

IBM

@server

xSeries 440

16-way Configuration Supplemental Information





**IBM**

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xSeries 440

16-way Configuration Supplemental Information

**Note:** Before using this information and the product it supports, read the general information in Appendix A, “Notices” on page 21.

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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.

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

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

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

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

Перед установкой продукта прочтите инструкции по  
технике безопасности.

Pred inštaláciou tohto zariadenia si 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:**

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

**To Disconnect:**

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

**Statement 3:**



**CAUTION:**

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

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



**DANGER**

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

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

**Statement 4:**



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

**CAUTION:**

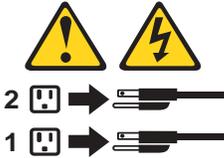
Use safe practices when lifting.

**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.



**Statement 8:**



**CAUTION:**

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



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

---

## Chapter 1. Introduction

An IBM® @server xSeries™ 440 server 16-way configuration consists of two xSeries 440 servers cabled together. This document provides the additional information needed to install, cable, and troubleshoot this configuration.

Your initial hardware installation and configuration is performed by an authorized IBM service representative. You must install your operating system and applications or purchase additional optional software installation services.

---

### Related publications

In addition to this document, the following xSeries 440 documentation is provided with your server:

- *Installation Guide*  
This printed publication contains setup and installation instructions. This publication is also provided in Portable Document Format (PDF) on the *IBM xSeries Documentation CD*.
- *Option Installation Guide*  
This publication is provided in PDF format on the *IBM xSeries Documentation CD*. It contains the information needed to install, remove, and connect optional devices supported by your server.
- *Rack Installation Instructions*  
This printed publication contains the instructions needed to install your server in a rack cabinet. This publication is also provided in PDF on the *IBM xSeries Documentation CD*.
- *Safety Information*  
This multilingual publication is provided in PDF on the *IBM xSeries Documentation CD*. It contains translated versions of the caution and danger statements that appear in the documentation for your server. Each caution and danger statement has an assigned number, which you can use to locate the corresponding statement in your native language.
- *User's Guide*  
This publication is provided in PDF on the *IBM xSeries Documentation CD*. It contains general information about your server.
- *Troubleshooting Guide*  
This publication is provided in PDF on the *IBM xSeries Documentation CD*. It contains the information needed to help you solve problems yourself, or provide helpful information to a service technician.

Depending on your server model, additional publications might be included on the *IBM xSeries Documentation CD*. Your server also comes with software documentation needed to install and configure your operating system.

---

## The 16-way configuration

The 16-way configuration consists of two IBM xSeries 440 servers containing two fully populated symmetrical multiprocessor (SMP) Expansion Modules. These two xSeries 440 servers are connected to each other with cables and through BIOS settings. In this section, you will find 16-way configuration considerations and an introduction to terms that are specific to the 16-way configuration.

## 16-way considerations

Before you configure two IBM xSeries 440 servers to operate in a 16-way configuration, review the following:

- You must have four long SMP Expansion cables and two short SMP Expansion cables to properly connect the servers in a 16-way configuration.
  - Each server must have two SMP Expansion modules. Each SMP Expansion module must have four Intel Xeon MP microprocessors and at least four DIMMs.
  - The Remote Supervisor Adapters on each server must be connected to an Enterprise Network, or to each other with an Ethernet crossover cable, prior to merging the two servers.
  - You must connect a ps/2 keyboard to the primary server. Do not connect a USB keyboard when two servers are connected in a 16-way configuration.
  - When two servers are connected in a 16-way configuration and no video device is connected to the secondary server an error beep code might be heard during startup. This is an acceptable action.
  - If two servers are cabled together without an RXE Expansion enclosure, the scan order will be the primary server, then the secondary server. The PCI slots are scanned in the following order: PCI-X slots 1, 2, 3, 4, 5, 6 in the primary server then PCI-X slots 7, 8, 9, 10, 11, 12 in the secondary server.
  - When two servers are cabled together and share an RXE Expansion enclosure the PCI slots are scanned in the following order: PCI-X slots 1, 2, 3, 4, 5, 6 in the primary server then PCI-X slots 7, 8, 9, 10, 11, 12 in the RXE Expansion enclosure; then, PCI-X slots 13, 14, 15, 16, 17, 18 in the secondary server and finally PCI-X slots 19, 20, 21, 22, 23, 24 in the RXE Expansion enclosure.
- Important:** This PCI-X scan order differs from the one described in the other xSeries 440 publications that came with your server.

## 16-way terms

This section provides definitions for terms that are specific to the 16-way configuration.

**Static partition:** A static partition is configured through the partition descriptor found in BIOS. This static partition defines how the servers are connected to share their resources.

