible Values / Remarks
Slot	**1**
CH	**CH1..CH4**
Bundle No.	**1..496**
Bundle Name	Bundle name for selected channel. Table will display one bundle name per line.
Admin. Status	Desired state of the link **Disconnected, Connected**
Oper. Status	Actual state of the link **Connected, Remote Fail, Local Fail, Disabled, Unavailable, Validation Fail**, **Sequence Error**, **Buffer Underflow**, **Buffer Overflow**
Dest. Name	Logical name or IP address of the destination IPmux
Sequence Errors (sec)	Number of seconds that the sequence number of an incoming frame caused a transition from the 'sync' state to the 'out of sequence' state. Out of sequence frames are dropped because the frames were received from the network with Sequence Numbers not equal to the last Sequence Number + (1 or 2).
Buffer Underflow (sec)	Number of seconds that the receive (Eth to TDM) buffer underflowed. When a continuous underflow is caused by a loss of frame flow, a single buffer underflow is counted. A buffer undeflow indicates that frames were dropped because the receive buffer was in an underrun state. The buffer enters underflow state when: • Sequence errors occur • Flow underrun takes place due to PDV expiration • An overflow condition occurs.
Buffer Overflow (sec)	Number of seconds that the receive (Eth to TDM) buffer overflowed. A buffer overflow indicates that frames were dropped because the receive buffer exceeded the maximum allowed depth.
PSN Sequence Errors	Number of times that the sequence number of an incoming frame indicated Loss of Frame or that Out of Order occurred in the PSN
PSN Reordered frames	Number of times that Frames had been reordered in the PSN

6.4 Viewing Bundle Current Statistics

The **Bundle Current Statistics** command enables you to view current statistics for the selected bundle connection. Statistics are displayed in both table and graph formats. This information is useful for assessing quality of service, for network troubleshooting and planning purposes.

➤ **To view the Bundle Current Table:**

1. Select **Statistics > Bundle Connection Statistics...**

   The Bundle Statistics dialog box appears (*Figure 6-2)*.

2. Select the bundle for which you wish to display the statistics.

3. Click <Bundle Current Statistics…>.

The Bundle Current Statistics dialog box appears.

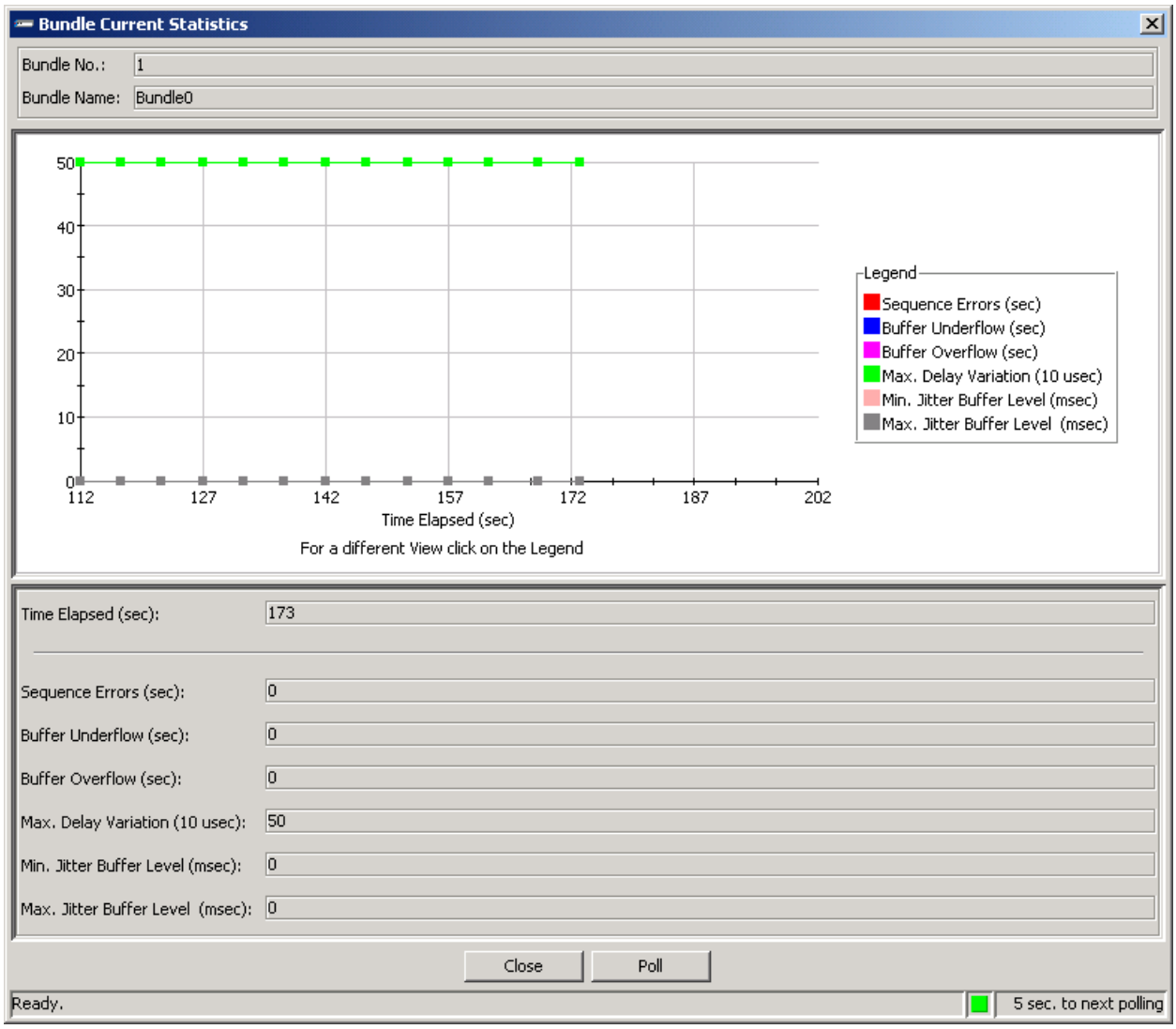

Figure 6-3. Bundle Current Statistics

Table 6-3. Bundle Current Statistics Parameters

Parameter	Remarks
Bundle No.	For E1: **1** to **496** For T1: **1** to **384**
Bundle Name	Bundle name for selected channel
Time Elapsed (sec)	Amount of time that has passed since the beginning of the current 15-minute interval **0..899**

