IBM BladeCenter PN41 Type 3020
Deep Packet Inspection Blade

Problem Determination and Service Guide

IBM BladeCenter PN41 Type 3020
Deep Packet Inspection Blade

Problem Determination and Service Guide

Note: Before using this information and the product it supports, read the general information in Appendix B, “Notices,” on page 65, and the *Warranty and Support Information* document on the IBM *Documentation* CD.

First Edition (August 2008)

© Copyright International Business Machines Corporation 2008.
US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

Safety v
Guidelines for trained service technicians vi
Inspecting for unsafe conditions vi
Guidelines for servicing electrical equipment vi
Safety statements vii

Chapter 1. Introduction 1
Related documentation 1
Notices and statements in this document 2
Features and specifications 3
Control panel buttons and LEDs 4
Turning on the DPI blade 5
Turning off the DPI blade 5
Firmware updates 6

Chapter 2. Setup information and instructions 7
Hardware and software requirements 7
Configuration summary 8
DPI blade IP addresses 9
Setting up and configuring the DPI blade 10

Chapter 3. Parts listing, Type 3020 23

Chapter 4. Removing and replacing DPI blade components 25
Installation guidelines 25
System reliability guideline 26
Handling static-sensitive devices 26
Returning a device or component 26
Removing and replacing Tier 1 CRUs 27
Removing the DPI blade from the BladeCenter unit 27
Installing the DPI blade in a BladeCenter unit 28
Removing the DPI blade cover 30
Replacing the DPI blade cover 31
Removing and replacing transceiver modules 31
Handling a transceiver module 31
Removing an XFP module 32
Replacing an XFP module 33
Replacing a 1 Gb SFP module 33
Disconnecting the transceiver module cable 35
Connecting the transceiver module cable 35
Removing the bezel assembly 36
Replacing the bezel assembly 37

Chapter 5. Diagnostics 39
Diagnostic tools 39
DPI blade diagnostics program 39
POST 40
Error logs 40
General problems 41
Checkout procedure 44
About the checkout procedure 44
Performing the checkout procedure 45
Troubleshooting tables 45

© Copyright IBM Corp. 2008

Web Management Interface event and alarm messages 45
Advanced management module error messages 52
Intermittent problems. 53
Network connection problems 54
Power problems 54
Service processor problems 55
Software problems 56
Diagnostic programs, messages, and error codes 56
Running the diagnostic programs 57
Diagnostic error messages 58
Solving shared BladeCenter resource problems 58
Network connection problems 59
Power problems 59
Solving undetermined problems. 60
Calling IBM for service 61

Appendix A. Getting help and technical assistance 63
Before you call 63
Using the documentation 63
Getting help and information from the World Wide Web 63
Software service and support 64
Hardware service and support 64
IBM Taiwan product service 64

Appendix B. Notices 65
Trademarks 66
Important notes. 67
Product recycling and disposal 67
Battery return program 69
Electronic emission notices 70
Federal Communications Commission (FCC) statement 70
Industry Canada Class A emission compliance statement 71
Avis de conformité à la réglementation d'Industrie Canada 71
Australia and New Zealand Class A statement 71
United Kingdom telecommunications safety requirement. 71
European Union EMC Directive conformance statement 71
Taiwanese Class A warning statement 72
Chinese Class A warning statement 72
Japanese Voluntary Control Council for Interference (VCCI) statement . . . 72
Korean Class A warning statement 72

Index 73

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 Safety Information (安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας (safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

© Copyright IBM Corp. 2008

Guidelines for trained service technicians

This section contains information for trained service technicians.

Inspecting for unsafe conditions

Use the information in this section to help you identify potential unsafe conditions in an IBM product on which you are working. Each IBM product, as it was designed and manufactured, has required safety items to protect users and service technicians from injury. The information in this section addresses only those items. Use good judgment to identify potential unsafe conditions that might be caused by non-IBM alterations or attachment of non-IBM features or options that are not addressed in this section. If you identify an unsafe condition, you must determine how serious the hazard is and whether you must correct the problem before you work on the product.

Consider the following conditions and the safety hazards that they present:

- Electrical hazards, especially primary power. Primary voltage on the frame can cause serious or fatal electrical shock.
- Explosive hazards, such as a damaged CRT face or a bulging capacitor.
- Mechanical hazards, such as loose or missing hardware.

To inspect the product for potential unsafe conditions, complete the following steps:

1. Make sure that the power is off and the power cord is disconnected.
2. Make sure that the exterior cover is not damaged, loose, or broken, and observe any sharp edges.
3. Check the power cord:
   - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
   - Make sure that the power cord is the correct type, as specified in the documentation for your BladeCenter unit.
   - Make sure that the insulation is not frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Guidelines for servicing electrical equipment

Observe the following guidelines when you service electrical equipment:

- Check the area for electrical hazards such as moist floors, nongrounded power extension cords, and missing safety grounds.
- Use only approved tools and test equipment. Some hand tools have handles that are covered with a soft material that does not provide insulation from live electrical current.
- Regularly inspect and maintain your electrical hand tools for safe operational condition. Do not use worn or broken tools or testers.

- Do not touch the reflective surface of a dental mirror to a live electrical circuit. The surface is conductive and can cause personal injury or equipment damage if it touches a live electrical circuit.
- Some rubber floor mats contain small conductive fibers to decrease electrostatic discharge. Do not use this type of mat to protect yourself from electrical shock.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Locate the emergency power-off (EPO) switch, disconnecting switch, or electrical outlet so that you can turn off the power quickly in the event of an electrical accident.
- Disconnect all power before you perform a mechanical inspection, work near power supplies, or remove or install main units.
- Before you work on the equipment, disconnect the power cord. If you cannot disconnect the power cord, have the customer power-off the wall box that supplies power to the equipment and lock the wall box in the off position.
- Never assume that power has been disconnected from a circuit. Check it to make sure that it has been disconnected.
- If you have to work on equipment that has exposed electrical circuits, observe the following precautions:
  - Make sure that another person who is familiar with the power-off controls is near you and is available to turn off the power if necessary.
  - When you are working with powered-on electrical equipment, use only one hand. Keep the other hand in your pocket or behind your back to avoid creating a complete circuit that could cause an electrical shock.
  - When using a tester, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on a suitable rubber mat to insulate you from grounds such as metal floor strips and equipment frames.
- Use extreme care when you measure high voltages.
- To ensure proper grounding of components such as power supplies, pumps, blowers, fans, and motor generators, do not service these components outside of their normal operating locations.
- If an electrical accident occurs, use caution, turn off the power, and send another person to get medical aid.

Safety statements

Important:

Each caution and danger statement in this documentation is labeled with a number. This number is used to cross reference an English-language caution or danger statement with translated versions of the caution or danger statement in the *Safety Information* document.

For example, if a caution statement is labeled “Statement 1,” translations for that caution statement are in the *Safety Information* document under “Statement 1.”

Be sure to read all caution and danger statements in this documentation before you perform the procedures. Read any additional safety information that comes with the DPI blade or optional device before you install the device.

Statement 1:

DANGER

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To Connect:	**To Disconnect:**
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

Statement 3:

CAUTION:
When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Statement 12:

CAUTION:
The following label indicates a hot surface nearby.

Statement 21:

CAUTION:
Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.

This device is intended for use only with UL Listed IBM BladeCenter H and BladeCenter HT units.

Chapter 1. Introduction

This *Problem Determination and Service Guide* contains information to help you solve problems that might occur in your IBM® BladeCenter® PN41 Type 3020 Deep Packet Inspection (DPI) Blade. It describes the diagnostic tools that come with the DPI blade, error codes and suggested actions, and instructions for replacing failing components.

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document.

Related documentation

In addition to this document, the following documentation also comes with the DPI blade:

- *Getting Started*

  This printed document is included with the DPI blade. It contains technical information about setting up and configuring the DPI blade.
- *Important Notices*

  This printed document is included with the DPI blade. It contains warranty information, safety information, and environmental notices for the DPI blade.
- *CPOS download for the IBM PN41 DPI Blade*

  This printed document is included with the DPI blade. It contains the information needed to download CloudShield PacketWorks Operating System (CPOS) for the IBM BladeCenter PN41 Type 3020 DPI Blade.
- *Installation and User's Guide*

  This document is in Portable Document Format (PDF) on the IBM *Documentation* CD. It contains information to help you install supported optional devices and configure the DPI blade.
- *Safety Information*

  This document is in PDF on the IBM *Documentation* CD. It contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Information* document.
- *Warranty and Support Information*

  This document is in PDF on the IBM *Documentation* CD. It contains information about the terms of the warranty and getting service and assistance.
- *Command Line Interface Reference Guide*

  This CloudShield document is in PDF on the IBM *Documentation* CD. It contains information about working with the CloudShield command-line interface.

© Copyright IBM Corp. 2008

- *Web Management Interface User Guide*

  This CloudShield document is in PDF on the IBM *Documentation* CD. It contains information about working with the CloudShield Web Management Interface.

Depending on your BladeCenter product, additional documents might be included on the IBM *Documentation* CD. In addition to the documentation in this library, be sure to review the *IBM BladeCenter Planning and Installation Guide* for your BladeCenter unit for information to help you prepare for system installation and configuration. To check for updated documentation and technical updates, complete the following steps.

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/.
2. Under **Product support**, click **BladeCenter**.
3. Under **Popular links**, click **Publications lookup**.
4. From the **Product family** menu, select **BladeCenter PN41** and click **Continue**.

Notices and statements in this document

The caution and danger statements in this document are also in the multilingual *Safety Information* document, which is on the IBM *Documentation* CD. Each statement is numbered for reference to the corresponding statement in the *Safety Information* document.

The following notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage might occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Features and specifications

The following table is a summary of the features and specifications of the DPI blade.

Notes:

- Power, cooling, removable-media drives, external ports, and advanced system management are provided by the BladeCenter unit.
- An additional host blade server is necessary to interface with the DPI blade, because the DPI blade does not have a direct user interface. The additional blade server must support VMware ESX Server 3.0 or later and have dual 1 Gb controllers.

Processor:
Contains an Intel® IXP2805 network processor for use in handling packets.
Note: This is a dedicated processor and is not available for general applications.

Memory: Contains multiple types of memory such as TCAM, QDR and RDRAM.
Note: Memory is dedicated to packet processing and is not expandable.

Drives:
The DPI blade contains no drives or flash drives.

Regex engine:
The DPI blade contains a regular expression accelerator to speed up searches.

Front 10 Gb connector:
XFP connection to 10 Gb Ethernet (optical).

SFP-module port:
Front 1 Gb SFP port, which can be used for data capture.

Electrical input:
12 V dc

Integrated functions:

- Quad Internal 1 Gb Ethernet controller used for the management interface
- Quad Internal 10 Gb Ethernet ports used for the data plane
- Single External 10 Gb Ethernet port used for the data plane
- Local service processor: Baseboard management controller (BMC) with Intelligent Platform Management Interface (IPMI) firmware
- RS-485 interface for communication with the management module

Environment:

- Air temperature:
  - DPI blade on: 10°C to 35°C (50°F to 95°F). Altitude: 0 to 914 m (0 to 3000 ft)
  - DPI blade on: 10°C to 32°C (50°F to 90°F). Altitude: 914 to 2134 m (3000 to 7000 ft)
  - DPI blade off: -40°C to 60°C (-40°F to 140°F)
- Humidity:
  - DPI blade on: 8% to 80%
  - DPI blade off: 5% to 80%

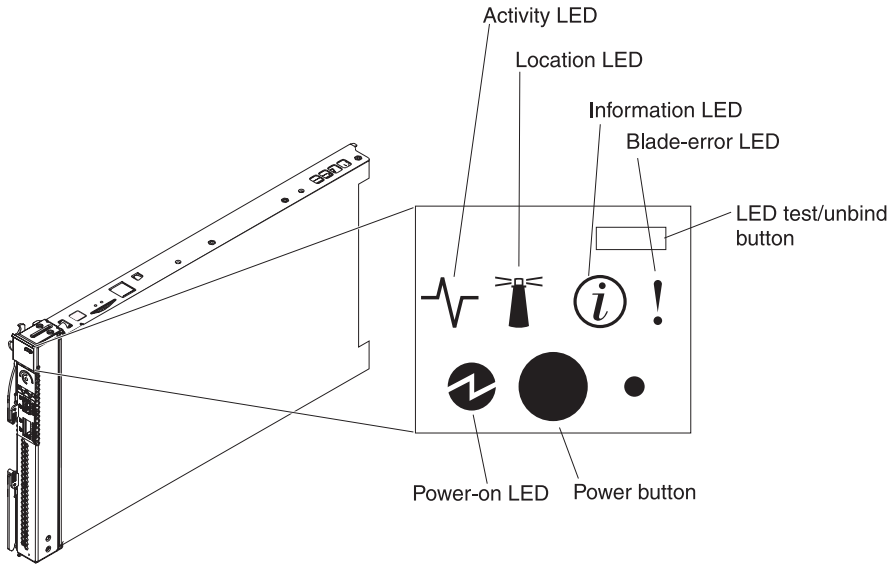
Size:

- Height: 24.5 cm (9.7 inches)
- Depth: 44.6 cm (17.6 inches)
- Width: 2.9 cm (1.14 inches)
- Maximum weight: 5.4 kg (12 lb)

Control panel buttons and LEDs

This section describes the controls and LEDs on the DPI blade. The indicator LEDs are on the front panel of the DPI blade and have two states: lit and off. When an LED is lit, the color indicates the status.

The DPI blade uses LEDs to visually indicate the status of various components, alarms, and events.



Activity LED: When this green LED is lit, it indicates that there is activity on the internal Ethernet ports. Activity LEDs next to the SPF-module port and XFP-module port indicate activity through the transceiver modules.

Location LED: This blue LED can be lit remotely by the system administrator to aid in visually locating the DPI blade. When this LED is lit, the location LED on the BladeCenter unit is also lit. The location LED can be turned off through the management-module Web interface or through IBM Director Console.

Information LED: When this amber LED is lit, it indicates that information about a system error in the DPI blade has been placed in the management-module event log. The information LED can be turned off through the management-module Web interface or through IBM Director Console.

Blade-error LED: When this amber LED is lit, it indicates that a system error has occurred in the DPI blade. The blade-error LED turns off only after the error is corrected.

LED test/unbind button: Press this button to light all the LEDs on the DPI blade control panel test the LED operation. To reset the DPI blade bindings, press this button for 15 - 20 seconds. Use this method if the blade was not unbound through the Application Server Module (ASM) and the binding information must be reset.

Power button: This button is behind the control panel door. It can be used to turn on or turn off the DPI blade.

Note: The power-control button has effect only if local power control is enabled for the DPI blade. Local power control is enabled and disabled through the management-module Web interface.

Power-on LED: This green LED indicates the power status of the DPI blade in the following manner:

- Flashing rapidly: The service processor (BMC) on the DPI blade is initializing communications with the management module.
- Flashing slowly: The DPI blade has power but is not turned on.
- Lit continuously: The DPI blade has power and is turned on.

Turning on the DPI blade

The DPI blade has two power domains: PD1 and PD2. Power domain 1 (PD1) occurs automatically when the DPI blade is connected to the BladeCenter unit. This enables the BMC to communicate with the management module and control the DPI blade.

Power domain 2 (PD2) occurs when power is applied to the entire DPI blade through the host blade server.

Depending on the binding state of the DPI blade, you can turn on the DPI blade using the power button on the front of the DPI blade, through the advanced management module interface, or through the ASM. The preferable way to turn on the DPI blade is through the ASM.

Notes:

1. Wait until the power-on LED on the DPI blade flashes slowly before you turn on the DPI blade through the ASM. While the service processor is initializing communications with the advanced management module, the power-on LED flashes rapidly and the power button on the DPI blade does not respond.
2. For you to power-on the DPI blade through the ASM, the DPI blade must be bonded with the ASM. If the DPI blade is not bonded, the ASM will not power-on the DPI blade. Bonding is required for normal operation.