**Partition descriptor:** A partition descriptor defines one server as the secondary server and the other as the primary.

**Primary server:** A primary server is the startup server. This server has control of the resources assigned to both servers and retains the error logs.

**Secondary server:** This server is controlled by the primary server.

---

## Chapter 2. Installation

This section provides the basic information that is needed to install an xSeries 440 16-way configuration. Some steps might require the use of other xSeries 440 documentation that comes with your server.

**Important:** The steps in this section are intended for the authorized IBM service representative.

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### Configuring the static partition

If you have not already done so, install both xSeries 440 servers in the same rack cabinet. You must install the primary server directly above the secondary server. See the *Rack Installation Instructions* to install your servers, but do not connect any signal or device cables except power.

Once your servers are installed in a rack cabinet, return here and complete the following steps:

1. Connect a pointing device, keyboard, and monitor to each of the two xSeries 440 servers.
2. Using the two short SMP Expansion cables that come with your servers, complete the following steps:
  - a. Connect one end of the first SMP Expansion cable to port 3 of the top SMP Expansion Module on the primary server; then, connect the opposite end of the cable to port 3 of the bottom SMP Expansion Module on the primary server.
  - b. Connect one end of the second SMP Expansion cable to port 3 of the top SMP Expansion Module on the secondary server; then, connect the opposite end of the cable to port 3 of the bottom SMP Expansion Module on the secondary server.
3. Start the Configuration/Setup Utility program.
  - a. Turn on a server and watch the monitor screen.
  - b. When the message Press F1 for Configuration/Setup appears, press F1.
  - c. Select **Start Options** from the menu; then, enable hyper-threading and change the value in the **Boot Fail Count** field to disabled.
  - d. Save and Exit setup.
4. Insert the Remote Supervisor Adapter diskette into the diskette drive.
5. Use the utility on the diskette to assign an IP address to the Remote Supervisor Adapter.

**Note:** If you are configuring the secondary server make a note of the IP address. You will need this information later in this procedure.
6. Exit the utility and turn off the server.
7. Repeat steps 3 through 6 on the other server.
8. Connect the Remote Supervisor Adapters of each server to the network or use the Ethernet crossover cable to connect them to each other.

9. Create a static partition.
  - a. Turn on the primary server and start the Configuration/Setup Utility as described in step 3.
 

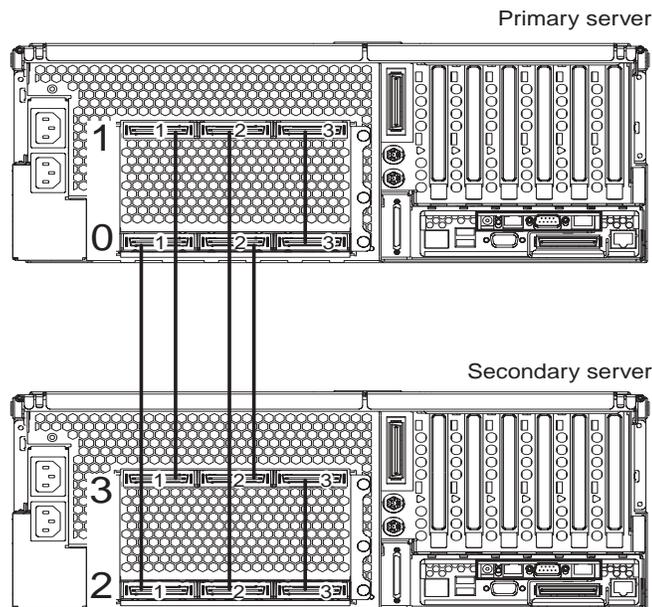
**Note:** Turning on the primary server will also turn on the secondary server. This is an acceptable action.
  - b. Select **Advanced Setup** from the main menu.
  - c. Select **Static Partition Settings**.
  - d. Type the IP address of the Remote Supervisor Adapter in the secondary server in the **Secondary Host Name** field.
  - e. Select **Save Static Partition Settings** and follow the prompts.
  - f. Exit the Configuration/Setup Utility Program.
  - g. Turn off both servers; then, continue with “Cabling the servers”.

