

System x iDataPlex dx340
Types 6385, 6386, 6389, 7831, 7832, and 7834



User's Guide

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Types 6385, 6386, 6389, 7831, 7832, and 7834



User's Guide

Note: Before using this information and the product it supports, read the general information in Appendix B, "Notices," on page 61 and the *Warranty and Support Information* document on the IBM *Documentation* CD.

Fourth Edition (January 2010)

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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 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 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.

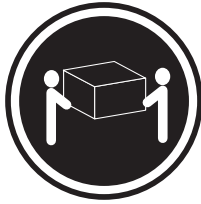


DANGER

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.

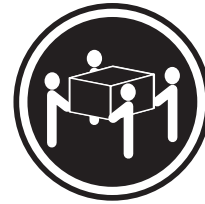
Statement 4:



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

CAUTION:

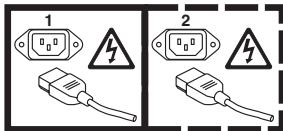
Use safe practices when lifting.

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.

Statement 10:



CAUTION:

Do not place any object on top of rack-mounted devices.



Chapter 1. Introduction

IBM® System x™ iDataPlex™ products are ideally suited for data-center environments that require high-performance, energy-efficient, cost-effective hardware. The modular design of the iDataPlex components makes it possible for you to order customized server solutions that meet the specific needs of your current environment.

This *IBM iDataPlex dx340 User's Guide* contains general information about how to use, upgrade, and configure the components in your customized server solution. These components consist of the IBM System x iDataPlex dx340 system-board tray, an IBM System x iDataPlex 2U Flex Chassis or IBM System x iDataPlex 3U Chassis, the IBM System x iDataPlex Storage enclosure, and the IBM System x iDataPlex I/O enclosure.

With the exception of the warranty period, the iDataPlex Types 6385, 6386, 6389, 7831, 7832, and 7834 products are functionally equivalent as follows:

- IBM System x iDataPlex dx340 system-board tray Types 6389 and 7832 are functionally equivalent
- IBM System x iDataPlex 2U chassis Types 6385 and 7831 are functionally equivalent
- IBM System x iDataPlex 3U chassis Types 6386 and 7834 are functionally equivalent

Depending on what you ordered, you received one or more of the following server solutions:

- Two dx340 system-board trays installed in a 2U chassis
- One dx340 system-board tray and one storage enclosure installed in a 2U chassis
- One dx340 system-board tray and one I/O enclosure installed in a 2U chassis
- One dx340 system-board tray installed in a 3U chassis

See Chapter 2, “Components, features, and controls,” on page 13 for detailed information about the components used in the customized server solutions.

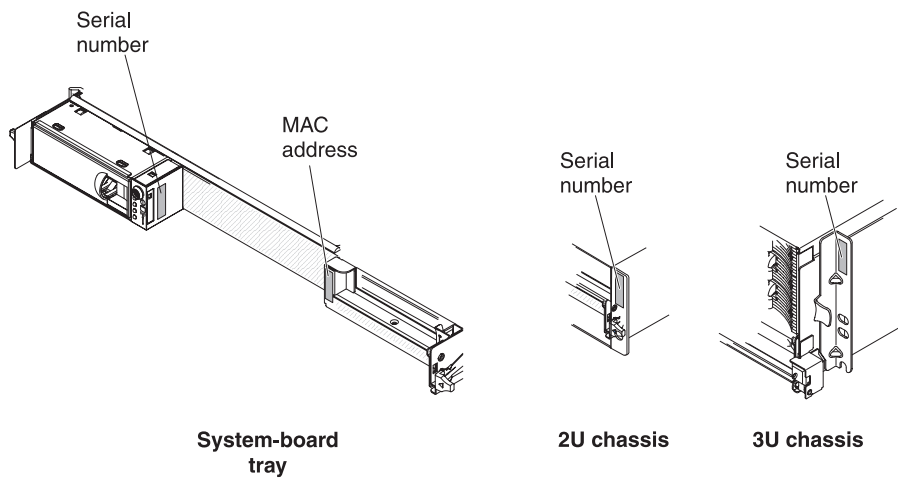
The iDataPlex products come with a limited warranty. For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document.

You can obtain up-to-date information about the IBM iDataPlex products and other IBM server products at <http://www.ibm.com/systems/x/>.

The system-board tray serial number is on a label at the front of the system-board tray to the left of the operator panel. The system-board tray baseboard management controller (BMC) media access control (MAC) address is on a tab at the left side of the system-board tray. The chassis machine type and serial number are on a label on the front of the chassis at the right side. Label locations are shown in the illustration following the table. This illustration might differ slightly from your hardware.

Record information about the server in the following table.

Product name	IBM System x iDataPlex dx340
Machine type (system-board tray)	Type _____
Serial number (system-board tray)	_____
BMC MAC address (system-board tray)	_____
Machine type (chassis)	Type _____ (2U chassis) or Type _____ (3U chassis)
Serial number (chassis)	_____



Related documentation

In addition to the printed *Important Notices* document and this *User's Guide*, the following documentation for the dx340 system-board tray, 2U chassis, and 3U chassis is provided in Portable Document Format (PDF) on the IBM *Documentation CD*:

- *Warranty and Support Information*

This document contains information about the terms of the warranty and getting service and assistance.

- *Safety Information*

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

- *Problem Determination and Service Guide*

This document contains information to help you solve problems yourself, and it contains information for service technicians.

Depending on the hardware configuration, additional documentation might be included on the IBM *Documentation CD*.

The iDataPlex documentation might be updated occasionally, or technical updates might be available to provide additional information that is not included in the documentation. These updates are available from the IBM Systems Information Center. To check for updated iDataPlex information and technical updates, go to <http://publib.boulder.ibm.com/infocenter/idadaplx/documentation/index.jsp>.

The updated iDataPlex documentation also is available from the IBM Support Web site. To check for updated documentation and technical updates, complete the following steps.

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to <http://www.ibm.com/systems/support/>.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Publications lookup**.
4. From the **Product family** menu, select **System x iDataPlex dx340 server** and click **Go**.

The IBM Documentation CD

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

Hardware and software requirements

The IBM *Documentation* CD requires the following minimum hardware and software:

- Microsoft Windows XP, Windows 2000, or Red Hat Linux
- 100 MHz microprocessor
- 32 MB of RAM
- Adobe Acrobat Reader 3.0 (or later) or xpdf, which comes with Linux operating systems

Using the Documentation Browser

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

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

- If Autostart is enabled, insert the CD into the CD or DVD drive. The Documentation Browser starts automatically.
- If Autostart is disabled or is not enabled for all users, use one of the following procedures:

- If you are using a Windows operating system, insert the CD into the CD or DVD drive and click **Start --> Run**. In the **Open** field, type

```
e:\win32.bat
```

where *e* is the drive letter of the CD or DVD drive, and click **OK**.

- If you are using Red Hat Linux, insert the CD into the CD or DVD drive; then, run the following command from the /mnt/cdrom directory:

```
sh runlinux.sh
```

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

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

To search all the documents, type a word or word string in the **Search** field and click **Search**. The documents in which the word or word string appears are listed in order of the most occurrences. Click a document to view it, and press Ctrl+F to use the Acrobat search function, or press Alt+F to use the xpdf search function within the document.

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

Notices and statements in this document

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

The following notices and statements are used in this document:

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

Features and specifications

The following information is a summary of the features and specifications of the hardware. Depending on the hardware configuration, some features might not be available, or some specifications might not apply.

Racks are marked in vertical increments of 4.45 cm (1.75 inches). Each increment is referred to as a unit, or "U." A 1U-high device is 1.75 inches tall.

