IBM® Remote Supervisor Adapter

IBM

Installation Guide

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Installation Guide

IBM

NOTE

Before using this information and the product it supports, be sure to read the general information in Appendix B, "Product warranties and notices," on page 37.

Safety

Before installing this product, read the Safety Information book.

مج، يجب قراءة   دات السلامة

Antes de instalar este produto, leia o Manual de Informações sobre Segurança.

安装本产品前请先阅读《安全信息》手册。

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs hæftet med sikkerhedsforskrifter, før du installerer dette produkt.

Lue Safety Information -kirjanen, ennen kuin asennat tämän tuotteen.

Avant de procéder à l'installation de ce produit, lisez le manuel Safety Information.

Vor Beginn der Installation die Broschüre mit Sicherheitshinweisen lesen.

Πριν εγκαταστήσετε αυτό το προϊόν, διαβάστε το εγχειρίδιο Safety Information.

Prije instalacije ovog proizvoda pročitajte priručnik sa sigurnosnim uputama.

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

Przed zainstalowaniem tego produktu należy przeczytać broszurę Informacje Dotyczące Bezpieczeństwa.

Prima di installare questo prodotto, leggere l'opuscolo contenente le informazioni sulla sicurezza.

本製品を導入する前に、安全情報資料を御読みください。

이 제품을 설치하기 전에, 안전 정보 책자를 읽어보십시오.

Пред да го инсталирате овој производ прочитајте ја книгата со безбедносни информации.

Lees voordat u dit product installeert eerst het boekje met veiligheidsvoorschriften.

Les heftet om sikkerhetsinformasjon (Safety Information) før du installerer dette produktet.

Antes de instalar este produto, leia o folheto Informações sobre Segurança.

Перед установкой продукта прочтите брошюру по технике безопасности (Safety Information).

Pred inštaláciou tohto produktu si prečítajte Informačnú brožúrku o bezpečnosti.

Preden namestite ta izdelek, preberite knjižico Varnostne informacije.

Antes de instalar este producto, lea la Información de Seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

在安裝本產品之前，也請先閱讀「安全性資訊」小冊子。

Installálás el tt olvassa el a Biztonsági el írások kézikönyvét !

Statement 1

Danger

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

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**

- **Connect all power cords to a properly wired and grounded electrical outlet.**

- **Connect to properly wired outlets any equipment that will be attached to this product.**

- **When possible, use one hand only to connect or disconnect signal cables.**

- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**

- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**

- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

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

Statement 2

CAUTION:

When replacing the lithium 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.

Statement 5

CAUTION:
The power control button on the device and the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.
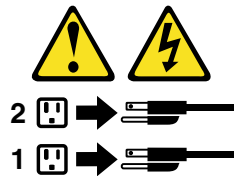
Attention: The RJ-45 connectors on the IBM Remote Supervisor Adapter are for only Ethernet and Advanced System Management Interconnect use and are not for telecommunications use.

Contents

Chapter 1. Introduction

Thank you for purchasing an IBM® Remote Supervisor Adapter. This *Installation Guide* provides the information that is needed to:

- Install and cable your adapter

- Install device drivers

- Configure your adapter

The IBM Remote Supervisor Adapter comes with a three-year limited warranty. For more information about this warranty, see Appendix B, "Product warranties and notices," on page 37.

You can access the latest information about product updates on the IBM Web site, http://www.ibm.com/pc/support/. For service, assistance, or additional information on the World Wide Web, see Appendix A, "Getting help, service, and information," on page 35.

The IBM Remote Supervisor Adapter is referred to throughout this book as Supervisor Adapter.

Installation prerequisites

Before installing the Supervisor Adapter, perform the following tasks:

- Make sure that the operating system is installed on your server before you install the Advanced System Management device drivers in Chapter 2. For information about installing the operating system, refer to the documentation that comes with your xSeries 220 server.

  To install the operating system using ServerGuide, use only ServerGuide version 6.0.3, or later.

  Note: If you previously installed the operating system with ServerGuide version 6.0.2, make sure that you install the Advanced System Management device drivers from the *IBM Remote Supervisor Adapter Support* CD, not from the directory that ServerGuide 6.0.2 created on the hard disk during its installation of the operating system. For information about installing the device drivers, see "Step 7. Installing the Advanced System Management device drivers" on page 23.

- Update the basic input/output system (BIOS) code on your IBM @server xSeries 220 server. The latest level of BIOS code for your server is available from the IBM Web site, http://www.ibm.com/pc/support. For information about how to update the BIOS code, refer to the documentation that comes with your xSeries 220 server.

- If you are planning to configure Simple Network Management Protocol (SNMP) trap alerts on the Supervisor Adapter, you must install and compile the management information base (MIB) on your SNMP manager. The MIB is provided in the \MIB directory on the *IBM Remote Supervisor Adapter Support* CD that comes with the Supervisor Adapter.

- If you want to use the operating system shutdown feature of the Advanced System Management (ASM) Web interface Server Power / Restart Control or use the ASM Web interface Remote Control features, you must install the agent component of the UM Server Extensions. This application is provided on the system-management software CD that comes with the xSeries 220 server. For information about installing the agent, refer to the documentation that comes with your xSeries 220 server.

- If you want to configure the remote alert recipients for Director over LAN or Director over modem, the remote alert recipient must be an IBM Netfinity Director server with UM Server Extensions.

Installation requirements

The following items are required to install the Supervisor Adapter:

- IBM xSeries 220 server
- The Advanced System Management device drivers for the Supervisor Adapter are supported on the following operating systems:
  - Novell NetWare 4.2, or later
  - Microsoft® Windows NT® 4.0 Server (with Service Pack 3 or later)
  - Microsoft Windows® 2000 Server
  - Microsoft Windows 2000 Advanced Server
  - SCO UnixWare 7.1.1, or later
- The documentation that comes with your server

If you want to access the Supervisor Adapter remotely through a Web browser, the supported Web browsers and browser requirements are:

- Microsoft Internet Explorer 4.0 (with Service Pack 1), or later
- Netscape Navigator 4.72, or later (version 6.0 is not supported)
- Java™ enabled Web browser (See your browser documentation or online Help for instructions about enabling its Java support.)
- Support for JavaScript 1.2, or later (See your browser documentation or online Help for instructions about enabling its JavaScript support.)
- Support of HTTP Version 1.0, or later
- Minimum display resolution of 800 x 600 pixels and 256 colors

Note: The ASM Web interface and the ASM text-based inferface do not support the double-byte character set (DBCS) languages.

Supervisor Adapter features

The Supervisor Adapter features the following:

- Continuous health monitoring and control
- Advanced Predictive Failure Analysis® (PFA)
- Configurable notification and alerts
- Event logs that are timestamped, saved by battery backup, and can be attached to e-mail alerts
- Remote graphics console redirection
- LAN, serial, and Advanced System Management (ASM) interconnect remote access
- Point-to-point protocol (PPP) support
- Simple Network Management Protocol (SNMP) and e-mail alerts
- Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) support

- Remote power control
- Microsoft Windows NT and Windows 2000 blue-screen capture
- Remote firmware update and access to critical server settings
- Independent power, which enables around-the-clock access to the server when the server power is off.

About your documentation

The documentation that comes with the Supervisor Adapter includes the following:

- *IBM Remote Supervisor Adapter Installation Guide* (this book)

  This printed document is designed to assist you with the installation of the adapter.

- *IBM Documentation* CD

  This CD contains the publications for the Supervisor Adapter in Adobe Acrobat Portable Document Format (PDF). The publications on the CD are:

  — *IBM Remote Supervisor Adapter Installation Guide* (this book)

  — *IBM Remote Supervisor Adapter User's Guide*

    The *User's Guide* describes the features and functions of the Advanced System Management (ASM) Web interface and the text-based user interface.

  — *IBM Safety Book*

    Before you install the Supervisor Adapter, be sure to read the caution and danger statements that are contained in this book.

System requirements

The *IBM Documentation* CD includes the *IBM Documentation Browser*. You can use the Documentation Browser to view the Supervisor Adapter documentation from your server or any workstation that meets the following requirements:

- Microsoft Windows NT 4.0 (with Service Pack 3 or later), Windows 95, Windows 98, Windows 2000, IBM OS/2® Warp® 3.0 (with Fix Pack 32 or later), or IBM OS/2 Warp 4.0 (with Fix Pack 5 or later)
- 100 MHz Pentium®-class microprocessor
- 32 MB RAM
- Adobe Acrobat Reader 3.0 or later (Adobe Acrobat Reader software is included on your *IBM Documentation* CD, and you can install it when you run the Documentation Browser)

Starting the IBM Documentation Browser

To start the Documentation Browser on a system running with:

- Windows NT, 95, 98, or 2000

  If you have Autostart enabled, place the *IBM Documentation* CD in your CD-ROM drive. When you close the CD-ROM drive, the Documentation Browser program starts automatically.

  If you have disabled Autostart on your system, click **Start** → **Run**; then, type:

  ```
  x:\docwin.cmd
  ```

  in the **Open** field (where *x* is the drive letter assigned to your CD-ROM drive). Click **OK.**

- OS/2

  Place the *IBM Documentation* CD in your CD-ROM drive. Close the drive; then, open a command prompt and type:

  ```
  x:\docos2.bat
  ```

  (where *x* is the drive letter assigned to your CD-ROM drive). Press Enter.

Using the IBM Documentation Browser

The IBM Documentation Browser enables you to browse the contents of the *IBM Documentation* CD, select from a list of available topics, see brief descriptions of the selected topics, and view selected topics using Adobe Acrobat Reader.

Note: The first time you run the Documentation Browser, you will need to configure the preferences for your system. The Preferences window opens automatically. Use the Preferences window to specify the location of your Adobe Acrobat Reader (if installed) or to install Adobe Acrobat Reader. You can also specify the location of an HTML viewer (such as Netscape Navigator or Microsoft Internet Explorer). For more information, see the on-line Help available from the Preferences window.

To use the Documentation Browser:

1. Select **Remote Supervisor Adapter** from the **Product** drop box.
2. Select a book from the **Topics** selection list; then, click **View**. Adobe Acrobat Reader will start and the selected topics will load automatically.

If you want to change the program preferences, click **Preferences**. Click **Help** for detailed information about using the IBM Documentation Browser. Click **Close** when you are finished.

Notices used in this book

This book contains notices to highlight information or provide safety information:

- **Notes**

  These notices provide important tips, guidance, or advice.

- **Attention**

  These notices indicate possible damage to programs, devices, or data.

  An attention notice is placed just before the instruction or situation in which damage could occur.

- **Caution**

  These notices indicate situations that can be potentially hazardous to you. A caution notice is placed just *before* descriptions of potentially hazardous procedure steps or situations.

Handling static sensitive devices

Attention: Static electricity can damage server components or options. To avoid damage, keep static sensitive devices in their static protective bag until you are ready to install them.

To reduce the possibility of electrostatic discharge (ESD) when you handle options and server components, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.

- Handle the device carefully, holding it by its edges or its frame.

- Do not touch solder joints, pins, or exposed printed circuitry.

- Do not leave the device where others can handle and possibly damage the device.

- While the device is still in its anti-static package, touch it to an unpainted metal part of the server for at least two seconds. (This drains static electricity from the package and from your body.)

- Remove the device from its package and install it directly into your server without setting it down. If it is necessary to set the device down, place it on its static-protective package. Do not place the device on your server cover or any metal surface.

