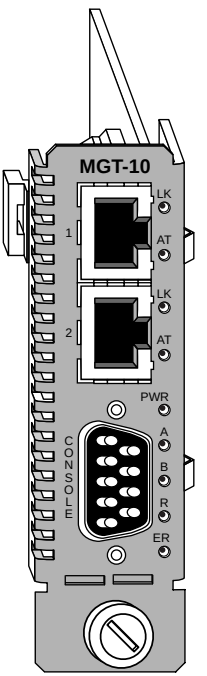
Command Line Interface



Reference Guide

Model: R502-M

Management Card

R502-M ____ Management Card with Dual Ethernet Interfaces

Contents

Chapter 1: Introduction

This document contains installation procedures and console commands necessary for the operation of the Metrobility R502-M management card. The first section describes how to connect the card to the network and to boot up for SNMP management. The document also describes the commands available to three privilege classes of users:

-->Guest

-->Admin

-->Root

Guest users can view information about the system, but cannot modify any of the fields. Admin users can monitor and configure the system, including its modules and ports. Root users, under the direction of a Metrobility support engineer, can customize or recover the system and internal file system.

The three user privileges correspond to a login and password of the same name. This list is cumulative (i.e., Admin privileges include Guest privileges, and Root privileges include all commands).

The Console Commands are organized by the three user privilege groups. The commands are listed by type (set, show, etc.). Use the comprehensive Table of Contents to locate documentation for a particular command.

Product Overview

The management line card is the SNMP agent for the chassis. Embedded in the card is the WebBeacon software for Web-based management of network devices. Used in conjunction with Metrobility's NetBeacon or WebBeacon management software, or any SNMP application, the management card delivers individual board status directly to the network administrator. Follow the console commands documented in this guide to configure the cards in the chassis.

R502-M Dual-Port Ethernet Management Card

Developed for the Radiance Optical Ethernet System, the R502-M supports all Metrobility chassis and cards. The R502-M offers a 50MHz processor and 32 Mbytes of memory. Each Ethernet interface has a unique IP address and subnet mask, and the management software can access all MIB data through either interface. The second interface can be connected to a stack of up to seven chassis using the Metrobility chassis stacking line card or an external hub. In a stacked chassis configuration, one R502-M is used as the master management card. Additional R502-Ms are used in each slave chassis in the stack.

Notation Conventions

This section describes the conventions used in this document.

Font Conventions

Arial Arial is the default font used for general text.

Times This font is used for program examples, prompt responses, and other system output.

Symbol Conventions

The following symbol conventions are used in this manual.

< > Angle brackets indicate that the enclosed information is a required entry.

[ ] Square brackets indicate that the enclosed information is optional.

| A vertical bar separating two or more text items indicates that any one of the terms may be entered as a value.

Command Field Conventions

<chassis>	Chassis number in the stack.
<module>	Chassis slot number where the card is installed.
[-converter]	Media converter number on a fixed port chassis.
<port>	Port number on the line card.
<remote>	Remote card number connected to an access line card.
<remoteport>	Port number on a remote card connected to an access line card.

Chapter 2: Installation Guide

This section describes how to install the management card into the chassis, connect to the network and stack, and boot up for SNMP management.

Safety Warnings

Electrostatic Discharge Warning
Electrostatic discharge precautions should be taken when handling any line card. Proper grounding is recommended (i.e., wear a wrist strap).

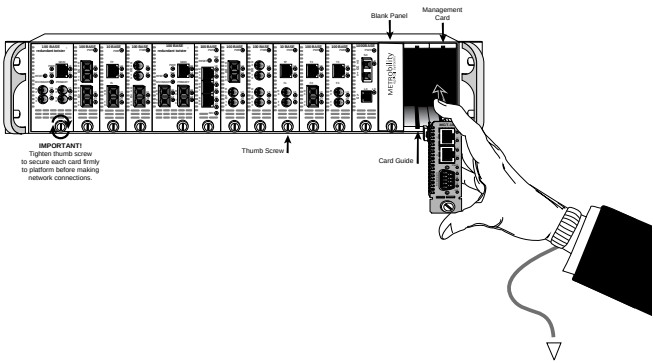
Battery Replacement Warning
Danger of explosion if the battery on the management card is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Install the Management Card

The management card must be installed in the slot furthest to the right of the chassis. You may install it in either slot of a two-slot chassis. All other line cards may be installed into any slot.

Follow the simple steps below to install the management card:

- Grasp the edges of the card by the front panel as shown.
- Line the edges of the card with the slot guides and slide the card in until the edges are flush and even with the front of the unit. Do not force the card into the slot unnecessarily. It should slide in easily and evenly.
- Secure by turning the thumb screw clockwise until snug. The card is now ready for connection to the network.



Connect to the Network

The management card supports 10Base-T Ethernet.

- Using a standard Category 3 or 5 UTP cable, connect the management card to your network. Connect Port 1 to your network. Although the port can be configured for either full or half duplex, half duplex is recommended.
- Using the supplied null-modem console cable, connect the male DB-9 port on the management card to the serial port on your PC.

Connect to the Stack

The R502-M management card supports two 10Base-T Ethernet connections. When connecting to the network, use a standard Category 3, 4 or 5 UTP cable.

Master Chassis

- Connect port 1 of the master R502-M to your network. For proper operation, the port is preset to half duplex and should not be changed.
- Connect port 2 on the master R502-M to a Metrobility chassis stacking line card or to a hub or switch that is NOT on your network. Port 2 is preset to half duplex and should not be changed.
- Using the supplied null-modem console cable, connect the male DB-9 port on the master R502-M to the serial port on your PC.

Slave Chassis

- For each slave chassis you want to include in the stack, connect the Ethernet port on its management card to the same chassis stacking card, hub, or switch to which you connected the master R502-M. This provides the communication path between the master R502-M and the network stack.

When using an R502-M in the slave position, use Port 1 to make the Ethernet connection to the stack, and disable Port 2 via the boot configuration menu.

Boot Up for SNMP Management

Management of the Metrobility chassis can be provided through our NetBeacon or WebBeacon software, or any SNMP network management application, via a PC. SNMP is supported on many general network platforms: SunNet

Manager, HP OpenView for UNIX, HP OpenView for NT, SNMPc and others. Refer to the Console Commands section for a detailed description of configuration commands.

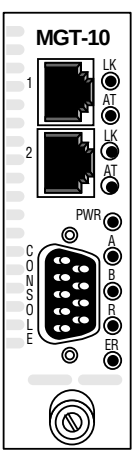
The PC Terminal Session Parameters are as follows:

9600 Baud / 8 data bits / 1 stop bit / no parity / no flow control

Power-on Boot Indications

Following power-up, the boot image is automatically executed. It starts by performing a system initialization, followed by diagnostic tests. During this process, the Run LED is off and the Error LED blinks. After diagnostics are complete, if a failure has occurred, the Error LED remains on. The Run LED does not illuminate until the operating system is successfully started.

Management Line Card LED Indicators



LED Name	Label	Status	Indication
Ethernet Link	LK	ON	LINK present
Ethernet Activity	AT	ON	LINK present and receiving packets
Power	PWR	ON	Management line card is receiving power
Power Supply A	A	ON	Power supply A is ON
Power Supply B	B	ON	Power supply B is ON
Run	R	OFF	Performing diagnostics or loading OS
		ON	Successful OS load and system operating normally

LED Name	Label	Status	Indication
Error	ER	ON (steady)	Diagnostic or boot failure
		ON (blinking)	Performing diagnostics or initializing system
		OFF	Normal operation

The following is an example of the console display information:

Metrobility Optical Systems Inc. Boot Application : 3.8.0
Executing Power-On Selftest.....

NETWORK INTERFACE PARAMETERS:
LAN IP address will be obtained from BOOTP
HARDWARE PARAMETERS:
Serial channels will use a baud rate of 9600
HARDWARE PARAMETERS:
R502-M Mpc850 (Rev 0.1) CPU running at 50 Mhz with 10 Mhz input clock
DRAM 32 Mbytes
NVRAM 8 Kbytes
FLASH 8 Mbytes
This board's Primary Ethernet MAC address is 0:0:0:0:0:0
The Primary Ethernet port will run in Half duplex mode
The board's Secondary Ethernet MAC address is 0:0:0:0:0:0
The Secondary Ethernet port will run in Half duplex mode

M7500 BOOTLOADER PARAMETERS:
Chassis is not in a Stack
Name of the Boot image is boot.bin
Boot via the DISK Bootloader
Disk device type is FLASH
ID of the disk to be used is 0
Volume is pHILE formatted
The file to load and start is corepm.biz
RADIUS authentication for the console is not disabled.
RADIUS failure defaults to local authentication is not enabled

```
Allow Telnet user to execute secure CLI commands is not enabled
After board is reset, start-up code will wait 10 seconds
```

```
To change any of this, press any key within 10 seconds

(M)odify any of this or (C)ontinue? [M] c

Verifying volume.
```

If you don’t have a BOOTP server, or if you don’t have a BOOTP entry for this system, you will see the following message:

```
BOOTP request failed: Check for a RARP server/Network Error
```

If you wish to set up your BOOTP server, you must provide an IP address, subnet mask, and default gateway. If you do not wish to use BOOTP, you can hit any key and modify the boot parameters.

Configuration of the Boot Loader

The boot loader can be configured to obtain its image and configuration information from three different sources: manually through the boot loader configuration dialog, through a BOOTP server, or partially configured through a RARP server.

To configure the boot load type, press any key within the designated time to access the system configuration menus.

Boot Option	Description
Manual Config: File System	Requires the user to input system configuration information, then starts the operating system from the on-board file system using that information. System configuration information is saved through power cycles.
BOOTP	Contacts a BOOTP server in your network to get system information used to boot.
Manual Config: TFTP Boot	Requires the user to input system information, then starts the operating system from a TFTP server using that information. System configuration information is saved through power cycles.

The following configuration information is required:

Name IP	When Required	Description
IP Address	BOOTP, File, TFTP	The IP address of the system is required to start the operating system.
		If BOOTP is used, the IP address must be set to 0.0.0.1.
		If RARP is used to get the IP address, 0.0.0.0 must be placed in the IP address field.
IP Subnet Mask	BOOTP, File, TFTP	The IP subnet mask is required to start the operating system.
Boot Type	BOOTP, File, TFTP	Used to determine if the system will load the operating system from the local file system or from a networked file system via TFTP.
File Name	TFTP	If the file is to be loaded via TFTP, the user must enter the operating system path and file name on the remote file system.
Default Gateway	If a default gateway is in your network.	Your network default router gateway.

Manual Configuration

Below is an example of the console display information:

```
Metrobility Optical Systems Inc. Boot Application : 3.8.0
Executing Power-On Selftest.....
-------------------------------------------------------------
NETWORK INTERFACE PARAMETERS:
  LAN IP address will be obtained from BOOTP
HARDWARE PARAMETERS:
  Serial channels will use a baud rate of 9600
HARDWARE PARAMETERS:
  R502-M Mpc850 (Rev 0.1) CPU running at 50 Mhz with 10 Mhz
input clock
      DRAM      32 Mbytes
      NVRAM      8 Kbytes
      FLASH      8 Mbytes
  This board's Primary Ethernet hardware address is 0:0:0:0:0:0
  The Primary Ethernet port will run in Half duplex mode
  This board's Secondary Ethernet hardware address is 0:0:0:0:0:0
  The Secondary Ethernet port will run in Half duplex mode
M7500 BOOTLOADER PARAMETERS:
  Chassis is not in a Stack
  Name of the Boot image is boot.bin
  Boot via the TFTP Bootloader
  IP ADDRESS of the TFTP host RARP server
  The file to download and start is corepm.biz
  RADIUS authentication for the console is not disabled.
  RADIUS failure defaults to local authentication is not enabled
  Allow Telnet user to execute secure CLI commands is not enabled
After board is reset, start-up code will wait 10 seconds
-------------------------------------------------------------
To change any of this, press any key within 10 seconds
(M)odify any of this or (C)ontinue? [M]
```

Each question that the boot loader poses has a default response contained within brackets [ ]. If the system has not been configured, the brackets contain the factory default values. If the system has been configured, the system saves the last used values.

For each of the following questions, you can press <Enter> to select the value shown in braces, or you can enter a new value.

NETWORK INTERFACE PARAMETERS:
This board's Primary LAN IP address (0.0.0.0 = RARP, 0.0.0.1 = BOOTP)? [0.0.0.1]

Management software requires IP protocols (SNMP and FTP) to work properly. For this reason, the boot loader prompts you for an IP address. IP addresses can be manually assigned, or assigned via a RARP or BOOTP server within the network to which the chassis is connected. If you are configuring an R502-M as the first chassis in a stack, you must do it manually.

To set up the system using BOOTP, enter <0.0.0.1> in the board's LAN IP address field. To configure the system using RARP, enter <0.0.0.0> in the board's LAN IP address field.

If you are configuring the system manually, the following question is asked:

Subnet mask for Primary LAN (0.0.0.0 for none)? [0.0.0.0]

For the R502-M, you are offered the option of enabling or disabling the secondary Ethernet port. If you are configuring a master R502-M for a stack, enter <Y> to enable the port. If you are configuring a slave R502-M for a stack, you must enter <N>.

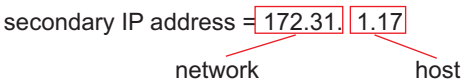
Do you want a Secondary LAN interface? [Y]

If you chose to enable the secondary LAN interface, the same two questions are repeated for the port.

This board's Secondary LAN IP address (0.0.0.0 = RARP, 0.0.0.1 = BOOTP)? [0.0.0.1]
Subnet mask for Secondary LAN (0.0.0.0 for none)? [0.0.0.0]

Stack Configuration

If you are configuring for a stack, the board's secondary LAN IP address must be a valid class B address, according to RFC 1597.



- Set the network half of the address between 172.16.0.0 and 172.31.0.0.
- Set the host half of the address to be the chassis's stack position number followed by the slot number of its management card.
- All other chassis in the same stack must have an IP address with the same network portion that was assigned to the R502-M's secondary interface. Increment the stack positions by one. Up to seven chassis are supported in each stack.
  Example:
  172.16.1.17 stack position 1, slot 17 (17-slot chassis)
  172.16.2.12 stack position 2, slot 12 (12-slot chassis)
  172.16.3.1 stack position 3, slot 1 (2-slot chassis)
- After manually configuring the first chassis in the stack, an alternative method of adding other chassis is to use the administrative level command: **bootp -set**. Refer to the Console Commands section for further details.

The following questions pertain to the board's primary interface.

Should there be a default gateway for packet routing? [Y]
What is its IP address? [0.0.0.0]

The boot loader poses the following questions for hardware parameters:

HARDWARE PARAMETERS:

Baud rate for serial channels [9600]

HARDWARE PARAMETERS:
Do you want to change the board's Primary Ethernet MAC address? [N]
Do you want to change the board's Secondary Ethernet MAC address? [N]

The following questions relate to stacking and load type.

Note: *The maximum number of chassis supported in a stack is seven (7).*

M7500 BOOTLOADER PARAMETERS:
Is this Chassis in a Stack? [Y]
Stack Position (1-7)? [1]
Boot from (D)isk or via (T)ftp over the network? [D]
Transfer file to disk via TFTP? [N]
Name of the file to load and start? [corepm.biz]

The following questions ask whether or not to override the console port, enable authentication locally if there is a RADIUS failure, and allow a user to perform secure commands via Telnet. It also asks for the length of time to wait before the CPU restarts.

Disable RADIUS authentication for the console? [Y]
Enable local authentication on RADIUS failre? [Y]
Enable Telnet user to execute secure console commands? [Y]
How long (in seconds) should CPU delay before starting up? [10]

The boot loader allows the operating system to be loaded from either the on-board file system or from a network accessible file system via TFTP. The on-board file system is the default method of image load.

If you select to load via TFTP, the boot loader poses these remaining questions:

Transfer file to disk via TFTP? [N] y
IP address of the server to copy file from? [0.0.0.0] 100.132.65.23
Name of the file to transfer? [corepm.biz]
Volume needs formatting? [N]
How long (in seconds) should CPU delay before starting up? [10]

Note: *This method of operating system load is primarily for loading a new operating system version, without deleting the old version from the system.*

Once the configuration is complete, the boot loader displays your responses in the start-up mode console description. You can either continue with the boot process or change any configuration parameters.

NETWORK INTERFACE PARAMETERS:
  IP address on Primary LAN is 100.132.60.155
  Primary LAN interface's subnet mask is 255.255.255.0
  IP address on Secondary LAN is 100.168.0.1
  Secondary LAN interface's subnet mask is 255.255.255.0
  IP address of default gateway to other networks is 100.132.60.1
HARDWARE PARAMETERS:
  Serial channels will use a baud rate of 9600
HARDWARE PARAMETERS:
  R502-M Mpc850 (Rev 0.1) CPU running at 50 Mhz with 10 Mhz input clock
    DRAM 32 Mbytes
    NVRAM 8 Kbytes
    FLASH 8 Mbytes
  This board's Primary Ethernet MAC address is 0:10:9f:14:C:12
  The Primary Ethernet port will run in Half duplex mode
  This board's Secondary Ethernet MAC address is 0:10:9f:14:C:13
  The Secondary Ethernet port will run in Half duplex mode
M7500 BOOTLOADER PARAMETERS:
  Stack Position is 1

Name of the Boot image is boot.bin
Boot via the DISK Bootloader
Disk device type is FLASH
ID of the disk to be used is 0
Volume is pHILE formatted
The file to download and start is corepm.biz
RADIUS authentication for the console is not disabled.
RADIUS failure defaults to local authentication is not enabled
Allow Telnet user to execute secure CLI commands is not enabled
After board is reset, start-up code will wait 10 seconds

(M)odify any of this or (C)ontinue? [M] c

If you are satisfied with the configuration parameters, type <c> to continue with the boot process. The boot process automatically continues if no key is pressed within 10 seconds.