## Cabling the servers

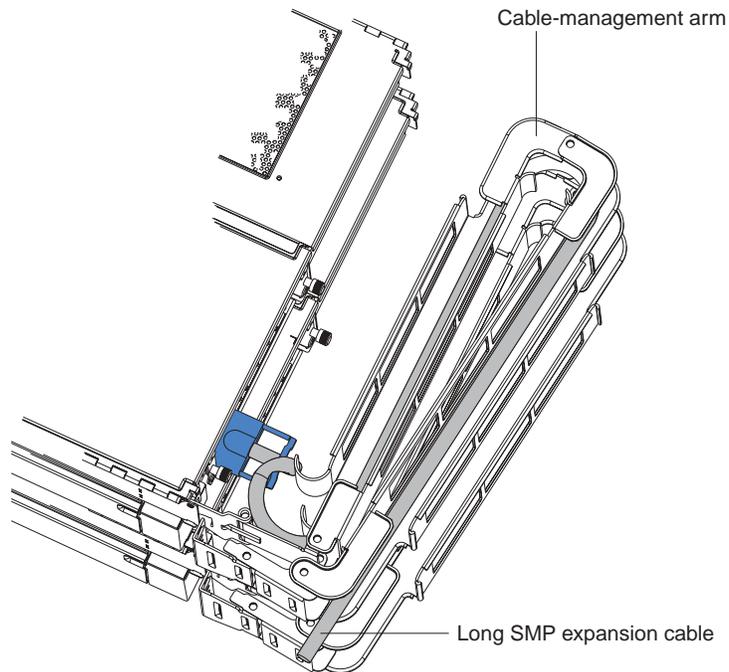
This section contains instructions on how to cable two xSeries 440 servers together in a 16-way configuration.

1. Label each end of the long SMP Expansion cables according to where they connect to each server. See the illustration on this page.

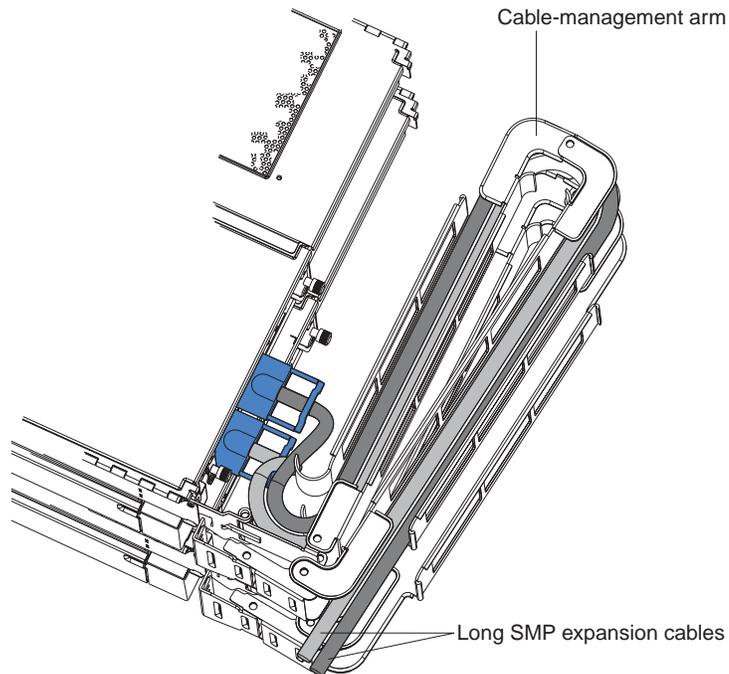
**Note:** The SMP Expansion module numbering shown in the following illustration is for reference purposes only. These numbers do not appear on the servers.



2. Connect the SMP Expansion cables to the primary server.
  - a. Connect one end of a long SMP Expansion cable to port 1 of SMP Expansion Module 0 on the primary server; then, route the cable through the cable-management arm.



- b. Connect one end of a long SMP Expansion cable to port 2 of SMP Expansion Module 0 on the primary server; then, route the cable beside the first cable in the cable-management arm.



- c. Connect one end of a long SMP Expansion cable to port 1 of SMP Expansion Module 1 on the primary server; then, route the cable through the cable-management arm as in step a.
- d. Connect one end of a long SMP Expansion cable to port 2 of SMP Expansion Module 1 on the primary server; then, route the cable through the cable-management arm as in step b.

