IBM Netfinity Server Options   S37L-5122-01

IBM Netfinity SP Switch

Hardware Maintenance Manual

September 1999

**Use this manual with the
Netfinity Server Hardware
Maintenance Manual**

**We Want Your Comments!
(Please see page 102)**

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IBM

> **Note**
>
> Before using this information and the product it
> supports, be sure to read the general information
> under "Notices" on page 106.

Second Edition (September 1999)

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About this manual

This manual contains diagnostic information, a Symptom-to-FRU index, service information, error codes, and configuration information for the IBM Netfinity SP Switch Adapter to be used in an IBM Netfinity Server Switch Fabric Solution. The IBM Netfinity Server Switch Fabric Solution consists of a parallel or distributed system of interconnected computers used as a single unified computing resource or *solution*.

The IBM Netfinity SP Switch is to be used in conjunction with:

- IBM Netfinity TB3 PCI Adapter
- IBM Netfinity SP Switch Fabric Interconnection Cable
- IBM Netfinity 7000 M10

Important

This manual is intended for trained servicers who are familiar with IBM Netfinity Server products.

Important Safety Information

Be sure to read all caution and danger statements in this book before performing any of the instructions.

Leia todas as instruções de cuidado e perigo antes de executar qualquer operação.

注意和危险声明（简体中文）

重要事项：

本书中的所有注意和危险声明之前都有编号。该编号用于英语的注意或危险声明与 *Safety Information* 一书中可以找到的翻译版本的注意或危险声明进行交叉引用。

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本書中所有「注意」及「危險」的聲明均以數字開
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意」或「危險」聲明可在「安全資訊」(Safety
Information) 一書中找到相同內容的「注意」或「危
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險」聲明的譯文將出現在「安全資訊」(Safety
Information) 一書的「聲明」1 中。

執行任何指示之前，請詳讀所有「注意」及「危險」
的聲明。

Prenez connaissance de toutes les consignes de type
Attention et
Danger avant de procéder aux opérations décrites par les
instructions.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine
Anweisung ausführen.

Accertarsi di leggere tutti gli avvisi di attenzione e di
pericolo prima di effettuare qualsiasi operazione.

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도록 하십시오.

Lea atentamente todas las declaraciones de precaución y
peligro ante
de llevar a cabo cualquier operación.

Online support

Use the World Wide Web (WWW) to download Diagnostic,
BIOS Flash, and Device Driver files.

File download address is:

http://www.us.pc.ibm.com/files.html

IBM online addresses:

The HMM manuals online address is:

http://www.us.pc.ibm.com/cdt/hmm.html

The IBM PC Company Support Page is:

http://www.us.ibm.com/support/index.html

The IBM PC Company Home Page is:

http://www.pc.ibm.com

Related publication

The following publications are available for IBM products. For more information, contact IBM or an IBM Authorized. Dealer.

For Information About	See Publication
Optimizeing the performance and service life of the UPS; it also contains information pertaining to power distribution of the hardware.	*APC Smart-UPS Uninterruptible Power Supply Model 1400/3000.*
The IBM 9306 Model 900 Netfinity Rack description, a list of available options, option and equipment installation guidelines, and a description of the of the IBM Netfinity Rack Configurator program.	*IBM 9306 Model 900 Netfinity Rack Planning and Installation Guide*
Detailed instructions for installing and setting up IBM Netfinity 7000 M10 servers.	*IBM Netfinity 7000 M10 Server Library*
IBM Netfinity TB3-PCI Adapter information with installation instructions.	*TB3-PCI Adapter Installation and User's Guide*
IBM Netfinity Racks Type 9306 diagnostic and service information.	*IBM PC Server/Netfinity Racks Type 9306 Hardware Maintenance manual*

Contents

IBM Netfinity SP Switch

General checkout

The server diagnostic programs are stored in upgradable read-only memory (ROM) on the system board. These programs are the primary method of testing the major components of your server: the system board, Ethernet controller, video controller, RAM, keyboard, mouse (pointing device), diskette drive, serial port, and parallel port. You can also use them to test some external devices. If you cannot determine whether a problem is caused by the hardware or by the software, you can run the diagnostic programs to confirm that the hardware is working properly. For more information about these programs, refer to the Hardware Maintemance manual for the system you are servicing.

When you run the diagnostic programs, a single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After the cause of the first error message is corrected, the other error messages might not occur the next time you run the test.

Note

A system attached to an IBM Netfinity SP Switch is likely to be part of a shared DASD switch fabric. A switch fabric consist of a IBM Netfinity SP Switch and the server it is connected to. When running the diagnostic programs, care must be taken not to effect the operation of the switch fabric by accessing the sharded DASD.

The hard disk test will exercise the shared DASD and may introduce a performance problem or error condition if the rest of the switch fabric is still operational. Physically disconnect the system from the shared DASD switch fabric prior to running the diagnostic programs, or do not run the the hard disk drive test.

> **Notes**
>
> 1. For systems that are part of a shared DASD switch fabric, run one test at a time in looped mode. Do not run all tests in looped mode, as this could enable the DASD diagnostic tests.
> 2. If multiple error codes are displayed, diagnose the first error code displayed.
> 3. Safety information, see "Safety information" on page 70.
> 4. For the following problems, refer to the Hardware Maintenance Manual" for the system you are servicing.
>   - System hangs
>   - Power Supply
>   - Undetermined problem

001

IS THE SYSTEM PART OF A SWITCH FABRIC?
Yes   No

> **002**
>
> Go to *General checkout* in the Hardware Maintenance manual for the system you are servicing.

003

– Schedule maintenance with the customer. Remove the system from the switch fabric; then, run the TB3 Card diagnostic programs. See "Diagnostics" on page 4.

DID YOU RECEIVE AN ERROR?
Yes   No

> **004**
>
> The diagnostics completed successfully. If you still suspect a problem, go to *Gweneral Checkout* in the Hardware Maintenance manual for the system you are servicing.

005

Find the failure system in "Symptom-to-FRU Index" on page 55.

Diagnostics

> **Important**
>
> The IBM Netfinity SP Switch diagnostics test the IBM Netfinity SP Host adapter, not the connections and links to the cluster or the IBM Netfinity SP Switch.

The following instructions describe starting and running the IBM Netfinity SP Host adapter diagnostics. To start the IBM Netfinity SP Host adapter diagnostics:

1. Click **Start** → **Programs**.
2. Click the program folder where the IBM Netfinity SP Switch Administrator was installed.
3. Double-click **PC-Doctor**. The OK to Continue with Diagnostics window opens.

4. Take the server (node) offline from the cluster. The diagnostic tests are run only on the IBM Netfinity SP Host adapter and the IBM Netfinity SP Switch cable on the individual server (node) and not on the entire cluster. When the diagnostic tests are complete, you must restart the server (node) to reconnect to the cluster.
5. Click **Yes** on the OK to Continue with Diagnostics window. The following diagnostic window opens.
6. Click the **Diagnostics** icon on the left of the PC-Doctor for Windows window to add the **Switch Adapter** icons to the diagnostics window. The diagnostics window is updated with the switch adapter icons.
7. You can run the IBM Netfinity SP Host adapter diagnostic tests collectively or selectively. To collectively run all diagnostic tests that have been defined for the IBM Netfinity SP Host adapter, Double-click the **Switch Adapter** icon representing the IBM Netfinity SP Host adapter you want to test (switch adapter 0 or switch adapter 1). To run the IBM Netfinity SP Host adapter diagnostic tests selectively, continue with the next step.
8. From the PC-Doctor for Windows screen tool bar, click **Test Set**, and click one of the following options:
   - **Run Quick Test Set**: This option is designed to run test modules in a mode that offers maximum diagnostic coverage in the minimum amount of time.
   - **Run Normal Test Set**: This option is a complete set of all diagnostic tests. The normal tests run

all test modules including the External Wrap Test which requires that you uncable the IBM Netfinity SP Switch and insert a cable wrap plug onto the IBM Netfinity SP Switch cable.

> **Note**
>
> The External Wrap Test will not be run in the **Run Quick Test Set** option.

To customize the settings and types of diagnostic tests, click **TestSet** → **Custom Test Settings** The selected test components are run when you select the **Run Quick Test Set** or the **Run Normal Test Set** options. The test sets are chosen when you click on the **Details** buttons.

To browse the log of all test results and events collected during the execution of each test module, from the PC-Doctor for Windows screen Tool Bar, click **Windows** → **Testlog**

Features

The IBM Netfinity SP Switch option consists of the following components:

- One (1) eight port switch card.
- Eight (8) interposer cards, one for each port.
- Two (2) 110VAC to 48VDC, N+1 redundant bulk power supplies.
- Two (2) 48VDC to 3.3VDC, N+1 redundant logic power supplies.
- Two (2) redundant fan assemblies, each containing two fans.
- One (1) power backplane card assembly with an external RS485 system management link.
- Two (2) power converter cards
- One (1) control panel with a two row by sixteen character vacuum florescent display (VFD), power indicator, fault indicator, on/off switch, and two display (cursor) control buttons.
- One cable-management tray
- Two (2) RS485 jack assemblies
- Two (2) RS485 cables

The installation requirements are:

- A TB3 card is required for each server (node) in the IBM Netfinity Switch Fabric Solution. The IBM Netfinity TB3 PCI Adapter card is installed into each server (node) and connected to the IBM Netfinity SP Switch by an IBM Netfinity SP Switch Switch Fabric Interconnect (STI) cable.
- The software required for the IBM Netfinity SP Switch and the IBM Netfinity TB3 PCI Adapter card consists of an IBM Netfinity SP Switch device driver (DD), IBM Netfinity TB3 PCI Adapter microcode, and a Fault Service Daemon.

> **Note**
>
> The IBM Netfinity SP Switch and the IBM Netfinity TB3 PCI Adapter card are designed to operate within an IBM Netfinity Switch Fabric Solution. This switch fabric solution requires Microsoft® Windows NT® 4.0 Enterprise Edition with Service Pack 3, Oracle Paralle Server Version 8.0.5.x for Windows NT, IBM Netfinity Fibre Channel RAID Support, Version 6.2 or later, and IBM Netfinity Switch Fabric Enabler, Version 1.1. Please refer to *IBM Netfinity Switch Fabric Enabler Hardware and Software Installation Guide for Oracle Parallel Server* for a description of the IBM Netfinity Switch Fabric Solution hardware and software installation process.

Additional service information

The following additional service information supports the IBM Netfinity SP Switch:

- "Installing the IBM Netfinity SP Switch software" on page 8.
- "Configuring the IBM Netfinity SP Switch software" on page 15.
- "Starting the Switch Manager Services (SMS) software" on page 17.
- "Configuring a switch fabric using eight IBM Netfinity SP Host adapters on a single switch card" on page 19.
- "Configuring a switch fabric using 12 IBM Netfinity SP Host adapters on dual switch cards" on page 21.
- "Configuring a switch fabric using 14 IBM Netfinity SP Host adapters on dual switch cards" on page 24.
- "Managing the IBM Netfinity SP Switch fabric" on page 27.
- "Using the IBM Netfinity SP Switch Configuration Utility" on page 30.
- "Using the Switch Port Reservation Utility" on page 32.

Installing the IBM Netfinity SP Switch software

Important

- The IBM Netfinity Switch Fabric Enabler software must be installed on each server (node) in the cluster.
- The IBM Netfinity Switch Fabric Enabler software is supported only on an IBM Netfinity 7000 M10 server.
- If you are reinstalling or upgrading the IBM Netfinity Switch Fabric Enabler software, you must uninstall the currently installed release of the software or install the software upgrade into the same subdirectory as the old software.
- If you successfully uninstalled a previous version of the IBM Netfinity Switch Fabric Enabler software and files are left in the subdirectory where the IBM Netfinity Switch Fabric Enabler software was installed, manually remove these files and subdirectories from the computer. If the uninstallation fails, contact IBM for service (see "Problem Determination Tips" on page 103 for instructions on contacting IBM for service).
- If you install an external LAN adapter in the server, it must be the first adapter in the TCP/IP binding order to be used by the IBM Netfinity SP Switch.
- The IBM Netfinity SP Switch software uses the TCP/IP Services file to allow network access to the switch fabric services. A default port number of 6745 is used. If this port number is not available in the TCP/IP Services file, you will be prompted to type a new port number for the IBM Netfinity SP Switch. The same port number must be used on all servers (nodes).
- IBM Netfinity Manager Version 5.2 or later must be installed on the server (node) if you want to manage alerts and error messages through the Netfinity Manager.

  Refer to *IBM Client Services for Netfinity Manager User's Guide* and *IBM Netfinity Manager User's Guide* for information on managing alerts and error messages through the Netfinity Manager software.

Before you begin the software installation, the following items are required:

- At least one IBM Netfinity SP Host adapter in each server (node) in the cluster
- Windows NT 4.0 Enterprise Edition with Service Pack 4 or Service Pack 5 on each server (node)

- TCP/IP installed and configured on each server (node)

To install the software for the IBM Netfinity SP Switch, follow these instructions:

1. Insert the *IBM Netfinity SP Switch Manager Services Configuration Release 1.5* CD into a server (node) CD-ROM drive.
2. Click **Start** → **Run**.
3. In the Open box, type `x\Setup\Install\SETUP.EXE` (where *x* is the CD-ROM drive letter) and press Enter.

   A warning message appears:

   ```
   This product is supported only on
   Netfinity 7000 M10 Systems
   ```

   Click **Ok** to proceed to the Welcome screen.

   > **Note**
   >
   > You must stop and close any open or running applications before the IBM Netfinity SP Switch Manager Services Configuration Release 1.5 software can be installed.

4. Click **Next**.
5. Click **Yes** or **No** to the license and warranty statement.
6. If you click **Yes** to the license and warranty statement, proceed to step 7. If you click **No**, the software installation process will terminate.

   > **Note**
   >
   > You must have an external LAN adapter installed in the server (node) for a remote software installation.

7. In the Setup Type window, select one of the following:
   - **Compact:** Install the Switch Manager Services (SMS) software and the online documentation for remote switch fabric management.
   - **Custom:** You will be prompted to choose from the following

- **Switch Manager Services (SMS):** With this software you can configure and manage the IBM Netfinity SP Switch fabric from a remote server (or workstation). You must have an external LAN adapter attached to the server (or workstation) to perform a remote Switch Manager Services (SMS) software installation, however an IBM Netfinity SP Host adapter is not required.
    - **IBM SP Device Drivers:** These are the IBM Netfinity SP Host adapter device drivers performance tools, and PC-Doctor diagnostics for the IBM Netfinity SP Host adapter. This service must be installed to support a server (node) on an IBM Netfinity SP Switch. At least one IBM Netfinity SP Host adapter must be installed in the server (node). The IBM SP Services option is also required to be installed with this option.
    - **IBM Netfinity SP Switch documentation:** This book in an online format.
    - **IBM SP Switch Configuration:** This software controls the communication between the RS485 link on the IBM Netfinity SP Switch and the IBM Netfinity Advanced Systems Management PCI adapter in the IBM Netfinity 7000 M10.
    - **IBM SP Services:** These are the software service tools for sending alerts to the IBM Netfinity SP Switch via the RS485 bus. This service must be installed if you are installing the IBM SP Switch Configuration option.
- **Typical:** Install the IBM Netfinity SP Host adapter device drivers, all IBM SP Switch Administrator software, switch services, switch configuration software, and the IBM Netfinity SP Switch documentation.