Verifying volume.

FLASH driver initialized...
Starting disk download of 44.0.0/corepm.biz...
Decompressing ... One moment...
Each . equals 10K bytes processed (uncompressed)
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
Decompression Complete!
Disk load completed

Transferring control to the downloaded code

Boot Completion Indications

The operating system displays a number of log messages on the screen as it comes up. The following is an example of that output:

```
ROOT  :00000000:INFO (DEV_PSEUDO initialized)
ROOT  :00000000:INFO (DEV_TFTP initialized)
ROOT  :00000000:INFO (DEV_TIMER initialized)
ROOT  :00000000:INFO (DEV_TFTP initialized)
ROOT  :00000000:INFO (DEV_FLASH initialized)
ROOT  :00000000:INFO (DEV_TOD initialized)
ROOT  :00000000:INFO (DEV_HTTP initialized)
ROOT  :00000000:INFO (DEV_I2C initialized)
ROOT  :00000000:INFO (DEV_LED initialized)
ROOT  :00000000:INFO (DEV_PHYSICAL initialized)
ROOT  :00000000:INFO (Locking boot sectors)
ROOT  :00000000:INFO (Image WebBeacon_corepm built on Apr
11 2005 at 11:09:48 by bldmstr@ROCKME)
ROOT  :00000000:INFO (Revision: 3.8.0)
ROOT  :00000000:INFO (Flash File System mounted on device 44.0)
ROOT  :00000000:INFO (Telnet daemon initialized)
ROOT  :00000000:INFO (TELNET daemon enabled)
ROOT  :00000000:INFO (Ftp daemon initialized)
ROOT  :00000000:INFO (FTP daemon enabled)
ROOT  :00000000:INFO (Dnsd daemon initialized)
ROOT  :00000000:INFO (Httpd daemon initialized)
CMGR :00000000:INFO (R131-13 Inserted in IoSlot1_1)
CMGR :00000000:INFO (R502-M Inserted in IoSlot1_2)
CMGR :00000000:INFO (AC Power Supply Inserted in PS Slot A)
CMGR :00000000:INFO (AC Power Supply Inserted in PS Slot B)

+*****************************************************+
*                                                     *
* Metrobility 17 Slot Chassis 19"                     *
*                                                     *
* Fri Apr 1219:29:42 2005                             *
* Version: 3.8.0 (Apr 11 2005)                        *
* Serial Number: A001200048                           *
*                                                     *
* Copyright 1998 - 2005 Metrobility Optical Systems, Inc.  *
+*****************************************************+
```

login:

Login Instructions

To log on to the network, do the following:

- Type your user name at the login prompt and hit <Enter>. The three default names are **guest**, **admin** and **root**.
- Type your password at the Password prompt and hit <Enter>. The default passwords are the same as their corresponding user names. Passwords are not displayed.

To view the current user/password list, delete a user or add a new user, refer to the 'user' commands, which are admin privilege commands.

Example:

login: admin

Password:
sh05 :00000000:INFO (User <Administrator> logged in)

Console>user -all
admin:~N6H1~B:11:11:Administrator:/:psh
guest:~H~Dh'1:21:21:Guest:/:psh
Console>

CLI Access Via Modem

To access the Command Line Interface (CLI) using a modem, the modem must be configured properly to support remote communications with the console port on the management card.

To configure your modem, use the AT command set or the software provided by the modem manufacturer. The settings required to enable a Zoom/Fax Modem V.34X+ Model 2836 to communicate with a Metrobility management card are shown

in the example below. Please refer to your modem's manual for compatible AT commands.

Modem Configuration

The modem configuration information shown below is for a Zoom/Fax Modem V.34X+ Model 2836.

E0 Disable echo.

N1 Enable automode detection.

Q1 Disable result codes to the DTE (data-terminal equipment).

X0 Disable monitoring of busy tones.

&C0 RLSD (received line signal detector) remains ON at all times.

&D0 Ignore DTR (data terminal ready); must also set &Q5.

&K0 Disable flow control.

&Q5 Modem will try to negotiate an error-corrected link.

&R1 CTS (clear to send) is always ON; RTS (ready to send) is ignored.

&S1 DSR (data set ready) becomes active after answer tone is detected, and inactive if carrier is lost.

&T5 Disable digital loopback.

&X0 Select internal timing.

S00 Set this to the number of rings for auto-answer; number must be greater than zero.

Console Port Configuration

The console port on the management card does not use hardware control lines, nor does it support software flow control. The port is permanently set to the following configuration:

Speed	9600 baud
Data Bits	8
Parity	none
Stop Bits	1

Caution: *There is a potential risk of opening a security hole if the modem is disconnected before logging off from the CLI session.*

In the following example, a Zoom/Fax Modem V.34X+ Model 2836 is connected to a Windows PC using Hyperterminal with AT commands.

ate1 (turns on echo)

at&vn (displays active and saved configurations)
B1 E0 L1 M0 N1 Q1 T V1 W0 X0 Y0 &C0 &D0 &G0 &J0 &K0
&Q5 &R1 &S1 &T5 &X0 &Y1
S00:001 S01:000 S02:043 S03:013 S04:010 S05:008 S06:002
S07:050 S08:002 S09:006
S10:014 S11:095 S12:050 S18:000 S25:005 S26:001 S36:007
S37:000 S38:020 S44:020
S46:138 S48:007 S95:000

ate0 (turns off echo)

RADIUS Authentication for the R502-M

Overview

The R502-M management card supports the Remote Authentication Dial In User Service (RADIUS) protocol for authentication, but not challenge/response. The R502-M neither processes nor responds to Access-Challenge messages.

When sending an Access-Request message, the R502-M includes the following four RADIUS attributes:

Attribute	Attribute #
User-Name	1
NAS-Identifier	32
NAS-IP-Address	4
User-Password	2

The value for the Network Access Server (NAS) identifier is the chassis alias, which is set using the command: set chassis name. The value for the NAS IP address is the IP of the primary Ethernet port. The username and password values are entered by the user. The password is protected using the MD5 hashing scheme described in RADIUS RFC 2865.

The R502-M expects only one attribute to be present in an Access-Accept message: Service-Type (6). The acceptable values for this attribute are:

Login (1)	Grants access in a user role (i.e., Guest login privileges).
Administrative (6)	Grants access in an administrative role (i.e., Administrative login privileges).

Any other attributes contained in the Access-Accept message are ignored.

Configuring FreeRADIUS for the R502-M

RADIUS authentication was verified using FreeRADIUS (www.freeradius.org) server version 0.9.1. Configuring the FreeRADIUS server to authenticate users of an R502-M card requires two steps, which are described below.

1. Enter the R502-M as a managed device. To configure FreeRADIUS to accept requests on behalf of the R502-M, you must edit the file clients.conf. (By default the file resides

in the /usr/local/etc/raddb/ directory.) Add an entry as shown in the following example:

```
client 100.150.2.200   {
secret                 = testing123
shortname              = chassis1
}
```

where:

secret is the shared secret between the server and device.
shortname is the NAS-identifier value.

2. Configure the users who will be allowed access to the R502-M. To do this, edit the file users in the same directory as above, and add entries as shown below:

Example 1.

```
raduser Auth-Type := Local, User-Password == "raduser"
        Service-Type = Login-User
```

Example 2.

```
radadmin Auth-Type := Local, User-Password == "radadmin"
        Service-Type = Administrative-User
```

Example 1 enables the user *raduser* to log on with the password *raduser* with user (guest) privileges. Example 2 allows the user *radadmin* to log on with the password *radadmin* with administrative privileges.

The RADIUS server is now ready to be started with the command radiusd.

Configuring the R502-M

Configuration of the R502-M to use RADIUS authentication consists of entering the information for the RADIUS server(s) and then enabling authentication for the desired interfaces. Enter server information using the following command:

set radius server <IP address> <secret> [<port number>] [primary]

where:

IP address	The IP address of the RADIUS server.
secret	The shared secret between the device and the server (up to 65 characters long).
port number	(optional) The UDP port where requests are sent (default port is 1812)
primary	(optional) Specifies that this is the primary server to use.

When configuring the RADIUS server's IP address, the R502-M attempts to verify that the server is available on the network. If the server is not available, you will be prompted to accept or reject the entry.

```
Console>set radius server 10.10.10.1 ok
Warning: Could not verify the existence of a RADIUS server at
10.10.10.1 port 1812
Do you want to accept this configuration? [N]
```

Authentication can then be enabled using the command:

set radius authentication <scope> [enable | disable]

where:

scope	all, telnet, web (FTP and HTTP) or console.

Persistence Data

When a chassis is initially started, the management line card polls all installed cards and saves their part numbers and hardware switch settings.

When you change a switch setting via software, the card's part number, hardware switch settings and new software setting are saved.

If you remove the card and insert a new card into its slot, one of the following occurs:

1. If the part number and hardware switch settings match, the software switch settings stay the same.
2. If the part number matches but the hardware switch settings do not, the new hardware switch settings take precedence. All other software settings remain unchanged.
3. If the part number does not match, all hardware settings for the new card take precedence and the persistence file is updated with the new data.

Upgrade Procedures

There are several ways of upgrading the embedded code[1]. This section describes three methods to upgrade the software.

- Command Line Interface (CLI) via FTP
- BOOT Process (to execute embedded software that does not reside on the management card, or to transfer embedded software to the management card via TFTP)
- NetBeacon Management Software

Metrobility does not support storing more than two copies of corepm.biz. If the Flash File System (FFS) is full, we cannot guarantee operation. In some instances, a full file system can corrupt the FFS. If the file system's limit is approached, a warning message will appear on the console asking you to delete unnecessary files.

1.When upgrading software to management cards in a stack, make sure that the same software version is installed within that stack (e.g., version 3.1 code cannot be mixed with 3.0.1 code in the same stack).

Upgrade Firmware Via FTP

To load the image file (corepm.biz) and boot code (boot.bin) via FTP on a local console, do the following:

1. Copy the corepm.biz and boot.bin files into a directory accessible via FTP.
2. Log on to the console at the administrator or root level.
3. FTP to the system where the corepm.biz and boot.bin files reside.
4. Set the FTP session into binary mode.
5. Go into the directory that contains the corepm.biz and boot.bin files.

Upgrading to a major software release (e.g., from version 2.1 to 3.x) requires both files to be updated. For most other software upgrades, you may download only the image file, however, Metrobility recommends keeping both files synchronized to the same version.

6. Type “get corepm.biz” and “get boot.bin”.

Note: *Do NOT reset or power-down the system while upgrading software! The file system may go into an unknown state causing boot failures.*

7. Once the download is complete, quit the FTP session.
8. If you downloaded the boot code, type “set module image boot <chassis> <module> file://[path/]boot.bin” (e.g., set module image boot 1 17 file://boot.bin).

Note: *Do not to interrupt the process.*

9. Reboot the management card by issuing the command: “reset module <chassis> <module>” (e.g., reset module 1 17).

Note: *Do NOT use the “reset chassis” command. After successfully rebooting the management card, you are done. Both boot.bin and corepm.biz will be running.*

Firmware Boot Process via TFTP

Continue with the following steps only AFTER copying boot.bin onto the management card.

The initial boot process provides two options for upgrading files via TFTP. One option enables you to execute a file that does not reside on the management card. This method does not load the file onto the management card. Another option allows you to transfer the file onto the management card and then execute it.

1. Copy the corepm.biz file into a directory accessible via TFTP.
2. Reset the management card.
3. During the initial boot process, hit the <space bar>.
4. Select Modify by typing <M>.
5. Make sure the Ethernet port is enabled, and that the network interface and hardware parameters are set.

   Continue with “Upgrading from a TFTP Server” or “Upgrading from Disk.”

Upgrading from a TFTP Server

To execute software that resides on a TFTP server, do the following:

A. When asked whether to boot from disk or via TFTP over the network, select TFTP by typing <T>.

B. Enter the IP address of the TFTP server where corepm.biz is located.

C. Enter the directory and filename for corepm.biz (e.g., \tftpboot\corepm.biz for Windows or /tftpboot/corepm.biz for Unix).

D. Complete the boot configuration dialog. At the end of the dialog, continue the boot process by typing <C>. The file will be executed, but not loaded to disk.

Upgrading from Disk

Continue with the following steps after performing steps 1 through 5 in “Firmware Boot Process Via TFTP.” This section describes how to transfer the embedded software to the management card via TFTP.

A. When asked whether to boot from disk or via TFTP over the network, select disk by typing <D>.

B. Type <Y> when prompted with “Transfer file to disk via TFTP?”

C. Enter the IP address of the system where corepm.biz resides.

D. Enter the directory and filename for corepm.biz (e.g., \tftpboot\corepm.biz for Windows or /tftpboot/corepm.biz for Unix).

E. Complete the boot configuration dialog. At the end of the dialog, continue the boot process by typing <C>. The file will be loaded to disk and executed.

NetBeacon Management Software

For detailed instructions on how to download the embedded software and boot code through NetBeacon, refer to the *NetBeacon Element Management Software Installation & User Guide*.

Obtaining Metrobility MIB and Firmware Files

To get the latest Metrobility Management Information Base (MIB) and firmware files, go to http://www.metrobility.com/support/software.htm. Follow the on-screen instructions to download the files.

Chapter 3: Console Commands Overview

This section lists all the commands available for the three privilege classes of users. The list is cumulative (i.e., Admin privileges include Guest level commands and Root includes all commands).

Guest Privilege Commands

Login = Guest
Default Password = Guest
cd
chassis
clrscr
exit
help
history
ls
module
ping
port
pwd
pwv
quit
rcli
remote
remoteport
top
up
show acl
show arp
show chassis
show help
show interface
show ip help
show ip routes
show ip stats
show log all
show log details
show log help
show log severities
show log summary
show log tail
show mac
show module
show motd
show netstat active
show netstat all
show netstat help

show netstat interface
show netstat routes
show netstat snmp
show netstat statistics
show port
show radius
show stats rmon
show system
show time
show trap controls
show trap destination
show trap help

Admin Privilege Commands

Login = Admin
Default Password = Admin

bootp -all
bootp -delete
bootp -help
bootp -set

clear acl
clear arp
clear help
clear ip help
clear ip route
clear log
clear motd
clear radius server
clear snmp community
clear snmp help
clear snmp user
clear trap destination
clear trap help

reset chassis
reset help
reset module
reset remote

set acl
set arp
set chassis asset
set chassis help
set chassis name
set help
set ip address
set ip help
set ip route
set logging add
set logging all
set logging delete
set logging help
set logging none
set module activefpga
set module activeos
set module asset
set module autorecover
set module autorevert
set module backpressure
set module bootpdisable
set module bootpenable

set module datarate
set module dhcp
set module dhcpretries
set module disable
set module enable
set module fdflowctrl
set module ftpdisable
set module ftpenable
set module help
set module icmp
set module image
set module ip
set module ipapply
set module ipgateway
set module ipmask
set module l3capability
set module llcf
set module mvlan
set module name
set module portfctl
set module portlbktime
set module portllcf
set module portmgmt
set module redabsel
set module redlink
set module redloa
set module redmode
set module redtx
set module sduplexAll
set module sfdflowctrlAll
set module shdflowctrlAll
set module SONAR
set module telnetdisable
set module telnetenable
set module transparent
set module upgactivate
set module upgfilename
set module upglocation
set module upgsrv
set module upgsrvpasswd
set module upgsrvproto
set module upgsrvusrname
set module webdisable
set module webenable
set module webredirect
set module webselect
set module write
set motd
set port autoneg
set port bandwidth
set port bert
set port burstlength
set port disable
set port dislbkres
set port duplex
set port enable
set port fault
set port fefenable
set port help
set port linebuildout
set port linecode
set port llr
set port loopback
set port name
set port remotelpbk
set port speed

set prompt
set radius authentication
set radius help
set radius retransmit
set radius server
set radius timeout
set snmp community
set snmp help
set snmp user
set snmp v1/v2
set system contact
set system help
set system location
set system name
set time
set trap control
set trap destination
set trap help

show snmp community
show snmp engineID
show snmp help
show snmp user
show snmp v1/v2

user -all
user -delete
user -help
user -set

cat
copyboot
echo
ftp
head
nvclear
password
tail
telnet
touch
tftp

Root Privilege Commands

Login = Root

Default Password = Root

cp
delhost
getaddr
gethname
ifconf
mkdir
mount
mv
rm
rmdir
setenv
sethost
sync
umount

Chapter 4: Guest Privilege Commands

Guest commands are basic user commands used to monitor system status. The default password is: **guest**

Utility Commands

Command: cd

Description: Change working directory.
Syntax: cd <directory>
Example: Console>cd etc

Command: chassis

Description: Set the chassis scope. The command prompt displays the selected chassis, and the chassis number is no longer entered in commands which have a chassis field (e.g., 'show module 4' instead of 'show module 1 4').
Syntax: chassis <chassis>
Example: Console>chassis 1
#1>

Command: clrscr

Description: Clear the screen.
Syntax: clrscr
Example: Console>clrscr

Command: exit

Description: Log off.
Syntax: exit
Example: Console>exit

Command: help

Description: Show available commands.

