IBM

BladeCenter PN41

Type 3020 Deep Packet
Inspection Blade

Installation and User's Guide

Welcome.

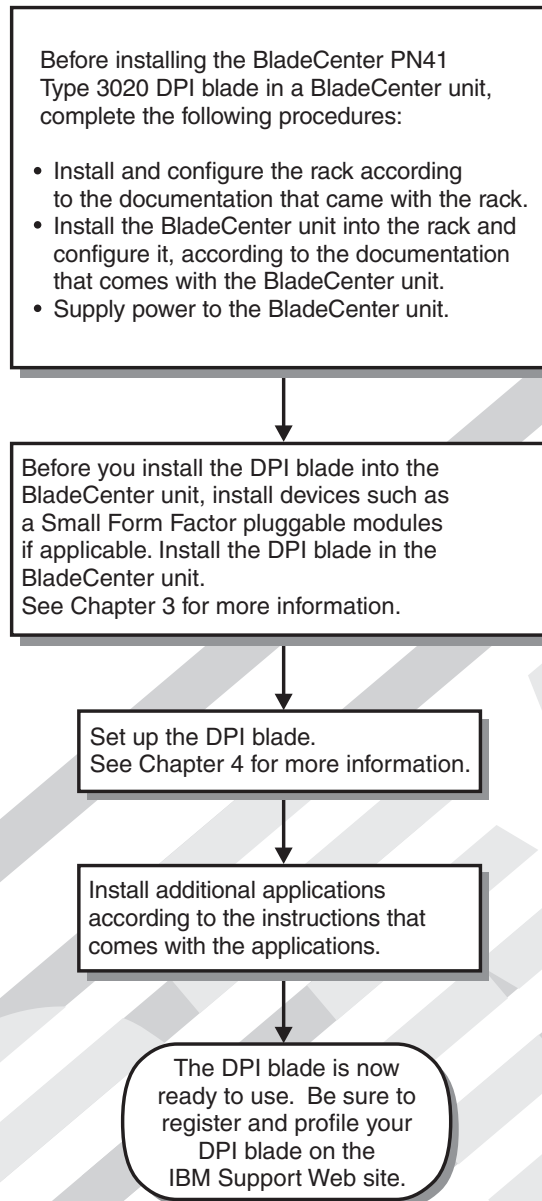Thank you for buying an
IBM Deep Packet Inspection
Blade.
Your DPI blade features
superior performance,
availability, and scalability.

This *Installation and User's Guide*
contains information for setting up,
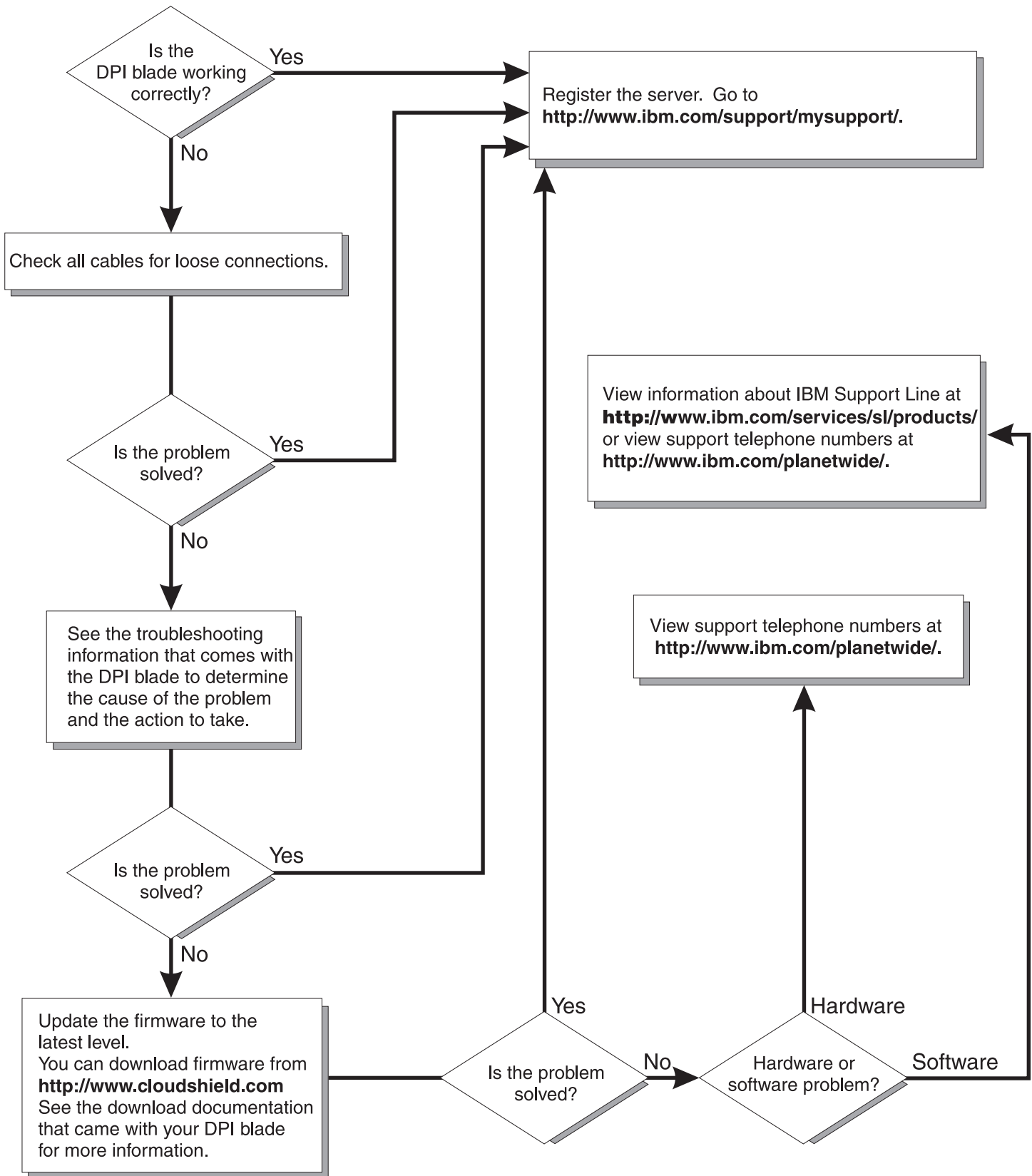configuring, and using your
DPI blade.

