Dell 10Gb Ethernet Pass Through -k for M1000e

Software User's Manual

Rev 1.00

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About this Manual

This manual describes the installation and basic use of the Dell 10Gb Ethernet Pass Through -k for M1000e.

Intended Audience

This manual is intended for users and system administrators responsible for installing and setting up the I/O module.

Related Documentation

Additional documentation available is provided in Table 1.

Table 1 - Referenced Documents

Firmware Releases	http://support.dell.com/support/

Terms, Abbreviations and Conventions

Table 2 - Abbreviations and Convention

Term	Definition
IOM	I/O Module
PTM	Pass Through Module
Downlink	Internal link – from servers to 10GbE PTM PHY (through the mid plane connector)
Uplink	External link – from 10GbE PTM PHY to external link (typically connected to Ethernet switch)
SSH	Secure Shell (also refers to a software program that allows connectivity using an SSH protocol.)
CMC	Chassis Management Controller
Component	10GbE PTM PHY device
Component numbering	Components are numbered from one (1) to three (3). When looking at the 10GbE PTM component side with external connectors (uplink) up, the components are numbered as follows: Device number 1 is the right-most component Device number 2 is the middle component Device number 3 is the left-most component Wherever applicable, device number 0 refers to the on-board micro-controller

1   Overview

This manual explains the use of the embedded software management of the 10GbE PTM. It explains how to connect to the 10GbE PTM and to the CMC, and how to update the module and device firmware and software.

This manual covers the following topics:

- The rest of this section provides a high-level overview of the I/O Module structure and capabilities
- Section 2, "Connecting to the 10GbE PTM CLI," on page 8, explains how to connect to the 10GbE PTM and issue CLI commands
- Section 3, "Command Line Interface (CLI) Reference," on page 12 documents the CLI
- Section 4, "Operating Procedures," on page 17 describes the detailed sequence of operations required to achieve tasks such as software update

1.1   Port Groups

The 10GbE PTM has 16 front panel ports divided into two groups: A and B. Group A consists of ports 1 through 8, providing service to blades 1 through 8, respectively; Group B consists of ports 9 through 16, providing service to blades 9 through 16, respectively.

The supported link protocol for all internal ports is 10GBase KR

Figure 1 shows the front panel ports and their partitioning into Group A and Group B.

Figure 1: Front Panel Link Speed Port Groups
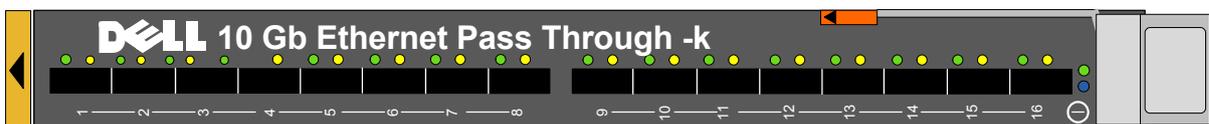
1.2   Port Link State Reflection

The 10GbE PTM reflects the link state from the uplink to the downlink. When an uplink port connected to a remote peer (e.g. an Ethernet switch) is disconnected, the respective server blade will indicate link down event. When the uplink port is connected, the respective server blade will indicate link up.

1.3   Link Protocol Mismatch Condition

A port may enter a link protocol mismatch condition. When in this condition, the port links (both uplink and downlink) will remain inactive. Mismatch condition is indicated by the port LEDs. Additional information about the mismatch condition is available via the CLI. Link protocol mismatch would occur under the following conditions:

• Downlink (server blade) does not support the link protocol of the port group to which it is attached
• Uplink (remote peer) does not support the link protocol of the port group to which it is attached

The following drawing demonstrates link protocol mismatch conditions:

Figure 2: Link Protocol Mismatch Examples
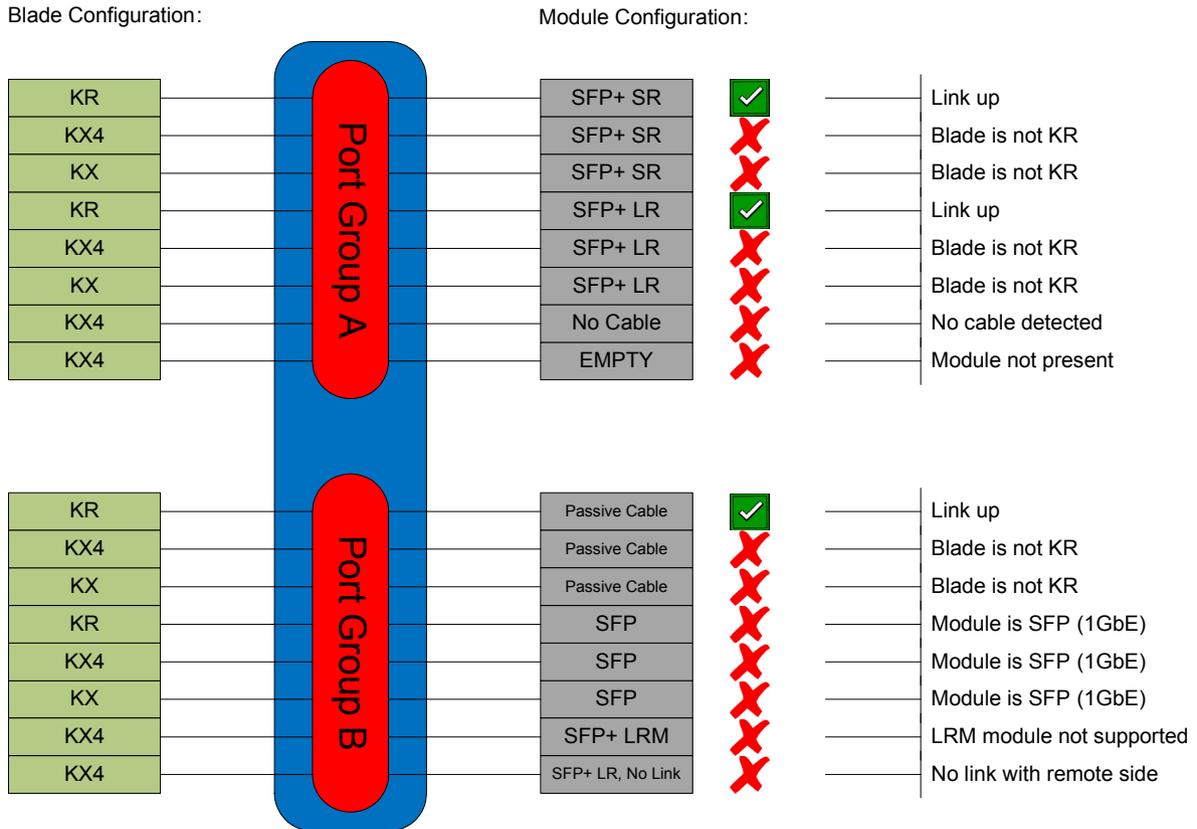
1.4 LED Behavior

The LED behavior is described in the following table:

Table 3 - LED Behavior

Condition	Green LED	Amber LED	Description
Link down	off	off	This condition occurs in the following cases: • Server blade not present, powered down, or link is inactive • Uplink port module not present • Uplink port cable not connected • One or both of the internal and/or external links is down

Table 3 - LED Behavior

Condition	Green LED	Amber LED	Description
Link up	on	off	Both the internal and external links are up
Data activity	on	blink	Link is up and data packets are sent or received
Link protocol mismatch	off	on	Refer to Section 1.3, "Link Protocol Mismatch Condition," on page 5 for details.

1.5   10GbE PTM Status Lights

The 10GbE PTM Status lights indicate whether the switch is receiving power from the chassis, and the state of the 10GbE PTM.

Figure 3: Indicator LEDs

The I/O Module is on and ready when both the blue and green LEDs are lit.