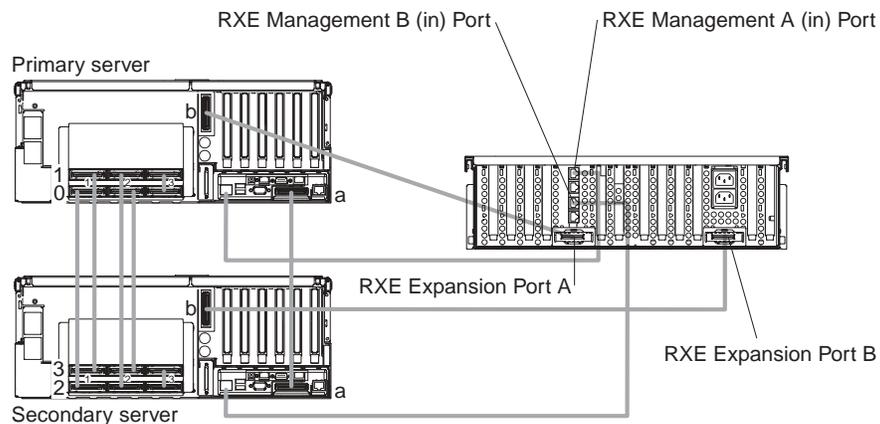
- e. Verify that a short SMP Expansion cable is connected between port 3 of SMP Expansion Module 0 and port 3 of SMP Expansion Module 1.
  3. Connect the SMP Expansion cables to the secondary server.
    - a. Locate the SMP Expansion cable that is connected to port 1 of SMP Expansion Module 0 on the primary server; then, connect the opposite end of the cable to port 1 of SMP Expansion Module 2. Next, route the cable through the secondary cable-management arm.
    - b. Locate the SMP Expansion cable that is connected to port 2 of SMP Expansion Module 1 on the primary server; then, connect the opposite end of the cable to port 2 of SMP Expansion Module 2. Next, route the cable through the secondary cable-management arm.
    - c. Locate the SMP Expansion cable that is connected to port 1 of SMP Expansion Module 1 on the primary server; then, connect the opposite end of the cable to port 1 of SMP Expansion Module 3. Next, route the cable through the secondary cable-management arm.
    - d. Locate the SMP Expansion cable that is connected to port 2 of SMP Expansion Module 0 on the primary server; then, connect the opposite end of the cable to port 2 of SMP Expansion Module 3. Next, route the cable through the secondary cable-management arm.
    - e. Verify that a short SMP Expansion cable is connected between port 3 of SMP Expansion Module 2 and port 3 of SMP Expansion Module 3.
  4. Route any remaining cables through the cable-management arms.
  5. Secure the cables in the cable-management arms with the hook-and-loop straps that come with your server.
  6. If you are connecting to an IBM RXE-100 Remote Expansion Enclosure, go to “Cabling an RXE-100” on page 7 for instructions on how to connect the IBM RXE-100 to a 16-way system; then, return here.
  7. Turn on the primary server; then, see the software documentation that comes with your server to install your operating system.

**Important:** Do not use ServerGuide™ to install the operating system that comes with your server.

## Cabling an RXE-100

Complete the following steps to connect an IBM RXE-100 Remote Expansion Enclosure to a 16-way system.

1. Turn on the primary server and start the Configuration/Setup Utility program.
  - a. When the message Press F1 for Configuration/Setup appears, press F1.
  - b. Select **Advanced Setup** from the main menu; then, select **Static Partition Settings**.
  - c. Enable **Remote Expansion Enclosure**.
  - d. Select **Save Static Partition Settings** and follow the prompts.
  - e. Exit the Configuration/Setup Utility Program.
  - f. Turn off the primary server.
2. Using an RXE Expansion cable, connect RXE Expansion Port A on the primary server to RXE Expansion Port A on the secondary server.



3. Using an RXE Expansion cable, connect RXE Expansion Port B on the primary server to RXE Expansion Port A on the RXE-100.
4. Using an RXE Expansion cable, connect RXE Expansion Port B on the secondary server to the RXE Expansion Port B on the RXE-100.
5. Using an RXE Management cable, connect the RXE Management Port on the primary server to RXE Management A (in) Port on the RXE-100.
6. Using an RXE Management cable, connect the RXE Management Port on the secondary server to RXE Management B (in) Port on the RXE-100.



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## Chapter 3. Operating Information

This section contains information about how your 16-way configuration works differently than described in the xSeries 440 documentation that comes with your server.

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### Turning on and off your 16-way configuration

The procedure for turning your 16-way configuration on and off is no different than the procedure described in the xSeries 440 documentation that comes with your server. However, pressing the power-control button on either the primary or secondary server in the 16-way configuration, will turn on or turn off both servers.

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### Using the locator light

The locator light is on the left front of the Light Path Diagnostic drawer. This blue light indicates the primary and secondary servers. This light blinks on the primary server. If the light remains solid, it indicates that server is the secondary server. See the illustration on page 37 of the *Installation Guide* for the exact location of the locator light.

---

### Using ports and connectors

USB, video, auxiliary pointing device, and keyboard considerations:

- **USB:** Once the two servers are merged together, the USB ports on the secondary server will no longer operate. Disconnect all USB devices from the secondary server prior to merging the two servers.
- **Video:** Once the two servers are merged together, the video port on the secondary server will no longer operate.
- **Auxiliary pointing device:** Once the two servers are merged together the, auxiliary pointing device port on the secondary server will no longer operate.
- **Keyboard:** Once the two servers are merged together, the keyboard port on the secondary server will no longer operate.