- Take additional care when handling devices during cold weather as heating reduces indoor humidity and increases static electricity.

Chapter 2. Installing and configuring the Supervisor Adapter

The following are the steps in the Supervisor Adapter installation process:

Step 1. Unpack and verify the components (see "Step 1. Unpacking and verifying components").

Step 2. Install the Supervisor Adapter in the server (see "Step 2. Installing the Supervisor Adapter" on page 10).

Step 3. Connect the external power supply (see "Step 3. Connecting the power supply adapter" on page 12).

Step 4. Connect the Ethernet and serial port cables (see "Step 4. Connecting the LAN and serial port cables" on page 14).

Step 5. Update the Supervisor Adapter firmware (see "Step 5. Updating the Supervisor Adapter firmware" on page 15).

Step 6. Perform the initial configuration to enable remote access to the Supervisor Adapter (see "Step 6. Performing initial configuration tasks to enable remote access to the Supervisor Adapter" on page 18). Use this step to:

- Configure the Ethernet port

- Configure the serial (COM) port

- Set up the point-to-point protocol (PPP)

See Table 2 on page 18 to determine the initial configuration procedures that you need.

Step 7. Install the Advanced System Management device drivers (see "Step 7. Installing the Advanced System Management device drivers" on page 23).

Step 8. Configure the remote control password to enable the ASM Web interface remote control features (see "Step 8. Configuring the remote control password" on page 27).

Step 9. Complete the installation (see "Step 9. Completing the installation" on page 28).

Step 1. Unpacking and verifying components

The following sections list the items that come with the Supervisor Adapter and describe the Supervisor Adapter components. You can install the Supervisor Adapter in only peripheral component interconnect (PCI) systems.

Inventory checklist

The Supervisor Adapter option contains the following items:

- Remote Supervisor Adapter
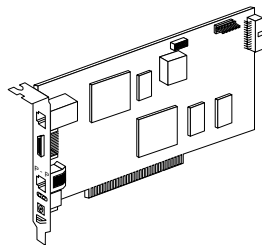
- Power supply adapter
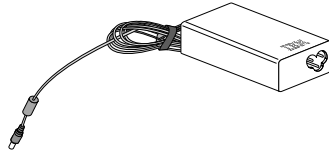
- Power cord
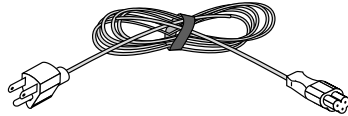
- 20-pin ribbon cable
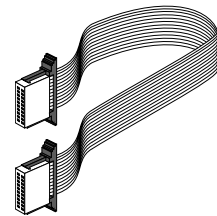
- Universal jumper cable

- Advanced System Management (ASM) Interconnect cable and connector module

  Attention: To avoid damage to the Ethernet connector, do not connect the ASM Interconnect cable into the Ethernet (RJ-45) port.
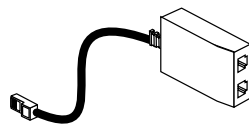
- *IBM Remote Supervisor Adapter Support* CD

  This CD helps you configure hardware and install device drivers.

- *IBM Documentation* CD

  The contents of this CD are described in "About your documentation" on page 3.

Supervisor Adapter components

The following illustration shows the Supervisor Adapter and the location of the connectors and components.
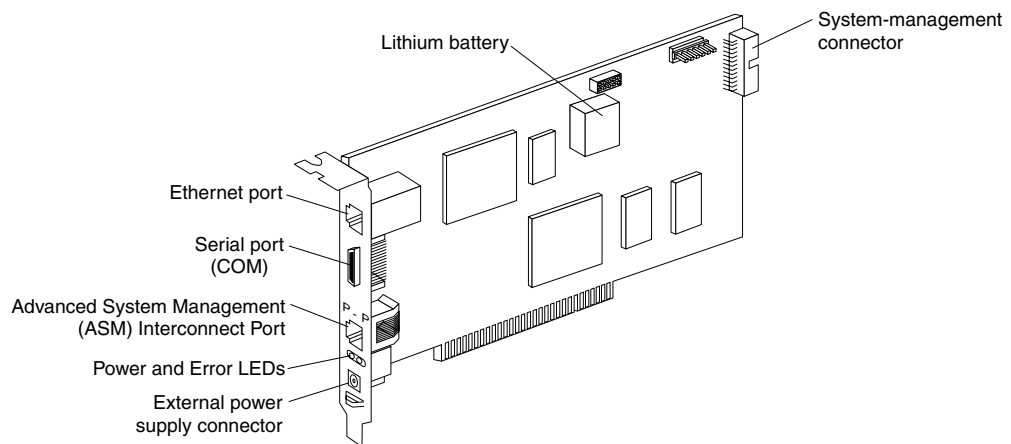
Descriptions of the Supervisor Adapter components are as follows:

Ethernet port (RJ-45)
> Connect a CAT 3 or CAT 5 Ethernet cable to this port to enable a LAN connection or Telnet session. The Ethernet port LEDs on the Supervisor Adapter are described in "Cabling the Ethernet LAN port" on page 14.

Serial port (COM)
> Connect a serial cable to this port to enable system management through a modem or connect a null modem cable to enable system management through a workstation or laptop computer.

Advanced System Management (ASM) Interconnect port
> Attach an ASM Interconnect cable (comes with the Supervisor Adapter) to this port to connect the Supervisor Adapter to the other devices on the ASM interconnect network.

Power and Error LEDs
> The green power LED indicates the status of the power connection. The amber Error LED indicates an error on the Supervisor Adapter.

External power supply connector
> Connect the power supply adapter (comes with the Supervisor Adapter) to this connector. This connection provides power to the Supervisor Adapter, independent of the server power supply.

Lithium battery
> Provides backup of the Supervisor Adapter real-time clock, event log, and configuration settings.

System management connector
> Connect the 20-pin ribbon cable (comes with the Supervisor Adapter) to this connector on the Supervisor Adapter and to the system-management connector on the server system board.

Step 2. Installing the Supervisor Adapter

Note: The illustrations and procedures in this document are specific to the IBM xSeries 220 server.

Attention: When you handle electrostatic discharge (ESD) sensitive devices, take precautions to avoid damage from static electricity. For details about handling ESD-sensitive devices, see "Handling static sensitive devices" on page 5.

To install the Supervisor Adapter, complete the following steps:

1. Review the safety precautions in "Safety" on page iii.

2. Turn off the server and attached devices and disconnect all external cables and power cords.

3. Remove the server cover. For instructions, refer to the documentation that comes with your server.

4. Remove the rear adapter retaining bracket from the server, as shown in the following illustration.
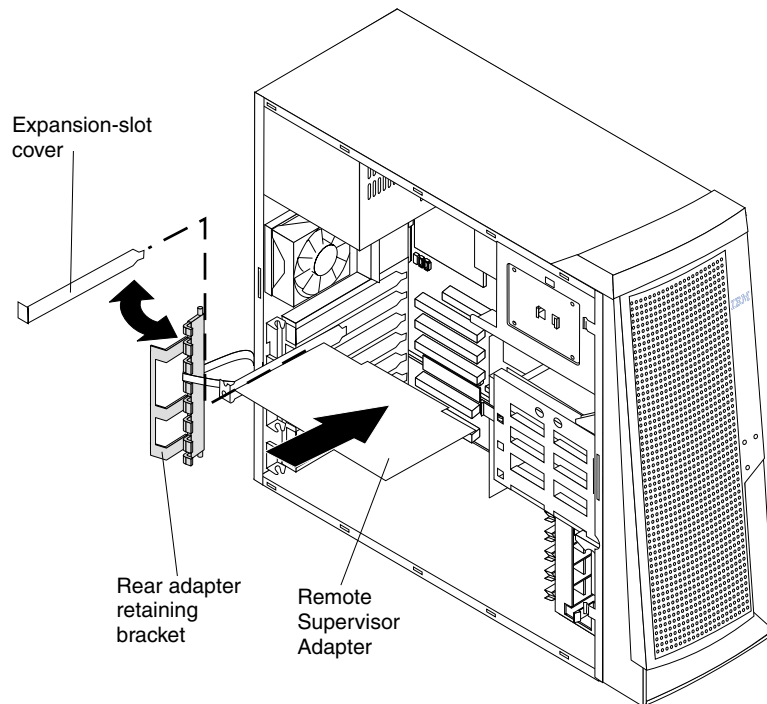
5. Remove the expansion-slot cover from PCI slot 2. Store it in a safe place for future use. For an illustration showing the location of PCI slot 2, see step 9b on page 12.

   Attention: Expansion-slot covers must be installed on all vacant slots. This maintains the electronic emission characteristics of the server and ensures proper cooling of server components.

6. Remove the adapter from the static-protective package.

   Attention: Avoid touching the components and gold-edge connectors on the adapter.

7. Install the adapter as follows:

   a. Carefully grasp the adapter by its top edge or upper corners, and align it with PCI slot 2 on the system board.

      Note: You must install the Supervisor Adapter in PCI slot 2.

   b. Press the adapter firmly into the PCI slot.

      Attention: When you install the adapter in the server, be sure that it is completely and correctly seated in the system-board connector before you apply power. Incomplete insertion might cause damage to the system board or the adapter.

8. Replace the rear adapter retaining bracket.

9. Connect the 20-pin ribbon cable as follows:

   a. Connect one end of the 20-pin ribbon cable to the system-management connector on the Supervisor Adapter. The 20-pin ribbon cable connector ends are keyed for proper installation.
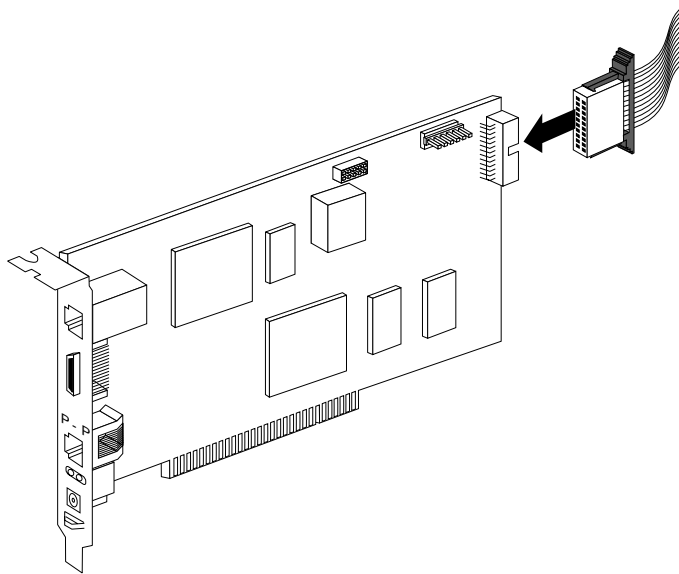
b. Connect the other end of the cable to the system-management connector on the system board.

The following illustration shows the location of the system-management connector on the xSeries 220 system board.