Parameter	Remarks
Sequence Errors (sec)	Number of seconds in the current interval that the sequence number of an incoming frame caused a transition from the 'sync' state to the 'out of sequence' state. Out of sequence frames are dropped because the frames were received from the network with Sequence Numbers not equal to the last Sequence Number + (1 or 2).
Buffer Underflow (sec)	Number of seconds in the current interval that the receive (Eth to TDM) buffer underflowed. When a continuous underflow is caused by a loss of frame flow, a single buffer underflow is counted. A buffer undeflow indicates that frames were dropped because the receive buffer was in an underrun state. The buffer enters underflow state when: • Sequence errors occur • Flow underrun takes place due to PDV expiration • An overflow condition occurs
Buffer Overflow (sec)	Number of seconds in the current interval that the receive (Eth to TDM) buffer overflowed. A buffer overflow indicates that frames were dropped because the receive buffer exceeded the maximum allowed depth.
Max. Delay Variation (10 µsec)	Maximum size of the buffer (in 10s of µsec) in the selected interval ***Note:*** *This parameter is used for a CES E1/T1 card whose hardware version is greater than 5.00.*
Min Jitter Buffer Level (msec)	Minimum jitter buffer level (in msec) for the current interval
Max Jitter Buffer Level (msec)	Maximum jitter buffer level (in msec) for the current interval

6.5 Viewing Bundle Intervals Statistics

RADview can display Intervals Statistics, information and graphs that aggregate the statistics over 15 minute intervals. The **Bundle Intervals Statistics** command displays intervals statistics for the selected bundle connection, in both table and graph formats. This information is useful for assessing quality of service, for network troubleshooting and planning purposes.

To view a list of statistics from previous intervals:

1. Select **Statistics > Bundle Connection Statistics...**
   The Bundle Statistics dialog box appears (*Figure 6-2)*.
2. Select the bundle for which you wish to display the statistics.
3. Click <**Bundle Intervals Statistics…**>.
   The Bundle Intervals Statistics dialog box appears.

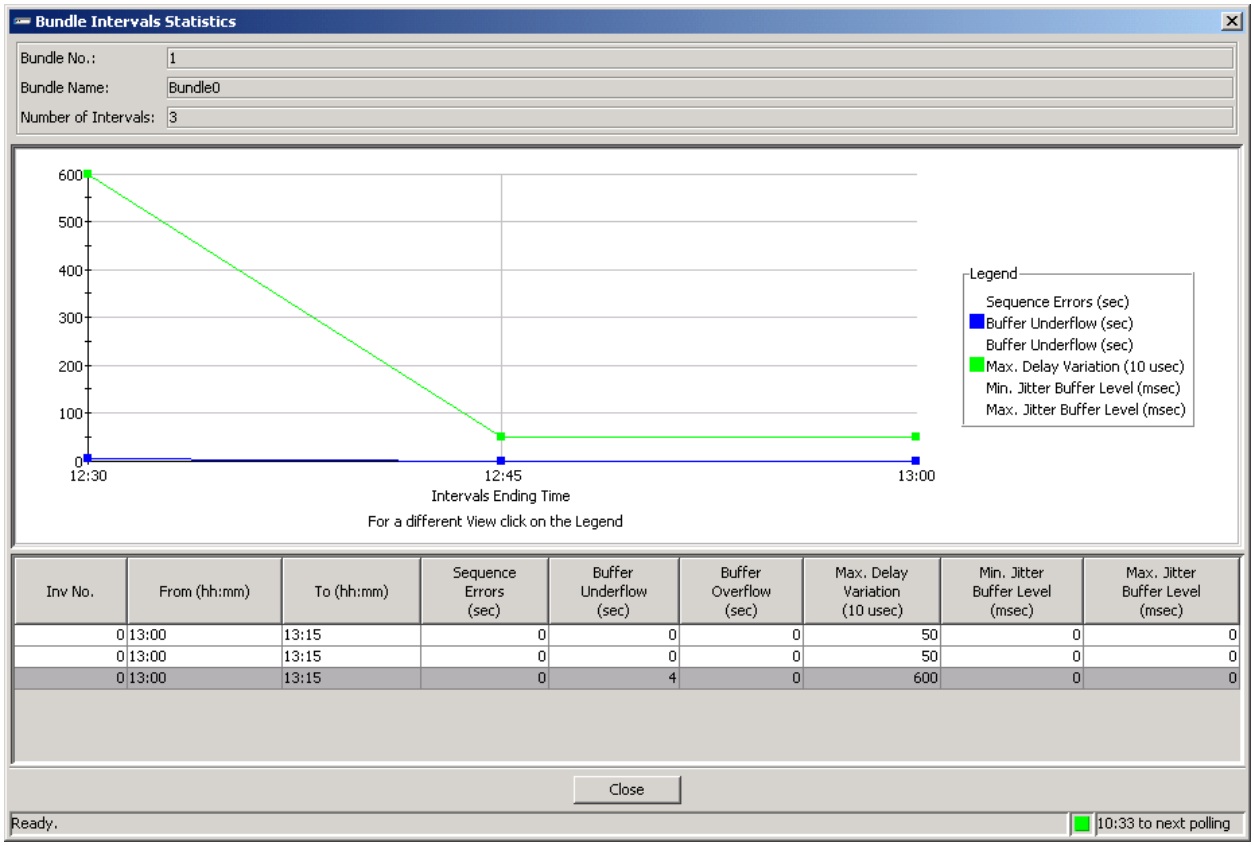

Figure 6-4. Bundle Intervals Statistics

The Bundle Intervals Data parameters are the same as the Bundle Current Data Parameters (*Table 6-3*) with the addition of information regarding Interval No. and its duration.