Syntax: help
?

Note: Using 'help' with another command (e.g., 'help ping') will display a description of the command followed by the following system message <reentrant, not locked> which may be disregarded.

Example:

```
Console>help

cd          chassis     clrscr      exit        help
history     ls          module      ping        port
pwd         pwv         quit        rcli        remote
remoteport  show        top         up
```

Command: history

Description: List all commands that have been entered, or repeat a prior command.

Syntax: history, !!, !#

Note: History lists all commands that have been entered.
!! repeats the last command.
!# repeats the #th command in the history list (e.g., !4 repeats the 4th command entered).

Example:

```
Console>history

1   show mod all
2   pwd
3   ls
4   show time

Console> !!

Date 4/12/2005
Time 18:09:43

Console> !2

44.0.0/
```

Command: ls

Description: List files.

Syntax: ls [-1FRdfgilqrs] [filename...]

Options:

- -1 Display output in one column.
- -F Put a '/' after each directory name.
- -R List files recursively through subdirectories.
- -d List actual directory, not contents.
- -f Do not sort output.
- -g Show group ownership of a file.
- -i Print a file's associated inode.
- -l Long output format, show all file details.
- -q Show unprintables as '?'.
- -r Reverse the sort order.
- -s Show a file's size.

Example:

```
Console>ls -l
total 2005
-r--r--r--   1 root     2048  Dec 10 2004 20:04 BITMAP.SYS
-r--r--r--   1 root    26112  Dec 10 2004 20:04 FLIST.SYS
dr-xr-xr-x   1 root      320  Mar 22 2005 21:50 NVconfig
-rw-rw-rw-   1 root   628708  Mar 30 2005 13:25 boot.bin
-rw-rw-rw-   1 root   992162  Mar 30 2005 13:25 corepm.biz
dr-xr-xr-x   1 root      208  Apr 07 2005 14:33 etc
dr-xr-xr-x   1 root       16  Mar 30 2005 14:04 webs
```

Command: module

Description: Set the module scope. The command prompt displays the selected chassis and module. The chassis and module numbers are no longer entered in commands which have these fields (e.g., 'show port 2' instead of 'show port 1 11 2').

Syntax: module <chassis> <module[-converter]>

Example:

```
Console>module 1 11

#1/11>
```

Command: ping

Description: Send ICMP echo request packets to the network host.

Syntax: ping [-s] <host> [timeout]

Note: When the -s option is specified, ping sends one datagram per second and prints one line of output for every response it receives. The default timeout is 10.

Example:
```
Console>ping 100.132.65.99

ping (100.132.65.99): 56 data bytes
100.132.65.99 is alive
```

Command: port

Description: Set the port scope. The command prompt displays the selected chassis, module and port. The chassis, module and port numbers are no longer entered in commands which have these fields (e.g., 'show port' instead of 'show port 1 11 2').

Syntax: port <chassis> <module[-converter]> <port>

Example:
```
Console>port 1 11 2

#1/11/2>
```

Command: pwd

Description: Print working directory.

Syntax: pwd

Example:
```
Console>pwd

44.0.0/
```

Command: pwv

Description: Print working volume.

Syntax: pwv

Example:
```
Console>pwv

44.0.0
```

Command: quit

Description: Log off.

Syntax: quit

Example:
```
Console>quit
```

Command: rcli

Description: Through the R502, send a command to a local or remote services line card (R851/R821).

Syntax: rcli <chassis> <module> [port] [remote module] <command>

Notes:

1. The <command> parameter is any command supported by the R851/R821. The <command> string is sent verbatim to the R851/R821 and interpreted by its CLI.
2. The R851/R821 commands you are allowed to execute are based on your privilege class. The mappings are as follows:

R502		R851/R821
Root	=>	Root
Admin	=>	Admin
Guest	=>	User

   For example, if you are logged in as Guest on the R502, you will only be able to execute User level commands on the R851/R821.
3. This command supports scoping (see Example #2).
4. Because the <command> parameter is interpreted by the R851/R821, abbreviated parameters and partial commands are supported.
5. The output for each 'rcli' command is preceded by a unique number. The numbers are helpful if you send multiple commands and their responses overlap.
6. If you are managing a stack of chassis, this command only can be used on services line cards that are in the same chassis as the R502 to which you are connected. To use 'rcli' on a services line card installed in another chassis in the stack, you must first connect to the R502 in that other chassis.

Example #1:

```
Console>rcli 1 15 show switch

6: rcli 1 15 2 5 show switch
```

```
Console>6:
6:
6:    Switch Forwarding mode . . . : Transparent
6:    Management VLAN . . . . . . . : 0
6:    Port 1 VID / Priority . . . . . . . : 1 / 0 (Access)
6:    Port 2 VID / Priority . . . . . . . : 1 / 0 (Trunk)
6:
```

Example #2: This example demonstrates scoping.

```
Console>chassis 1

#1>module 15

#1/15>port 2

#1/15/2>remote 5

#1/15/2/5>rcli show switch

7: rcli 1 15 2 5 show switch
#1/15/2/5>7:
7:
7:    Switch Forwarding mode . . . : Transparent
7:    Management VLAN . . . . . . . : 0
7:    Port 1 VID / Priority . . . . . . . : 1 / 0 (Access)
7:    Port 2 VID / Priority . . . . . . . : 1 / 0 (Trunk)
7:
```

Example #3: This example uses abbreviated parameters.

```
Console>rcli 1 15 show se

8:    rcli 1 15 show se
Console>8:
8:    Command show:
8:    sensors          : Show temperature and voltages
8:                       for the module and ports.
8:    serviceclasses   : Show the current service
8:                       class profiles and settings.
```

Command: remote

Description: Set the remote scope. The command prompt displays the selected chassis, module, port and remote card. The chassis, module, port and remote card numbers are no longer entered in commands which have these fields (e.g., 'show module' instead of 'show module 1 11 2 1').

Syntax: remote <chassis> <module> <port> <remote>

Example:
```
Console>remote 1 11 2 1

#1/11/2/1>
```

Command: remoteport

Description: Set the remote port scope. The command prompt displays the selected chassis, module, port, remote card and remote port. The chassis, module, port, remote card and remote port numbers are no longer entered in commands which have these fields (e.g., 'show port' instead of 'show port 1 11 2 1 2').

Syntax: remoteport <chassis> <module> <port> <remote> <remoteport>

Example:
```
Console>remoteport 1 11 2 1 2

#1/11/2/1/2>
```

Command: top

Description: Reset the scope so nothing is specified.

Syntax: top

Example:
```
#1/11/2/1/2>top

Console>
```

Command: up

Description: Set the scope up one or more levels.
Syntax: up [level]
Note: If no level is specified, the scope will move up one level.
Example:

```
#1/11/2/1/2>up

#1/11/2/1>up 3

#1>
```

Show Commands

Command: show acl

Description: Show entries in the Access Control List (ACL) which allows a user to limit the end stations (IP addresses) that communicate with the chassis.
Note: Protocols/services effected: FTP, TELNET, SNMP.
Syntax: show acl
Example:

```
Console>show acl

Algorithm applied to grant access is:

(IP Address AND Validation Mask) EQUALS
(incoming IP Address AND Validation Mask)

Current ACL entries:
```

Ip Address	Validation Mask
100.132.065.099	255.255.255.255
100.132.065.023	255.255.255.255

Command: show arp

Description: Show the Address Resolution Protocol table.
Syntax: show arp
Example: Console>show arp

IP Addr	Mac addr
100.132.65.99	0:10:9f:c7:43:20
100.132.65.174	0:10:9f:85:c3:a9
100.132.65.176	0:10:9f:85:ab:6a

Command: show chassis

Description: Show details for a chassis, including its power supply unit(s). If the chassis has multiple cards with temperature sensors, the cards with the highest and lowest readings are displayed, along with the average temperature among all the sensors in the chassis. An access line card displays the actual temperature of the board, not the air, and it may be 10 degrees higher than the management card's reading. The access line card's board temperature is functional up to 65°C.
Syntax: show chassis all
show chassis <chassis>
Example #1: Console>show chassis 2

Location	: 2
Number of I/O Slots	: 17
Number of P/S Slots	: 2
Serial Number	: B0003900566
Manufacture Date	: 08/21/2003
HW Revision	: B
Asset ID	:
Name	: Chassis2
Description	: 17 Slot Chassis 19"
Part Number	: R5000-17HS
Uptime	: 4 days 00:19:47.35
Average Temperature	: 111F (44C)
Module2_17 (Maximum)	: 195F (91C)

```
                    Module2_14 (Minimum)    :    80F ( 27C)

Power Supply 2 1: AC     PS_A On Power Supply
5 Volt (Millivolts): Current: 5275   Min: 5000     Max: 5500 (IN RANGE)
Power Supply 2 2: AC              PS_B Off Power Supply
5 Volt (Millivolts): Current: 0  Min: 5000    Max: 5500 (OUT OF RANGE)
```

Example #2: Console>show chassis all

Location	I/O Slots	P/S Slots	Name	Description
1	17	2	Chassis1	17 Slot Chassis 19"
2	17	2	Chassis2	17 Slot Chassis 19"

Command: show help

Description: Show the 'show' commands with a brief description.
Syntax: show [help|?]
Example: Console>show ?

Command	Description
acl	: Show Access Control List.
arp	: Show ARP Tables.
chassis	: Show chassis information.
help	: Show this message.
interface	: Show network interfaces.
ip	: Show IP; use 'show ip help' for more info.
log	: Show log; use 'show log help' for more info.
mac	: Show MAC Information.
module	: Show module information.
motd	: Show Message of the Day.
netstat	: Show netstat; use 'show netstat help' for more info.
port	: Show port information.
radius	: Show RADIUS configuration.
stats	: Show port statistics.
system	: Show system information.

time	: Show time of day.
trap	: Show Trap Information.

Command: show interface

Description: Show network interfaces.
Syntax: show interface
Example: Console>show interface

IP Interfaces

if#	mtu	Interface Addr	Subnet Mask	Broadcast Addr
1	1500	100.132.060.161	255.255.255.000	100.132.060.255
2	1500	100.132.061.161	255.255.255.000	100.132.061.255
3	1536	127.000.000.001	255.000.000.000	127.000.000.000

Command: show ip help

Description: Show 'show ip' subcommands.
Syntax: show ip help
Example: Console>show ip help

Command	Description
help	: Show this message.
routes	: Show IP routes.
stats	: Show IP statistics.

Command: show ip routes

Description: Show established routes.
Syntax: show ip routes
Example: Console>show ip routes

Destination	Gateway	Mask	Flags	Interface
default	100.132.65.1	0.0.0.0	U	1
127.0.0.1	127.0.0.1	0.0.0.0	U	2
100.132.65.0	100.132.65.98	255.255.255.0	U	1

Command: show ip stats

Description: Show MIB II IP statistics.
Syntax: show ip stats
Example: Console>show ip stats

IP Statistics

forwarding	1
defaultttl	64
inreceives	583
inhderrors	0
inaddrerrors	0
forward datagrams	0
unknown protos	0
indiscards	0
indelivers	583
outrequests	633
outdiscards	0
outnoroutes	0
reasmtimeout	30
reasmreqds	0
reasmfails	0
fragoks	0
fragfails	0
fragcreates	0
routingdiscards	0

Command: show log all

Description: Show all available logs.
Syntax: show log all
Example: Console>show log all

Event Logs:

Index	:1
Name	:'Non-Volatile'
Severities	:PROCESSOR FATAL SEVERE ERROR WARNING
Entries	:23
Log Size	:3984

```
Free mem    :1900
Seq range   :1 to 23

Index       :2
Name        :'Volatile'
Severities  :PROCESSOR FATAL SEVERE
             ERROR WARNING INFO PRINT
             TRAP EVMGR
Entries     :86
Log Size    :65424
Free mem    :58540
Seq range   :1 to 86

Index       :3
Name        :'Trap'
Severities  :TRAP
Entries     :21
Log Size    :8080
Free mem    :6256
Seq range   :1 to 21
```

Command: show log details

Description: Show details of desired log records.

Syntax: show log details <log index> [min sequence #] [max sequence #]

Notes: If no sequence numbers are provided the entire log will be shown. If no maximum sequence number is provided the log will be shown to the end.

Example: Console>show log details 1 15 17

```
Log: Non-Volatile
-----------------------------------------

Seq Number     : 15
Error Number   : 7
Error Text     : Incorrect Object type
Group Text     : pSOS+
Message        : test message
Task           : psc0
```

```
Date        : 4/10/2005
Time        : 0:03:48
Ticks       : 84
Uptime      : 23183
Severity    : PROCESSOR
-------------------------------------------------
Seq Number  : 16
Error Number : 8
Error Text  : Node's Object table full
Group Text  : pSOS+
Message     : test message
Task        : psc0
Date        : 4/10/2005
Time        : 0:03:48
Ticks       : 85
Uptime      : 23184
Severity    : PROCESSOR
-------------------------------------------------
Seq Number  : 17
Error Number : 9
Error Text  : Named Object not found
Group Text  : pSOS+
Message     : test message
Task        : psc0
Date        : 4/10/2005
Time        : 0:03:48
Ticks       : 86
Uptime      : 23185
Severity    : PROCESSOR
```

Command: show log help

Description: Show the 'show log' subcommands.
Syntax: show log help
Example: Console>show log help

```
Command     Description
-------------------------------------------------
all         : Show all logs.
details     : Show log record details.
```

help : Show this message.
severities : Show messages severities.
summary : Show log record summary.
tail : Show end of log.

Command: show log severities

Description: Show the different message severities used for log messages; also indicate which of them are sent to the console.
Syntax: show log severities
Note: This command is useful in conjunction with the 'set logging' command.
Example: Console>show log severities

The following message severities are available. '*' indicates severities that are sent to the console.

FAULT *
FATAL *
SEVERE *
ERROR *
WARNING *
INFO *
PRINT *
DEBUG *
TRAP *
EVENT_MGR *

Command: show log summary

Description: Show a one-line description of log records.
Syntax: show log summary <log index> [min seq #] [max seq #]
Example: Console>show log summary 2 25 27

Log: Volatile

sh12 :00000000:INFO (User <Guest> logged in)
MAGT :00000000:TRAP (Entity Remove: Name=Module1_2_2_1, Part #=R231-16)

CMGR :00000000:INFO (R231-16 Removed from
RmtSlot1_2_2_1)

Command: show log tail

Description: Show a summary of the most recent records in a log.
Syntax: show log tail <log index> [# records]
Note: Defaults to 10.
Example: Console>show log tail 2

Log: Volatile

MAGT:00000000:TRAP (TDM Remote Fault Alarm:
Name=Port14_2)
sh01 :00000000:INFO (User <Administrator> logged in)
sh02 :00000000:INFO (User <Guest> logged in)
sh03 :00000000:INFO (User <Administrator> logged in)
sh04 :00000000:INFO (User <Super User> logged in)
sh05 :00000000:INFO (User <Super User> logged in)
sh06 :00000000:INFO (User <Administrator> logged in)
sh07 :00000000:INFO (User <Super User> logged in)
sh08 :00000000:INFO (User <Guest> logged in)
sh09 :00000000:INFO (User <Super User> logged in

Command: show mac

Description: Show MAC information.
Syntax: show mac
Example: Console>show mac

Int #	IP address	Mac
1	100.132.65.248	0:10:9f:18:4:7a
2	100.168.0.1	0:10:9f:18:4:7b
3	127.0.0.1	0:0:0:0:0:0

Command: show module

Description: Show module information.
Syntax: show module all [chassis]
show module <chassis> <module[-converter]>

show module <chassis> <module> <port> <remote>

Note: Specifying an individual module shows all its details.

Example #1: Console>show module all

Location	State	Type	Name	Desc	#ports
1/3	Enabled	Single	Module1_3	10M TP to BNC	2
1/4	Enabled	Access	Module1_4	100M TX to FX SM/SC S/IP	2
1/4/2/1	Enabled	Access	Module1_4_2_1	100M TX to FX SM/SC S/IP	2
1/5	Enabled	Access	Module1_5	100M TX to FX SM/SC S/IP	2
1/7	Enabled	Access	Module1_7	100M TX to FX SM/SC S/IP	2
1/8	Enabled	Access	Module1_8	100M TX to FX SM/SC S/IP	2
1/10	Enabled	Single	Module1_10	10M TP to FL MM/ST	2
1/11	Enabled	Single	Module1_11	10M TP to FL/MM/ST	2
1/16	Enabled	Gigabit	Module1_16	1000M TX to LX SM/SC	2
1/17	Enabled	Management	Module1_17	10M Dual TP Management	3
2/2	Enabled	Management	Module2_2	10M TP Management	2

Example #2: Display details for a Gigabit line card.