Additionally, a service information
label is attached to each BladeCenter
unit and DPI blade. This label
provides a graphical summary of
many of the installation and service
activities that are associated with
each device.

For more information about your
BladeCenter components and
features, you can view the
publications on the *Documentation*
CD or download them from the
IBM Support Web site.

Go to http://www.ibm.com/systems/support/.

Before installing the BladeCenter PN41
Type 3020 DPI blade in a BladeCenter unit,
complete the following procedures:

- Install and configure the rack according
  to the documentation that came with the rack.
- Install the BladeCenter unit into the rack and
  configure it, according to the documentation
  that comes with the BladeCenter unit.
- Supply power to the BladeCenter unit.

↓

Before you install the DPI blade into the
BladeCenter unit, install devices such as
a Small Form Factor pluggable modules
if applicable. Install the DPI blade in the
BladeCenter unit.
See Chapter 3 for more information.

↓

Set up the DPI blade.
See Chapter 4 for more information.

↓

Install additional applications
according to the instructions that
comes with the applications.

↓

The DPI blade is now
ready to use. Be sure to
register and profile your
DPI blade on the
IBM Support Web site.

Server Support

Is the DPI blade working correctly?

Yes →

Register the server. Go to **http://www.ibm.com/support/mysupport/.**

No ↓

Check all cables for loose connections.

Is the problem solved?

Yes →

No ↓

See the troubleshooting information that comes with the DPI blade to determine the cause of the problem and the action to take.

Is the problem solved?

Yes →

No ↓

Update the firmware to the latest level.
You can download firmware from **http://www.cloudshield.com**
See the download documentation that came with your DPI blade for more information.

Is the problem solved?

Yes ↑

No →

Hardware or software problem?

Hardware ↑

View support telephone numbers at **http://www.ibm.com/planetwide/.**

Software →

View information about IBM Support Line at **http://www.ibm.com/services/sl/products/** or view support telephone numbers at **http://www.ibm.com/planetwide/.**

IBM BladeCenter PN41 Type 3020
Deep Packet Inspection Blade

Installation and User's Guide

Note: Before using this information and the product it supports, read the general information in Appendix B, "Notices," on page 45 and the *Warranty and Support Information* document for your DPI blade type on the IBM *Documentation* CD.

Contents

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.

Important:

Each caution and danger statement in this document 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 document before you perform the procedures. Read any additional safety information that comes with the server 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:

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

Statement 8:

CAUTION:
Never remove the cover on a power supply or any part that has the following label attached.

Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

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

Note: This documentation is intended for experienced users with knowledge of network configurations.

The IBM® BladeCenter® PN41 Type 3020 Deep Packet Inspection (DPI) Blade is a content-processing blade. The DPI blade can save space in data centers and reduce maintenance requirements. Each DPI blade requires its own Application Server Module (ASM). The ASM runs as a virtual machine (VM) on any compatible blade server in the same BladeCenter.

This *Installation and User's Guide* provides information about the following tasks:
- Setting up the DPI blade
- Starting and configuring the DPI blade
- Removing and installing optional hardware devices
- Setting up the DPI blade and installing the CloudShield PacketWorks Operating System (CPOS)

Packaged with this document are software CDs that help you to configure hardware and install the operating system. To download the latest device drivers, 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.

The DPI blade comes with a limited warranty. For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document for your DPI blade on the IBM *Documentation* CD. You can obtain up-to-date information about the DPI blade at http://www.ibm.com/systems/bladecenter/.

Documentation updates are available. You can download them from the IBM Web site. The DPI blade might have features that are not described in the documentation that comes with the DPI blade, and the documentation might be updated occasionally to include information about those features, or technical updates might be available to provide additional information that is not included in the DPI blade documentation. To check for 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 **Go**.

Record information about the DPI blade in the following table. You will need these numbers when you register the DPI blade with IBM. You can register the DPI blade at http://www.ibm.com/support/mysupport/.

Product name	BladeCenter PN41 DPI Blade
Machine type	3020
Model number	_____
Serial number	_____

The model number and serial number are on the ID label that is behind the control panel door on the front of the DPI blade, and on a label on the side of the DPI blade that is visible when the DPI blade is not in the BladeCenter unit.

