

Remote Supervisor Adapter II



Installation Guide

Remote Supervisor Adapter II



Installation Guide

Note: Before using this information and the product it supports, read the general information in Appendix B, "Warranty information", on page 35 and Appendix C, "Notices", on page 49.

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

在安裝本產品之前，請仔細閱讀 **Safety Information**
(安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

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 switch on 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.



WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. *Wash hands after handling.*

ADVERTENCIA: El contacto con el cable de este producto o con cables de accesorios que se venden junto con este producto, pueden exponerle al plomo, un elemento químico que en el estado de California de los Estados Unidos está considerado como un causante de cancer y de defectos congénitos, además de otros riesgos reproductivos. *Lávese las manos después de usar el producto.*

Chapter 1. Introduction

This manual provides information about installing the IBM® Remote Supervisor Adapter II in IBM @server xSeries™ servers, including how to:

- Install and cable your adapter
- Download the software and firmware needed to configure the adapter

For service, assistance, or additional information, see Appendix A, “Getting help and technical assistance”, on page 33.

After you install and configure the Remote Supervisor Adapter II, use the Remote Supervisor Adapter II Web interface to use the Remote Supervisor Adapter II features. For more information, see the *IBM Remote Supervisor Adapter II User's Guide* on the *IBM Documentation CD*.

Installation prerequisites

Before installing the Remote Supervisor Adapter II, perform the following tasks:

- Make sure you have an Internet connection. You will need an Internet connection during the installation process to download software and firmware from the IBM Support Web site. For information about how to download the Remote Supervisor Adapter II files, see “Obtaining Remote Supervisor Adapter II software and firmware” on page 19.
- Install the operating system on your server before you install the device drivers for the Remote Supervisor Adapter II. For information about installing the operating system, see the documentation that comes with your server.

Installation requirements

The following items are required to install the Remote Supervisor Adapter II:

- Supported IBM @server xSeries server
- Remote Supervisor Adapter II device drivers, which are supported on the following operating systems:
 - Microsoft® Windows® 2000 Server
 - Microsoft Windows 2000 Advanced Server
 - Red Hat Linux® 7.3, or later

Note: Not all versions of Red Hat Linux are supported for all servers. To check if there is a supported Remote Supervisor Adapter II device

driver for your server model running your version of Red Hat Linux, go to <http://www.ibm.com/pc/support/>.

- SuSE Linux 8.0, or later

Note: Not all versions of SuSE Linux are supported for all servers. To check if there is a supported Remote Supervisor Adapter II device driver for your server model running your version of SuSE Linux, go to <http://www.ibm.com/pc/support/>.

- The remote disk function requires the following software:
 - Server (for the server operating system to support the remote disk): Microsoft Windows 2000 with Service Pack 3 or above.
 - Client: Microsoft Windows 2000 or above and the Java 1.4 Plug-in or later.
- Documentation that comes with your server

The Remote Supervisor Adapter II supports the following Web browsers for remote access. The Web browser that you use must be Java™-enabled and must support JavaScript™.

- Microsoft Internet Explorer version 4.0 (with Service Pack 1), or later
- Netscape Navigator version 4.72, or later (version 6.x is not supported)

Notes:

1. Java Plug-in version 1.4 or later is required
2. The Remote Supervisor Adapter II Web interface does not support the double-byte character set (DBCS) languages.

Remote Supervisor Adapter II features

The Remote Supervisor Adapter II provides the following:

- Seamless remote accelerated graphics
- Enhanced security features
- Continuous health monitoring and control
- Advanced Predictive Failure Analysis® (PFA) support
- Automated Server Restart (ASR)
- Automatic notification and alerts
- Event logs that are time stamped, saved on the Remote Supervisor Adapter II, and can be attached to e-mail alerts
- Server console redirection
- LAN and Advanced System Management (ASM) interconnect remote access
- Simple Network Management Protocol (SNMP) trap support
- Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) support

- Remote power control
- Capture operating-system-failure screen
- Remote firmware update and access to critical server settings
- Independent power, which enables around-the-clock access to the server even when the server power is off
- Virtually attach remote diskette drive, CD-ROM drive, or disk image to server

About your IBM Documentation CD

Your Remote Supervisor Adapter II comes with the IBM *Documentation CD*, which contains documentation for the adapter in Portable Document Format (PDF) and includes the IBM Documentation Browser to help you find information quickly.

System requirements for the IBM Documentation Browser

To run the IBM *Documentation CD*, use a system that has the following minimum hardware and software:

- Microsoft Windows NT[®] 4.0 (with Service Pack 3 or later), Windows 98, or Windows 2000.
- 100 MHz Intel Pentium[®] microprocessor.
- 32 MB RAM.
- Adobe Acrobat Reader 3.0 or later. Adobe Acrobat Reader software for Microsoft Windows is included on the IBM *Documentation CD*, and you can install it when you run the IBM Documentation Browser.

Starting the IBM Documentation Browser

Use one of the following procedures to start the Documentation Browser:

- If Autostart is enabled, insert the documentation CD into your CD-ROM drive. The Documentation Browser will start automatically.
- If Autostart is disabled, insert the documentation CD into your CD-ROM drive; then, click **Start** → **Run**. In the **Open** field, type
`e:\win32.bat`
where *e* is the drive letter of your CD-ROM drive, and click **OK**.

Using the IBM Documentation Browser

Use the IBM Documentation Browser to browse the contents of the documentation CD, select from a list of available topics, see brief descriptions of the selected topics, and view selected topics using Adobe Acrobat Reader. The Documentation Browser automatically detects the regional settings in use

on your system and presents the information in the language for that region (if available). If a topic is not available in the language for that region, the English version is displayed.

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

Complete the following steps to use the Documentation Browser:

1. From the **Product** drop-down list, select **Remote Supervisor Adapter II**.

The **Topics** list is displayed. It lists all topics that pertain to the selected product. Topics are in folders or under other topics. A plus sign (+) is displayed beside each folder or topic that has additional topics under it. Click the plus sign to display the additional topics.

2. Click a topic to select it.

When you select a topic, a description of the topic contents is displayed in the **Description** field.

Note: To select multiple topics, press and hold down the Ctrl key while selecting your topic.

3. View selected topics.

Click **View Book**. Adobe Acrobat Reader starts, and the selected topics are displayed.

Using the search feature

Complete the following steps to use the Documentation Browser search feature:

1. Type a key word in the **Search** field.
2. Click **Search**. The topics containing the search word are listed in order based on the number of occurrences.
3. Click a file to open it.
4. Press Ctrl+F and use the Adobe Acrobat search function to search within the file.

Related publications

This *Installation Guide* provides general information about your Remote Supervisor Adapter II, including information about features, how to install and configure your Remote Supervisor Adapter II, how to configure an ASM interconnect network, and how to get help.

In addition to this *Installation Guide*, the following documentation is provided in PDF on the IBM *Documentation* CD that comes with your Remote Supervisor Adapter II.

- *IBM Remote Supervisor Adapter II User's Guide*

This publication describes the features and functions of the Remote Supervisor Adapter II Web interface.

- *Safety Information*

This publication contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Information* book.

Notices and statements used in this book

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

The following notices and statements are used in the documentation:

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

Unpacking and verifying components

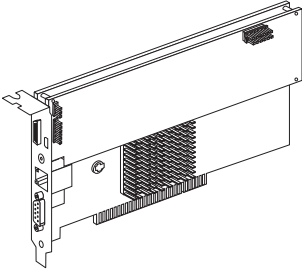
The following sections list the items that come with the Remote Supervisor Adapter II and describe the Remote Supervisor Adapter II components. You must install the Remote Supervisor Adapter II in a peripheral component interconnect (PCI) expansion slot.

Inventory checklist

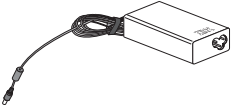
The Remote Supervisor Adapter II option package contains the following items.