Turning off the DPI blade

Note: When you turn off the DPI blade, it is still connected to power through the BladeCenter unit. The DPI blade can respond to requests from the management module, such as a remote request to turn on the DPI blade. To remove all power from the DPI blade, you must remove it from the BladeCenter unit.

The DPI blade can be turned off in any of the following ways:

- You can press the power button on the DPI blade (behind the control panel door) on the DPI blade (see “Control panel buttons and LEDs” on page 4).
- The management module can turn off the DPI blade:
  - The preferable way to turn off the DPI blade is through the ASM. If you are removing or changing the DPI blade in any way, you must unbind the DPI blade by using the ASM before you proceed. See Chapter 2, “Setup information and instructions,” on page 7 for more information about the binding process.
  - If there are critical voltage or temperature errors, the management module will automatically turn off the DPI blade

– You can also configure the management module to turn off the DPI blade through the management-module Web interface. For additional information, see the *IBM BladeCenter Management Module User's Guide*.

Firmware updates

Firmware updates are imbedded in the Cloudshield PacketWorks Operating System (CPOS) and are available for updates when the new CPOS is installed. You must choose to update the firmware to use the new CPOS version. You will still be able to install applications in a different version of CPOS that is compatible with the firmware version.

See the CPOS download documentation on the IBM *Documentation* CD for more information about updating the firmware for the DPI blade.

Important: To avoid problems and to maintain proper system performance, always make sure that the DPI blade BIOS, service processor, and diagnostic firmware levels are consistent for all DPI blades of the same type within the BladeCenter unit.

Chapter 2. Setup information and instructions

This chapter contains the procedures that you must complete before you can use the DPI blade.

Hardware and software requirements

To set up the DPI blade, you must have the following items:

- VMware ESX Server version 3.0 or later
- VMware Virtual Infrastructure Client 2.0 or later
- A VMware ESX compatible server or blade server
- A 1 Gb Ethernet switch module installed in bay 1 of the BladeCenter unit
- A Nortel Networks Layer 2/3 copper (32R1860) or fiber (32R1861) Ethernet switch module installed in bay 2 of the BladeCenter unit with firmware 1.4.2.0 or later
- 10 Gb switch modules (the number of switches depends on applications)
- A RAVE application, or the ability to create a RAVE application, using an Integrated Development Environment
- An IBM advanced management module installed in the BladeCenter unit
- CloudShield PacketWorks Operating System (CPOS) software download
- A remote console with Microsoft® Internet Explorer 6.0 or later

Two network interface connection ports are used in the configuration of the DPI blade. One port is used for management access, such as through the CloudShield Web Management Interface or a command-line interface (CLI) over Secure Shell (SSH). The other port is used to communicate with the Deep Packet Processing Module (DPPM). The DPI management and CPOS management must be on different subnets.

Performance of the DPI blade varies, depending on the following factors:

- The application that is being deployed
- The packet size
- The DPI blade configuration
- The type of traffic

High availability is available on the DPI blade through a combination of some applications and configurations.

© Copyright IBM Corp. 2008

Configuration summary

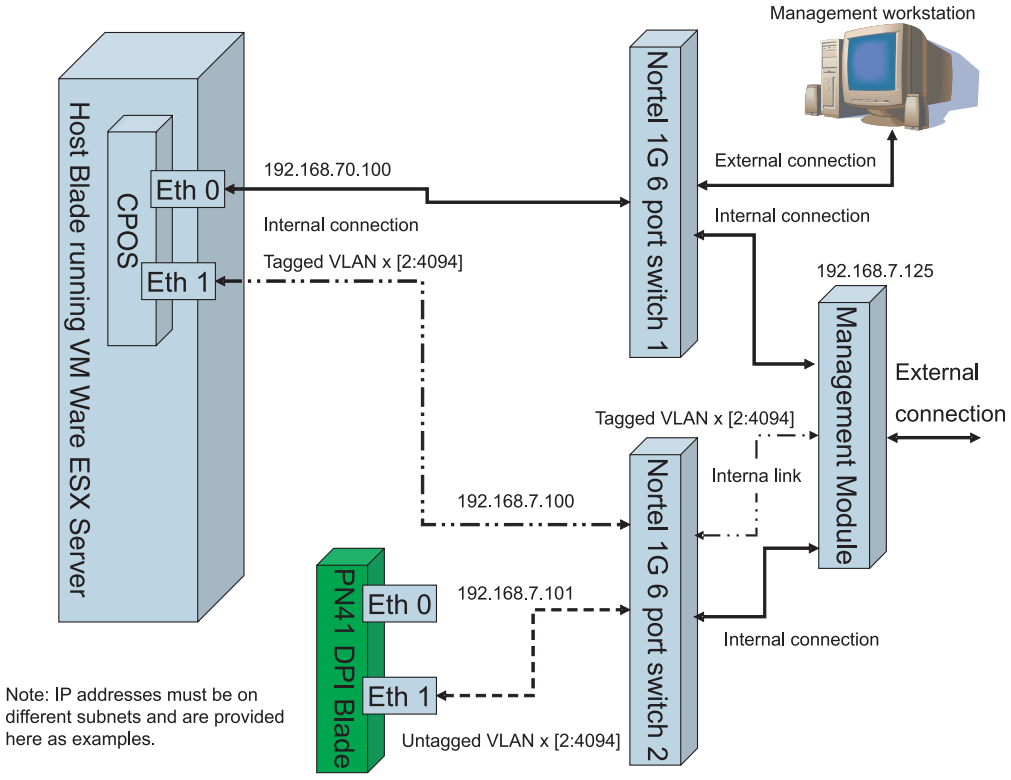
The following overview summarizes the tasks that you must complete to make the DPI blade operational. The order of the tasks in this overview differs from the order of the actual steps. For step-by-step instructions, see Chapter 2, “Setup information and instructions,” on page 7.

- Configure the management module:
  - Enable SNMPv1 and add the CPOS control port IP address to the public community, or set SNMPv1 to the defaults.
  - Set the TCP command mode protocol to *n* + *m*, where *n* is the number of DPI blades in the BladeCenter unit and *m* is the number of TCP command mode protocol connections that currently exist.
- Configure the chassis internal network (CIN):
  - Set the IP addresses of the CPOS management port.
  - Create a management VLAN and add ports on a CIN-supported switch module.
  - Enable the chassis internal network (CIN) and set the IP addresses in the advanced management module.
- Install and configure the VMware ESX Server virtual machine:
  - Create a virtual switch for the DPPM network.
  - Select Red Hat Enterprise Linux 4 as the operating-system type.
  - Select one processor with 1024 MB of memory. Select two NICs (one for the VM network and one for the DPPM network). Create an LSI Logic virtual disk with a minimum size of 10 Gb.
  - Configure the virtual machine BIOS boot order to be **Hard Drive** and then **CD-ROM Drive**.
  - Install the CPOS on the virtual machine.
- Configure the CloudShield PacketWorks Operating System:
  - The default user ID is `admin`, and the default password is `cloudshield`.
  - Set the IP address of the management port (eth0).

    Note: The CPOS management port must be on a different subnet than the BladeCenter advanced management module.
  - Set the IP address of the control port (eth1).

    Note: The CPOS control port must be on the same subnet as the BladeCenter advanced management module.
  - See Chapter 2, “Setup information and instructions,” on page 7 for command-line configuration options to configure the Application Server Module (ASM) network.

The following illustration shows an example configuration that uses the DPI blade. The 192.168.7.*xxx* subnetwork uses VLAN ID 4094 to communicate internally within the BladeCenter unit and is used as the CPOS control network. The 192.168.70.*xxx* subnetwork is used as the CPOS management network. The IP addresses and the VLAN ID are shown for illustrative purposes only.



DPI blade IP addresses

Use this table to record the IP addresses that you set during configuration. You will need these IP addresses when you set up the DPI blade.

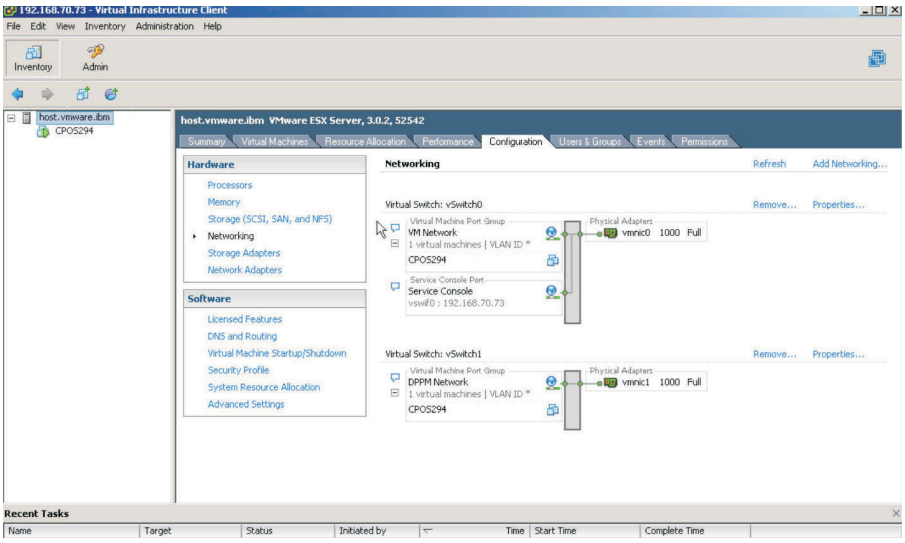
Table 1. IP addresses

ID	IP address	Notes
BladeCenter advanced management module IP address		
CPOS eth0		Internal connection to switch bay 1
CPOS eth1		Tagged VLAN to switch bay 2
DPI blade eth1		Untagged VLAN to switch bay 2
VLAN ID		
Host blade server		

Setting up and configuring the DPI blade

To set up and configure the DPI blade, complete the following steps:

1. Enable the SNMPv1 agent:
   a. From the remote console, log in to the advanced management module in the BladeCenter unit and start a session.
   b. Select **MM Control → Network Protocol**. Under **Management Module Network Protocols**, select **Simple Network Management Protocol** (SNMP).
   c. From the menu, select **Enabled** for the SNMPv1 agent. Click **Save**.
   d. Under **Management Module Network Protocols**, select **TCP Command Mode Protocol**. Set the **Command Mode** field to *n* + *m*, where *n* is the number of DPI blades in the BladeCenter unit and *m* is the number of TCP command mode protocol connections that currently exist.
2. Install VMware ESX Server on the host (client) blade server. Follow the installation instructions that come with the software. During the installation, specify a user name and password, and assign an IP address to the host blade server. Record this IP address in “DPI blade IP addresses” on page 9.
3. Install VMware Virtual Infrastructure Client 2.0 on the remote console. Follow the installation instructions that come with the software.
4. Add a virtual switch:
   a. From Virtual Infrastructure Client on the remote console, log in to the host blade server, using the IP address, user name, and password that you specified in step 2.
   b. Click the **Configuration** tab.
   c. Under **Hardware**, click **Networking**, and click **Add Networking**.



   d. Select **Virtual Machine**, and click **Next**.
   e. Select **Create a Virtual Switch**, and click **Next**.
   f. In the **VLAN ID** field, enter an unused VLAN ID number between 2 and 4094. Record the VLAN ID in “DPI blade IP addresses” on page 9.

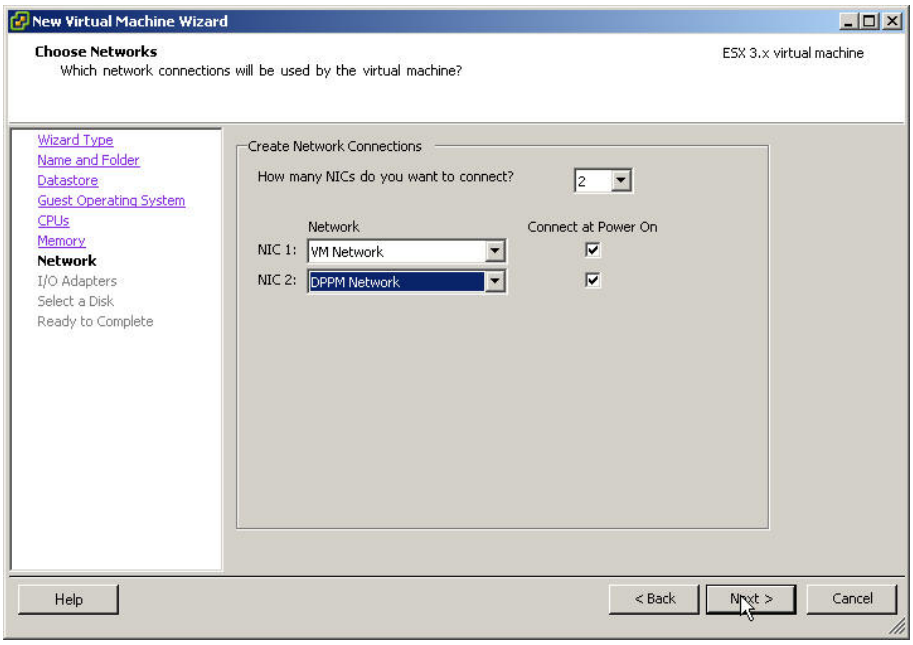
      Note: This is the VLAN ID of the chassis internal network, where the host blade server communicates with the advanced management module.

g. In the **Network Label** field, type `DPPM Network`. Click **Next**, and click **Finish**.

5. Create a virtual machine in the host blade server:
   a. Click **File → New → Virtual Machine**.
   b. Select **Custom**, and click **Next**.
   c. In the **Virtual Machine Name** field, type a name for the virtual machine. Click **Next**.
   d. Select the datastore in which to store files for the virtual machine.
   e. Select **Linux®**; then, select **Red Hat Enterprise Linux 4** from the menu. Click **Next**.

      Attention: You must select the correct version of Linux for compatibility with the CloudShield PacketWorks Operating System (CPOS).

   f. In the **Number of virtual processors** field, select **1**. Click **Next**.
   g. In the **Memory for the virtual machine** field, select **1024 MB**. Click **Next**.
   h. In the **How many NICs do you want to connect** field, select **2**. In the **NIC 1** field, select **VM Network**. In the **NIC 2** field, select **DPPM Network**.
   i. Select the **Connect at Power On** check box for each NIC. Click **Next**.



   j. Select **LSI Logic**. Click **Next**.
   k. Select **Create a new virtual disk**. Click **Next**.
   l. Under **Disk Capacity → Disk Size**, select at least 10 Gb; then, select **Store with the virtual machine**. Click **Next**.
   m. Click **Next**, and click **Finish**.

6. Configure the virtual machine BIOS.

   Note: Each virtual machine has its own independent BIOS setting. An alternative method is to place the ISO image on the host blade server and mount the virtual CD drive with the ISO image. If you mount the ISO image on the client, the host blade server might not automatically eject the virtual CD as required at the end of the installation, and you might have to eject the CD manually. The installation will start over if you do not eject the CD.

   a. From the left pane, select the virtual machine that you created in step 5.

b. Click the **Console** tab.