PCI 2
(J31)

xSeries 220 system board

System
management
(J32)
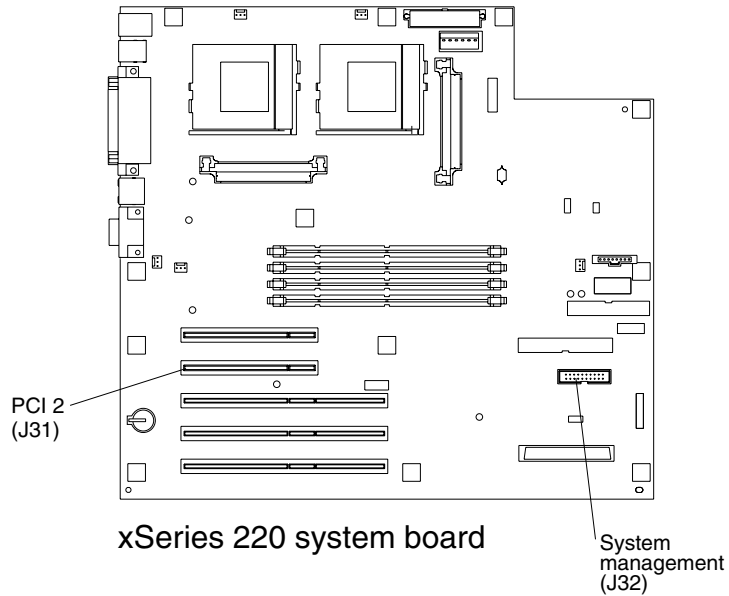
10. Replace the side cover.

11. Reconnect the external cables and power cords that you removed in step 2.

12. Continue with "Step 3. Connecting the power supply adapter".

Step 3. Connecting the power supply adapter

You must attach the power supply adapter that comes with the Supervisor Adapter. After you connect the power supply adapter to the Supervisor Adapter, you can use the power cord to connect the power supply adapter to a properly grounded electrical outlet or use the universal jumper cable (comes with the Supervisor Adapter) to connect the power supply adapter to a power distribution unit (PDU) or to an uninterruptible power supply (UPS).

To connect the power supply adapter and power cord, complete the following steps:

1. From the power supply adapter **3**, connect the power supply control cable **2** to the power supply adapter connector on the Supervisor Adapter **1**.
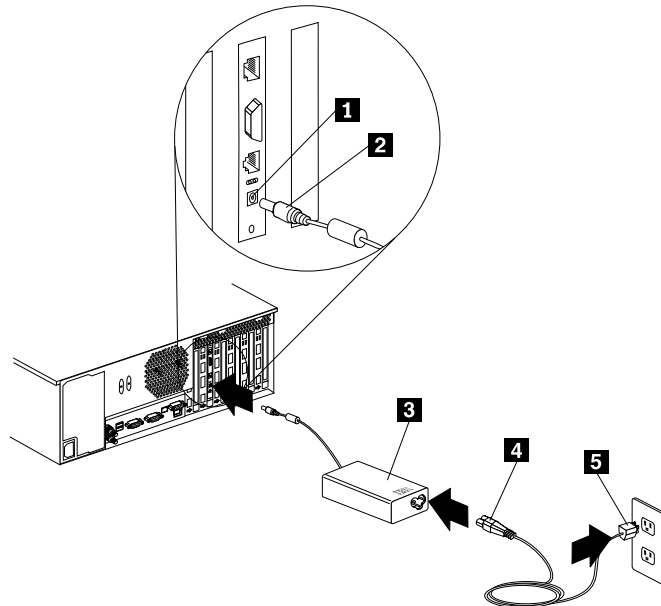
2. Connect one end of the power cord **4** to the connector on the power supply adapter **3**.

3. Connect the other end of the power cord **5** to a properly grounded electrical outlet.

   Note: Alternately, you can connect one end of the universal jumper cable to the power supply adapter; then, connect the other end to a power distribution unit (PDU) or to an uninterruptible power supply (UPS).

4. Make sure that the Supervisor Adapter power LED is green. For the location of the power LED, see the illustration in "Cabling the Ethernet LAN port" on page 14.

5. Continue with "Step 4. Connecting the LAN and serial port cables" on page 14.

Step 4. Connecting the LAN and serial port cables

You can manage your server remotely using the connections and user interfaces that are described in the following table. Choose the interface method by which you want to perform remote management; then, perform the indicated cabling procedure.

If you plan to set up an ASM interconnect network, go to Chapter 3, "Using the ASM interconnect network," on page 29 for instructions about cabling the ASM interconnect port and setting up the network. Then, return here to continue the configuration procedures.

Table 1. Cabling tasks to enable remote access to the Supervisor Adapter.

Connection to Supervisor Adapter	User interface to Supervisor Adapter	For the cabling procedure, see:
LAN using the Ethernet port	ASM Web interface using the HTTP protocol	"Cabling the Ethernet LAN port"
	Text-based user interface using the Telnet protocol	
Serial (COM) port	Text-based user interface using a modem or a null modem	"Cabling the serial (COM) port" on page 15
	ASM Web interface using point-to-point (PPP) protocol	
	Text-based user interface using the Telnet protocol over PPP	

Cabling the Ethernet LAN port

To attach the Ethernet cables, complete the following steps.

Attention: To avoid damage to the Ethernet connector, do not connect the ASM Interconnect cable into the Ethernet (RJ-45) port.

1. Connect one end of a CAT 3 or CAT 5 Ethernet cable to the Ethernet port on the Supervisor Adapter. Connect the other end of the Ethernet cable to your network.

2. Check the Ethernet LEDs. The location of the LEDs is shown in the following illustration.

Ethernet link
LED (green)

Ethernet port

Ethernet activity
LED (green)

Serial port
(COM)

P - P

ASM Interconnect port

Error LED
(amber)

Power LED
(green)

External power
supply connector
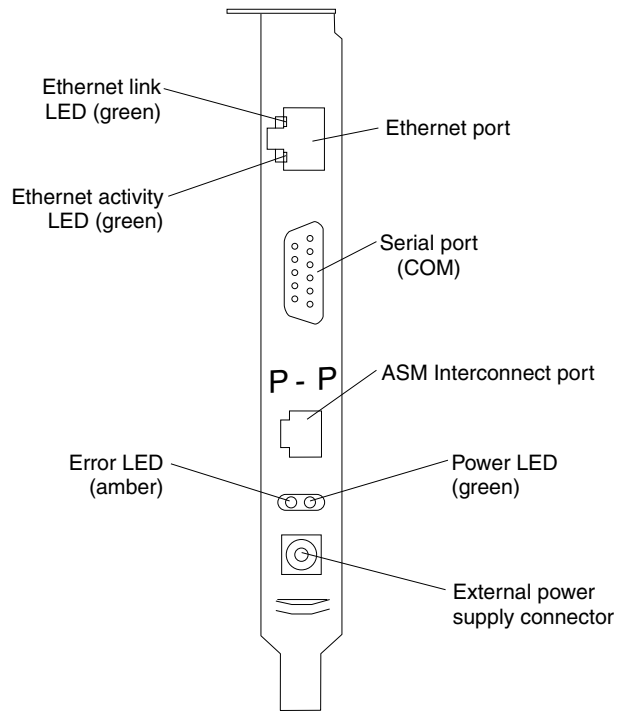
Ethernet link
> The green Ethernet link LED is lit when the Ethernet cable is connected properly.

Ethernet activity
> The green Ethernet activity LED is flashing when there is Ethernet activity.

3. If you plan to use the serial port connection, continue with "Cabling the serial (COM) port"; otherwise, go to "Step 5. Updating the Supervisor Adapter firmware".

Cabling the serial (COM) port

To cable the serial (COM) port, complete the following steps:

1. Connect a modem or null modem cable to the serial port on the Supervisor Adapter.

2. Continue with "Step 5. Updating the Supervisor Adapter firmware".

Step 5. Updating the Supervisor Adapter firmware

You can use the IBM Remote Supervisor Utility program to check the firmware level on the Supervisor Adapter and to update the firmware. This Utility program is a DOS utility on the *IBM Remote Supervisor Adapter Support* CD that comes with the Supervisor Adapter. You can obtain the latest firmware code from the IBM Web site, http://www.ibm.com/pc/support.

After you initially configure the Supervisor Adapter to enable remote access through a Web connection, you can update the Supervisor Adapter firmware using the ASM Web interface. The procedures to initially configure the Supervisor Adapter for remote access are described later in this chapter.

For information about using the ASM Web interface to monitor your server, refer to the *IBM Remote Supervisor Adapter User's Guide*, which is available in Adobe Acrobat Portable Document Format (PDF) on the *IBM Documentation* CD.

To update the Supervisor Adapter firmware, complete the following steps:

1. Turn on the server.

2. Insert the *IBM Remote Supervisor Adapter Support* CD into the CD-ROM drive and close the CD-ROM drive before the server completes power-on self-test (POST).

   Note: If you do not insert the CD and close the CD-ROM drive before POST completes, you must restart the server with the CD in the CD-ROM drive.

3. The CD starts automatically and the IBM Remote Supervisor Utility screen opens.

```
                    IBM Remote Supervisor Utility

                Select Option:

                   •  Hardware Status and Information
                   •  Configuration Settings
                   •  Update System Management Firmware

                Exit Utility




  <F1>  Help                                    <↑><↓>  Move
  <Esc> Exit                                    <Enter> Select
```

4. Use the up and down arrow keys (↑ and ↓) to select **Update System Management Firmware**; then, press Enter.

5. A warning screen opens; press Enter to continue.

```
                    IBM Remote Supervisor Utility



              ┌──────────────────────────────────────┐
              │        WARNING!! WARNING!!           │
              │ You are about to update the system management
              │ firmware.  This may take up to 2 minutes.
              │ Do not power off or restart the system during
              │ this procedure.
              │
              │ Press Enter to continue anyway. Press ESC to cancel.
              └──────────────────────────────────────┘



  <F1>  Help                                    <↑><↓>  Move
  <Esc> Exit                                    <Enter> Select
```
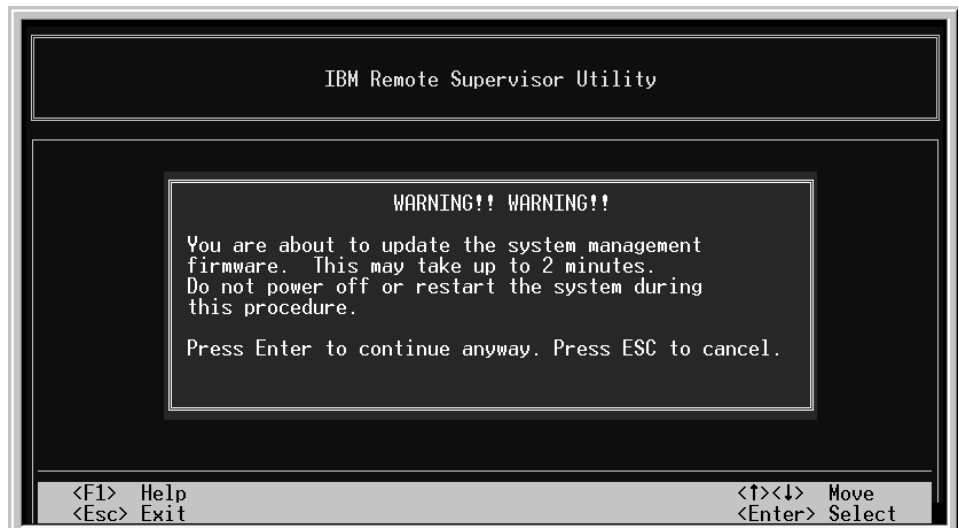
6. The Firmware Update Options Menu screen opens. Use the arrow keys to select **Normal Flash - All subsystems**; then, press Enter.

```
                    IBM Remote Supervisor Utility



                    Firmware Update Options Menu

            Select Option:

              •  Normal Flash - All subsystems
              •  Hardware Flash Option
              •  No, return to the main menu




    <F1>  Help                              <↑><↓>  Move
    <Esc> Exit                              <Enter> Select
```

7. The Firmware Update Status screen opens and displays a message to confirm you want to update the firmware. Press Enter. The system updates the Supervisor Adapter firmware.