Notes:

1. Not all items are required for all servers.
 2. The illustrations in this document might differ slightly from your hardware.
- Remote Supervisor Adapter II



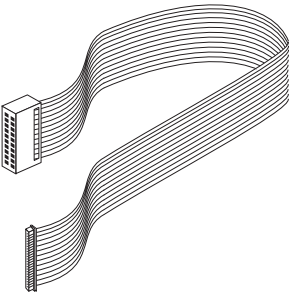
- Power-supply adapter



- Power cord



- 20-pin ribbon cable



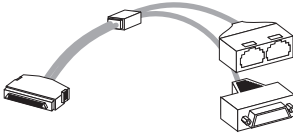
- Mini-USB cable



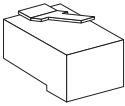
- Universal power cord



- Advanced System Management (ASM) breakout cable



- RS-485 terminator plugs (comes with two)



- IBM *Documentation* CD

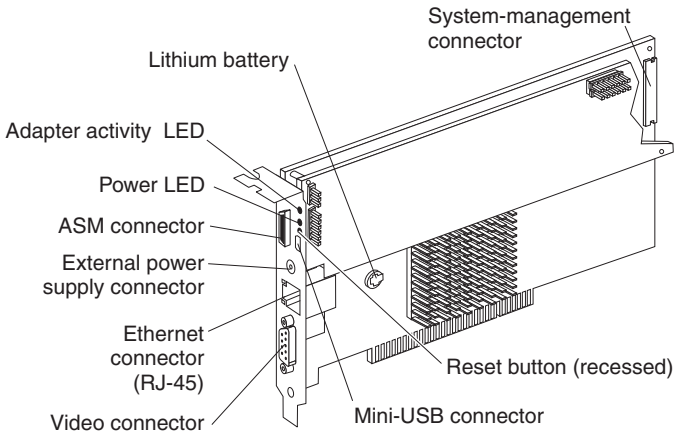
This CD contains the Remote Supervisor Adapter II documentation and the Documentation Browser.

You might need the following items that are not provided with the Remote Supervisor Adapter II option package:

- Category 3 or Category 5 cable to connect the Remote Supervisor Adapter II to your LAN.
- Category 3 or Category 5 cable to connect the Remote Supervisor Adapter II to an ASM interconnect network
- Serial RS-232 cable to connect a modem to the Advanced System Management (ASM) breakout cable

Remote Supervisor Adapter II components

The following illustration shows the Remote Supervisor Adapter II and the locations of the connectors and components.



Adapter activity LED

The amber adapter activity LED indicates the status of the Remote Supervisor Adapter II. When the LED is flashing, the Remote Supervisor Adapter II is functioning normally. When the LED is lit continuously, there is a problem with the Remote Supervisor Adapter II. When the LED is off, the Remote Supervisor Adapter II is not functioning.

Power LED

The green power LED indicates the status of the power connection. The power LED is lit when one or both of the following situations occur:

- The Remote Supervisor Adapter II is receiving power from the server in which it is installed.
- The external power-supply adapter is connected to the Remote Supervisor Adapter II and to a properly grounded electrical outlet.

ASM connector

Connect the ASM breakout cable to the ASM connector to enable system management through the serial connector (dial-out capability only) and through the ASM RS-485 connectors.

External power-supply connector

Connect the power-supply adapter that comes with the Remote Supervisor Adapter II to this connector. Using the power-supply adapter is optional. It provides power to the Remote Supervisor Adapter II, independent of the server power supply.

Ethernet connector (RJ-45)

Connect a Category 3 (10 Mbps) or Category 5 (100 Mbps) Ethernet cable to this connector to enable a LAN connection. The Ethernet connector LEDs on the Remote Supervisor Adapter II are described in “Cabling the Ethernet LAN connector” on page 14.

Attention: The RJ-45 connector on the Remote Supervisor Adapter II is only for Ethernet and Advanced System Management interconnect use and is not for telecommunications use.

Video connector

Connect the server monitor to this connector.

Mini-USB connector

Connect one end of the mini-USB cable to the mini-USB connector on the Remote Supervisor Adapter II and the other end of the mini-USB cable to the server USB connector.

Reset button

Insert and press the open end of a paper clip (or a similar device) into the hole of the recessed Reset button to manually reset the Remote Supervisor Adapter II.

Lithium battery

The lithium battery provides backup for the Remote Supervisor Adapter II real-time clock.

System-management connector

Connect the 20-pin ribbon cable that comes with the Remote Supervisor Adapter II to the system-management connector on the Remote Supervisor Adapter II and to the Remote Supervisor Adapter connector (sometimes referred to as system-management connector) on the system board in your server.

Chapter 2. Installing and cabling the Remote Supervisor Adapter II

This chapter describes how to install and cable the Remote Supervisor Adapter II in supported xSeries servers and how to download software and firmware files from the IBM Support Web site. (See Table 1 on page 12 for a list of supported xSeries servers.)

Before you begin

Before you begin installing the Remote Supervisor Adapter II in your server, read the following information:

- Read the safety information beginning on page v and the guidelines in “Handling static-sensitive devices”. This information will help you work safely with your server and options.
- Verify and complete the installation prerequisites. See “Installation prerequisites” on page 1.
- Unpack and verify the components. See “Unpacking and verifying components” on page 5.

Handling static-sensitive devices

Attention: Static electricity can damage electronic devices, including your server. To avoid damage, keep static-sensitive devices in their static-protective package until you are ready to install them.

To reduce the possibility of damage from electrostatic discharge, 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 circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an unpainted metal part of the server for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the server without setting down the device. If it is necessary to set down the device, place it back into its static-protective package. Do not place the device on your server cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Installing the adapter

Complete the following steps to install the Remote Supervisor Adapter II in an xSeries server:

1. Turn off the server and attached devices, and disconnect all power cords and external cables.
2. Remove the server from the rack cabinet (if applicable).
3. Remove the server cover. For instructions, see the documentation that comes with your server.
4. Using Table 1, determine which expansion slot you will use for the Remote Supervisor Adapter II.

Table 1. Remote Supervisor Adapter II required PCI slot

Server ¹	Required PCI slot
xSeries 235 Type 8671	1
xSeries 345 Type 8670	5

¹For installation information for supported xSeries servers not listed in this table, see the documentation that comes with your server.

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.

5. Remove the expansion-slot cover. Store it in a safe place for future use.

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

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

7. Complete the following steps to install the adapter. For more information, see the Option Installation Guide that comes with your server.

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

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.

- b. Press the adapter firmly into the PCI slot.

8. Connect the 20-pin ribbon cable according to the procedure in “Connecting the 20-pin ribbon cable” on page 13. Then, return to step 9.
9. Replace the server cover.
10. Connect the mini-USB cable to the mini-USB connector on the Remote Supervisor Adapter II and to the USB connector on the server.
11. Install the server in the rack cabinet (if applicable).

12. Connect the external cables and power cords that you disconnected in step 1 on page 12.
13. Connect the Ethernet cable to the Ethernet connector on the Remote Supervisor Adapter II. For more information, see “Cabling the Ethernet LAN connector” on page 14; then, return to step 14.
14. Connect the video cable of your video device to the video connector on the Remote Supervisor Adapter II. If the video device is already connected to the server, remove the video cable from the server and connect it to the video connector on the Remote Supervisor Adapter II.
15. If you want redundant power, which gives you access to the Remote Supervisor Adapter II event log when the main server power source is unavailable, connect the external power-supply adapter that comes with the Remote Supervisor Adapter II. For information about connecting the power-supply adapter, see “Connecting the external power-supply adapter” on page 16. Then, return to step 16.
16. If you want to connect the Remote Supervisor Adapter II to a modem or to an ASM interconnect network, connect the ASM breakout cable to the ASM connector on the Remote Supervisor Adapter II. For more information, see “Connecting the ASM breakout cable” on page 18.

Note: Connecting a modem to the Remote Supervisor Adapter II provides dial-out support only.