8. Click **Next**.
9. If you choose a Custom installation in step 7 on page 9, the Select Components window opens. Otherwise, proceed to step 14 on page 11.

10. Select the components that you want to install by clicking the check boxes next to the component descriptions.

11. Select a destination folder in which to install the IBM Netfinity SP Switch software.
    a. To accept the default path, click **Next** and then proceed to step 16 on page 12.
    b. To select a different directory, click **Browse** and select the desired directory name. Click **OK**.

12. Click **Next**.

13. Proceed to step 16 on page 12.

14. If you choose a Typical installation, select a destination folder in which to install the IBM Netfinity SP Switch software.

    a. To accept the default path, click **Next** and then proceed to step 16 on page 12.
    b. To select a different directory, click **Browse** and select the desired directory name.
    c. Click **OK**.

> **Note**
>
> If you are installing the IBM SP Switch online
> documentation on the computer and you do not
> have Adobe Acrobat Reader installed, you will be
> prompted to install Adobe Acrobat Reader. If you
> click **No** on the prompt, the online documentation
> will not be installed.

15. Click **Next**.
16. Select a program folder in which to add the IBM
     Netfinity Switch Fabric Enabler software.

17. Click **Next**.
18. In the IBM SP Adapter Selection window, choose
     between a single or dual adapter configuration. If you
     are installing one IBM Netfinity SP Host adapter in the
     server, choose **Single adapter configuration**. If you
     are installing two IBM Netfinity SP Host adapters in
     the server, choose **Dual adapter configuration**.
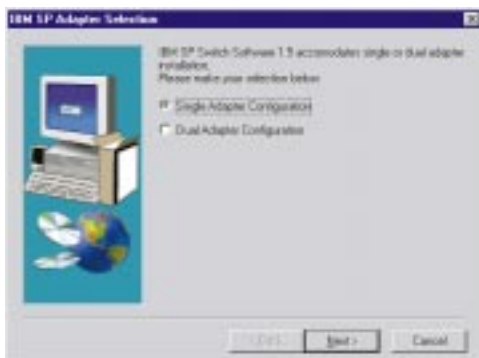
19. Click **Next**. The IBM Netfinity SP Host Adapter0
     Configuration window opens.
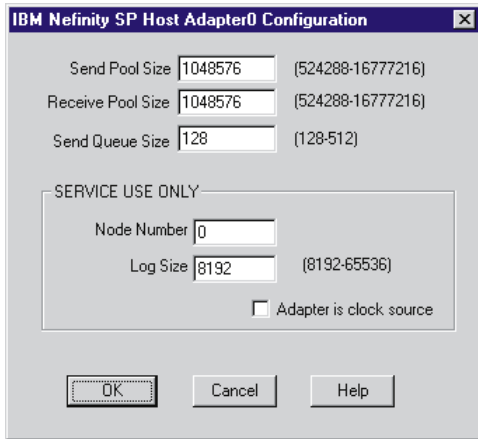
20. Click **OK**.

    If you selected a dual adapter configuration in step 18 on page 12, the IBM Netfinity SP Host Adapter1 Configuration window opens. Click **OK**.

    The following software components are copied to the desired directory for a typical installation:
    - IBM Netfinity SP Switch Administrator
    - IBM Netfinity SP Switch Configuration Utility
    - IBM Netfinity SP Switch Port Reservation Utility

    and the Microsoft NT 4.0 Registry Keys are updated.

    If the TCP/IP IP addresses have not been configured on the IBM Netfinity SP Host adapters, the Windows NT Network window opens. Update the IP address section and configure TCP/IP in the Network window. All TCP/IP addresses for a single switch fabric should be on the same Subnet Mask. If all network addresses have been configured, proceed with step 22.

    Refer to *Microsoft Windows NT Installation and User's Guide* for detailed instructions for configuring TCP/IP.
21. Click **OK** when TCP/IP has been configured.
22. Select **Yes, I want to restart my computer now** when the Restarting Windows window opens.

23. Click **OK**.

> **Note**
>
> The server must be restarted for the settings to take effect.

24. Repeat steps 1 on page 9 through step 23 to install the IBM Netfinity SP Switch software on each server (node).

Configuring the IBM Netfinity SP Switch software

> **Important**
>
> - To run the Switch Manager Services (SMS) software from a remote location, the remote computer and the primary node must have an external LAN adapter and the remote computer must be connected to the primary node.
> - You must configure and start the IBM Netfinity SP Switch fabric before running any additional software applications that access the IBM Netfinity SP Switch interconnect network.
> - Configuring a node as a primary node will not degrade the performance on that server while software applications are running.
> - Use the Windows NT event viewer to check for problems logged in the event viewer pertaining to the switch fabric.
> - Once the switch fabric has been configured, if you change the switch topology, you must shut down and restart each node attached to the IBM Netfinity SP Host adapters, and you must turn the power off (then turn the power on) the IBM Netfinity SP Switch to reset the switch.

This section describes the configuration and management of the Switch Manager Services (SMS) software. The combination of the IBM Netfinity SP Switch, configured and clustered servers (nodes), and cabled hardware topology makes up an IBM Netfinity SP Switch fabric. The IBM Netfinity SP Switch fabric servers (nodes) consist of:

- **One primary node:**
  Manages the status of all servers (nodes) on the switch fabric. The primary node controls the online and offline status of all servers (nodes) on the switch fabric.
- **One backup node:**
  Provides functional failover support for the primary node.
- **Secondary node:**
  All other servers (nodes) attached to the IBM Netfinity SP Switch fabric.

Before you run the Switch Manager Services (SMS) software, make sure that the following services and processes are running:

- **Device Driver:**
  1. Click **Start** → **Settings** → **Control Panel**.
  2. Double-click **Devices**.
  3. Scroll through the list of device drivers and make sure that IBMTB3N and IBMTB3 are started. If

these drivers are not started as Automatic, manually start them.

- **Switch Services:**
  1. Click **Start** → **Settings** → **Control Panel**.
  2. Double-click **Services**.
  3. Scroll through the list of processes and make sure that IBM TB3 Switch Manager Service is started. If this service is not started as Automatic, manually start it.
- **Switch Manager:**
  1. Using the right mouse button, click the Windows NT task bar.
  2. Select **Task Manager**.
  3. Click **Processes**. Scroll through the list of processes and make sure that SwitchMgr is started. There will be one switch manager service started for each IBM Netfinity SP Host adapter installed. If this process is not started, manually start it as a new task. If you have 2 IBM Netfinity SP Host adapters installed, and only one switch manager service is started, stop the switch manager service and manually restart both switch manager services as new tasks.

Starting the Switch Manager Services (SMS) software

```
┌─ Note ──────────────────────────────────┐
│                                         │
│ If no nodes are displayed in the Switch  │
│ Manager Services (SMS) window, from the  │
│ Switch Manager Services (SMS) menu bar:  │
│                                         │
│  1. Click View.                         │
│  2. Click Options. Add the IP address or │
│     TCP/IP hostname of an active node    │
│     within the subnet mask that you      │
│     expected to see in the Switch        │
│     Manager Services (SMS) window. See on│
│     page 29 for instructions on using the│
│     Options component.                   │
│                                         │
└─────────────────────────────────────────┘
```

To start the Switch Manager Services (SMS) software:

1. Click **Start** → **Programs**.
2. Click the program folder where the IBM Netfinity SP Switch Administrator was installed.
3. Double-click **IBM Netfinity SP Switch Administrator**.

The IBM Netfinity SP Switch Administrator window opens.

The IBM Netfinity SP Switch Administrator window is composed of three major components or internal windows:

- **Fabric view** - The fabric view window graphically displays all IBM Netfinity SP Switch fabrics, fabric components and unassigned nodes. This window is in the upper left corner of the IBM Netfinity SP Switch Administrator window. Component properties and actions are called from this view. Placing the cursor over a switch fabric, or one of the switch fabric components, will display the component status in a text pop-up window. Right-clicking a fabric icon or other component icon brings-up menu command options.
- **Node view** - The Node view window displays nodes within the selected IBM Netfinity SP Switch fabric. This window is in the upper right portion of the IBM Netfinity SP Switch Administrator window. The node information displayed shows:
  - Node name and IBM Netfinity SP Host adapter occurrence
  - Node number
  - Type of node
  - IBM Netfinity SP Switch IP address
  - External network IP address (if an external network adapter is installed)
  - Node PCI slot number where the IBM Netfinity SP Host adapter is installed
  - Port number where the IBM Netfinity SP Host adapter is attached to the IBM Netfinity SP Switch

- **Message window** - The Message window contains the detailed communication output from the IBM Netfinity SP Switch fabrics. This window is in the bottom portion of the IBM Netfinity SP Switch Administrator window.

Configuring a switch fabric using eight IBM Netfinity SP Host adapters on a single switch card

> **Note**
>
> - The selected node is used as the primary node.
> - Assign one node to the switch fabric. All other unassigned nodes that are members of the cabled hardware topology are assigned to the switch fabric when it is started.
> - The switch fabric name must be unique.

From the IBM Netfinity SP Switch Administrator window:

1. Using the right mouse button, click a node in the Unassigned nodes list to assign the node to the switch fabric.
2. Click **Assign fabric name**.
3. The Assign fabric name window opens.

4. Type the name of the IBM Netfinity SP Switch fabric that you want to use. The node that you selected is assigned to this switch fabric.
5. Click **OK**.

   The Switch Manager Services (SMS) window displays the switch fabric.
6. Using the right mouse button, click the fabric name under the Fabrics folder.
7. Click **Configure**.
8. The Configure Topology window opens.

   This figure represents a possible eight-node configuration (using one IBM Netfinity SP Host adapter in each node) or a four-node configuration (using two IBM Netfinity SP Host adapters in each node).
9. Select the eight-node configuration from the Topology pull-down list.
10. Type the switch board name that correctly represents the IBM Netfinity SP Switch and IBM Netfinity SP Host adapter wiring configuration. The name can be a total of 18 characters. The last two characters must be /A. The A corresponds to the side of the IBM Netfinity SP Switch where the switch card and interposers are installed. A1 through A8 is stamped above the interposers.
11. Click **OK**.
12. The Wiring Instructions window opens.

Use the cabling instructions in this window as a guide for the IBM Netfinity SP Host adapter connections from the nodes to the switch card connections (interposers) on the IBM Netfinity SP Switch.

13. Loosen the two thumbscrews holding the two cable-retaining bars on the cable-management tray on the IBM Netfinity SP Switch (one thumbscrew on each cable-retaining bar) and remove the cable-retaining bars. You will replace the cable-retaining bars after you have cabled each node to the IBM Netfinity SP Switch.

14. Using an IBM Netfinity SP Switch cable, attach one end of the cable to the IBM Netfinity SP Host adapter.

15. Lay the other end of the IBM Netfinity SP Switch cable across the cable-retaining block and attach the 50-pin connector to an available interposer card on the rear of the IBM Netfinity SP Switch.

16. Repeat steps 14 and 15 for each cable that you want to attach.

17. Replace the cable-retaining bars.

18. Click **OK**. You are returned to the IBM Netfinity SP Switch Administrator window. The switch fabric is configured and is ready to be brought online.

19. Using the right mouse button, click the switch fabric name and click **On-line**. The Start Fabric window opens.

20. In the Fabric Name field, type the fabric name that you assigned in step 2 on page 19.

21. In the Primary field, choose the node that you selected in step 1 on page 19. If you want to assign another primary node, you must assign another node to the switch fabric. See step 1 on page 19 for instructions on assigning nodes to a switch fabric.

22. Select the switch board from the Primary's Switch Board pull-down list.

23. Select the jack label from the Primary's Jack Label pull-down list.

24. Select a new backup node name from the Backup pull-down list (or keep the default name).

25. Click **OK**.

The IBM Netfinity SP Switch is now configured and started. The Switch Manager Services (SMS) window displays the nodes attached to the switch fabric

Configuring a switch fabric using 12 IBM Netfinity SP Host adapters on dual switch cards

> **Note**
>
> - The IBM Netfinity SP Switch Card Option is required to support this configuration.
> - The selected node is used as the primary node.
> - Assign one node to the switch fabric. All other unassigned nodes that are members of the cabled hardware topology are assigned to the switch fabric when it is started.
> - The switch fabric name must be unique.

From the IBM Netfinity SP Switch Administrator window:

1. Using the right mouse button, click a node in the Unassigned nodes list to assign the node to the switch fabric.
2. Click **Assign fabric name**.
3. The Assign fabric name window opens.

4. Type the name of the IBM Netfinity SP Switch fabric that you want to use. The node selected is assigned to this switch fabric.
5. Click **OK**.

   The Switch Manager Services (SMS) window displays the switch fabric.
6. Using the right mouse button, click the fabric name under the Fabrics folder.
7. Click **Configure**.
8. The Configure Topology window opens.

   This figure represents a possible 12-node configuration on two switch cards with two IBM Netfinity SP Host adapters and two IBM Netfinity SP 0.53 M cables. The second IBM Netfinity SP 0.53 M cable provides improved network throughput for the switch cards.
9. Select the 12-node configuration from the Topology pull-down list.
10. Type the switch board name that correctly represents the IBM Netfinity SP Switch. The name can be a total of 18 characters. The last two characters must be `/A` or `/B`. The `A` or `B` corresponds to the side of the IBM Netfinity SP Switch where the switch cards and interposers are installed. `A1` through `A8` and `B1` through `B8` are stamped into the rear of the IBM Netfinity SP Switch above the installed interposers.

11. Cable one end of the first 0.53 M cable to port A7 and the other end of the cable to port B2. Cable one end of the second 0.53 M cable to port A8 and the other end of the cable to port B1 as specified in the wiring diagram window.

12. Click **OK**.

13. The Wiring Instructions window opens.

    Use the cabling instructions in this window as a guide for the IBM Netfinity SP Host adapter connections from the nodes to the switch card connections (interposers) on the IBM Netfinity SP Switch.

14. Loosen the two thumbscrews holding the two cable-retaining bars on the cable-management tray on the IBM Netfinity SP Switch (one thumbscrew on each cable-retaining bar) and remove the cable-retaining bars. You will replace the cable-retaining bars after you have cabled each node to the IBM Netfinity SP Switch.

15. Using an IBM Netfinity SP Switch cable, attach one end of the cable to the IBM Netfinity SP Host adapter.

16. Lay the other end of the IBM Netfinity SP Switch cable across the cable-retaining block and attach the 50-pin connector to an available interposer card on the rear of the IBM Netfinity SP Switch.