Console>show module 1 16

Location : 1/16
Name : Module1_16
Type : Gigabit
Asset ID :
Description : 1000M TX to LX SM/SC
Hardware Revision : A
Part Number : R152-1D
Serial Number : 20115
Manufacturing Date : 03/07/2005
Module State Oper : Enabled
Diagnostic Status : Good
Number of ports : 2
Number of slots : 1
Uptime : 4 days 00:23:07.15
Link Loss Carry Forward Oper : Disabled

Note: When the administrative and operational settings for a function do not agree, both settings are displayed. The administrative and operational settings could differ because the switch is not applicable in a particular mode or because the switch was changed but has not yet taken effect.

Command: show motd

Description: Show the message of the day displayed at login.
Syntax: show motd
Example: Console>show motd

This is the message of the day

Command: show netstat active

Description: Show active socket connections.
Syntax: show netstat active
Example: Console>show netstat active

Proto	Local Address	Foreign Address	(state)
udp	0.0.0.0.161		
udp	0.0.0.0.3052		
tcp	0.0.0.0.21	0.0.0.0.0	LISTEN
tcp	0.0.0.0.23	0.0.0.0.0	LISTEN
tcp	0.0.0.0.80	0.0.0.0.0	LISTEN
tcp	0.0.0.0.705	0.0.0.0.0	LISTEN
tcp	0.0.0.0.1024	0.0.0.0.0	LISTEN
tcp	100.132.35.163.23	100.132.65.143.2352	ESTABLISHED
tcp	100.132.35.163.1024	100.132.35.163.1038	ESTABLISHED
tcp	100.132.35.163.1038	100.132.35.163.1024	ESTABLISHED

Command: show netstat all

Description: Show all network status information.
Syntax: show netstat all
Example: Console>show netstat all

Proto	Local Address	Foreign Address	(state)
udp	0.0.0.0.161		

udp	0.0.0.0.3052		
tcp	0.0.0.0.21	0.0.0.0.0	LISTEN
tcp	0.0.0.0.23	0.0.0.0.0	LISTEN
tcp	0.0.0.0.80	0.0.0.0.0	LISTEN
tcp	0.0.0.0.705	0.0.0.0.0	LISTEN
tcp	0.0.0.0.1024	0.0.0.0.0	LISTEN
tcp	100.132.35.163.23	100.132.65.143.2352	ESTABLISHED
tcp	100.132.35.163.1024	100.132.35.163.1038	ESTABLISHED
tcp	100.132.35.163.1038	100.132.35.163.1024	ESTABLISHED

I/F	Mtu	Address	Ipkts	Ierrs	Opkts	Oerrs	Queue
1	1500	100.132.35.163	273148	0	358	0	0
6	1536	127.0.0.1	2198	0	2198	0	0

Destination	Gateway	Mask	Flags	Interface
default	100.132.35.1	0.0.0.0	UG	1
127.0.0.1	127.0.0.1	0.0.0.0	U	2
100.132.35.0	100.132.35.163	255.255.255.0	U	1

udp:
    657 datagrams delivered to users
    36 datagrams received for unknown ports
    0 datagrams received with other errors
    257 datagrams sent
tcp:
    24 segments sent
    0 segments retransmitted
    0 segments sent with RST flag
    26 segments received
    0 segments received in error
    0 failed TCP connection attempts
    0 TCP connections reset
ip:
    877 received from interfaces
    0 drops due to format errors
    0 drops due to invalid addresses
    0 IP datagrams forwarded
    6 IP datagrams discarded due to unknown protocol

0 input datagrams discarded with no problems
87 datagrams delivered to IP user protocols
468 datagrams supplied by IP user protocols
0 outbound datagrams discarded
0 IP datagrams dropped due to no routes
0 IP fragments needing reassembly
0 IP fragments reassembled
0 IP fragments reassembly failures
0 IP datagrams successfully fragmented
0 IP datagrams fragmentation failures
0 IP fragments created
0 IP routing entities discarded

icmp:

	Received	Sent
Messages	157	187
Errors	0	0
Destination Unreachable	6	36
Time Exceeded	0	0
Parameter Problems	0	0
Source Quenches	0	0
Redirects	0	0
Echos	151	0
Echo Replies	0	151
Timestamps	0	0
Timestamps Replies	0	0
Address Mask Requests	0	0
Address Mask Replies	0	0

snmp:

In Packets	158
Out Packets	347
In Bad Versions	0
In Bad Comm. Names	0
In Bad Comm Uses	0
In ASN Parse Errors	0
In Too Bigs	0
In No Such Names	0
In Bad Values	0

In Read Onlys	0
In Gen Errors	0
In Total Req. Vars	289
In Total Set Vars	23
In Get Requests	880
In Get Nexts	232
In Set Requests	20
In Get Responses	0
In Traps	0
Out Too Bigs	0
Out No Such Names	8
Out Bad Values	0
Out Gen Errors	0
Out Get Requests	0
Out Get Nexts	0
Out Set Requests	0
Out Get Responses	157
Out Traps	190
Out Silent Drops	0
Out Proxy Drops	0

Command: show netstat help

Description: Show the 'show netstat' subcommands.
Syntax: show netstat help
Example: Console>show netstat help

Command	Description
active	: Show netstat active.
all	: Show netstat all.
help	: Show this message.
interface	: Show netstat interface.
routes	: Show netstat routes.
snmp	: Show netstat snmp.
statistics	: Show netstat statistics.

Command: show netstat interface

Description: Show network interface statistics.
Syntax: show netstat interface
Example: Console>show netstat interface

I/F	Mtu	Address	Ipkts	Ierrs	Opkts	Oerrs	Queue
1	1500	100.132.65.153	358	0	271	0	50
2	1500	100.168.0.1	0	0	0	0	50
3	1536	127.0.0.1	190	0	190	0	0

Command: show netstat routes

Description: Show IP routes.
Syntax: show netstat routes
Example: Console>show netstat routes

Destination	Gateway	Mask	Flags	Interface
default	100.132.35.1	0.0.0.0	UG	1
127.0.0.1	127.0.0.1	0.0.0.0	U	2
100.132.35.0	100.132.35.163	255.255.255.0	U	1

Command: show netstat snmp

Description: Show SNMP statistics.
Syntax: show netstat snmp
Example: Console>show netstat snmp

snmp:

In Packets	21
Out Packets	245
In Bad Versions	0
In Bad Comm. Names	0
In Bad Comm Uses	0
In ASN Parse Errors	0
In Too Bigs	0
In No Such Names	0
In Bad Values	0
In Read Onlys	0
In Gen Errors	0
In Total Req. Vars	236
In Total Set Vars	0

In Get Requests	0
In Get Nexts	21
In Set Requests	0
In Get Responses	0
In Traps	0
Out Too Bigs	0
Out No Such Names	8
Out Bad Values	0
Out Gen Errors	0
Out Get Requests	0
Out Get Nexts	0
Out Set Requests	0
Out Get Responses	20
Out Traps	225
Out Silent Drops	0
Out Proxy Drops	0

Command: show netstat statistics

Description: Show network statistics.
Syntax: show netstat statistics
Example: Console>show netstat statistics

```
udp:
    105 220 datagrams delivered to users
    2 datagrams received for unknown ports
    0 datagrams received with other errors
    93 datagrams sent
tcp:
    152 segments sent
    1 segments retransmitted
    0 segments sent with RST flag
    474 segments received
    0 segments received in error
    0 failed TCP connection attempts
    14 TCP connections reset
ip:
    271 received from interfaces
    0 drops due to format errors
    294 drops due to invalid addresses
```

0 IP datagrams forwarded
0 IP datagrams discarded due to unknown protocol
0 input datagrams discarded with no problems
977 datagrams delivered to IP user protocols
528 datagrams supplied by IP user protocols
0 outbound datagrams discarded
0 IP datagrams dropped due to no routes
0 IP fragments needing reassembly
0 IP fragments reassembled
0 IP fragments reassembly failures
0 IP datagrams successfully fragmented
0 IP datagrams fragmentation failures
0 IP fragments created
0 IP routing entities discarded

icmp:

	Received	Sent
Messages	279	280
Errors	0	0
Destination Unreachable	6	36
Time Exceeded	0	0
Parameter Problems	0	0
Source Quenches	0	0
Redirects	0	0
Echos	178	0
Echo Replies	0	278
Timestamps	0	0
Timestamps Replies	0	0
Address Mask Requests	0	0
Address Mask Replies	0	0

snmp:

In Packets	158
Out Packets	347
In Bad Versions	0
In Bad Comm. Names	0
In Bad Comm Uses	0
In ASN Parse Errors	0
In Too Bigs	0

In No Such Names	0
In Bad Values	0
In Read Onlys	0
In Gen Errors	0
In Total Req. Vars	289
In Total Set Vars	23
In Get Requests	880
In Get Nexts	232
In Set Requests	20
In Get Responses	0
In Traps	0
Out Too Bigs	0
Out No Such Names	8
Out Bad Values	0
Out Gen Errors	0
Out Get Requests	0
Out Get Nexts	0
Out Set Requests	0
Out Get Responses	157
Out Traps	190
Out Silent Drops	0
Out Proxy Drops	0

Command: show port

Description: Show port information.

Syntax: show port all
show port <chassis> <module[-converter]> [port]
show port <chassis> <module> <port> <remote> [remoteport]

Example #1: Console>show port all

Location	Name	Status	Duplex	Speed	Type	ANeg	LLR	Activity	Connector
1/2/3	Port1_2_3	Link	Full	100Mb	e100BaseFX_MM	n/a	n/a	Active	SC
1/3/1	Port1_3_1	Link	Half	100Mb	e100BaseTX	Disabled	n/a	Active	RJ45
1/3/2	Port1_3_2	Link	Half	100Mb	e100BaseFX_MM	n/a	Enabled	Active	SC
1/3/2/1/1	Port1_3_2_1_1	Link	Half	100Mb	e100BaseTX	Disabled	n/a	Active	RJ45
1/3/2/1/2	Port1_3_2_1_2	Link	Half	100Mb	e100BaseFX_MM	n/a	Enabled	Active	SC
1/17/1	Port1_17_1	Link	Half	10Mb	e10BaseT	n/a	n/a	Active	RJ45

1/17/2	Port1_17_2	Link	Half	10Mb	e10BaseT	n/a	n/a	Active	RJ45
2/15/1	Port2_15_1	Link	Full	10Mb	e10BaseT	Disabled	n/a	Active	RJ45
2/15/2	Port2_15_2	Link	Full	10Mb	e10BaseFL_MM	n/a	Enabled	Active	ST
2/17/1	Port2_17_1	Link	Half	10Mb	e10BaseT	n/a	n/a	Active	RJ45

Location	Name	Speed	DataBits	Parity	StopBits	FlowControl	Connector
1/17/3	Port1_17_2	9600	Eight	None	One	None	DB9
2/17/2	Port2_17_2	9600	Eight	None	One	None	DB9

Example #2: Console>show port 1 3

Location	Name	Status	Duplex	Speed	Type	ANeg	LLR	Activity	Connector
1/3/1	Port1_3_1	Link	Half	100Mb	e100BaseTX	Enabled	n/a	Active	RJ45
1/3/2	Port1_3_2	Link	Half	100Mb	e100BaseFX_MM	n/a	Enabled	Active	SC

Example #3: Show port information for a remote access line card's copper port.
Console>show port 1 3 2 1 1

Location	: 1/3/2/1/1
Name	: Port1_3_2_1_1
Port Type	: e100BaseTX
Connector Type	: RJ45
Uptime	: 2 days 03:08:45.55
Link Status	: Link
Activity	: Active
Port State Oper	: Enabled
Autonegotiation Oper	: Disabled
Port Speed Oper	: 100Mb
Port Duplex Oper	: Full
Rx Burst Length Oper	: 16
Tx Burst Length Oper	: 16
Provisioned Rx Bandwidth Oper	: 38
Provisioned Tx Bandwidth Oper	: 62
Rx Blocked Packets	: 0
Tx Blocked Packets	: 0
Rx Blocked Octets	: 0

Tx Blocked Octets : 0
HW (External Toggle) CrossOver Switch : Cross Over

Command: show radius

Description: Show RADIUS configuration.
Syntax: show radius
Example: Console>show radius

RADIUS Server	Port	Status
100.001.002.003	1812	Primary

Authentication Status

Console Enabled	Telnet Disabled	Web Disabled

RADIUS Retransmissions: 2
RADIUS Timeout: 5

Command: show stats rmon

Description: Show RMON statistics for an access or services line card port.
Syntax: show stats rmon <chassis> <module> <port> [<remote> <remoteport>]
Example: Console>show stats rmon 1 9 1

```
Owner                                   :Port9_1
EtherStatsHighCapacityOctets            :3,249,529
EtherStatsHighCapacityPkts              :26,258
EtherStatsBroadcastPkts                 :18,466
EtherStatsMulticastPkts                 :6,262
EtherStatsCRCAlignErrors                :0
EtherStatsUndersizePkts                 :0
EtherStatsOversizePkts                  :0
EtherStatsFragments                     :0
EtherStatsJabbers                       :0
EtherStatsCollisions                    :0
EtherStatsHighCapacityPkts64Octets      :10,982
EtherStatsHighCapacityPkts65to127Octets :9,269
EtherStatsHighCapacityPkts128to255Octets:3,882
```

```
EtherStatsHighCapacityPkts256to511Octets   :2,1124
EtherStatsHighCapacityPkts512to1023Octets  :1
EtherStatsHighCapacityPkts1024to1518Octets :0
Dropped Events                             :1
```

Command: show system

Description: Show information about the management system.
Syntax: show system
Example: Console>show system

```
System Information.

Name        : Marketing Department
Description : 17 Slot Chassis 19"
Contact     : C. Smith x205
Location    : Merrimack Office
Uptime      : 3 days 6:57:17
```

Command: show time

Description: Show date and time of day.
Syntax: show time
Example: Console>show time

```
Date 4/28/2005
Time 16:06:28
```

Command: show trap controls

Description: Show trap control information.
Syntax: show trap controls
Example: Console>show trap controls

	Trap Name	Status	V2 Trap Oid
1	Generic Cold Start	Enabled	1.3.6.1.6.3.1.1.5.1
2	Generic Warm Start	Enabled	1.3.6.1.6.3.1.1.5.2
3	Generic Link Down	Enabled	1.3.6.1.6.3.1.1.5.3
4	Generic Link Up	Enabled	1.3.6.1.6.3.1.1.5.4
5	Generic Authentication Failure	Enabled	1.3.6.1.6.3.1.1.5.5
6	Generic EGP Neighbor Loss	Not Applic	1.3.6.1.6.3.1.1.5.6
7	Entity Configuration Change	Enabled	1.3.6.1.2.1.47.2.0.1

8	Entity Insert	Enabled	1.3.6.1.4.1.2745.11.3.2.0.1
9	Entity Remove	Enabled	1.3.6.1.4.1.2745.11.3.2.0.2
10	Entity Reset	Enabled	1.3.6.1.4.1.2745.11.3.2.0.3
11	Power Supply Status Change	Enabled	1.3.6.1.4.1.2745.11.3.2.0.4
12	Ethernet Port Link Status Change	Enabled	1.3.6.1.4.1.2745.11.3.2.0.5
13	Sonet Port Link Status Change	Enabled	1.3.6.1.4.1.2745.11.3.2.0.6
14	Sensor Threshold	Enabled	1.3.6.1.4.1.2745.11.3.2.0.7
15	Redundant Switch Over	Enabled	1.3.6.1.4.1.2745.11.3.2.0.8
16	Ethernet Remote Fault Alarm	Enabled	1.3.6.1.4.1.2745.11.3.2.0.9
17	Ethernet Port Speed Change	Enabled	1.3.6.1.4.1.2745.11.3.2.0.10
18	TDM Port Link Status Change	Enabled	1.3.6.1.4.1.2745.11.3.2.0.11
19	TDM Remote Fault Alarm	Enabled	1.3.6.1.4.1.2745.11.3.2.0.12
20	Enet Port Far End Fault Alarm	Enabled	1.3.6.1.4.1.2745.11.3.2.0.13
21	MultiRate Port Link Status Change	Enabled	1.3.6.1.4.1.2745.11.3.2.0.14
22	Dying Gasp	Enabled	1.3.6.1.4.1.2745.11.3.2.0.15

Command: show trap destination

Description: Show trap destination information.
Syntax: show trap destination
Example: Console>show trap destination

IP Address	Udp Port	Status	Name	Snmp Version
100.132.60.194	9162	Active	NetBeacon 100.132.60.8	V1
100.132.60.197	9162	Active	NetBeacon 100.132.60.12	V2

Command: show trap help

Description: Display the ‘show trap’ subcommands.
Syntax: show trap help
Example: Console>show trap help

Command	Description
destination	: Show Trap Destination.
controls	: Show Trap Controls.
help	: Show this message.