<p>Microprocessor: One or two quad-core Intel® Xeon™ microprocessors in each system-board tray</p> <p>Note: Use the BIOS configuration utility program to determine the type and speed of the microprocessor.</p> <p>Memory:</p> <ul style="list-style-type: none"> Up to four DIMM channels: 8 DIMM connectors Type: Fully buffered, double-data rate 2 (DDR2), ECC, PC2-5300 FB-DIMMs with advanced memory buffering Supports 1 GB, 2 GB, and 4 GB (as of the date of this publication) for a total memory of up to 32 GB <p>Hard disk drives: The system-board tray supports one 3.5-inch simple-swap SAS, one 3.5-inch simple-swap SATA, or two 2.5-inch hot-swap SAS hard disk drives (with optional SAS controller). The system-board tray with an enclosure attached can support the following drive configurations:</p> <ul style="list-style-type: none"> Up to four 3.5-inch simple-swap SAS hard disk drives with the storage enclosure and optional SAS controller Up to five 3.5-inch simple-swap SATA hard disk drives with the storage enclosure Up to eight 2.5-inch hot-swap SAS hard disk drives with the I/O enclosure and optional SAS controller Up to twelve 3.5-inch hot-swap SAS hard disk drives in a 3U chassis and optional SAS controller 	<p>Integrated functions:</p> <ul style="list-style-type: none"> Dual-port Gigabit Ethernet controller One or two PCIe expansion connectors (depending on server configuration) Baseboard management controller (BMC) with Intelligent Platform Management Interface (IPMI) firmware ATI RN50 ES1000 video controller Six-port Serial ATA (SATA) controller Serial over LAN (SOL) Front connectors for USB 2.0 (2 ports), serial, video, and RJ-45 LAN (2 ports) <p>Predictive Failure Analysis (PFA) alerts:</p> <ul style="list-style-type: none"> Memory Hard disk drives <p>Power Supply:</p> <ul style="list-style-type: none"> Support for one 100 - 240 V ac power supply 375 W (2U chassis only) 900 W (2U chassis or 3U chassis) <p>Electrical Input:</p> <ul style="list-style-type: none"> Input voltage low range: 100 V ac (minimum) to 127 V ac (maximum), sine-wave input (50-60 Hz) Input voltage high range: 200 V ac (minimum) to 240 V ac (maximum), sine-wave input (50-60 Hz) 	<p>Environment:</p> <ul style="list-style-type: none"> Air temperature: <ul style="list-style-type: none"> Server on: 10°C to 35°C (50°F to 95°F); altitude: 0 to 914.4 m (0 to 3000 ft). Derate maximum temperature by 1°C for every 304.8 m (1000 ft) increase in elevation to a maximum of 3,048.0 m (10000 ft) at an ambient temperature of 28°C Server off: 10°C to 43°C (59°F to 109.4°F); maximum altitude: 2133 m (7000 ft) Humidity: <ul style="list-style-type: none"> Server on: 10% to 80% Server off: 8% to 80% <p>Size:</p> <ul style="list-style-type: none"> Height: <ul style="list-style-type: none"> 2U chassis: 8.6 cm (3.39 inches) 3U chassis: 13.0 cm (5.1 inches) Depth: 47.3 cm (18.6 inches) Width: 44.6 cm (17.6 inches) Weight: <ul style="list-style-type: none"> 2U chassis: <ul style="list-style-type: none"> Fully loaded: 22.7 kg (46.1 lb) Without system-board trays: 7.1 kg (15.6 lb) 3U chassis: <ul style="list-style-type: none"> Fully loaded: 28.1 kg (62.0 lb) Without hard disk drives: 15.4 kg (34.0 lb)
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What your dx340 system-board tray offers

The dx340 system-board tray uses the following features and technologies:

- **Active PCI Express x8 adapter capabilities**

The dx340 system-board tray has one or two connectors for PCI Express x8 adapters, depending on the server configuration. These connectors accept x16 adapters, but the adapters will downshift to operate at the x8 bandwidth.

- **Baseboard management controller**

The baseboard management controller provides basic service-processor environmental monitoring functions. If an environmental condition exceeds a threshold or if a system component fails, the baseboard management controller lights LEDs to help you diagnose the problem and records the error in the error log. The baseboard management controller also provides remote server management capabilities, using the Intelligent Platform Management Interface (IPMI) version 2.0 protocol.

Note: In messages and documentation, the term *service processor* refers to the baseboard management controller.

- **Dynamic System Analysis (DSA) programs**

The DSA programs collect and analyze system information to aid in diagnosing problems. The diagnostic programs collect the following information:

- System configuration
- Network interfaces and settings
- Installed hardware
- Service processor status and configuration
- Vital product data, firmware, and BIOS configuration
- Hard disk drive health
- RAID controller configuration
- Event logs for ServeRAID controllers and service processors

The diagnostic programs create a merged log that includes events from all collected logs. The information is collected into a file that you can send to IBM service and support. Additionally, you can view the information locally through a generated text report file. You can also copy the log to removable media and view the log from a Web browser.

- **Integrated network support**

The dx340 system-board tray comes with an integrated Intel dual-port Gigabit Ethernet controller, which supports connection to a 10 Mbps, 100 Mbps, or 1000 Mbps network. For more information, see “Configuring the Gigabit Ethernet controller” on page 53.

- **Large data-storage capacity and hot-swap capability**

The dx340 system-board tray supports one 3.5-inch simple-swap SAS, one 3.5-inch simple-swap SATA, or two 2.5-inch hot-swap SAS hard disk drives. An optional SAS controller must be installed when using SAS hard disk drives. With the storage enclosure attached, the system-board tray can support up to four 3.5-inch simple-swap SAS (with optional SAS controller) or five simple-swap SATA hard disk drives. With the I/O enclosure attached, the system-board tray can support up to two 3.5-inch simple-swap SATA hard disk drives, up to two 3.5-inch simple-swap SAS hard disk drives (with optional SAS controller), or up to eight 2.5-inch hot-swap SAS hard disk drives (with optional SAS controller). When it is installed in a 3U chassis, the system-board tray can support up to

twelve 3.5-inch hot-swap SAS (with optional SAS controller) or SATA hard disk drives. With the hot-swap feature, you can remove or replace hard disk drives without turning off the dx340 server.

- **Large system-memory capacity**

The dx340 system-board tray supports up to 32 GB of system memory. The memory controller supports error correcting code (ECC) for up to eight industry-standard fully-buffered, double-data rate 2 (DDR2), PC2-5300 FB-DIMMs with advanced memory buffering.

- **Redundant connection**

The addition of an optional network interface card (NIC) provides a failover capability to a redundant Ethernet connection. If a problem occurs with the primary Ethernet connection, all Ethernet traffic that is associated with the primary connection is automatically switched to the redundant NIC. If the applicable device drivers are installed, this switching occurs without data loss and without user intervention.

- **ServeRAID support**

The dx340 system-board tray supports ServeRAID adapters to create redundant array of independent disks (RAID) configurations.

- **Symmetric multiprocessing (SMP)**

The dx340 system-board tray comes with one or two Intel microprocessors. If the system-board tray comes with only one microprocessor, you can not add a second microprocessor.

- **Systems-management capabilities**

The dx340 system-board tray supports IPMI version 2.0 over LAN system management protocol. It supports an optional rack-level management controller that uses industry-standard management tools.

Reliability, availability, and serviceability

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

The dx340 has the following RAS features:

- Advanced Configuration and Power Interface (ACPI)
- Advanced Desktop Management Interface (DMI) features
- Automatic error retry or recovery
- Automatic restart after a power failure, based on the BIOS setting
- Boot-block recovery
- Built in, menu-driven setup, system configuration, and redundant array of independent disks (RAID) configuration (depending on server configuration)
- Built-in monitoring for fan, power, temperature, and voltage
- CD-based diagnostic programs
- Customer support center that is available 24 hours a day, 7 days a week¹
- Diagnostic support of ServeRAID adapters
- Error codes and messages
- Power-on self-test (POST) with error logging of POST failures
- Power management
- Hot-swap Serial Attached SCSI (SAS) hard disk drives (some configurations)
- Integrated Ethernet controller
- Read-only memory (ROM) checksums
- Redundant Ethernet capabilities with failover support
- Simple-swap Serial Advanced Technology Attachment (SATA) hard disk drives (some configurations)
- Simple-swap Serial Attached SCSI (SAS) hard disk drives (some configurations)
- Standby voltage for systems-management features and monitoring
- System-error LED on the front bezel
- Upgradeable BMC firmware
- Upgradeable microcode for POST, basic input/output system (BIOS) code, and read-only memory (ROM) resident code, locally or over a LAN
- Vital product data (VPD); includes firmware revision numbers, stored in nonvolatile memory, for easier remote maintenance

1. Service availability will vary by country. Response time varies; may exclude holidays.

IBM Director

With IBM Director, a network administrator can perform the following tasks:

- View the hardware configuration of remote systems, in detail
- Monitor the usage and performance of critical components, such as microprocessors, disks, and memory
- Centrally manage individual or large groups of IBM and non-IBM x86-processor-based servers, desktop computers, workstations, and notebook computers on a variety of platforms

IBM Director provides a comprehensive entry-level workgroup hardware manager. It includes the following key features:

- Advanced self-management capabilities for maximum system availability.
- Multiple operating-system platform support, including Microsoft® Windows® 2000 Server, Windows Server 2003, Windows XP Professional, AIX, i5/OS, Red Hat Linux, SUSE Linux, VMware, and Novell NetWare. For a complete list of operating systems that support IBM Director, see the *IBM Director Compatibility* document (for v5.10) or the *Hardware and Software Support Guide* (for v5.20). These documents are in Portable Document Format (PDF) at <http://www.ibm.com/systems/management/director/resources/>. They are updated every 6 to 8 weeks.
- Support for IBM and non-IBM servers, desktop computers, workstations, and notebook computers.
- Support for systems-management industry standards.
- Integration into leading workgroup and enterprise systems-management environments.
- Ease of use, training, and setup.