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

Release handles
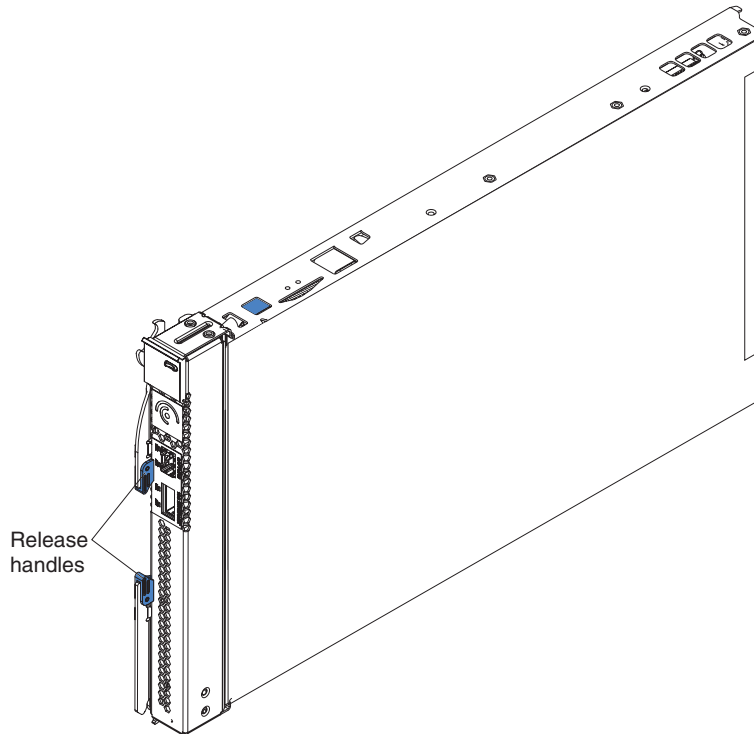
A set of blank labels comes with your BladeCenter unit. When you install the DPI blade in the BladeCenter unit, write identifying information on a label and place the label on the BladeCenter unit bezel. See the documentation for your BladeCenter unit for recommended label placement.

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

Related documentation

This *Installation and User's Guide* contains general information about the DPI blade, including how to install supported optional devices and how to configure the DPI blade. 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 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 the CloudShield PacketWorks Operating System for the DPI blade.

- *Problem Determination and Service Guide*

  This document is in Portable Document Format (PDF) on the IBM *Documentation* CD. It contains information to help you solve problems yourself and it contains information for service technicians.

- *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.

- *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 **Go**.

The IBM Documentation CD

You can run the IBM *Documentation* CD on any computer that meets the hardware and software requirements.

The IBM *Documentation* CD contains documentation for the DPI blade in Portable Document Format (PDF) and includes the IBM Documentation Browser to help you find information quickly.

Hardware and software requirements

The IBM *Documentation* CD requires the following minimum hardware and software:
- Microsoft® Windows NT® XP, Windows 2000, or Red Hat Linux®
- 100 MHz microprocessor
- 32 MB of RAM
- Adobe Acrobat Reader 3.0 (or later) or xpdf, which comes with Linux operating systems

Using the Documentation Browser

Use the Documentation Browser to browse the contents of the CD, read brief descriptions of the documents, and view documents, using Adobe Acrobat Reader or xpdf. The Documentation Browser automatically detects the regional settings in your system and displays the documents in the language for that region (if available). If a document is not available in the language for that region, the English-language version is displayed.

Use one of the following procedures to start the Documentation Browser:
- If Autostart is enabled, insert the CD into the CD drive. The Documentation Browser starts automatically.
- If Autostart is disabled or is not enabled for all users, use one of the following procedures:
    - If you are using a Windows® operating system, insert the CD into the CD or DVD drive and click **Start → Run**. In the **Open** field, type

      `e:\win32.bat`

      where *e* is the drive letter of the CD or DVD drive, and click **OK**.
    - If you are using Red Hat Linux, insert the CD into the CD or DVD drive; then, run the following command from the /mnt/cdrom directory:

      `sh runlinux.sh`

Select your DPI blade from the **Product** menu. The **Available Topics** list displays all the documents for the DPI blade. Some documents might be in folders. A plus sign (+) indicates each folder or document that has additional documents under it. Click the plus sign to display the additional documents.

When you select a document, a description of the document is displayed under **Topic Description**. To select more than one document, press and hold the Ctrl key while you select the documents. Click **View Book** to view the selected document or documents in Acrobat Reader or xpdf. If you selected more than one document, all the selected documents are opened in Acrobat Reader or xpdf.

To search all the documents, type a word or word string in the **Search** field and click **Search**. The documents in which the word or word string appears are listed in

order of the most occurrences. Click a document to view it, and press Crtl+F to use the Acrobat search function, or press Alt+F to use the xpdf search function within the document.

Click **Help** for detailed information about using the Documentation Browser.

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 possible 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 information 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)

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
- 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.

What your DPI blade offers

The DPI blade uses the following features and technologies:

- **Baseboard management controller (BMC)**

  The BMC is on the system board of the DPI blade. The BMC operates as the service processor for the DPI blade and performs several tasks:
  - Provides RS-485 interfaces to the management module
  - Provides support for the following features:
    - Intelligent Platform Management Interface (IPMI)
    - Power control and advanced power management
    - Reliability, availability, and serviceability (RAS) features

- **Microprocessor technology**

  The DPI blade contains an Intel IXP2805 network processor.

- **RAVE application**

  A programmable high-performance dataplane application that performs DPI processing functions.

- **Integrated network support**

  The DPI blade comes with an embedded four-port 1 Gb Ethernet network interface controller (NIC). This controller supports connection to a 1000 Mbps network through an Ethernet-compatible switch module in the BladeCenter unit and supports connection to the PN41 management interface on the 1 Gb network through Ethernet switch modules in the BladeCenter unit.

- **Large system memory**

  The DPI blade system board contains multiple types of dedicated memory, including TCAM, RDRAM, and QDRAM. This memory is not user accessible or expandable.

- **Diagnostics**

  A diagnostics application is accessible through the Web Management Interface. For more information, see the *Problem Determination and Service Guide.*

Reliability, availability, and serviceability features

Three of the most important features in server design are reliability, availability, and serviceability (RAS). These RAS features help to ensure the integrity of the data that is stored in the DPI blade, availability of the DPI blade when you need it, and ease with which you can diagnose and correct problems.