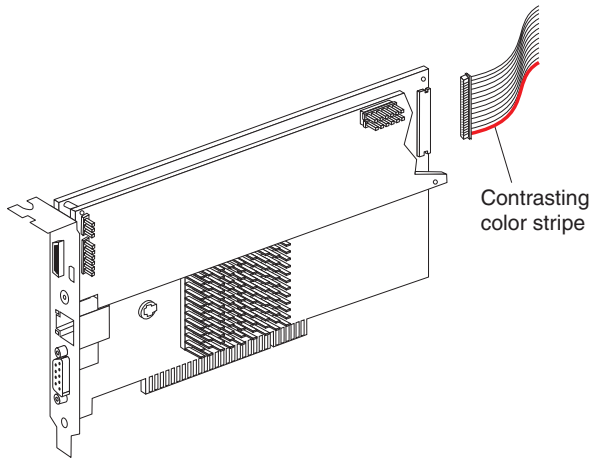
17. Go to “Obtaining Remote Supervisor Adapter II software and firmware” on page 19.

Connecting the 20-pin ribbon cable

The 20-pin ribbon cable connects the Remote Supervisor Adapter II to the server system board or riser card and is required for power and data transfer.

Complete the following steps to connect the 20-pin ribbon cable from the Remote Supervisor Adapter II to the server system board or riser card:

1. Connect one end of the 20-pin ribbon cable to the system-management connector on the Remote Supervisor Adapter II. The 20-pin ribbon cable connector ends are keyed for proper installation. When you connect the ribbon cable to the Remote Supervisor Adapter II, be sure the contrasting color stripe on the cable is closest to the adapter edge that has the gold edge connectors.



Attention: Route cables so that they do not block the flow of air from the fans.

2. Connect the other end of the 20-pin ribbon cable to the Remote Supervisor Adapter connector (sometimes referred to as system-management connector) on the system board or riser card. For the connector location on your server system board, see Table 2 or the documentation that comes with your server.

Table 2. System board connector locations for 20-pin ribbon cable

Server ¹	System board connector location for the 20-pin ribbon cable
xSeries 235 Type 8671	J27
xSeries 345 Type 8670	J2

¹For system board connector locations for supported xSeries servers not listed in this table, see the documentation that comes with your server.

3. Return to step 9 on page 12.

Cabling the Ethernet LAN connector

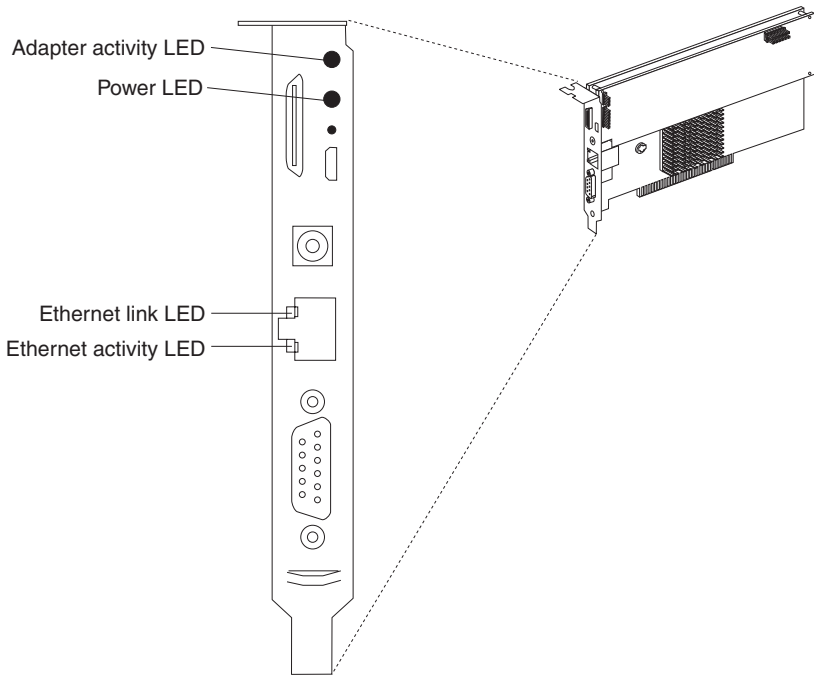
You can manage your server remotely through the Remote Supervisor Adapter II using the Web-based user interface.

Note: To remotely monitor a server through the Remote Supervisor Adapter II Web interface, you must connect a Category 3 or Category 5 Ethernet cable from your LAN to the Ethernet connector on the Remote Supervisor Adapter II. This connection is not the LAN connection for the server. To connect the server itself to your Ethernet network, you

will need to connect a second Category 3 or Category 5 Ethernet cable from your network to the Ethernet connector on the server.

Complete the following steps to connect the Remote Supervisor Adapter II to your network using an Ethernet cable.

1. Connect one end of a Category 3 or Category 5 Ethernet cable to the Ethernet connector on the Remote Supervisor Adapter II. Connect the other end of the Ethernet cable to your network.
2. Check the Remote Supervisor Adapter II Ethernet LEDs and power and adapter activity LEDs. The location of the LEDs is shown in the following illustration. Then, continue with step 14 on page 13.



Ethernet link LED

The green Ethernet link LED is lit when the Ethernet cable is connected properly.

Ethernet activity LED

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

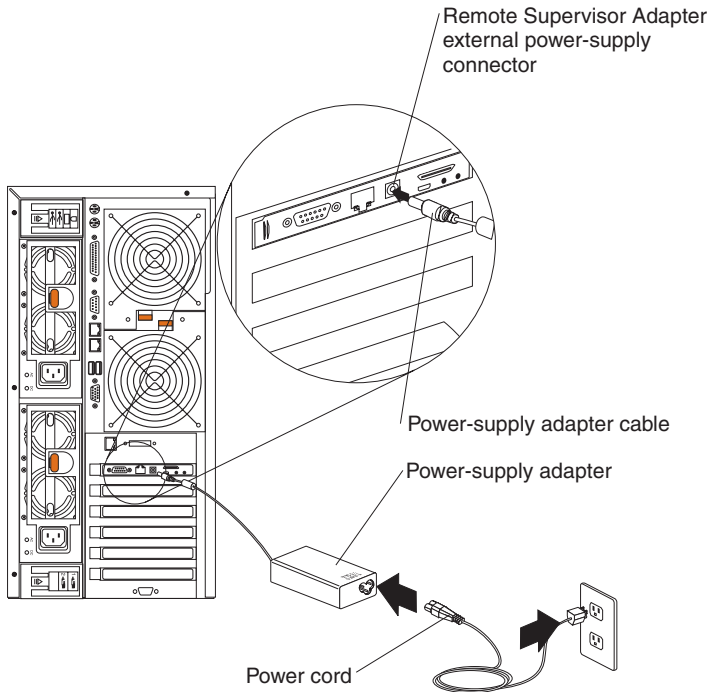
Connecting the external power-supply adapter

Connecting the power-supply adapter to the Remote Supervisor Adapter II is optional and provides access to the Remote Supervisor Adapter II event log when the main server power source is unavailable. After you connect the power-supply adapter to the Remote Supervisor Adapter II, you can use the power cord to connect the power-supply adapter to a properly grounded electrical outlet. You can use the universal power cord that comes with the Remote Supervisor Adapter II to connect the power-supply adapter to a power distribution unit (PDU) or to an uninterruptible power supply.

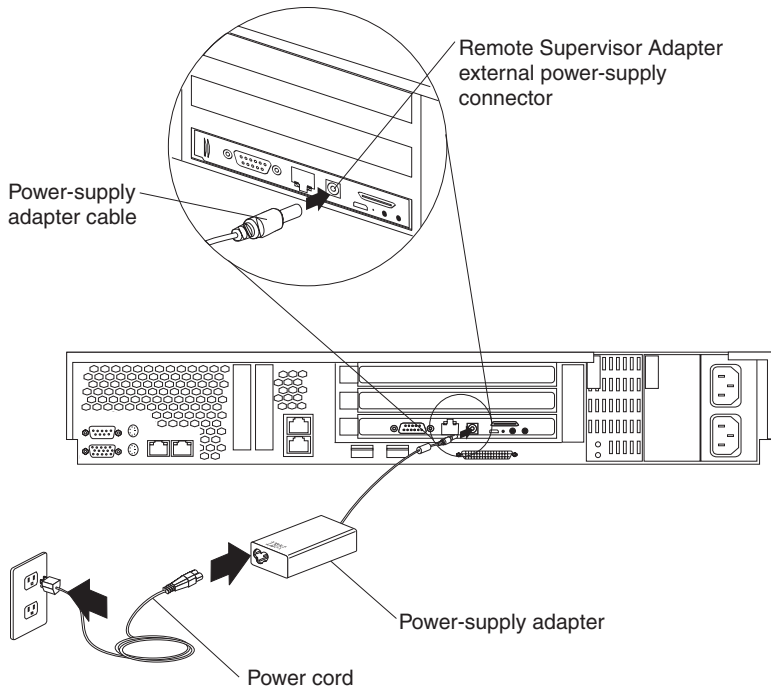
Complete the following steps to connect the power-supply adapter and power cord to your server:

1. If the server is running, shut down the operating system and turn off the server.
2. Disconnect the power cords from the server.
3. Connect the power-supply adapter cable to the external power-supply connector on the Remote Supervisor Adapter II.