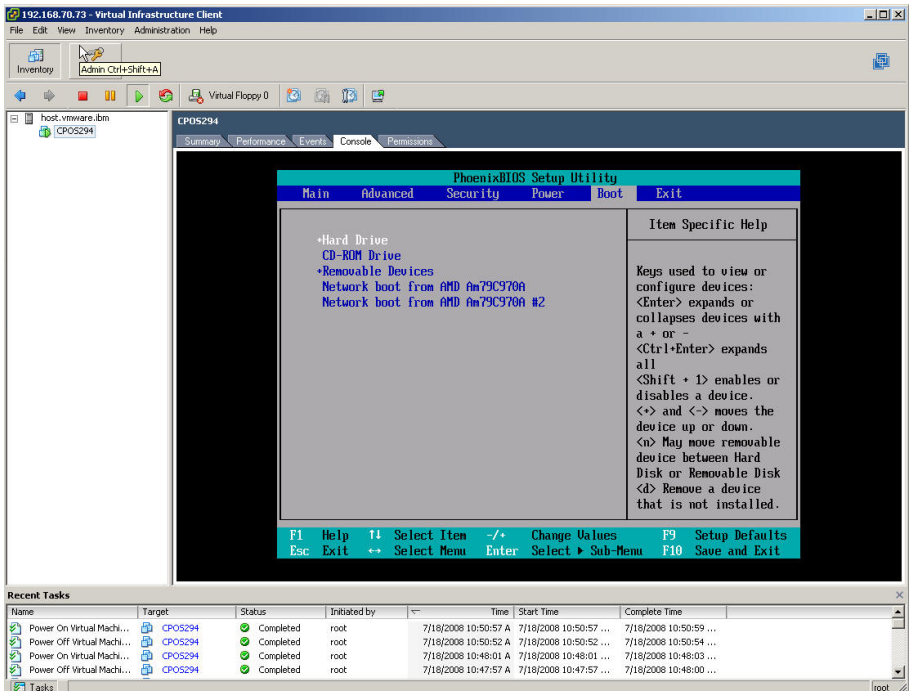
Important: In the following step, you must press F2 while the VMware screen is displayed. If you fail to do this, press Ctrl+Alt to release the cursor from the console window, and click the **Reset** icon to restart the boot process.

c. Click the **Power on** icon and click inside the console window. When the VMware screen is displayed, press F2.

d. Using the Right Arrow key, highlight **Boot**.

e. Using the Down Arrow key, highlight **Hard Drive**; then, press + to move **Hard Drive** to the top of the list.

f. Using the Down Arrow key, highlight **CD-ROM Drive**; then, press + to move **CD-ROM Drive** to the second position in the list.



g. Press F10. Select **Yes**, and press Enter.

7. Install the CloudShield PacketWorks Operating Sytem (CPOS) on the virtual machine:

a. See *CPOS download for the IBM PN41 DPI blade* on the IBM *Documentation* CD. For more information about installing an image under VMware, or for alternative methods, see http://www.vmware.com/.

b. Click the **Summary** tab. Under **Commands**, select **Edit Settings**.

c. Select **CD/DVD Drive 1**. Under **Device Type**, select **client device**.

d. Select the **Connect at power on** check box, and click **OK**.

e. Click the **Console** tab. Power-on the virtual machine by clicking the **Power On** icon, or reset the virtual machine by clicking the **Reset** icon.

f. When the CloudShield Recovery CD screen is displayed at the beginning of the installation, select the operating-system security standard (rescue-permissive or rescue-enforcing) and press Enter.

Notes:

1) If you press Enter without selecting a security standard, rescue-enforcing is used as the default.

2) Contact your system administrator for more information about permissive and enforcing modes.
3) Package installation screens are displayed during the installation.

g. After the installation, eject the CD or disconnect the ISO image from the virtual CD drive.

h. When the POST installation screen is displayed, select the first option that is shown or wait for the timeout, which defaults to the first selection. The system restarts.

i. Type the default user name, `admin`, and the default password, `cloudshield`. You can change the user name and password after the setup is complete. For more information, see the CloudShield *Web Management Interface Users Guide* on the IBM *Documentation* CD.

Note: When you type the password, the cursor does not move, and the password is not displayed.

j. At the command prompt, type the following commands. After each command, press Enter.

```
admin@CloudShield!> set asm port=eth0 ipaddress=ipaddress
netmask=netmask admin=enable role=management
admin@CloudShield!> set asm port=eth1 ipaddress=ipaddress
netmask=netmask admin=enable role=control
admin@CloudShield!> set route 0.0.0.0 netmask=0.0.0.0
gateway=gateway
admin@CloudShield!> set service http adminstate=enabled
admin@CloudShield!> set authhost 0.0.0.0 netmask=0.0.0.0 ruleOrder=1
httpsAccess=enabled httpAccess=enabled
```

ipaddress, *netmask*, and *gateway* are the IP address, netmask, and gateway that are to be assigned to the virtual machine. Record these IP addresses in “DPI blade IP addresses” on page 9.

Notes:

1) The IP address of eth0 (the CPOS management port) must be on a different subnetwork than the advanced management module.
2) The IP address of eth1 (the CPOS control port) must be on the same subnetwork as the advanced management module.
3) The gateway must be on the same subnet as eth0.

You now have access to the CloudShield Web Management Interface and the services that you enabled. For information about the command-line interface (CLI) command syntax and options, see the *Command Line Interface Reference Guide* on the IBM *Documentation* CD.

8. Configure the chassis internal network:
   a. Log in to the advanced management module.
   b. Under **MM Control** in the left pane, select **Chassis Internal Network** .
   c. From the **Chassis Internal Network Configuration** menu, select **Enabled**.
   d. Select an unused **CIN VLAN ID** link to define the first CIN entry.
   e. On the Chassis Internal Network Entry Definition page, enter the VLAN ID that you specified in step 4f. In the **CTRL** field, enter the IP address of eth1. Click **Save**. Record the IP address in “DPI blade IP addresses” on page 9.
   f. Under **I/O Module Tasks** in the left pane, select **Configuration**.
   g. Click **Bay 2** and select **Advanced Configuration**.

h. Scroll down and click **Start Web Session** to display the switch module administration page.

i. Enter the switch module login information, and click **OK**.

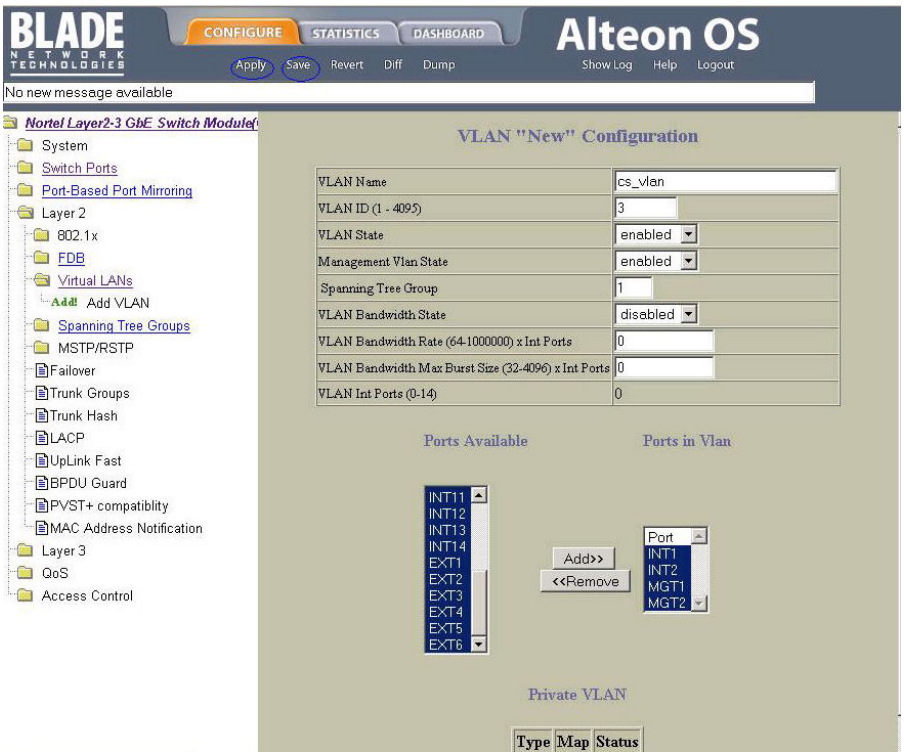
j. Click the **Configure** tab. In the left pane, select the Nortel Layer 2-3 GbE Switch Module folder, select the Layer 2 folder, and select the Virtual LANs folder. Click **Add!**.

k. In the **VLAN Name** field, enter the VLAN ID that you specified in step 4f.

l. From the **VLAN State** menu, select **enabled**. From the **Management VLAN State** menu, select **enabled**.

m. Add the ports that are associated with the host blade server and the DPI blade to the **Ports in Vlan** list.

n. Add the MGT1 and MGT2 ports to the **Ports in Vlan** list.



o. Click **Submit**. Click **Apply**. Click **Save**.

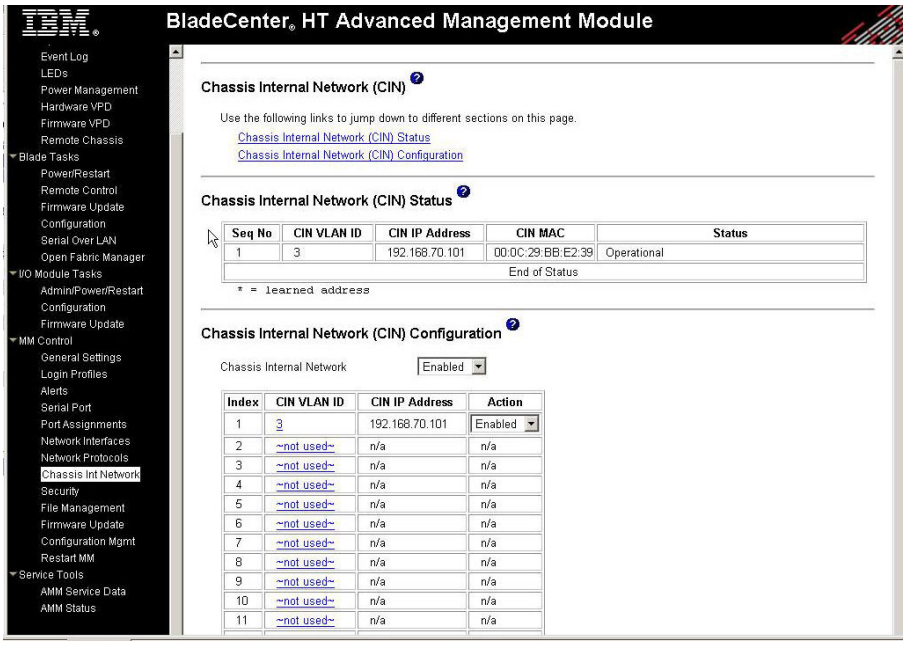
Note: In the list of VLAN ports, INT1 through INT14 are associated with blade bays 1 through 14 in BladeCenter H units, and INT13 and INT14 are associated with the interswitch links (ISL) in BladeCenter HT units.

p. In the left pane, click **Switch Ports**. Select the switch port that is associated with the DPI blade.

q. For each DPI blade, set the **Default Port VLAN ID** to the VLAN ID that you specified in step 4f.

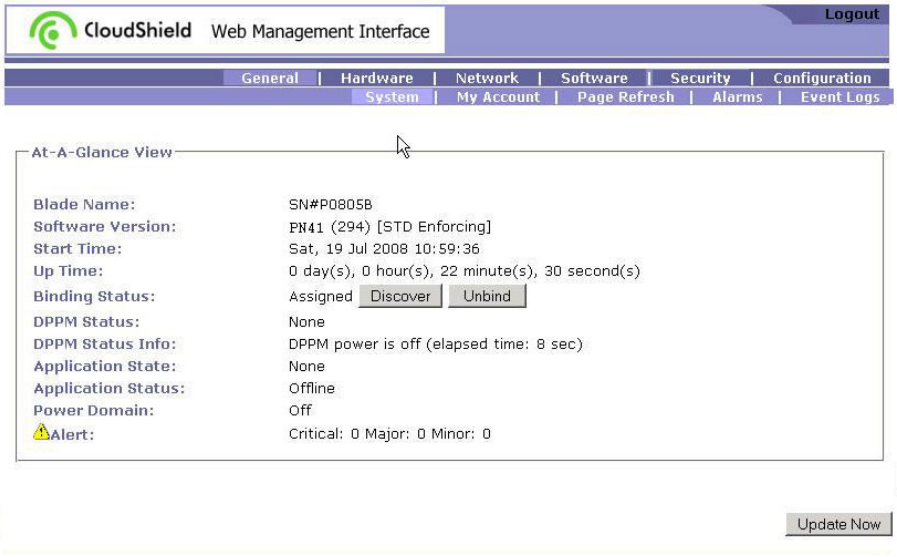
r. Click **Submit**. Click **Apply**. Click **Save**.

s. Log in to the advanced management module and select **Chassis Internal Network** from the left pane. Make sure that the status is Operational and a CIN MAC address is shown.



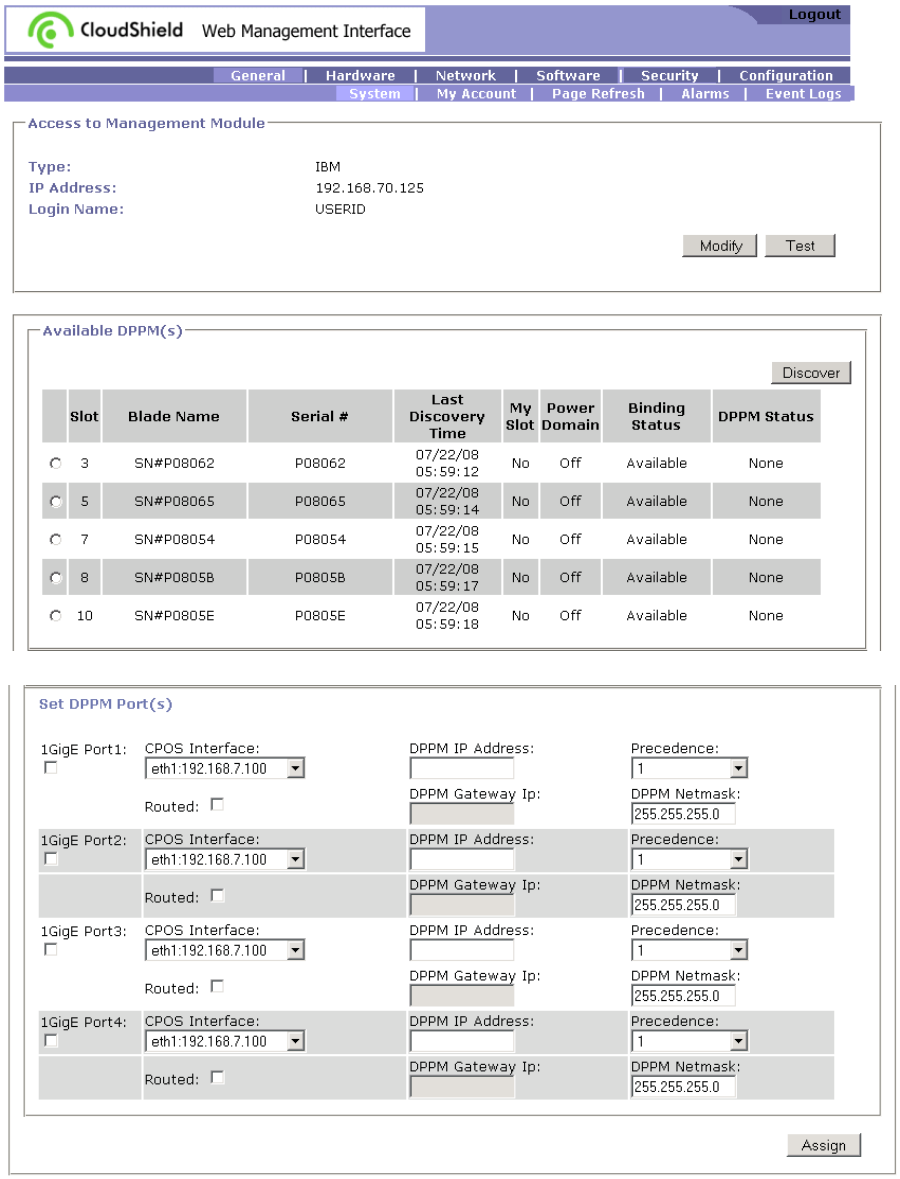
9. Configure the CloudShield PacketWorks Operating System (CPOS):
   a. Log in to the CloudShield Web Management Interface.
   b. From a system on the same network as the virtual machine, open Microsoft Internet Explorer. In the address bar, type the IP address that you assigned to the virtual machine in step 7j.
   c. In the **Login Name** and **Password** fields, type the user name and password.