6.6 Viewing E1/T1 Port Current Statistics

The **Current** statistics command enables you to view current statistics for the selected E1 or T1 port. Statistics are displayed in both table and graph forms. This information is useful for assessing quality of service, for network troubleshooting and planning purposes.

➤ **To view a list of current error statistics for an E1/T1 port:**

1. Click an E1/T1 port.
2. Select **Statistics > Current...**

   The Port Current Statistics dialog box appears.

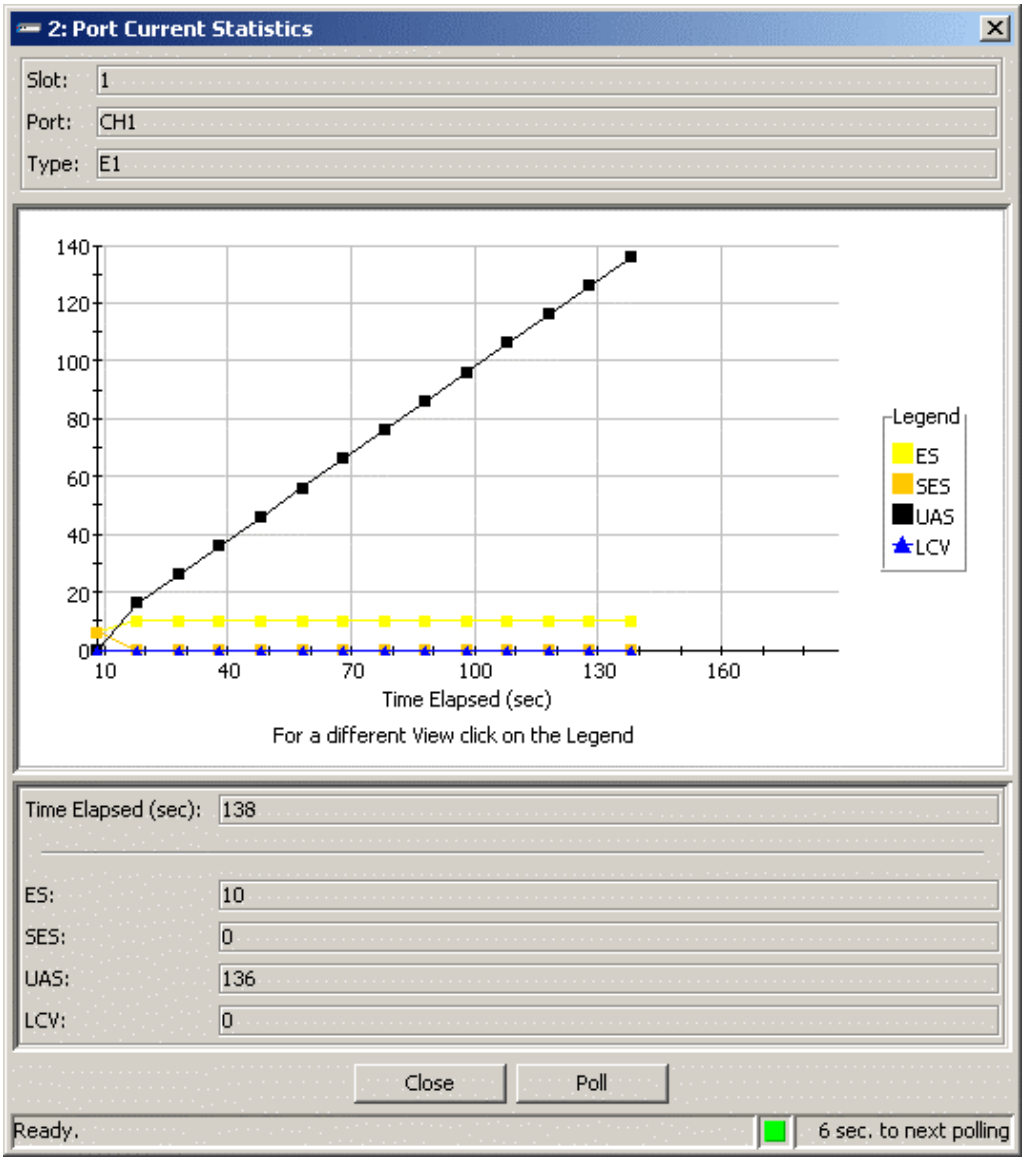

Figure 6-5. Port Current Statistics

Table 6-4. Port Current Statistics Parameters – E1/T1

Parameter	Remarks
Slot	**1**
Port	**CH1..CH4**
Type	**E1, T1**
Current Data	Each parameter displays the number of seconds of that particular type of error encountered by the E1/T1 interface during the current 15-minute interval
Time Elapsed (sec)	Amount of time that has passed since the beginning of the current 15-minute interval **0..899**

Parameter	Remarks
ES	Errored Seconds A second containing one or more of the following events: CRC error, SEF (OOF), or AIS. ***Note:*** • *An OOF defect is the occurrence of a framing bits error.* *If SES also occurs at the same time, ES will stop after 10 seconds.*
SES	Severely Errored Seconds 320 or more CRC error events, one or more SEF (OOF), or AIS. OOF defect indicates a framing bits error.
UAS	Unavailable Seconds Number of seconds that the interface is unavailable. The system is unavailable after 10 continuous SES.
LCV	Line Code Violations **For T1**: The sum of BPV and EXZ defects that occurred in a second. BPV is the occurrence of a zero string greater than 15 (for AMI) or 7 (for B8ZS). EXZ is the occurrence of a pulse of the same polarity as the previous pulse. **For E1**: The number of code violations. (Two consecutive bipolar violations of the same polarity).