8. When the Supervisor Adapter firmware update process is complete, press Enter to return to the Utility program main screen.

9. Continue with "Step 6. Performing initial configuration tasks to enable remote access to the Supervisor Adapter" on page 18.

Step 6. Performing initial configuration tasks to enable remote access to the Supervisor Adapter

The Supervisor Adapter requires initial configuration to enable remote access through the Ethernet and serial ports. From Table 2, choose the interface method by which you want to perform remote management; then, perform the indicated configuration procedure.

Table 2. Configuration tasks to enable remote access to the Supervisor Adapter.

Connection to Supervisor Adapter	User interface to Supervisor Adapter	For the configuration procedure, see:
LAN using the Ethernet port	ASM Web interface using the HTTP protocol	"Configuring the Ethernet port"
	Text-based user interface using the Telnet protocol	
Serial (COM) port	Text-based user interface using a modem or a null modem	"Configuring the serial port" on page 20
	ASM Web interface using point-to-point (PPP) protocol	"Configuring the serial port" on page 20 and "Setting up point-to-point protocol" on page 22
	Text-based user interface using the Telnet protocol over PPP	

For detailed information about using the ASM Web interface and the text-based user interface, refer to the *IBM Remote Supervisor Adapter User's Guide*.

Configuring the Ethernet port

If you have an accessible, active, and configured dynamic host configuration protocol (DHCP) server on your network, the hostname, IP address, gateway address, subnet mask, and DNS server IP address are set automatically. You do not need to perform further configuration tasks to enable the Ethernet connection because the default value for the **DHCP Setting** field is Enabled. If you need to configure the serial port, go to "Configuring the serial port" on page 20; otherwise, go to "Step 7. Installing the Advanced System Management device drivers" on page 23.

If you do not have a DHCP server on your network, complete the following steps to configure the Ethernet port:

1. If you completed the update firmware procedure and the Utility program main screen is open, go to step 5; otherwise, continue with step 2.
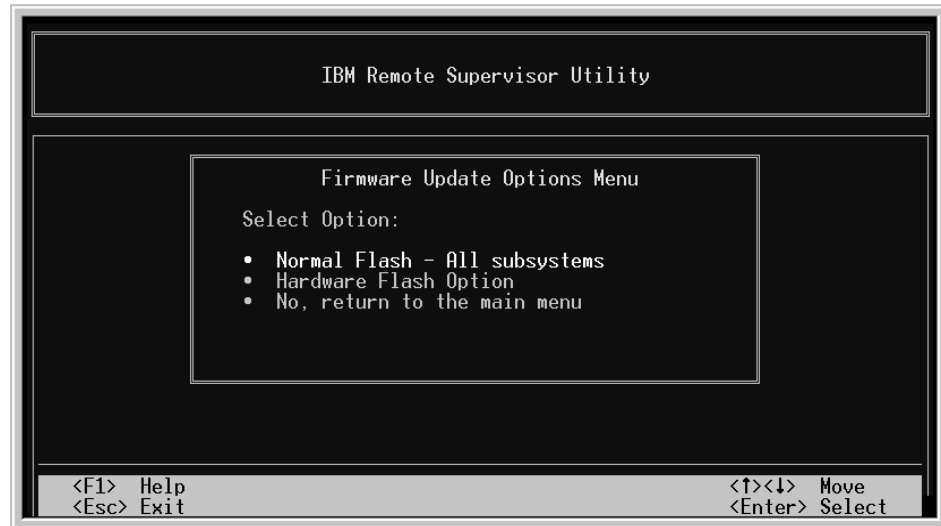
2. Turn on the server.

3. Insert the *IBM Remote Supervisor Adapter Support* CD into the CD-ROM drive and close the CD-ROM drive before the server completes POST.

   Note: If you do not insert the CD and close the CD-ROM drive before POST completes, you must restart the server with the CD in the CD-ROM drive.

4. The CD starts automatically and the IBM Remote Supervisor Utility screen opens.

5. Use the up and down arrow keys (↑ and ↓) to select **Configuration Settings**; then, press Enter.

The Configuration Settings screen opens.

```
                    IBM Remote Supervisor Utility



                        Configuration Settings

                Select Option:

                    •   General Settings
                    •   Ethernet Settings
                    •   PPP Settings
                    •   Modem Settings
                    •   View Advanced Network Settings




   <F1>  Help                                    <↑><↓>  Move
   <Esc> Exit                                    <Enter> Select
```

6. Use the arrow keys to select **Ethernet Settings**; then, press Enter.

    The Ethernet Settings screen opens.

    Note: The values in the following screen are only examples; your settings will be different.

```
                    IBM Remote Supervisor Utility



                          Ethernet Settings
            Network Interface:        ENABLED_
            IP Address:               _9._67._41._22
            Subnet Mask:              255.255.255.__0
            Gateway:                  _9._67._41._1
            Line Type:                Ethernet__
            Host Name:                NTServerst3
            Data Rate:                AUTO
            Duplex:                   AUTO
            MTU size:                 1500__
            User Defined MAC address: 00-00-00-00-00-00
            DHCP Setting:             DISABLED
            To allow ASM to use static IP address, subnet mask, and
            gateway values, you must set DHCP to "DISABLED".
   <F1>  Help        <F2> Refresh               <↑><↓>  Move
   <Esc> Exit        <F6> Apply                 <F9>   Restart
```

7. Use the arrow keys to navigate to each field. Your system administrator can provide the information for the following fields:

    Network Interface
    > The default value is Enabled; verify that it is still set to Enabled.

    IP Address
    > Type the IP address of the Supervisor Adapter.

    Subnet Mask
    > Type the subnet mask used by the Supervisor Adapter. The default value is 255.255.255.0.

Gateway Type your network gateway router.

Host Name

Type the IP hostname of the Supervisor Adapter. The default hostname is ASMA*<burned-in MAC address>*.

For detailed information about the Ethernet settings, refer to the *IBM Remote Supervisor Adapter User's Guide*.

8. You must change the **DHCP Setting** field to Disabled. The default value is Enabled.

9. Press F6 to apply.

10. Press Esc. In the Warning screen that opens, press Enter to restart the Supervisor Adapter.

11. Press Esc to return to the Configuration Settings window.

12. If you need to configure the serial port, go to "Configuring the serial port"; otherwise continue with step 13.

13. Press Esc to return to the Utility program main screen.

14. Use the arrow keys to select **Exit Utility** from the menu or press Esc to close the Utility program.

15. Remove the CD from the CD-ROM drive. The Supervisor Adapter restarts automatically.

16. Go to "Step 7. Installing the Advanced System Management device drivers" on page 23.

Configuring the serial port

To configure the Supervisor Adapter serial port for access using a modem or null modem, complete the following steps:

1. If you completed the procedure for configuring the Ethernet port and the Configuration Settings screen is open, go to step 6; otherwise, continue with step 2.

2. Turn on the server.

3. Insert the *IBM Remote Supervisor Adapter Support* CD into the CD-ROM drive and close the CD-ROM drive before the server completes POST.

    Note: If you do not insert the CD and close the CD-ROM drive before POST completes, you must restart the server with the CD in the CD-ROM drive.

4. The CD starts automatically and the IBM Remote Supervisor Utility screen opens.

5. Use the up and down arrow keys (↑ and ↓) to select **Configuration Settings**; then, press Enter.
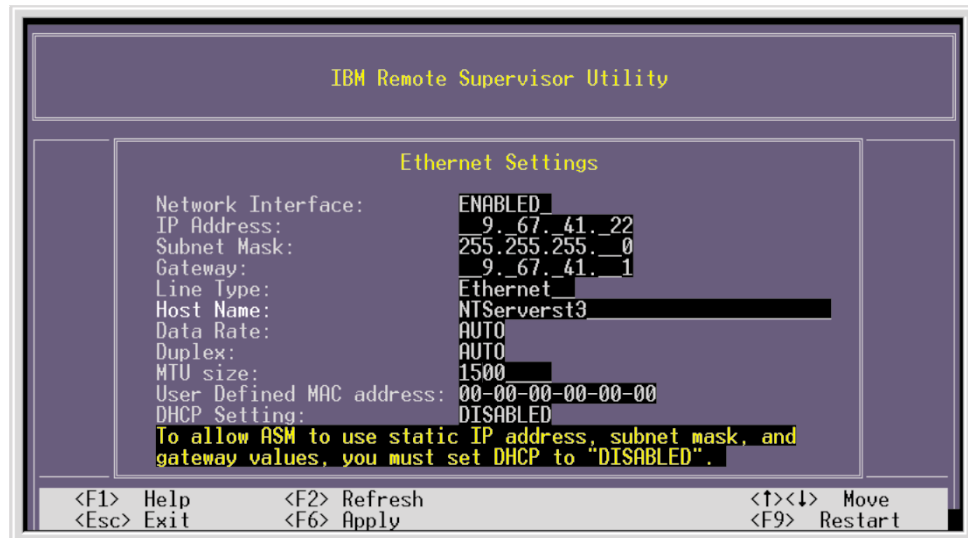
    The Configuration Settings screen opens.

6. Use the arrow keys to select **Modem Settings**; then, press Enter.

    The Modem Settings screen opens.

    Note: The values in the following screen are only examples; your settings might be different.

```
                      IBM Remote Supervisor Utility


                                Modem Settings

   Port to configure: 1          Baud Rate: 57600
   Dedicated to ASM:  ENABLED_    Parity:    NONE_     Stop Bits: 1

   Initialization string:     ATZ_____
   Hang up string:            ATH0_____
   Return to factory settings: AT&F0_____

   Escape guard time:  100         Escape string:        +++_____
   Dial prefix string: ATDT_____ Dial postfix string:
   Auto answer string: ATS0=1_____  Auto answer stop:    ATS0=0_____
   Caller ID:                       Query string:        AT_____



   <F1>  Help        <F2> Refresh     <→> Next Value      <↑><↓>  Move
   <Esc> Exit        <F6> Apply       < Previous Value
```

7. Verify the following serial port values:

Baud Rate

> The default is 57600. Make sure that the baud rate matches the baud rate of the device you are connecting to the serial port on the Supervisor Adapter.

Dedicated to ASM

> The default is Disabled. If you are using point-to-point protocol (PPP), make sure that you set this field to Enabled. If the value in this field is Enabled when the server is restarted, the serial port remains dedicated to system management and is not returned to the operating system.

> You can either dedicate the integrated serial port on the Supervisor Adapter to system management or share it with the operating system. If the serial port is dedicated to system management, it serves only the Supervisor Adapter and is always available for dial-in or dial-out alerting purposes. You cannot view the port using the operating system or any application.

> If the serial port is shared with the operating system, it is dedicated to the Supervisor Adapter only while the server is turned off or during POST. The port is returned to the operating system after POST completes. You can view the port using the operating system or any application. The Supervisor Adapter takes over the port from the operating system only when information about a critical event is received. The Supervisor Adapter dials out and transmits an alert and keeps the port dedicated until the server is restarted. (The port is no longer available to the operating system or applications.)