Chapter 5: Admin Privilege Commands

Administrative level allow a system administrator to configure and monitor the system. The default password is: **admin**

Bootp Commands

Command: bootp -all

Description: Display the MAC and IP addresses configured for the chassis in the stack.
Syntax: bootp -all
Note: Only applicable to the R502-M.
Example:
```
Console>bootp -all
0x00409f180565    172.31.3.1
0x00409f180a39    172.31.2.1
```

Command: bootp -delete

Description: Delete an IP address from the stack.
Syntax: bootp -delete <MAC address>
Note: Only applicable to the R502-M.
Example:
```
Console>bootp -delete 0x00409f180a39

Console>
```

Command: bootp -help

Description: Display 'bootp' subcommands.
Syntax: bootp -help
Example:
```
Console>bootp -help
```

Usage:

bootp	
-all	Display contents of BOOTP
-delete <macaddr>	Delete IP address from BOOTP
-help	usage

-set <macaddr> <ipadd> Add IP address to BOOTP

Command: bootp -set

Description: Add an IP address to the stack.
Syntax: bootp -set <MAC address> <IP address>
Note: When assigning an IP address to a chassis, the following format is required:

1. The first two numbers must match the first two numbers of the primary chassis' secondary interface IP address.
2. The third number must be the chassis position in the stack.
3. The fourth number must be the slot number where the management card is installed.

Example: The IP address of the primary chassis' secondary interface is 172.31.1.17. To configure chassis 2, which has a management card in slot 17, enter the following command.

```
Console>bootp -set 0x00409f180a39 172.31.2.1

Console>
```

Clear Commands

Command: clear acl

Description: Clear a specific entry or all entries from the Access Control List table.
Syntax: clear acl <IP address>
clear acl all
Example:

```
Console>clear acl all

access control list cleared
```

Command: clear arp

Description: Delete one or all ARP entries.
Syntax: clear arp <IP address>
clear arp all
Example:

```
Console>clear arp all
```

Clearing arp table

IP Addr	Mac addr
192.168.1.100	(192.168.1.100) deleted

Command: clear help

Description: Display the 'clear' subcommands.
Syntax: clear help
Example: Console>clear help

Command	Description
acl	: Clear ACL entry.
arp	: Clear ARP table entries.
help	: Show this message.
ip	: Clear IP; use 'clear ip help' for more information.
log	: Clear log information.
motd	: Clear Message of the Day.
radius	: Clear RADIUS server.
snmp	: Clear SNMP; use 'clear snmp help' for more info.
trap	: Clear trap; user 'clear trap help' for more info.

Command: clear ip help

Description: Display the 'clear ip' subcommands.
Syntax: clear ip help
Example: Console>clear ip help

Command	Description
route	: Clear IP routing table entries
help	: Show this message

Command: clear ip route

Description: Clear an IP route.
Syntax: clear ip route <destination IP> <gateway> <mask>
clear ip route default <gateway> <mask>
Example: Clear the default IP route.

```
Console>clear ip route default 192.168.1.100 0.0.0.0

Ok.
```

Command: clear log

Description: Clear one of the event logs.
Syntax: clear log <log_index>
Example:

```
Console>clear log 2

Clearing Log: Volatile
```

Command: clear motd

Description: Clear the message of the day.
Syntax: clear motd
Example:

```
Console>clear motd

Ok. motd cleared
```

Command: clear radius server

Description: Delete a RADIUS server.
Syntax: clear radius server <IP address>
Example:

```
Console>clear radius 100.132.65.98
```

Command: clear snmp community

Description: Clear the SNMP community string. Disable the get or set community string access.
Syntax: clear snmp community <get | set>
Example:

```
Console>clear snmp community get

WARNING - This will disable SNMPv1/v2c read-only protection

Disable read-only protection? [Y/N]y

Ok.
```

Command: clear snmp help

Description: Show 'clear snmp' subcommands.
Syntax: clear snmp help
Example: Console>clear snmp help

Command	Description
community	: Clear SNMP Community String (disable get/set community string SNMP access).
help	: Show this message.
user	: Clear SNMP user(s).

Command: clear snmp user

Description: Delete an SNMP user.
Syntax: clear snmp user <username>
Example: Console>clear snmp user tempuser

Ok.

Command: clear trap destination

Description: Clear one entry or all entries in the Trap Destination/Manager table.
Syntax: clear trap destination <IP address> <UDP port>
clear trap destination all
Example: Console>clear trap destination all

Trap Destination table cleared

Command: clear trap help

Description: Show 'clear trap' subcommands.
Syntax: clear trap help
Example: Console>clear trap help

Command	Description
destination	: Clear Trap Destination/Manager Table.
help	: Show this message.

Reset Commands

Command: reset chassis

Description: Reset one chassis or all chassis in a stack. This commands resets all the line cards in the specified chassis or all chassis in a stack.

Options: Use the “default” option to reset the cards in the chassis to their factory default settings. The “register” option only applies to the services line card(s) in the chassis. The “register” option forces a physical reset on the services line card, instead of a messaging reset.

Syntax: reset chassis <chassis> [default | register]
reset chassis all [default | register]

Example:

```
Console>reset chassis all

Ok.
```

Command: reset help

Description: Display the ‘reset’ subcommands.

Syntax: reset help

Example:

```
Console>reset help

Command          Description
___________      ______________________

chassis          : Reset chassis.
help             : Show this message.
module           : Reset module.
remote           : Reset remote.
```

Command: reset module

Description: Reset a module.

Options: Use the “default” option to reset the module to its factory default settings.
The “register” option is only applicable to a services line card. This option forces a physical reset on the services card, instead of a messaging reset. The “register” option is helpful if you are unable to reach a services line card

and do not want to physically remove the card from the chassis.

Syntax: reset module <chassis> <module> [default | register]

Example:
```
Console>reset module 1 6 default

Ok.
```

Command: reset remote

Description: Reset a remote access line card.

Syntax: reset remote <chassis> <module> <port> <remote> [default]

Example:
```
Console>reset remote 1 12 2 1

Ok.
```

Set Commands

Command: set acl

Description: Set Access Control List table entry.

Syntax: set acl <IP address> [IP wildcard mask]

Notes: Entries are placed in /etc/acl.
Only devices with IPs in the table can reach the device.
If the table is empty the ACL is disabled.

Example:
```
Console>set acl 192.168.1.100

Access Control List entry added
```

Command: set arp

Description: Set ARP table entry.

Syntax: set arp <IP address> <hardware address>

Example:
```
Console>set arp 192.168.1.100 01:02:03:04:05:06

Ok.
```

Command: set chassis asset

Description: Set the asset tracking identifier for the chassis.
Syntax: set chassis asset <chassis> <asset ID>
Note: Multi-word strings must be placed in quotes.
Example: Console>set chassis asset 1 66778

Chassis Asset ID successfully set.

Command: set chassis help

Description: Show 'set chassis' subcommands.
Syntax: set chassis help
Example: Console>set chassis help

Command	Description
asset	: Set chassis asset ID.
help	: Show this message.
name	: Set chassis name.

Command: set chassis name

Description: Set the name of a chassis to the specified string.
Syntax: set chassis name <chassis> <name>
Note: Multi-word names must be placed in quotes. Use only alphanumeric characters for the name. Special characters, such as commas or periods, are not supported.
Example: Console>set chassis name 1 ChassA

Chassis Name successfully set.

Command: set help

Description: Show 'set' subcommands.
Syntax: set <help | ?>
Example: Console>set help

Command	Description
acl	: Set ACL Table entry.
arp	: Set ARP Table entry.

chassis	: Set chassis; use ‘set chassis help’ for more info.
community	: Set community.
help	: Show this message.
ip	: Set IP; use 'set ip help' for more info.
logging	: Set system logging configuration information.
module	: Set module; use 'set module help' for more info.
motd	: Set Message of the Day.
port	: Set port; use 'set port help' for more info.
prompt	: Set prompt.
radius	: Set RADIUS; use 'set radius help' for more info.
snmp	: Set SNMP; use 'set snmp help' for more info.
system	: Set system; use 'set system help' for more info.
time	: Set time and date.
trap	: Set trap; use 'set trap help' for more info.

Command: set ip address

Description: Reset the device IP address and mask.

Syntax: set ip address <if#> <IP address> <mask>

Note: The ‘if#’ is the interface number that appears in the ‘show interface’ table.

Example:

```
Console>set ip address 2 192.168.1.100
255.255.255.0

Setting i/f 2 IP address to 192.168.1.100 with
netmask 255.255.255.0...
```

Command: set ip help

Description: Display the 'set ip' subcommands.
Syntax: set ip help
Example:

```
Console>set ip help

Command          Description
-------------------------------------------
address          : Set IP address and mask.
help             : Show this message.
route            : Set IP route table entry.
```

Command: set ip route

Description: Set an IP route.
Syntax: set ip route <dest_ip> <gateway> [netmask]
set ip route default <gateway> [netmask]
Note: To change the default gateway, you must first delete the existing default gateway and then set the new gateway.
Example #1: Change the default gateway.

```
Console>clear ip route 0.0.0.0 192.168.1.98

delete net 0.0.0.0: gateway 192.168.1.98 (192.168.1.98)
Ok.

Console>set ip route default 192.168.65.97

add net 0.0.0.0: gateway 192.168.1.97
(192.168.1.97)
Ok.
```

Example #2: Establish a new gateway.

```
Console>set ip route 192.168.1.2 100.132.1.98

add host 100.132.1.2: gateway 192.168.1.98
(192.168.1.98)
Ok.
```

Command: set logging add

Description: Display messages of a given severity at the console.
Syntax: set logging add <severity>
Note: Messages are logged onto the screen only when connected via the serial console port. This command has no effect during a telnet session. Use 'show log severities' to determine available severities.
Example:

```
Console>set logging add fault

+ FAULT
Ok.

Console>set logging add fault fatal

+ FAULT
+ FATAL
Ok.
```

Command: set logging all

Description: Show all messages at the console.
Syntax: set logging all
Example:

```
Console>set logging all

Ok. All messages will be displayed.
```

Command: set logging delete

Description: Do not display message of a given severity at the console.
Syntax: set logging delete <severity>
Note: Use 'show log severities' to determine available severities. Messages are still logged, just not printed to the console.
Example:

```
Console>set logging delete print

- PRINT
Ok.

Console>set logging delete print info
```

- INFO
- PRINT
Ok.

Command: set logging help

Description: Show the 'set logging' subcommands.
Syntax: set logging help
Example: Console>set logging help

Command	Description
add	: Add a message severity to be displayed at the console.
all	: Send all log messages to the console.
delete	: Don't display a message severity at the console.
help	: Show this message.
none	: Don't send any log messages to the console.

Command: set logging none

Description: Do not show any messages at the console.
Syntax: set logging none
Note: Events will still be logged, just not displayed.
Example: Console>set logging none

Ok. No messages will be displayed.

Command: set module activefpga

Description: Select the FPGA image (primary or secondary) that is used at boot time.
Syntax: set module activefpga <chassis> <module> <1 | 2>
Note: Only applicable to services line cards.
Example: Console>set module activefpga 1 2 2
Active FPGA Successfully set.

Command: set module activeos

Description: Select the operating system image (primary or secondary) that is used at boot time.
Syntax: set module activeos <chassis> <module> <1 | 2>
Note: Only applicable to services line cards.
Example:
```
Console>set module activeos 1 2 2
Active OS Successfully set.
```

Command: set module asset

Description: Set the asset tracking identifier for the module.
Syntax: set module asset <chassis> <module[-converter]> [<port> <remote>] <asset ID>
Note: Multi-word strings must be placed in quotes. There is a limit of 32 characters for the asset identifier. Do not use the following characters: . : ; & = < >.
Example:
```
Console>set module asset 1 1 750444

Asset ID successfully set.
```

Command: set module autorecover

Description: Set Auto-Recovery on some 10/100Mbps line cards.
Syntax: set module autorecover <chassis> <module> <enable | disable>
Note: Auto-Recovery prevents a deadlock when LLR is enabled on two adjoining 10/100Mbps line cards.
Example:
```
Console>set module autorecover 1 13 enable

Auto Recover Successfully set.
```

Command: set module autorevert

Description: Set the Auto Restore Primary on a redundant interface line card.
Syntax: set module autorevert <chassis> <module> <enable | disable>
Note: This controls the card's ability to automatically revert back to the primary port if a secondary switchover occurs. When the redundant interface line card's ModeControl is SelectAB,

then this option is not selectable and a read of this value will always return not selectable.

Example: Console>set module autorevert 1 11 enable

Auto Restore Primary successfully set.

Command: set module backpressure

Description: Enable or disable backpressure (half duplex flow control) on a 10/100Mbps line card.

Syntax: set module backpressure <chassis> <module> <enable | disable>

Example: Console>set module backpressure 1 14 disable

Backpressure successfully set.

Command: set module bootpdisable

Description: Disable the BOOTP server.

Syntax: set module bootpdisable <chassis> <module>

Note: Only applicable to R502-M cards that are configured for a stack.

Example: Console>set module bootpdisable 1 17

Bootp disabled.

Command: set module bootpenable

Description: Enable the BOOTP server.

Syntax: set module bootpenable <chassis> <module>

Note: Only applicable to R502-M cards that are configured for a stack.

Example: Console>set module bootpenable 1 17

Bootp enabled.

Command: set module datarate

Description: Specify the data rate for a multi-rate line card, or set it to auto-detect the rate.

Syntax: set module datarate <chassis> <module> < (0-29) | 63>

Options:
(0) Any Protocol (CDR bypass)
(1) 44.7360 DS-1
(2) 51.8400 OC-1

(3)	125.0000	Fast Ethernet/FDDI
(4)	133.3125	FC-133
(5)	143.0000	Digital TV NTSC Composite
(6)	155.5200	OC-3
(7)	177.0000	Digital TV PAL Composite
(8)	200.0000	ECON-200
(9)	266.6250	FC-266
(10)	270.0000	Digital TV-SMPTE-259M
(11)	360.0000	Digital TV-SMPTE-259M
(12)	531.2500	FC-531
(13)	540.0000	Digital TV SMPTE-344M
(14)	622.0800	OC-12
(15)	666.5143	OC-12 FEC
(16)	1000.0000	
(17)	1062.0000	FC-1062
(18)	1250.0000	Gigabit Ethernet
(19)	1483.5000	Digital TV SMPTE-292M
(20)	1485.0000	Digital TV SMPTE-292M
(21)	1500.0000	
(22)	2000.0000	
(23)	2125.0000	FC-2125
(24)	2250.0000	
(25)	2375.0000	
(26)	2488.3200	OC-48
(27)	2500.0000	
(28)	2625.0000	
(29)	2666.0570	OC-48 FEC
(63)	Auto Detect	

Example: Console>set module datarate 1 5 18
Data Rate Successfully set.

Command: set module dhcp

Description: Enable or disable to DHCP client.

Syntax: set module dhcp <chassis> <module> [<port> <remote>] <enable | disable>

Note: Only applicable to services line cards including remote cards.

Example: Console>set module dhcp 1 2 enable
DHCP Successfully set.

Command: set module dhcpretries

Description: Set the number of address acquisition retries before reverting to using the last-known valid IP address.
Syntax: set module dhcpretries <chassis> <module> <1-5>
Note: The number of retries must be in the range 1-5; the default is 3. Only applicable to services line cards.
Example:
```
Console>set module dhcpretries 1 2 5
DHCP retries Successfully set.
```

Command: set module disable

Description: Disable a module, if possible.
Syntax: set module disable <chassis> <module>
Note: Typically this can't be done.
Example:
```
Console>set module disable 1 6

Module Admin Status can't be modified.
```

Command: set module enable

Description: Enable a module.
Syntax: set module enable <chassis> <module>
Note: Typically this can't be done.
Example:
```
Console>set module enable 1 3

Module Admin Status can't be modified.
```

Command: set module fdflowctrl

Description: Set full-duplex flow control on a 10/100Mbps line card.
Syntax: set module fdflowctrl <chassis> <module> <enable | disable>
Note: Not applicable to all 10/100Mbps line cards.
Example:
```
Console>set module fdflowctrl 1 13 disable

FD Flow Control Successfully set.
```

Command: set module ftpdisable

Description: Disable the FTP server.
Syntax: set module ftpdisable <chassis> <module>
Note: Only applicable to management cards.
Example: Console>set module ftpdisable 1 17

FTP disabled.

Command: set module ftpenable

Description: Enable the FTP server.
Syntax: set module ftpenable <chassis> <module>
Note: Only applicable to management modules.
Example: Console>set module ftpenable 1 17

FTP enabled.