The following illustration shows the location of the power-supply connector on a Remote Supervisor Adapter II installed in a tower-model server.



The following illustration shows the location of the power-supply connector on a Remote Supervisor Adapter II installed in a rack-mounted server.



4. Connect one end of the power cord to the connector on the power-supply adapter.
5. Connect the other end of the power cord to a properly grounded electrical outlet.

Note: You can connect one end of the universal power cord to the power-supply adapter; then, connect the other end to a power distribution unit (PDU) or to an uninterruptible power supply.

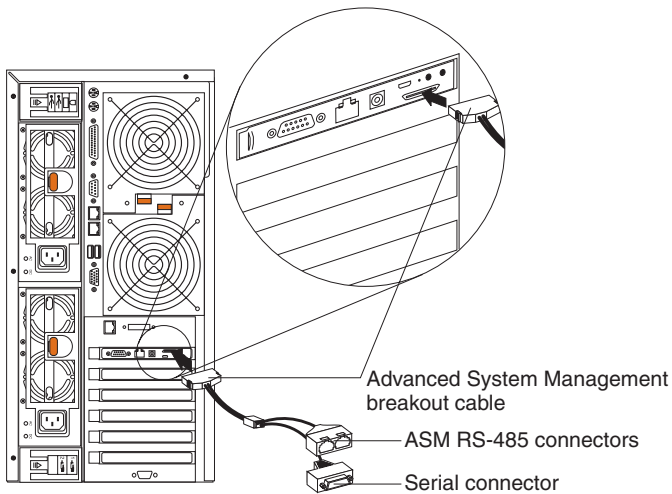
6. Check that the Remote Supervisor Adapter II power LED is lit, to verify that there is power to the Remote Supervisor Adapter II. For the location of the power LED, see the illustration in “Cabling the Ethernet LAN connector” on page 14.
7. Connect the power cords to the server and turn on the server.
8. Return to step 16 on page 13.

Connecting the ASM breakout cable

The ASM breakout cable connects the Remote Supervisor Adapter II to the ASM interconnect network through the ASM RS-485 connectors or to a modem through the serial connector. The ASM breakout cable comes with the Remote Supervisor Adapter II.

Note: Connecting a modem to the Remote Supervisor Adapter II provides dial-out support only.

The following illustration shows how to connect the ASM breakout cable to the ASM connector on a Remote Supervisor Adapter II installed in a tower model server.



To connect the Remote Supervisor Adapter II to an ASM interconnect network, connect a Category 3 or Category 5 cable to one of the ASM RS-485 connectors on the ASM breakout cable. For more information, see Chapter 3, “Using the ASM interconnect network”, on page 23.

To connect the Remote Supervisor Adapter II to a modem, connect the modem to the serial cable connector on the ASM breakout cable.

Continue with “Obtaining Remote Supervisor Adapter II software and firmware” on page 19.

Obtaining Remote Supervisor Adapter II software and firmware

Before you can continue the installation and configuration of the Remote Supervisor Adapter II, you must download software and firmware from the IBM Support Web page. This section describes how to download the files from the Web page. Which files you need to download depends on your server type and operating system.

For Microsoft Windows 2000

If the server in which the Remote Supervisor Adapter II is installed is running the Microsoft Windows 2000 operating system, you will need to download files for the following software and firmware:

- Software and firmware installation instructions
- @server xSeries BIOS code with support for the Remote Supervisor Adapter II
- Diagnostic code
- Remote Supervisor Adapter II firmware code
- Remote Supervisor Adapter II device drivers
- Supported video drivers
- Advanced Settings Utility program

The software and firmware files that you need are contained in one system service package. Complete the following steps to locate and download the package file:

1. Go to <http://www.ibm.com/pc/support/>.
2. In the **Search** text box at the top of the page, type "system service package". To narrow the search results, type quotation marks around the search string.

Note: To further narrow the search results, click **Servers** in the Browse column on the main IBM Support Web page, then select your product family before specifying the search string.

3. Click **Go** or press Enter to view a list of search results.
4. Select the system service package that corresponds to the server in which the Remote Supervisor Adapter II is installed.
5. Download the system service package to *d:\ibmssp* (create the directory if necessary), where *d* is the hard disk drive letter.
6. Browse the *d:\ibmssp* directory and double click the *.exe file to extract the packaged files. Extract the files into the *d:\ibmssp* directory.
7. See the readme.txt file that is extracted into the *d:\ibmssp* directory for a list of the file names and their descriptions.

8. To ensure correct software installation, follow the detailed installation instructions in *Remote Supervisor Adapter II Installation Instructions for Windows Users* that is in Portable Document Format (PDF) in the `d:\ibmssp` directory.

Note: If you do not have Adobe Acrobat Reader installed on the computer or server on which you unpacked the downloaded files, it is available on the IBM *Documentation* CD that comes with the Remote Supervisor Adapter II option package.

For SuSE Linux and Red Hat Linux

If the server in which the Remote Supervisor Adapter II is installed is running the Red Hat Linux or SuSE Linux operating system, you will need to download files for the following software and firmware:

- Software and firmware installation instructions
- @server xSeries BIOS code with support for the Remote Supervisor Adapter II
- Diagnostic code
- Remote Supervisor Adapter II firmware code
- Remote Supervisor Adapter II device drivers
- Advanced Settings Utility program

The software and firmware files that you need are contained in one Remote Supervisor Adapter II Linux Installation kit. Complete the following steps to locate and download this file:

1. Go to <http://www.ibm.com/pc/support/>.
2. In the **Search** text box at the top of the page, type "remote supervisor adapter ii linux installation kit". To narrow the search results, type quotation marks around the search string.

Note: To further narrow the search results, click **Servers** in the Browse column on the main IBM Support Web page, then select your product family before specifying the search string.

3. Click **Go** or press Enter to view a list of search results.
4. Select and download the Remote Supervisor Adapter II Linux installation kit that corresponds to the server in which the Remote Supervisor Adapter II is installed. The file you download will be in *.tgz format.
5. From a command-line prompt, type "`tar xvfvz filename.tgz`", where *filename* is the name of the file you downloaded. This command will create a directory named `ibmssp` and extract the files to it.
6. See the `readme.txt` file that is extracted into the `ibmssp` directory for a list of the file names and their descriptions.

7. To ensure correct software installation, follow the detailed installation instructions in *Remote Supervisor Adapter II Installation Instructions for Linux Users* that is in Portable Document Format (PDF) in the `ibmssp` directory.

Completing the installation

Complete the following steps to finish the installation of the Remote Supervisor Adapter II:

1. If you plan to configure Simple Network Management Protocol (SNMP) traps on the Remote Supervisor Adapter II, install and compile the management information base (MIB) on your SNMP manager. The MIB supports SNMP traps. The MIB is available on the IBM Support Web site. For more information, see “Obtaining Remote Supervisor Adapter II software and firmware” on page 19.
2. If you did not restart the server after installing the Remote Supervisor Adapter II device drivers, restart the server now.
3. See the *IBM Remote Supervisor Adapter II User’s Guide* for detailed instructions about completing the configuration of the Remote Supervisor Adapter II 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 Remote Supervisor Adapter II Web interface
 - Controlling the server remotely
 - Virtually attaching remote diskette drive, CD-ROM drive, or disk image to server

If you want to set up an ASM interconnect network and have not already done so, go to Chapter 3, “Using the ASM interconnect network”, on page 23. If you do not want to set up an ASM interconnect network, your installation is now completed.