17. Repeat steps 15 and 16 for each cable that you want to attach.

18. Replace the cable-retaining bars.

19. Click **OK**. You are returned to the IBM Netfinity SP Switch Administrator window. The switch fabric is configured on both IBM Netfinity SP Host adapters and is ready to be brought online. Power-off and then power-on the IBM Netfinity SP Switch to reset the internal switch clock and synchronize the two switch cards.

20. Using the right mouse button, click the switch fabric name and click **On-line**.

21. The Start Fabric window opens.

22. In the Fabric Name field, type the fabric name that you assigned in step 2 on page 21.

23. In the Primary field, select the node that you chose in step 1 on page 21. If you want to assign another primary node, you must assign another node to the switch fabric. See step 1 on page 21 for instructions on assigning nodes to a switch fabric.

24. Select the switch board from the Primary's Switch Board pull-down list.

25. Select the jack label from the Primary's Jack Label pull-down list.

26. Select a new backup node name from the Backup pull-down list (or keep the default name). The primary and backup nodes must not be the same.

27. Click **OK**.

The IBM Netfinity SP Switch is now configured and started.
The Switch Manager Services (SMS) window displays the
nodes attached to the switch fabric.

Configuring a switch fabric using 14 IBM Netfinity SP Host adapters on dual switch cards

> **Note**
>
> - The IBM Netfinity SP Switch Card Option is required to support this configuration.
> - The selected node is used as the primary node.
> - Assign one node to the switch fabric. All other unassigned nodes that are members of the cabled hardware topology are assigned to the switch fabric when it is started.
> - The switch fabric name must be unique.

From the IBM Netfinity SP Switch Administrator window:

1. Using the right mouse button, click a node in the Unassigned nodes list to assign the node to the switch fabric.
2. Click **Assign fabric name**.
3. The Assign fabric name window opens.

4. Type the name of the IBM Netfinity SP Switch fabric that you want to use. The node name that you typed is assigned to this switch fabric.
5. Click **OK**.

   The Switch Manager Services (SMS) window displays the switch fabric.

6. Using the right mouse button, click the fabric name under the Fabrics folder.
7. Click **Configure**.
8. The Configure Topology window opens.

   This figure represents a possible 14-node configuration on two switch cards with two IBM Netfinity SP Host adapters and one IBM Netfinity SP 0.53 M cable.

9. Select 14-node configuration from the Topology pull-down list.
10. Type the switch board name that correctly represents the IBM Netfinity SP Switch. The name can be a total of 18 characters. The last two characters must be /A or /B. The A or B corresponds to the side of the IBM Netfinity SP Switch where the switch cards and interposers are installed.   A1 through A8 and B1 through B8 are stamped into the rear of the IBM Netfinity SP Switch above the installed interposers.

11. Cable one end of the 0.53 M cable to port `A8` and the other end of the cable to port `B1` as specified in the wiring diagram window.
12. Click **OK**.
13. The Wiring Instructions window opens.

    Use the cabling instructions in this window as a guide for the IBM Netfinity SP Host adapter connections from the nodes to the switch card connections (interposers) on the IBM Netfinity SP Switch.
14. Loosen the two thumbscrews holding the two cable-retaining bars on the cable-management tray on the IBM Netfinity SP Switch (one thumbscrew on each cable-retaining bar) and remove the cable-retaining bars. You will replace the cable-retaining bars after you have cabled each node to the IBM Netfinity SP Switch.
15. Using an IBM Netfinity SP Switch cable, attach one end of the cable to the IBM Netfinity SP Host adapter.
16. Lay the other end of the IBM Netfinity SP Switch cable across the cable-retaining block and attach the 50-pin connector to an available interposer card on the rear of the IBM Netfinity SP Switch.
17. Repeat steps 15 and 16 for each cable that you want to attach.
18. Replace the cable-retaining bars.
19. Click **OK**. You are returned to the IBM Netfinity SP Switch Administrator window. The switch fabric is configured on both IBM Netfinity SP Host adapters and ready to be brought online. Power-off and then power-on the IBM Netfinity SP Switch to reset the internal switch clock and synchronize the two switch cards.
20. Using the right mouse button, click the switch fabric name and click **On-line**.
21. The Start Fabric window opens.
22. In the Fabric Name field, type the fabric name that you assigned in step 2 on page 24.
23. In the Primary field, select the node that you chose in step 1 on page 24. If you want to assign another primary node, you must assign another node to the switch fabric. See step 1 on page 24 for instructions on assigning nodes to a switch fabric.
24. Select the switch board from the Primary's Switch Board pull-down list.
25. Select the jack label from the Primary's Jack Label pull-down list.
26. Select a new backup node name from the Backup pull-down list (or keep the default name). The primary and backup nodes must not be the same.
27. Click **OK**.

The IBM Netfinity SP Switch is now configured and started.
The Switch Manager Services (SMS) window displays the
nodes attached to the switch fabric.

Managing the IBM Netfinity SP Switch fabric

> **Note**
>
> Do not run the IBM Netfinity SP Switch Administrator software from a secondary node if the secondary node does not have an external network adapter.

The following commands are available through the Switch Manager Services (SMS) software to manage the IBM Netfinity SP Switch. These switch fabric commands are run from the IBM Netfinity SP Switch Administrator menu bar, or by right-clicking the switch fabric or node in the IBM Netfinity SP Switch Administrator window.

- Command
  - **Off-line**: This command can be issued on a switch fabric or on an individual server (node). You can use the Off-line command to take a switch fabric offline. The servers (nodes) attached to this switch fabric cannot be accessed through the IBM Netfinity SP Switch while the switch fabric is offline.

    Using the right mouse button, click a node to perform the same command on a node instead of a switch fabric:
    - **Off-Line:** This command will bring a node offline and stop network IP traffic from flowing through this node
  - **On-line**: This command can be issued on a switch fabric or on an individual server (node). The On-line command brings the switch fabric online and allows the servers (nodes) to send data across the network.

    Using the right mouse button, click a node to perform the same command on a node instead of a switch fabric:
    - **On-Line:** This command will bring a node online and allow network IP traffic to flow through this node
  - **Configure**: This command can be issued on a switch fabric or on a switch card. This command cannot be issued on an individual server (node). The Configure command opens the Configure Topology window. You can configure the IBM Netfinity SP Switch fabric by following the hardware cabling shown in the window.
  - **Properties**: This command can be issued only on a switch fabric and cannot be issued on an individual server (node). The Properties command opens the Fabric Properties Discovery window and lists all of the servers (nodes) attached to the switch fabric and the status of the nodes.

- **Assign Fabric**: This command is issued from a server (node) in the Unassigned Node list. This command opens the Assign Fabric Name window. Servers (nodes) are assigned to this switch fabric and can be used after configuration. The assigned fabric name must be unique (unique to other switch fabrics) and cannot exceed 16 characters in length. All unassigned nodes that are members of the cabled hardware topology are assigned to the switch fabric when the switch fabric is started.
  - **Exit**: This command closes the IBM Netfinity SP Switch Administrator window. Communication through the IBM Netfinity SP Switch is not interrupted.
- View
  - **Toolbar**: You can use this command to toggle the toolbar on or off.

    By clicking the icons (located below the menu bar), you can select a direct path or shortcut to the following commands:
    - View Large Icons
    - View Small Icons
    - View Node List
    - View Node Details
    - View Current Messages
    - View All Messages
  - **Status Bar**: This command shows or hides the switch fabric status bar located at the bottom of the IBM Netfinity SP Switch Administrator window. The status bar displays the definition of the Menu Bar commands when the mouse pointer highlights the command.
  - **Refresh**: This command activates a query on the switch fabric and updates the contents of the IBM Netfinity SP Switch Administrator windows with the latest status of the switch fabric.
  - **Large Icons**: This command displays the servers (nodes) in the IBM Netfinity SP Switch Administrator window as large icons.
  - **Small Icons**: This command displays the servers (nodes) in the IBM Netfinity SP Switch Administrator window as small icons.
  - **List**: This command displays the server (node) names in the IBM Netfinity SP Switch Administrator window.
  - **Details**: This command displays the server (node) names in the IBM Netfinity SP Switch Administrator window and displays the server (node):
    - Node number
    - Personality
    - External IP address
    - SP switch IP address

- Node PCI slot number
- Jack label
– **All Messages**: This command displays any
  messages generated from all of the switch
  fabrics with network connectivity to the node
  where the IBM Netfinity SP Switch Administrator
  is running.
– **Current Messages**: This command displays the
  messages generated from the selected switch
  fabric that is managed by the IBM Netfinity SP
  Switch Administrator.
– **Options**: This command opens the Options
  window so that you can add or remove network
  IP addresses or host names. These IP
  addresses or host names are resolved to a
  subnet mask and expand the search capability
  for the IBM Netfinity SP Switch Administrator in
  relation to other switch fabrics and unassigned
  nodes. The Default language selection on the
  Options window selects the language conforming
  to the code page loaded by the Windows NT
  operating system. The current supported
  languages are:
    - English
    - French
    - German
    - Italian
    - Spanish
    - Japanese
  Click **OK** to save the selections or click **Cancel**
  to close this window and keep the default
  selections.
- Help
  – **Help Contents**: This displays a help index.
  – **About**: The version/release of the IBM Netfinity
    SP Switch Administrator.

Using the IBM Netfinity SP Switch Configuration Utility

> **Important**
>
> 1. The IBM Netfinity Advanced Systems Management PCI adapter must be installed in the node and its accompanying device drivers installed and operational before using the IBM Netfinity SP Switch Configuration Utility. The latest device drivers are on the IBM WEB site at:
>
>   http://www.ibm.com/pc/support
>
>   a. Under Select a Brand, click **Server**.
>   b. Under Select the family click **IBM Netfinity 7000 M10**.
>   c. Under Technical information click **Downloadable files**.
>   d. Download the correct device drivers.
>
>   For more information on the IBM Netfinity Advanced Systems Management PCI adapter, see the *Advanced System Management* section of the server library.
>
> 2. Take the switch fabric offline before you power-off the IBM Netfinity SP Switch through the configuration utility.

This section describes the IBM Netfinity SP Switch Configuration Utility. To use the configuration utility, the IBM Netfinity Advanced System Management PCI adapter must be installed in the server with an IBM Netfinity Advanced System Management Interconnect Cable option. Using a standard, customer supplied, 10BaseT Ethernet cable, connect one end of the cable to the RS485 port on the rear of the IBM Netfinity SP Switch, and the other end to the Advanced System Management Interconnect Cable option on the server.
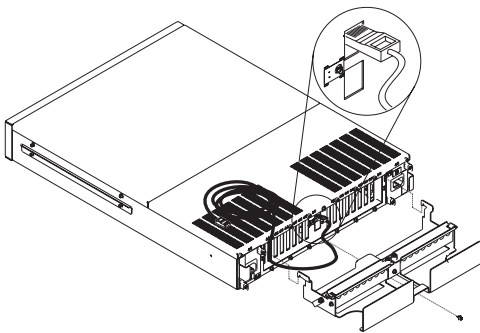
Refer to the *IBM Netfinity Advanced System Management PCI Adapter Installation Instructions* book for information on installing and using the advanced system management adapter.

Refer to the *IBM Netfinity Advanced System Management Interconnect Cable Option* book for information on installing and using the interconnect cable option.

The configuration utility allows communication from a server to an IBM Netfinity SP Switch through the RS485 port and the power backpane. The configuration utility:

- Displays the status of the IBM Netfinity SP Switch
- Turns power on or turns power off to the IBM Netfinity SP Switch
- Changes the name displayed on the IBM Netfinity SP Switch
- Displays any alerts generated by the IBM Netfinity SP Switch
- Displays all IBM Netfinity SP Switch units attached to the RS485 bus.

To start the IBM Netfinity SP Switch Configuration Utility:

1. Click **Start** → **Programs**.
2. Click the program folder where the IBM Netfinity SP Switch Administrator was installed.
3. Double-click **Switch Configuration Utility**. The Switch Configuration Utility window opens.

4. Choose the task you wish to perform on the IBM Netfinity SP Switch from the buttons provided. The status messages are displayed in the Switch Status window. Any alerts encountered are displayed in the Alerts window. Press the Refresh button for up-to-date status on the selected switch.

Using the Switch Port Reservation Utility

This section describes the IBM Netfinity SP Switch Port Reservation Utility.

To start the Switch Port Reservation Utility:

1. Click **Start** → **Programs**.
2. Click the program folder where the IBM Netfinity SP Switch Administrator was installed.
3. Double-click **Switch Port Reservation Utility**. The IBM Netfinity SP Switch Port Reservation Utility window opens.

The IBM Netfinity SP Switch software uses the TCP/IP Services file to allow network access to the switch fabric services. A default port number of 6745 is used. If this port number is not available in the TCP/IP Services file, use the port reservation utility to assign a new port number for the IBM Netfinity SP Switch Administrator software. The same port number must be used on all servers (nodes).

°

Locations/Removals

The following information supports the IBM Netfinity SP
Switch.

Cable management and labeling

Cable management and labeling are increasingly important. Cable management and labeling needs have expanded from the traditional labeling of network connections to labeling most cable connections among the servers, disk subsystems, multiple network connections, power configurations, and video subsystems. Examples include fibre-channel configurations, server switch fabrics, multiple unique switch fabrics located in the same rack or across multiple racks, and switch fabrics where components might not be physically located in the same room, building, or site.

The necessity for detailed cable management and labeling is due to the complexity of today's configurations and the potential distances between components. Benefits from more detailed cable management and labeling include:

- Ease of installation
- Ongoing switch fabric and systems management
- Increased serviceability

Be sure to label the cables. Refer to the IBM support Web site at:

http://www.pc.ibm.com/support

1. Click **IBM Server Support** on the left side of the Web page.
2. Click **Hints and Tips** on the right side of the Web page.
3. Click **Configuration** on the right side of the Web page.
4. Click **Servers - Cable management and labeling for solutions utilizing racks, n-node switch fabrics or fiber channel**. for detailed instructions on how to label the IBM Netfinity switch fabric.

Installing the IBM Netfinity SP Switch into an IBM 9306 Model 900 PC Server Rack Enclosure
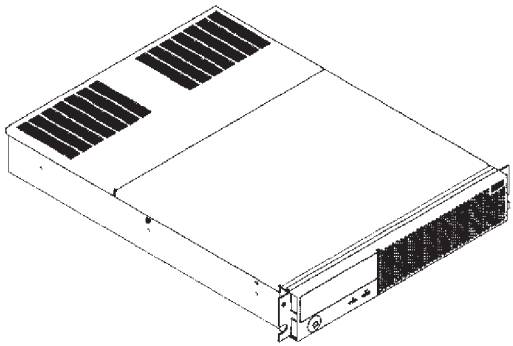
The IBM Netfinity SP Switch consists of the following major hardware components:

- One 8-port switch card (an optional 8-port switch card is available separately)
- Eight interposer cards, one for each port on the switch card
- Two power supplies
- Two power converter cards
- Two fan assemblies, each containing two fans
- One power backplane card
- One display panel with a 2-row by 16-character display panel, power indicator, fault indicator, on/off switch, and two display (cursor) control buttons
- One cable-management tray
- Two RS485 jack assemblies

The following steps describe installing an IBM Netfinity SP Switch into an IBM 9306 Model 900 PC Server Rack Enclosure.