IBM Director also provides an extensible platform that supports advanced server tools that are designed to reduce the total cost of managing and supporting networked systems. By deploying IBM Director, you can achieve reductions in ownership costs through the following benefits:

- Reduced downtime
- Increased productivity of IT personnel and users
- Reduced service and support costs

For more information about IBM Director, see the documentation on the *IBM Director* DVD that comes with the server, the IBM Director Information Center at http://publib.boulder.ibm.com/infocenter/eserver/v1r2/topic/dirinfo_all/dirinfoparent.html, and the IBM xSeries Systems Management Web page at <http://www.ibm.com/systems/management/>, which presents an overview of IBM Systems Management and IBM Director.

The Update*Xpress* program

The Update*Xpress* program detects supported and installed device drivers and firmware in the server and installs available updates. You can download the Update*Xpress* program from the Web at no additional cost, or you can purchase it on a CD. To download the program or purchase the CD, go to <http://www.ibm.com/systems/management/xpress.html>. Additional information about Update*Xpress* is available from the Tools Center at <http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/index.jsp>.

Note: To install the Update*Xpress* program, you might need to use an external USB CD-RW/DVD drive such as the IBM and Lenovo part number 73P4515 or 73P4516. See “Firmware updates” on page 57 for additional instructions about using an external USB CD-RW/DVD drive.

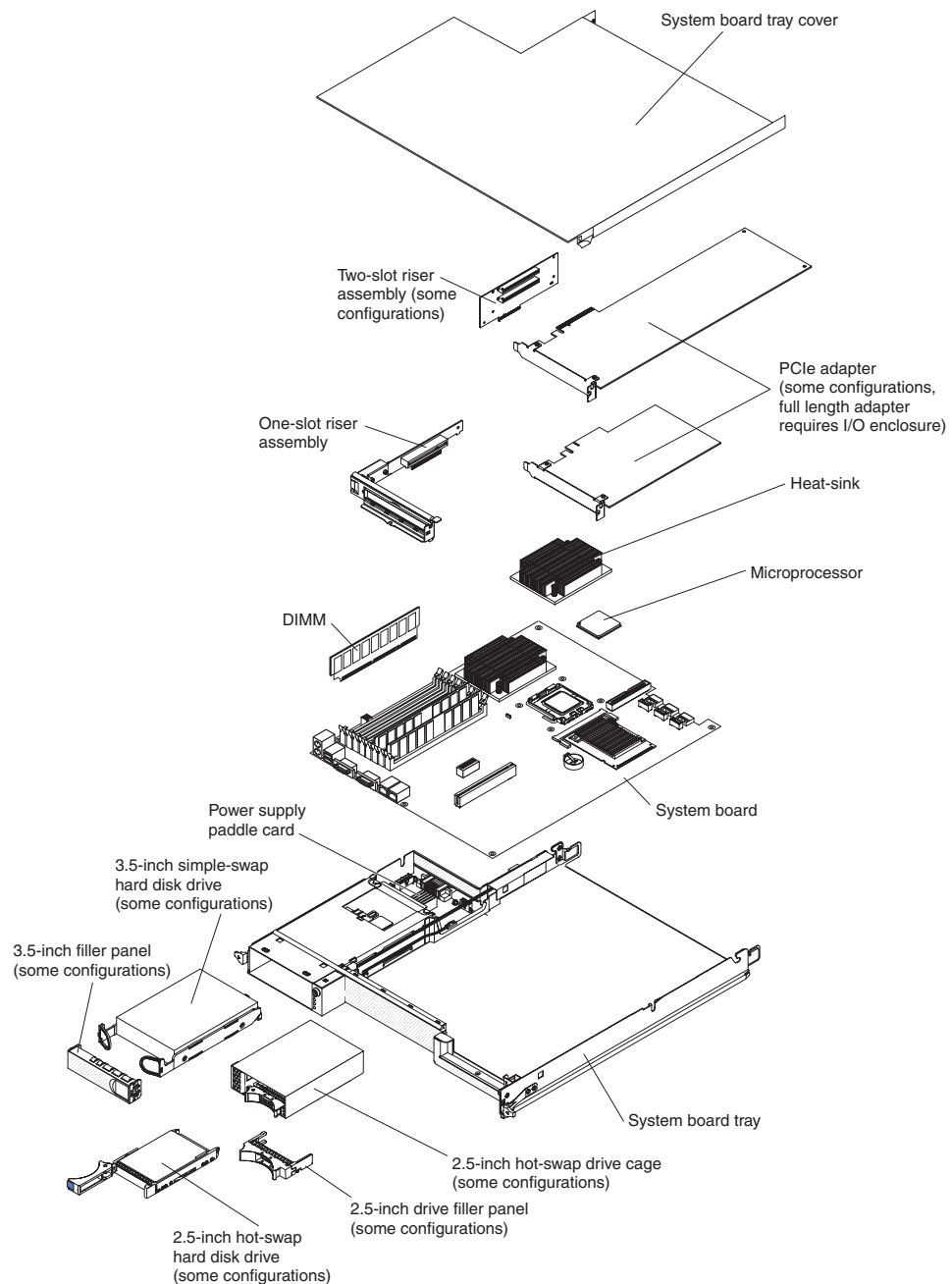
Chapter 2. Components, features, and controls

This section describes the server components and configurations, the server controls and light-emitting diodes (LEDs), and how to turn the system-board tray on and off.