Chapter 3. Using the ASM interconnect network

This chapter includes information about how to configure and connect your server to function within an Advanced System Management (ASM) interconnect network.

Overview

You can connect system-management processors and adapters together to form an Advanced System Management (ASM) interconnect network.

System-management processors and adapters are Remote Supervisor Adapter IIs, Remote Supervisor Adapters, ASM processors, ASM PCI adapters, and integrated system management processors (ISMPs). These system-management processors and adapters are also known as *service processors*.

An ASM interconnect network provides two levels of functionality. First, the ASM interconnect network enables you to control and to configure settings for the servers in which other system-management processors and adapters reside. Second, the ASM interconnect network enables other system-management processors and adapters to use the resources (Ethernet or modem) of other Remote Supervisor Adapter IIs, Remote Supervisor Adapters, ASM processors (modems only), and ASM PCI adapters in the ASM interconnect network for sending alerts. This interconnect network is used when system-management processors or adapters cannot send an alert and must forward the information to another system-management processor or adapter to send the alert.

Planning and cabling your ASM interconnect network

To support the most recent ASM features, a Remote Supervisor Adapter II must be the main gateway to your ASM interconnect network if the network also includes servers with Remote Supervisor Adapters, ASM PCI adapters, ASM processors, or ISMPs. The Remote Supervisor Adapter II forwards the ASM information generated by the servers attached to the ASM interconnect network to other servers on your Ethernet network or that are attached through a modem. The connected ASM processors, ASM PCI Adapters, and ISMPs are managed through the user interface and Web browser access of the Remote Supervisor Adapter II.

Before cabling the ASM interconnect network, review the following information:

- You must connect an ASM breakout cable to the Remote Supervisor Adapter II.
- You must connect an ASM interconnect module to the Remote Supervisor Adapter.

- The cables in an ASM interconnect network are hot-swappable.
- Make sure that the firmware for the Remote Supervisor Adapter II, Remote Supervisor Adapter, ASM processor, ASM PCI adapter, and ISMP are at the latest level.
- The servers in an ASM interconnect network are referred to by their assigned names, not by their positions in the rack cabinet.

An ASM interconnect network can have up to 24 RS-485 connections, depending on the configuration. The connections can include Remote Supervisor Adapter IIs, Remote Supervisor Adapter s, ASM processors, ASM PCI adapters, and ISMPs. Use the following information to determine the number of servers and connections that you can have on your ASM interconnect network:

- Each Remote Supervisor Adapter II, Remote Supervisor Adapter, ASM processor, ASM PCI adapter, and ISMP in a server that is connected to the network uses one connection. For example, if a server that is connected to the network has a Remote Supervisor Adapter and an integrated ASM processor, the server uses two connections on the network.
- The network must include at least one server with a Remote Supervisor Adapter II or Remote Supervisor Adapter (either installed as an option or preinstalled in the server).
- On an ASM interconnect network, one ASM processor or one ASM PCI adapter can communicate with 11 RS-485 connections. These connections must be to ASM processors, ASM PCI adapters, Remote Supervisor Adapters, or Remote Supervisor Adapter IIs. The ASM processor and ASM PCI adapter cannot communicate with ISMPs.
- If your existing ASM interconnect network has 12 RS-485 connections that include only ASM processors, ASM PCI adapters, and at least one Remote Supervisor Adapter or Remote Supervisor Adapter II, you can also add up to 12 ISMP-based servers to this same network. The Remote Supervisor Adapter on this network will communicate with all 23 RS-485 connections; however, an ASM processor or ASM PCI adapter on this network will communicate with only the 11 non-ISMP RS-485 connections. The ASM processor and ASM PCI adapter will not recognize the ISMPs, but the ISMPs can reside on the same ASM interconnect network.
- 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 terminated beginning and end points. Be sure to use the RS-485 terminator plugs. For more information, see “Using the RS-485 terminator plugs on interconnected servers” on page 25.
- Make sure that the total combined length of all Ethernet cables connecting the servers in the ASM interconnect network does not exceed 91 m (300 ft).

Using the RS-485 terminator plugs on interconnected servers

The Remote Supervisor Adapter II comes with two RS-485 terminator plugs. To ensure successful RS-485 communication on your ASM interconnect network, you must install the terminator plugs in the open connectors at each end of the RS-485 bus. The illustrations in “ASM interconnect network configuration examples” on page 29 can help you determine where to put the RS-485 terminator plugs on your ASM interconnect network.

Considerations when configuring xSeries 232 and xSeries 342 servers

You can connect xSeries 232 and xSeries 342 servers to an ASM interconnect network using the integrated system management processor (ISMP) connectors located on the back of those servers. If the ISMP firmware level is revision 6 or 8, you must update the ISMP firmware. Go to <http://www.ibm.com/pc/support/> to obtain the latest ISMP firmware and update instructions.

Attention:

1. If your server BIOS code level is earlier than revision 1.02, you must update your server BIOS code before you update the ISMP firmware. BIOS update diskettes and update instructions are on the IBM Support Web site.
2. Make sure that no servers or devices are connected to the server ISMP connectors when you update the ISMP firmware if its level is revision 6 or 8. You cannot update the firmware while devices are connected to the ISMP connectors.

You must connect at least one Remote Supervisor Adapter to the ASM interconnect network to support the connection of xSeries 232 and xSeries 342 servers using their ISMP connectors. If your Remote Supervisor Adapter firmware level is earlier than revision 17, you must update the Remote Supervisor Adapter firmware. Go to <http://www.ibm.com/pc/support/> to obtain the latest Remote Supervisor Adapter II firmware and update instructions.

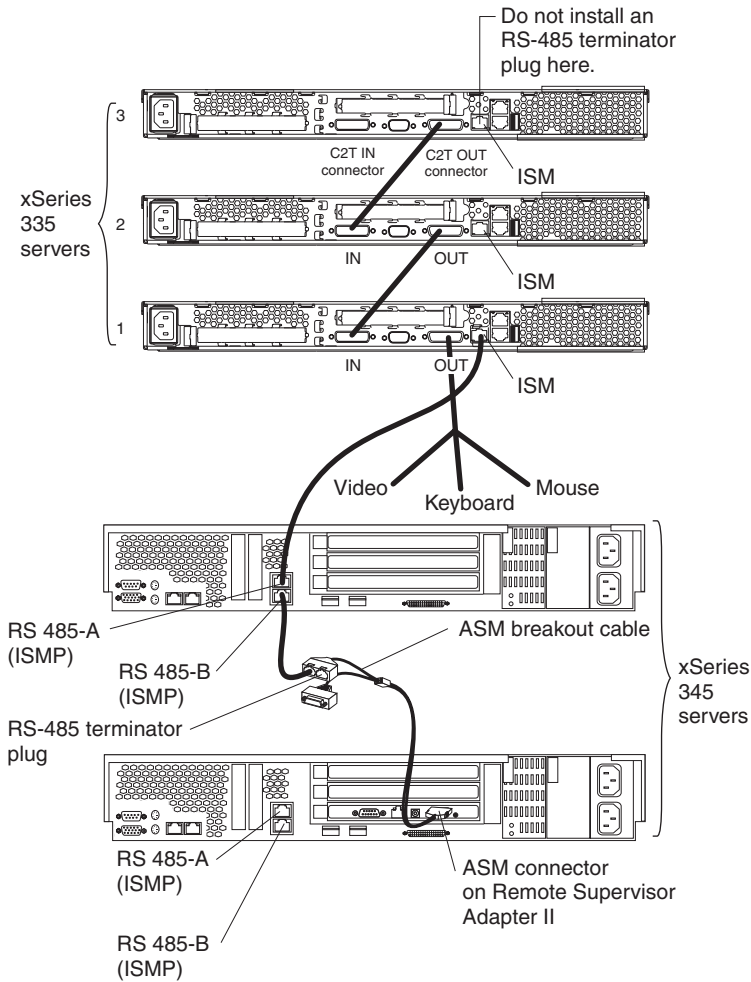
Considerations when configuring xSeries 335 servers

You can connect up to 24 xSeries 335 servers in an ASM interconnect network using one Remote Supervisor Adapter. However, if you use both xSeries 335 and other server models in the same interconnect network, the xSeries 335 servers must be installed at the end of the chain.