> **Important**
>
> - At least one or two servers (nodes) must be in the same rack as the IBM Netfinity SP Switch.
> - You must install cage nuts (provided in the IBM Netfinity SP Switch package) in the appropriate holes in the IBM 9306 Model 900 PC Server Rack Enclosure. These cage nuts are required to receive the screws for the IBM Netfinity SP Switch. Use the Cage Nut Insertion Tool (provided in the IBM 9306 Model 900 PC Server Rack Enclosure package) to correctly install the cage nuts.
> - Two people might be needed to install the IBM Netfinity SP Switch into the IBM 9306 Model 900 PC Server Rack Enclosure.

Refer to *IBM 9306 Model 900 Netfinity Rack Planning and Installation Guide* for detailed hardware installation instructions.

1. Review the safety information provided with the IBM server.
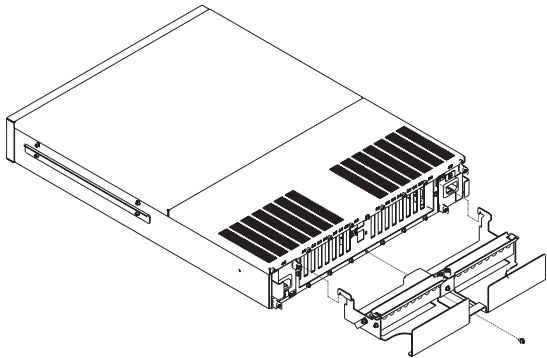
2. From the rear of the IBM Netfinity SP Switch, loosen the center-bottom screw with a flat-blade screwdriver.
3. Slide the two cable-management tray hooks (one on each side of the cable-management tray) into the two slots located on the IBM Netfinity SP Switch (located between the two power supplies) and slip the cable-management tray center slot over the screw loosened in step 2. Tighten the center-bottom screw.
4. Select an available 2U slot on the IBM 9306 Model 900 PC Server Rack Enclosure (referred to as the rack).
5. Using the Cage Nut Insertion Tool, install four cage nuts in the rear slots selected (two for the left rail and two for the right rail) and four cage nuts in the front slots selected (two for the left rail and two for the right rail) to hold the screws for the IBM Netfinity SP

Switch rails and proceed to the next step to prepare the left rail (marked *L*) to be installed in the rack.

6. Loosen the two adjustment screws in the center of the rail to allow the rail to be extended to fit the rack.

7. From the front of the rack, align the bottom-front hole of the rail with the front hole of the slot; then insert and hand tighten the screw provided.

8. From the rear of the rack, adjust the rail to the correct depth of the rack, and align the two rear holes of the rail with the two rear holes on the slot of the rack.

9. Insert two screws (provided with the rails) into the aligned holes and tighten them with a flat-blade screwdriver.

10. Tighten the two rail-adjustment screws to lock the adjusted rail that allows the IBM Netfinity SP Switch to slide along the rails.
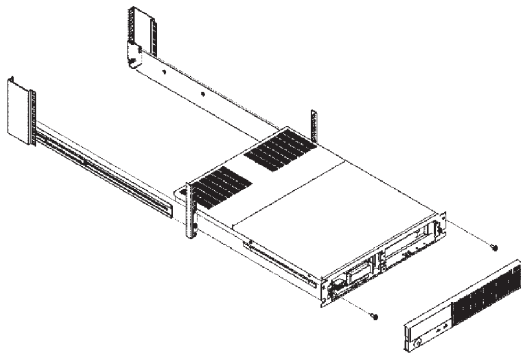
11. Repeat steps 6 through 10 to install the right rail (marked *R*) into the rack.

12. From the front of the rack, slide the IBM Netfinity SP Switch along the previously installed rails (insert the rear of the switch into the rails first).

13. From the front of the rack, align the left and right sides of the IBM Netfinity SP Switch mounting screw holes with the left and right screw holes in the slot (the screw holes are located above the front rail screws). Insert and hand-tighten the screws.
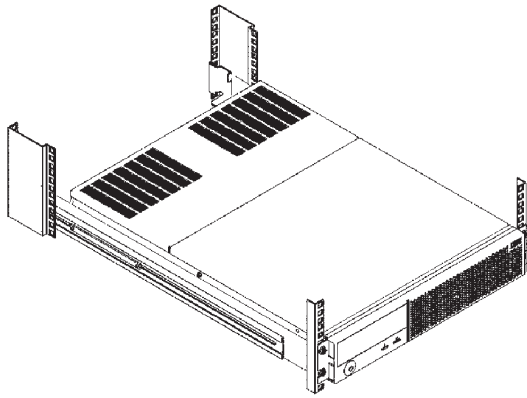
14. Tighten all screws.

> **Note**
>
> An APC Smart-UPS or similar uninterruptable power supply is necessary to provide backup electrical power. Refer to *APC Smart-UPS Uninterruptible Power Supply Model 1400/3000* for detailed power connection instructions.

15. From the rear of the IBM Netfinity SP Switch, connect a power cord to the right power supply and a power cord to the left power supply.

Installing an IBM Netfinity SP Host adapter

The following steps describe installing the IBM Netfinity SP Host adapter into an available PCI slot on an IBM Netfinity 7000 M10.

Important

1. The Power Control button on the front of the server does not turn off the electrical current supplied to the server. The server also might have more than one power cord. To remove all electrical current from the server, ensure that all power cords are disconnected from the power source. Refer to the *IBM Netfinity 7000 M10 Server Library* legal and safety information for safety concerns while installing this adapter.
2. If you have configured the server for one IBM Netfinity SP Host adapter and you are upgrading the server with a second IBM Netfinity SP Host adapter, install the second IBM Netfinity SP Host adapter in a PCI slot with a higher PCI bus address. Refer to the I/O components section of the *IBM 7000 M10 Server Library* for detailed hardware information.
3. If you have installed two IBM Netfinity SP Host adapters in the server, and you want to disable one of the adapters, remove the IBM Netfinity SP Host adapter from the Windows NT properties. To remove the adapter properties:
    a. Click **Start** → **Settings** → **Control Panel**.
    b. Double-click **Network**.
    c. Click **Adapters**.
    d. Click **IBM Netfinity SP Host adapter**.
    e. Click **Remove**.
   Physically remove the IBM Netfinity SP Host adapter from the server.
4. Label the IBM Netfinity SP Switch cables for future reference.
5. The wrap plug that is packaged with the IBM Netfinity SP Switch should be stored in a safe place should diagnostic testing be required.

---

1. Review the safety information provided with the IBM server.
2. Install an IBM Netfinity SP Host adapter into an available PCI slot in each IBM Netfinity 7000 M10. If you purchased an additional IBM Netfinity SP Host adapter, install it into another available PCI slot in the server.

   Refer to the option installation section of the *IBM Netfinity 7000 M10 Server Library* and to the *IBM Netfinity SP Host adapter Installation and User's Guide* for detailed installation instructions.

Replacing parts

The following section provides information on replacing certain failed components in the IBM Netfinity SP Switch.

Note

The following components in the IBM Netfinity SP Switch are **hot-swappable** or **hot-swap** components.

- Two power supplies
- Two power converter cards
- Two fan assemblies, each containing two fans

Removing the front bezel
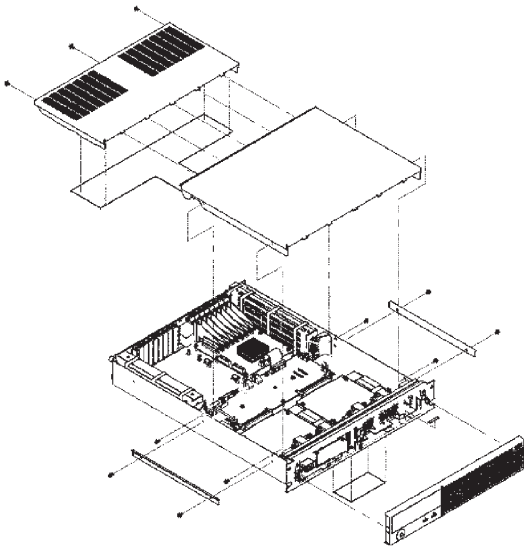
Remove the front IBM Netfinity SP Switch bezel by grasping the ends of the front bezel firmly, and gently pulling it forward, tilting the bezel slightly downwards as you pull it forward.

Replacing the A fan assembly
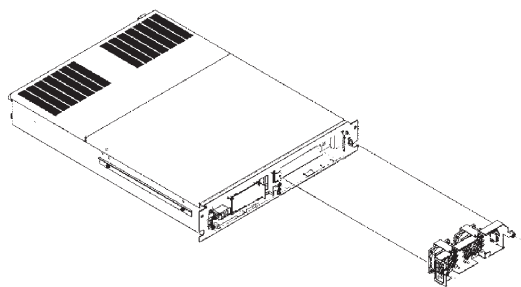
1. Remove the front IBM Netfinity SP Switch bezel by grasping the ends of the front bezel firmly, and gently pulling it forward, tilting the bezel slightly downwards as you pull it forward.
2. With a Philips-head screwdriver, loosen the two screws located to the left and right of the A fan assembly (labelled "A" fan assembly).
3. Grasp the tab in the top center of the A fan assembly and gently pull the A fan assembly forward.
4. Replace the A fan assembly and reverse the previous procedures to reassemble the IBM Netfinity SP Switch.

Replacing the B fan assembly
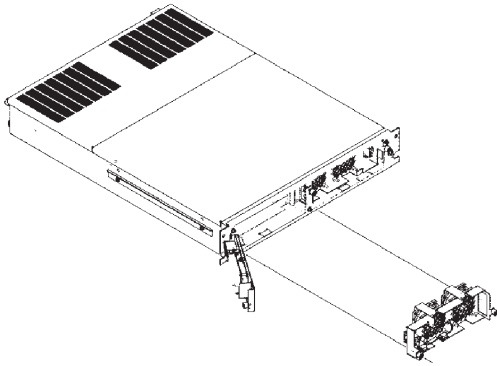
1. Remove the front IBM Netfinity SP Switch bezel by grasping the ends of the front bezel firmly, and gently pulling it forward, tilting the bezel slightly downwards as you pull it forward.
2. Remove the display panel assembly by loosening the screw (located to the right of the display panel) with a Philips-head screwdriver.
3. Swing the display panel from right to left on the hinged-support to free a path to remove the B fan assembly.
4. With a Philips-head screwdriver, loosen the two screws located to the left and right of the B fan assembly (labelled "B" fan assembly).
5. Grasp the tab in the top center of the B fan assembly and gently pull the B fan assembly forward.
6. Replace the B fan assembly and reverse the previous procedures to replace the display panel and reassemble the IBM Netfinity SP Switch.

Replacing the A power converter card.
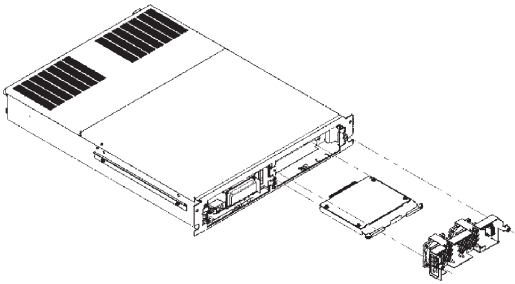
1. Follow the procedures in section "Removing the front bezel" on page 41 to remove the front bezel and section "Replacing the A fan assembly" on page 42 to remove the A fan assembly.
2. Pull the power converter card bracket levers (one to the right and one to the left of the power converter card bracket) forward simultaneously to release the adapter from the power backplane and gently slide the entire power converter card bracket forward and out of the power converter card bracket rails holding it.
3. Slide the new power converter card along the power converter card bracket rails until contact is made with the power backplane.
4. Simultaneously close the power converter card bracket levers (one to the right and one to the left of the power converter card bracket) by pressing forward on them until they latch securely .
5. Replace the A fan assembly and reassemble the IBM Netfinity SP Switch.

Replacing the B power converter card
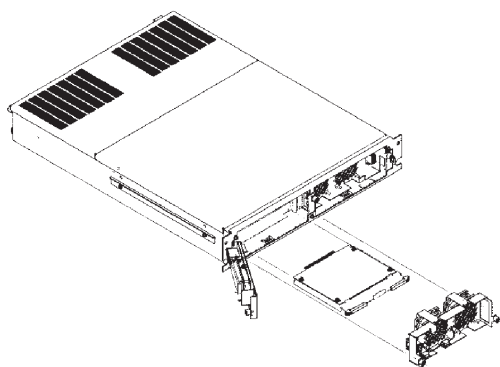
1. Follow the procedures in section "Removing the front bezel" on page 41 to remove the front bezel and section "Replacing the B fan assembly" on page 43 to remove the B fan assembly.
2. Pull the power converter card bracket levers (one to the right and one to the left of the power converter card bracket) forward simultaneously to release the adapter from the power backplane and gently slide the entire power converter card bracket forward and out of the power converter card bracket rails holding it.
3. Slide the new power converter card along the power converter card bracket rails until contact is made with the power backplane.
4. Simultaneously close the power converter card bracket levers (one to the right and one to the left of the power converter card bracket) by pressing forward on them until they latch securely .
5. Replace the B fan assembly and reassemble the IBM Netfinity SP Switch.

Replacing the A power supply

Note

Each power supply is keyed to fit into the rear of the
IBM Netfinity SP Switch in only one way.

---
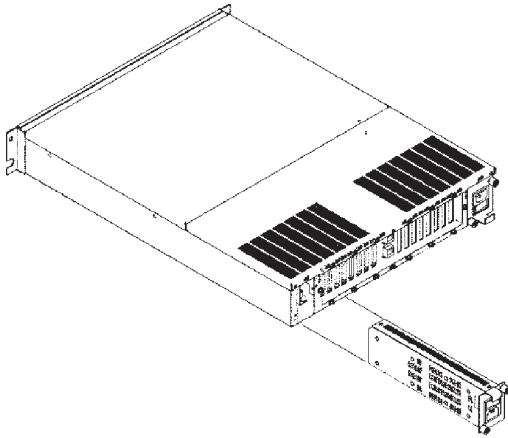
1. At the rear of the IBM Netfinity SP Switch, on the side
   marked "A", unplug the power cord to the power
   supply.
2. Loosen the two screws on the power supply with a
   Philips-head screwdriver.
3. Grasp the tab at the top center of the power supply
   and firmly pull the power supply supply straight out of
   the IBM Netfinity SP Switch.
4. Replace with a new power supply and tighten the two
   screws provided.
5. Plug in the power cord.