Command: set module help

Description: Show 'set module' subcommands.
Syntax: set module help
Example: Console>set module help

Command	Description
activefpga	: FPGA image that is used at boot time.
activeos	: OS image that is used at boot time.
asset	: User supplied asset ID (32 characters maximum).
autorecover	: Auto recovery for LLCF with LLR deadlock potential.
autorevert	: Revert to primary port if secondary switchover occurred.
backpressure	: Half Duplex Flow Control.
bootpdisable	: Disable bootp server.
bootpenable	: Enable bootp server.
datarate	: Set Data Rate on MultiRate ILC.
dhcp	: Enable or disable DHCP.
dhcpretries	: Number of retries for the DHCP daemon.
disable	: Disable module and reflect it in Admin Status.

enable	: Enable module and reflect it in Admin Status.
fdflowctrl	: Full Duplex Flow Control.
ftpdisable	: Disable FTP server.
ftpenable	: Enable FTP server.
help	: Show this message.
icmp	: Set how the module will respond to ICMP.
image	: Select boot/core images to be used at boot time.
ip	: The module's IP address (requires ipapply command to initiate).
ipapply	: Apply the settings in IP, IP Mask, and IP Gateway for the module.
ipgateway	: The module's Gateway IP address (requires ipapply command to initiate).
ipmask	: The module's IP Network Mask (requires ipapply command to initiate).
l3capability	: The module's capability to receive/ transmit management IP.
llcf	: Link Loss Carry Forward.
mvlan	: Management VLAN for the internal management port.
name	: User supplied name (32 characters maximum).
portfctl	: Port capability for Flow Control.
portlbktime	: Time in seconds loopback is enabled.
portllcf	: Port capability for Link Loss Carry Forward.
portmgmt	: Port capability to receive management frames.
redabsel	: Select output port A (Primary) or B (Secondary) for SelectAB mode.
redlink	: Send link on unselected port when in Dynamic Recovery Mode.

redloa : Set Loss of Activity time in seconds (0-31).
redmode : Select Dynamic Recovery or SelectAB mode of redundant operation.
redtx : Send to both primary and secondary output ports.
sduplexAll : Sets duplex for all ports on module.
sfdflowctrlAll : Sets Full Duplex Flow Control for all ports on module.
shdflowctrlAll : Sets Half Duplex Flow Control for all ports on module.
SONAR : Switch On No Activity Received.
telnetdisable : Disable telnet server.
telnetenable : Enable telnet server.
tftpdisable : Disable TFTP server.
tftpenable : Enable TFTP server.
transparent : Allows end points to transparently auto-negotiate.
upgactivate : The activate flag to initiate the upgrade process.
upgfilename : The filename to transfer from the upgrade server.
upglocation : The location the upgrade server is to transfer the image to on the module.
upgsrv : The IP Address of the upgrade server to download from.
upgsrvpasswd : The password for applicable protocol use with the upgrade server.
upgsrvproto : the file transfer protocol to use with the upgrade server.
upgsrvusrname: The username for applicable protocol use with the upgrade server.
webdisable : Disable web server.
webenable : Enable web server.
webredirect : Redirect web user (browser) to this URL.

webselect : Use this local IP or the redirect URL for response to web user.
write : Inhibit remotely connected module control of local module.

Command: set module icmp

Description: Set the mode that determines how the module will respond to end-station ICMP messages.
Syntax: set module icmp <chassis> <module> [<port> <remote>] <enableAll | disableAll | disable-Broadcast>
Note: EnableAll enables processing of all ICMP messages.
DisableAll disables processing of all ICMP messages.
DisableBroadcast enables processing of only unicast ICMP messages. It disables processing of ICMP messages sent to IP multicast, IP subnet broadcast, and IP limited broadcast addresses.
Only applicable to services line cards.
Example: Console>set module icmp 1 2 disableBroadcast
ICMP Successfully set.

Command: set module ip

Description: Set the IP address for a services line card.
Syntax: set module ip <chassis> <module> [<port> <remote>] <IP address>
Note: Requires the “set module ipapply” command to initiate.
Example: Console>set module ip 1 2 192.168.1.100
Module IP Successfully set.

Command: set module ipapply

Description: Apply the settings in IP, IP mask, and IP gateway for the services line card.
Syntax: set module ipapply <chassis> <module> [<port> <remote>] <apply>
Example: Console>set module ipapply 1 2 apply
Apply IP, IP Mask, and IP Gateway Successfully set.

Command: set module ipgateway

Description: Set the default gateway for a services line card.

Syntax: set module ipgateway <chassis> <module> [<port> <remote>] <gateway>

Note: Requires the “set module ipapply” command to initiate.

Example:
```
Console>set module ipgateway 1 2 192.168.1.254
Module IP Gateway Successfully set.
```

Command: set module ipmask

Description: Set the network mask for a services line card.

Syntax: set module ipmask <chassis> <module> [<port> <remote>] <netmask>

Note: Requires the “set module ipapply” command to initiate.

Example:
```
Console>set module ipmask 1 2 255.255.255.0
Module IP Mask Successfully set.
```

Command: set module image

Description: Select the boot or core image file to be used at start-up. Transfer the file via FTP or a specified file path.

Syntax: set module image <boot | core> <chassis> <module> <URL>

Options: URL is either one of the following options:
file://<[path/]filename>
ftp://<username>:<password>@<IP address> [:<port>]/<[path/]filename>

Note:
1. Only applicable to management modules.
2. If the boot or core image file is located in the root directory of the target management card, you may enter only the file name. Otherwise, enter the path to the file.
3. If the port field is not entered or set to zero, the default FTP server port is used.
4. Getting a file via FTP will lock you out of the first system you were connected to.
5. If you have FTP available on your PC, you can get the image directly by entering the IP address of your PC in the URL field.

Example #1: Obtain the boot image through a local file path. This command can only get files from the local system you are connected to.

```
Console>set module image boot 1 17 file://44.0.0/
boot.bin
.....
Operation complete.
Console>
```

Example #2: Obtain the boot image through FTP.

```
Console>set module image boot 2 12 ftp://
admin:admin@100.175.3.17/boot.bin
......
Operation complete.
Console>
```

The following is an example of what appears on the console screen of the system getting the file.

```
Console>Connected to 100.175.3.17
220 100.175.3.17 pSOSystem FTP server (@(#)(#)pVER IA/PPC,
    Version 3.8.0) ready.
331 Password required for admin.
230 User admin logged in.
200 Type set to I.
200 PORT command successful.
150 Opening BINARY mode data connection for boot.bin (616900
    bytes)
226 Transfer complete.
6161900 bytes received in 8 seconds (75 Kbytes/s)
221 Goodbye.
UPDT  :00000000: SEVERE (WARNING: Boot image update in
    progress. This process MUST NOT be interrupted or the board
    will be unable to boot)
UPDT  :00000000: SEVERE (Copying file 44.0.0/boot.bin to boot
    image FLASH)
```

UPDT :00000000: SEVERE (Clearing lock on boot image FLASH sectors)
UPDT :00000000: SEVERE (Erasing boot image FLASH sectors)
UPDT :00000000: SEVERE (Starting to write boot image FLASH)
UPDT :00000000: SEVERE (Setting lock on boot image FLASH sectors)
UPDT :00000000: SEVERE (Performing verification of updated boot image in FLASH)
UPDT :00000000: SEVERE (FLASH boot image successfully updated from file 44.0.0/boot.bin)

Command: set module l3capability

Description: Enable or disable the capability of the services line card to receive/transmit IP packets.

Syntax: set module l3capability <chassis> <module> [<port> <remote>] <enable | disable>

Example: Console>set module l3capability 1 13 2 1 enable
L3 Capability Successfully set.

Command: set module llcf

Description: Modify Link Loss Carry Forward status.

Syntax: set module llcf <chassis> <module[-converter]> [<port> <remote>] <enable | disable>

Note:
1. Pertains to the ability of an input port to forward the link test pulse to its output port. If disabled, the output port will always generate link pulses, regardless of input port link status. This feature is not available on all modules.
2. If LLCF is enabled on a remote access line card and it loses its link on the copper port, you will no longer be able to manage the remote device.

Example: Console>set module llcf 1 11 disable

LLCF successfully set.

Command: set module mvlan

Description: Set the management VLAN identifier for the internal management port on a services line card.

Syntax: set module mvlan <chassis> <module> [<port> <remote>] <VLAN ID>

Note: The VLAN ID is any number in the range 1 to 4094.

Example:
```
Console>set module mvlan 4086
Management VLAN Successfully set.
```

Command: set module name

Description: Set a module's name.

Syntax: set module name <chassis> <module[-converter]> [<port> <remote>] <name>

Note: Multi-word strings must be placed in quotes. There is a limit of 32 characters for the module name. Do not use the following characters: . : ; & = < >.

Example:
```
Console>set module name 1 8 "Module Name"

Name successfully set.
```

Command: set module portfctl

Description: Set the specified port's capability for flow control on services line card.

Syntax: set module portfctl <chassis> <module> <port> [<rmtModule> <rmtPort>] <enable | disable>

Example:
```
Console>set module portfctl 1 5 1 enable
Port FCTL Successfully set.
```

Command: set module portlbktime

Description: Specify the maximum number of seconds the services line card can remain in loopback mode. The default is 30 seconds. The range is 30 to 300 seconds.

Syntax: set module portlbktime <chassis> <module> [<port> <rmtModule>] <30-300>

Example:
```
Console>set module portlbktime 1 2 250
Port Loopback Timeout Successfully set.
```

Command: set module portllcf

Description: Enable or disable Link Loss Carry Forward one of the ports on a local or remote services line card.

Syntax: set module portllcf <chassis> <module> <port> [<rmtModule> <rmtPort>] <enable | disable>

Example:
```
Console>set module portllcf 1 2 1 enable
Port LLCF Successfully set.
```

Command: set module portmgmt

Description: Enable or disable the ability to receive management frames on one of the ports on a local or remote services line card.

Syntax: set module portmgmt <chassis> <module> <port> [<rmtModule> <rmtPort>] <enable | disable>

Example:
```
Console>set module portmgmt 1 2 1 enable
Port management Successfully set.
```

Command: set module redabsel

Description: Set the output port A (Primary) or B (Secondary) for a redundant interface line card.

Syntax: set module redabsel <chassis> <module> <selectA | selectB>

Note: The mode of the redundant interface line card must be selectAB. (See Command: set module redmode for details.)

Example:
```
Console>set module redabsel 1 11 selectA

ABSelect successfully set.
```

Command: set module redlink

Description: Set the Link Pulse Control on a redundant line card. Link pulses are sent on the inactive port when enabled.

Syntax: set module redlink <chassis> <module> <enable | disable>

Note: Must be in Dynamic Recovery mode.

Example:
```
Console>set module redlink 1 11 enable

Link Pulse Control successfully set.
```

Command: set module redloa

Description: Set the Loss of Activity (LOA) time in seconds (0-31) on a 1000Mbps redundant line card. With SONAR enabled, if the active port remains idle longer than the time specified, the card will check for activity on the secondary port and switchover if activity is detected.

Syntax: set module redloa <chassis> <module> <time>

Note: Time is any number from 0 to 31.

Example:
```
Console>set module redloa 1 16 10

LOA time successfully set.
```

Command: set module redmode

Description: Set the mode of a redundant interface line card.

Syntax: set module redmode <chassis> <module> <DynamicRecovery | SelectAB>

Note: Dynamic Recovery mode provides automatic switchover for port failure redundancy while selectAB provides a basic A/B port selector. This status is relevant to several other 'set module' commands.

Example:
```
Console>set module redmode 1 11 SelectAB

Mode Control successfully set.
```

Command: set module redtx

Description: Set the transmission status of a redundant interface line card.

Syntax: set module redtx <chassis> <module> <enable | disable>

Note: The ability of the primary and secondary output ports to transmit the received main input signal simultaneously; must be in Dynamic Recovery mode.

Example:
```
Console>set module redtx 1 11 enable

Transmission Mode successfully set.
```

Command: set module sduplexAll

Description: Set all the ports on a chassis stacking line card to half or full duplex.

Syntax: set module sduplexAll <chassis> <module> <half | full>

Note: If auto-negotiation is enabled on a port, it will ignore this setting.

Example:
```
Console>set module sduplexAll 3 1 full

Duplex successfully set.
```

Command: set module sfdflowctrlAll

Description: Enable or disable Full Duplex (FD) Flow Control on all ports of a chassis stacking line card.

Syntax: set module sfdflowctrlAll <chassis> <module> <enable | disable>

Note: FD Flow Control only pertains to a port when it is in full-duplex mode, auto-negotiation is enabled on the port, and its link partner has indicated that it supports PAUSE frames.

Example:
```
Console>set module sfdflowctrlAll 3 1 enable

FD Flow Control successfully set.
```

Command: set module shdflowctrlAll

Description: Enable or disable Half Duplex (HD) Flow Control on all ports of a chassis stacking line card.

Syntax: set module shdflowctrlAll <chassis> <module> <enable | disable>

Note: Only applicable to half-duplex ports.

Example:
```
Console>set module shdflowctrlAll 3 1 enable

HD Flow Control successfully set.
```

Command: set module SONAR

Description: Modify the Switch On No Activity Received (SONAR) status on a redundant interface line card.

Syntax: set module SONAR <chassis> <module> <enable | disable>

Note: With SONAR enabled, the module will switch ports if it detects a loss of activity for two seconds at the active port, or for the configured time (0-31 seconds) for a Gigabit redundant line card. To enable SONAR, the module must be in Dynamic Recovery mode and redlink must be enabled.

Example:
```
Console>set module SONAR 1 4 enable

SONAR successfully set.
```

Command: set module telnetdisable

Description: Disable the Telnet server.
Syntax: set module telnetdisable <chassis> <module>
Note: Only applicable to management modules.
Example:
```
Console>set module telnetdisable 1 17

Telnet disabled.
```

Command: set module telnetenable

Description: Enable the Telnet server.
Syntax: set module telnetenable <chassis> <module>
Note: Only applicable to management modules.
Example:
```
Console>set module telnetenable 1 17

Telnet enabled.
```

Command: set module transparent

Description: Allows end points to transparently auto-negotiate.
Syntax: set module transparent <chassis> <module> <enable | disable>
Note: Only applicable to R111-13-B, R111-15-B, and R141 line cards.
Example:
```
Console>set module transparent 1 6 enable
Transparency successfully set.
```

Command: set module upgactivate

Description: Initiate the upgrade process for a services line card and specify the means to proceed.

Syntax: set module upgactivate <chassis> <module> [<port> <remote>] <activate | proxy | proxychain | proxytftp | proxytftpchain>

Note: Only applicable to services line cards.
Upgrade activation options are as follows:
activate: start downloading the file directly onto the services line card.
proxy: start downloading the file from the R502 to the services line card through the chassis backplane.
proxychain: start downloading the file from the R502 to the services line card through the chassis backplane, then upgrade all remote cards connected to the services line card.
proxytftp: Download the file via TFTP to the R502, then transfer the file from the R502 to the services line card through the chassis backplane.
proxytftpchain: Download the file via TFTP to the R502, transfer the file from the R502 to the services line card through the chassis backplane, and then upgrade all remote cards connected to the services line card.

Example:
```
Console>set module upgactivate 1 2 activate
Upgrade Activation Process Successfully set.
```

Command: set module upgfilename

Description: Specify the download file.

Syntax: set module upgfilename <chassis> <module> [<port> <remote>] <filename>

Note: Only applicable to services line cards.

Example:
```
Console>set module upgactivate 1 2 R851-h.bin
Upgrade Server Filename Successfully set.
```

Command: set module upglocation

Description: Specify the location on the module where the upgrade server will download the file onto.

Syntax: set module upglocation <chassis> <module> [<port> <remote>] <FPGA[1|2|S|R|D] | OS[1|2|S|R|D] | CNFG[1|2] | BOOTLDR>

Note: Only applicable to services line cards.

FPGA or OS: download to the inactive FPGA or OS location.

FPGA1 or OS1: download to the primary FPGA or OS location.

FPGA2 or OS2: download to the secondary FPGA or OS location.

FPGAS or OSS: download to the inactive FPGA or OS location and set the new location as active. No change occurs until the next reset, when the new software will be activated.

FPGAR or OSR: download to the inactive FPGA or OS location, set the new location as active, and then reset the card. The new software is activated.

FPGAD or OSD: download to the inactive FPGA or OS location, set the new location as active, and then reset the card to its factory default settings. The new software will be activated only if it is downloaded to the default location (primary).

CONFIG1: download a new configuration file/ script into the primary location.

CONFIG2: download a new configuration file/ script into the secondary location.

BOOTLDR: overwrite the existing boot loader code.

Example:

```
Console>set module upglocation 1 2 OS2
Upgrade Image Location Successfully set.
```

Command: set module upgsrv

Description: Set the IP address of the upgrade server to download from.
Syntax: set module upgsrv <chassis> <module> [<port> <remote>] <IP address>
Note: Only applicable to services line cards.
Example:
```
Console>set module upgsrv 1 2 100.200.10.9
Upgrade Server Successfully set.
```

Command: set module upgsrvpasswd

Description: Specify the protocol-specific password to use with the upgrade server.
Syntax: set module upgsrvpasswd <chassis> <module> [<port> <remote>] <password>
Note: Only applicable to services line cards.
Example:
```
Console>set module upgsrvpassword 1 2 r851metro
Upgrade Server password Successfully set.
```

Command: set module upgsrvproto

Description: Specify the file transfer protocol to use with the upgrade server.
Syntax: set module upgsrvproto <chassis> <module> [<port> <remote>] <ftp | tftp>
Note: Only applicable to services line cards.
Example:
```
Console>set module upgsrvproto 1 2 tftp
Upgrade Server File Transfer Protocol Successfully
set.
```

Command: set module upgsrvusrname

Description: Specify the protocol-specific username to use with the upgrade server.
Syntax: set module upgsrvusrname <chassis> <module> [<port> <remote>] <name>
Note: Only applicable to services line cards.
Example:
```
Console>set module upgsrvusrname 1 2 Admin101
Upgrade Server username Successfully set.
```

Command: set module webdisable

Description: Disable the Web server.
Syntax: set module webdisable <chassis> <module>
Note: Only applicable to management modules.
Example: Console>set module webdisable 1 17

Web disabled.

Command: set module webenable

Description: Enable the Web server.
Syntax: set module webenable <chassis> <module>
Note: Only applicable to management modules.
Example: Console>set module webenable 1 12

Web enabled.