      Note: The default user name is `admin`, and the default password is `cloudshield`. You can change the user name and password when setup is complete.
   d. Select **Terminate existing session and login as you are**. Click **Apply**.
   e. Click the **General** tab. Make sure that the binding status is Available, and then click **Bind**.

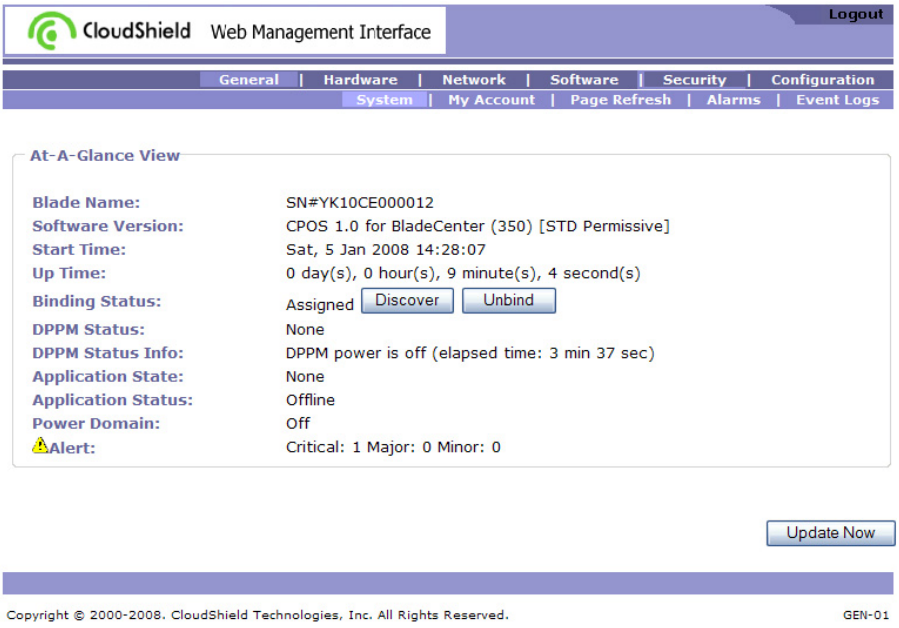


   f. Click **Modify**.
   g. In the **IP Address** field, type the IP address of the advanced management module and enter the login name and password for the advanced management module. Click **Apply**.
   h. Click **Test**. If there is communication with the advanced management module, `OK` is displayed.
   i. Click **Discover** and select the slot of the DPI blade that you want to bind to the Application Server Module (ASM).
   j. From the **Available DPPM(s)** list, select your DPI blade.

k. Select the **1GigE Port2** check box. From the **CPOS Interface** menu, select the ASM eth1 IP address. In the **DPPM IP Address** field, type an IP address of the DPPM, on the same subnetwork as the CPOS interface Ethernet device. Click **Assign**.

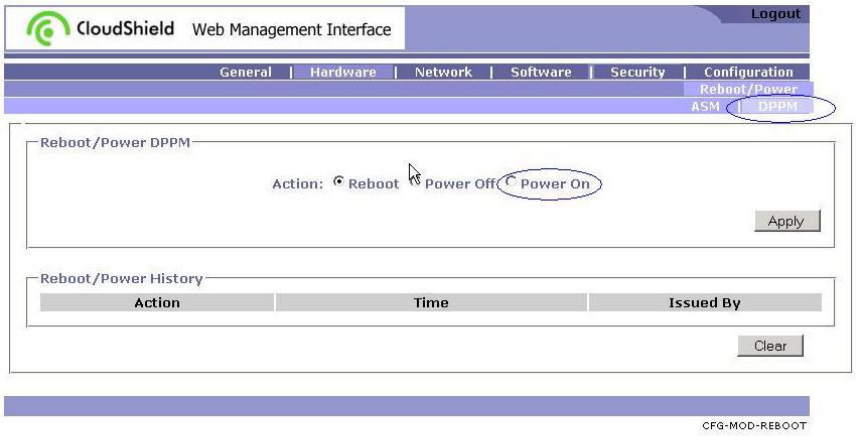


Note: Make sure that the binding status is Assigned.



l. Turn on the DPPM modules:

1) Click the **Hardware** tab.
2) Click **DPPM**.
3) Select **Power On**, and click **Apply**.



m. Click the **General** tab. Click **Update Now**. If the DPI blade is current, the DPPM status is Bonded. If the blade must be updated, the DPPM status is FPGA Mismatch. To update the FPGA (field programmable gate array), click **FPGA Upgrade** and click **OK**.

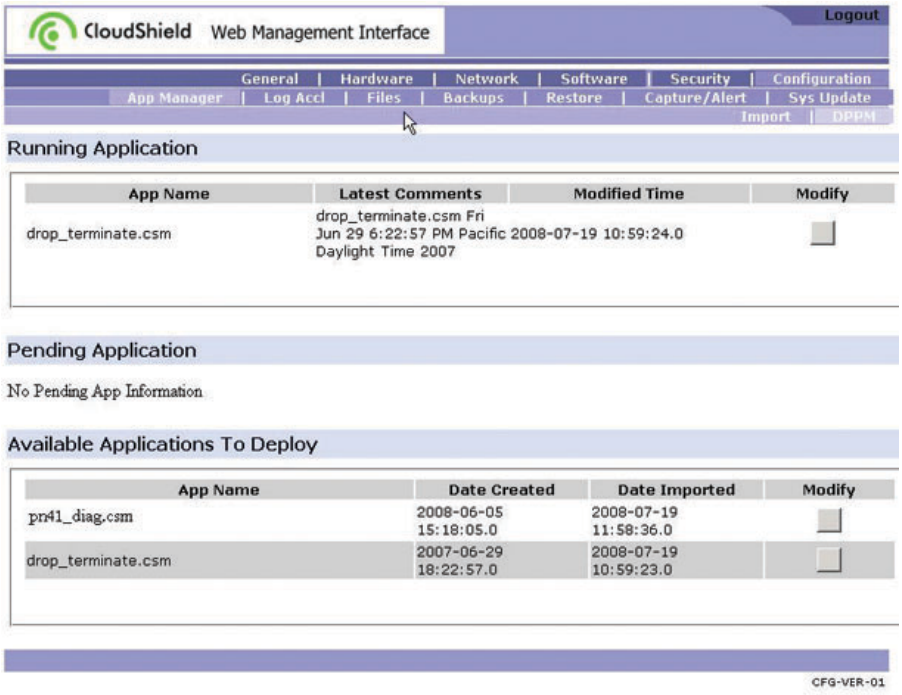
Note: Do not power-off or remove the blade during the FPGA upgrade process.
Applications will not be installed until the FPGA upgrade is complete. To see the current status of the upgrade process, click **Update Now**. The upgrade process can take up to 10 minutes. After the FPGA upgrade is complete, the DPPM status is Bonded.

10. Install applications on the DPI blade:
    a. Click the **Configuration** tab.
    b. In the **Upload Application File** area, click **Browse**, select a file from the **App File** list, and click **Upload**.

c. From **Import Application File** list, select the application file that is to be imported, and click **Import**.

d. Click **Yes** to import the file.

e. Click **DPPM**. Select the available application to install by selecting the **Modify** check box beside the application name.



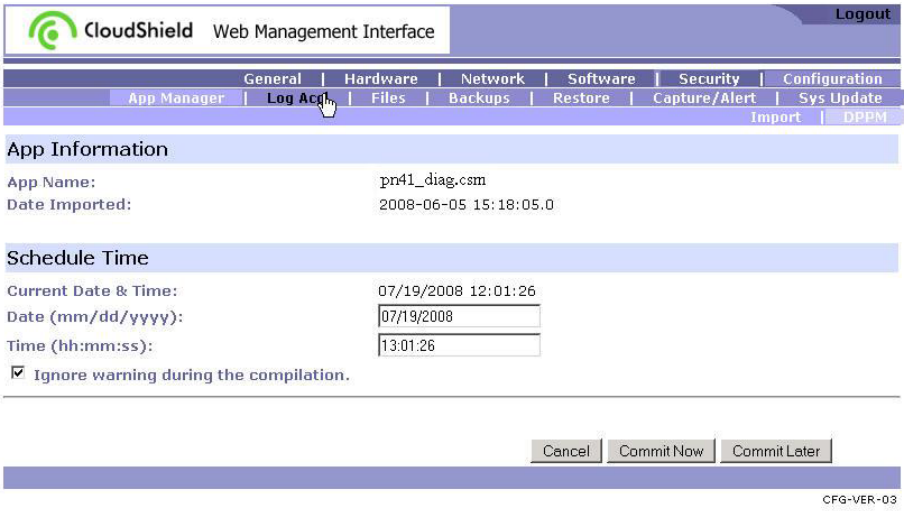
f. Select **Commit Now** or **Commit Later** to install the application to the DPI blade.

Notes:

1) The installation process can take up to 10 minutes.

2) The pn41_diag.csm application is the diagnostics application that comes with the DPI blade.

3) The drop_terminate.csm application also comes with the DPI blade. The drop_terminate application drops and terminates all packets that are received on an enabled port while the application is running.



g. Click **OK** to complete the installation process.

Note: To view the variable statistics for the application, click the **Software** tab.

11. Enable networking ports on the DPI blade:
    a. In the Web Management Interface, click the **Hardware** tab.
    b. Enable the networking ports according to your installed applications.

Table 2. Networking ports

Switch-module bay	DPI blade port
	0 (front XFP)
7	1
8	3
9	2
10	4
	15 (front SFP)

c. Click the port that you want to enable and click **Modify**. Click **Enable**. Click **Update**.

For more information, see the CloudShield *Web Management Interface User Guide* and the CloudShield *Command Line Interface Reference Guide* on the IBM *Documentation* CD

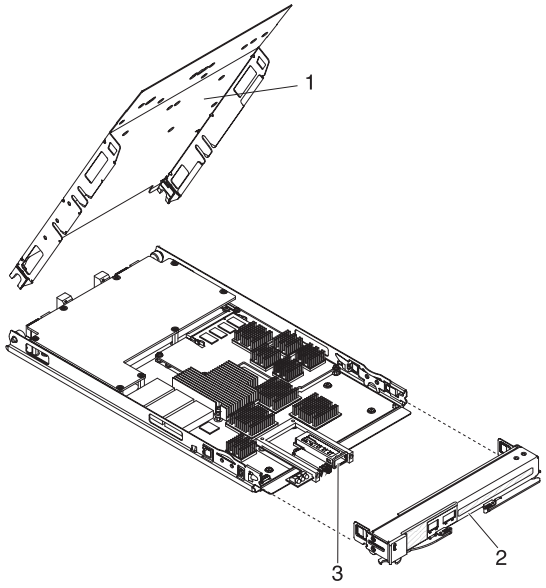
Chapter 3. Parts listing, Type 3020

The following replaceable components are available for the IBM BladeCenter PN41 Type 3020 DPI blade. For an updated parts listing on the Web, complete the following steps.

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/.
2. Under **Product support**, click **BladeCenter**.
3. Under **Popular links**, click **Part documents lookup**.
4. From the **Product family** menu, select **BladeCenter PN41**, and click **Go**.

Note: The illustrations in this document might differ slightly from your hardware.



Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document.

Index	Description	CRU Number (Tier 1)	CRU Number (Tier 2)	FRU Number
1	Cover (all models)	42D8680		
2	Bezel assembly	46C7185		

© Copyright IBM Corp. 2008

Index	Description	CRU Number (Tier 1)	CRU Number (Tier 2)	FRU Number
3	10 Gb Small-Form-Factor Pluggable Module (XFP Module) Short Range Fiber XFP Transceiver			32R1883
	IBM PN41 Deep Packet Inspection Blade		46C7014	
	Label, system service	46C7186		
	Label, FRU	46C7187		

Chapter 4. Removing and replacing DPI blade components

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

See Chapter 3, “Parts listing, Type 3020,” on page 23 to determine whether a component is a Tier 1 CRU, Tier 2 CRU, or FRU.

For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document.

Installation guidelines

Before you remove or replace a component, read the following information:

- Read the safety information that begins on page v and the guidelines in “Handling static-sensitive devices” on page 26. This information will help you work safely.
- When you install your new DPI blade, take the opportunity to download and apply the most recent firmware updates. This step will help to ensure that any known issues are addressed and that your DPI blade is ready to function at maximum levels of performance. To download firmware updates for your DPI blade, complete the following steps.

  Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

  1. Go to http://www.ibm.com/systems/support/.
  2. Under **Product support**, click **BladeCenter**.
  3. Under **Popular links**, click **Software and device drivers**.
  4. Click **BladeCenter PN41** and scroll down to display the list of downloadable files for the DPI blade.
- Observe good housekeeping in the work area. Place removed covers and other parts in a safe place.
- Back up all important data before you make changes to disk drives.
- Before you remove a DPI blade from the BladeCenter unit, you must unbind and turn off the DPI blade. You do not have to shut down the BladeCenter unit itself.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it or open or close a latch.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that you can remove or install the component while the BladeCenter unit is running (orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.

© Copyright IBM Corp. 2008

- When you are finished working on the DPI blade, reinstall all safety shields, guards, labels, and ground wires.
- For a list of supported optional devices for the DPI blade, see http://www.ibm.com/servers/eserver/serverproven/compat/us/.

System reliability guideline

To help ensure proper cooling and system reliability, make sure that you do not operate the BladeCenter unit without a DPI blade, blade server, or filler installed in each blade bay. See the documentation for your BladeCenter unit for additional information.

Handling static-sensitive devices

Attention: Static electricity can damage the DPI blade and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of damage from electrostatic discharge, observe the following precautions:

- When you work on a BladeCenter unit that has an electrostatic discharge (ESD) connector use a wrist strap, especially when you handle modules, optional devices, or DPI blades. To work correctly, the wrist strap must have a good contact at both ends (touching your skin at one end and firmly connected to the ESD connector on the front or back of the BladeCenter unit).
- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an *unpainted* metal part of the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component in the rack in which you are installing the device for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the DPI blade without setting it down. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on the DPI blade cover or on a metal surface.
- Take additional care when you handle devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Returning a device or component

If you are instructed to return a device or component, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

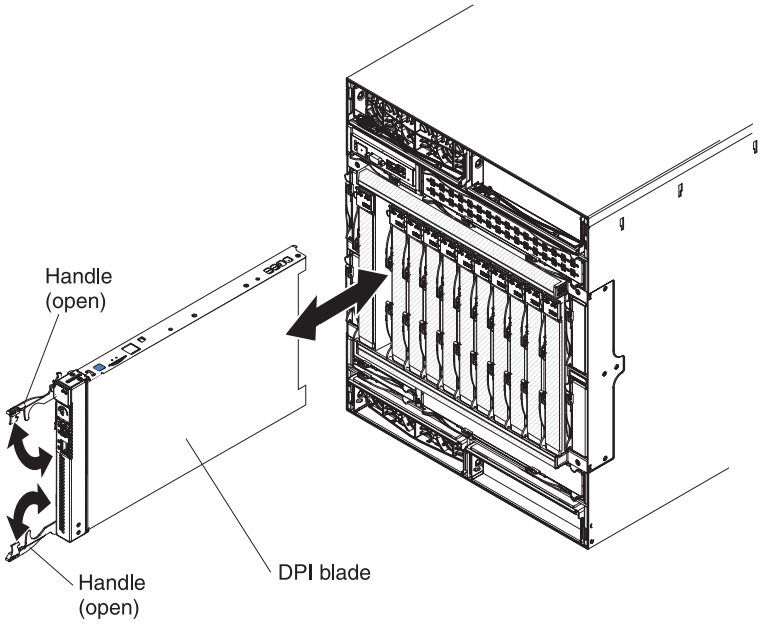
Removing and replacing Tier 1 CRUs

Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

The illustrations in this document might differ slightly from your hardware.

Removing the DPI blade from the BladeCenter unit

The following illustration shows how to remove a DPI blade from a BladeCenter H or HT unit. The appearance of your BladeCenter unit might be different. See the documentation for your BladeCenter unit for additional information.