The DPI blade has the following RAS features:
- ASM-based diagnostics
- Automatic server restart
- Built-in monitoring for temperature and voltage
- Customer support center 24 hours per day, 7 days a week[1]
- Customer-upgradeable firmware code and diagnostics
- Power-on self-test (POST)
- Service processor that communicates with the management module to enable DPI blade management
- System error logging
- XFP and SFP presence detection

---

1. Service availability will vary by country. Response time will vary depending on the number and nature of incoming calls.

Chapter 2. Power, controls, and indicators

This chapter describes the power features, how to turn on and turn off the DPI blade and what the controls and indicators mean.

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 by using the power-control button on the front of the DPI blade, the advanced management module interface, or through the ASM interface. 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 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-control button (behind the control panel door) on the DPI blade (see "Control panel buttons and LEDs" on page 12).
- 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 4, "Setting up and configuring the DPI® blade," on page 27 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*.

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.

The LEDs indicate the status of various components, alarms, and events. See the *Problem Determination and Service Guide* for information about how to clear the LEDs.
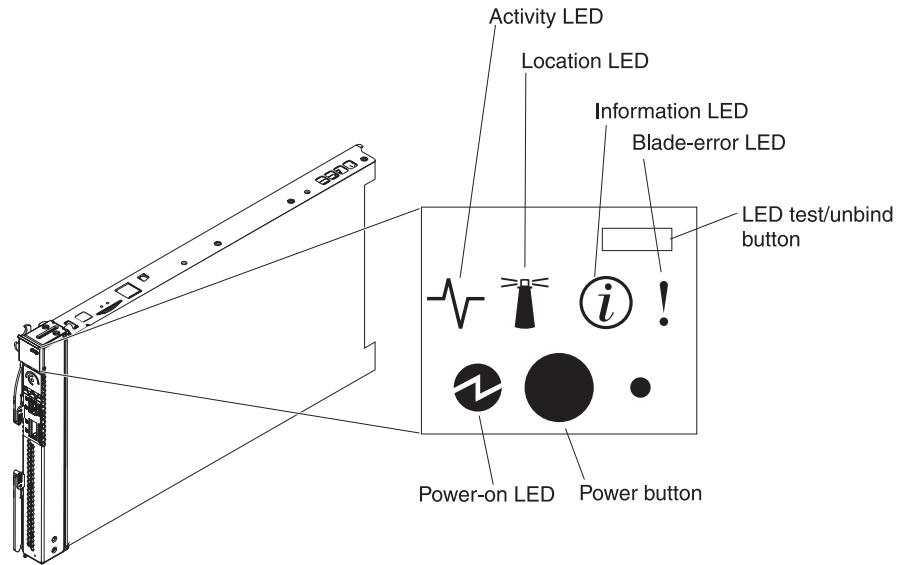
Activity LED: When this green LED is lit, it indicates that there is activity on the internal Ethernet ports. Activity LEDs next to the SPF-module port and XFP-module port indicate activity through the transceiver modules.

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 to 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 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 communication 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.

Chapter 3. Installing optional devices

This chapter provides instructions for installing optional hardware devices in the DPI blade. There are no internal optional devices for the DPI blade.

Installation guidelines

Before you install optional devices, read the following information:

- Read the safety information that begins on page v and the guidelines in "Handling static-sensitive devices" on page 16. 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.

- 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.

- 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 bade, 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.

Removing the DPI blade from the BladeCenter unit

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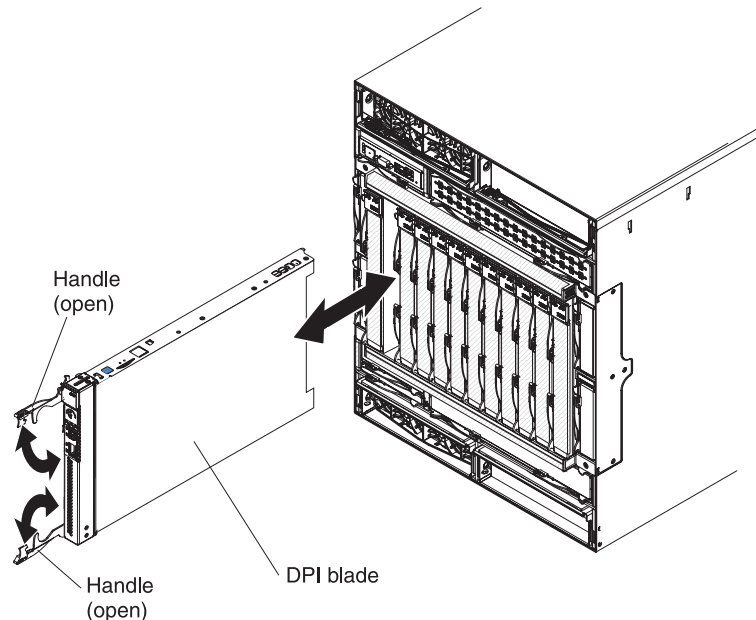
Attention:

- To maintain proper system cooling, do not operate the BladeCenter unit without a blade server or blade 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 by using the ASM. This should turn off the DPI blade. If the DPI blade is not bound or assigned, press the power-control button (behind the DPI blade control panel door) to turn off the DPI blade. See "Turning off the DPI blade" on page 11 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 filleror another blade in the bay within 1 minute.