6.7 Viewing Port Intervals Statistics

RADview can display Intervals Statistics, information and graphs that aggregate the statistics over 15 minute intervals. The **Interval** statistics command displays intervals statistics for the selected E1 or T1 port, in both table and graph formats. This information is useful for assessing quality of service, for network troubleshooting and planning purposes.

➤ **To view a list of statistics from previous intervals:**

1. Click an E1/T1 port.
2. Select **Statistics > Interval...**

   The Port Intervals Statistics dialog box appears.

   The results of the previous intervals are displayed in the Port Intervals Statistics table, below the graph.

Note

- *If system is running less than fifteen minutes, the following message is displayed: "**System is up less than 15 min. No intervals data**."*
- *After 900 or more Unavailable Seconds, the Ratios (AR, ESR, and SESR) display **0**.*

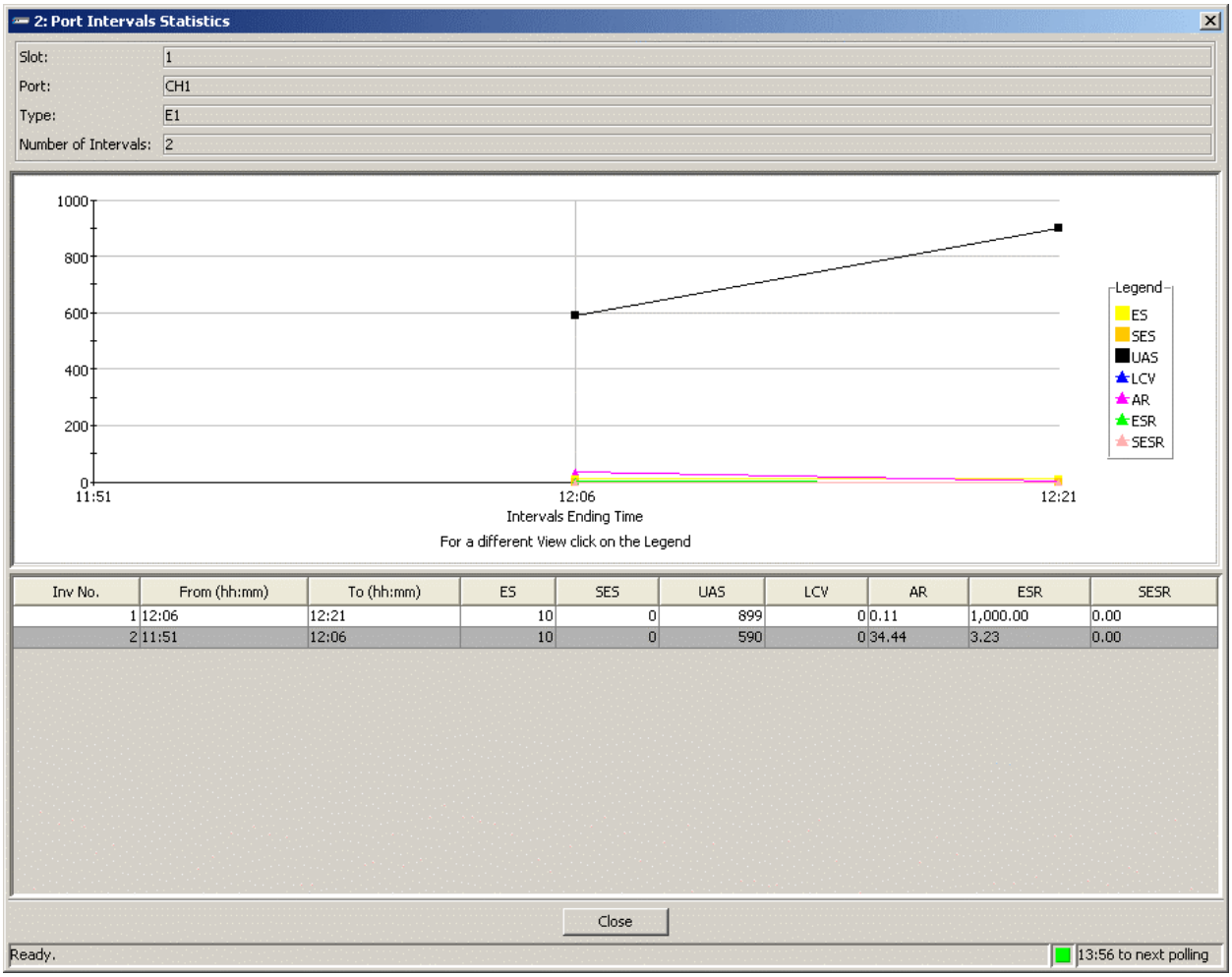

Figure 6-6. Port Intervals Statistics

Table 6-5. Port Intervals Statistics Parameters – E1/T1

Parameter	Remarks
Slot	**1**
Port	**CH1**
Type	**E1, T1**
Number of Intervals	Number of intervals sampled
Inv No.	Interval Number
From (hh:mm)	Starting time of the interval
To (hh:mm)	Ending time of the interval
ES	Errored Seconds A second containing one or more of the following events: CRC error, SEF (OOF), or AIS. ***Note:*** • *An OOF defect is the occurrence of a framing bits error.* • *If SES also occurs at the same time, ES will stop after 10 seconds.*