System-board tray components

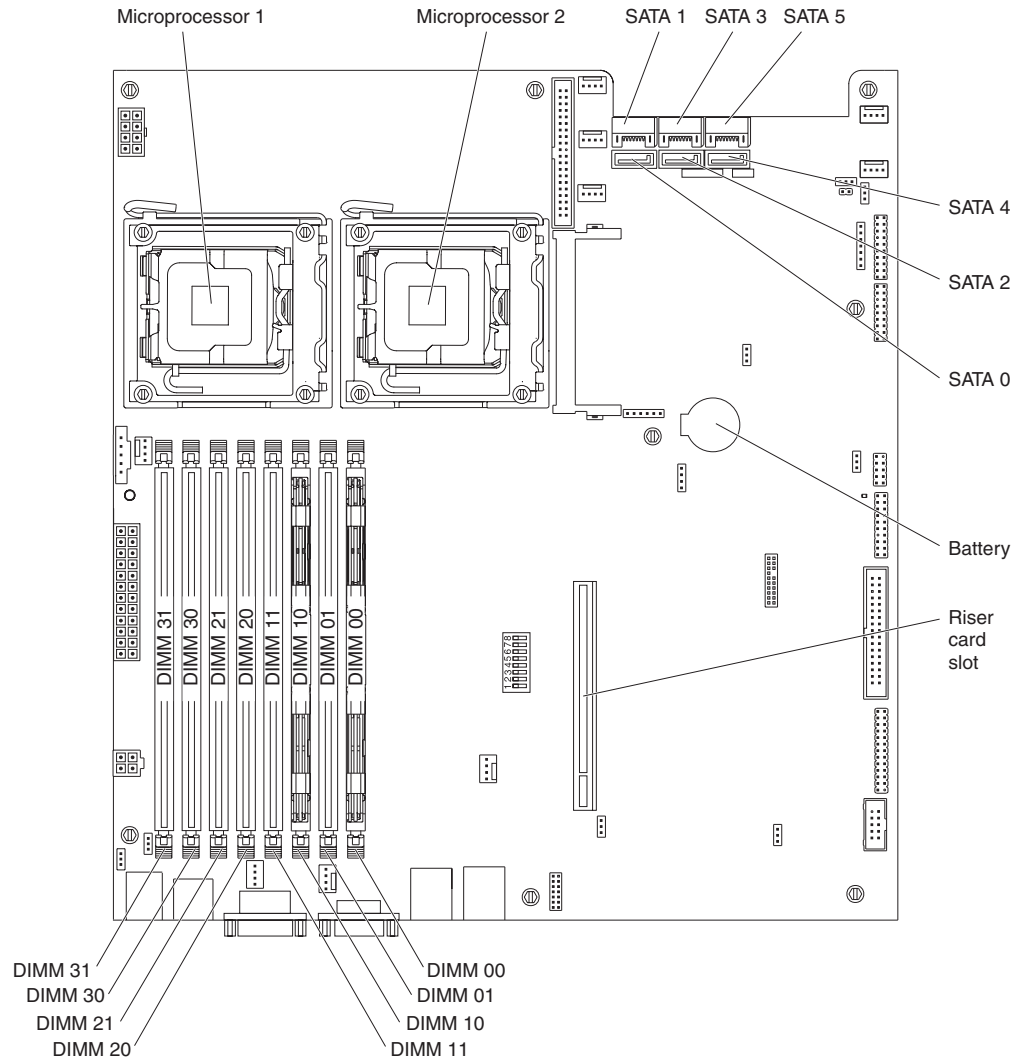
The following illustration shows the major components in the dx340 system-board tray.

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



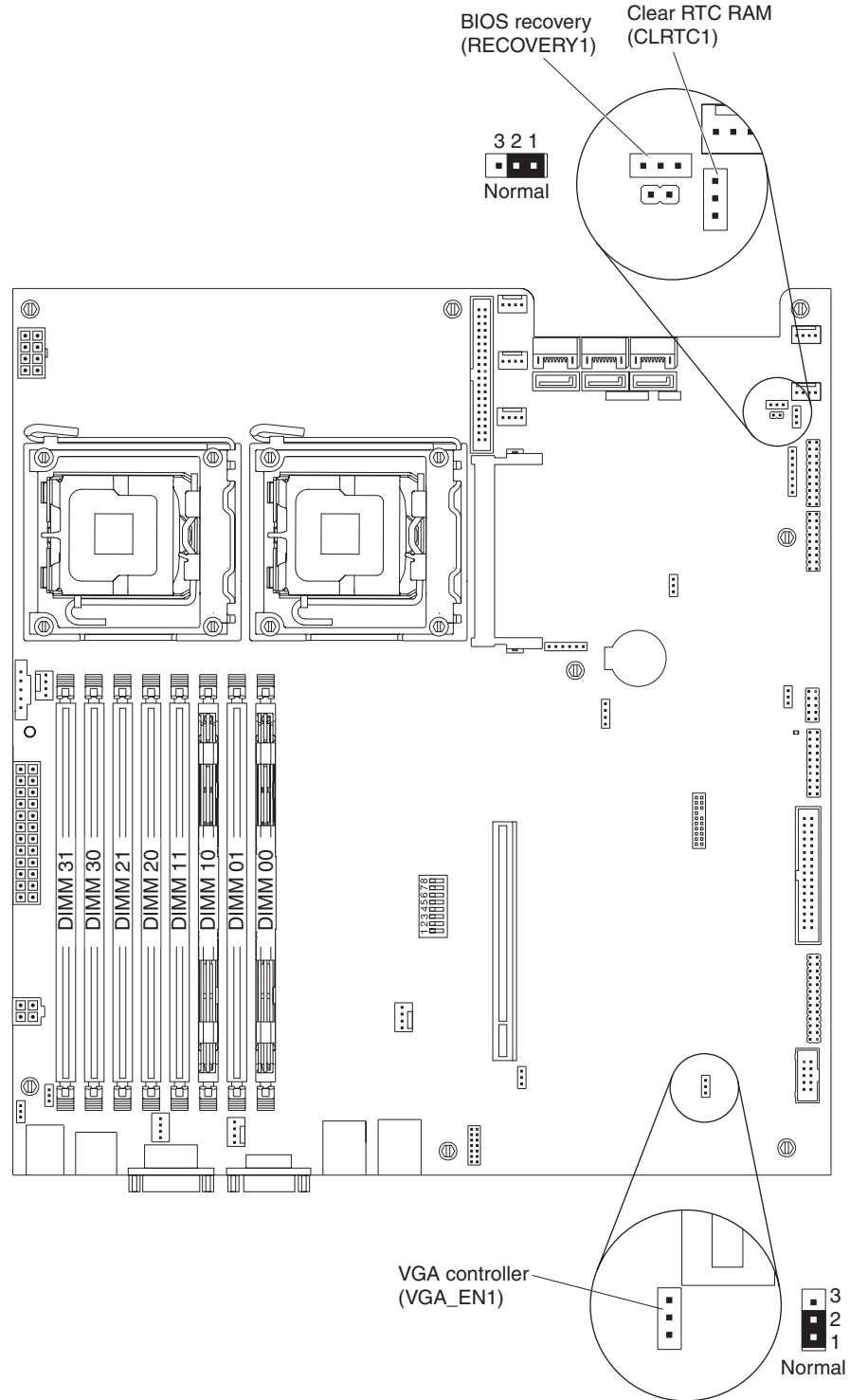
System-board connectors

The following illustration shows the locations of internal connectors on the system board that are used for installing options. See “Operator panel controls, LEDs, connectors, and power” on page 20 for information about the external connectors. See the *Problem Determination and Service Guide* for information about the other system-board connectors.



System-board switches and jumpers

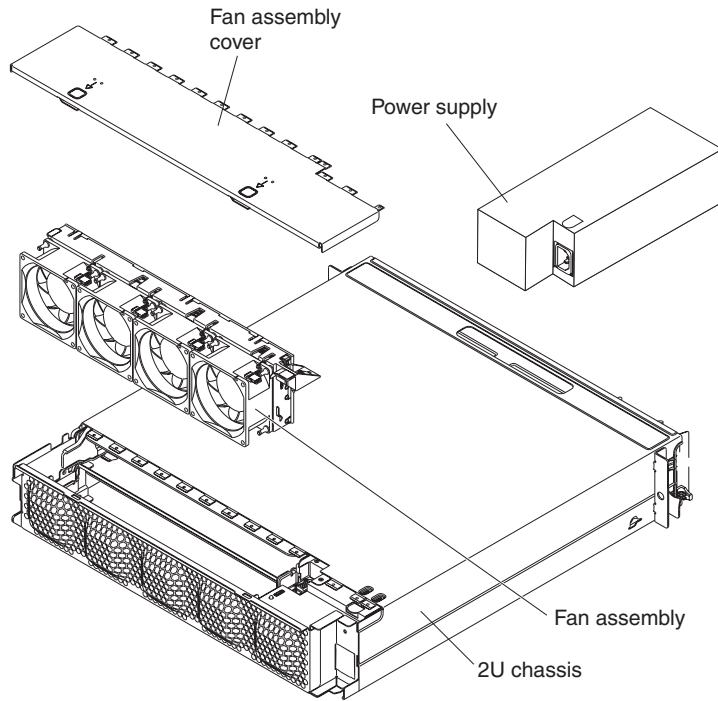
The following illustration shows the locations of the jumpers on the system board that relate to selected system functions. See the *Problem Determination and Service Guide* for more information about using switches and jumpers on the system board.