Replacing the B power supply

> **Note**
>
> Each power supply is keyed to fit into the rear of the
> IBM Netfinity SP Switch in only one way.
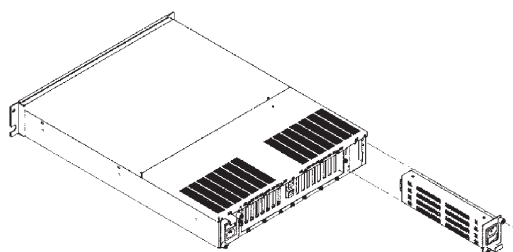
1. At the rear of the IBM Netfinity SP Switch, on the side
   marked "B", unplug the power cord to the power
   supply.
2. Loosen the two screws on the power supply with a
   Philips-head screwdriver.
3. Grasp the tab at the top center of the power supply
   and firmly pull the power supply straight out of the
   IBM Netfinity SP Switch.
4. Replace with a new power supply and tighten the two
   screws provided.
5. Plug in the power cord.

- One display panel
- Eight interposers
- One switch card
- One power backplane

Servicing the IBM Netfinity SP Switch non-hot-swappable components

> **Important**
>
> 1. To service components in the IBM Netfinity SP Switch that are not hot-swappable, you must power-down the IBM Netfinity SP Switch and remove all cables (including any power cables and any IBM Netfinity SP Switch cables) from the rear of the IBM Netfinity SP Switch.
> 2. If you are required to uncable the IBM Netfinity SP Switch for service, it is important for you to have labelled the cables at this time. Please refer to section "Cable management and labeling" on page 34 in this document for cable management.
> 3. You are **not** required to uncable the IBM Netfinity SP Switch when servicing the Vacuum Fluorescent Display (VFD).

The following service procedures require that the IBM Netfinity SP Switch and each server (node) be powered-down. Please follow these instructions to power-down the servers (nodes) and the IBM Netfinity SP Switch.

1. Shutdown each server (node) in the switch fabric.
2. At the completion of each server (node) shutdown, power-down the IBM Netfinity SP Switch.
3. Unplug the power cords from their supply source.
4. From the rear of the rack where the IBM Netfinity SP Switch is installed, remove the power cords from each of the power supplies.
5. Unplug and remove each of the IBM Netfinity SP Switch cables.
6. From the front of the rack, loosen the left IBM Netfinity SP Switch mounting screw from the left rail and remove it.
7. Loosen the right IBM Netfinity SP Switch mounting screw from the right rail and remove it.
8. Remove the front IBM Netfinity SP Switch bezel by grasping the ends of the front bezel firmly, and gently pulling it forward, tilting the front bezel slightly downwards as you pull it.
9. From the front of the rack and IBM Netfinity SP Switch, slide the IBM Netfinity SP Switch forward along the rails and remove it from the rack. Place the IBM Netfinity SP Switch on a flat stable surface, such as a work table, to service the unit.
10. With a flat-blade screwdriver, remove the four screws that hold the top front IBM Netfinity SP Switch cover (two screws on each side of the IBM Netfinity SP Switch).

11. With a flat-blade screwdriver, remove the two screws from each rear corner of the rear IBM Netfinity SP Switch ventilated cover.
12. Lift and remove the rear IBM Netfinity SP Switch ventilated cover first.
13. Lift and remove the IBM Netfinity SP Switch front cover next.
14. The following internal servicable parts can now be removed.

- See "Replacing the Vacuum Florescent Display (VFD) unit" on page 50.
- See "Replacing the Interposers" on page 51.
- "Replacing the switch card" on page 52.
- "Replacing the power backplane" on page 53..

Replacing the Vacuum Florescent Display (VFD) unit

To replace the Vacuum Florescent Display (VFD) in the IBM Netfinity SP Switch, please follow these instructions:

1. Power-down the IBM Netfinity SP Switch.
2. Remove the front IBM Netfinity SP Switch bezel by grasping the ends of the front bezel firmly, and gently pulling it forward, tilting the front bezel slightly downwards as you pull it.
3. Loosen the VFD screw (located to the right of the VFD) with a Philips-head screwdriver.
4. Swing the VFD from right to left on the VFD hinged-support away from the IBM Netfinity SP Switch.
5. Unplug the ribbon cable located in the back of the VFD.
6. Remove the VFD from its hinged-support by tilting the VFD upwards at a forty-five degree angle and removing it from the VFD hinged-support slot on the front frame of the IBM Netfinity SP Switch.
7. Replace the VFD and follow the reverse procedures above to reassemble the IBM Netfinity SP Switch.

Replacing the Interposers

To replace one or more Interposer cards, please follow
these instructions:

1. With a Philips-head screwdriver, loosen the top
   spring-loaded Interposer card screw and remove the
   failed card.
2. Replace the failed Interposer card by inserting it firmly
   into the switch card.
3. Tighten the top spring-loaded Interposer screw and
   proceed to "Reassembling the IBM Netfinity SP
   Switch after service" on page 54.

Replacing the switch card

To replace the switch card, please follow these instructions:

1. With a Philips-head screwdriver, loosen the top spring-loaded Interposer card screws and remove each Interposer card from the switch card.
2. With a flat-blade screwdriver, remove the six screws (three on each side of the switch card) that hold the switch card onto the IBM Netfinity SP Switch.
3. Remove the failed switch card and replace it with a new card.
4. Reinstall the Interposers.
5. Connect one end of the IBM Netfinity Switch Card cable to the 30-pin connector on the switch card and the other end to the 30-pin connector on the power backplane.
6. Go to "Reassembling the IBM Netfinity SP Switch after service" on page 54.

Replacing the power backplane

> **Note**
>
> After replacing the power backplane and reassembling the IBM Netfinity SP Switch, the box serial number must be programmed into the VPD of the new power backplane. For detailed instructions on programming the VPD of the replacement power backplanes, go to the IBM support Web site at:
>
> http://www.ibm.com/pc/support
>
> 1. Under Select a Brand, click **Server.**
> 2. Under Select your Family, click **Clustering.**
> 3. Under Technical Information, click **Downloadable Files.**
> 4. Click **All.**
> 5. Click **IBM Netfinity Switch - Programming box serial number in the VPD of a replacement power backplane.**

To replace the power backplane, please follow these instructions:

1. Unplug the VFD ribbon cable from the front left of the power backplane.
2. Unplug the power supply cables from the left and right sides of the power backplane.
3. Unplug the fan assembly power cables from the left and right sides of the power backplane.

   > **Attention**
   >
   > To avoid bending the locating pins on power backplane, unplug the power converter card(s) before you remove the power backplane screws.

4. Unplug the power backplane from each power converter card, remove the failed power backplane and replace it with a new card.
5. Remove the nine screws (3 located on the front of the card, 2 located in the middle of the card, and 4 on the back edge of the card) that hold the power backplane onto the IBM Netfinity SP Switch.
6. Recable the new power backplane.
7. Go to "Reassembling the IBM Netfinity SP Switch after service" on page 54.

Reassembling the IBM Netfinity SP Switch after service

After you have replaced any failed components, please follow these steps to reassemble the IBM Netfinity SP Switch.

1. Replace the top front IBM Netfinity SP Switch cover.
2. With a flat-blade screwdriver, insert and tighten the four screws that hold the top front IBM Netfinity SP Switch cover (two screws on each side of the IBM Netfinity SP Switch).
3. Replace the rear IBM Netfinity SP Switch ventilated cover.
4. With a flat-blade screwdriver, insert and tighten the two screws from each rear corner of the rear IBM Netfinity SP Switch ventilated cover.
5. Reinsert the IBM Netfinity SP Switch into the IBM 9306 Model 900 PC Server Rack Enclosure and reinsert and tighten all screws.

   Refer to section "Installing the IBM Netfinity SP Switch into an IBM 9306 Model 900 PC Server Rack Enclosure" on page 35 in this document for rack hardware installation instructions.
6. From the rear of the rack, recable the IBM Netfinity SP Switch. Follow the cable labeling procedures that were established from the "Cable management and labeling" on page 34 section in this document.
7. From the rear of the rack, connect each power cord to the power supplies located in the rear of the IBM Netfinity SP Switch.
8. The IBM Netfinity SP Switch is now ready for use.

Symptom-to-FRU Index

This index supports IBM Netfinity SP Switch.

> **Notes**
>
> 1. Check the configuration before you replace a FRU. Configuration problems can cause false errors and symptoms.
> 2. For IBM devices not supported by this index, refer to the manual for that device.
> 3. Always start with "General checkout" on page 2.

The Symptom-to-FRU Index lists symptoms, errors, and the possible causes. The most likely cause is listed first. Use this Symptom-to-FRU Index to help you decide which FRUs to have available when servicing the computer.

Error codes

In the following error codes, *X* can be any number or letter.

Error Code/Symptom	FRU/Action
425-027-XXX (Switch Adapter Configuration/Setup Error)	1. **Cannot open device driver; install device driver**
425-25X-XXX (Failed Switch Adapter Test)	1. **Device driver error; reinstall device driver** 2. Diagnostic software error; reinstall diagnostics
425-26X-XXX (Failed Switch Adapter Test)	1. Hardware error; replace Switch Adapter PCI Card

Error symptoms

The following table list some error symptoms that might occur. The first column contains a description of the problem. The second column contains a brief explanation of the problem. The last column provides a course of actions to resolve the problem.

Error Symptom	Explanation	Action
Cannot communicate with a **Secondary Node**, but the server (node) is listed as part of the switch fabric in the Switch Manager Services (SMS).	This node was either disconnected from the IBM Netfinity SP Switch or there was a problem with the Switch Manager Services (SMS) and the **Primary Node** could not be informed.	Verify the physical cable connections between the **Secondary Node** and the IBM Netfinity SP Switch, and then reboot the **Secondary Node**. After a five minute wait, if the **Secondary Node** has not rejoined the switch fabric.
No **Primary** or **Backup** node is listed in the Switch Manager Services (SMS), but the **Secondary Nodes** can communicate in the Switch Manager Services (SMS).	Either the **Primary** and **Backup** nodes have been disconnected from the IBM Netfinity SP Switch or there has been a failure in the Switch Manager Services (SMS) on both the **Primary** and **Backup** nodes.	Verify the physical cable connections between the **Primary** and **Backup** nodes and the IBM Netfinity SP Switch, and then reboot the **Primary** and **Backup** nodes. Recreate the switch fabric on your original **Primary** node. If a problem occurs creating the switch fabric using your original **Primary** and **Backup** nodes, create the switch fabric on a **Secondary Node**. After the switch fabric has been created, if the previously defined **Primary** and **Backup** nodes do not join the switch fabric.

Error Symptom	Explanation	Action
IBM Netfinity SP Switch configuration error: error code xxx-yyy, from every server (node) in the switch fabric when an **Estart** command is issued.	All ports in the IBM Netfinity SP Switch are in an "Offline" state due to a **Primary** or **Backup** node reboot without first issuing a **Stop** command.	Shutdown all servers (nodes) and power-down the IBM Netfinity SP Switch (to recycle the IBM Netfinity SP Switch). At shutdown completion on all servers (nodes), power-on the IBM Netfinity SP Switch and restart all servers (nodes). This will clear all status codes in the IBM Netfinity SP Switch and allow the IBM Netfinity SP Switch to restart normally.

Vacuum Florescent Display (VFD) messages

The information that can be displayed in the VPD is limited to the following:

- Information messages from the IBM Netfinity SP Switch Configuration Utility
- Error and information messages from the IBM Netfinity SP Switch Subsystem

The following table describes information messages. The first column contains the message displayed on the VFD. The second column contains a brief explanation of the message. The last column provides a course of action:

Information Message	Explanation	Action
Netfinity M3529 S/N xxxxxxxx	The IBM Netfinity SP Switch model number and serial number are displayed, where xxxxxxxx is the machine serial number.	Any error messages detected will replace this message on the IBM Netfinity SP Switch display panel.
<KEEP>Remind Clr	All functions are displayed on the display panel.	Press the Scroll button to advance to the desired function. Press Enter to make your selection.

About Error Messages:

When an error condition occurs on the IBM Netfinity SP Switch, the error message is displayed on the first line of the VFD. The second line of the VFD is the action line for error message processing. There are 3 options on the action line of the VFD which are controlled by **Scroll** and **Enter** buttons on the front panel. The options are:

1. **Keep** to retain the message on the VFD and enable the system error light to continue to flash.
2. **Remind** to retain the message on the VFD and enable the system error light to flash slowly.
3. **Clear** to clear the message from the VFD and enable the system error light to stop flashing. An error message will only be cleared when some action is taken and the error is corrected or if the condition no longer exists.

The following table lists the error messages that might
appear on the VFD. The first column contains the
message displayed on the VFD. The second column
contains a brief explanation of the problem. The last
column provides a course of action to resolve the problem.

Error Message	Explanation	Action
Fan 1A Fail	Fan 1 Bank A; the fan speed has dropped below the levels required to cool the IBM Netfinity SP Switch.	Replace the A fan assembly.
Fan 2A Fail	Fan 2 Bank A; the fan speed has dropped below the levels required to cool the IBM Netfinity SP Switch.	Replace the A fan assembly.
Fan 1B Fail	Fan 1 Bank B; the fan speed has dropped below the levels required to cool the IBM Netfinity SP Switch.	Replace the B fan assembly.
Fan 2B Fail	Fan 2 Bank B; the fan speed has dropped below the levels required to cool the IBM Netfinity SP Switch.	Replace the B fan assembly.
Ambient Warm	The inlet (ambient) temperature has exceeded levels required for safe operation of the IBM Netfinity SP Switch.	Check for air-flow blockages on your IBM Netfinity SP Switch. If no air-flow blockage exists, replace the power backplane.
Switch A Warm	The A-side temperature of the switch card has exceeded levels required for safe operation of the IBM Netfinity SP Switch.	Check for air-flow blockages on your IBM Netfinity SP Switch. If no air-flow blockage exists, replace the power backplane.
Switch B Warm	The B-side temperature of the switch card has exceeded levels required for safe operation of the IBM Netfinity SP Switch.	Check for air-flow blockages on your IBM Netfinity SP Switch. If no air-flow blockage exists, replace the power backplane.
Ambient Hot	The inlet (ambient) temperature has exceeded levels required for safe operation of the IBM Netfinity SP Switch.	Check for air-flow blockages on your IBM Netfinity SP Switch. If no air-flow blockage exists, replace the power backplane.

Error Message	Explanation	Action
Switch A Hot	The A-side temperature of the switch card has exceeded levels required for safe operation of the IBM Netfinity SP Switch.	Check for air-flow blockages on your IBM Netfinity SP Switch. If no air-flow blockage exists, replace the power backplane.
Switch B Hot	The B-side temperature of the switch card has exceeded levels required for safe operation of the IBM Netfinity SP Switch.	Check for air-flow blockages on your IBM Netfinity SP Switch. If no air-flow blockage exists, replace the power backplane.
Power 1A Fail	Power supply 1A has failed.	Reseat power supply 1A. If this does not resolve the problem, replace power supply 1A.
Power 1B Fail	Power supply 1B has failed.	Reseat power supply 1B. If this does not resolve the problem, replace power supply 1B.
Power 2A Fail	Power converter card 2A has failed.	Reseat power converter card 2A. If this does not resolve the problem, replace power converter card 2A.
Power 2B Fail	Power converter card 2B has failed.	Reseat power converter card 2B. If this does not resolve the problem, replace power converter card 2B.
Power 1A Removed	Power supply 1A was not detected by the power backplane.	Ensure that power supply 1A has been installed. Reseat power supply 1A if it has already been installed in your IBM Netfinity SP Switch.