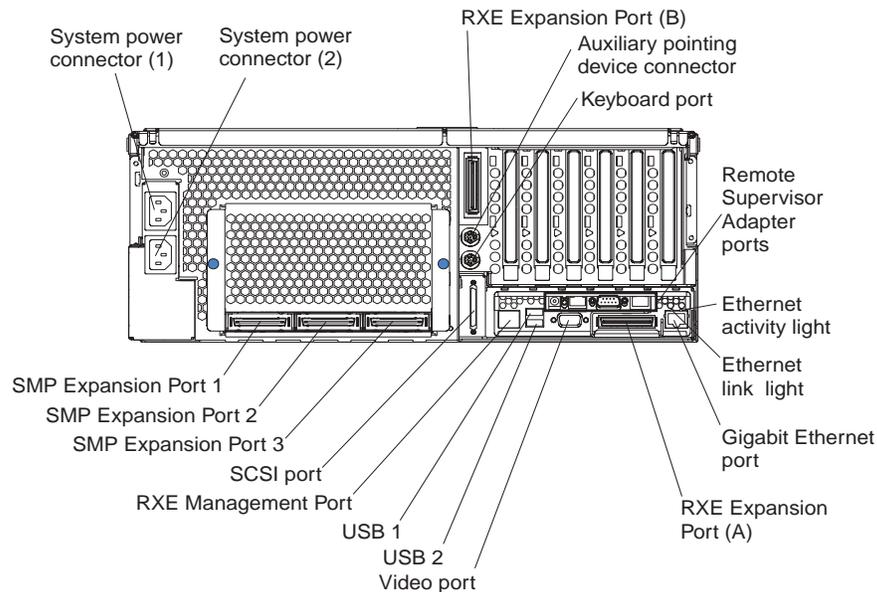
**Note:** You must connect a ps/2 keyboard to the primary server. Do not connect a USB keyboard when two servers are connected in a 16-way configuration.

For details about the locations and functions of all of the ports, indicators, and connectors refer to the *Option Installation Guide* on the *IBM xSeries Documentation* CD.

**Note:** See the software documentation provided with your server for additional cabling instructions.

---

## Working with cables



To effectively manage the cables on this server, keep groups of cables secured together.

**Notes:**

1. Use hook-and-loop fasteners to secure the cable bundles in the cable-management arms.
2. When possible, separate data and power cables.
3. Do not secure cables too tightly. Overtightening can cause internal damage to the cables.

---

## Configuring static partitions

In this section you will find the information and instructions needed to create or remove a static partition. In some instances creating or deleting static partitions are referred to as merging or unmerging the servers.

**Notes:**

1. Before you can create or delete a static partition, the Remote Supervisor Adapters must connect to a network or to each other with an Ethernet crossover cable. This connection is needed so that the Remote Supervisor Adapters can communicate and perform the necessary functions for the two servers to merge or unmerge.
2. You must create a static partition on the primary server prior to cabling the servers together.
3. Anytime you delete the static partition you must remove all the interconnected cables between the servers.
4. When two servers are merged together the CD-ROM, diskette drive, keyboard, USB ports, mouse, and video are disabled on the secondary server.

## Creating a static partition

If you have deleted the static partition for any reason, you must first remove all interconnecting cables with the exception of the Remote Supervisor Adapter Ethernet cable before continuing. For instructions on creating a static partition, see “Configuring the static partition” on page 3.

## Deleting a static partition

Complete the following steps to delete the static partition:

1. Start the Configuration/Setup Utility on the primary server.
2. Select **Advanced Setup** from the main menu.
3. Select **Static Partition Settings**.
4. Select **Delete Static Partition Settings**.  
**Note:** Do not select **Save Static Partition Settings** when you delete the static partition.
5. Exit the Configuration/Setup Utility Program.
6. Turn the servers off and disconnect all interconnecting cables between the two servers.



---

## Chapter 4. Troubleshooting

This section provides additional information that is needed to troubleshoot servers that are merged into a 16-way configuration. See the *Troubleshooting Guide* on the *IBM xSeries Documentation* CD or the *Installation Guide* for the xSeries 440 server for general information.

---

### Diagnostic tools overview

The following tools are available to help you identify and resolve hardware-related problems:

- **POST beep codes**

The power-on self-test beep codes indicate the detection of a problem.

- One beep indicates successful completion of POST.
- More than one beep indicates that POST detected a problem. Error messages also appear during startup if POST detects a hardware-configuration problem.

See “POST beep code descriptions” and the *Troubleshooting Guide* on the *IBM xSeries Documentation* CD for more information.

- **Troubleshooting charts**

These charts list problem symptoms and steps to correct the problems. See the “Troubleshooting charts” on page 18 for more information.