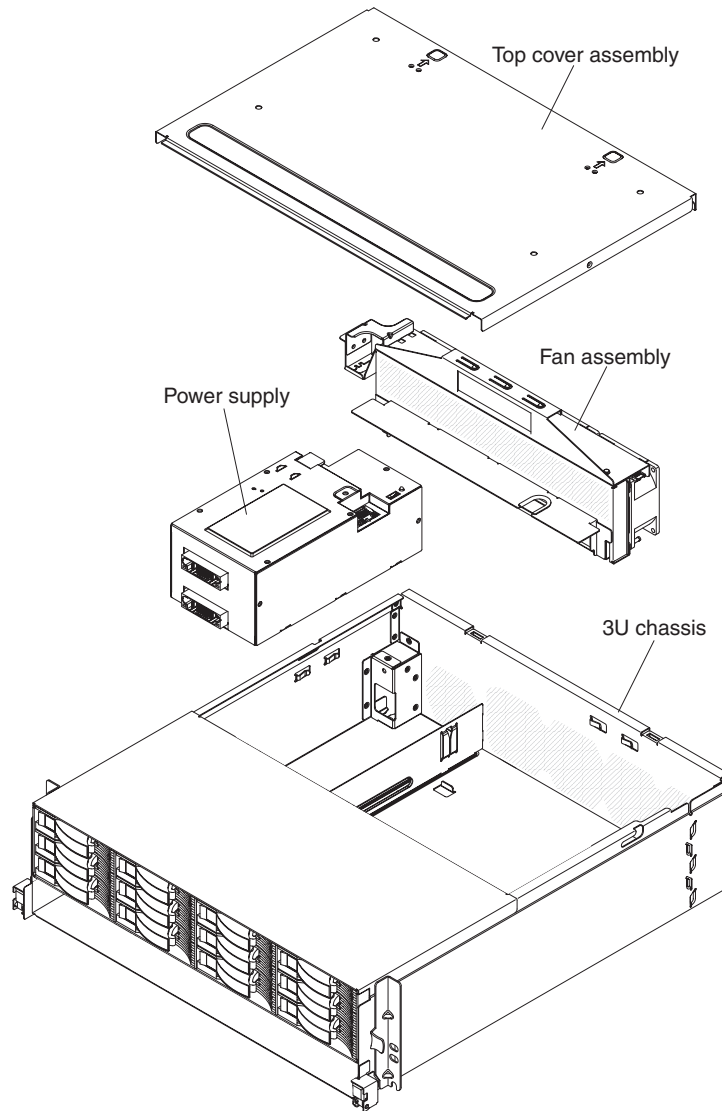
Flexible chassis features

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

The following illustration shows a 2U chassis. The 2U chassis contains a power supply and a fan assembly that provide operating power and cooling for all components in the chassis. The 2U chassis can support two system-board trays or one system-board tray with an expansion enclosure.



The following illustration shows a 3U chassis. The 3U chassis contains a power supply and a fan assembly that provide operating power and cooling for all components in the chassis. Depending on your server configuration, it also provides support for the installation of up to twelve 3.5-inch hot-swap SAS or SATA hard disk drives (SAS and SATA hard disk drives cannot be used within the same server). The 3U chassis supports one system-board tray that must have a RAID adapter installed to control operation of these hard disk drives.



Hardware configuration examples

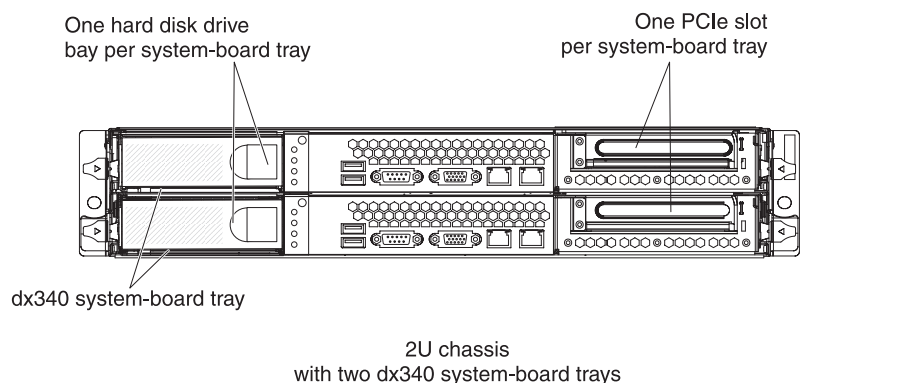
The 2U chassis and 3U chassis support the following iDataPlex dx340 server configurations:

- 2U compute server: a 2U chassis that contains two dx340 system-board trays
- 2U input/output server: a 2U chassis that contains one dx340 system-board tray and an optional I/O enclosure
- 2U storage server: a 2U chassis that contains one dx340 system-board tray and an optional storage enclosure
- 3U storage server: a 3U chassis that contains one dx340 system-board tray and integrated storage

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

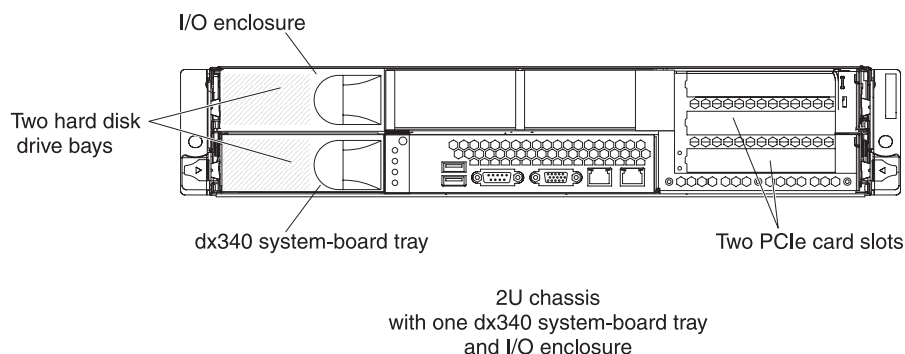
2U compute server

The 2U compute server consists of two identical dx340 system-board trays installed in a 2U chassis. Each system-board tray has one PCI adapter connector and one 3.5-inch hard disk drive bay that might be configured to hold two 2.5-inch hard disk drives. The following illustration shows a 3.5-inch simple-swap SATA hard disk drive installed. A 3.5-inch simple-swap SAS hard disk drive configuration and a 2.5-inch hot-swap SAS hard disk drive configuration are also available.



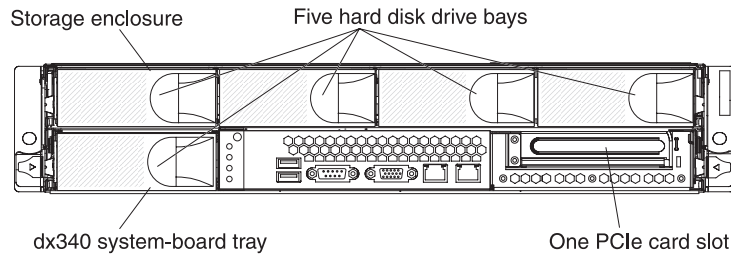
2U input/output server

The 2U input/output server consists of one dx340 system-board tray with the I/O enclosure installed in a 2U chassis. The I/O enclosure provides one additional 3.5-inch hard disk bay or six additional 2.5-inch drive bays, and two PCIe slots for the system-board tray. You can configure the 2U input/output server with up to two 3.5-inch hard disk drives or up to eight 2.5-inch hard disk drives. The following illustration shows two 3.5-inch simple-swap SATA hard disk drives installed.



2U storage server

The 2U storage server consists of one dx340 system-board tray with the storage enclosure installed in a 2U chassis. The storage enclosure provides four additional 3.5-inch hard disk drive bays for the system-board tray, for a total of five. Depending on the server configuration, you can configure the 2U storage server with up to four SAS 3.5-inch hard disk drives or up to five SATA 3.5-inch hard disk drives. The following illustration shows five 3.5-inch simple-swap SATA hard disk drives installed.