Attention:

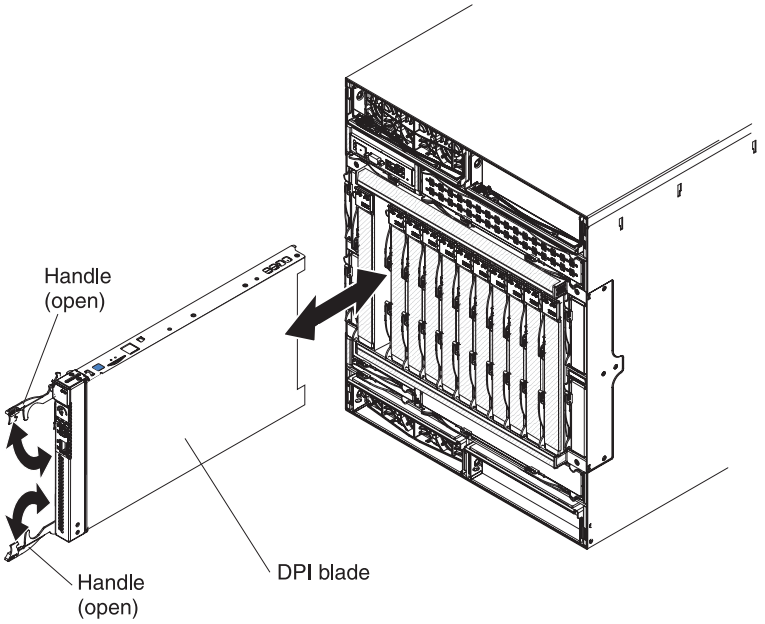
- To maintain proper system cooling, do not operate the BladeCenter unit without a blade server, DPI blade, or filler installed in each blade bay.
- When you remove the DPI blade, note the bay number. Reinstalling a DPI blade into a different bay from the one it was removed from can have unintended consequences. Some configuration information and update options are established according to bay number; if you reinstall the DPI blade into a different bay, you might have to reconfigure the DPI blade.

To remove the DPI blade, complete the following steps:

1. If the DPI blade is operating, unbind it from the ASM. This turns off the DPI blade. If the DPI blade is not bound or assigned, press the power-control/unbind button (behind the DPI blade control panel door) to turn off the DPI blade. See “Control panel buttons and LEDs” on page 4 and “Turning off the DPI blade” on page 5 for more information.
2. Open the two release handles as shown in the illustration. The DPI blade moves out of the bay approximately 0.6 cm (0.25 inch).
3. Pull the DPI blade out of the bay.
4. Place either a filler or another blade in the bay within 1 minute.
5. If you are instructed to return the DPI blade, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the DPI blade in a BladeCenter unit

The following illustration shows how to install a DPI blade into a BladeCenter H or HT unit. The appearance of your BladeCenter unit might be different. See the documentation for your BladeCenter unit for additional information.



To install a DPI blade in a BladeCenter unit, complete the following steps.

Statement 21:

CAUTION:
Hazardous energy is present when the blade server is connected to the power source. Always replace the blade cover before installing the blade server.

1. Read the safety information that begins on page v, “Installation guidelines” on page 25, and “Handling static-sensitive devices” on page 26, and read the safety statements in the BladeCenter unit documentation.
2. Select the bay for the DPI blade.

   Notes:

   - If you reinstall a DPI blade into the same blade bay from which you removed it, the DPI blade automatically rebinds with the host blade server. Some DPI blade configuration information and update options are established according to bay number. Reinstalling a DPI blade into a different bay from which it was removed will required you to bind the DPI blade to the host blade server.
   - When any blade server, DPI blade, or other device is in blade bays 7 through 14 (in a BladeCenter H unit) or 7 through 12 (in a BladeCenter HT unit), power modules must be installed in all four power-module bays. For additional information, see the *Installation and User’s Guide* that comes with the BladeCenter unit.
   - To help ensure proper cooling, performance, and system reliability, make sure that each blade bay on the front of the BladeCenter unit contains a blade

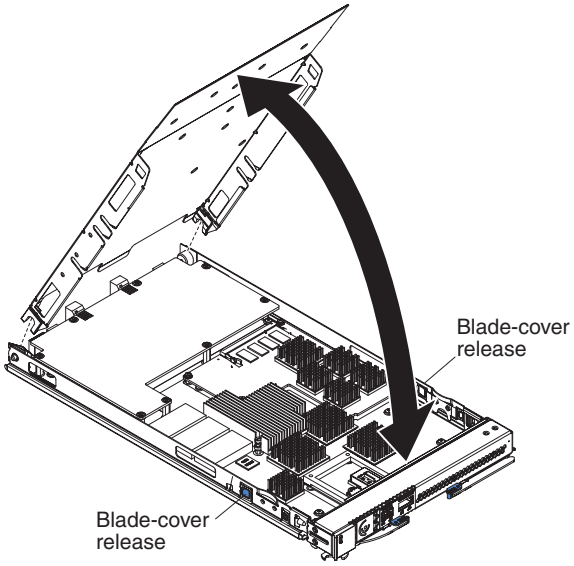
server, DPI blade, or filler. Do not operate a BladeCenter H or HT unit for more than 1 minute without a blade server, DPI blade, or filler in each blade bay.

3. Make sure that the release handles on the DPI blade are in the open position (perpendicular to the DPI blade).
4. Slide the DPI blade into the blade bay until it stops.
5. Push the release handles on the front of the DPI blade to the closed position.
6. Turn on the DPI blade. See “Turning on the DPI blade” on page 5 for more information.
7. Make sure that the power-on LED on the DPI blade control panel is lit continuously, indicating that the DPI blade is receiving power and is turned on.
8. (Optional) Write identifying information on one of the labels that come with the BladeCenter unit and place the label on the BladeCenter unit bezel. See the documentation for your BladeCenter unit for information about the label placement.

   Important: Do not place the label on the DPI blade or in any way block the ventilation holes on the DPI blade.

Removing the DPI blade cover

The following illustration shows how to remove the DPI blade cover.



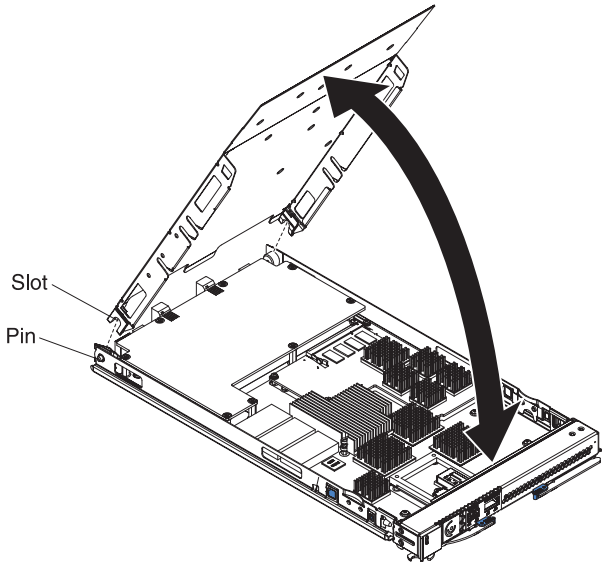
To remove the DPI blade cover, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 25.
2. If the DPI blade is installed in a BladeCenter unit, remove it. See “Removing the DPI blade from the BladeCenter unit” on page 27 for instructions.
3. Carefully lay the DPI blade on a flat, static-protective surface, with the cover side up.
4. Press the blade-cover release on each side of the DPI blade and lift the cover open as shown in the illustration.
5. Remove the cover from the DPI blade.
6. If you are instructed to return the cover, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Replacing the DPI blade cover

Attention: You cannot insert the DPI blade into the BladeCenter unit until the cover is installed and closed. Do not attempt to override this protection.

The following illustration shows how to install the DPI blade cover.



To install the DPI blade cover, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 25.
2. If you removed the bezel assembly, replace it. See “Replacing the bezel assembly” on page 37 for instructions.
3. Make sure that all components are installed and seated correctly and that you have not left loose tools or parts inside the DPI blade.
4. Lower the cover so that the slots at the rear slide down onto the pins at the rear of the DPI blade, as shown in the illustration.
5. Pivot the cover to the closed position, as shown in the illustration, until it clicks into place.

Removing and replacing transceiver modules

This section provides instructions for installing XFP and SFP transceiver modules in the DPI blade.

Note: The illustrations in this document might differ slightly from your hardware.

Handling a transceiver module

Before you install an XFP or SFP transceiver module, read the following information:

- The housing of a transceiver module has an integral guide key that is designed to prevent you from inserting the module incorrectly.
- Use minimal pressure when you insert the module into the port. Forcing the module into the port can cause damage to the module or the module port.
- You can insert or remove the module while the BladeCenter unit is turned on.
- You must first insert the module into the port before you can connect the cables.

- You must remove the cables from the module before you remove the module from the DPI blade.

  Statement 3:

CAUTION:
When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

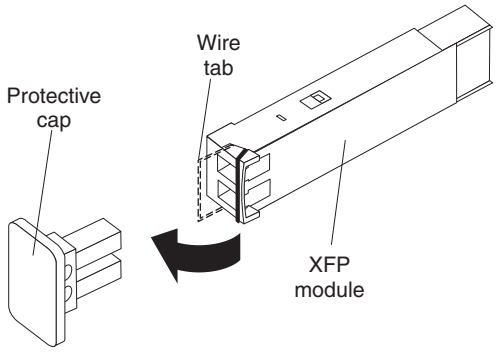
Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaite
Appareil À Laser de Classe 1

Removing an XFP module

To remove an XFP module, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 25.
2. Read the information in “Handling a transceiver module” on page 31.
3. Remove the fiber-optic cable from the XFP module that you want to replace. For more information about removing the cable, see “Disconnecting the transceiver module cable” on page 35.

   Attention: To avoid damage to the cable or the XFP module, disconnect the fiber-optic cable *before* you remove the XFP module.
4. Unlock the XFP module by pulling the wire tab straight out, as shown in the following illustration.



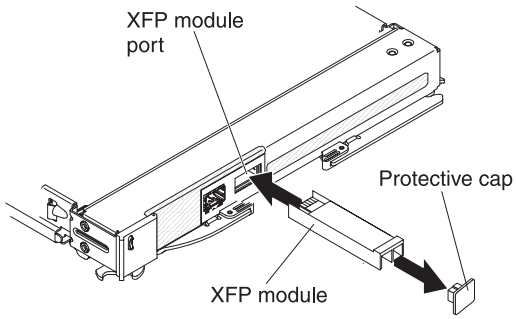
5. Grasp the wire tab on the XFP module and pull it out of the port.
6. Replace the protective cap on the XFP module.
7. Place the XFP module into a static-protective package.

Replacing an XFP module

To install an XFP module, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 25.
2. If you have not already done so, touch the static-protective package that contains the XFP module to an *unpainted* metal surface of the BladeCenter unit or an *unpainted* metal surface on any other grounded rack component in the rack in which you are installing the XFP module for at least 2 seconds.
3. Read the information in “Handling a transceiver module” on page 31.
4. Remove the XFP module from its static-protective package.
5. Remove the protective cap from the XFP module and store the cap in a safe place.

   Attention: To avoid damage to the cable or the XFP module, *do not* connect the fiber-optic cable before you install the XFP module.
6. Insert the XFP module into the XFP module port in the front of the DPI blade until it clicks into place.

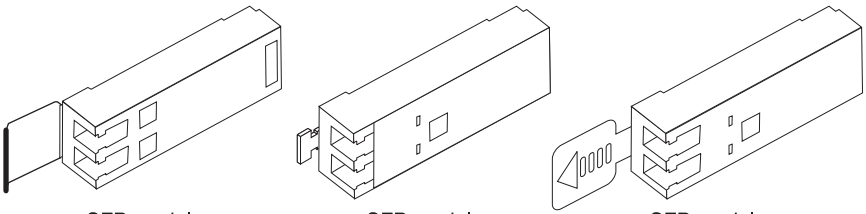


7. Connect the fiber-optic cable and any other cables that you disconnected earlier. See “Connecting the transceiver module cable” on page 35 for more information.

Replacing a 1 Gb SFP module

When you use fiber-optic SFP modules, the SPF modules at both ends of the cable must have identical wavelength specifications, and the cable must not exceed the specified length. An SFP module has one of three types of latching devices to secure and detach the SFP module. Use the following illustration to determine

which type of latch your SFP module has.



SFP module with a bale-clasp latch

SFP module with an actuator button

SFP module with a plastic tab

Attention: Do not install or remove an SFP module with fiber-optic cables attached to it because of the potential for damage to the cables, cable connector, or optical interfaces in the SFP module. Disconnect all cables before you install or remove the SFP module.

Removing and reinstalling an SFP module can shorten its useful life. Do not remove and insert an SFP module more often than is absolutely necessary.

Protect a fiber-optic SFP module by inserting a clean protective cap into the connector after you remove the cables. Be sure to clean the optic surfaces of the cables with a soft antistatic cloth before you reconnect them to another SFP module. Avoid getting dust and other contaminants into the optical bores; the optics do not work correctly if they are obstructed by dust.

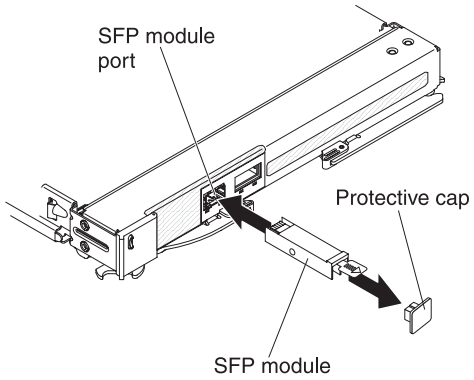
Before you install the SFP module in the switch module, read the following information:

- Read the safety information that begins on page v, “Installation guidelines” on page 25, and “Handling static-sensitive devices” on page 26, and read the safety statements in the BladeCenter unit documentation.
- You do not have to turn off the BladeCenter unit to install or replace hot-swap devices.

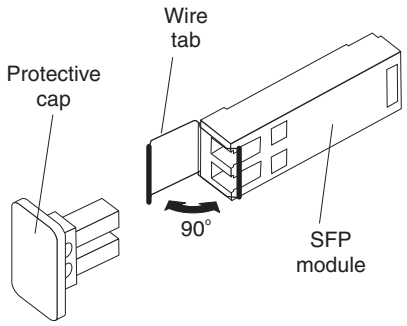
To install the SFP module, complete the following steps:

1. Touch the static-protective package that contains the SFP module to any *unpainted* metal surface of the BladeCenter unit or any *unpainted* metal surface on any other grounded rack-component for at least 2 seconds.
2. Remove the SFP module from its static-protective package.
3. Locate the send (TX) and receive (RX) markings that identify the top of the SFP module. Some SFP modules have arrows that point from the SPF module connector (TX) and toward the port connector (RX) on the DPI blade.

4. Insert and slide the SFP module into the SFP-module port connector until you feel the module snap into place.



5. When you are ready to connect the fiber-optic cables, remove the protective cap from the SFP module.



Note: The caps protect the SFP module ports and cables from contamination and ambient light. Always leave the protective caps inserted in the SFP module when the cables are not attached. Store the protective caps in a safe place for reuse.

Disconnecting the transceiver module cable

To disconnect the transceiver module cable, complete the following steps:

1. Squeeze the release tabs and gently pull the fiber-optic cable from the transceiver module.
2. Replace the protective caps on the ends of the fiber-optic cable.