Opening the DPI blade cover

The following illustration shows how to open the DPI blade cover.
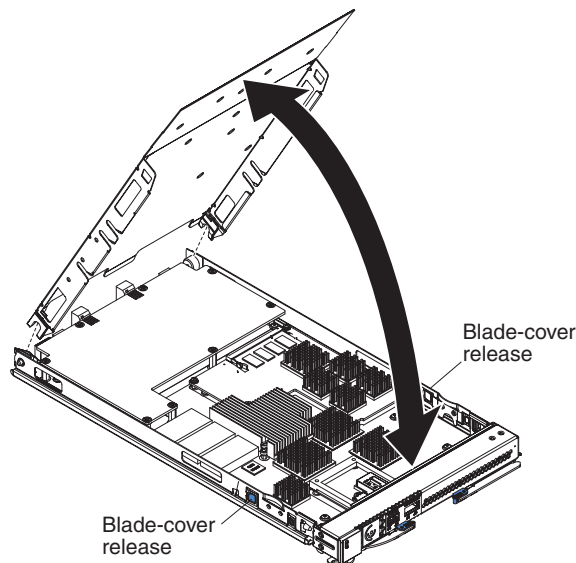
To open the DPI blade cover, complete the following steps:

1. Read the safety information that begins on page v and "Installation guidelines" on page 15.
2. If the DPI blade is installed in a BladeCenter unit, remove it. See "Removing the DPI blade from the BladeCenter unit" on page 17 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. Lay the cover flat.

Removing the bezel assembly

To remove the bezel from the DPI blade, complete the following steps.
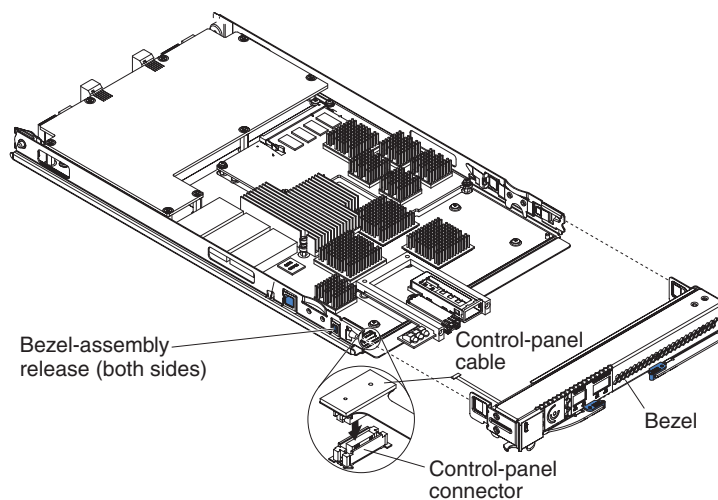
1. Read the safety information that begins on page v and "Installation guidelines" on page 15.

2. If the DPI blade is installed in a BladeCenter unit, remove it. See "Removing the DPI blade from the BladeCenter unit" on page 17 for more information.
3. Carefully lay the DPI blade on a flat, static-protective surface.
4. Remove the cover from the DPI blade. See "Opening the DPI blade cover" on page 18 for more information.
5. Disconnect the control panel cable from the control panel connector.
6. Press the bezel-assembly release and pull the bezel assembly away from the DPI blade.
7. Store the bezel assembly in a safe place.

Installing the bezel assembly

The following illustration shows how to install the bezel assembly.
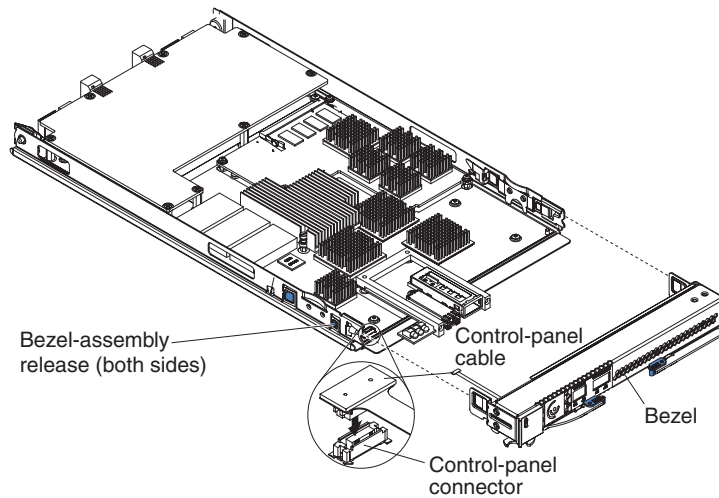
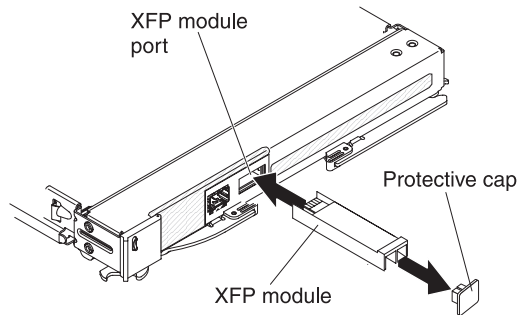To install the DPI blade bezel assembly, complete the following steps:
1. Read the safety information that begins on page v and "Installation guidelines" on page 15.
2. Carefully slide the bezel assembly onto the DPI blade until it clicks into place.
3. Connect the control panel cable to the control panel connector on the system board.

Closing 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 close the DPI blade cover.
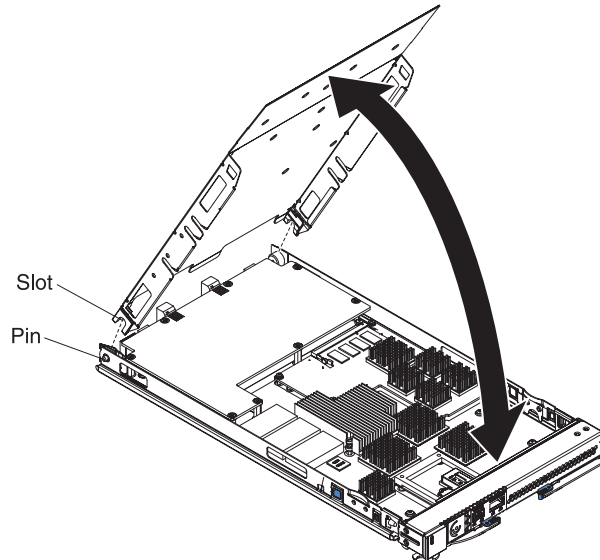
To close the DPI blade cover, complete the following steps:

1. Read the safety information that begins on page v and "Installation guidelines" on page 15.
2. If you removed the blade bezel assembly, replace it. See "Installing the bezel assembly" on page 19 for instructions.
3. 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. Before you close the cover, 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. Pivot the cover to the closed position, as shown in the illustration, until it clicks into place.