This LED can be blue or amber. A fault is indicated when the amber LED is blinking. See Table 4.
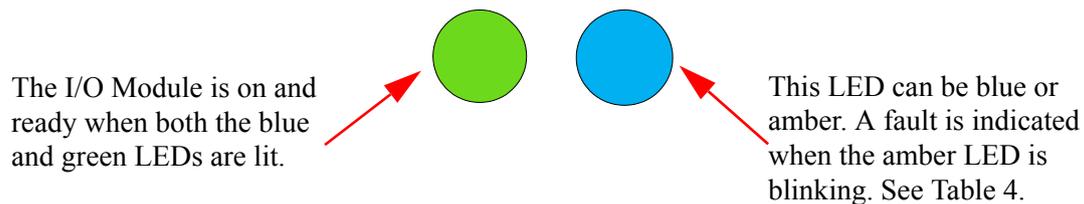
Table 4 - 10GbE PTM states and LED configurations:

LED			10GbE PTM Status
Indication	Green	Status	
	OFF	OFF	OFF
	ON	OFF	Boot in Progress 10GbE PTM not ready
	ON	BLINKING BLUE	The CMC is identifying the newly installed 10GbE PTM
	ON	ON BLUE	10GbE PTM is on and operating Normally
	ON	ON or BLINKING AMBER	Fault in System Self-diagnosed
	OFF	ON or BLINKING AMBER	Fault in System CMC-detected

2   Connecting to the 10GbE PTM CLI

If you are connecting to the system over a network, you will need an SSH client that supports ZModem file transfer. The examples in this document use Secure CommNet v2.35 (download from www.radient.com). After you download the software, some initial configuration is necessary. Please follow the next configuration steps; when using a different client software, similar settings should be available.

If you are connecting directly to the serial port of the Chassis Management Console (CMC), skip to step (9).

1.   Go to Setup => SSH2 settings, and set the compression to **none**.
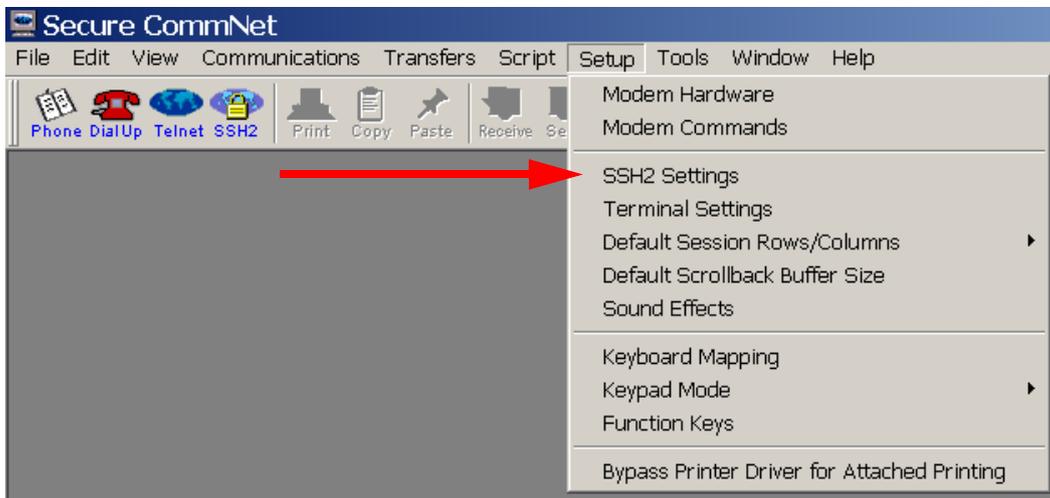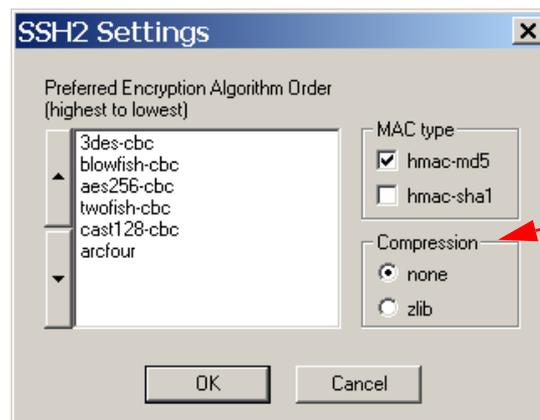
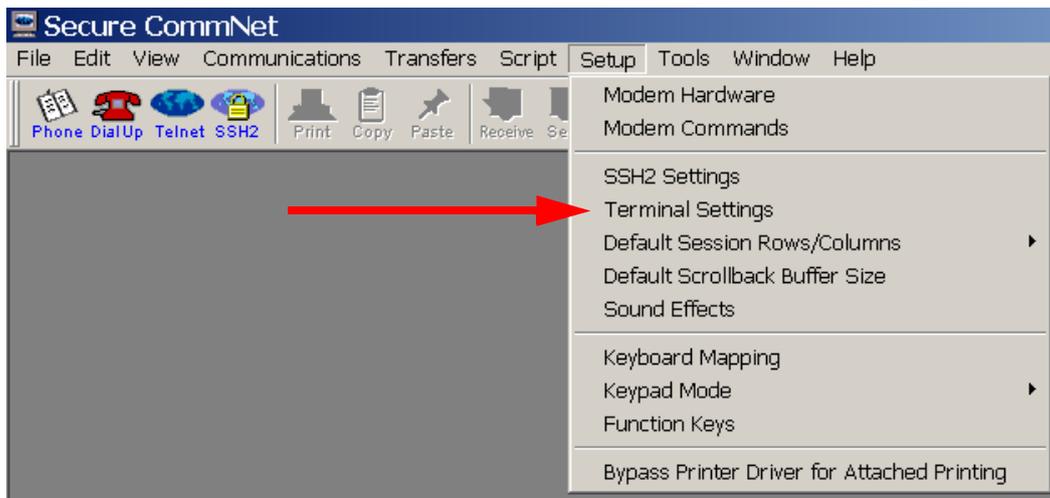*Figure 4: Setup > SSH2 Settings*