Parameter	Remarks
SES	Severely Errored Seconds 320 or more CRC error events, one or more SEF (OOF), or AIS. OOF defect indicates a framing bits error.
UAS	Unavailable Seconds Number of seconds that the interface is unavailable. The system is unavailable after 10 continuous SES.
LCV	Line Code Violations **For T1**: The sum of BPV and EXZ defects that occurred in a second. BPV is the occurrence of a zero string greater than 15 (for AMI) or 7 (for B8ZS). EXZ is the occurrence of a pulse of the same polarity as the previous pulse. **For E1**: The number of code violations. (Two consecutive bipolar violations of the same polarity).
AR	Availability Ratio
ESR	Errored Seconds Ratio
SESR	Severely Errored Seconds Ratio

6.8 Viewing Ethernet Port Statistics

The Ethernet **Interface Statistics** command enables you to view statistics for the selected Ethernet port. The aggregate statistics for the port are displayed in a dialog box. This information is useful for assessing quality of service, for network troubleshooting and planning purposes.

➤ **To view Ethernet interface statistics:**

1. Click the User or Network Ethernet interface.
2. Select **Statistics > Interface Statistics...**

   The Ethernet Interface Statistics dialog box appears.

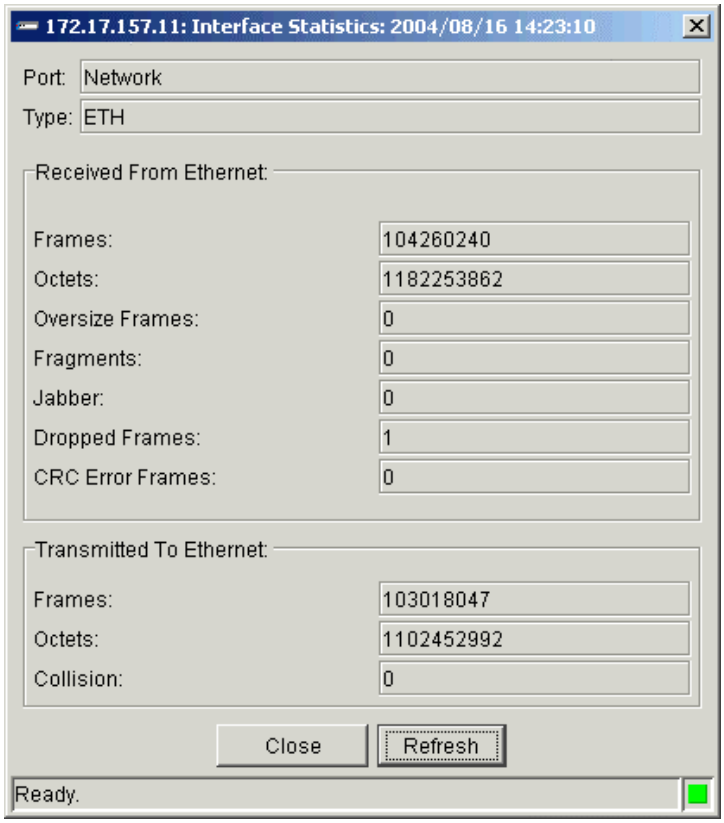

Figure 6-7. Interface Statistics Dialog Box

Table 6-6. Interface Statistics Parameters

Parameter	Possible Values / Remarks
Port	**User1, User2, Network**
Type	**ETH**
Received from Ethernet	
Frames	The total number of packets received (including bad packets, broadcast packets, and multicast packets)
Octets	The total number of octets of data (including those in bad packets) received on the network (excluding framing bits but including FCS octets)
Oversize Frames	Number of frames that are too long, and CRC is valid
Fragments	Number of frames that are shorter than 64 bytes and have an invalid CRC
Jabber	Number of frames that are too long and have an invalid CRC
Dropped Frames	Number of dropped frames due to delivery problems
CRC Error Frames	The number of good frames with invalid CRC
Transmitted to Ethernet	
Frames	Total number of frames successfully transmitted
Octets	Total number of octets successfully transmitted
Collision	Best estimate of the total number of collisions on Ethernet segment

Chapter 7

Fault Management

This chapter describes how to manage IPmux-14 alarms and how to run a loopback test, and contains the following sections:

- Monitoring Object Status
  - Masking Traps
  - Viewing Active Alarms
  - Viewing the History Log
  - Clearing the History Log
  - Viewing Self Test Results
- Performing Loopback Tests

7.1 Monitoring Object Status

- This section discusses monitoring the status of network objects including managing alarms.

Masking Traps

The **Masking Traps** command enables you to select which SNMP traps should be masked (disabled). You can mask a trap in order to prevent a known problem from causing repeated alerts at the network monitoring station and to enable focusing on new problems that may arise. All traps can be selected or deselected for masking as a group, or they can be selected individually.

➤ **To manually select traps for masking:**

1. Select **Options > Masking Traps…**

   The Masking Traps dialog box appears (*Figure 7-1*).