Parity The default is None.

Stop Bits

> The default is 1.

Note: The data bits value is preset to 8 and cannot be changed.

For detailed information about the serial port and modem settings, refer to the *IBM Remote Supervisor Adapter User's Guide*.

8. If you make changes to the serial port settings, press F6 to apply.

9. Press Esc to return to the Configuration Settings window.

10. If you need to set up PPP, go to "Setting up point-to-point protocol"; otherwise, continue with step 11.

11. Press Esc to return to the Utility program main window.

12. Use the arrow keys to select **Exit Utility** from the menu or press Esc to close the Utility program.

13. Remove the CD from the CD-ROM drive. The Supervisor Adapter restarts automatically.

14. Go to "Step 7. Installing the Advanced System Management device drivers" on page 23.

Setting up point-to-point protocol

The Supervisor Adapter serial port supports point-to-point protocol (PPP). The PPP enables TCP/IP communication over the serial port, which enables Web-based management and Telnet sessions over a modem.

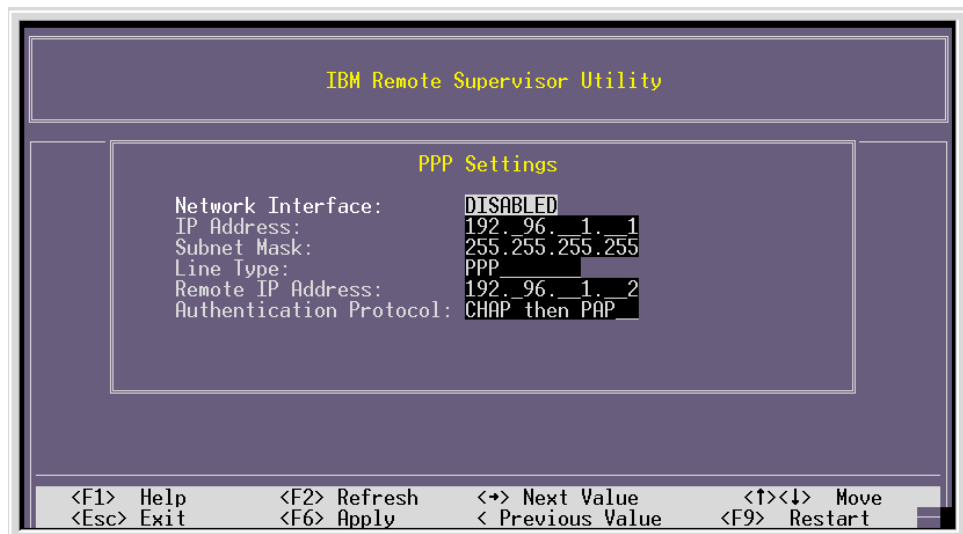To set up PPP, complete the following steps:

1. If you completed the procedure for configuring the serial port and the Configuration Settings screen is open, go to step 6; otherwise, continue with step 2.

2. Turn on the server.

3. Insert the *IBM Remote Supervisor Adapter Support* CD into the CD-ROM drive and close the CD-ROM drive before the server completes POST.

   Note: If you do not insert the CD and close the CD-ROM drive before POST completes, you must restart the server with the CD in the CD-ROM drive.

4. The CD starts automatically and the IBM Remote Supervisor Utility screen opens.

5. Use the up and down arrow keys (↑ and ↓) to select **Configuration Settings**; then, press Enter.

   The Configuration Settings screen opens.

6. Use the arrow keys to select **PPP Settings**; then, press Enter.

   The PPP Settings screen opens.

```
                    IBM Remote Supervisor Utility


                          PPP Settings
          Network Interface:     DISABLED
          IP Address:            192._96.__1.__1
          Subnet Mask:           255.255.255.255
          Line Type:             PPP
          Remote IP Address:     192._96.__1.__2
          Authentication Protocol: CHAP then PAP




     <F1>  Help       <F2> Refresh    <→> Next Value       <↑><↓>  Move
     <Esc> Exit       <F6> Apply      < Previous Value     <F9>  Restart
```

7. Use the arrow keys to navigate to each field. Verify the values in the following fields:

Network Interface
> The default is Disabled. Change this field to Enabled.

IP Address
> The default value is 192.96.1.1. Make sure that the client is configured to allow the server to assign this IP Address.

Subnet Mask
> The default value is 255.255.255.255.

Line Type
> The default is PPP.

Remote IP Address
> The default value is 192.96.1.2.

Authentication Protocol
> The default is CHAP then PAP. Make sure that the value in this field matches your client settings.

For detailed information about the PPP settings, refer to the *IBM Remote Supervisor Adapter User's Guide*.

8. Press F6 to apply.

9. Press Esc to return to the Configuration Settings window.

10. Press Esc to return to the Utility program main screen.

11. Use the arrow keys to select **Exit Utility** from the menu or press Esc to close the Utility program.

12. Remove the CD from the CD-ROM drive. The Supervisor Adapter restarts automatically.

13. Continue with "Step 7. Installing the Advanced System Management device drivers".

Step 7. Installing the Advanced System Management device drivers

You must install the Advanced System Management device drivers for the Supervisor Adapter. These device drivers are included on the *IBM Remote Supervisor Adapter Support* CD that comes with the adapter. You can obtain the latest device drivers from the IBM Web site, http://www.ibm.com/pc/support.

The following sections describe the procedure for installing the Advanced System Management device drivers on your server, depending on your operating system.

Notes:

1. Make sure that the operating system is installed on your server before you install the Advanced System Management device drivers. For information about installing the operating system, refer to the documentation that comes with your server.

2. To install the operating system using ServerGuide, use only ServerGuide version 6.0.3, or later. If you install the Supervisor Adapter and then install Microsoft Windows NT or Windows 2000 using ServerGuide version 6.0.3 or later, the Advanced System Management device drivers are installed automatically and you can skip this step and go to "Step 8. Configuring the remote control password" on page 27.

3. If you previously installed the operating system with ServerGuide version 6.0.2, make sure that you install the Advanced System Management device drivers from the *IBM Remote Supervisor Adapter Support* CD, not from the directory that

ServerGuide 6.0.2 created on the hard disk during its installation of the operating system. For the Windows 2000 operating system, follow the installation instructions in "Manually installing the device drivers" on page 24.

4. If a system-management application (for example, IBM Netfinity Director) is running on the server on which you are installing the device drivers, be sure to stop the application before installing the device drivers.

5. For information about updating the device drivers, refer to your server documentation.

Installing Windows 2000 device drivers

If you have the Windows 2000 operating system, install the Advanced System Management device drivers using one of the following methods:

* Hardware Wizard

* Manual installation

Note: If IBM Netfinity Director, IBM Director, or UM Services is running on the server, be sure to stop it before proceeding.

Using the Hardware Wizard to install the device drivers

To use the automatic Windows Hardware Wizard to install the Supervisor Adapter Advanced System Management device drivers for Windows 2000, complete the following steps:

1. Restart the server.

   The Hardware Wizard automatically checks for new hardware. When complete, the Found New Hardware Wizard window opens.

2. Click **Next**.

   The Remote Supervisor hardware is automatically detected as an Unknown device.

3. Select **Search for a suitable driver for my device**; then, click **Next**.

4. Insert the *IBM Remote Supervisor Adapter Support* CD into the CD-ROM drive on the server.

5. Under Optional search locations, select **CD-ROM drives**. Click **Next** to continue.

6. The Hardware Wizard locates on the CD the appropriate drivers for the Supervisor Adapter hardware, and then installs them. If multiple versions of the drivers are found, select the most recent version.

7. Follow the instructions in the wizard until the Finish message displays. Click **Finish** to complete the installation of the drivers.

   Note: The Hardware Wizard might repeat the installation process four times as it installs all of the Supervisor Adapter device drivers.

Manually installing the device drivers

To manually install the Windows 2000 device drivers, complete the following steps:

1. On the desktop, right-click on **My Computer**; then, select **Properties** → **Hardware** → **Device Manager**.

   The Supervisor Adapter hardware is detected automatically as an Unknown device under Other devices.

2. Select **Unknown device**; then, right-click and select **Properties**.

3. Click the Driver tab; then, select **Update Driver**.

   The Welcome to the Upgrade Device Driver Wizard window opens.

4. Click **Next**.

5. Select **Search for a suitable driver for my device**; then, click **Next**.

6. Insert the *IBM Remote Supervisor Adapter Support* CD into the CD-ROM drive on the server.

7. Under Optional search locations, select **CD-ROM drives**. Click **Next** to continue.

8. The Hardware Wizard locates on the CD the appropriate drivers for the Supervisor Adapter hardware, and then installs them. If multiple versions of the drivers are found, select the most recent version.

9. Follow the instructions in the Wizard until the Finish message displays. Click **Finish** to complete the installation of the drivers.

   Note: The Hardware Wizard might repeat the installation process four times as it installs all of the Supervisor Adapter device drivers.

Installing Windows NT device drivers

If you have the Windows NT operating system, install the Advanced System Management device drivers using one of the following methods:

- Non-interactive

  The non-interactive method for installing the Advanced System Management device drivers accepts the default values for any screen prompts that display. You are prompted to respond only if an error occurs during installation.

- Interactive

  The normal, or interactive method, prompts you with instructions and waits for you to respond before continuing with the installation.

Note: If IBM Netfinity Director, IBM Director, UM Services, or IBM Netfinity Manager is running on the server, be sure to stop it before proceeding.

Using the non-interactive method

To use the non-interactive method, complete the following steps:

1. Open a Windows NT command prompt; then, type one of the following commands:

   - If the installation is from a diskette, type:

     `A:\NT\SETUP -q`

     (where *A* is the drive letter assigned to your diskette drive).

     Press Enter.

   - If the installation is from a CD, type:

     `D:\DD\NT\SETUP -q`

     (where *D* is the drive letter assigned to your CD-ROM drive).

     Press Enter.

2. Follow the instructions that display on the screen.

Using the interactive method

To use the interactive method, complete the following steps:

1. Open a Windows NT command prompt; then, type one of the following commands:

   - If the installation is from a diskette, type:

     `A:\NT\SETUP`

     (where *A* is the drive letter assigned to your diskette drive).

     Press Enter.

   - If the installation is from a CD, type:

     `D:\DD\NT\SETUP`

     (where *D* is the drive letter assigned to your CD-ROM drive).

     Press Enter.

2. Follow the instructions that display on the screen.

Installing Novell NetWare device drivers

To install the Advanced System Management device drivers for the Novell NetWare operating system, complete the following steps:

Note: If IBM Netfinity Director, IBM Director, or IBM Netfinity Manager is running on the server, be sure to stop it before proceeding.

1. From a system console session, type one of the following commands:

   - If the installation is from a diskette, type:

     `LOAD A:\NETWARE\SETUP`

     (where *A* is the drive letter assigned to your diskette drive).

     Press Enter.

   - If the installation is from a CD, type:

     `LOAD D:\DD\NETWARE\SETUP`

     (where *D* is the drive letter assigned to your CD-ROM drive).

     Press Enter.

2. Follow the instructions that display on the screen.

Installing SCO UnixWare device drivers

Choose one of the following methods to install the SCO UnixWare Advanced System Management device drivers.

Note: If IBM Netfinity Director or IBM Director is running on the server, be sure to stop it before proceeding.