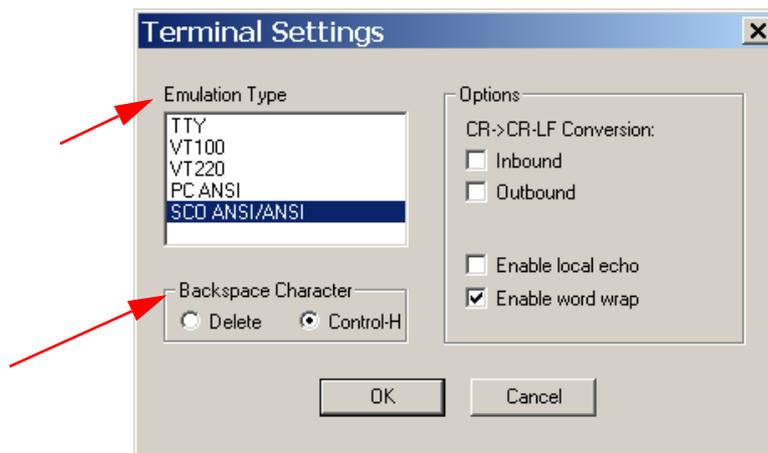*Figure 5: Set Compression to "none"*

2.   Go to Setup => Terminal Settings

Figure 6: Setup > Terminal Settings

3. Select Emulation type => SCOANSI/ANSI and VT100.
4. Select Backspace Character => Control-H

Figure 7: Set Emulation Type and Backspace Character

5. Go to Communications => Open SSH2 connection. This will open the SSH2 Connection dialog box.

Figure 8: Communications > Open SSH Connection
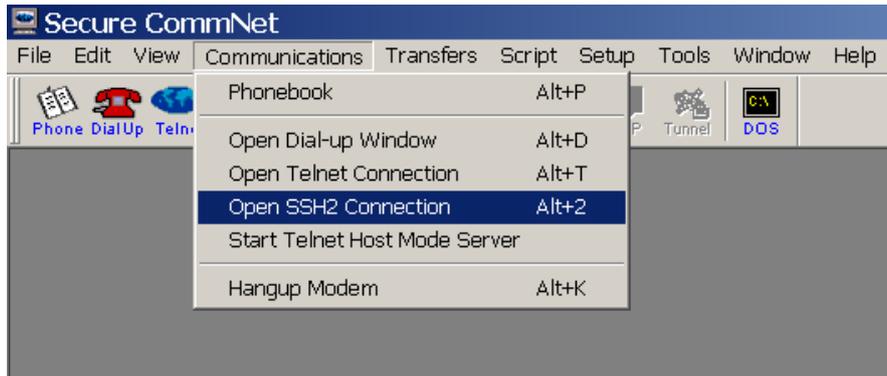
6. Fill in the hostname or IP address of your system.
7. Fill in the user name and the password.