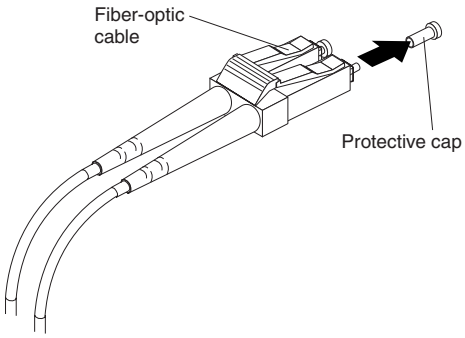
Connecting the transceiver module cable

Attention: To avoid damage to the fiber-optic cables, follow these guidelines:

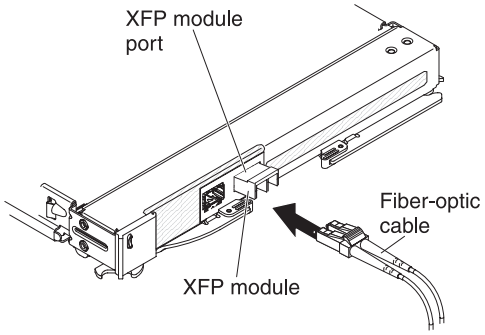
- Do not route the cable along a folding cable-management arm.
- When you attach the cable to a device on slide rails, leave enough slack in the cable so that it does not bend to a radius of less than 38 mm (1.5 in.) when the device is extended or become pinched when the device is retracted.
- Route the cable away from places where it can be snagged by other devices in the rack.
- Do not overtighten the cable straps or bend the cable to a radius of less than 38 mm (1.5 in.).
- Do not put excess weight on the cable at the connection point. Make sure that the cable is well supported.

To connect the transceiver module cable, complete the following steps:

1. Remove the protective caps from the ends of the fiber-optic cable.



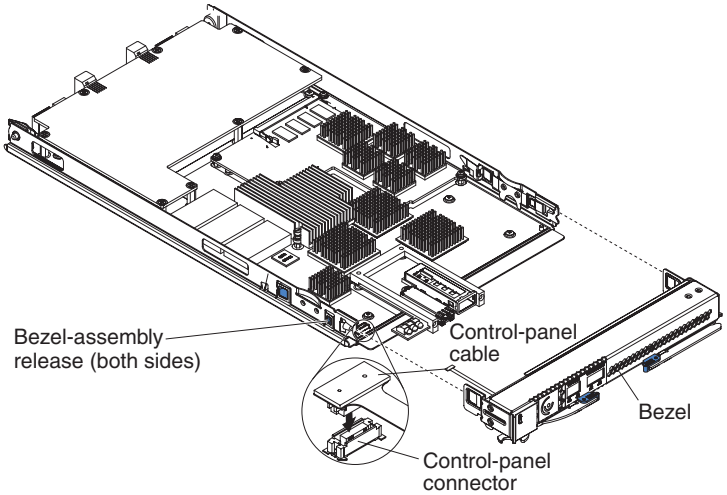
2. Gently slide the fiber-optic cable into the transceiver module until it clicks into place. (The following illustration shows an XFP module and cable.)



3. Check the LED next to the port connector on the DPI blade bezel. When the transceiver module is operating correctly, the green link LED is lit.

Removing the bezel assembly

The following illustration shows how to remove the bezel from the DPI blade.



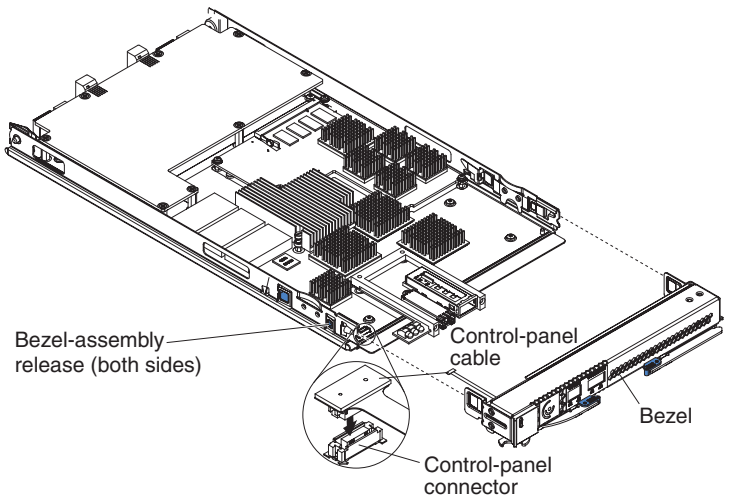
To remove the bezel, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 25.
2. If the DPI blade is installed in a BladeCenter unit, remove it. See “Removing the DPI blade from the BladeCenter unit” on page 27 for more information.

3. Carefully lay the DPI blade on a flat, static-protective surface.
4. Remove the cover of the DPI blade. See “Removing the DPI blade cover” on page 30 for more information.
5. Remove the XFP module if one is installed in the DPI blade. See “Removing an XFP module” on page 32 for more information.
6. Remove the SFP module if one is installed in the DPI blade.
7. Disconnect the control-panel cable from the control-panel connector.
8. Press the bezel-assembly release on both sides and pull the bezel assembly away from the DPI blade.
9. If you are instructed to return the bezel, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Replacing the bezel assembly

The following illustration shows how to install the bezel assembly.



To install the DPI blade bezel assembly, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 25.
2. Carefully slide the bezel assembly onto the DPI blade until it clicks into place.
3. Connect the control panel cable to the control panel connector on the system board.

Chapter 5. Diagnostics

This chapter describes the diagnostic tools that are available to help you solve problems that might occur in the DPI blade.

Note: The DPI blade uses shared resources that are installed in the BladeCenter unit. Problems with these shared resources might appear to be in the DPI blade (see “Solving shared BladeCenter resource problems” on page 58 for information about isolating problems with these resources). See the *Problem Determination and Service Guide* or the *Hardware Maintenance Manual and Troubleshooting Guide* for your BladeCenter unit and other BladeCenter component documentation for diagnostic procedures for shared BladeCenter components.

If you cannot diagnose and correct a problem by using the information in this chapter, see Appendix A, “Getting help and technical assistance,” on page 63 for more information.

Diagnostic tools

The following tools are available to help you diagnose and solve hardware-related problems:

- **DPI blade diagnostic program**

  The DPI blade diagnostic program circulates test packets to various processing elements and returns statistics about the processing of the packets.
- **Troubleshooting tables**

  These tables list problem symptoms and actions to correct the problems. See “Troubleshooting tables” on page 45 for more information.
- **Diagnostic programs, messages, and error codes**

  The diagnostic programs are the primary method of testing the major components of the DPI blade. These programs are stored in Cloudshield Packet Operating System (CPOS), in the host blade server.

DPI blade diagnostics program

The DPI blade diagnostics program is an essential tool for identifying and isolating hardware problems. The DPI blade diagnostics program is based on a custom RAVE application that is developed by CloudShield. It circulates packets at maximum rate to the various processing elements and provides an output screen on the Web Management Interface that displays the statistics of a number of packets that have been processed. This test exercises the major processing elements of their associated memory banks and the data paths. If there are errors, you can view them from the Applications page in the Web Management Interface.

© Copyright IBM Corp. 2008

POST

When you turn on the DPI blade, it performs a series of tests to check the operation of the DPI blade components and some optional devices in the DPI blade. This series of tests is called the power-on self-test, or POST.

Error logs

There are two types of error logs for the DPI blade: the advanced management module log and the Application Server Module (ASM) log.

The advanced management module log contains all critical errors, such as voltage and temperature errors. It also contains data about the DPI blade status. The advanced management module log does not contain application-related status.

The ASM provides all the physical property information, application information, status messages, and error messages that are necessary to describe the DPI blade. You can view this information from the Web Management Interface or the command-line interface.

Important:

- A single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After you correct the cause of the first error message, the other error messages usually will not occur the next time you run the test.
- The management-module event log in the BladeCenter unit lists messages according to the position of the DPI blade in the blade bays. If a DPI blade is moved from one bay to another, the management-module event log reports messages for that DPI blade in relation to the new bay number; messages for that DPI blade that were generated before the move will still be listed in relation to the previous bay number.

General problems

The following table lists symptoms of problems and suggested actions to correct the problems.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.** • **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.** • **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	
Symptom	**Action**
Power LED Fast Blink (will not discover)	1. Check the advanced management module log events for any errors. 2. Reseat the blade. 3. Make sure that the advanced management module firmware is at the latest level. 4. Call for service.
Web Management Interface to advanced management module communications failures	1. Make sure that the number of TCP command protocol connections in the advanced management module is correct (see the *Installation and User's Guide* for additional information). In the advanced management module Web interface, click **MM Control → Network → Protocols** to check the TCP connections. 2. Make sure that your CIN and VLANs are configured correctly. 3. Make sure that your VMware Ethernet configuration is set correctly (see the *Installation and User's Guide* for additional information). 4. Make sure that the code levels on the switches and the advanced management module are correct. 5. Make sure that your network setup is correct (see the *Installation and User's Guide* for additional information). 6. Call for service.
DPPM card on the Web Management Interface discovery list is not available for binding	1. Check the advanced management module event log to verify that the Deep Packet Processing Module (DPPM) is shown. 2. If the DPPM card is bonded to another device, press and hold the LED test/reset button on the DPI blade for 20 seconds to unbind the blade.
Problems bonding DPPM blade to the ASM	1. If the DPPM is not shown on the Hardware page, click the **General** tab and check the binding status. 2. See chapter 4 in the *Installation and User's Guide* for information about binding the DPI blade to the ASM.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.** • **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.** • **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	
Symptom	**Action**
DPPM CPOS was not fully downloaded to the DPPM	1. To determine whether the CloudShield PacketWorks Operating System (CPOS) download was completed, click **General → System**. If the DPPM status is Connecting and the DPPM status information is Waiting for DPPM Ping Response, the download was not completed. To complete the download, complete the following steps: • Make sure that the CIN and VLANs are configured correctly (see the *Installation and User's Guide* for more information). • Check the advanced management module event log for a `Blade failed` message. • Reseat the DPPM. • Turn off the ASM and turn it on again. • Click **Hardware → Reboot/Power → DPPM** to verify that the DPPM is turned on. Click the **General** tab to verify the status. • Click **General → System** to verify that the download was completed.
DPPM RAVE application cannot start	Click **General → System**. If the application state of the RAVE application is Failed, complete the following steps: 1. Check the event and alarm log on the General page in the Web Management Interface for errors that are related to the discovery process. 2. Turn off the DPPM, turn it on again, and click **General → System** to verify the status 3. Turn off the ASM and turn it on again.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.** • **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.** • **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	
Symptom	**Action**
Packets are not getting routed correctly through the DPPM	Packets through the DPI blade are incorrectly modified, dropped, or not routed to the correct port. Complete the following steps: • Click **Configuration → App Manager → DPPM** and verify that the RAVE application has been deployed. Verify that the current application is the RAVE application that is supposed to be running. • Verify that the application state of the RAVE application is Completed and the application status is Application Active. • Check the Alarm log for active alarms in the system. • Make sure that the packets are being received on and transmitted from the correct interfaces. – To verify the packets for the front port, click **Hardware → Front → Statistics** and click the port icon. Make sure that the admin state of the Ethernet port is Enabled and the link LED is green. – To verify the packets for the back port, click **Hardware → Back → Statistics** and click the port icon. Make sure that the admin state of the Ethernet port is Enabled and the link LED is green. • Run the DPI blade diagnostics program and report the results back to IBM service and support. See "Diagnostic tools" on page 39 for more information.
Planar voltage fault (power xx V fault)	1. Reseat the DPI blade. 2. Call for service.
DPI blade is incompatible with BladeCenter unit	Make sure that the management-module firmware is at the latest level. The DPI blade is supported only in IBM BladeCenter H and BladeCenter HT units.
VPD serial number not set	Replace the DPI blade.
TEMP (Over temperature error)	1. Check the function of the BladeCenter unit resources. 2. Make sure that the room temperature is not too high. See "Features and specifications" on page 3 for temperature information. 3. Make sure the air path is not blocked.
Temperature warning	1. Make sure that the latest version of CPOS is installed. 2. Make sure that the DPI blade is sufficiently cooled. 3. Make sure that all fillers and blade servers are installed correctly. 4. Make sure that the front bezel on the DPI blade is not blocked. 5. Contact service.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.** • **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.** • **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	
Symptom	**Action**
Unexpected network issues	• To run the diagnostics application from the Web Management Interface on the ASM, click **Configuration → App Manager→ DPPM**, select the file pn41_diag.csa and click **Commit now**. To generate test packets while you run the DPI blade diagnostic program, you must use a packet. When the first packet is detected by the DPI blade diagnostic program, it generates test packets through the various data paths on the system. • To view statistics that are generated by the tool, click **Software → Variable Export**. • If the counters on the Variable Export screen are not incrementing, you can attach a notebook computer to the SFP-module port and send a ping to initialize the DPI blade diagnostics program. **Note:** None of the error counters should be incrementing. • If there are errors, restart the ASM and run the test again. • Reseat the DPI blade and run the diagnostic test again. • If errors remain, there is a hardware problem, and the DPI blade must be repaired. The diagnostic application runs until it is terminated. Run the application for approximately 3 minutes to get accurate results. • To stop the test, select the **Test_Loop_Flag** check box and click **Clear Selected**. After the test is terminated, you can start another application. You must stop the diagnostic test before you start another application.

Checkout procedure

The checkout procedure is the sequence of tasks that you should follow to diagnose a problem in the DPI blade.

About the checkout procedure

Before you perform the checkout procedure for diagnosing hardware problems, review the following information:

- Read the safety information that begins on page v.
- The diagnostic programs provide the primary methods of testing the major components of the DPI blade. If you are not sure whether a problem is caused by the hardware or by the software, you can use the diagnostic programs to confirm that the hardware is working correctly.

- When you run the diagnostic programs, a single problem might cause more than one error message. When this happens, correct the cause of the first error message. The other error messages usually will not occur the next time you run the diagnostic programs.
- For intermittent problems, check the error log; see “Error logs” on page 40 and “Diagnostic programs, messages, and error codes” on page 56.
- If no LEDs are lit on the DPI blade control panel, verify the DPI blade status and errors in the advanced management module Web interface; also see “Solving undetermined problems” on page 60.
- If device errors occur, see “Troubleshooting tables.”

Performing the checkout procedure

To perform the checkout procedure, complete the following steps:

1. If the DPI blade is running, turn off the DPI blade.
2. Turn on the DPI blade. If the DPI blade does not start, see “Troubleshooting tables.”

Troubleshooting tables

Use the troubleshooting tables to find solutions to problems that have identifiable symptoms. If these symptoms relate to shared BladeCenter unit resources, see “Solving shared BladeCenter resource problems” on page 58.

If you cannot find a problem in these tables, see “Running the diagnostic programs” on page 57 for information about testing the DPI blade.

If you have just added new software or a new optional device, and the DPI blade is not working, complete the following steps before you use the troubleshooting tables:

1. Remove the software or device that you just added.
2. Run the diagnostic tests to determine whether the DPI blade is running correctly.
3. Reinstall the new software or new device.