Error Message	Explanation	Action
Power 1B Removed	Power supply 1B was not detected by the power backplane.	Ensure that power supply 1B has been installed. Reseat power supply 1B if it has already been installed in your IBM Netfinity SP Switch.
Power 2A Removed	Power converter card 2A was not detected by the power backplane.	Ensure that power converter card 2A has been installed. Reseat power converter card 2A if it has already been installed.
Power 2B Removed	Power converter card 2B was not detected by the power backplane.	Ensure that power converter card 2B has been installed. Reseat power converter card 2B if it has already been installed.
Fan Bank A Remvd	Fan assembly A was not detected by the power backplane.	Ensure that fan assembly A has been installed. Reseat fan assembly A if it has already been installed.
Fan Bank B Remvd	Fan assembly B was not detected by the power backplane.	Ensure that fan assembly B has been installed. Reseat fan assembly B if it has already been installed.
Cable A Removed	The internal A cable was not detected by the power backplane.	Ensure that the RJ45 cable connection to the power backplane is installed. Reseat the RJ45 cable if it has already been installed.

Error Message	Explanation	Action
Cable B Removed	The internal B cable was not detected by the power backplane.	Ensure that the RJ45 cable connection to the power backplane is installed. Reseat the RJ45 cable if it has already been installed.
I2C Error	The power backplane card has failed.	Follow the instructions on power backplane.
REVnn TMPtt Aaa	nn is the microcode revision level, tt is the ambient temperature, and aa is the RS485 address.	Press Enter and then press the Scroll button to view the details.
swn=aaaaaaaa	n is switch card A or switch card B. • a is X if the IBM Netfinity SP Switch is untuned • a is T if the IBM Netfinity SP Switch send and receive commands are tuned • a is S if the IBM Netfinity SP Switch send command is tuned • a is R if the IBM Netfinity SP Switch receive command is tuned • a is Not Powered if the IBM Netfinity SP Switch does not have electrical power • a is Not Present if the IBM Netfinity SP Switch does not detect a switch card	Press Enter and then press the Scroll button to view the details.
Temp = tt (tt is in hexadecimal)	Where tt is the IBM Netfinity SP Switch temperature.	Press Enter and then the Scroll button to view other possible messages that might occur with a temperature error.
Status = ss	Where ss is the IBM Netfinity SP Switch status code for an I2C or power supply error.	Press Enter and then the Scroll button to view other possible messages that might occur.

Error Message	Explanation	Action
RPM = rrrr	Where rrrr is the IBM Netfinity SP Switch fan rpm error.	Press Enter and then the Scroll button to view other possible messages that might occur.
Detect = dd	Where dd is the IBM Netfinity SP Switch power supply error.	Press Enter and then the Scroll button to view other possible messages that might occur.
!!VPD error!!	The VPD area on the power backplane is corrupted. The !!VPD error!! will also be displayed on the IBM Netfinity SP Switch Configure Utility as the name of the failing device. The serial number of the failing device will be displayed in the Configure Utility as Errorxx, where xx is the RS 485 address assigned to the IBM Netfinity SP Switch.	Replace the power backplane. Go to "Replacing the power backplane" on page 53.

Parts Listing (IBM Netfinity SP Switch)
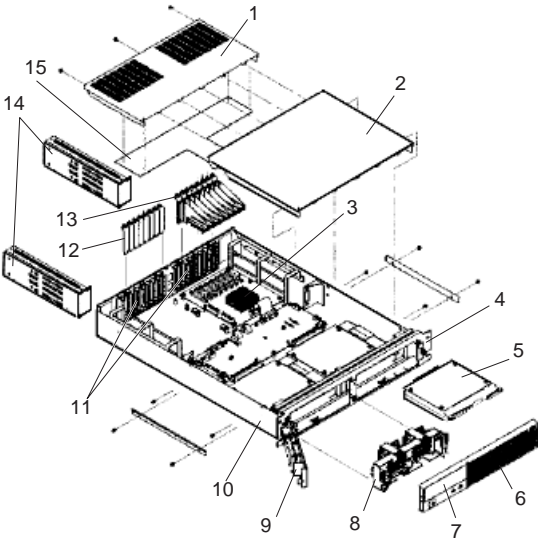
Index	Option (IBM Netfinity SP Switch)	FRU No.
1	Top Rear Cover	10L6874
2.	Top Front Cover	10L6873
3	Switch Card Assembly	01K7303
4	Bezel Bracket	10L6879
5	Power Card Assembly	01K7858
6.	Bezel Assembly	10L6869
7	Lens Bezel	10L6877
8	Fan Assembly with Bracket	10L6868
9	Front Panel LED Card Assembly	10L6867
10	Base Frame Assembly	10L6866
11	Interposer Brackets	10L6888
12.	Interposer Blank Bracket	10L6870
13	Interposer Assembly	26H3233
14	Power Supply 80 Watt	01K7857
15	Flex Plate	10L6876
	0.53M Communication Cable	05N4980
	2.3M Switch Communication Cable, optional	11J6106
	5M Switch Communication Cable, optional	46H9698
	10M Switch Communication Cable, optional	46H9699
	Cable Management Tray Assembly	00N6896
	Display to Power Backplane Card Assembly Cable	03K9216
	EMC Shield	10L6881
	Miscellaneous Parts Kit	00N6928
	Mounting Rail Kit	00N6897
	PCI Adaptor	31L8495
	PCI Adapter Assembly, optional	31L7741
	Power Backplane Card Assembly	01K7302
	Power Backplane Card Assembly to Fan Cable	03K9218
	Power Supply to Power Backplane Card Assembly Cable	03K9219
	Power Tray Bracket	10L6878
	Service Label	36L9918
	Switch Card to Power Backplane Card Assembly Cable	03K9217
	Power Backplane to RS485 Connector System Management Cable	03K9215
	VFD Assembly	12J4633
	Wrap plug	77G0818

Related service information

> **Important**
>
> The service procedures are designed to help you
> isolate problems. They are written with the
> assumption that you have model-specific training on
> all computers, or that are familiar with the computers,
> functions, terminology, and service information
> provided in this manual.

Safety information

The following section contains the safety information that you need to be familiar with before servicing an IBM server.

General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
    1. Ensure you can stand safely without slipping.
    2. Distribute the weight of the object equally between your feet.
    3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
    4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

    Remember: Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

Electrical safety

Caution

Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the server covers, unless instructed otherwise in the installation and configuration procedures.

Observe the following rules when working on electrical equipment.

Important

Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has *exposed* electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you.

    Remember: Another person must be there to switch off the power, if necessary.
  - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.

> **Remember:** There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.

- When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
- Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts *with the power on* when they are removed from their normal operating places in a machine:
  - Power supply units
  - Pumps
  - Blowers and fans
  - Motor generators

  and similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
  - **Use caution; do not become a victim yourself.**
  - **Switch off power.**
  - **Send another person to get medical aid.**

Safety inspection guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards 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 bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:
    a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
    b. The power cord should be the appropriate type as specified in the parts listings.
    c. Insulation must not be 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 unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.

2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

    Note: The use of a grounding system is desirable but not required to protect against ESD damage.

    – Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
    – Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
    – Use the round ground-prong of the AC plug on AC-operated computers.

Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

DANGER

Para evitar choques elétricos, não conecte ou desconecte nenhum cabo, nem efetue instalação, manutenção ou reconfiguração deste produto durante uma tempestade com raios.

Para evitar choques elétricos:

- O cabo de alimentação deve ser conectado a um receptáculo corretamente instalado e aterrado.
- Todos os equipamentos aos quais este produto será conectado devem também ser conectados a receptáculos corretamente instalados.

Quando possível, utilize uma das mãos para conectar ou desconectar cabos de sinal, para evitar um possível choque ao tocar duas superfícies com potenciais elétricos diferentes.

A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicação é perigosa. Para evitar choques elétricos, conecte e desconecte os cabos conforme descrito a seguir, ao instalar, movimentar ou abrir tampas deste produto ou de dispositivos conectados.

Para Conectar	**Para Desconectar**
1. DESLIGUE tudo.	1. DESLIGUE tudo.
2. Conecte primeiro todos os cabos nos dispositivos.	2. Remova primeiro o(s) cabo(s) de alimentação das tomadas.
3. Conecte os cabos de sinal nos receptáculos.	3. Remova os cabos de sinal dos receptáculos.
4. Conecte o(s) cabo(s) de alimentação nas tomadas.	4. Remova todos os cabos dos dispositivos.
5. LIGUE o dispositivo.	

⚠

CAUTION:
Ao substituir a bateria, utilize apenas o Número de Peça IBM 33F8354 ou um tipo de bateria equivalente recomendado pelo fabricante. Se seu sistema possuir um módulo com uma bateria de lítio, substitua-o apenas pelo mesmo tipo de módulo, produzido pelo mesmo fabricante. A bateria contém lítio e pode explodir se não for utilizada, manuseada e descartada de forma adequada.

Não:

- **Jogue ou coloque na água**
- **Aqueça a mais de 100°C (212°F)**
- **Conserte nem desmonte.**

Descarte a bateria conforme requerido pelas disposições e regulamentações locais.

⚠

CAUTION:
Quando uma unidade de CD-ROM estiver instalada, observe o seguinte.

A utilização de controles ou ajustes ou a execução de procedimentos diferentes daqueles especificados nesta publicação pode resultar em exposição perigosa à radiação.

A remoção das tampas da unidade de CD-ROM pode resultar em exposição a radiação perigosa de laser. Não existem peças que possam ser consertadas no interior da unidade de CD-ROM. Não remova as tampas da unidade de CD-ROM.

DANGER

> **Algumas unidades de CD-ROM contém um diodo de laser da Classe 3A ou da Classe 3B. Observe o seguinte.**
>
> **Radiação de laser quando aberto. Não olhe diretamente para o feixe de laser, não olhe diretamente com instrumentos óticos, e evite exposição direta ao raio.**
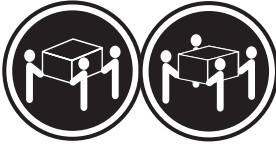
≥32 kg (70,5 lbs) ≥55 kg (121,2 lbs)

CAUTION:
Utilize práticas seguras para levantamento de peso ao levantar sua máquina.

CAUTION:
O botão de Controle de Energia na parte frontal do servidor não desliga a corrente elétrica fornecida ao servidor. O servidor pode também possuir mais que um cabo de alimentação. Para remover toda a corrente elétrica do servidor, assegure que todos os cabos de alimentação estejam desconectados da fonte de energia.

CAUTION:
Quando o suporte do cabo de alimentação estiver instalado no cabo de alimentação, o servidor deve estar conectado a uma fonte de energia de fácil acesso.

▶50 kg (110 lbs)

CAUTION:
Não coloque qualquer objeto com peso superior a 50 kg (110 lbs) sobre o modelo de gaveta do servidor.

声明 1

⚠

危险！

为避免电击危险，请不要在暴风雨期间连接或断开任何电缆，
或是进行此产品的安装、维护或重新配置操作。

为避免电击危险：

– 电源线必须连接到适当的电线及接地插座。

– 此产品将要连接的所有设备也必须连接到正确接线的插座上。

如果可能，请使用一只手连接或断开连接信号电缆，以避免在
接触两个具有不同电势的表面时遭到电击。

电源线、电话线以及通信电缆中的电流非常危险。为避免电击，
请在安装、移动或打开本产品或连接设备的外盖时，按照下述
步骤连接或断开电缆。

要连接电缆	要断开电缆
1. 关闭所有设备。	1. 关闭所有设备。
2. 首先将所有电缆与设备连接。	2. 首先从电源插座拔下电源线。
3. 将信号线连接到插座。	3. 从插座拔下信号电缆。
4. 将电源线连接到电源插座。	4. 从设备上拔下所有电缆。
5. 打开设备。	

声明 2

⚠

注意！

当更换电池时，仅可使用 IBM 部件号为 33F8354 的产品或由制造商
推荐的同等电池。如果系统中有包含锂电池的模块，则只能使用由相
同制造商制造的相同类型模块更换。该电池含有锂，如果使用、操作
或处理不当会发生爆炸。

不要：

– 将其投入或浸于水中

– 加热超过100℃ （212℉)

– 修理或拆卸

应按照当地法规和条例对此电池进行处理。

声明 3

⚠

注意 ！

在已安装 CD-ROM 驱动器的情况下，请注意下面的内容。

不遵循此处指定的控制、调整、或操作过程的操作将可能导致危险
的辐射泄漏。

取下 CD-ROM 驱动器的外盖会导致危险的激光辐射泄漏。CD-ROM 驱
动器内没有可以使用的部件。请不要取下 CD-ROM 驱动器的外盖。

声明 4

危险 ！

> 一些 CD-ROM 驱动器中包含内置的 3A 类或 3B 类激光二极管。
> 请注意下述内容。
>
> 打开驱动器会产生激光辐射。请不要凝视激光束，请不要使用光学仪器
> 直接观看激光束，同时也要避免人体直接暴露在激光束下。

声明 5

32 kg (70.5 磅)　　**55 kg (121.2 磅)**

注意！

搬运机器时，请进行安全搬运操作。

声明 6

注意！

关闭服务器前端的电源控制按钮并不能完全切断供给服务器的电流。
服务器可能有多条电源线。为从服务器断开所有电流，应确保断开
所有电源线与电源的连接。

声明 7

注意！

当电源线上安装有电源线固定夹选件时，服务器必须插在容易接近
的电源上。

声明 12

>50 kg (110 磅)

注意！

请不要将任何重量超过 50 kg(1101 磅)的物体放在抽屉型服务器的
顶部。

- 聲明 1

⚠️

危險

> 為了避免雷擊，在閃電期間，請勿連接或拔掉本裝置上的任
> 何電纜線，或請勿安裝、維修或重新架構本產品。
>
> 為了避免雷擊：
>
> - 電源線必須連接到接線及接地正確的插座。
> - 本產品所連接的設備也必須連接到接線正確的插座。
>
> 儘可能使用單手來連接或拔掉信號電纜，以避免因接觸兩不
> 同電位的平面，而受到電擊。
>
> 電源、電話及通信電纜上均有電流流通。為了避免電擊，在
> 安裝、移動本產品，或開啟本產品的蓋子或與本產品連接之
> 裝置的蓋子時，請依照下列「連接」及「拔掉」電纜線的步
> 驟操作。

連接	拔掉
1. 關掉所有開關。	1. 關掉所有開關。
2. 首先，將所有電纜線連接到裝置。	2. 首先，自電源插座拔掉電源線。
3. 將信號電纜連接到信號插座。	3. 拔掉信號插座上的所有信號電纜。
4. 將電源線連接到電源插座。	4. 拔掉裝置上的所有電纜線。
5. 開啟裝置電源。	

- 聲明 2

⚠️

注意：
更換電池時，只可使用 IBM 零件編號 33F8354 的電池，或廠商建議
的相當類型的電池。如您系統中的模組含有鋰電池，更換時，請使
用相同廠商製造的相同模組類型。如未正常使用、處理或捨棄含有
鋰的電池時，可能會造成爆炸。

嚴禁：.