Figure 9: Enter Hostname and Password
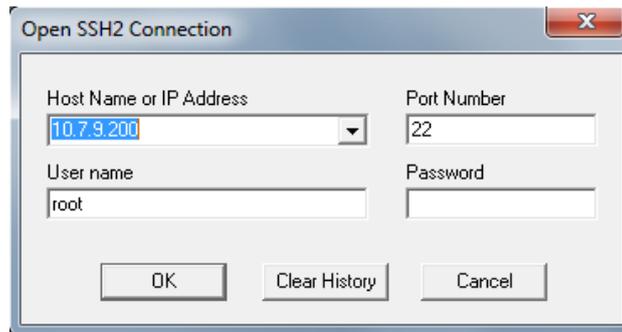
8. Your SSH connection will open. You will see a welcome banner and a user prompt (#)

Figure 10: SSH Connected

9. To list all the devices in the system, enter the following command:

```
# getioinfo
```

Figure 11: getioinfo

The 10GbE PTM is listed by the system as "10Gb PT KR" .

10. Run the following command to connect to the 10GbE PTM CLI:

```
# connect switch-3
```

Figure 12: 10GbE PTM Welcome Banner

You are now connected to the 10GbE PTM and can start entering commands.

11. To show the list of available commands, run the command:

```
# help
```

3   Command Line Interface (CLI) Reference

10GbE PTM management is done via the 10GbE PTM CLI. You can use the commands described in this section after successfully connecting to the 10GbE PTM CLI according to the procedure described in Section 2, "Connecting to the 10GbE PTM CLI," on page 8.

3.1   Quick Reference

Table 5 provides a quick reference to the CLI commands:

Table 5 - List of Commands

Command name	Short Description	Reference
General Commands		
help	Shows the list of available commands	Section 3.3.1, "help," on page 13
exit	Exit current privilege level	Section 3.3.2, "exit," on page 13
Software Image Commands		
show image ver	Shows the software image version	Section 3.4.1, "show image ver," on page 13
copy image from-file	Upload new software image to the PTM	Section 3.4.2, "copy image from-file," on page 14
Port Commands		
show port link	Shows port link state	Section 3.5.1, "show port link," on page 15
show port module	Shows uplink module parameters	Section 3.5.2, "show port module," on page 16

3.2   CLI Command Reference Conventions

This section describes the PTM CLI commands.

For each command, the following information is provided:

• Synopsys:
  Lists the command name and any required or optional parameters. Variable parameters (like port numbers) are shown in *italics*. Optional parameters are shown in square brackets, e.g. [*optional_parameter*]. Required parameters are shown with no brackets.

• Description:
  Provides a detailed description of the command and of all its parameters

- Example:
  Usage example and command output.

- For purpose of automation, the symbol '#' is used to indicate a comment that extends until the next new-line character.

3.3 General Commands

3.3.1 help

Synopsys:

```
help
```

Description:

Show the list of all available commands.

Example:

```
# help

Commands list:
?                       Show this help message
help                    Show this help message
copy image from-file    Upload new software image to the PTM
...
#
```

3.3.2 exit

Synopsys:

```
exit
```

Description:

Exit current privilege level.

Example:

```
& exit
```

3.4 Software Update Commands

3.4.1 show image ver

Synopsys:

```
show image ver
```

Description:

Display the current software image version.

Example:

3.4.2 copy image from-file

Synopsys:

```
copy image from-file
```

Description:

Update the firmware the PTM software image. In ADMIN mode, it allows selective upgrade of a single device in the PTM. Immediately after running this command, the CLI waits for the user to send the firmware image using the ZModem protocol. To abort this operation, use CTRL-C. For additional details on the firmware update procedure refer to Section 4, "Operating Procedures," on page 17.