- To use the SCO UnixWare package utility, complete the following steps:

  1. Open a shell prompt.

  2. Type:

     `scoadmin`

     then, press Enter.

  3. Click **Application Installer**.

  4. Click to access the diskette or the CD-ROM drive (for example, DISK_A or CD-ROM_1); then, install the package file that displays.

- Interactive installation from a shell prompt:

  Note: The commands in the following steps are case-sensitive.

  1. Open a shell prompt.
  2. If the installation is from a diskette, type:

     ```
     pkgadd -d diskette1
     ```
  3. If the installation is from a CD, type:

     ```
     pkgadd -d cdrom1
     ```

- Non-interactive installation from a shell prompt:

  Note: The commands in the following steps are case-sensitive.

  1. Open a shell prompt.
  2. If the installation is from a diskette, type:

     ```
     pkgadd -d diskette1 -q-p-n uw7advmg
     ```
  3. If the installation is from a CD, type:

     ```
     pkgadd -d cdrom1 -q-p-n uw7advmg
     ```

Step 8. Configuring the remote control password

If you want to use the remote control features of the Supervisor Adapter ASM Web interface, you must configure the Remote Control password using the Configuration/Setup Utility program that comes with your server. This program is part of the basic input/output system (BIOS) code.

To set up a remote control password, complete the following steps:

1. Turn on the server and watch the monitor screen.
2. When the message `Press F1 for Configuration/Setup` displays, press F1.

   The Configuration/Setup Utility main menu screen opens.
3. Use the up and down arrow keys (↑ and ↓) to select **System Security;** then, press Enter.

   The System Security screen opens.
4. Select **Remote Control Security Settings**; then, press Enter.

   The Remote Control Security Settings screen opens.
5. Enter the Remote Control Password that you will use each time you log into the remote control features of the Supervisor Adapter ASM Web Interface.
6. Select **Save New Remote Control Password**; then, press Enter.
7. In the System Security screen, press Esc.
8. Select **Save Settings**; then, press Enter.
9. Confirm your selection; then, exit the Configuration/Setup Utility.

Step 9. Completing the installation

To complete the installation of the Supervisor Adapter, do the following:

1. If you did not restart the server after installing the Advanced System Management device drivers, restart the server now.

   Note: You do not need to restart the server if you are running the Windows NT operating system.

2. Refer to the *IBM Remote Supervisor Adapter User's Guide* for detailed instructions about completing the configuration of the Supervisor Adapter features. These features include the following:

   • Defining the login IDs and passwords

   • Selecting the events that will receive alert notification

   • Monitoring remote server status using the ASM Web interface or a text-based user interface

   • Remote control of the server

Chapter 3. Using the ASM interconnect network

This chapter includes information about how to configure and connect your server to function within an ASM interconnect network. Your ASM interconnect network can include as many as 12 individual ASM connections in a single bus. These connections can include Supervisor Adapters, ASM processors, and ASM PCI Adapters. After your clients and servers are connected, they use the ASM interconnect network to share ASM resources, information, and alerts between multiple servers, without having to add additional communications hardware or network interface adapters.

Setting up the ASM interconnect network

The Supervisor Adapter must be the main Ethernet gateway to your ASM interconnect bus. The Supervisor Adapter forwards the ASM information generated by the servers attached to the ASM interconnect bus to other servers on your Ethernet network. Using the Supervisor Adapter as the primary connection point, the connected ASM processors and ASM PCI Adapters are managed through the new user interface and Web browser access of the Supervisor Adapter.

You must install an ASM Interconnect cable on the Supervisor Adapter and on each of the servers that you plan to connect to the ASM interconnect network bus. For instructions for installing the ASM Interconnect cable on the Supervisor Adapter, see "Installing the ASM Interconnect cable" on page 30.

Before connecting your servers, note the following setup and configuration considerations:

- Make sure that the ASM interconnect network is set up as a bus, not as a ring. You must connect the servers to the ASM interconnect network in a series, with beginning and end points.

- Make sure that the total length of all Ethernet cables connecting the server in the ASM interconnect network does not exceed 91.4 M (300 ft).

- Each Supervisor Adapter, ASM PCI adapter, or ASM processor that is connected to the ASM interconnect network bus counts as one connection. For example, if an ASM PCI adapter is installed in a server that has an ASM processor, the processor and the adapter are connected to each other using one ASM interconnect connection but the processor and the adapter count as two connections on the ASM interconnect network bus.
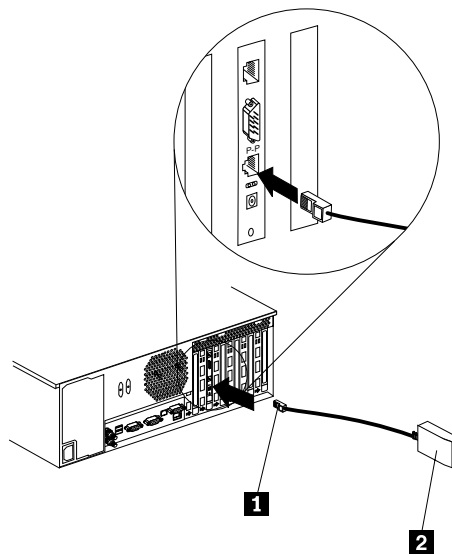
Installing the ASM Interconnect cable

The ASM Interconnect cable connects the Supervisor Adapter to the ASM interconnect network. This cable comes with the Supervisor Adapter option. For detailed instructions about installing the ASM Interconnect cable on servers with ASM processors and ASM PCI adapters, refer to the documentation that comes with those devices.

To install the ASM Interconnect cable to the Supervisor Adapter, complete the following steps.

Attention: To avoid damage to the Ethernet connector, do not connect the ASM Interconnect cable into the Ethernet (RJ-45) port.

1. Connect the ASM Interconnect cable **1** to the Supervisor Adapter ASM Interconnect port. This port has a P – P (for peer-to-peer) above it.

   Note: The following illustration shows a Supervisor Adapter installed in an xSeries 220 server.

2. Connect one or two CAT 3 or CAT 5 Ethernet cables to the other end of the ASM Interconnect cable **2** .

3. Continue with "Forwarding alerts".

Forwarding alerts

Supervisor Adapters, ASM PCI adapters, and ASM processors that are connected to an ASM interconnect network share resources and system-management information. This section provides information on how alerts are shared and forwarded in the ASM interconnect network.

One benefit of an ASM interconnect network is remote access and alert redundancy for several managed servers at the same location. Alerts are sent only once (per connection type), even with more than one active LAN or serial connection. However, if one connection device has failed, all other interconnected devices will route the

alerts to the next available connection. The same flexibility applies to remote access capabilities.

During normal operation, each Supervisor Adapter, ASM processor, or ASM PCI adapter on the ASM interconnect network communicates with the other processors and adapters on the network. Processors or adapters that have a modem or Ethernet connection "tell" the other processors and adapters that these communications resources are available for use by other servers on the ASM interconnect network. These communications resources are then used as ASM interconnect network resources, enabling Supervisor Adapters, ASM processors, or ASM PCI adapters on the ASM interconnect network to send alerts to a modem or an IP address, even if they do not have a modem or network connection physically attached.

When alerts are generated, they are forwarded to the Supervisor Adapter, ASM processor, or ASM PCI adapter on the ASM interconnect network that has the communication resources to forward the alert. If no system on the ASM interconnect network meets the requirements, the alert is queued for dial-out if the connection type is configured later.

If multiple modems or multiple network connections exist in the ASM interconnect network, you cannot specify which system will receive an alert or which will use its modem or network connection to forward the alert. If an alert is forwarded to another Supervisor Adapter, ASM processor, or ASM PCI adapter that is unable to deliver the alert (for example, the modem it is configured to use has failed or the network cannot resolve the destination IP address), the processor or adapter attempts to forward the alert to another system on the ASM interconnect network that has the communication resources to forward the alert.

After you review the sample ASM interconnect configurations in the following section, if you did not complete the procedures in Chapter 2, return to Table 1 on page 14 to continue the installation process.
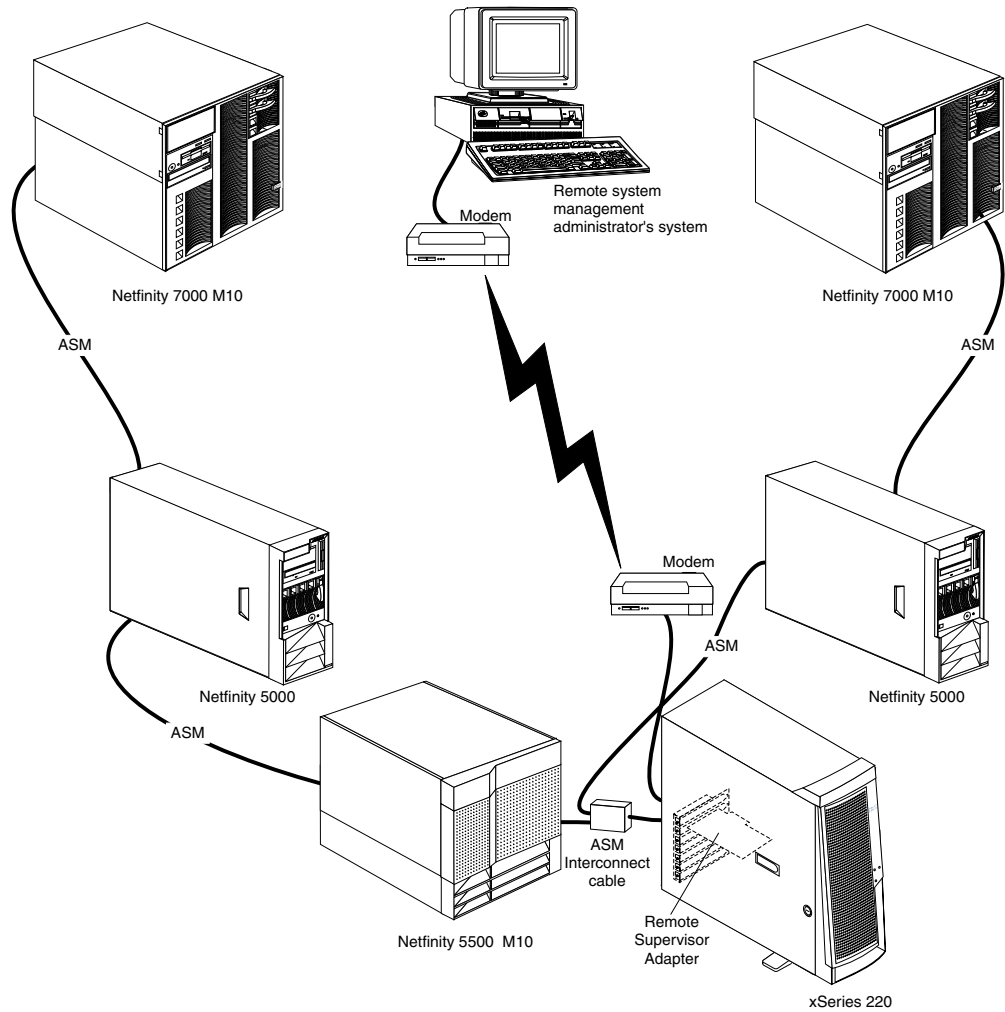
Sample ASM interconnect configurations

The illustrations in this section show sample ASM interconnect network configurations.