Installing and removing 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

Installing an XFP module

An XFP module is a laser product that converts electrical signals to optical signals. Install a 10 Gb small-form-factor pluggable module (XFP) in the XFP-module port in the DPI blade.

To install an XFP module, complete the following steps:

1. Read the safety information that begins on page v and "Installation guidelines" on page 15.

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 20.

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 24 for more information.

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 15.
2. Read the information in "Handling a transceiver module" on page 20.
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 24.

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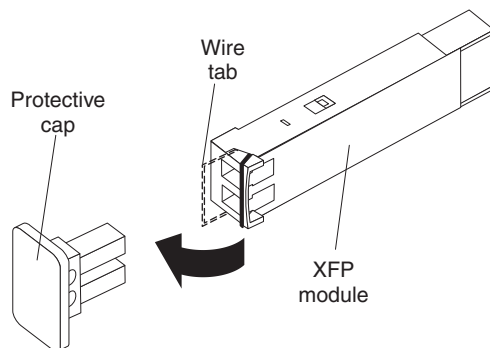
5. Grasp the wire tab on the XFP module and pull it out of the port.
6. Replace the protective cap on the XFP module.
7. Place the XFP module into a static-protective package.

Installing a 1 Gb SFP module

A hot-pluggable SFP module provides a 1 Gb Ethernet connection with other 1 Gb Ethernet fiber or copper devices. Install an SFP module in the SFP-module port in the DPI blade.

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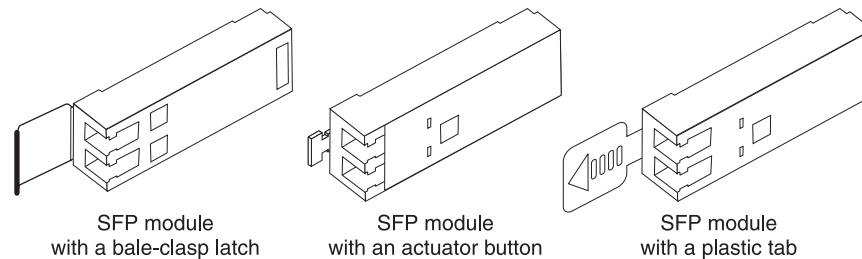
Attention: Do not install or remove an SFP module with fiber-optic cables attached to it because of the potential for damage to the cables, cable connector, or optical interfaces in the SFP module. Disconnect all cables before you install or remove the SFP module.

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 15, and "Handling static-sensitive devices" on page 16, 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.
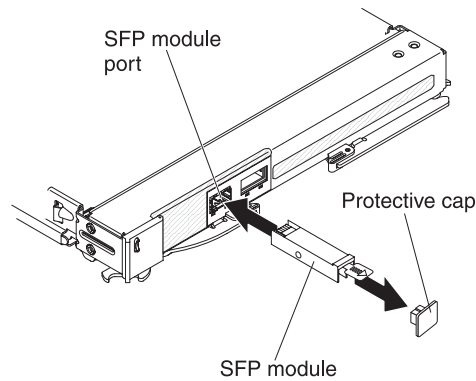
5. When you are ready to connect the fiber-optic cables, remove the protective cap from the SFP module.
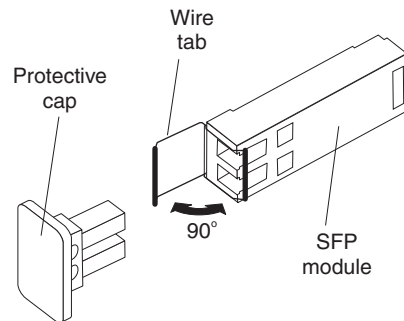
Note: The caps protect the SFP module ports and cables from contamination and ambient light. Always leave the protective caps inserted in the SFP module when the cables are not attached. Store the protective caps in a safe place for reuse.

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.
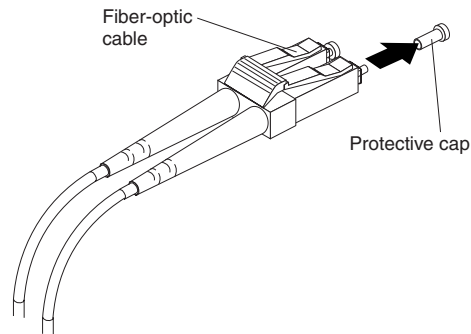
2. Gently slide the fiber-optic cable into the transceiver module until it clicks into place. (The following illustration shows an XFP module and cable.)
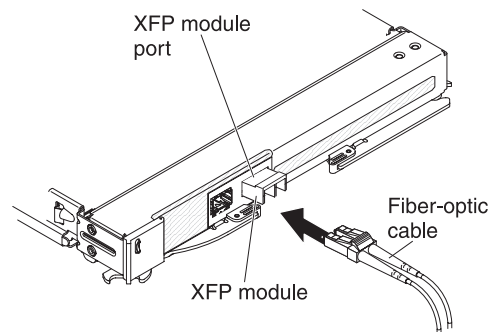
3. Check the LED next to the port connector on the DPI blade bezel. When the transceiver module is operating correctly, the green link LED is lit.