Example:

```
# copy image from-file
#
```

3.5   Port Commands

3.5.1   show port link

Synopsys:

```
show port link [port_number]
```

Description:

This command displays detailed port information. If an uplink port number is specified ([port_number]), then the command displays information only for this port; otherwise, the command displays information for all the ports.

The command displays the following information per port:

• Port number

• Port group identifier and speed: A, B, followed by the configured speed (10G)

• Pass through connection status, may have one of the following values:
   down - either uplink or downlink is not connected
   mismatch - both uplink and downlink are connected, but there is a mismatch
   10G - uplink and downlink are connected at 10GbE

• Downlink port link state:

   - down: blade not present

   - 10G: 10GbE link

• Uplink port link state:

   - empty: No module present

   - module_type [no link]: Module is present (module type is shown);
     no link: optical fiber cable is disconnected

Example:

```
# show port link
Port  Group        Connect      Downlink    Uplink       Status
-------------------------------------------------------------
1     A (10G)      10G          10G         SFP+ SR      Link Up
2     A (10G)      10G          10G         SFP+ SR      Link Up
3     A (10G)      10G          10G         SFP+ LR      Link Up
4     A (10G)      10G          10G         SFP+ SR      Link Up
5     A (10G)      10G          10G         SFP+ SR      Link Up
6     A (10G)      mismatch     10G         SFP SX       Link Down
7     A (10G)      down         down        SFP+ SR      Link Down
8     A (10G)      down         down        empty
9     B (10G)      mismatch     10G         SFP SX       Link Down
10    B (10G)      mismatch     10G         SFP SX       Link Down
11    B (10G)      mismatch     10G         SFP SX       Link Down
12    B (10G)      mismatch     10G         SFP LX       Link Down
13    B (10G)      down         down        empty
14    B (10G)      down         10G         SFP+ SR      Link Down
15    B (10G)      mismatch     1G          SFP+ SR      Link Down
16    B (10G)      mismatch     1G          SFP+ SR      Link Down
```

```
#
# show port link 7
Port  Group       Connection  Downlink   Uplink     Status
-------------------------------------------------------------
7    A (10G)     down        down       SFP+ SR    Link Down
#
```

3.5.2 show port module

Synopsys:

```
show port module port_number
```

Description:

Show the transceiver module information for the specified uplink port.

Example:

```
# show port module 1
Status........................................ OK
Gigabit Ethernet Compliance Codes.............. 10GBASE-SR
Vendor Name.................................... FINISAR CORP.
Vendor Part Number............................. FTLX8571D3BCL-ME
Vendor Serial Number........................... UDD01@A
Vendor Revision Number......................... A
#
```

•

4   Operating Procedures

4.1   Procedure for Updating Software

The 10GbE PTM consists of three PhyX® devices and a micro-controller (CPU).

The 10GbE PTM is delivered with the latest firmware available at the time of production. New firmware versions will be posted on the Dell support page. The latest firmware can be found at:

http://support.dell.com/support/

Step 1   Download the 10GbE PTM firmware .zip file and extract the .pfw binary file.

Step 2.   Connect to the 10GbE PTM using an SSH Client as described in Section 2, "Connecting to the 10GbE PTM CLI," on page 8.

Step 3.   From the CMC command line, connect to the 10GbE PTM CLI. Enter:

Note: At least 20 seconds must have passed since the last power cycle of the 10GbE PTM module before running the following connect command.

```
$ connect switch-<n>
```

where <n> is the number of the switch -- 2 in our example.

The prompt should change to #.

Step 4.   To start the upgrade process, run the command:

```
# copy image from-file
```

The system will now wait for a ".pfw" file to be transferred from the SSH client.

Step 5.   In your SSH client, initiate file transfer by pulling down the Transfers menu and clicking Send Files. Provide the path to the ".pfw" file and send it.

Figure 13: Transferring the .pfw File
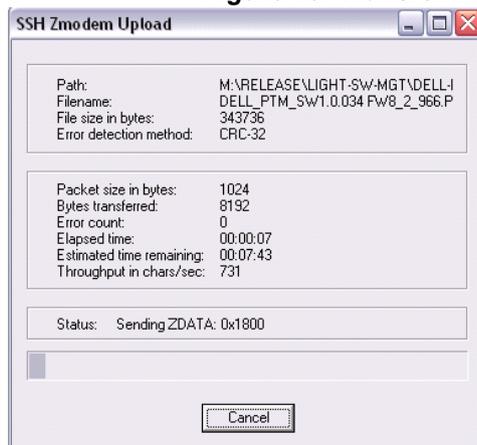
After loading the .pfw file, both the software and firmware will be programmed onto the 10GbE PTM.