2. Select which traps to mask, and then click <**Set**>.

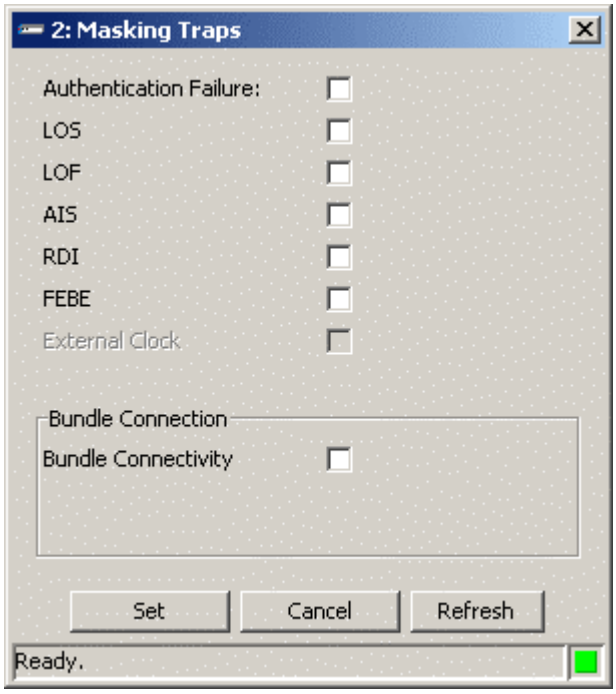

Figure 7-1. Masking Traps Dialog Box

Table 7-1. Masking Traps Parameters

Parameter	Possible Values/Remarks
Authentication Failure	Selecting this checkbox disables the Authentication Failure trap.
LOS	Selecting this checkbox disables the LOS trap.
LOF	Selecting this checkbox disables the LOF trap.
AIS	Selecting this checkbox disables the AIS trap.
RDI	Selecting this checkbox disables the RDI trap.
FEBE	Selecting this checkbox disables the FEBE trap.
External Clock	Selecting this checkbox, if available, disables the External Clock trap. ***Note:*** *This parameter is only enabled when an external clock is operational.*
Bundle Connection	
Bundle Connectivity	Selecting this checkbox disables the Bundle Connectivity trap.

Viewing Active Alarms

The **Alarms** command enables you to view agent alarms from the time that the selected IPmux-14 was turned on or from the last time the active alarm list was cleared. Use this command to locate problems and as a troubleshooting aid.

➤ **To view the Active Alarm List:**

- Select **Fault > Alarms...**

  The Active Alarm list appears.

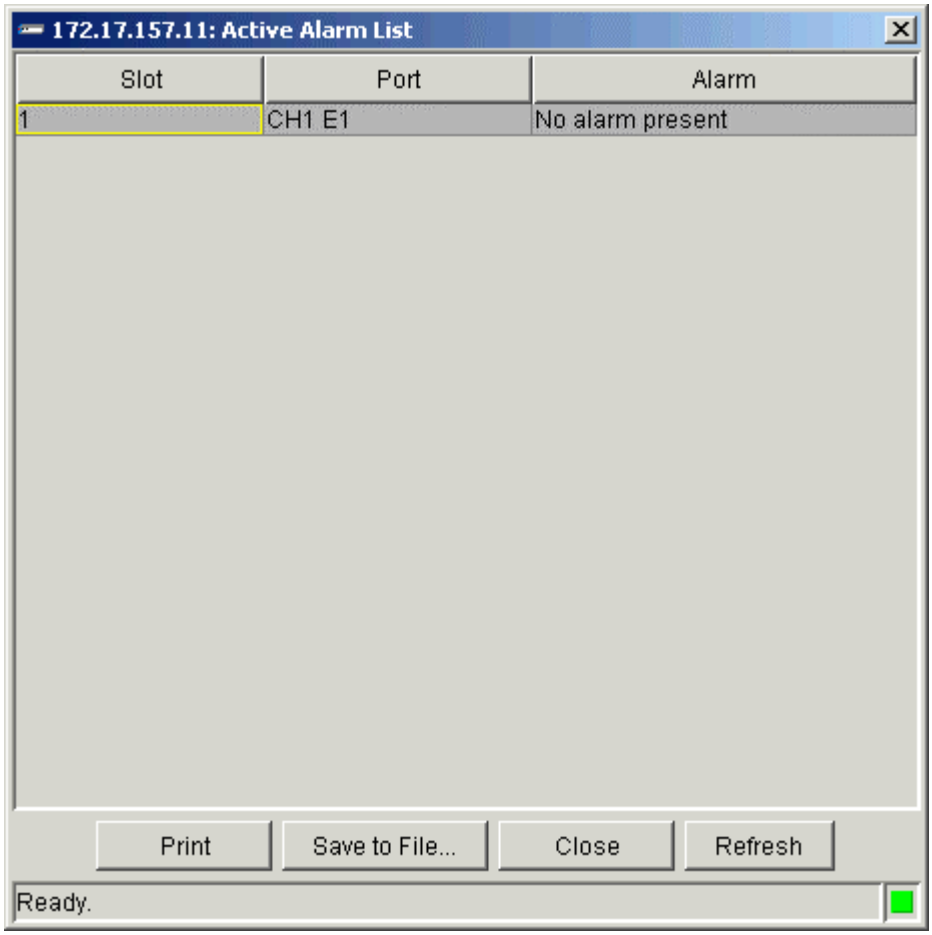

Figure 7-2. Active Alarm List

Table 7-2. Active Alarm Parameters

Parameter	Possible Values/Remarks
Slot	**1**
Port	The type of port **T1/E1**
Alarm	The type of Alarm Port alarms: **Far End LOF, Far End Sending AIS, Near End LOF, Near End Loss of Signal, Near End Sending TS16 LOMF**

Viewing the History Log

The **History Log** command enables you to display a history of alarms (up to 512 entries) that were sent from the selected IPmux-14 to the network management station. Use this command to locate problems and as a troubleshooting aid.

➤ **To view the History Log:**

- Select **Fault > History Log > List…**

  The System Log Buffer table appears.