- **Diagnostic programs and error messages**

The system diagnostic programs are provided in ROM. These programs test the major components of your server.

**Notes:**

1. The diagnostic programs and error messages are specific to each server. When running diagnostics and reading error messages of two merged servers, be sure that you know which server gave the error before attempting any repairs or changing any settings.
2. Refer to the *Troubleshooting Guide* on the *IBM xSeries Documentation* CD for more information.

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### POST beep code descriptions

#### **One beep**

Indicates successful completion of POST.

#### **Repeating long beeps**

Indicates that a memory error has occurred. Ensure that all DIMMs are correctly installed.

#### **One long beep and two short beeps**

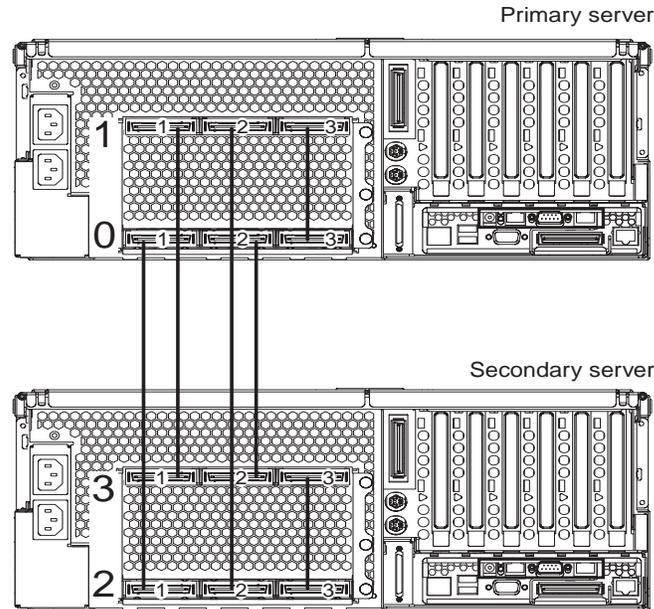
Indicates that a video error has occurred and the BIOS code cannot initialize the video screen to display any additional information.

**Note:** When turning on the 16-way configuration you might hear this beep code if no video device is connected to the secondary server. This is an acceptable action.

## Verifying the SMP Expansion port cabling

Use the following illustration and tables to verify that your SMP Expansion cables are properly connected.

**Note:**



*Table 1. Long SMP Expansion Module cable connections*

From		To	
SMP Expansion Module	Port	SMP Expansion Module	Port
0	1	2	1
1	1	3	1
0	2	3	2
1	2	2	2

*Table 2. Short SMP Expansion Module cable connections*

From		To	
SMP Expansion Module	Port	SMP Expansion Module	Port
0	3	1	3
2	3	3	3

## Verifying the RXE Expansion port cabling

Use the following illustration and table to verify that your RXE Expansion cables are properly connected.

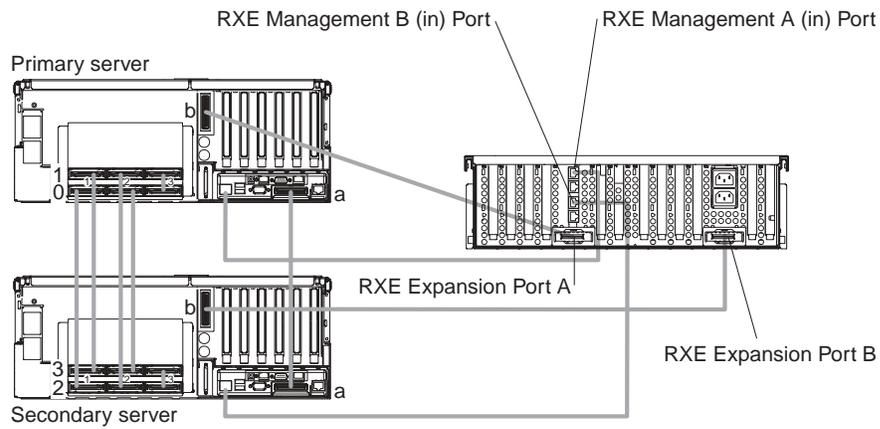


Table 3. RXE Expansion cable connections

From		To	
Server	Port	Server/RXE	Port
Primary	A	Secondary	A
Primary	B	RXE	A
Secondary	B	RXE	B

## Verifying the RXE Management port cabling

Use the following illustration and table to verify that your RXE Management cables are properly connected.