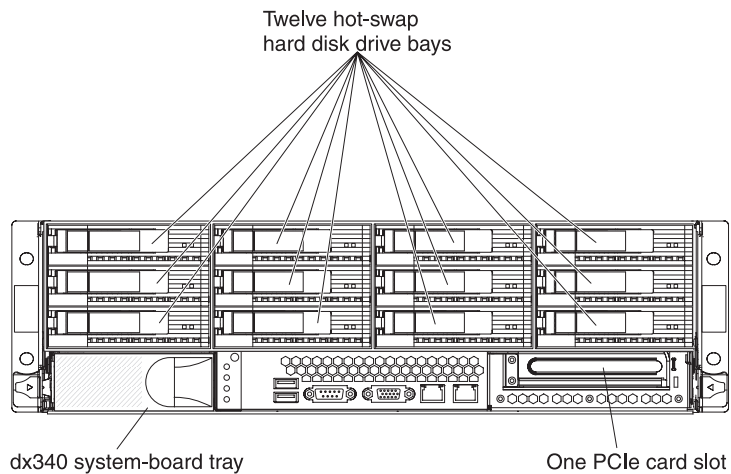


2U chassis
with one dx340 system-board tray
and storage enclosure

3U storage server

The 3U storage server consists of one dx340 system-board tray installed in a 3U chassis. Depending on the server configuration, the 3U chassis supports up to twelve 3.5-inch hot-swap SAS or SATA hard disk drives. The following illustration shows twelve 3.5-inch hot-swap SAS hard disk drives installed.

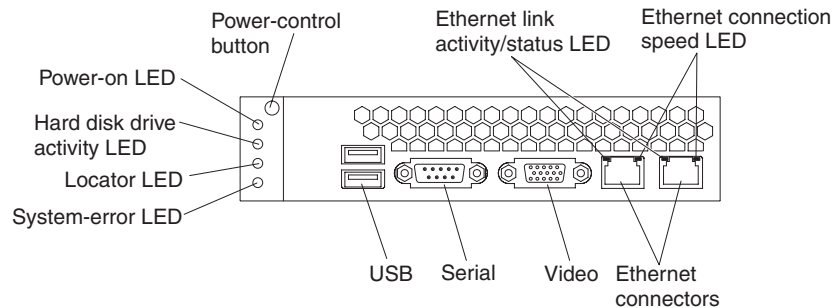
Note: The hard disk drive bays in the system-board tray are not used in the 3U storage server configuration.



3U chassis
with one dx340 system-board tray

Operator panel controls, LEDs, connectors, and power

The following illustration shows the controls, LEDs, and connectors on the front of the server. The operator panel on the system-board tray is the same for all server configurations.



Power-control button: Press this button to turn the system-board tray on and off manually. Note that the power-control button is recessed to prevent the system-board tray from being turned on or off accidentally. There is a power-control button cover that can be removed for easier access to the power-control button.

Ethernet link activity/status LED: This LED is on each Ethernet connector. When this LED is lit, it indicates that there is an active connection on the Ethernet port. When this LED is flashing, it indicates that there is activity between the server and the network.

Ethernet connection speed LED: This LED is on each Ethernet connector. The status of this LED indicates the connection speed, in megabits-per-second (Mbps), between the server and the network as follows:

- LED off: 10 Mbps connection
- LED lit amber: 100 Mbps connection
- LED lit green: 1000 Mbps connection

Ethernet connectors: Use these connectors to connect the server to a network.

Video connector: Connect a monitor to this connector.

Serial connector: Connect a 9-pin serial device to this connector.

USB connectors: Connect USB 2.0 devices to these connectors.

System-error LED: When this LED is lit, it indicates that a system error has occurred. The source of the error is logged in the BMC system-event log that is accessed in the BIOS configuration utility program.

Locator LED: This LED can be lit remotely by the system administrator to aid in visually locating the system-board tray. In an IPMI environment, the system administrator can light the LED by using the BMC IPMI **Chassis Identify** command.

Hard disk drive activity LED: When this LED is on or flashing, it indicates that an associated hard disk drive is in use.

Power-on LED: When this LED is lit, it indicates that the system-board tray is turned on.

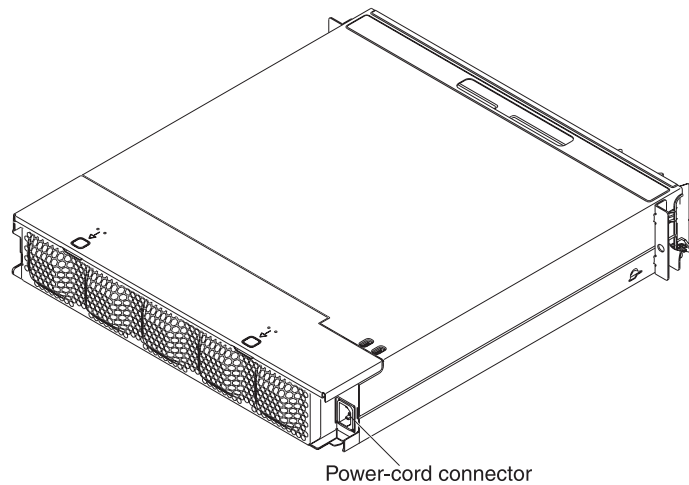
Note: If this LED is off, it does not mean that no electrical power is present. The LED might be burned out. To remove all electrical power, you must remove the system-board tray from the chassis, remove the chassis from the rack, or disconnect the power cord from the power source.

Hot-swap hard disk drive activity LED: In some configurations, each hot-swap hard disk drive has an activity LED. When this LED is flashing, it indicates that the drive is in use.

Hot-swap hard disk drive status LED: In some configurations, each hot-swap hard disk drive has a status LED. When this LED is lit, it indicates that the drive has failed.

Rear connectors

Power-cord connector: Connect the power cord to this connector. When the chassis is installed in an iDataPlex rack, it is automatically connected to power through a power cord that is mounted to the rack rail.



Turning on the system-board tray

After you install the system-board tray in a chassis, the system-board tray can start in any of the following ways.

Important: To avoid potential problems during startup, disconnect any USB keys from the system that contain the Smart Launch Utility before you turn on the system-board tray.

- You can press the power-control button on the front of the system-board tray (see “Operator panel controls, LEDs, connectors, and power” on page 20) to start the system-board tray.
- In an IPMI environment, the system administrator can turn on the system-board tray by using the BMC IPMI **Chassis Control** command.
- If a power failure occurs, the system-board tray can start automatically when power is restored, if it is configured to do so.

Turning off the system-board tray

When you turn off the system-board tray, it is still connected to ac power through the chassis power supply. The system-board tray still can respond to requests from the service processor, such as a remote request to turn on the system-board tray. To remove all power from the system-board tray, you must remove the tray from the chassis.

Shut down the operating system before you turn off the system-board tray. See the operating-system documentation for information about shutting down the operating system.

The system-board tray can be turned off in any of the following ways:

- You can press the power-control button on the front of the system-board tray (see “Operator panel controls, LEDs, connectors, and power” on page 20). This starts an orderly shutdown of the operating system, if this feature is supported by the operating system.
- You can turn off the system-board tray from the operating system, if the operating system supports this feature. After an orderly shutdown of the operating system, the system-board tray will be turned off automatically.
- In an IPMI environment, the system administrator can turn off the system-board tray by using the BMC IPMI **Chassis Control** command.
- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the system-board tray.
- You might be able to turn off the system-board tray by using an optional management appliance.
 - If the system is not operating correctly, the management appliance might automatically turn off the system-board tray.
 - Through the management appliance control interface, you might also be able to configure the management appliance to turn off the system-board tray. For additional information, see the documentation for your management appliance.

Chapter 3. Installing optional devices

This section provides detailed instructions for installing optional hardware devices.

Installation guidelines

Before you install optional devices, read the following information:

- Read the safety information that begins on page v and “Handling static-sensitive devices” on page 24. This information will help you work safely.
- Before you install optional hardware devices, make sure that the server is working correctly. Start the server, and make sure that the operating system starts, if an operating system is installed, or that an error message is displayed, indicating that an operating system was not found but the server is otherwise working correctly. If the server is not working correctly, see the *Problem Determination and Service Guide* for diagnostic information.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- Do not attempt to lift an object that you think is too heavy for you. If you have to lift a heavy object, observe the following precautions:
 - Make sure that you can stand safely without slipping.
 - Distribute the weight of the object equally between your feet.
 - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
 - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles.
- Back up all important data before you make changes to disk drives.
- Have a small flat-blade screwdriver and a small Phillips screwdriver available.
- You do not have to turn off the system-board tray to install or replace hot-swap drives or hot-plug Universal Serial Bus (USB) devices. However, you must shut down the operating system and turn off the system-board tray before you remove the system-board tray from a chassis or before you install simple-swap hard disk drives.
- Blue on a component indicates touch points, where you can grip the component to remove or install it, open or close a latch, and so on.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.