In the following example, a modem is connected to the ASM PCI adapter that is included with a Netfinity 7000 M10 server and a Supervisor Adapter option is installed in an xSeries 220 server. The xSeries 220 server with the Supervisor Adapter will act as the network gateway, forwarding system management data generated by the other systems in the ASM interconnect network bus to the system management administration system that is connected to the network. The Netfinity 7000 M10 server is configured to use a modem to forward the system management data to the administrator as well, providing redundancy in case of a network failure.
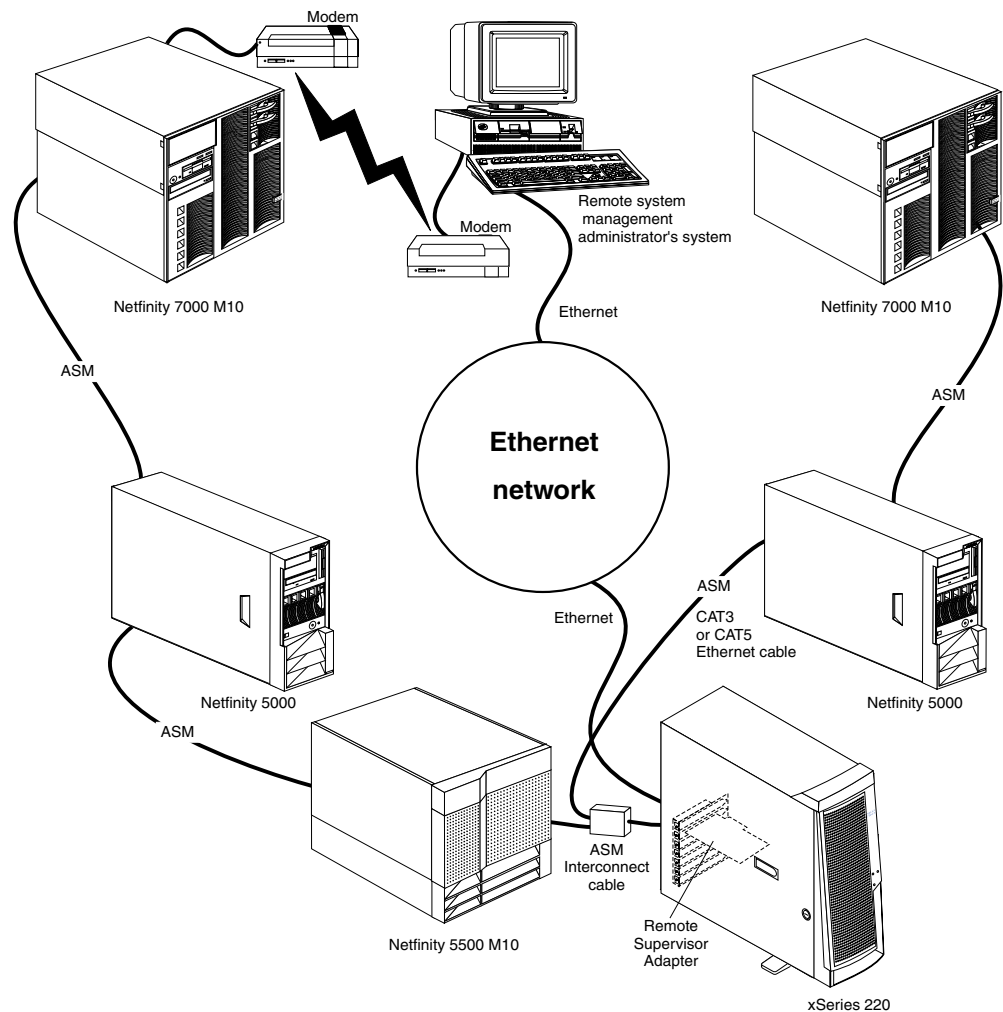
In the following example, a modem is connected to the Supervisor Adapter that is installed in an xSeries 220 server. In this case, the xSeries 220 server uses the modem to forward system management data generated by the other systems in the ASM interconnect network bus, to the remote system management administrator.

Netfinity 7000 M10

Modem

Remote system management administrator's system

Netfinity 7000 M10

ASM

ASM

Netfinity 5000

Modem

ASM

Netfinity 5000

ASM

ASM Interconnect cable

Remote Supervisor Adapter

Netfinity 5500 M10

xSeries 220

In the following example, modems are connected to the ASM PCI adapters that are included with Netfinity 7000 M10 servers that are connected at each end of the ASM interconnect network bus. Placing modems at opposite ends of the ASM interconnect network bus ensures that if an ASM interconnect connection in the bus has failed, all of the systems on the ASM interconnect network will have access to a modem to forward system-management data to the remote system-management administrator.
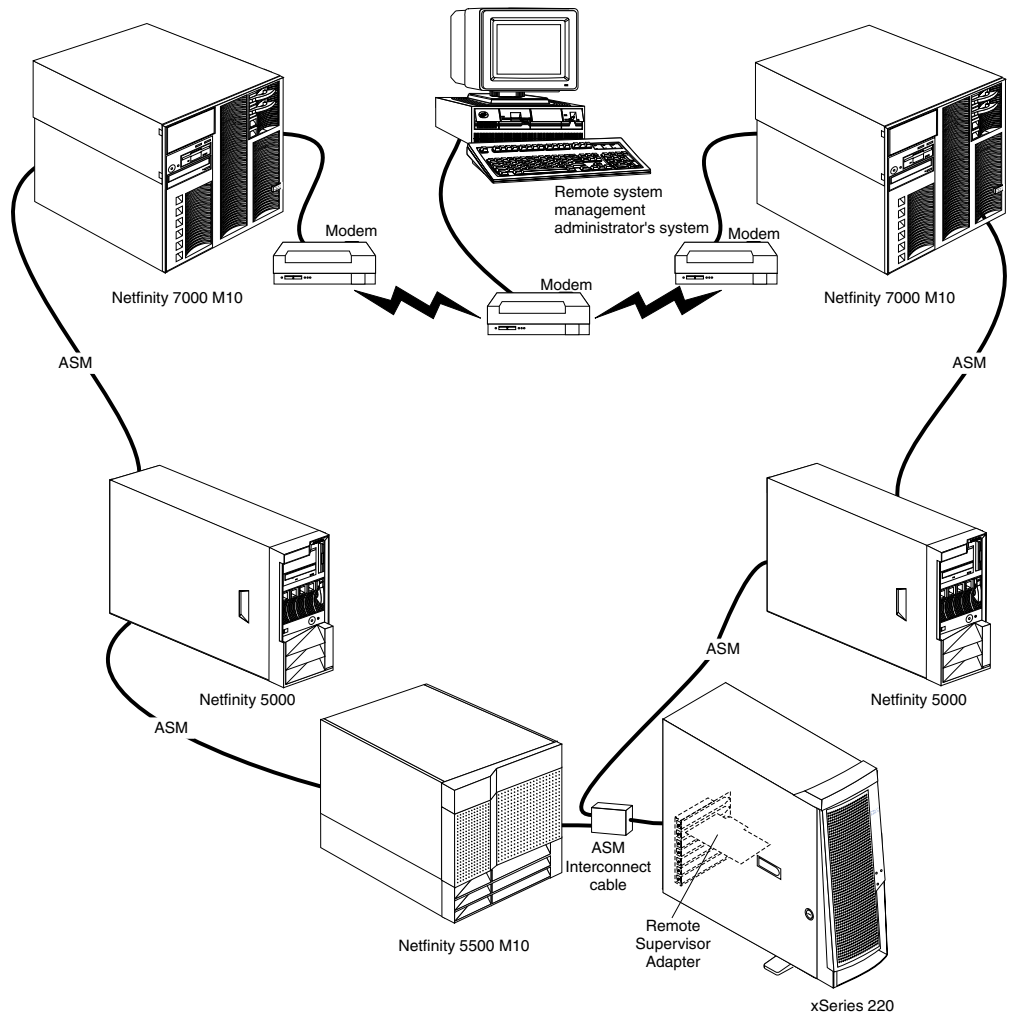
Appendix A. Getting help, service, and information

If you need help, service, technical assistance, or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you.

With the original purchase of an IBM hardware product, you have access to extensive support coverage. During the IBM hardware product warranty period, you may call the IBM Personal Systems HelpCenter (1-800-772-2227 in the U.S.) for hardware product assistance covered under the terms of the IBM Statement of Limited Warranty.

The following services are available during the warranty period:

- Problem Determination - Trained personnel are available to assist you with determining if you have a hardware problem and deciding what action is necessary to fix the problem.

- IBM Hardware Repair - If the problem is determined to be caused by IBM hardware under warranty, trained service personnel are available to provide the applicable level of service.

- Engineering Change Management - Occasionally, there might be changes that are required after a product has been sold. IBM or your reseller, if authorized by IBM, will make Engineering Changes (ECs) available that apply to your hardware.

Be sure to retain your proof of purchase to obtain warranty service. Refer to the IBM hardware warranty for a full explanation of IBM's warranty terms.

Please have the following information ready when you call:

- Machine Type and Model

- Serial numbers of your IBM hardware products

- Description of the problem

- Exact wording of any error messages

- Hardware and software configuration information

On the World Wide Web, the IBM Personal Computing Web site has up-to-date information about IBM Personal Computer products and support.

Some helpful addresses are:

http://www.ibm.com	Main IBM home page
http://www.ibm.com/pc	IBM Personal Computing
http://www.ibm.com/pc/support	IBM Personal Computing Support
http://www.ibm.com/pc/us/accessories	Options by IBM (U.S.)
http://www.ibm.com/eserver/xseries	IBM xSeries Servers
http://www.ibm.com/pc/techconnect	IBM TechConnect

You can select a country-specific Web site from these pages.

If you select Profile from the support page, you can create a customized support page that is specific to your hardware, complete with Frequently Asked Questions, Parts Information, Technical Hints and Tips, and Downloadable Files. You will have the information you need, all in one place. In addition, you can choose to receive e-mail notifications whenever new information becomes available about your registered products. You can also access online support forums, which are community sites monitored by IBM support staff.

Appendix B. Product warranties and notices

This chapter contains warranty and emission notices. It also contains trademarks and general-information notices.

Warranty statements

The warranty statements consist of two parts: Part 1 and Part 2. Part 1 varies by country. Part 2 is the same for all countries. Be sure to read both the Part 1 that applies to your country and Part 2.

- **United States, Puerto Rico, and Canada (Z125-4753-05 11/97)**

  Limited warranty for US, Puerto Rico, and Canada.

  (page 37, Part 1 - General Terms)

- **Worldwide except Canada, Puerto Rico, Turkey, and United States (Z125-5697-01 11/97)**

  ("Part 1 - General Terms," on page 40)

- **Worldwide Country-Unique Terms**

  ("Part 2 - Worldwide Country-Unique Terms" on page 42)

IBM Statement of Limited Warranty for United States, Puerto Rico, and Canada (Part 1 - General Terms)

This Statement of Limited Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. ***The terms of Part 2 may replace or modify those of Part 1.*** The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

Machine - IBM Remote Supervisor Adapter

Warranty Period* - Three Years

*Contact your place of purchase for warranty service information. Some IBM Machines are eligible for On-site warranty service depending on the country where service is performed.

The IBM Warranty for Machines
IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your sales receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if approved by IBM to provide warranty service, will provide repair and exchange service for the Machine, without charge, under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded. The replacement may not be new, but will be in good working order.