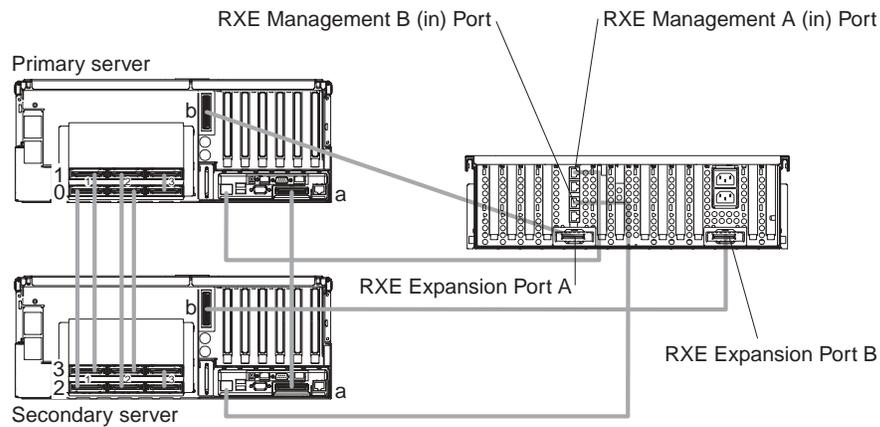


Table 4. RXE Management cable connections

From	To
Server	RXE Management Port
Primary	A (in)
Secondary	B (in)

## Verifying the Remote Supervisor Adapter cabling

See the *User's Guide* on the *IBM Documentation CD* for detailed information about the Remote Supervisor Adapter.

**Note:** The Remote Supervisor Adapter must connect to an Enterprise Network when two servers are connected in a 16-way configuration. You can alternatively connect the Remote Supervisor Adapters to each other with an Ethernet crossover cable.

---

## Starting the diagnostic programs

This section contains the information needed to start the diagnostic programs while your xSeries 440 servers are connected in the 16-way configuration.

Complete the following steps to start the diagnostic programs:

1. Turn on the servers and watch the monitor screen.
2. When the message Press ESC to bypass partition merge and boot standalone appears, press ESC.
3. Then, press F2 to start the diagnostic program.

**Note:** You must connect a pointing device, keyboard, and monitor to the secondary server in order to run diagnostic programs on that server. The procedure for starting diagnostics is the same for both servers and the merge process can be stopped from either the primary or secondary servers.

## Troubleshooting charts

You can use the troubleshooting charts in this section to supplement information in other xSeries 440 documentation and find solutions to problems that have definite symptoms.

**Attention:** If diagnostic error messages appear that are not listed in the following tables, make sure that your system has the latest level of BIOS code installed.

Refer to the *Troubleshooting Guide* on the *IBM xSeries Documentation CD* for more detailed information about testing the system. If you have run the diagnostic test programs or if running the tests does not reveal the problem, call for service.

Look for the symptom in the left column of the chart. Instructions and probable solutions to the problem are in the right column. If you have just added new software or a new option and your system is not working, do the following before using the troubleshooting charts:

- Remove the software or device that you just added.
- Run the diagnostic tests to determine if your system is running correctly.
- Reinstall the new software or new device.

Table 5. Troubleshooting charts

Device	Suggested action
<b>CD-ROM drive</b>	Verify that:
CD-ROM drive is not recognized.	<ol style="list-style-type: none"> <li>1. The primary IDE channel is enabled in the Configuration/Setup Utility program.</li> <li>2. All cables and jumpers are installed correctly.</li> <li>3. The correct device driver is installed for the CD-ROM drive.</li> </ol> <p><b>Note:</b> When two servers are merged together the CD-ROM, diskette drive, keyboard, USB ports, mouse, and video are disabled on the secondary server.</p>
<b>Diskette drive</b>	If there is a diskette in the drive, verify that:
Diskette drive in-use light stays on, or the system bypasses the diskette drive.	<ol style="list-style-type: none"> <li>1. The diskette drive is enabled in the Configuration/Setup Utility program.</li> <li>2. The diskette is good and not damaged. (Try another diskette if you have one.)</li> <li>3. The diskette contains the necessary files to start the system.</li> <li>4. Your software program is working properly.</li> </ol> <p><b>Note:</b> When two servers are merged together the CD-ROM, diskette drive, keyboard, USB ports, mouse, and video are disabled on the secondary server.</p> <p>If the diskette drive in-use light stays on, or the system continues to bypass the diskette drive, call for service.</p>
<b>Intermittent problems</b>	Verify that:
A problem occurs only occasionally and is difficult to detect.	<ol style="list-style-type: none"> <li>1. All cables and cords are connected securely to the rear of the system and attached options.</li> <li>2. When the system is turned on, air is flowing from the rear of the system at the fan grille. If there is no air flow, the fan is not working. This causes the system to overheat and shut down.</li> <li>3. Ensure that the SCSI bus and devices are configured correctly and that the last external device in each SCSI chain is terminated correctly.</li> </ol> <p>If the items above are correct, call for service.</p>