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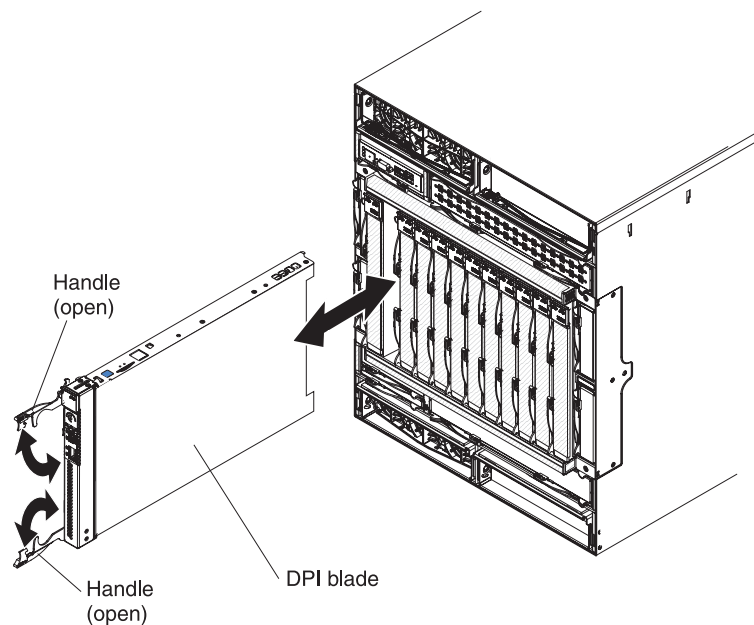
To install a DPI blade in a BladeCenter unit, complete the following steps.

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 15, and "Handling static-sensitive devices" on page 16, and read the safety statements in the BladeCenter unit documentation.
2. If you have not done so already, install any optional devices that you want in the DPI blade.
3. 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 blade bay from which it was removed will require you to bind the 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.

4. Make sure that the release handles on the DPI blade are in the open position (perpendicular to the DPI blade).
5. Slide the DPI blade into the blade bay until it stops.
6. Push the release handles on the front of the DPI blade to the closed position.
7. Turn on the DPI blade. See "Turning on the DPI blade" on page 11 for more information.
8. 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.
9. (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.

If this is the initial installation of the DPI blade in the BladeCenter unit, you must configure the DPI blade and bind the DPI blade to the ASM. See Chapter 4, "Setting up and configuring the DPI® blade," on page 27 for details.

Chapter 4. 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 Chapter 5, "DPI blade IP addresses," on page 39.

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**.
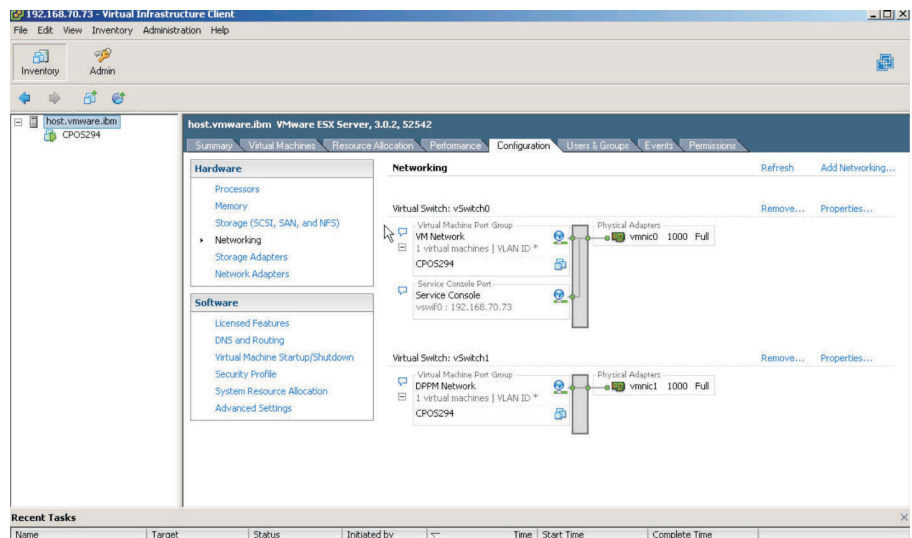
   d. Select **Virtual Machine**, and click **Next**.

   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 Chapter 5, "DPI blade IP addresses," on page 39.

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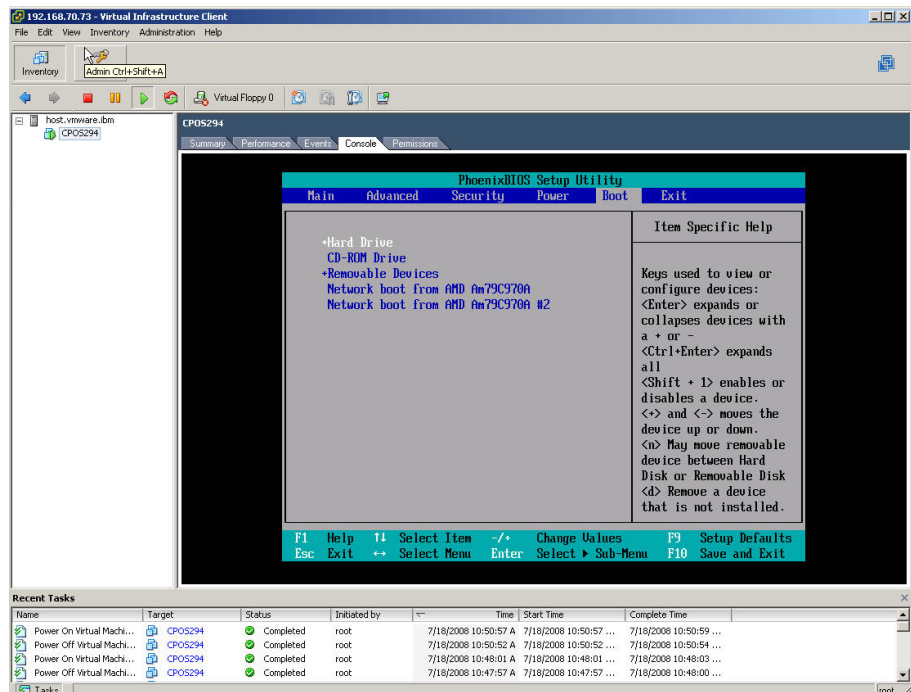
g. Press F10. Select **Yes**, and press Enter.