Notes:

1. An RS-485 terminator plug must be installed in the open RS-485 connector on the first server in the ASM interconnect network.
2. An xSeries 335 server is self-terminating; therefore, do not install an RS-485 terminator plug in the last open RS-485 connector in the ASM interconnect network.
3. The xSeries 335 uses Cable Chain Technology (C2T) for ASM interconnect connection. Follow the instructions for cabling a C2T chain in the documentation that comes with your xSeries 335 server.
4. Connect an ASM interconnect module (which comes with the Remote Supervisor Adapter) to the RS-485 connector on the Remote Supervisor Adapter in the first server. If the network contains more than 23 servers, do the same on the 24th server.
5. Connect an ASM link cable (which comes with the Remote Supervisor Adapter) from the ASM interconnect module to the integrated system management (ISM) connector in the first server on the interconnect network. Insert a terminator into the second connector on the ASM interconnect module. If the network contains more than 24 servers, do the same on the 25th server. Do not install an RS-485 terminator plug in the last xSeries 335 server, because the xSeries 335 server is self-terminating.
6. Your ASM interconnect network of xSeries 335 servers can include multiple Remote Supervisor Adapters. Use the following information to install and connect the Remote Supervisor Adapters:
 - You must install the Remote Supervisor Adapters starting with the first xSeries 335 server in the ASM interconnect network (typically the bottom server in a rack cabinet).
 - The xSeries 335 servers without Remote Supervisor Adapters must be together at the end of the C2T chain (or above the others in a rack cabinet).
 - Connect an ASM interconnect module to each Remote Supervisor Adapter.
 - For only the first xSeries 335 server with a Remote Supervisor Adapter, connect an ASM link cable from the ASM interconnect module to the ISM connector on the same server. (There is a C2T breakout cable connecting the monitor, keyboard, and pointing device to the C2T OUT connector on the first server.)
 - Using a Category 5 cable, connect the other Remote Supervisor Adapters to each other through their ASM interconnect modules.
 - Insert an RS-485 terminator plug in the open ASM interconnect module connector.

The following illustration shows an ASM interconnect network with three xSeries 335 servers and two xSeries 345 servers. The Remote Supervisor Adapter is installed in the bottom xSeries 345 server.



Forwarding alerts

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

During normal operation, each Remote Supervisor Adapter, ASM processor, ASM PCI adapter, and ISMP 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 notify the other processors and adapters that these communications resources are available for use by other servers on the ASM interconnect network. These resources are then used as ASM interconnect network resources, enabling Remote Supervisor Adapters, ASM processors, ASM PCI adapters, and ISMPs on the ASM interconnect network to send alerts using a modem or the network, even if they do not have a modem or network connection physically attached.

Note: ISMPs can use the communications resources of a Remote Supervisor Adapter or Remote Supervisor Adapter II only.

When alerts are generated, they are forwarded to the Remote Supervisor Adapter II, Remote 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 set for transmission if the connection type is configured or becomes available later.

If multiple modems or 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 a Remote Supervisor Adapter II, Remote 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.

Alerts are typically sent only once (per connection type), but an alert is forwarded to another interconnect device if the resources exist on other interconnect devices in the network. For example, on a three ASM processor network where ASM processor 1 generates a modem alert, but does not have a modem and the two other ASM servers with ASM processors have modems connected to them, the following might occur:

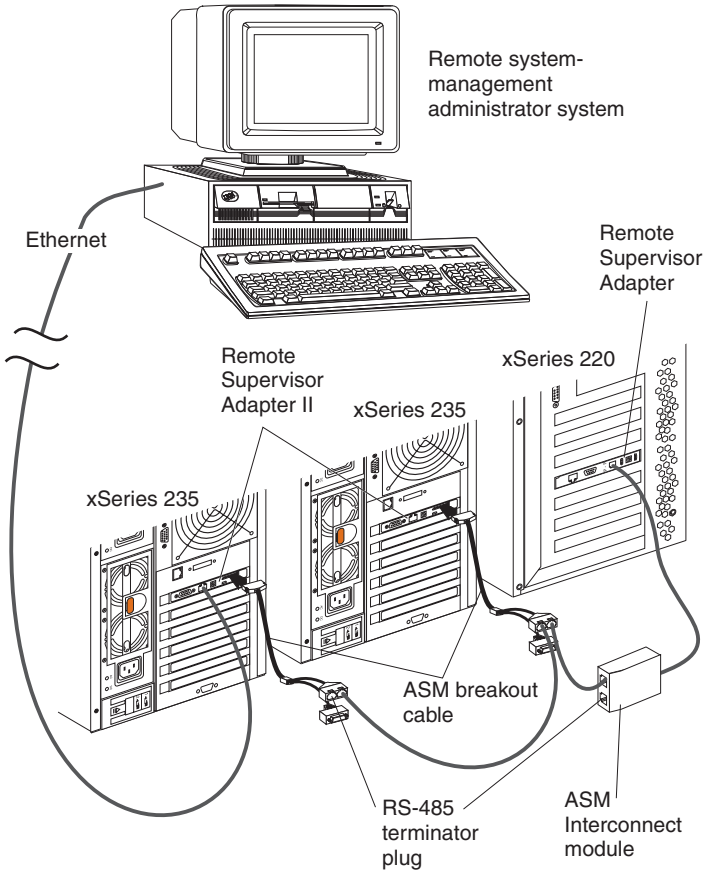
If ASM processor 1 generates an alert and the modem is unplugged from ASM processor 2 45 seconds or less prior to ASM processor 1 generating the alert, ASM processor 1 forwards the alert to ASM processor 2 having previously determined that ASM processor 2 had an available modem (which is now no longer available). When ASM processor 2 receives the forwarded alert, knowing its modem is not available, it determines that a modem is attached to ASM processor 3, and forwards the alert to ASM processor 3. Therefore, depending upon the time frame (45 seconds) within which a resource (modem)

fails, the alert might be forwarded multiple times until a device on the interconnect network can send the alert.

ASM interconnect network configuration examples

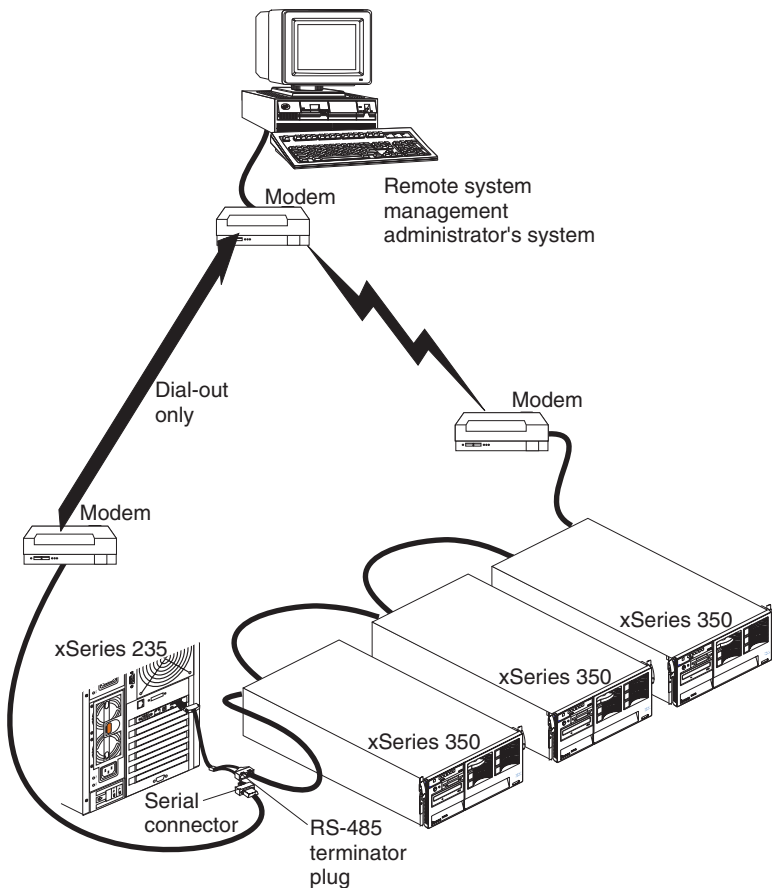
The illustrations in this section show sample ASM interconnect network configurations.