- 丟入或浸入水中
- 加熱超過攝氏100 度（華氏 212 度）
- 修補或拆解

處理廢棄電池時，請遵照當地法令規章處理。

- 聲明 3

⚠️

注意：
安裝光碟機時，請注意下列事項：

不依此處所指示的控制、調整或處理步驟，恐有遭致輻射之虞。

移開光碟機蓋子，恐有遭致雷射輻射之虞。光碟機中沒有需要維修
的部分。請勿移開光碟機的蓋子。

- 聲明 4

⚠️

危險

> 光碟機含有內嵌式 Class 3A 或 Class 3B 雷射二極體時，請
> 注意下列事項：
>
> 開啟時會產生雷射輻射。請勿凝視光束，不要使用光學儀器
> 直接觀察，且應避免直接暴露在光束下。

· 聲明 5

>= 32 公斤(70.5 磅)　　　>= 55 公斤(121.2 磅)

注意：
提昇機器時，請使用安全提昇措施。

· 聲明 6

注意：
伺服器前面的電源控制按鈕無法關閉供應伺服器的電流。本伺服器
可能有一條以上的電源線。如要移除伺服器上的所有電流，請確認
所有電源線已與電源分離。

· 聲明 7

注意：
如電源線上安裝了電源線托架裝置，則所使用的電源必須是伺服器
容易使用為原則。

· 聲明 12

>50 公斤(110 磅)

注意：
請勿將任何重量超過 50 公斤(110 磅) 的東西置於伺服器的抽屜上
方。

⚠ DANGER

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.

To avoid shock hazard:

- **The power cord must be connected to a properly wired and earthed receptacle.**
- **Any equipment to which this product will be attached must also be connected to properly wired receptacles.**

When possible, use one hand to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

Electrical current from power, telephone, and communications cables is hazardous. To avoid shock hazard, connect and disconnect cables as described following when installing, moving, or opening covers of 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 cord(s) from outlet.
3. Attach signal cables to receptacles.	3. Remove signal cables from receptacles.
4. Attach power cord(s) to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

NOTE: In the UK, by law, the telephone cable must be connected after the power cord.	NOTE: In the UK, the power cord must be disconnected after the telephone cable.

CAUTION:
**When replacing the battery, use only IBM Part Number
33F8354 or an equivalent type battery recommended
by the manufacturer. If your system has a module
containing a lithium battery, replace it only with the
same module type made by the same manufacturer.
The battery contains lithium and can explode if not
properly used, handled, or disposed of.**

Do not:
- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

**Dispose of the battery as required by local ordinances
or regulations.**

CAUTION:
When a CD-ROM drive is installed, note the following.

**Use of controls or adjustments or performance of
procedures other than those specified herein might
result in hazardous radiation exposure.**

**Removing the covers of the CD-ROM drive could result
in exposure to hazardous laser radiation. There are no
serviceable parts inside the CD-ROM drive. Do not
remove the CD-ROM drive covers.**

DANGER

> **Some CD-ROM drives 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.**

≥32 kg (70.5 lbs)   ≥55 kg (121.2 lbs)

CAUTION:
Use safe lifting practices when lifting your machine.

CAUTION:
The Power Control button on the front of the server does not turn off the electrical current supplied to the server. The server also might have more than one power cord. To remove all electrical current from the server, ensure that all power cords are disconnected from the power source.

CAUTION:
When the power cord bracket option is installed on the power cord, the server must be plugged to a power source that is easily accessible.

≥50 kg (110 lbs)

CAUTION:
Do not place any object weighing more than 50 kg (110 lbs) on top of the rack model of the server.

⚠ **DANGER**

> **Pour éviter tout risque de choc électrique, ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.**
>
> **Pour éviter tout risque de choc électrique :**
>
> - **Les cordons d'alimentation du présent produit et de tous les appareils qui lui sont connectés doivent être branchés sur des socles de prise de courant correctement câblés et mis à la terre.**
>
> **Afin d'éviter tout risque de choc électrique provenant d'une différence de potentiel de terre, n'utilisez qu'une main, lorsque cela est possible, pour connecter ou déconnecter les cordons d'interface.**
>
> **Le courant électrique passant dans les câbles de communication, ou les cordons téléphoniques et d'alimentation peut être dangereux. Pour éviter tout risque de choc électrique, lorsque vous installez ou que vous déplacez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.**

Connexion	Déconnexion
1. Mettez les unités hors tension.	1. Mettez les unités hors tension.
2. Commencez par brancher tous les cordons sur les unités.	2. Commencez pas débrancher les cordons alimentation des socles de prise de courant.
3. Branchez les câbles d'interface sur les prises.	3. Débranchez les câbles d'interface des prises.
4. Branchez les cordons d'alimentation sur un socle de prise de courant.	4. Débranchez tous les câbles des unités.
5. Mettez les unités sous tension.	

CAUTION:
Remplacez la pile usagée par une pile de référence identique exclusivement - voir la référence IBM - ou par une pile équivalente recommandée par le fabricant. Si votre système est doté d'un module contenant une pile au lithium, vous devez le remplacer uniquement par un module identique, produit par le même fabricant. La pile contient du lithium et présente donc un risque d'explosion en cas de mauvaise manipulation ou utilisation.

- **Ne la jetez pas à l'eau.**
- **Ne l'exposez pas à une température supérieure à 100 °C.**
- **Ne cherchez pas à la réparer ou à la démonter.**

Pour la mise au rebut, reportez-vous à la réglementation en vigueur.

CAUTION:
Si une unité de CD-ROM est installée, prenez connaissance des informations suivantes :

Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites dans le présent document.

Pour éviter une exposition directe au rayon laser, n'ouvrez pas l'unité de CD-ROM. Vous ne pouvez effectuer aucune opération de maintenance à l'intérieur.

DANGER

> **Certaines unités de CD-ROM contiennent une diode laser de classe 3A ou 3B. Prenez connaissance des informations suivantes :**
>
> **Rayonnement laser lorsque le carter est ouvert. Évitez de regarder fixement le faisceau ou de l'observer à l'aide d'instruments optiques. Évitez une exposition directe au rayon.**

≥32 kg   ≥55 kg

CAUTION:
Ce produit pèse un poids considérable. Faites-vous aider pour le soulever.

CAUTION:
Le bouton de mise sous tension/hors tension situé sur la face avant du serveur ne coupe pas l'arrivée de courant électrique à l'intérieur de la machine. Il se peut que votre serveur dispose de plusieurs cordons d'alimentation. Pour isoler totalement le serveur du réseau électrique, débranchez tous les cordons d'alimentation des socles de prise de courant.

CAUTION:
Lorsqu'une patte de fixation du cordon d'alimentation est installée, branchez le serveur sur une prise de courant électrique facile d'accès.
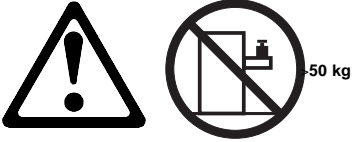
CAUTION:
Ne posez pas d'objet dont le poids dépasse 50 kg sur les modèles tiroir de serveur.

⚠ DANGER

Aus Sicherheitsgründen bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs- oder Rekonfigurationsarbeiten durchführen.

Aus Sicherheitsgründen:

- **Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.**

- **Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.**

Signalkabel möglichst einhändig anschließen oder lösen, um einen Stromschlag durch Berühren von Oberflächen mit unterschiedlichem elektrischem Potential zu vermeiden.

Elektrische Spannungen von Netz-, Telefon- und Datenübertragungsleitungen sind gefährlich. Um einen Stromschlag zu vermeiden, nur nach den Anweisungen arbeiten, die für Installation, Transport oder Öffnen von Gehäusen dieses Produkts oder angeschlossenen Einheiten gelten.

Kabel anschließen	**Kabel lösen**
1. Alle Geräte ausschalten und Netzstecker ziehen.	1. Alle Geräte ausschalten.
2. Zuerst alle Kabel an Einheiten anschließen.	2. Zuerst Netzstecker von Steckdose lösen.
3. Signalkabel an Anschlußbuchsen anschließen.	3. Signalkabel von Anschlußbuchsen lösen.
4. Netzstecker an Steckdose anschließen.	4. Alle Kabel von Einheiten lösen.
5. Gerät einschalten.	

⚠

CAUTION:
Eine verbrauchte Batterie nur durch eine Batterie mit der IBM Teilenummer 33F8354 oder durch eine vom Hersteller empfohlene Batterie ersetzen. Wenn Ihr System ein Modul mit einer Lithium-Batterie enthält, ersetzen Sie es immer mit dem selben Modultyp vom selben Hersteller. Die Batterie enthält Lithium und kann bei unsachgemäßer Verwendung, Handhabung oder Entsorgung explodieren.

Die Batterie nicht

- **mit Wasser in Berührung bringen.**
- **über 100 C erhitzen.**
- **reparieren oder zerlegen.**

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.

⚠

CAUTION:
Wenn ein CD-ROM-Laufwerk installiert ist, beachten Sie folgendes. Steuer- und Einstellelemente sowie Verfahren nur entsprechend den Anweisungen im vorliegenden Handbuch einsetzen. Andernfalls kann gefährliche Laserstrahlung auftreten.

Das Entfernen der Abdeckungen des CD-ROM-Laufwerks kann zu gefährlicher Laserstrahlung führen. Es befinden sich keine Teile innerhalb des CD-ROM-Laufwerks, die vom Benutzer gewartet werden müssen. Die Verkleidung des CD-ROM-Laufwerks nicht öffnen.

⚠

DANGER

> **Manche CD-ROM-Laufwerke enthalten eine eingebaute Laserdiode der Klasse 3A oder 3B. Die nachfolgend aufgeführten Punkte beachten.**
>
> **Laserstrahlung bei geöffneter Tür. Niemals direkt in den Laserstrahl sehen, nicht direkt mit optischen Instrumenten betrachten und den Strahlungsbereich meiden.**
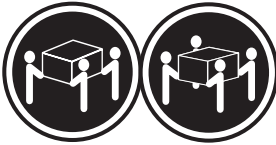
≥32 kg   ≥55 kg

CAUTION:
Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.

CAUTION:
Mit dem Betriebsspannungsschalter an der Vorderseite des Servers wird die Stromversorgung für den Server nicht unterbrochen. Der Server könnte auch mehr als ein Netzkabel aufweisen. Um die gesamte Stromversorgung des Servers auszuschalten, muß sichergestellt werden, daß alle Netzkabel aus den Netzsteckdosen herausgezogen wurden.

CAUTION:
Wenn am Netzkabel eine Kabelhalterung angebracht ist, muß der Server an eine leicht zugängliche Netzsteckdose angeschlossen werden.
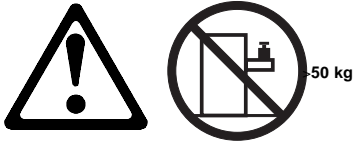
-50 kg

CAUTION:
Legen Sie keine Gegenstände, die mehr als 50 kg
wiegen, auf das Einschubmodell des Servers.

⚠️

PERICOLO

Per evitare il pericolo di scosse elettriche durante i temporali, non collegare o scollegare cavi, non effettuare l'installazione, la manutenzione o la riconfigurazione di questo prodotto.

Per evitare il pericolo di scosse elettriche:

- **collegare il cavo di alimentazione ad una presa elettrica correttamente cablata e munita di terra di sicurezza;**
- **collegare qualsiasi apparecchiatura collegata a questo prodotto ad una presa elettrica correttamente cablata e munita di terra di sicurezza.**

Quando possibile, collegare o scollegare i cavi di segnale con una sola mano per evitare il rischio di scosse derivanti dal contatto con due superfici a diverso potenziale elettrico.

La corrente elettrica circolante nei cavi di alimentazione, del telefono e di segnale è pericolosa. Per evitare scosse elettriche, collegare e scollegare i cavi come descritto quando si effettuano l'installazione, la rimozione o l'apertura dei coperchi di questo prodotto o durante il collegamento delle unità.

Per collegare	**Per scollegare**
1. SPEGNERE tutti i dispositivi.	1. SPEGNERE tutti i dispositivi.
2. Collegare prima tutti i cavi alle unità.	2. Rimuovere prima il(i) cavo(i) di alimentazione dalla presa elettrica.
3. Collegare i cavi di segnale alle prese.	3. Rimuovere i cavi di segnale dalle prese.
4. Collegare il(i) cavo(i) di alimentazione alla presa elettrica.	4. Rimuovere tutti i cavi dalle unità.
5. ACCENDERE le unità.	

ATTENZIONE:
Quando si sostituisce la batteria, utilizzare solo una batteria IBM o batterie dello stesso tipo o di tipo equivalente consigliate dal produttore. Se il sistema di cui si dispone è provvisto di un modulo contenente una batteria al litio, sostituire tale batteria solo con un tipo di modulo uguale a quello fornito dal produttore. La batteria contiene litio e può esplodere se utilizzata, maneggiata o smaltita impropriamente.

Evitare di:

- **Gettarla o immergerla in acqua**
- **Riscaldarla ad una temperatura superiore ai 100° C**
- **Cercare di ripararla o smaltirla**

Smaltire secondo la normativa in vigore (D.Lgs 22 del 5/2/97) e successive disposizioni nazionali e locali.

ATTENZIONE:
Quando è installata un'unità CD-ROM, notare quanto segue:

L'utilizzo di controlli, regolazioni o l'esecuzione di procedure non descritti nel presente manuale possono provocare l'esposizione a radiazioni pericolose.

L'apertura di un'unità CD-ROM può determinare l'esposizione a radiazioni laser pericolose. All'interno dell'unità CD-ROM non vi sono parti su cui effettuare l'assistenza tecnica. Non rimuovere i coperchi dell'unità CD-ROM.

PERICOLO

> Alcune unità CD-ROM contengono all'interno un diodo laser di Classe 3A o Classe 3B. Prestare attenzione a quanto segue:
>
> Aprendo l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici ed evitare l'esposizione diretta al fascio.
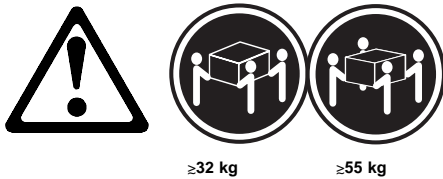
ATTENZIONE:
Durante il sollevamento della macchina seguire delle norme di di sicurezza.