Web Management Interface event and alarm messages

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, “Parts listing, Type 3020,” on page 23 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.**

ID	Message	Severity	When/why it Occured	Action
1	Link up - Network	Informational	The link attached to one of the ports is now operational.	Message is for informational purposes only.
2	Link down - Network	Critical	The link attached to one of the ports is no longer operational	Verify that the cabling and switch configurations that control the link to that port are correct.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

ID	Message	Severity	When/why it Occured	Action
3	Link loop back - Network	Informational	A link loopback condition is detected in a port.	Set loopbacks only for special test conditions
48	Configuration Manager Information Configuration	Informational	ASM and DPPM configuration	N/A
49	Configuration Manager Error Configuration	Critical	ASM and DPPM configuration	Check consistency of the configuration.
50	Backup Manager Information Configuration	Informational	ASM backup and restore operations	Message is for informational purposes only.
51	Backup Manager Error Configuration	Minor	ASM backup and restore operations	1. Redo backup operation. 2. If the problem persists, call for service.
52	Resource monitor - Software	Minor	ASM maintenance tasks are completed (such as log file rotation).	Message is for informational purposes only.
133	SFP Mismatch - Hardware	Major	The SFP plugged in the capture port is not compatible with the version of CPOS.	1. Replace the SFP module. 2. If the problem persists, call for service.
150	FPGA Error - Hardware	Critical	A discrepancy detected in the image of an FPGA	Update the FPGA.
612	Resource monitor - Hardware	Informational	ASM disk space or memory is low.	Message is for informational purposes only.
693	SFP Mismatch OK - Hardware	Informational	The correct SPF module is plugged into the capture port.	Message is for informational purposes only.
710	FPGA - Hardware	Informational	FPGA upgrade is progressing.	Message is for informational purposes only.
5550	Flow Control Disabled - Network	Informational	Operator configured Flow Control to Disabled for the specified port.	Message is for informational purposes only.
5551	Flow Control Enabled to TRANSMIT - Network	Informational	Operator configured Flow Control to Transmit Only for the specified port.	Message is for informational purposes only.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

ID	Message	Severity	When/why it Occured	Action
5552	Flow Control Enabled to RECEIVE - Network	Informational	Operator configured Flow Control to Receive Only for the specified port.	Message is for informational purposes only.
5553	Flow Control Enabled to TRANSMIT and RECEIVE - Network	Informational	Operator configured Flow Control to Transmit and Receive for the specified port.	Message is for informational purposes only.
5554	Port Attribute Change - Hardware	Informational	Operator has changed an attribute of the specified port.	Message is for informational purposes only.
6000	Capture Events - Software	Informational	Information sent by the CPOS application as designed.	Message is for informational purposes only
7150	System Monitoring - Software	Minor	CPOS has lost communication with the advanced management module.	Message is for informational purposes only.
7298	Advanced management module Failed - Hardware	Critical	BladeCenter unit advanced management module failed.	See the BladeCenter unit advanced management module documentation for additional information.
7299	Blade Failed - Hardware	Critical	CPOS is no longer under control of the DPPM. Possible reasons include the DPI blade was unbound or the DPPM power was turned off.	1. Make sure that the control network is running. 2. Make sure the DPI blade is receiving power. 3. Check the binding parameters. 4. Turn off the DPI blade. Turn on the DPI blade.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

ID	Message	Severity	When/why it Occured	Action
7303	HeartBeat Monitor generic error - Software	Critical	The heartbeat process detects that the blade is no longer optional. This error clears automatically if the heartbeat process detects that the blade is operation again.	1. Make sure that the control network is running. 2. Make sure the DPI blade is receiving power. 3. Check the binding parameters. 4. Turn off the DPI blade. Turn on the DPI blade.
7304	Module unequipped - Hardware	Critical	The DPI blade is removed from the BladeCenter unit.	1. Reseat the blade in the BladeCenter unit. 2. Make sure that the control network is running. 3. Make sure the DPI blade is receiving power. 4. Check the binding parameters. 5. Turn off the DPI blade. Turn on the DPI blade.
7305	FastPath Ingress down - Hardware	Critical	Internal DPPM hardware busses failed to synchronize.	1. Check the control communication link. 2. Turn on the DPI blade and attempt to run an application. 3. If the problem persists, call for service.
7306	FastPath Engress down - Hardware	Critical	Internal DPPM hardware buses failed to synchronize.	1. Check the control communication link. 2. Turn on the DPI blade and attempt to run an application. 3. If the problem persists, call for service.
7307	Module failure - Hardware	Critical	Internal DPPM hardware failure detected.	1. Use the **show techsupport all** CLI command to create a report, then call for service. See the CloudShield *Command Line Interface Users Guide* on the *IBM BladeCenter PN41 Documentation CD.* 2. If the application is critical; then, turn off the DPI blade.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

ID	Message	Severity	When/why it Occured	Action
7310	Tree deployment status - Software	Major	Error detected while deploying an application.	1. If a single event of this type occurs, you can continue to operate. If multiple events of this type occur, then a Tree deployment failed alarm is generated. 2. If the application is critical; then, turn off the DPI blade. 3. Use the **show techsupport all** CLI command to create a report, then call for service. See the CloudShield *Command Line Interface Users Guide* on the *IBM BladeCenter PN41 Documentation CD.*
7311	Tree deployment failed - Software	Critical	Two or more Tree deployment status alarms occurred.	1. If the application is critical; then, turn off the DPI blade. 2. Use the **show techsupport all** CLI command to create a report, then call for service. See the CloudShield *Command Line Interface Users Guide* on the *IBM BladeCenter PN41 Documentation CD.*
7312	Unknown hardware - Hardware	Critical	Does not apply to DPI blade.	N/A
7419	Access DB error - Software	Critical	Failure in ASMs mySQL database has been detected.	Use the **show techsupport all** CLI command to create a report, then call for service. See the CloudShield *Command Line Interface Users Guide* on the *IBM BladeCenter PN41 Documentation CD.*
7483	Alarm manager module initialized - Software	Informational	Alarm manager database reinitialized	1. Use the **show techsupport all** CLI command to create a report, then call for service. See the CloudShield *Command Line Interface Users Guide* on the *IBM BladeCenter PN41 Documentation CD.* 2. Call for service.
7484	Alarm manager database initialized - Software	Informational	Alarm manager database reinitialized.	1. Use the **show techsupport all** CLI command to create a report, then call for service. See the CloudShield *Command Line Interface Users Guide* on the *IBM BladeCenter PN41 Documentation CD.* 2. Call for service.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

ID	Message	Severity	When/why it Occured	Action
7486	HeartBeat Monitor started - Software	Informational	Heartbeat monitor has reinitialized.	1. Use the **show techsupport all** CLI command to create a report, then call for service. See the CloudShield *Command Line Interface Users Guide* on the *IBM BladeCenter PN41 Documentation CD.* 2. Call for service.
7487	HeartBeat Monitor stopped - Software	Critical	HeartBeat monitor has stopped.	1. Use the **show techsupport all** CLI command to create a report, then call for service. See the CloudShield *Command Line Interface Users Guide* on the *IBM BladeCenter PN41 Documentation CD.* 2. If the problem persists, call for service.
7601	Module disabled - Hardware	Critical	Does not apply to the DPI blade.	N/A
7602	Module CPU disabled - Hardware	Critical	ASM detected the CPU hardware in the DPI blade is not operational, usually due to lack of power to the DPI blade.	1. Check the control communication link. 2. Turn on the DPI blade and attempt to run an application. 3. If the problem persists, call for service.
7700	Administrator state enabled - CPOS Information	Informational	Operator enabled ports on the DPPM.	Message is for informational purposes only.
7701	Administrator state disabled - CPOS Information	Informational	Operator disabled the ports on the DPPM.	Message is for informational purposes only.
7858	Advanced management module Status - BladeCenter Information	Informational	Communications with the advanced management module have been verified.	Message is for informational purposes only.
7859	Blade Status - Hardware	Informational	A state change has occurred between the ASM and the DPI blade.	Message is for informational purposes only.
7863	HeartBeat Monitor generic error OK - Software	Informational	ASM detects DPPM HeartBeat again after a failure.	Message is for informational purposes only.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

ID	Message	Severity	When/why it Occured	Action
7865	FastPath Ingress up - Hardware	Informational	Internal DPPM hardware busses have been synchronized.	Message is for informational purposes only.
7866	FastPath Egress up - Hardware	Informational	Internal DPPM hardware busses have been synchronized.	Message is for informational purposes only.
7870	Tree deployment completed	Informational	Replayed by RAVE application deployed event.	Message is for informational purposes only.
7951	Module CPU enabled - Software	Informational	The DPI blade has booted successfully and is ready to pass traffic.	Message is for informational purposes only.
8000	Boot process complete - Hardware	Informational	The DPI blade is now bonded and has booted successfully.	Message is for informational purposes only.
8001	Reboot command received - Hardware	Informational	Operator rebooted the ASM or the DPPM.	Message is for informational purposes only.
8002	Halt command received - Software	Informational	Operator halted the ASM or the DPPM	Message is for informational purposes only.
8030	RAVE Application deployed - Application	Informational	Deployment of CPOS application completed successfully.	Message is for informational purposes only.
8031	CAM Table Load Failed - Hardware	Critical	Loading of the Database table onto the hardware has failed.	1. Check the control communication link. 2. Turn on the DPI blade and attempt to run an application. 3. If the problem persists, call for service.
8032	Classifier Table Load Failed - Hardware	Critical	Loading of the string tables onto the hardware has failed.	1. Check the control communication link. 2. Turn on the DPI blade and attempt to run an application. 3. If the problem persists, call for service.
8033	RAVE Application Deployment Failed - Hardware	Critical	Deployment of the CPOS application has failed.	1. Check the control communication link. 2. Turn on the DPI blade and attempt to run an application. 3. If the problem persists, call for service.

Advanced management module error messages

Power to the DPI blade is provided by shared BladeCenter unit resources. See the following table and “Solving shared BladeCenter resource problems” on page 58.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, “Parts listing, Type 3020,” on page 23 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.**

Message	Action
VRD Power Good fault	1. Reseat the DPI blade. 2. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 58 for more information. 3. Replace the DPI blade.
System under or over recommended voltage for xx.	1. Reseat the DPI blade. 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 58). 3. Refer to the following voltages table for more information. 4. If the problem persists, call for service.
System over temperature for xx component	1. Reseat the DPI blade. 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 58). 3. See the following temperature table for more information. 4. Replace the DPI blade.

Table 3. Temperature (°C)

Component	Value	Warning	Hard shutdown	Warning reset
BACN temperature	48.11	75.69	87.51	65.84
BACS temperature	54.02	75.69	87.51	65.84
Base temperature 1	32.00	60.00	70.00	55.00
Base temperature 2	33.00	60.00	70.00	55.00
PSWX Temperature	52.05	75.69	87.51	65.84
IXP2805 Temperature	52.05	75.00	85.00	65.00

Table 4. Voltages

Source	Value	Critical
BACN Vcc Aux 2.5	+2.49	(+2.37 , +2.62)
BACN Vcc Int 1.0	+0.99	(+0.94 , +1.05)
BACN Vrefp 2.5	+2.49	(+2.44 , +2.55)
BACS Vcc Aux 2.5	+2.50	(+2.37 , +2.62)
BACS Vcc Int 1.0	+1.00	(+0.94 , +1.05)
BACS Vrefp 2.5	+2.49	(+2.44 , +2.55)
Base Vcc 1.0 V	+1.01	(+0.94 , +1.05)

Table 4. Voltages (continued)

Source	Value	Critical
Base Vcc 1.2 V	+1.19	(+1.13 , +1.26)
Base Vcc 1.3 V	+1.31	(+1.22 , +1.35)
Base Vcc 1.5 V	+1.50	(+1.42 , +1.56)
Base Vcc 1.8 V	+1.77	(+1.70 , +1.88)
Base Vcc 12 V	+12.05	(+9.94 , +13.92)
Base Vcc 2.5 V	+2.52	(+2.37 , +2.62)
Base Vcc 3.3 V	+3.32	(+3.13 , +3.46)
Base Vcc PX1 1.8	+1.76	(+1.70 , +1.88)
Base Vcc PX2 1.8	+1.77	(+1.70 , +1.88)
Base Vtt PAX V	+1.66	(+1.48 , +1.81)
Base Vtt QDR V	+0.74	(+0.67 , +0.81)
HSDC 1.0 V Dig	+0.99	(+0.94 , +1.05)
HSDC 1.8 V Dig	+1.79	(+1.70 , +1.88)
HSDC 12 V In	+12.21	(+10.08 , +14.10)
HSDC 2.5 V Dig	+2.50	(+2.37 , +2.62)
HSDC 5 V Dig	+4.96	(+4.49 , +5.49)
HSDC N 1.5 V	+1.48	(+1.42 , +1.56)
HSDC N 3.3 V	+3.29	(+3.13 , +3.46)
HSDC N MGT 1.0	+0.99	(+0.94 , +1.05)
HSDC N PLL 1.2	+1.19	(+1.13 , +1.26)
HSDC N Vtt 1.2	+1.19	(+1.13 , +1.26)
HSDC S 1.5 V	+1.49	(+1.42 , +1.56)
HSDC S 3.3 V	+3.27	(+3.13 , +3.46)
HSDC S MGT 1.0	+0.98	(+0.94 , +1.05)
HSDC S PLL 1.2	+1.19	(+1.13 , +1.26)

Intermittent problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
A problem occurs only occasionally and is difficult to diagnose.	1. Make sure that: • When the DPI blade is turned on, air is flowing from the rear of the BladeCenter unit at the blower grille. If there is no airflow, the blower is not working. This causes the DPI blade to overheat and shut down. • The SAS hard disk drives are configured correctly. 2. Check the Alarms log (see "Error logs" on page 40). 3. See "Solving undetermined problems" on page 60.

Network connection problems

The DPI blade connects to the network using shared BladeCenter unit resources. See the following table and “Solving shared BladeCenter resource problems” on page 58.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, “Parts listing, Type 3020,” on page 23 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.**

Symptom	Action
One or more DPI blades are unable to communicate with the network.	1. Make sure that your network is configured correctly and that there are no duplicate IP addresses. 2. Make sure that the RAVE application routes traffic to the applicable ports.

Power problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, “Parts listing, Type 3020,” on page 23 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.**

Symptom	Action
The Power-control/unbind button does not work.	1. Reseat the control panel connector. 2. Replace the bezel assembly. 3. Make sure that the blade is correctly bonded to the CPOS image. 4. Make sure that Enabled Local Power on the advanced management module is enabled. 5. Replace the DPI blade.
The DPI blade does not turn on.	1. Make sure that the DPI blade is bonded to the ASM. 2. Check the function of the shared BladeCenter unit resources. 3. Make sure that the power-on LED on the control panel is flashing slowly. If the power-on LED is flashing rapidly and continues to do so, the DPI blade is not communicating with the advanced management module. 4. Reseat the DPI blade. 5. If the power-on LED is off, replace the DPI blade or LED information panel. The blade bay is not receiving power. 6. Check the management-module log of the corresponding DPI blade for an error that is preventing the DPI blade from turning on. 7. If you tried another DPI blade in the blade bay when you checked the function of the shared BladeCenter unit resources and the other DPI blade worked, replace the DPI blade. 8. See “Solving undetermined problems” on page 60.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
The DPI blade does not start, and the following conditions are present: • The amber system-error LED on the BladeCenter unit system LED panel is lit. • The amber blade-rror LED on the DPI blade control panel is lit.	Replace the DPI blade.
The DPI blade turns off for no apparent reason.	1. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 58). 2. Replace the DPI blade.
The DPI blade does not turn off.	1. If the problem remains, complete the following steps: a. Turn off the DPI blade by pressing the power-control/unbind button for 4 seconds. b. If the DPI blade fails and the power-control button does not work, remove the DPI blade from the BladeCenter unit and reseat it. 2. Replace the DPI blade.

Service processor problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
The management-module reports a general monitor failure.	Disconnect the BladeCenter unit from all electrical sources, wait for 30 seconds, reconnect the BladeCenter unit to the electrical sources, and restart the DPI blade. If the problem remains, see "Solving undetermined problems" on page 60, and the *Hardware Maintenance Manual and Troubleshooting Guide* or *Problem Determination and Service Guide* for your BladeCenter unit.

Software problems

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.** • **See Chapter 3, "Parts listing, Type 3020," on page 23 to determine which components are CRUs and which components are FRUs.** • **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	
Symptom	**Action**
You suspect a software problem.	1. If you receive any error messages when you use the software, see the information that comes with the software for a description of the messages and suggested solutions to the problem. 2. Contact your place of purchase of the software.

Diagnostic programs, messages, and error codes

The diagnostic programs are the primary method of testing the major components of the DPI blade. If you cannot find a problem by using the diagnostic programs, see "Solving undetermined problems" on page 60 for information about testing the DPI blade.

Running the diagnostic programs

The diagnostics programs for the DPI blade is an application that comes with the DPI blade. The application is available through the Web Management Interface.

If the diagnostic programs do not detect any hardware errors but the problem remains during normal server operations, a software error might be the cause. If you suspect a software problem, see the information that comes with your software.

A single problem might cause more than one error message. When this happens, correct the cause of the first error message.