In the following example, an Ethernet cable connects the remote system management administrator's system to the Remote Supervisor Adapter II that is installed in an xSeries 235. In this case, the xSeries 235 uses the LAN connection to forward system-management data generated by the other servers in the ASM interconnect network to the remote system-management administrator.



In the following example, a Remote Supervisor Adapter is installed in an xSeries 235, and creates an interconnect network with the xSeries 235 server and the xSeries 350 servers. A modem is connected to the serial connector of the Remote Supervisor Adapter II (on one end of the ASM breakout cable), a modem is connected to the ASM PCI adapter in the server connected to the end of the ASM interconnect network, and a modem is connected to the remote system-management administrator's system.

Note: For information about connecting a modem to the serial port on an xSeries 350, see the documentation that comes with the server.



Appendix A. Getting help and technical assistance

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

Before you call

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system.
- Go to the IBM Support Web site at <http://www.ibm.com/pc/support/> to check for technical information, hints, tips, and new device drivers.
- Use an IBM discussion forum on the IBM Web site to ask questions.

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

Using the documentation

Information about your IBM xSeries or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/pc/support/> and follow the instructions. Also,

you can order publications through the IBM Publications Ordering System at <http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi>.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM xSeries and IntelliStation products, services, and support. The address for IBM xSeries information is <http://www.ibm.com/eserver/xseries/>. The address for IBM IntelliStation information is <http://www.ibm.com/pc/intellistation/>.

You can find service information for your IBM products, including supported options, at <http://www.ibm.com/pc/support/>.

Software service and support

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

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

Hardware service and support

You can receive hardware service through IBM Integrated Technology Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. Go to <http://www.ibm.com/planetwide/> for support telephone numbers, or in the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

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

Appendix B. Warranty information

This section contains information about your warranty period and the service and support that are provided by your warranty.

Warranty period

The warranty period varies by machine type and country or region.

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

Prior to on-site warranty service, you are required to go through problem determination with an IBM service specialist call center technician.

This paragraph applies only to products with a warranty period of 3 years on parts and 1 year on labor. A warranty period of 3 years on parts and 1 year on labor means that IBM will provide warranty service without charge for:

1. parts and labor during the first year of the warranty period
2. parts only, on an exchange basis, in the second and third years of the warranty period. IBM will charge you for any labor it provides in performance of the repair or replacement.

The IBM Machine Warranties Web site at http://www.ibm.com/servers/support/machine_warranties/ contains a worldwide overview of the IBM Statement of Limited Warranty for IBM Machines, a glossary of terms used in the Statement of Limited Warranty, Frequently Asked Questions (FAQ), and links to Product Support Web pages. The IBM Statement of Limited Warranty is available from this Web site in 29 languages in Portable Document Format (PDF).

Machine - IBM Remote Supervisor Adapter II

Country or region	Warranty period	Service delivery method
Worldwide	Parts - 3 years Labor - 3 years	Customer carry-in or mail-in

Problem determination

Prior to on-site warranty service, you are required to go through problem determination with an IBM service specialist call center technician. The service specialist will run diagnostic tests on the hardware and check the software.

Running diagnostics

The IBM service specialist will help you determine whether your equipment is functioning as specified. It might be necessary to isolate the failing xSeries, Netfinity[®], or IntelliStation system; IBM component; or both from any active production environment to run diagnostics and perform defect-isolation programs. You are responsible for making the system, IBM component, or both available for running diagnostics and defect-isolation programs.

Checking software

The IBM service specialist will help you ensure that the correct BIOS code, firmware, device drivers, and other supporting IBM software are installed and correctly configured. It might be necessary to manually gather information about the relevant software levels or run IBM-approved utility programs to gather this information. It might be necessary to isolate the failing system from any active production environment to gather this information. You are responsible, with assistance from the service specialist, for gathering this information. The IBM Statement of Limited Warranty does not include on-site assistance with this activity.

Warranty service and support

With the original purchase of an IBM xSeries or IntelliStation system, you have access to extensive service and support. During the IBM Machine warranty period, you may call IBM or your reseller for problem-determination assistance 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, either on-site or at an IBM service center as determined by IBM.
- **Engineering Change management** - Occasionally, there might be changes that are required after a product has been shipped from IBM. In those instances, IBM will make Engineering Changes (ECs) available that apply to your hardware.
- **Customer replaceable units (CRUs)** - Some parts of IBM xSeries and IntelliStation systems are designated as customer replaceable units. IBM ships CRUs to you for replacement by you. CRUs include keyboards, monitors, memory, diskette drives, hard disk drives, and mice (this list is not inclusive of all CRUs).

The following items are not covered under warranty service:

- Replacement or use of non-IBM parts. All IBM parts contain a 7-character identification in the format IBM FRU XXXXXXXX.
- Identification of software problem sources.
- Installation of customer replaceable units (CRUs).
- Installation and configuration of BIOS code, firmware, or device drivers that are designated as customer installable.

See the IBM Statement of Limited Warranty for a full explanation of IBM warranty terms. Be sure to retain your proof of purchase to obtain warranty service.

Please have the following information ready when you call:

- The machine type and model of your IBM hardware product (if available)
- Serial numbers of your IBM hardware products
- A description of the problem
- The exact wording of any error messages
- Hardware and software configuration information

International Warranty Service

If you travel with your xSeries or IntelliStation system or relocate it to a country or region where your system is sold and serviced by IBM or IBM resellers authorized to perform warranty service, International Warranty Service (IWS) is available during the warranty period. Eligible IBM systems are identified by their four-digit machine types.

You can obtain IWS through the service delivery method (such as depot, carry-in, or on-site) provided in the servicing country or region. Service methods and procedures vary by country or region, and some service or parts might not be available in all countries and regions. Service centers in certain countries or regions might not be able to service all models of a particular machine type. In addition, some countries or regions might have fees and restrictions that apply at the time of service.

To determine whether your system is eligible for IWS, go to <http://www.ibm.com/pc/support/> and click **Warranty lookup**.

Purchasing additional services

During and after the warranty period, you can purchase additional services, such as support for IBM and non-IBM hardware, operating systems, and application programs; network setup and configuration; upgraded or extended hardware repair services; and custom installations. Service availability and service name might vary by country or region.

For more information about these services, contact your IBM marketing representative.

IBM Statement of Limited Warranty Z125-4753-06 8/2000

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 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 Limited 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.

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 ("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.

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.

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. 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 a Machine, contact IBM or your reseller. If you do not register your Machine with IBM, you may be required to present proof of purchase.

During the warranty period, IBM or your reseller, if approved by IBM to provide warranty service, provides without charge certain types of repair and exchange service 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. At its discretion, IBM or your reseller will 1) either repair or exchange the failing Machine and 2) provide the service either at your location or a service center. IBM or your reseller will also manage and install selected engineering changes that apply to the Machine.

Some parts of IBM Machines are designated as Customer Replaceable Units (called “CRUs”), e.g., keyboards, memory, or hard disk drives. IBM ships CRUs to you for replacement by you. You must return all defective CRUs to IBM within 30 days of your receipt of the replacement CRU. You are responsible for downloading designated Machine Code and Licensed Internal Code updates from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides.

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. 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.

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), except for any liability that cannot be waived or limited by applicable laws, 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 charges (if recurring, 12 months' charges apply) for the Machine that is subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code.

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, LOST PROFITS OR LOST 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.

Governing Law: Both you and IBM consent to the application of the laws of the country in which you acquired the Machine to govern, interpret, and enforce all of your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Agreement, without regard to conflict of law principles.

Part 2 - Country-unique Terms

AMERICAS

BRAZIL

Governing Law: *The following is added after the first sentence:* Any litigation arising from this Agreement will be settled exclusively by the court of Rio de Janeiro.