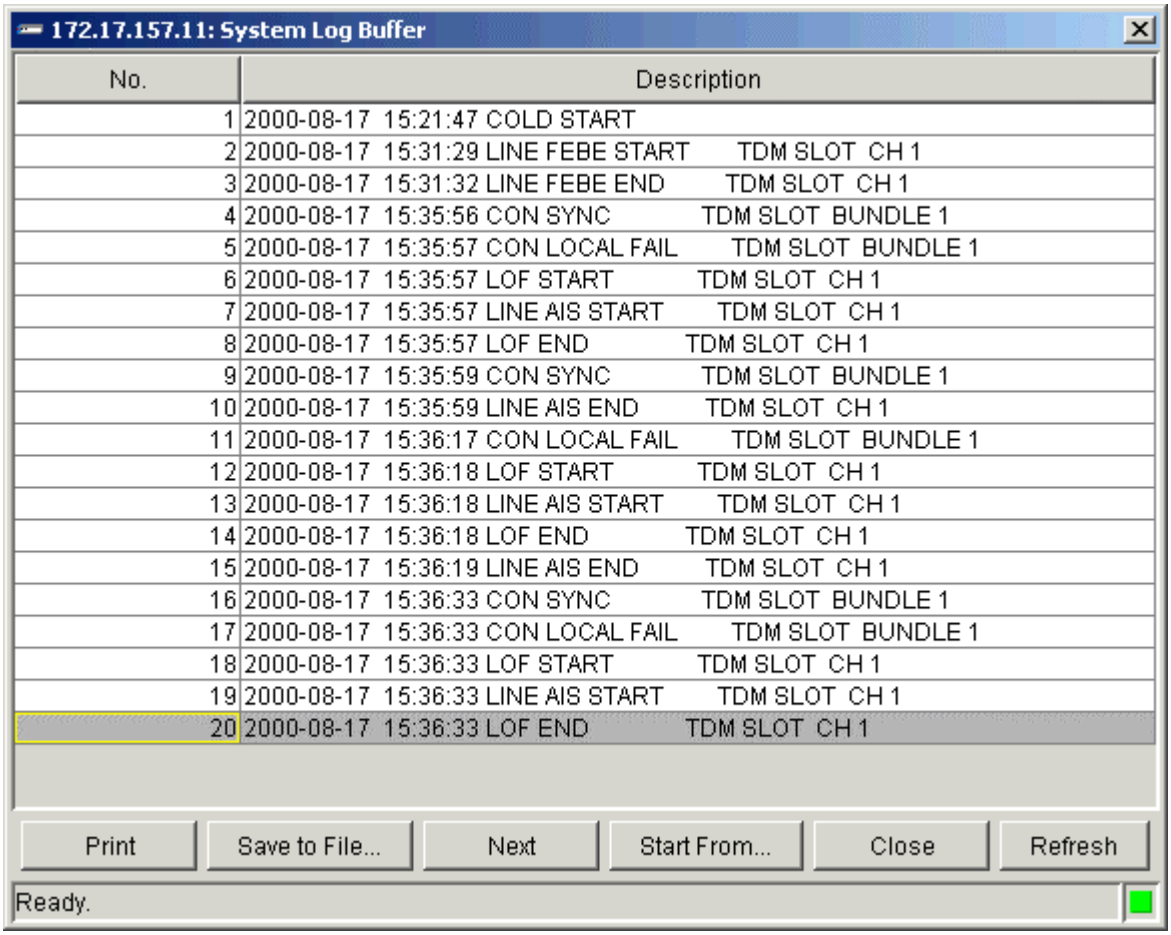

Figure 7-3. System Log Buffer

Table 7-3. System Log Buffer Parameters

Parameter	Possible Values/Remarks
No.	The number of the alarm in the log buffer
Description	Brief description of the alarm Up to 80 characters

➤ **To view entries, starting from a specific number, in the History Log:**

1. Click <Start From…>
2. Select the starting number.
3. Click <**Set**>

➤ **To print all the entries in the History Log:**

- Click <**Print**>.

Clearing the History Log

The **History Log > Clear** command enables you to erase all of the entries in the alarm history. This command is helpful for clearing out large numbers of entries for repeated alarms resulting from problems that have already been corrected or noted.

➤ **To clear the History Log:**

1. Select **Fault > History Log > Clear**.

   A confirmation box appears.

2. Click <**OK**> to confirm.

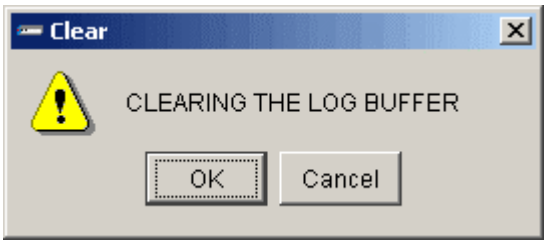

Figure 7-4. Clearing the Log Buffer Confirmation Message

Viewing Self Test Results

The **Self Test Results** command enables you to view the results of the IPmux-14 self-test. When the device is turned on, it checks itself. In case a fault is detected, this is noted in the Self Test Results log. Use this command as a troubleshooting aid to help determine the cause of an apparent device hardware or software failure.

➤ **To view Self Test results obtained when the selected IPmux-14 was powered up:**

- Select **Diagnostics > Self Test Results...**

  The Self Test Results dialog box appears displaying descriptions of detected faults.