If the DPI blade stops responding during testing and you cannot continue, restart the DPI blade and try running the diagnostic programs again. If the problem remains, replace the DPI blade.

Diagnostic error messages

The diagnostic programs do not generate any diagnostic error messages. They do generate error counters. In the Web Management Interface, click the **Software** tab to view these counters when the diagnostic programs are running.

Diagnostic counters that are labeled “ERROR_<xxxx> that are not=0” should be considered a problem. Contact service.

Diagnostic counters that are not labeled “ERROR_<xxxx> that are not=0” should be considered normal. No action is required.

Solving shared BladeCenter resource problems

Problems with BladeCenter shared resources might appear to be in the DPI blade. The following sections provide procedures to help you isolate DPI blade problems from shared BladeCenter resource problems. If the problem is thought to be with a shared resource, see the *Problem Determination and Service Guide* or the *Hardware Maintenance Manual and Troubleshooting Guide* for your BladeCenter unit and other BladeCenter component documentation for additional information. If the problem cannot be solved, see “Solving undetermined problems” on page 60.

To check the general function of shared BladeCenter resources, complete the following operations:

- Make sure that the following requirements are met:
  - The required power modules are installed in the BladeCenter unit, and the BladeCenter unit is connected to a working power source.
  - Power management has been correctly set for the BladeCenter unit configuration.
- Determine whether the problem is being experienced with more than one DPI blade. Perform a test of the function on a known-good DPI blade.
- Try the DPI blade in a different blade bay.
- Try a known-good DPI blade in the blade bay.

Network connection problems

To check for network connection problems, complete the following steps until the problem is solved:

1. Make sure that the following requirements are met:
   - The network cables are securely connected to the I/O module.
   - Power configuration of the BladeCenter unit supports the I/O-odule configuration.
   - Installation of the I/O-module type is supported by the BladeCenter unit and DPI blade hardware.
   - The I/O modules for the network interface that is being used are installed in the correct BladeCenter bays and are configured and operating correctly.
   - The settings in the I/O module are correct for the DPI blade (settings in the I/O module are specific to each DPI blade).
2. Check for correct I/O-module operation; troubleshoot and replace the I/O module as indicated in the documentation for the I/O module.
3. Check for correct management-module operation (see the documentation for your BladeCenter unit).

   Note: Some BladeCenter unit types have several management-module components that might have to be tested or replaced (see the *Installation Guide* for your management module for more information).
4. Replace the management module (see the documentation for your BladeCenter unit).

If these steps do not solve the problem, it is likely a problem with the DPI blade. See “Network connection problems” on page 54.

Power problems

To check for power problems, make sure that the following requirements are met:

- The LEDs on all the BladeCenter power modules are lit.
- Power is being supplied to the BladeCenter unit.
- Installation of the DPI blade is supported by the BladeCenter unit.
- The BladeCenter unit has the correct power configuration to operate the blade bay in which the DPI blade is installed (see the documentation for the BladeCenter unit).
- The BladeCenter unit power management configuration and status support DPI blade operation (see the *Management Module User’s Guide* or the *Management Module Command-Line Interface Reference Guide* for information).
- Local power control for the DPI blade is correctly set (see the *Management Module User’s Guide* or the *Management Module Command-Line Interface Reference Guide* for information).
- The BladeCenter unit blowers are correctly installed and operational.

If these operations do not solve the problem, it is likely a problem with the DPI blade. See “Advanced management module error messages” on page 52 and “Power problems” on page 54.

Solving undetermined problems

Note: When you are diagnosing a problem in the DPI blade, you must determine whether the problem is in the DPI blade or in the BladeCenter unit.

- If all of the DPI blades have the same symptom, the problem is probably in the BladeCenter unit. For more information, see the *Hardware Maintenance Manual and Troubleshooting Guide* or *Problem Determination and Service Guide* for your BladeCenter unit.
- If the BladeCenter unit contains more than one DPI blade and only one of the DPI blades has the problem, troubleshoot the DPI blade that has the problem.
- The following minimum configuration is required for the DPI blade to start:
  - ASM host blade server with CPOS
  - Switch 1 with CIN support
  - Switch 2
  - Correctly configured network
  - A functioning BladeCenter unit

If the diagnostic tests did not diagnose the failure or if the DPI blade is inoperative, use the information in this section.

If you suspect that a software problem is causing failures (continuous or intermittent), see “Software problems” on page 56.

Check the LEDs on all the power supplies in the BladeCenter unit in which the DPI blade is installed. If the LEDs indicate that the power supplies are working correctly and reseating the DPI blade does not correct the problem, complete the following steps:

1. If the LEDs on the control panel of the DPI blade are not working, replace the bezel assembly; then, try to turn on the DPI blade from the management module (see the documentation for the BladeCenter unit and management module for more information).
2. Turn off the DPI blade.
3. Remove the DPI blade from the BladeCenter unit.
4. Install the DPI blade into the BladeCenter unit and turn on the DPI blade. If the problem remains, suspect the DPI blade.

If you suspect a networking problem and the DPI blade passes all the system tests, suspect a network cabling problem that is external to the system.

Calling IBM for service

See Appendix A, “Getting help and technical assistance,” on page 63 for information about calling IBM for service.

When you call for service, have as much of the following information available as possible:

- Machine type, model, and serial number
- Management-module service data information (see the documentation for your BladeCenter unit management module).
- Failure symptoms
  - Does the BMC error log report any errors? If so, what are the errors?
  - Does the blade workstation fail the diagnostic programs? If so, what are the error codes?
  - What occurs? When? Where?
  - Is the failure repeatable?
  - Has the current BladeCenter configuration ever worked?
  - What changes, if any, were made before it failed?
  - Is this the original reported failure, or has this failure been reported before?
- Hardware configuration (print screen of the system summary)
- CPOS code level
- Operating-system type and version level on the host blade server
- Host blade server machine type and serial number
- Host blade server BIOS code level
- Host blade server

You can solve some problems by comparing the configuration and software setups between working and nonworking workstations. When you compare workstations to each other for diagnostic purposes, consider them identical only if all the following factors are exactly the same in all the blade workstations:

- Machine type and model
- BIOS level
- Adapters and attachments, in the same locations
- Address jumpers, terminators, and cabling
- Software versions and levels
- Diagnostic program type and version level
- Configuration option settings
- Operating-system control-file setup

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Problem Determination and Service Guide* on the IBM *Documentation* CD that comes with your system.
- Go to the IBM support Web site at http://www.ibm.com/systems/support/ to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the documentation that is provided with your IBM product. The documentation that comes with IBM systems also describes the diagnostic tests that you can perform. Most systems, operating systems, and programs come with documentation that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to http://www.ibm.com/systems/support/ and follow the instructions. Also, some documents are available through the IBM Publications Center at http://www.ibm.com/shop/publications/order/.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM systems, optional devices, services, and support. The address for IBM System x™ and xSeries® information is http://www.ibm.com/systems/x/. The address for IBM BladeCenter information is http://www.ibm.com/systems/bladecenter/. The address for IBM IntelliStation® information is http://www.ibm.com/intellistation/.

© Copyright IBM Corp. 2008

You can find service information for IBM systems and optional devices at http://www.ibm.com/systems/support/.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with System x and xSeries servers, BladeCenter products, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, see http://www.ibm.com/services/sl/products/.

For more information about Support Line and other IBM services, see http://www.ibm.com/services/, or see http://www.ibm.com/planetwide/ for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through your IBM reseller or IBM Services. To locate a reseller authorized by IBM to provide warranty service, go to http://www.ibm.com/partnerworld/ and click **Find a Business Partner** on the right side of the page. For IBM support telephone numbers, see http://www.ibm.com/planetwide/. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

IBM Taiwan product service

台灣 IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路 7 號 3 樓
電話：0800-016-888

IBM Taiwan product service contact information:
IBM Taiwan Corporation
3F, No 7, Song Ren Rd.
Taipei, Taiwan
Telephone: 0800-016-888

Appendix B. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the users responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product, and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

© Copyright IBM Corp. 2008

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at “Copyright and trademark information” at http://www.ibm.com/legal/copytrade.shtml.

Adobe and PostScript are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc., in the United States, other countries, or both and is used under license therefrom.

Intel, Intel Xeon, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc., in the United States, other countries, or both.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product, or service names may be trademarks or service marks of others.

Important notes

Processor speed indicates the internal clock speed of the microprocessor; other factors also affect application performance.

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity can vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives that are available from IBM.

Maximum memory might require replacement of the standard memory with an optional memory module.

IBM makes no representation or warranties regarding non-IBM products and services that are ServerProven®, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

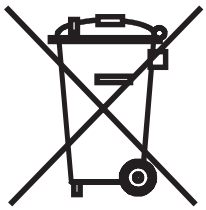
IBM makes no representations or warranties with respect to non-IBM products. Support (if any) for the non-IBM products is provided by the third party, not IBM.

Some software might differ from its retail version (if available) and might not include user manuals or all program functionality.

Product recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet sites at http://www.ibm.com/ibm/recycle/us/index.shtml and http://www.ibm.com/ibm/environment/products/index.shtml.

Esta unidad debe reciclarse o desecharse de acuerdo con lo establecido en la normativa nacional o local aplicable. IBM recomienda a los propietarios de equipos de tecnología de la información (TI) que reciclen responsablemente sus equipos cuando éstos ya no les sean útiles. IBM dispone de una serie de programas y servicios de devolución de productos en varios países, a fin de ayudar a los propietarios de equipos a reciclar sus productos de TI. Se puede encontrar información sobre las ofertas de reciclado de productos de IBM en el sitio web de IBM http://www.ibm.com/ibm/environment/products/index.shtml.



Notice: This mark applies only to countries within the European Union (EU) and Norway.

This appliance is labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

この機器には、EU 諸国に対する廃電気電子機器指令 2002/96/EC(WEEE) のラベルが貼られています。この指令は、EU 諸国に適用する使用済み機器の回収とリサイクルの骨子を定めています。このラベルは、使用済みになった時に指令に従って適正な処理をする必要があることを知らせるために種々の製品に貼られています。

Remarque : Cette marque s'applique uniquement aux pays de l'Union Européenne et à la Norvège.

L'etiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques (DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.

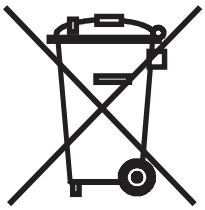
Battery return program

This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to http://www.ibm.com/ibm/environment/products/index.shtml or contact your local waste disposal facility.

In the United States, IBM has established a return process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and battery packs from IBM equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

For Taiwan: Please recycle batteries.

For the European Union:



Notice: This mark applies only to countries within the European Union (EU).

Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

Les batteries ou emballages pour batteries sont étiquetés conformément aux directives européennes 2006/66/EC, norme relative aux batteries et accumulateurs en usage et aux batteries et accumulateurs usés. Les directives déterminent la marche à suivre en vigueur dans l'Union Européenne pour le retour et le recyclage des batteries et accumulateurs usés. Cette étiquette est appliquée sur diverses batteries pour indiquer que la batterie ne doit pas être mise au rebut mais plutôt récupérée en fin de cycle de vie selon cette norme.

バッテリーあるいはバッテリー用のパッケージには、EU 諸国に対する廃電気電子機器指令 2006/66/EC のラベルが貼られています。この指令は、バッテリーと蓄電池、および廃棄バッテリーと蓄電池に関するものです。この指令は、使用済みバッテリーと蓄電池の回収とリサイクルの骨子を定めているもので、EU 諸国にわたって適用されます。このラベルは、使用済みになったときに指令に従って適正な処理をする必要があることを知らせるために種々のバッテリーに貼られています。

In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury, and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and treatment of batteries and accumulators. Customer participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances. For proper collection and treatment, contact your local IBM representative.

This notice is provided in accordance with Royal Decree 106/2008 of Spain: The retail price of batteries, accumulators, and power cells includes the cost of the environmental management of their waste.

For California:

Perchlorate material – special handling may apply. See http://www.dtsc.ca.gov/hazardouswaste/perchlorate/.

The foregoing notice is provided in accordance with California Code of Regulations Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate Materials. This product/part may include a lithium manganese dioxide battery which contains a perchlorate substance.

Electronic emission notices

Federal Communications Commission (FCC) statement

Note: 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.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Class A emission compliance statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Australia and New Zealand Class A statement

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

United Kingdom telecommunications safety requirement

Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

European Community contact:

IBM Technical Regulations
Pascalstr. 100, Stuttgart, Germany 70569
Telephone: 0049 (0)711 785 1176
Fax: 0049 (0)711 785 1283
E-mail: tjahn@de.ibm.com

Taiwanese Class A warning statement

警告使用者:
這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

Chinese Class A warning statement

声　　明
此为 A 级产品。在生活环境中，
该产品可能会造成无线电干扰。
在这种情况下，可能需要用户对其
干扰采取切实可行的措施。

Japanese Voluntary Control Council for Interference (VCCI) statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に
基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を
引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求
されることがあります。

Korean Class A warning statement

이기기는 업무용으로 전자파 적합등록을 받은 기기
이오니, 판매자 또는 사용자는 이점을 주의하시기
바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에
서 비업무용으로 교환하시기 바랍니다.

Index

A

assistance, getting 63
attention notices 2

B

battery return program 69
blade filler 27, 29
BladeCenter PN41
  specifications 3

C

cables
  transceiver module
    installing 35
    removing 35
caution statements 2
checkout procedure
  about 44
  performing 45
Class A electronic emission notice 70

D

danger statements 2
diagnostic
  error messages 58
  programs, overview 56
  programs, starting 57
  tools, overview 39
documentation, related 1
DPI blade
  installing 28
  removing 27

E

electronic emission Class A notice 70
error logs 40
  BMC system event log 40
  Management-module event log 40
error symptoms
  intermittent 53
  software 56
errors
  messages, diagnostic 56

F

FCC Class A notice 70
fiber optic cables
  installing 36
  removing 35
firmware updates 6

G

getting help 63

H

handling
  fiber optic cables 35
  static-sensitive devices 26
hardware service and support 64
help, getting 63

I

IBM Support Line 64
important notices 2
installation
  procedure
    cables 35
    transceiver module cable 36
installing
  bezel assembly 37
  DPI blade 28
  fiber optic cables 36
  SFP module 33
  transceiver modules 31
installing options 25
integrated functions 3
intermittent problems 53

L

LEDs
  activity 4
  blade-error 4
  information 4
  location 4
  power-on 5
  test/unbind 4
logs
  BMC system event 40
  Management module event 40

M

memory
  specifications 3
messages
  diagnostic 56

N

network connection problems 54
notes 2
notes, important 67
notices 65
  electronic emission 70

© Copyright IBM Corp. 2008

notices *(continued)*
FCC, Class A 70
notices and statements 2

P

parts listing 23
POST
about 40
power button 4
power problems 54
problems
intermittent 53
network connection 54
power 54
service processor 55
software 56
undetermined 60
processor 3
product recycling and disposal 67

R

recycling and disposal, product 67
related documentation 1
removing
bezel assembly 36
blade cover 30
DPI blade 27
fiber optic cables 35
XFP module 32
replacing the DPI blade cover 31

S

service processor problems 55
service, calling for 61
Setting up the DPI blade 7
SFP module 33
small form factor pluggable module 31
small form-factor pluggable module 32
software problems 56
software service and support 64
specifications
BladeCenter PN41 3
starting the DPI blade 5
static electricity 26
static-sensitive devices, handling 26
stopping the DPI blade 5
support, web site 63
system reliability 26

T

telephone numbers 64
tools, diagnostic 39
trademarks 66
transceiver module
installing 36
troubleshooting tables 45
turning off the DPI blade 5
turning on the DPI blade 5

U

undetermined problems 60
United States electronic emission Class A notice 70
United States FCC Class A notice 70
updating firmware 6

W

web site
publication ordering 63
support 63
support line, telephone numbers 64
supported DPI blade options 26

X

XFP module
removing 32

Part Number: 44R5180

Printed in USA

(1P) P/N: 44R5180