System reliability guidelines

To help ensure proper cooling and system reliability, make sure that the following requirements are met:

- Each of the drive bays has a drive or a filler panel and electromagnetic compatibility (EMC) shield installed in it.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a hot-swap drive within 2 minutes of removal.
- The system-board tray battery is operational. If the battery becomes defective, replace it immediately.
- Microprocessor socket 2 always contains either a microprocessor baffle or a microprocessor and heat sink.

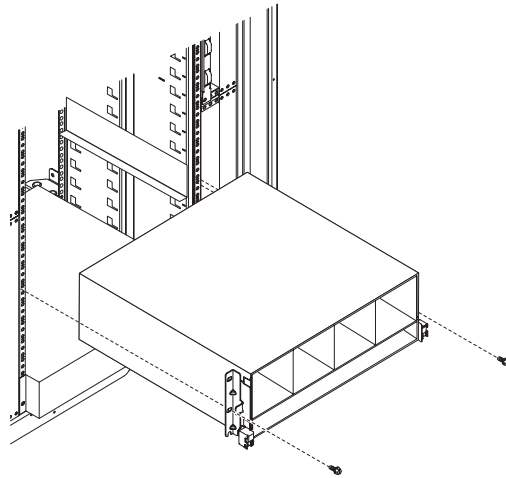
Handling static-sensitive devices

Attention: Static electricity can damage the server and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of damage from electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- The use of a grounding system is recommended. For example, wear an electrostatic-discharge wrist strap, if one is available.
- 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 surface on the outside of the chassis or rack 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 system-board tray or enclosure without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on a metal surface.
- Take additional care when you handle devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Removing a 3U chassis from an iDataPlex rack



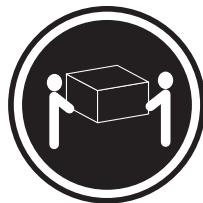
To remove a 3U chassis from an iDataPlex rack, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the server and all attached devices (see “Turning off the system-board tray” on page 22).
3. If external cables are connected to the front of the system-board tray, note where they are connected; then, remove them.

Attention: When using RAID arrays, hard disk drives must be installed in the same location from which they were removed.

4. Note where the hard disk drives are installed; then, remove them (see “Removing a hard disk drive” on page 30).

Statement 4:



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

CAUTION:
Use safe practices when lifting.

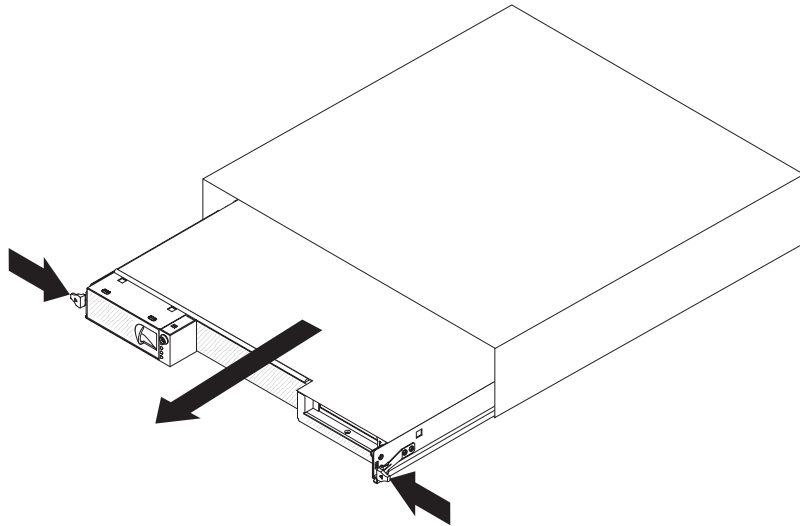
5. Remove screws and slide the 3U chassis from the iDataPlex rack.
6. Set the 3U chassis on a flat, static-protective surface.

Removing a system-board tray from a 2U chassis

Notes:

1. If two system-board trays are installed in the chassis, they can be removed independently of each other.
2. If an expansion enclosure is installed on the system-board tray, you will remove the expansion enclosure and the system-board tray from the chassis as one assembly.

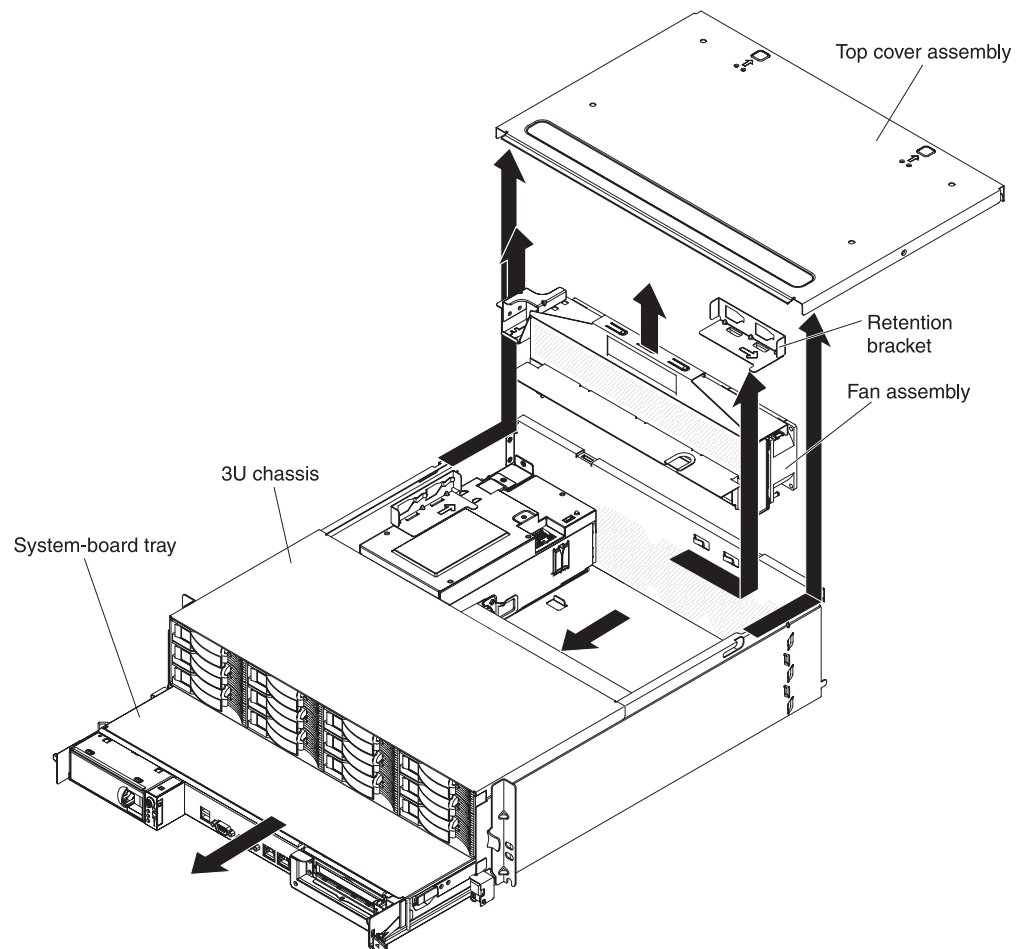
Attention: When two system-board trays are installed in the chassis, do not operate the upper system-board tray with the lower system-board tray removed or powered off, except for servicing. When the lower system-board tray is removed or powered-off, chassis-level system-management information is not available. For example, chassis fan speeds and temperatures may be returned as zero values. In this situation, the chassis will continue to operate normally, since the power supply and fans are designed to operate independently.



To remove a system-board tray from a 2U chassis, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the system-board tray and all attached devices (see “Turning off the system-board tray” on page 22).
3. If external cables are connected to the front of the system-board tray or expansion enclosure, note where they are connected; then, remove them.
4. Press in on the two release handles, pull the system-board tray and expansion enclosure, if one is attached, out of the 2U chassis, and set it on a flat, static-protective surface.