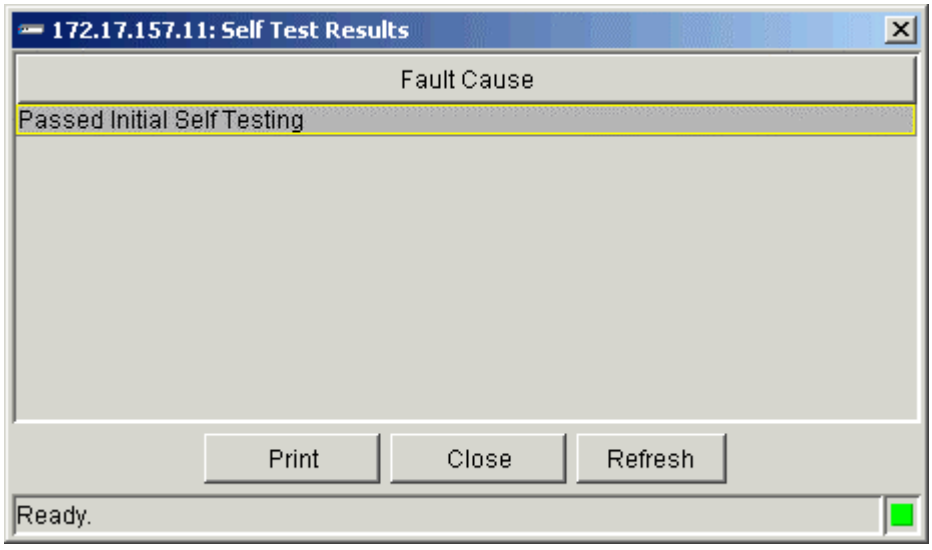

Figure 7-5. Self Test Results

7.2 Performing Loopback Tests

The **Loopback** diagnostics command enables you run loop tests on an E1 or T1 port, to troubleshoot data loss on a link and locate where the data is being lost in order to correct the problem.

➤ **To initiate a loopback test for an E1/T1 interface:**

1. Click an E1/T1 port.
2. Select **Diagnostics > Loopback...**

   The Interface Loopback dialog box appears (*Figure 7-6*).
3. Set the desired loopback test and click <**Set**>.

   The loopback test is performed.

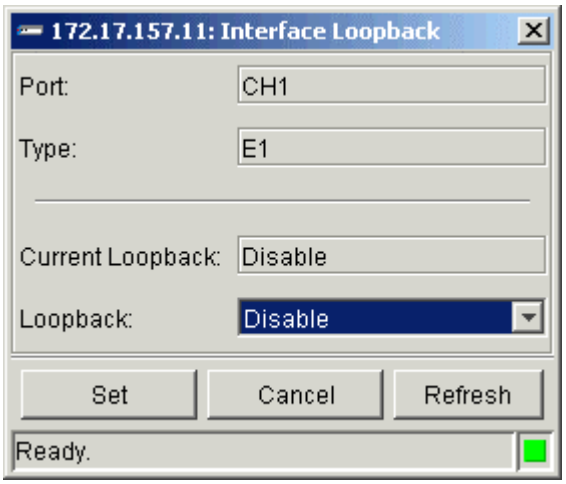

Figure 7-6. Interface Loopback State Dialog Box

Table 7-4. Interface Loopback Parameters

Parameter	Possible Values/Remarks
Port	Port number of the interface.
Type	**E1, T1**
Current Loopback	Current loopback status **Internal, External, Disable**
Loopback	Type of loopback test **Internal, External, Disable**

Index

—A—
Agent
  resetting
    IPmux-14, 3-30
Agent mode
  system level menu options, 2-7
Alarms
  active
    viewing, 7-3

—B—
Bundle Connections
  managing, 3-25
Bundles
  bundle connection table, 3-25
  configuring, 3-23
  removing, 3-28
  viewing
    current table, 6-3
    intervals table, 6-5
    statistics, 6-2

—C—
Clocks
  system
    configuring, 3-10
Configuration Management, 3-1

—D—
Default Configuration
  resetting, 3-30
Device, 1-1

—E—
E1/T1
  parameters
    configuring, 3-18
  statistics
    viewing
      current, 6-6
      intervals, 6-8
Element Manager, 2-4
Ethernet
  interface information
    displaying, 3-29
  parameters
    configuring, 3-21
  statistics
    viewing, 6-10

—F—
Fault Management, 7-1
FCAPS model, 1-2

—H—
History Log
  clearing, 7-5
  viewing, 7-4

—I—
Installation and Setup, 2-1
Introduction, 1-1
IPmux-14
  Introduction, 1-1

—L—
LAN Table
  deleting, 3-17
Loopback Tests
  performing, 7-7

—M—
MAC Table
  configuring, 3-14
  deleting, 3-17
Management
  configuration, 2-1, 3-1
  connecting to the NMS, 2-3
  fault, 7-1
  functions, 1-2
  options, 1-1
  performance, 6-1
  security, 5-1
  setting access authorizations, 5-1
Manager List, 3-6
Masking Traps, 7-1
Menu Options
  system level, Agent mode, 2-7

—P—
Performance Management, 6-1
Polling Interval
  setting, 6-1
Polling the Agent, 3-30

Port Level Management Options, 2-8
Port Level Menu Options
IPmux-14, 2-8

—Q—
QoS,configuring, 3-16
Quality of Service,configuring, 3-16

—R—
RADview
launching, 2-3
RADview, using, 2-4
Rate Limitation,see QoS,configuring, 3-16
Resetting
Agent, 3-30

—S—
Security, 5-1
UNIX users and permissions, 5-2
Security Management, 5-1
Self Test Results
viewing, 7-6
Serial Port
configuring, 3-4
Statistics
bundle, 6-2
Ethernet, 6-10
System
clocks
configuring, 3-10
System Commands
resetting
Agent, 3-30
default configuration, 3-30
System Information
configuring, 3-3
System level menu options
Agent mode, 2-7
System Level Operations, 2-7
System management options
Agent mode, 2-7
System Management Options, 2-7
System Parameters
configuring, 3-2

—T—
Telnet Access, 5-1
Traps
masking, 7-1
Typical Applications
configuration sequence, 4-4
configuring, 4-1
IPmux-11 and IPmux-14 Units, 4-2
connecting IPmux-11 to the NMS, 4-3
creating circuits, 4-5

—U—
User interface, 2-4

—V—
VLAN
configuring parameters, 3-12

—W—
Web Access, 5-1