Extent of Warranty
The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Items Not Covered by Warranty
IBM does not warrant uninterrupted or error-free operation of a Machine.

Unless specified otherwise, IBM provides non-IBM machines **WITHOUT WARRANTIES OF ANY KIND.**

Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND.**

Warranty Service
To obtain warranty service for the Machine, contact your reseller or IBM. In the United States, call IBM at 1-800-772-2227. In Canada, call IBM at 1-800-565-3344. (In Toronto, call 416-383-3344.) You may be required to present proof of purchase.

IBM or your reseller provides certain types of repair and exchange service, either at your location or at a service center, to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. IBM may repair the failing Machine or exchange it at its discretion.

When warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

Any feature, conversion, or upgrade IBM or your reseller services must be installed on a Machine which is 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part.

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;

2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and

3. where applicable, before service is provided

   a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides,

   b. secure all programs, data, and funds contained in a Machine,

   c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations, and

   d. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

Production Status
Each IBM Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's appropriate warranty terms apply.

Limitation of Liability
Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and

2. the amount of any other actual direct damages, up to the greater of U.S. $100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

   This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

IBM Statement of Warranty Worldwide except Canada, Puerto Rico, Turkey, United States (Part 1 – General Terms)

This Statement of Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. **The terms of Part 2 may replace or modify those of Part 1**. The warranties provided by IBM in this Statement of Warranty apply only to Machines you purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

Machine - IBM Remote Supervisor Adapter

Warranty Period* - Three Years

*Contact your place of purchase for warranty service information. Some IBM Machines are eligible for On-site warranty service depending on the country where service is performed.

The IBM Warranty for Machines
IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your sales receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if approved by IBM to provide warranty service, will provide repair and exchange service for the Machine, without charge, under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded. The replacement may not be new, but will be in good working order.

Extent of Warranty
The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Items Not Covered by Warranty
IBM does not warrant uninterrupted or error-free operation of a Machine.

Unless specified otherwise, IBM provides non-IBM machines **WITHOUT WARRANTIES OF ANY KIND.**

Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND.**

Warranty Service
To obtain warranty service for the Machine, contact your reseller or IBM. You may be required to present proof of purchase.

IBM or your reseller provides certain types of repair and exchange service, either at your location or at a service center, to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. IBM may repair the failing Machine or exchange it at its discretion.

When warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

Any feature, conversion, or upgrade IBM or your reseller services must be installed on a Machine which is 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part.

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;

2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and

3. where applicable, before service is provided

   a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides,

   b. secure all programs, data, and funds contained in a Machine,

   c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations, and

   d. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller

for any reason. You should remove all such information from the Machine prior to its return.

Production Status
Each IBM Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's appropriate warranty terms apply.

Limitation of Liability
Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and

2. the amount of any other actual direct damages, up to the greater of U.S. $100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

   This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Part 2 - Worldwide Country-Unique Terms

ASIA PACIFIC

AUSTRALIA: The IBM Warranty for Machines: The following paragraph is added to this Section:
The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other legislation and are only limited to the extent permitted by the applicable legislation.

Extent of Warranty: The following replaces the first and second sentences of this Section:
The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, operation in other than the Specified Operating Environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible.

Limitation of Liability: The following is added to this Section:
Where IBM is in breach of a condition or warranty implied by the Trade Practices Act 1974, IBM's liability is limited to the repair or replacement of the goods or the supply of equivalent goods. Where that condition or warranty relates to right to sell, quiet possession or clear title, or the goods are of a kind ordinarily acquired for personal, domestic or household use or consumption, then none of the limitations in this paragraph apply.

PEOPLE'S REPUBLIC OF CHINA: Governing Law: The following is added to this Statement:
The laws of the State of New York govern this Statement.

INDIA: Limitation of Liability: The following replaces items 1 and 2 of this Section:

1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM's negligence;

2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of Warranty, IBM's liability will be limited to the charge paid by you for the individual Machine that is the subject of the claim.

NEW ZEALAND: The IBM Warranty for Machines: The following paragraph is added to this Section:
The warranties specified in this Section are in addition to any rights you may have under the Consumer Guarantees Act 1993 or other legislation which cannot be excluded or limited. The Consumer Guarantees Act 1993 will not apply in respect of any goods which IBM provides, if you require the goods for the purposes of a business as defined in that Act.

Limitation of Liability: The following is added to this Section:
Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this Section are subject to the limitations in that Act.

EUROPE, MIDDLE EAST, AFRICA (EMEA)

The following terms apply to all EMEA countries.

The terms of this Statement of Warranty apply to Machines purchased from an IBM reseller. If you purchased this Machine from IBM, the terms and conditions of the applicable IBM agreement prevail over this warranty statement.

Warranty Service

If you purchased an IBM Machine in Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland or United Kingdom, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

If you purchased an IBM Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kirghizia, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

The applicable laws, Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided. However, the laws of Austria govern this Statement if the warranty service is provided in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Federal Republic of Yugoslavia, Georgia, Hungary, Kazakhstan, Kirghizia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, and Ukraine.

The following terms apply to the country specified:

EGYPT: Limitation of Liability: The following replaces item 2 in this Section:
2. as to any other actual direct damages, IBM's liability will be limited to the total amount you paid for the Machine that is the subject of the claim.

Applicability of suppliers and resellers (unchanged).

FRANCE: Limitation of Liability: The following replaces the second sentence of the first paragraph of this Section:
In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: (items 1 and 2 unchanged).

GERMANY: The IBM Warranty for Machines: The following replaces the first sentence of the first paragraph of this Section:
The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this Section:
The minimum warranty period for Machines is six months.

In case IBM or your reseller are unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

Extent of Warranty: The second paragraph does not apply.

Warranty Service: The following is added to this Section:
During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

Production Status: The following paragraph replaces this Section:
Each Machine is newly manufactured. It may incorporate in addition to new parts, re-used parts as well.

Limitation of Liability: The following is added to this Section:
The limitations and exclusions specified in the Statement of Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

In item 2, replace "U.S. $100,000" with "1.000.000 DEM."

The following sentence is added to the end of the first paragraph of item 2:
IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

IRELAND: Extent of Warranty: The following is added to this Section:
Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

Limitation of Liability: The following replaces items one and two of the first paragraph of this Section:
1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; and 2. the amount of any other actual direct damages, up to the greater of Irish Pounds 75,000 or 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

Applicability of suppliers and resellers (unchanged).

The following paragraph is added at the end of this Section:
IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

ITALY: Limitation of Liability: The following replaces the second sentence in the first paragraph:
In each such instance unless otherwise provided by mandatory law, IBM is liable for no more than: (item 1 unchanged) 2)as to any other actual damage arising in all situations involving non-performance by IBM pursuant to, or in any way related to the subject matter of this Statement of Warranty, IBM's liability, will be limited to the total amount you paid for the Machine that is the subject of the claim.

Applicability of suppliers and resellers (unchanged).

The following replaces the second paragraph of this Section:
Unless otherwise provided by mandatory law, IBM and your reseller are not liable for any of the following: (items 1 and 2 unchanged) 3) indirect damages, even if IBM or your reseller is informed of their possibility.

SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND:
Limitation of Liability: The following is added to this Section:
IBM's entire liability to you for actual damages arising in all situations involving nonperformance by IBM in respect of the subject matter of this Statement of Warranty will be limited to the charge paid by you for the individual Machine that is the subject of your claim from IBM.

TURKIYE: Production Status: The following replaces this Section:
IBM fulfills customer orders for IBM Machines as newly manufactured in accordance with IBM's production standards.

UNITED KINGDOM: Limitation of Liability: The following replaces items 1 and 2 of the first paragraph of this Section:
1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; 2. the amount of any other actual direct damages or loss, up to the greater of Pounds Sterling 150,000 or 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

The following item is added to this paragraph:
3. breach of IBM's obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982.

Applicability of suppliers and resellers (unchanged).

The following is added to the end of this Section:
IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default will be limited to damages.

<u>**NORTH AMERICA**</u>

CANADA: Warranty Service: The following is added to this section:
To obtain warranty service from IBM, call **1-800-565-3344**. In Toronto, call **416-383-3344**.

UNITED STATES OF AMERICA: Warranty Service: The following is added to this section:
To obtain warranty service from IBM, call **1-800-772-2227**.

Notices

This section contains trademarks, electronic emission notices, and other important information.

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> *IBM Corporation*
> *North Castle Drive*
> *Armonk, NY 10504-1785*
> *U.S.A.*

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

Edition Notice

Processing date data

This IBM hardware product and IBM software products that might be packaged with it have been designed, when used in accordance with their associated documentation, to process date data correctly within and between the 20th and 21st centuries, provided all other products (for example, software, hardware, and firmware) used with these products properly exchange accurate date data with them.

IBM cannot take responsibility for the date data processing capabilities of non-IBM products, even if those products are preinstalled or otherwise distributed by IBM. You should contact the vendors responsible for those products directly to determine the capabilities of their products and update them if needed. This IBM hardware product cannot prevent errors that might occur if software, upgrades, or peripheral devices you use or exchange data with do not process date data correctly.

The foregoing is a Year 2000 Readiness Disclosure.

Trademarks

The following terms are trademarks of the IBM Corporation in the United States, other countries, or both:

@	OS/2
HelpCenter	OS/2 Warp
IBM	Predictive Failure Analysis
Netfinity	xSeries
Netfinity Manager	

Pentium is a trademark of Intel Corporation in the United States, other countries, or both.

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

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

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

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

Important notes

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

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

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

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

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

Electronic emission notices

Federal Communications Commission (FCC) Statement

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

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

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

Industry Canada Class A emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Australia and New Zealand Class A statement

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

United Kingdom telecommunications safety requirement

Notice to Customers

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

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

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

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

Taiwan electrical emission statement

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

Japanese Voluntary Control Council for Interference (VCCI) statement

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

Power cords

For your safety, IBM provides a power cord with a grounded attachment plug to use with this IBM product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.

IBM power cords for a specific country or region are usually available only in that country or region.

IBM power cord part number	Used in these countries and regions
13F9940	Argentina, Australia, China (PRC), New Zealand, Papua New Guinea, Paraguay, Uruguay, Western Samoa
13F9979	Afghanistan, Algeria, Andorra, Angola, Austria, Belgium, Benin, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Rep., Chad, Czech Republic, Egypt, Finland, France, French Guiana, Germany, Greece, Guinea, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Jordan, Lebanon, Luxembourg, Macau, Malagasy, Mali, Martinique, Mauritania, Mauritius, Monaco, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Romania, Senegal, Slovakia, Spain, Sudan, Sweden, Syria, Togo, Tunisia, Turkey, former USSR, Vietnam, former Yugoslavia, Zaire, Zimbabwe
13F9997	Denmark
14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka
14F0033	Antigua, Bahrain, Brunei, Channel Islands, Cyprus, Dubai, Fiji, Ghana, Hong Kong, India, Iraq, Ireland, Kenya, Kuwait, Malawi, Malaysia, Malta, Nepal, Nigeria, Polynesia, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Kingdom, Yemen, Zambia
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Ethiopia, Italy, Libya, Somalia
14F0087	Israel
1838574	Thailand
6952301	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), United States of America, Venezuela

IBM

Part Number: 21P8723R
File Number:

21P8723R

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