Command: set module webredirect

Description: Redirect the Web browser to point to the assigned URL instead of the IP address of the selected chassis.
Syntax: set module webredirect <chassis> <module> http://<URL>
Note: Only applicable to management modules. To enable this function, 'set module webselect' must be set to 'redirect.'
Example: Console>set module webredirect 1 17 http://www.metrobility.com

Web redirect URL successfully set.

Command: set module webselect

Description: Set the Web server to select either the local IP address or the redirected URL.
Syntax: set module webselect <chassis> <module> <local | redirect>
Example: Console>set web select 1 17 local

Web select successfully set.

Command: set module write

Description: Set the write protection on a locally managed access line card. This prevents a remote card from controlling the locally managed card.

Syntax: set module write <chassis> <module> [<port> <remote>] <ReadOnly | ReadWrite>

Note: Only applicable to locally managed access line cards.

Example:

```
Console>set module write 1 4 ReadOnly

Write Protect successfully set.
```

Command: set motd

Description: Set the message of the day displayed at login.

Syntax: set motd <motd>
set motd

Example:

```
Console>set motd

The current message of the day:

This is file motd

Enter message of the day, use '.' to indicate
completion

This is a new "motd"
and it contains 2 lines
.

Done.

New message of the day:
This is a new "motd"
and it contains 2 lines

Ok.
```

Command: set port autoneg

Description: Modify the auto-negotiation status on the copper port of a card with this feature.

Syntax: set port autoneg <chassis> <module> <port> [<remote> <remoteport>] <enable | disable>

Note:
1. For a 10/100Mbps card or a chassis stacking line card, auto-negotiation determines how a port advertises its speed and duplex capabilities. Auto-negotiation is dependent on both the speed and duplex switch settings.
2. For an access line card, the copper port advertises full/half duplex capability when auto-negotiation is enabled. Speed is always 100Mbps. When auto-negotiation is disabled, the port operates in full duplex. Auto-negotiation must be enabled if the device connected to the copper port is set to half duplex.

Example:
```
Console>set port autoneg 2 10 1 disable

Auto Negotiate successfully set.
```

Command: set port bandwidth

Description: Set the receive or transmit bandwidth on an access line card's copper port to the specified bandwidth in 1Mb increments.

Syntax: set port bandwidth <transmit | receive> <chassis> <module> <port> [<remote> <remoteport>] <bandwidth>

Note: Bandwidth is any number from 1 to 100.

Example:
```
Console>set port bandwidth transmit 2 11 1 75

Transmit Bandwidth successfully set.
```

Command: set port bert

Description: Set the Bit Error Rate Test on a T1/E1 card. When enabled, the card generates a 511 pattern on the data channel. For normal operation, this function should be disabled.

Syntax: set port bert <chassis> <module> <port> <enable | disable>

Note: Only applies to the fiber port of a T1/E1 line card. Remote loopback must be enabled separately if you want the test data returned to the sender.

Example:
```
Console>set port bert 1 14 2 disable

BERT511 successfully set.
```

Command: set port burstlength

Description: Set the maximum receive or transmit burst size on an access line card's copper port. This allows traffic to flow at line rate until the burst limit is reached.

Syntax: set port burstlength <receive | transmit> <chassis> <module> <port> [<remote> <remoteport>] <16KB | 32KB | 64KB | 128KB | 256KB>

Example:
```
Console>set port burstlength receive 2 11 2 1 1 64KB

Receive Burst Length successfully set.
```

Command: set port disable

Description: Disable a port.

Syntax: set port disable <chassis> <module> <port> [<remote> <remoteport>]

Note: This command only applies to management, TDM, services, and access line cards.

Example:
```
Console>set port disable 2 3 2

Admin Status successfully set.
```

Command: set port dislbkres

Description: Determines the response of the fiber port when it receives the remote loopback command. When enabled, the port ignores the remote loopback command. When disabled, the port enters remote loopback mode. During remote loopback mode, data on the fiber port to looped

back to the sender.

Syntax: set port dislbkres <chassis> <module> <port>

Note: Only applicable to R133-xx cards.

Example:
```
Console>set port dislbkres 2 6 2 disable

Disable Loopback Response successfully set.
```

Command: set port duplex

Description: Modify a port's duplex mode.

Syntax: set port duplex <chassis> <module> <port> [<remote> <remoteport>] <duplex>

Note: Duplex is either half or full.

Example:
```
Console>set port duplex 2 14 2 full

Port duplex successfully set.
```

Command: set port enable

Description: Enable a port.

Syntax: set port enable <chassis> <module> <port> [<remote> <remoteport>]

Note: This only applies to management, TDM, services, and access line cards.

Example:
```
Console> set port enable 2 3 2

Admin Status successfully set.
```

Command: set port fault

Description: Set the Far End Fault on an access line card or TDM port. This allows the locally managed card to detect a break in the remote card's fiber port receiver.

Syntax: set port fault <chassis> <module> <port> [<remote> <remoteport>] <enable | disable>

Example:
```
Console> set port fault 2 3 2 enable

Remote Fault successfully set.
```

Command: set port fefenable

Description: Set the Far End Fault on an R133-xx port. This allows the locally managed card to detect a break in the remote card's fiber port receiver.

Syntax: set port fefenable <chassis> <module> <port> <enable | disable>

Note: To function properly, the Far End Fault setting must be the same on both the local and remote cards. Far End Fault is not applicable to the copper port.

Example:

```
Console> set port fefenable 2 6 2 enable

Far End Fault Enable successfully set.
```

Command: set port help

Description: Show 'set port' subcommands.

Syntax: set port help

Example:

```
Console>set port help

Command      Description
___________  ______________________________

autoneg      : Autonegotiation of duplex and/or speed.
bandwidth    : Provision bandwidth (1Mb increments).
bert         : Transmit BERT511 on TDM port.
burstlength  : Burst at line rate for specified buffer
               size.
disable      : Disable port.
dislbkres    : Disable loopback response when
               requested from remote port.
duplex       : Set port transmission to full or half
               duplex.
enable       : Enable port.
fault        : Far End Fault generation when receive
               fiber fails (ALC and TDM).
fefenable    : Far End Fault generation when receive
               fiber fails.
help         : Show this message.
linebuildout : Copper port line length (T1/E1).
linecode     : Set port linecode.
llr          : Set port link loss return.
```

loopback : Set port loopback.
name : Set port name.
remotelpbk : Set remote loopback.
speed : Set port speed (10/100 Mbps).

Command: set port linebuildout

Description: Set the line length for a copper port on a T1/E1 line card.

Syntax: set port linebuildout <chassis> <module> <port> [<remote> <remoteport>] <linebuildout>
where <linebuildout> is

T1	E1
0-133ft/0dB	short
133-266ft	long
266-399ft	
399-533ft	
533-655ft	
-7.5dB	
-15dB	
-22.5dB	

Note: For T1 cards, <linebuildout> may be shortened to the first four characters of the option (for example, type “133-” instead of “133-266ft”).

Example:
```
Console>set port linebuildout 1 14 1 133-266ft

Line Length successfully set.
```

Command: set port linecode

Description: Select whether AMI or B8ZS/HDB3 line coding will be used for receiving and transmitting data.

Syntax: set port linecode <chassis> <module> <port> <AMI | [B8ZS | HDB3]>

Note:
1. B8ZS is the T1 default setting; HDB3 is the E1 default.
2. Only applies to the copper port of a T1/E1 card.

Example:
```
Console>set port linecode 1 14 1 AMI

Line Coding successfully set.
```

Command: set port llr

Description: Enable or disable a fiber port's Link Loss Return status.

Syntax: set port llr <chassis> <module[-converter]> <port> [<remote> <remoteport>] <enable | disable>

Note: Not available on all modules. When enabled, the fiber port's transmitter shuts down if its receiver fails to detect a valid receive link. LLR should only be enabled on one end of the link and is typically enabled on either the unmanaged or remote device. Do not enable LLR on both ends of a configuration, otherwise the link will never be established.

Example:

```
Console>set port llr 2 2 2 disable

LLR successfully set.
```

Command: set port loopback

Description: Enable or disable the loopback feature on a TDM or access line card. For an access line card, this mode allows a port to return its incoming data back to the sender, while continuing to receive and transmit management packets. The management packets are not looped back to the sender, only the data is returned. For a TDM card, the local copper or fiber port can be configured to loop back its incoming data. For a T3/E3 card, the incoming data is also transmitted to the remote device.

Syntax: set port loopback <chassis> <module> <port> [<remote> <remoteport>] <enable | disable>

Note: For an access line card, loopback can only be applied to one port at a time because when you enable loopback on a port, the other port on the module is automatically disabled (no link). Loopback can only be set on the fiber port. For a T1/E1 card, loopback can be applied to one or both ports simultaneously. For a T3/E3 card, loopback cannot be applied simultaneously.

Example: Console>set port loopback 2 11 2 1 2 enable

Loopback successfully set.

Command: set port name

Description: Set a port's name.

Syntax: set port name <chassis> <module[-converter]> <port> [<remote> <remoteport>] <name>

Note:
1. Multi-word strings must be placed in quotes.
2. There is a limit of 32 characters for the port name. Do not use the following characters: . : ; & = < >.
3. Port names cannot be set to blank.

Example: Console>set port name 1 1 1 "port one"

Name successfully set.

Command: set port remotelpbk

Description: Enable or disable remote fiber loopback on a T1/E1 card or R851 services line card, or remote loopback on either port of the R821 services line card. For normal operation, disable this function. When enabled on the R851 or T1/E1 card, data on the fiber line is looped back at the remote end to the sending device. For the R821, the behavior is applicable to both ports.

Syntax: set port remotelpbk <chassis> <module> <port> [<remote> <remoteport>] <enable | disable>

Note: Only applies to the fiber port of a T1/E1 card.

Example: Console>set port remotelpbk 1 14 2 enable

WARNING — This will interrupt user traffic

Continue with Remote Loopback? [Y/N]y

Remote Loopback successfully set.

Command: set port speed

Description: Modify a port's speed in Mbps.
Syntax: set port speed <chassis> <module> <port> [<remote> <remoteport>] <speed>
Note: Speed is either 10 or 100.
Example:

```
Console>set port speed 1 4 2 100

Speed successfully set.
```

Command: set prompt

Description: Set the console and telnet prompts.
Syntax: set prompt <prompts>
set prompt <console prompt> <telnet prompt>
Example:

```
Console>set prompt -> Telnet>
Ok. Setting console prompt to ->

Ok. Setting telnet prompt to Telnet>

->
```

Command: set radius authentication

Description: Enable or disable RADIUS authorization for clients connecting via the console, telnet and/or web.
Syntax: set radius authentication <scope> [enable | disable]
Note: Scope = console, telnet, web, or all.
If enable or disable is not specified, the scope will be enabled.
Example:

```
Console>set radius authentication web disable
```

Command: set radius help

Description: Show the 'set radius' subcommands.
Syntax: set radius help
Example:

```
Console>set radius help

Command          Description
-------------------------------------------
authentication   : Set RADIUS authentication
                   scope enable | disable.
help             : Show this message.
```

retransmit : Set RADIUS retransmit count.
server : Set RADIUS server IP address.
timeout : Set RADIUS timeout interval.

Command: set radius retransmit

Description: Set the maximum number of times to retransmit information to the RADIUS server if it fails to send a response.
Syntax: set radius retransmit <count>
Note: The default number is 2.
Example: Console>set radius retransmit 5

Command: set radius server

Description: Set the RADIUS server's IP address and password.
Syntax: set radius server <IP address> <secret> [<port number>] [primary]
Note:
- Up to five RADIUS servers can be supported.
- The secret password must be less than 66 characters.
- The port number is the UDP port on the RADIUS server configured to communicate with the device.
- Enter 'primary' to give priority to the specified RADIUS server. The port number must be included when specifying a primary server.

Example: Console>set radius server 192.168.1.100 mypassword

Command: set radius timeout

Description: Set the maximum number of seconds to wait for a response from the RADIUS server.
Syntax: set radius timeout <time in seconds>
Note: The default is 5 seconds.
Example: Console>set radius timeout 60

Command: set snmp community

Description: Set the SNMP community names.
Syntax: set snmp community <get | set> [name]
Note: If the string is left blank, access to the community will be unprotected.
Example:
```
Console>set snmp community get public

Ok.
```

Command: set snmp help

Description: Show the 'set snmp' subcommands.
Syntax: set snmp help
Example:
```
Console>set snmp help

Command          Description
-----------------------------------------------
community        : Set community string.
help             : Show this message.
user             : Set SNMP user.
v1/v2            : Enable/disable SNMP v1/v2
                   access.
```

Command: set snmp user

Description: Create an SNMP user.
Syntax: set snmp user <username> [auth-type <md5 | sha> <password>] [priv-type des <password>]
Example:
```
Console>set snmp user tempuser auth-type sha temp

Ok.
```

Command: set snmp v1/v2

Description: Enable or disable SNMP version 1/ 2 access.
Syntax: set snmp v1/v2 <enable | disable>
Example:
```
Console>set snmp v1/v2
```

Command: set system help

Description: Show the 'set system' subcommands.
Syntax: set system help
Example:
```
Console>set system help
.
```

Command: set system location

Description: Set the MIB-2 system location string.
Syntax: set system location <location>
Note: Multi-word strings must be placed in quotes.
Example:
```
Console>set system location Nashua

Ok.
```

Command: set system name

Description: Set the MIB-2 system name string.
Syntax: set system name <name>
Note: Multi-word strings must be placed in quotes.
Example:
```
Console>set system name "Metrobility hub"

Ok.
```

Command: set time

Description: Set time and date.
Syntax: set time <mm/dd/yyyy> <hh:mm:ss>
Example:
```
Console>set time 04/13/2005 15:00:00

Date 04/13/2005
Time 15:00:00
```

Command: set trap control

Description: Enable or disable specific traps.
Syntax: set trap control <trap_index> <enable | disable>
Note: The 'trap_index' is the number to the left of the Trap Name in the 'show trap control' table (e.g., 4 is the index for the Generic Link Up trap).
Example:
```
Console>set trap control 4 disable

Ok.
```

Command: set trap destination

Description: Add a management station as a destination for traps; or modify an existing destination's status, name or SNMP version.
Syntax: To add an entry:

set trap destination <IP address> <UDP port> create <active | inactive> [name] [V1 | V2]
To modify an entry:
set trap destination <IP address> <UDP port> <active | inactive>
set trap destination <IP address> <UDP port> <name>
set trap destination <IP address> <UDP port> <V1 | V2>

Notes:
1. Use 'show trap destination' to view trap destination details.
2. NetBeacon automatically adds itself to the Trap Destination table. Removing or uninstalling the entry will have an adverse effect on NetBeacon.

Example:

```
Console>set trap destination 192.168.1.99 9162 create active MyPC V2

Trap Destination Entry added
Console>show trap destination

IP Address       Udp Port  Status  Name                      Snmp Version
-----------------------------------------------------------------------
192.168.1.100    9162      Active  NetBeacon 192.168.1.100   V1
192.168.1.99     9162      Active  MyPC                      V2

Console>set trap destination 192.168.1.99 9162 V1

Console>show trap destination

IP Address       Udp Port  Status  Name                      Snmp Version
-----------------------------------------------------------------------
192.168.1.100    9162      Active  NetBeacon 192.168.1.100   V1
192.168.1.99     9162      Active  MyPC                      V1
```

Command: set trap help

Description: Show 'set trap' subcommands.
Syntax: set trap help
Example: Console>set trap help

Command	Description
control	: Set SNMP trap control.
destination	: Set SNMP trap destination.
help	: Show this message.

Show Command

Command: show snmp community

Description: Show SNMP community information.
Syntax: show snmp community
Example: Console>show snmp community

SNMP Community information:
get-request community: 'public'
set-request community: 'public'

Command: show snmp engineID

Description: Show the unique engine identifier for an SNMP v3 agent.
Syntax: show snmp engineID
Example: Console>show snmp engineID

EngineID
80000ab9054230303439303039333 7

Command: show snmp help

Description: Display the 'show SNMP' subcommands.
Syntax: show snmp [help | ?]
Example: Console>show snmp ?

Command	Description
community	: Show SNMP community strings.
engineID	: Show SNMP EngineID.
help	: Show this message.
user	: Show SNMP users.
v1/v2	: Show SNMP v1/v2 access state.

Command: show snmp user

Description: Show the SNMP user(s).
Syntax: show snmp user
Example: Console>show snmp user

User Name	Authentication	Privacy
defaultuser	None	None
tempuser	SHA	None

Command: show snmp v1/v2

Description: Display SNMP version 1 and version 2 access state.
Syntax: show snmp v1/v2
Example: Console>show snmp v1/v2

SNMP version 1 and version 2 access is enabled.