Note: The update process takes a few minutes.

At the end of this process, the following message will be displayed at the prompt:

```
# Received update image successfully. Changes will take effect after
next reboot.
#
```

Step 6.   Exit the 10GbE PTM CLI to the CMC command line. Run:

```
# exit
```

Step 7.   Power cycle the 10GbE PTM for the firmware to take effect. From the CMC command line type the following command:

```
$ racadm chassisaction -m switch-<n> powercycle
```

Step 8.   Wait for 20 seconds, and then connect to the 10GbE PTM. Run:

```
$ connect switch-<n>
```

You will be able to view the progress of the SW update.

Step 9.   At the end of a successful SW update process, the following message will be displayed:

```
FW updated successfully!
Welcome to the Dell 10GbE PTM Management Console firmware X.X.XXX-<date
stamp>
#
```

5   Troubleshooting

This section provides troubleshooting information for common error conditions. If the described procedure does not solve the problem, please contact your Dell representative for assistance.

Please use the following table to identify the required correctional operation:

Table 6 - Error Conditions and Correctional Operation

Error Condition	Correctional Operation
10GbE PTM power LED does not turn on	See Section 5.1, "Resolving 10GbE PTM Power Problems," on page 19
Downlink connection to a blade server does not come up	See Section 5.2, "Resolving Link Connectivity Problems," on page 19
Uplink connection to remote switch does not come up	See Section 5.2, "Resolving Link Connectivity Problems," on page 19
Unable to connect to 10GbE PTM10GbE PTM CLI	See Section 5.4, "Resolving CLI Connectivity Problems," on page 20
10GbE PTM CLI hangs during operation	See Section 5.5, "Recovery From Non-Responsive 10GbE PTM CLI," on page 20
10GbE PTM software update procedure fails	See Section 5.6, "Recovery From a Software Update Failure," on page 20

5.1   Resolving 10GbE PTM Power Problems

Make sure the system is powered on.

Take out the 10GbE PTM, wait for 10 seconds and plug it back in.

5.2   Resolving Link Connectivity Problems

1. Check that external cables and/or optical modules are properly inserted.
2. Make sure the cables/modules are supported by the 10GbE PTM.
3. Log in to 10GbE PTM CLI and run the "show port link" command. Check the status of the downlink and uplink in the relevant port – see Section 3.5.1 for details.
   a. If a blade is inserted but not recognized by the 10GbE PTM – restart the network device in the blade and check again. Reboot the blade if the problem is not resolved.
   b. If an Ethernet NIC or switch is connected to an 10GbE PTM external port but the link is down for the 10GbE PTM external port – check cables/modules connectivity in the external device and reboot the external device if not resolved.

If none of the above resolves the issue – reboot the 10GbE PTM through the CMC CLI using the following command:

```
chassisaction –m switch-<n> powercycle
```

where <n> is the switch number [1-6].

5.3   Resolving a Link Protocol Mismatch

Log in to 10GbE PTM CLI and run the "show port link" command. Check the status of the down-link and uplink in the relevant port to identify the mismatch – see Section 3.5.1 for details.

5.4   Resolving CLI Connectivity Problems

Reboot the 10GbE PTM through the CMC CLI using the following command:

```
chassisaction –m switch-<n> powercycle
```

where <n> is the switch number [1-6].

5.5   Recovery From Non-Responsive 10GbE PTM CLI

Reboot the 10GbE PTM through the CMC CLI using the following command:

```
chassisaction –m switch-<n> powercycle
```

where <n> is the switch number [1-6].

5.6   Recovery From a Software Update Failure

1. Reboot the 10GbE PTM through the CMC CLI using the following command:

    ```
    chassisaction –m switch-<n> powercycle
    ```

    where <n> is the switch number [1-6].
2. Restart the software update process.