NORTH AMERICA

Warranty Service: *The following is added to this Section:* To obtain warranty service from IBM in Canada or the United States, call 1-800-IBM-SERV (426-7378).

CANADA

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:* laws in the Province of Ontario.

UNITED STATES

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:* laws of the State of New York.

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 similar legislation and are only limited to the extent permitted by the applicable legislation.

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 or other similar legislation, 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.

Governing Law: *The following replaces “laws of the country in which you acquired the Machine” in the first sentence: laws of the State or Territory.*

CAMBODIA, LAOS, AND VIETNAM

Governing Law: *The following replaces “laws of the country in which you acquired the Machine” in the first sentence: laws of the State of New York.*

The following is added to this Section: Disputes and differences arising out of or in connection with this Agreement shall be finally settled by arbitration which shall be held in Singapore in accordance with the rules of the International Chamber of Commerce (ICC). The arbitrator or arbitrators designated in conformity with those rules shall have the power to rule on their own competence and on the validity of the Agreement to submit to arbitration. The arbitration award shall be final and binding for the parties without appeal and the arbitral award shall be in writing and set forth the findings of fact and the conclusions of law.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator.

The two arbitrators appointed by the parties shall appoint a third arbitrator before proceeding upon the reference. The third arbitrator shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the ICC. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

The English language version of this Agreement prevails over any other language version.

HONG KONG AND MACAU

Governing Law: *The following replaces “laws of the country in which you acquired the Machine” in the first sentence: laws of Hong Kong Special Administrative Region.*

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 Limited Warranty, IBM's liability will be limited to the charge paid by you for the individual Machine that is the subject of the claim.

JAPAN

Governing Law: *The following sentence is added to this Section:* Any doubts concerning this Agreement will be initially resolved between us in good faith and in accordance with the principle of mutual trust.

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.

PEOPLE'S REPUBLIC OF CHINA (PRC)

Governing Law: *The following replaces this Section:* Both you and IBM consent to the application of the laws of the State of New York (except when local law requires otherwise) to govern, interpret, and enforce all your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Agreement, without regard to conflict of law principles.

Any disputes arising from or in connection with this Agreement will first be resolved by friendly negotiations, failing which either of us has the right to submit the dispute to the China International Economic and Trade Arbitration Commission in Beijing, the PRC, for arbitration in accordance with its arbitration rules in force at the time. The arbitration tribunal will consist of three arbitrators. The language to be used therein will be English and Chinese.

An arbitral award will be final and binding on all the parties, and will be enforceable under the Convention on the Recognition and Enforcement of Foreign Arbitral Awards (1958).

The arbitration fee will be borne by the losing party unless otherwise determined by the arbitral award.

During the course of arbitration, this Agreement will continue to be performed except for the part which the parties are disputing and which is undergoing arbitration.

EUROPE, MIDDLE EAST, AFRICA (EMEA)

THE FOLLOWING TERMS APPLY TO ALL EMEA COUNTRIES: The terms of this Statement of Limited Warranty apply to Machines purchased from IBM or an IBM reseller.

Warranty Service: If you purchase 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 purchase 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.

If you purchase an IBM Machine in a Middle Eastern or African country, you may obtain warranty service for that Machine from the IBM entity within the country of purchase, if that IBM entity provides warranty service in that country, or from an IBM reseller, approved by IBM to perform warranty service on that Machine in that country. Warranty service in Africa is available within 50 kilometers of an IBM authorized service provider. You are responsible for transportation costs for Machines located outside 50 kilometers of an IBM authorized service provider.

Governing Law: The applicable laws that govern, interpret and enforce rights, duties, and obligations of each of us arising from, or relating in any manner to, the subject matter of this Statement, without regard to conflict of laws principles, as well as Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided, except that in 1) Albania, Bosnia-Herzegovina, Bulgaria, Croatia,

Hungary, Former Yugoslav Republic of Macedonia, Romania, Slovakia, Slovenia, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan, the laws of Austria apply; 2) Estonia, Latvia, and Lithuania, the laws of Finland apply; 3) Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Djibouti, Democratic Republic of Congo, Equatorial Guinea, France, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Mali, Mauritania, Morocco, Niger, Senegal, Togo, and Tunisia, this Agreement will be construed and the legal relations between the parties will be determined in accordance with the French laws and all disputes arising out of this Agreement or related to its violation or execution, including summary proceedings, will be settled exclusively by the Commercial Court of Paris; 4) Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, United Kingdom, West Bank/Gaza, Yemen, Zambia, and Zimbabwe, this Agreement will be governed by English Law and disputes relating to it will be submitted to the exclusive jurisdiction of the English courts; and 5) in Greece, Israel, Italy, Portugal, and Spain any legal claim arising out of this Statement will be brought before, and finally settled by, the competent court of Athens, Tel Aviv, Milan, Lisbon, and Madrid, respectively.

THE FOLLOWING TERMS APPLY TO THE COUNTRY SPECIFIED:

AUSTRIA AND 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 is 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.

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

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

EGYPT

Limitation of Liability: *The following replaces item 2 in this Section:* 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. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code.

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).

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 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: 1. (unchanged) 2. as to any other actual damage arising in all situations involving nonperformance 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 third 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.

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 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 shall be limited to damages.

Appendix C. Notices

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Important notes

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

CD-ROM drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

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

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

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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.

Product recycling and disposal

This unit contains materials such as circuit boards, cables, electromagnetic compatibility gaskets, and connectors which may contain lead and copper/beryllium alloys that require special handling and disposal at end of life. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. IBM offers product-return programs in several countries. For country-specific instructions, refer to the following Web site:

<http://www.ibm.com/ibm/environment/products/prp.shtml>.

This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries, contact your local waste disposal facility.

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

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. 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 using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

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

Industry Canada Class A emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Australia and New Zealand Class A statement

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

United Kingdom telecommunications safety requirement

Notice to Customers

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

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 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.

Taiwanese Class A warning statement

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

Chinese Class A warning statement

聲 明
此為 A 級產品。在生活環境中，該產品可能會造成無線電干擾。在這種情況下，可能需要用戶對其干擾採取切实可行的措施。

Japanese Voluntary Control Council for Interference (VCCI) statement

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

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
02K0546	China
13F9940	Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea

IBM power cord part number	Used in these countries and regions
13F9979	Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Azerbaijan, Belarus, Belgium, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Democratic Republic of), Congo (Republic of), Cote D'Ivoire (Ivory Coast), Croatia (Republic of), Czech Republic, Dahomey, Djibouti, Egypt, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, French Guyana, French Polynesia, Germany, Greece, Guadeloupe, Guinea, Guinea Bissau, Hungary, Iceland, Indonesia, Iran, Kazakhstan, Kyrgyzstan, Laos (People's Democratic Republic of), Latvia, Lebanon, Lithuania, Luxembourg, Macedonia (former Yugoslav Republic of), Madagascar, Mali, Martinique, Mauritania, Mauritius, Mayotte, Moldova (Republic of), Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Reunion, Romania, Russian Federation, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Slovakia, Slovenia (Republic of), Somalia, Spain, Suriname, Sweden, Syrian Arab Republic, Tajikistan, Tahiti, Togo, Tunisia, Turkey, Turkmenistan, Ukraine, Upper Volta, Uzbekistan, Vanuatu, Vietnam, Wallis and Futuna, Yugoslavia (Federal Republic of), Zaire
13F9997	Denmark
14F0015	Bangladesh, Lesotho, Maceo, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda
14F0033	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dominica, Gambia, Ghana, Grenada, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Polynesia, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad and Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Italy, Libyan Arab Jamahiriya
14F0087	Israel
1838574	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Costa Rica, Colombia, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Taiwan, United States of America, Venezuela
24P6858	Korea (Democratic People's Republic of), Korea (Republic of)

IBM power cord part number	Used in these countries and regions
34G0232	Japan
36L8880	Argentina, Paraguay, Uruguay
49P2078	India
49P2110	Brazil
6952300	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Caicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Thailand, Taiwan, United States of America, Venezuela

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