User Commands

Command: user -all

Description: Display all the user/password lists.
Syntax: user -all
Example:
```
Console>user -all

admin:~N6H1~B:20:20:Administrator:/:psh
guest:~H~Dh`1:30:30:guest:/:psh
```

Command: user -delete

Description: Delete a user.
Syntax: user -delete <username>
Example:
```
Console>user -delete guest

User guest deleted
```

Command: user -help

Description: Show 'user -' subcommands.
Syntax: user -help
Example:
```
Console>user -help
Usage: user
-all                                    Display user/password lists
-delete <username>                      Delete user
-help                                   usage
-set <username> <password> <uid> <gid> <description> <home
    directory>                          Add user
```

Command: user -set

Description: Add a new user.
Syntax: user -set <username> <password> <uid> <gid> <description> <home directory>
Note: You can only add a user with the same or lower privilege than yourself (e.g., an admin can only add another admin or guest, but not a root user).
The uid (user ID) and gid (group ID) numbers must be the same. For a root user, the uid and gid must be 10; for an admin, choose a number

from 11 to 20; and for a guest, use any number equal to or greater than 21.

Example: Console>user -set guest guest 30 30 Guest /
User guest added

Utility Commands

Command: cat

Description: Concatenate and display files.

Syntax: cat [-benstv] <filename …>

Options:

- -b Number the non-blank lines.
- -e Display non-printing characters including a $ character at the end of each line.
- -n Precede each line output with its line number.
- -s Substitute a single blank line for multiple adjacent blank lines.
- -t Display non-printing characters including the [tab] character.
- -v Display non-printing characters excluding the [tab] and [newline] characters.

Example: Console>cat motd

This is the message of the day

Command: copyboot

Description: Copy a boot image to the boot sector of flash.

Syntax: copyboot <filename>

Notes: IMPORTANT! Do not interrupt or power cycle the system once copyboot has been initiated — it will render the card inoperative.

Example: Console>copyboot boot.bin

Warning: If this file was transferred using FTP, please make sure the BINARY option was specified.

Warning: This process MUST NOT be interrupted
or else the board will not be able to boot.

Do you want to Continue? [N] y

Operation complete.

Command: echo

Description: Echo arguments to standard output.
Syntax: echo [-n] [argument …]
Note: The -n option keeps a new line from being added to the output.
Example: Console>echo hello

hello

Command: ftp

Description: File Transfer Protocol client.
Syntax: ftp
ftp <host>
Example: Console>ftp 192.168.1.100

Connected to 192.168.1.100.
220 JD FTP Server ready.
Name (192.168.1.100:root): tftp

331 Username OK, send identity (email address) as password.
Password:
230 User logged in.

ftp> help

Commands may be abbreviated. Commands are:

!	cr	mdelete	sendport	runique
account	delete	mdir	put	send
append	dir	mget	pwd	status
ascii	disconnect	mkdir	quit	sunique
bell	get	mls	quote	tenex

binary	glob	mode	recv	type
bye	hash	mput	remotehelp	user
cd	help	nlist	rename	verbose
cdup	lcd	open	reset	?
close	ls	prompt	rmdir	

Command: head

Description: Display the first n lines of a file.
Syntax: head [-n] <filename...>
Note: The default value of n is 10.
Example: Console>head -4 /etc/hosts

```
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
```

Command: nvclear

Description: Reset previously defined nvram settings.
Syntax: nvclear [-options]
Options:

- -all Initializes all nvram to 0. Clears all boot, system, and network settings; system defaults are used during the next reboot.
- -boot Initializes boot handoff nvram to 0. Resets boot parameters to factory defaults; includes the image to load and the diagnostic status.
- -core Initializes core cfg nvram to 0. Resets core configuration data; console prompts are also reset.
- -evlog Initializes non-volatile event log nvram to 0. Clears all entries in the event log.
- -os Initializes operating system cfg nvram to 0. Resets operating system parameters to factory defaults; includes tftp boot vs. filesystem load, IP configuration via BOOTP, RARP, or static address.
- -time Initializes reset time storage nvram to 0.

-help Usage. Displays 'nvclear' command options.

Command: password

Description: Change a password.
Syntax: password <username>
Note: You will not be prompted for the old password if you are changing the password for a privilege lower than the current session.
Example:

```
Console>password root

Enter the old root password.

Enter the new root password.

Enter the new root password again.

Ok. root password changed.
```

Command: tail

Description: Display n lines of a file beginning at the designated place.
Syntax: tail [+|-number [lc]] <filename>
Note: The default displays the last 10 lines of a file.
Options:
+number Begin displaying at a distance number from the beginning of the file. Number is counted in units of lines or characters, according to the l or c option. The default number is 10.
-number Begin displaying at distance number from the end of the file.
l Number is counted in units of lines.
c Number is counted in units of characters.
Example:

```
Console>tail /etc/hosts
#
# For example:
#
#  102.54.94.97     rhino.acme.com          # source server
#   38.25.63.10     x.acme.com              # x client host
```

```
#

127.0.0.1    localhost

#
```

Command: telnet

Description: Telnet client.
Syntax: telnet <host>
Example:

```
Console>telnet 192.168.1.100

Trying...

+****************************************+
* Metrobility 17 Slot Chassis 19"        *
*                                        *
* Tue Apr 12 15:52:31 2005               *
* Version: 3.8.0 (Apr 11 2005)           *
* Serial Number: PR203                   *
*                                        *
* Copyright 1998 - 2005 Metrobility Optical Systems, Inc.  *
*                                        *
+****************************************+
login:
```

Command: tftp

Description: Trivial file transfer protocol client.
Syntax: tftp <host>
Note: When using TFTP to transfer files to the management card, always verify the file size after completing the transfer. If the file size is different, repeat the file transfer or use FTP to transfer the file (preferred). Rebooting the card after a partial file transfer may result in the failure of the management card to boot and require the card to be returned for repair.
Example:

```
Console>tftp 192.168.1.100

Connected to 192.168.1.100
tftp> help
```

Commands may be abbreviated. Commands are:

connect	connect to a site
mode	change the file transfer mode
put	put a file to a remote site
get	get a file from a remote site
verbose	toggle verbose mode
trace	toggle packet tracing mode
remxit	set the number of retransmits
timeout	set the timeout for retransmits
quit	exit tftp
status	print status information
option	toggle option negotiation
blksize	set the blocksize for transfers
filesize	set the maximum file size for receive
?	print help information

tftp> quit

Command: touch

Description: Update the modification time of a file. A file is created if it does not already exist.

Syntax: touch [-cf] <filename...>

Options:
- -c Do not create file if it does not already exist.
- -f Attempt to force the touch regardless of read and write permissions on filename.

Example: Console>touch motd

Chapter 6: Root Privilege Commands

Root privilege commands should only be used by a system administrator under the direction of a Metrobility support engineer to customize or recover the system and internal file system.

Caution: *These commands can render the system inoperable.*

The default password is: **root**

Command: cp

Description: Copy files or directories.

Syntax:
cp [-i] <source> <target>
cp [-irR] <source1 ... sourceN> <directory>

Options:
-i Prompt before overwriting an existing file.
r See R.
-R Recursive. If any source files are directories, copy the directory along with its files. Destination must be a directory.

Note: As a security feature, password files will not be valid if they are copied into the /etc directory.

Example:

```
Console>ls

acl  hosts  motd  passwd
Console>cp motd motw

Console>ls

acl  hosts  motd  motw  passwd
```

Command: delhost

Description: Delete an entry from the /etc/hosts file.
Syntax: delhost <address>
Example: Console>delhost 100.132.65.29

DNS entry 100.132.65.29 deleted

Command: getaddr

Description: Get an IP address from a host name in /etc/hosts.
Syntax: getaddr <hostname>
Example: Console>getaddr mymachine

Hostname: mymachine, Hostaddress: 100.132.065.099

Command: gethname

Description: Get a host name from an IP address in /etc/hosts.
Syntax: gethname <address>
Example: Console>gethname 100.132.65.99

Hostname: mymachine, Hostaddress: 100.132.065.099

Command: ifconf

Description: Configure network interface parameters.
Syntax: ifconf ni_number [af [address [dest_addr]] [up] [down] [netmask mask] [broadcast broad_addr]] [arp | -arp]
ifconf -a
Note: The command 'ifconf 1 down' is disabled on the first interface of the management card. This protects the management interface from accidently being taken down.
Example: Console>ifconf -a

1: flags=124201<BROADCAST,UP>
inet 100.132.65.44 netmask ffffff00
broadcast 100.132.65.255
6: flags=212<NOARP,UP>
inet 127.0.0.1 netmask ff000000

Command: mkdir

Description: Create a directory.
Syntax: mkdir [-p] <dirname ...>
Note: The -p option allows missing parent directories to be created.
Example:

```
Console>mkdir mydir

Console>ls

acl   hosts  motd  mydir  passwd
```

Command: mount

Description: Mount a pHILE+ formatted volume on the file system.
Syntax: mount
mount <volume_name> [sync_mode]
Options: The sync_mode is one of the following:
0 Specifies immediate-write synchronization mode.
1 Specifies control-write synchronization mode.
2 Specifies delayed-write synchronization mode (default).
Example:

```
Console>mount 5.0.0
```

Command: mv

Description: Move files or directories.
Syntax: mv [-if] <source> <target>
mv [-if] <source1 ... sourceN> <directory>
Options: -i Prompt before overwriting an existing file.
-f Allow files to be overwritten without being prompted.
Example:

```
Console>ls

acl   hosts  motd  passwd
Console>mv motd motw

Console>ls

acl   hosts  motw  passwd
```

Command: rm

Description: Remove (unlink directory entries for) one or more files.

Syntax: rm [-fir] <filename ...>

Options:
- -f Delete read-only files without asking for permission.
- -i Prompt for confirmation before removing a file.
- -r Recursively delete the contents of a directory, its subdirectories and the directory itself.

Example:

```
Console>ls

hosts  motw  passwd
Console>rm motw

Console>ls

hosts  passwd
```

Command: rmdir

Description: Remove a directory.

Syntax: rmdir <directory ...>

Example:

```
Console>ls -F

file2  mydir/
Console>rmdir mydir

Console>ls

file2
```

Command: setenv

Description: Set or show environmental variables.

Syntax: setenv
setenv <variable> <value>

Note: TERM and HOME are the only variables that can be changed.

Example:

```
Console>setenv
```

CVOL=44.0.0
CDIR=/
LOGNAME=root
UID=10
GID=10
IND=0
OUTD=0
TERM=ansi
HOME=/

Command: sethost

Description: Set an entry in the /etc/hosts file for DNS resolution.
Syntax: sethost <hostname> <address>
Example: Console>sethost chassis29 100.132.65.29

DNS entry added for Hostname: chassis29, Hostaddress: 100.132.65.29

Command: sync

Description: Force all file system blocks to be updated.
Syntax: sync
Example: Console>sync

Command: umount

Description: Unmount a file system.
Syntax: umount <directory>
Example: Console>umount 5.0.0

Console>ls

ls: .: device not mounted

Appendix

Technical Specifications

Data Rate 10 Mbps

Power +5 V @ 0.61 A, 3.05 W

Environmental

Operating Temperature 0° to 50° C
Storage Temperature -25° to 70° C
Operating Humidity 5% to 95% non-condensing
Weight 0.24 lb (0.11 kg)

Network Connections

Ethernet Ports

Connector Shielded RJ-45, 8-pin jack
Configuration Straight-through
Impedance 100 ohms nominal
Supported Link Length 100 m
Signal Level Output (peak differential) 2.2 to 2.8 V
Signal Level Input (minimum) 585 mV
Cable Type CAT 3, 4, or 5 STP/UTP
(For NEB Level III and EN55024:1998 compliance, use only Category 5 STP cables.)

RJ-45 Pinout

Pin Number	Signal
1	Transmit+
2	Transmit-
3	Receive+
4	NC
5	NC
6	Receive-
7	NC
8	NC

Serial Port

Connector _____ male DB-9 TIA/EIA-232F

Configuration _____ Data Terminal Equipment

Cable Type _____ Null-modem

DB-9 Pinout

Pin Number	Signal
1	NC
2	Receive Data
3	Transmit Data
4	Data Terminal Ready
5	Ground
6	Data Set Ready
7	NC
8	NC
9	NC

Discontinued Product Suppport

Metrobility aims to offer high quality software support to our customers. In order to do this, it may be necessary to discontinue products with a diminished market demand, so that available resources can be used to develop newer technology desired by our customers.

This version of our embedded software provides only basic support for discontinued products, including the Lancast 10Mbps Fixed Port Chassis. Metrobility does not conduct extensive testing on discontinued products and full compatibility with the lastest software is not assured.

Managed Fixed Port Chassis

A fixed port chassis is similar to any other Metrobility chassis and the same commands are used to monitor and manage it. The only exception is that when referring to a specific a fixed port, an extra field, <-converter>, is required with the module number. The management card is always Module 1 on a fixed port chassis. The individual fixed ports are Module 2-x, where x is the number of the fixed port.

Examples.

Display module details for Fixed Port 9.

```
>show module 1 2-9
Location                          : 1/2-9
Name                              : Module2-9
   :                                    :
Uptime                            : 7 days 12:32:30.48
Link Loss Carry Forward Oper      : Disabled
```

Show port information for Fixed Port 12.

```
>show port 1 2-12
```

Location	Name	Status	Duplex	Speed	Type	ANeg	LLR	Activity	Connector
1/2-12/1	Port2-12_1	Link	Full	10Mb	e10BaseFL_SM	n/a	Enabled	Inactive	ST
1/2-12/2	Port2-12_2	Link	Full	10Mb	eBaseT	n/a	n/a	Inactive	RJ-45

Set LLR on the fiber port of Fixed Port 8. The fiber port is Port 1.

```
>set port LLR 1 2-8 1 enable
LLR successfully set.
```

Set LLCF on Fixed Port 3.

```
>set mod LLCF 1 2-3 enable
LLCF successfully set.
```

Persistence for a Fixed Port Chassis

When a management card is installed in a fixed port chassis, the software can be used to override the LLCF/LLR switch settings. Upon initial boot-up, the management card reads the position of the LLCF/LLR switches and sets the ports to match the settings. This information is saved in a persistence data file.

Following a reboot, the management card reads the position of the LLCF/LLR switches and compares them to the persistence data file. Persistence works as outlined below.

1. If the switch settings match the settings in the persistence data file, the software settings will be enforced, and the persistence data file will be unaffected.
2. If the switch settings do not match because a change was made, the new hardware switch setting takes precedence. All other software settings will stay the same.

Pushing any LLCF or LLR hardware switch takes effect immediately.

Product Safety and Compliance Statements

This product complies with the following requirements and protocols:

- Internet Protocol RFC 791
- Address Resolution Protocol RFC 826
- Simple Network Management Protocol RFC 1157, 1902, 3414, 3416
- MIB-II RFC 1213
- Boot Protocol (BOOTP)
- File Transfer Protocol (FTP)
- Reverse Address Resolution Protocol (RARP)
- RADIUS
- PING
- UL
- CSA
- CE
- CB
- FCC Part 15, Class A
- EN55022 Class A (emissions)
- EN55024: 1998 (immunity)
- ICES-003 Class A (emissions)

- NEBS Level III Certification

This product shall be handled, stored and disposed of in accordance with all governing and applicable safety and environmental regulatory agency requirements.

The following FCC and Industry Canada compliance information is applicable to North American customers only.

USA FCC Radio Frequency Interference Statement

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

Caution: *Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

Canadian Radio Frequency Interference Statement

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Réglement sur le matériel brouilleur du Canada.

Warranty and Servicing

Three-Year Warranty for the Metrobility Management Card

Metrobility Optical Systems, Inc. warrants that every Metrobility management card will be free from defects in material and workmanship for a period of THREE YEARS from the date of Metrobility shipment. This warranty covers the original user only and is not transferable. Should the unit fail at any time during this warranty period, Metrobility will, at its sole discretion, replace, repair, or refund the purchase price of the product. This warranty is limited to defects in workmanship and materials and does not cover damage from accident, acts of God, neglect, contamination, misuse or abnormal conditions of operation or handling, including overvoltage failures caused by use outside of the product's specified rating, or normal wear and tear of mechanical components.

Metrobility supports only the current released version and the most recent previous minor version of the software embedded on the management card.

To establish original ownership and provide date of purchase, complete and return the registration card or register the product online at www.metrobility.com. If product was not purchased directly from Metrobility, please provide source, invoice number and date of purchase.

To return a defective product for warranty coverage, contact Metrobility Customer Service for a return materials authorization (RMA) number. Send the defective product postage and insurance prepaid to the address provided to you by the Metrobility Technical Support Representative. Failure to properly protect the product during shipping may void this

warranty. The Metrobility RMA number must be clearly on the outside of the carton to ensure its acceptance.

Metrobility will pay return transportation for product repaired or replaced in-warranty. Before making any repair not covered by the warranty, Metrobility will estimate cost and obtain authorization, then invoice for repair and return transportation. Metrobility reserves the right to charge for all testing and shipping costs incurred, if test results determine that the unit is without defect.

This warranty constitutes the buyer's sole remedy. No other warranties, such as fitness for a particular purpose, are expressed or implied. Under no circumstances will Metrobility be liable for any damages incurred by the use of this product including, but not limited to, lost profits, lost savings, and incidental or consequential damages arising from the use of, or inability to use, this product. Authorized resellers are not authorized to extend any other warranty on Metrobility's behalf.

Product Manuals

The most recent version of this manual is available online at
http://www.metrobility.com/support/manuals.htm

Product Registration

To register your product, go to
http://www.metrobility.com/support/registration.asp

25 Manchester Street, Merrimack, NH 03054 USA
tel: 1.603.880.1833 • fax: 1.603.594.2887
www.metrobility.com

5660-000013 M
5/05