ATTENZIONE:
Il pulsante del controllo dell'alimentazione situato nella parte anteriore del servente non disattiva la corrente elettrica fornita al servente. Il servente potrebbe anche avere più di un cavo di alimentazione. Per disattivare la corrente elettrica del servente, assicurarsi che tutti i cavi di alimentazione siano scollegati dalla sorgente di alimentazione.

ATTENZIONE:
Quando sul cavo di alimentazione è installata l'opzione di sostegno del cavo, il servente deve essere collocato in prossimità di una presa elettrica facilmente accessibile.
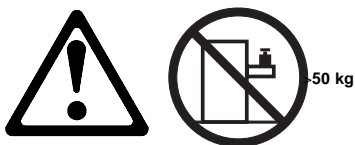
ATTENZIONE:
Non poggiare oggetti che pesano più di 50 kg sulla parte superiore del servente.

경고문 1

⚠ **위험**

전기 충격을 피하려면 날씨가 나쁠 때(예: 눈 또는 비가 오거나 천둥 번개가 칠
때)는 케이블을 연결하거나 끊지 않도록 하고 이 제품의 설치, 유지보수 또는 재구
성 등의 작업을 수행하지 않도록 하십시오.

전기 충격을 피하려면 다음과 같아야 합니다.

– 고압선은 적절한 배선 및 접지 상태의 콘센트로 연결되어야 합니다.

– 이 제품이 접속될 모든 장비도 적절한 배서 상태의 콘센트로 연결되어야 합니다.

다른 전위를 가진 두 표면을 만졌을 때 발생할 수 있는 전기 충격을 피하려면 한 손
으로 신호선을 연결하거나 끊으십시오.

전원, 전화 및 통신 케이블로부터 흘러 나오는 전류는 위험합니다. 전기 충격을 피
하려면 이 제품이나 접속 장치를 설치, 이동 및 덮개를 열 때 다음 설명에 따라 케
이블을 연결하고 끊도록 하십시오.

연결하려면	연결해제하려면
1. 모든 스위치를 켠다.	1. 모든 스위치를 끈다.
2. 먼저 모든 케이블을 장치에 연결한다.	2. 먼저 모든 케이블을 장치에 제거한다.
3. 신호선을 콘센트에 연결한다.	3. 신호선을 콘센트에서 제거한다.
4. 전원을 콘센트에 연결한다.	4. 장치에서 모든 케이블을 제거한다.
5. 장치 스위치를 켠다.	

경고문 2

⚠

주의:
배터리를 교체할 때는 IBM 부품 번호 &PN. 또는 제조업체에서 추천하는 동등한
유형의 배터리를 사용하십시오. 시스템에 리튬 배터리를 포함하는 모듈이 있으면
이것은 동일한 제조업체에서 생산된 동일한 모듈 유형으로만 교체하십시오.
배터리에는 리튬이 포함되어 있으므로 제대로 사용, 처리 또는 처분하지 않으면
폭발할 수 있습니다.

다음을 주의하십시오.

– 던지거나 물에 담그지 않도록 하십시오.
– 100°C(212°F) 이상으로 가열하지 않도록 하십시오.
– 수리하거나 분해하지 않도록 하십시오.

지역 법령이나 규정의 요구에 따라 배터리를 처분하십시오.

경고문 3

⚠

주의:
CD-ROM 드라이브가 설치되어 있으면 다음 사항을 명심하십시오.

여기에서 지정하지 않은 방식으로 CD-ROM 드라이브를 제어 또는 조절하거나 다른 절차로
사용하면 위험한 방사능 노출이 발생할 수 있습니다.

CD-ROM 드라이브의 덮개를 제거하면 위험한 레이저 방사능이 노출될 수 있습니다.
CD-ROM 드라이브 내에는 정비할 수 있는 부품이 없습니다. CD-ROM 드라이브 덮개를
제거하지 않도록 하십시오.

경고문 4

위험

> 일부 CD-ROM 드라이브에는 클래스 3A 또는 3B 레이저 2극
> 진공관(다이오드)이 들어 있습니다. 다음 사항을 명심하십시오.
>
> 열면 레이저 방사능이 노출됩니다. 광선을 주시하거나 광학 기계를
> 직접 처다보지 않도록 하고 광선에 노출되지 않도록 하십시오.

경고문 5

32kg(70.5 파운드)   55kg(121.2 파운드)

주의:
기계를 들 때는 안전하게 들어 올리십시오.

경고문 6

주의:
서버 앞쪽의 전원 제어 버튼을 꺼도 서버로 공급되는 전류가 차단되지 않습니다.
또한 서버에 둘 이상의 전선이 연결되어 있는 경우가 있습니다. 서버에서 모든
전류를 차단하려면 모든 전선이 전원으로부터 차단되어 있는지 확인하십시오.

경고문 7

주의:
전선 브래킷 옵션이 전선에 설치되어 있으면 서버는 쉽게 액세스할 수 있는 전원으로
연결되어야 합니다.

경고문 12

50kg(110 파운드) 이상

주의:
서랍형 모델의 서버 상단에는 50kg(110 파운드)이 넘는 물체를 올려 놓지 않도록
하십시오.

DANGER

> **Para evitar una posible descarga eléctrica, no conecte ni desconecte los cables ni lleve a cabo ninguna operación de instalación, de mantenimiento o de reconfiguración de este producto durante una tormenta eléctrica.**
>
> **Para evitar una posible descarga:**
>
> - **El cable de alimentación debe conectarse a un receptáculo con una instalación eléctrica correcta y con toma de tierra.**
> - **Los aparatos a los que se conecte este producto también deben estar conectados a receptáculos con la debida instalación eléctrica.**
>
> **Cuando sea posible, utilice una sola mano para conectar o desconectar los cables de señal a fin de evitar una posible descarga al tocar dos superficies con distinto potencial eléctrico.**
>
> **La corriente eléctrica de los cables de comunicaciones, teléfono y alimentación puede resultar peligrosa. Para evitar una posible descarga, siga las indicaciones de conexión y desconexión de los cables siempre que tenga que instalar, mover o abrir las cubiertas de este producto o de los dispositivos acoplados.**

Instrucciones de conexión	Instrucciones de desconexión
1. Apague todos los componentes (OFF).	1. Encienda todos los componentes (ON).
2. En primer lugar, conecte todos los cables a los dispositivos.	2. En primer lugar, retire los cables de alimentación de las tomas.
3. Conecte los cables de señal a los receptáculos.	3. Retire los cables de señal de los receptáculos.
4. Conecte los cables de alimentación a las tomas.	4. Retire todos los cables de los dispositivos.
5. Encienda el dispositivo (ON).	

CAUTION:

Al cambiar la batería, utilice únicamente la batería IBM Número de pieza 33F8354 o un tipo de batería equivalente recomendado por el fabricante. Si el sistema tiene un módulo que contiene una batería de litio, sustitúyalo únicamente por el mismo tipo de módulo del mismo fabricante. La batería contiene litio y puede explotar si no se utiliza, manipula o desecha correctamente.

Lo que no debe hacer

- **Tirar o sumergir el producto en agua.**
- **Exponer el producto a una temperatura superior a 100°C.**
- **Reparar o desmontar el producto.**

Cuando quiera desechar la batería, siga las disposiciones y reglamentaciones locales.

CAUTION:

Cuando instale una unidad de CD-ROM, tenga en cuenta la siguiente información.

Si se llevan a cabo controles o ajustes o se utilizan métodos que no se atengan a lo aquí especificado, se puede producir una exposición peligrosa a las radiaciones.

Si se retiran las cubiertas de la unidad de CD-ROM, se puede producir una peligrosa exposición a radiaciones de láser. Dentro de la unidad de CD-ROM no existen piezas reparables. No retire las cubiertas de la unidad de CD-ROM.

DANGER

> **Algunas unidades de CD-ROM tienen incorporado un diodo de láser de Clase 3A o de Clase 3B Tenga en cuenta la siguiente información.**
>
> **Cuando la unidad está abierta se generan emisiones de rayos láser. No dirija la mirada al haz, no lo observe directamente con instrumentos ópticos y evite la exposición directa.**

≥32 kg   ≥55 kg

CAUTION:
Alce la máquina con cuidado; el sobrepeso podría causar alguna lesión.

CAUTION:
El botón de control de alimentación del panel frontal del servidor no apaga la corriente eléctrica suministrada al servidor. Puede suceder que el servidor tenga más de un cable de alimentación. Para eliminar por completo la corriente eléctrica del servidor, asegúrese de desconectar todos los cables de alimentación del suministro de alimentación.

CAUTION:
Cuando la opción de soporte del cable de alimentación está instalada en el cable de alimentación, el servidor debe estar conectado a un suministro de alimentación de fácil acceso.
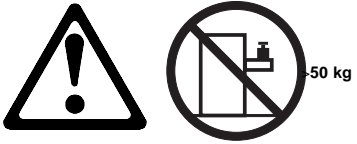
CAUTION:
No coloque ningún objeto cuyo peso sea superior a los 50 kilos sobre la bandeja modelo del servidor.

-50 kg

Send Us Your Comments!

We want to know your opinion about this manual (part number 37L5122). Your input will help us to improve our publications.

Please photocopy this survey, complete it, and then fax it to **IBM HMM Survey** at **919-543-8167 (USA)**.

Name _____

Phone Number _____

1. Do you like this manual?

   □ Yes   □ No

   _____

   _____

2. What would you like to see added, changed, or deleted in this manual?

   _____

   _____

3. What is your service experience level?

   □ Less than five years

   □ More than five years

   _____

   _____

4. Which Servers do you service most?

   _____

   _____

   _____

   _____

Thanks in advance for your response!

Problem Determination Tips

Due to the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Processor or hard disk upgrades
- Failure symptom
  - Do diagnostics fail?
  - What, when, where, single, or multiple systems?
  - Is the failure repeatable?
  - Has this configuration ever worked?
  - If it has been working, what changes were made prior to it failing?
  - Is this the original reported failure?
- Reference/Diagnostics Diskette Version
  - Type and version level
- Hardware configuration
  - Print (print screen) configuration currently in use
  - BIOS level
- Operating system software
  - Type and version level

Important

To eliminate confusion, identical systems are considered *identical* only if they:

1. Are the exact machine type and models
2. Have the same BIOS level
3. Have the same adapters/attachments in the same locations
4. Have the same address jumpers/terminators/cabling
5. Have the same software versions and levels
6. Have the same Reference/Diagnostics Diskette (version)
7. Have the same configuration options set in the system
8. Have the same setup for the operation system control files

Comparing the configuration and software set-up between "working and non-working" systems will often lead to problem resolution.

Phone Numbers, U.S. and Canada

> **Note**
>
> EMEA customers should contact their Dealer or IBM Service organization.

Before you place a call to the Support Center, refer to "Problem Determination Tips" on page 103.

Authorized Dealers or Servicers

Number	Information
919-517-0001	Bulletin Board Service - PC Company
800-528-7705	Bulletin Board Service - TSS Only
800-937-3737	IBM Business Partner Education
800-426-2472	IBM Customer Engineer Technical Support
800-IBM-DEAL	IBM Dealer Support Center
800-342-6672	IBM Direct Desktop Software Sales
303-924-4015	IBM Part Number ID and Look Up
800-426-7763	IBM PC HelpCenter
800-237-5511	IBM Software Defect Support (CSDs)
800-327-5711	IBM Software Ordering (Publications)
800-426-1484	IBM Supplies Technical Hotline
800-388-7080	IBM Warranty Parts Claims Center

U.S. Customers and Helpware Subscribers

Number	Information
919-517-0001	Bulletin Board Service - PC Company
800-426-8322	Customer Education Business Unit
800-999-0052	Customized Operational Services
800-237-4824	EduQuest (Educational Computers)
800-964-8523	End User HelpDesk Support
800-742-2493	IBM Anti-Virus Services
800-447-4700	IBM Authorized Dealer Referrals
800-426-2468	IBM Dealer Referral
800-426-3333	IBM Information Referral Service
800-IBM-SERV	IBM Service
800-772-2227	IBM PC HelpCenter and HelpDesk
800-426-7282	IBM Technical Manuals
800-426-9402 (Ext. 150)	Multimedia Information Center
800-241-1620	Multimedia HelpCenter
800-342-6672	OS/2 Information Line
800-237-5511	OS/2 Support Services
800-284-5933	Prodigy
914-962-0310	Prodigy User Questions
800-547-1283	Technical Coordinator Program SystemXtra for Personal Systems LAN Automated Distribution/2 OS/2 Bulletin Board OS/2 Application Assistance Center
800-551-2832	Technical Solutions Magazine

IBM Canada Customer and Servicer Support

Number	Information
800-661-PSMT	Business Partner Marketing Support
905-316-5556	Business Partner Marketing Support - Toronto
514-938-6048	Business Partner Marketing Support - French
800-465-4YOU	Customer Relations
800-IBM-SERV	Customer Service Dispatch
800-263-2769	Customer Service Parts
800-465-2222	Customer Support Center (ISC)
416-443-5701	Customer Service Repair Centre
800-505-1855	Dealer Support Group (DSG)
800-465-7999	HelpClub Registration / IBM Direct
800-465-3299	HelpFax
905-316-3299	HelpFax - Toronto
800-565-3344	HelpPC
905-513-3355	IBM Certification Administrator Mail to: 50 Acadia Drive Markham, Ontario L3R 0B3
800-661-2131	IBM Education (A+ Course)
800-268-3100	IBM Information Network Support
800-387-8343	IBM PC Service Partners
800-487-7426	International Warranty Registration
800-663-7662	Lexmark Product Information
800-IBM-9990	PartnerLine
800-263-2769	Parts Orders, Exchange or Emergency
416-443-5808 (Fax)	Parts Regular Orders, Exchange
416-443-5755	Parts Orders, Inquiries
514-938-3022	PC Co Bulletin Board - Montreal
905-316-4255	PC Co Bulletin Board - Markham
604-664-6464	PC Co Bulletin Board - Vancouver
204-934-2735	PC Co Bulletin Board - Winnepeg
800-661-7768	PS Marketing Support (PSMT)
800-565-3344	PS/1 Warranty Customer Helpline
800-387-8483	PS/1 Warranty Service (DOAs)
800-465-1234	Publications Ordering
905-316-4148	Service Management Support
905-316-4100 (Fax)	Service Management Support
905-316-4150	Service (Warranty) Manager
905-316-4100 (Fax)	Service (Warranty) Manager
905-316-4872	Service Quality Programs
905-316-4100 (Fax)	Service Quality Programs
800-661-2131	Skill Dynamics (Education)
800-565-3344	ThinkPad EasyServe
416-443-5835 (Fax)	Warranty Claim Fulfillment
905-316-2445	Warranty Claim Reimbursement
905-316-3515 (Fax)	Warranty Claim Reimbursement
416-443-5778	Warranty Claim Parts Inquiry
800-505-1855	Warranty Provider Support Hotline
800-267-7472	Warranty Service, ThinkPad

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