Table 5. Troubleshooting charts (continued)

Device	Suggested action
<p><b>Keyboard, mouse, or pointing-device</b></p>	<ol style="list-style-type: none"> <li>1. Make sure that the keyboard cable is properly connected to the system.</li> <li>2. Make sure that the system and the monitor are turned on.</li> <li>3. Try using another keyboard.</li> </ol>
<p>All or some keys on the keyboard do not work.</p>	<p><b>Note:</b> When two servers are merged together the CD-ROM, diskette drive, keyboard, USB ports, mouse, and video are disabled on the secondary server.</p> <p>If the problem remains, call for service.</p>
<p>The mouse or pointing device does not work.</p>	<ol style="list-style-type: none"> <li>1. Verify that the mouse or pointing-device cable is securely connected and the device drivers are installed correctly.</li> <li>2. Try using another mouse or pointing device.</li> </ol> <p><b>Note:</b> When two servers are merged together the CD-ROM, diskette drive, keyboard, USB ports, mouse, and video are disabled on the secondary server.</p> <p>If the problem remains, call for service.</p>
<p><b>USB Keyboard, mouse, or pointing-device</b></p>	<ol style="list-style-type: none"> <li>1. You must connect a ps/2 keyboard to the primary server. Do not connect a USB keyboard when two servers are connected in a 16-way configuration.</li> <li>2. Make sure that the system and the monitor are turned on.</li> <li>3. Try using another keyboard.</li> </ol>
<p>All or some keys on the keyboard do not work.</p>	<p><b>Note:</b> When two servers are merged together the CD-ROM, diskette drive, keyboard, USB ports, mouse, and video are disabled on the secondary server.</p> <p>If the problem remains, call for service.</p>
<p>The USB mouse or USB pointing device does not work.</p>	<ol style="list-style-type: none"> <li>1. Make sure that the mouse or pointing-device USB cable is properly connected to the system.</li> <li>2. Make sure that the system and the monitor are turned on.</li> <li>3. Ensure that the USB mouse support is enabled in BIOS.</li> <li>4. If a USB hub is in use, disconnect the USB device from the hub and connect it directly to the server.</li> <li>5. Ensure that the USB device is not connected to the secondary server in a merged configuration.</li> <li>6. Try using another mouse or pointing-device.</li> </ol> <p><b>Note:</b> When two servers are merged together the CD-ROM, diskette drive, keyboard, USB ports, mouse, and video are disabled on the secondary server.</p> <p>If the problem remains, call for service.</p>
<p><b>Monitor</b></p>	<p>Verify that:</p>
<p>The monitor works when you turn on the system, but goes blank when you start some application programs.</p>	<ol style="list-style-type: none"> <li>1. The primary monitor cable is connected to the video port.</li> <li>2. You installed the necessary device drivers for the applications.</li> </ol> <p>Some IBM monitors have their own self-tests. If you suspect a problem with your monitor, refer to the information that comes with the monitor for adjusting and testing instructions.</p> <p><b>Note:</b> When two servers are merged together the CD-ROM, diskette drive, keyboard, USB ports, mouse, and video are disabled on the secondary server.</p> <p>If you still cannot find the problem, call for service.</p>

Table 5. Troubleshooting charts (continued)

Device	Suggested action
The screen is blank.	<p>Verify that:</p> <ol style="list-style-type: none"> <li>1. The system power cord is plugged into the server and a working electrical outlet.</li> <li>2. The monitor cables are connected properly.</li> <li>3. The monitor is turned on and the brightness and contrast controls are adjusted correctly.</li> <li>4. Ensure that the monitor is not connected to the secondary server in a merged configuration.</li> </ol> <p><b>Note:</b> When two servers are merged together the CD-ROM, diskette drive, keyboard, USB ports, mouse, and video are disabled on the secondary server.</p> <p>If the items above are correct and the screen remains blank, call for service.</p>
<p><b>Universal Serial Bus (USB) ports</b></p> <p>A USB device does not work.</p>	<p>Verify that:</p> <ol style="list-style-type: none"> <li>1. You are not trying to use a USB keyboard.</li> <li>2. The correct USB device driver is installed.</li> <li>3. Your operating system supports USB devices.</li> <li>4. If a USB hub is in use, disconnect the USB device from the hub and connect it directly to the server.</li> </ol> <p><b>Note:</b> When two servers are merged together the CD-ROM, diskette drive, keyboard, USB ports, mouse, and video are disabled on the secondary server.</p> <p>If the problem remains, call for service.</p>

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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.

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