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 Chapter 5, "DPI blade IP addresses," on page 39.

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 Chapter 5, "DPI blade IP addresses," on page 39.

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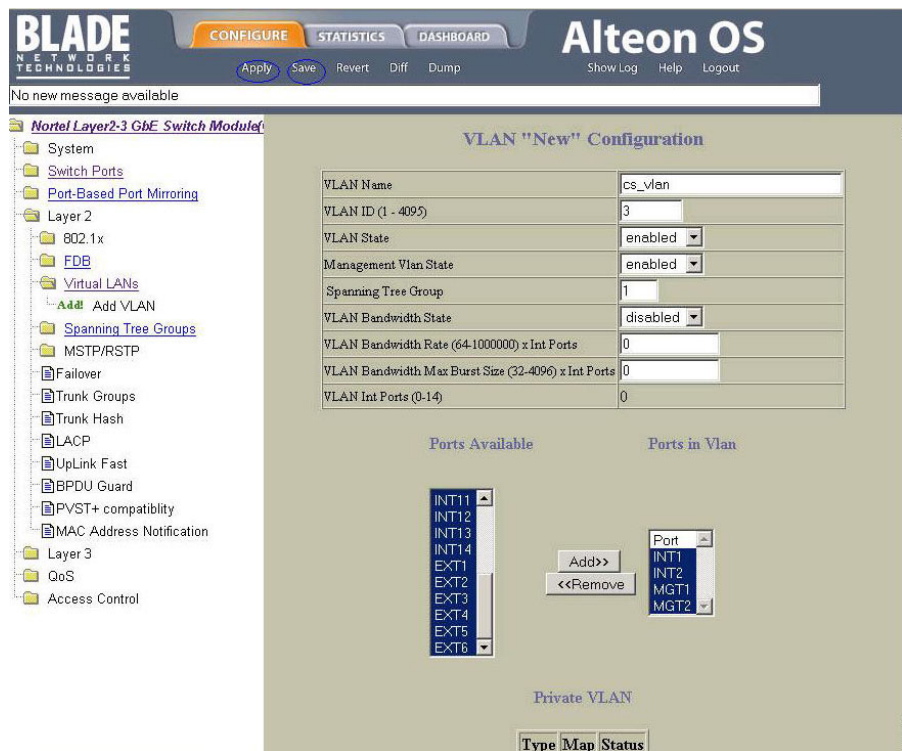
o. Click **Submit**. Click **Apply**. Click **Save**.

   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 1. 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 5. 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 2. 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		

Chapter 6. Solving problems

This chapter provides basic information about the diagnostic tools that are available to help you solve some common problems that might occur while you set up the DPI blade.

If you install the DPI blade in the BladeCenter unit and the DPI blade does not turn on, perform the following actions:

- Make sure that your network configurations are set up correctly.
- Make sure that the BladeCenter unit is correctly connected to a power source.
- Reseat the DPI blade in the BladeCenter unit. See "Installing the DPI blade in a BladeCenter unit" on page 25 for more information.
- If the power-on LED is flashing slowly, turn on the DPI blade. See "Turning on the DPI blade" on page 11 for more information.
- Make sure that the DPI blade is assigned to an ASM and bonded. See Chapter 4, "Setting up and configuring the DPI® blade," on page 27 for more information.
- If you have just added a new optional device or component, make sure that it is correctly installed and compatible with the DPI blade and its components. If the device or component is not compatible, remove it from the DPI blade, reinstall the DPI blade in the BladeCenter unit, and then restart the DPI blade.
- Make sure that both switch modules 1 and 2 are installed in the BladeCenter unit.

If the DPI blade does not start after you have performed these actions, see the *Problem Determination and Service Guide* for the DPI blade on the IBM *Documentation* CD.

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

- **Troubleshooting tables**

  Use the troubleshooting tables to find solutions to problems that have identifiable symptoms. These tables are in the *Problem Determination and Service Guide* for the DPI blade.

- **Diagnostic programs and error messages**

  The diagnostic programs test the major components of the DPI blade while it is running. Diagnostics can be run from the ASM after the DPI blade is bonded. See the *Problem Determination and Service Guide* for more information.

  Note: If you are unable to find the system-error logs in the blade server firmware code, view the system-event log in the BladeCenter management module.

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/.

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 user's 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.

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 ^{TM}), 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.
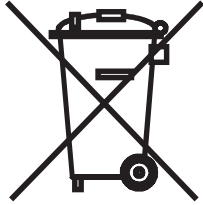
Notice: This mark applies only to countries within the European Union (EU) and Norway.

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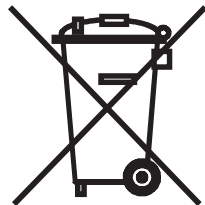
Notice: This mark applies only to countries within the European Union (EU).

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。

Index

IBM ®

Part Number: 44R5179

Printed in USA