Removing a system-board tray from a 3U chassis



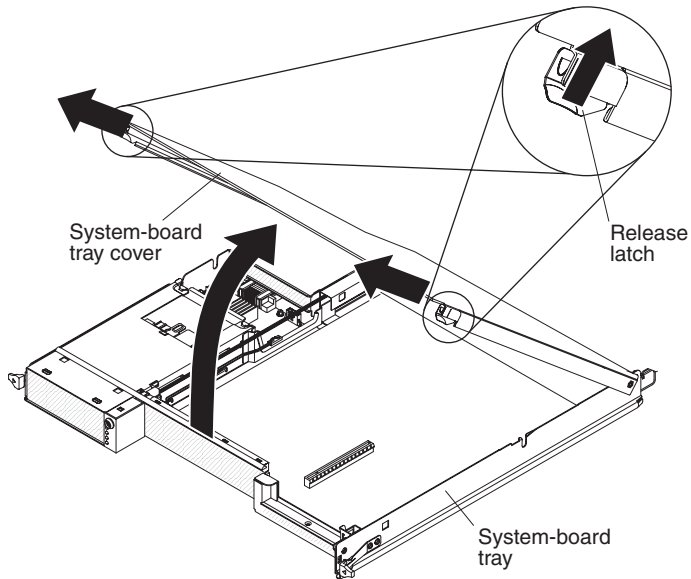
To remove a system-board tray from a 3U chassis, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the server and all attached devices (see “Turning off the system-board tray” on page 22).
3. If external cables are connected to the front of the system-board tray, note where they are connected; then, remove them.
4. Remove the 3U chassis from the iDataPlex rack (see “Removing a 3U chassis from an iDataPlex rack” on page 25).
5. Press on the two release latches at the top-rear edge of the top-cover assembly; then, slide the top-cover assembly toward the rear of the 3U chassis and remove it.
6. Slide the retention bracket to release it and remove the bracket from the chassis.
7. Lift up on both fan-assembly handles and remove the fans from the 3U chassis.
8. Note the cable routing and connection locations; then, disconnect the cables that connect the system-board tray to the 3U chassis.
9. Push on the back edge of the system-board tray from inside the 3U chassis and slide the system-board tray forward.

10. Pull the system-board tray out of the 3U chassis and set it on a flat, static-protective surface.

Removing the system-board tray cover

Note: If an expansion enclosure is installed on the system-board tray, remove it instead (see “Removing an expansion enclosure” on page 29).

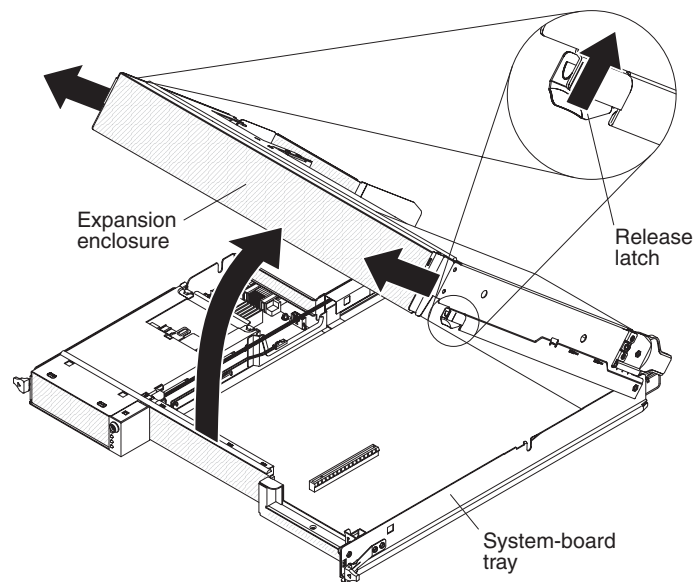


To remove the system-board tray cover, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the system-board tray and all attached devices (see “Turning off the system-board tray” on page 22).
3. If the system-board tray is installed in a chassis, remove it (see “Removing a system-board tray from a 2U chassis” on page 26 or “Removing a system-board tray from a 3U chassis” on page 27).
4. Carefully set the system-board tray on a flat, static-protective surface, with the cover side up.
5. Pull the cover release on each side of the system-board tray outward; then, lift the cover open.
6. Lift the cover off the system-board tray and store it for future use.

Note: If two system-board trays are installed in a 2U chassis, both must have their covers installed.

Removing an expansion enclosure



To remove an expansion enclosure, complete the following steps:

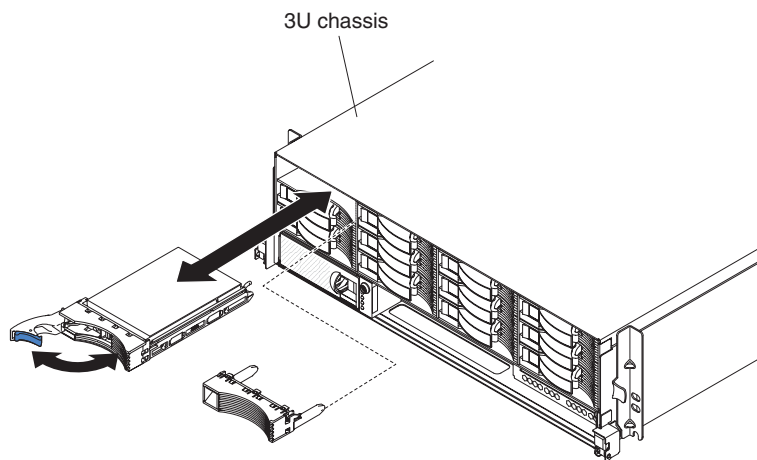
1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the system-board tray and all attached devices (see “Turning off the system-board tray” on page 22).
3. If the system-board tray is installed in a chassis, remove it (see “Removing a system-board tray from a 2U chassis” on page 26 or “Removing a system-board tray from a 3U chassis” on page 27).
4. Carefully set the system-board tray on a flat, static-protective surface.
5. If you are removing the enclosure, note the cable routing and connection locations; then, disconnect the cables that connect the expansion enclosure to the system-board tray.
6. Pull the expansion-unit release on each side of the system-board tray outward; then, rotate the expansion enclosure open.
7. Using care not to pull on the cables, lift the expansion enclosure from the system-board tray and carefully set it upside down behind the system-board tray on a flat, static-protective surface.

Removing a hard disk drive

The dx340 server configurations support installation of three hard disk drive types. The following sections describe removing each type of hard disk drive.

Removing a 3.5-inch hot-swap hard disk drive

Note: The following illustration shows how to remove a 3.5-inch hot-swap hard disk drive from a 3U chassis.



Note: You do not have to turn off the server to remove a hot-swap drive.

To remove a hot-swap hard disk drive, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Rotate the drive tray handle to the open position.
3. Grasp the handle; then, pull the drive out of the drive bay.

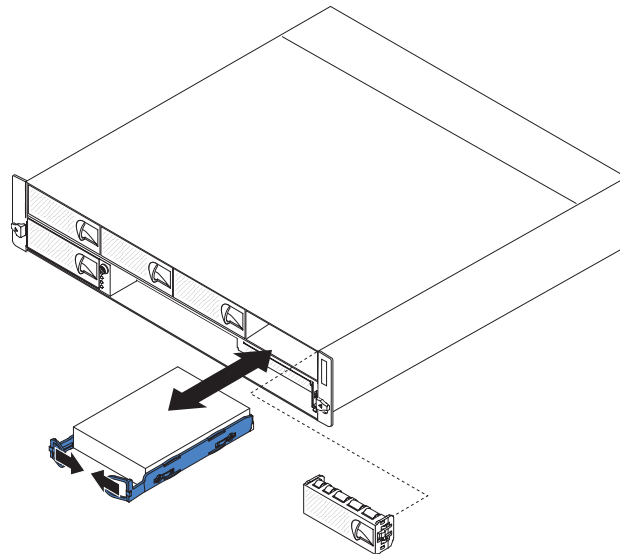
Note: A hard disk drive or filler panel must always be installed in each drive bay when the server is turned on.

4. Store the drive for later use.

Note: If you install or remove a hard disk drive, see the documentation that comes with your RAID adapter for information about reconfiguring the disk arrays.

Removing a 3.5-inch simple-swap hard disk drive

Note: The following illustration shows how to remove a 3.5-inch simple-swap hard disk drive from a 2U chassis.



To remove a simple-swap hard disk drive, complete the following steps:

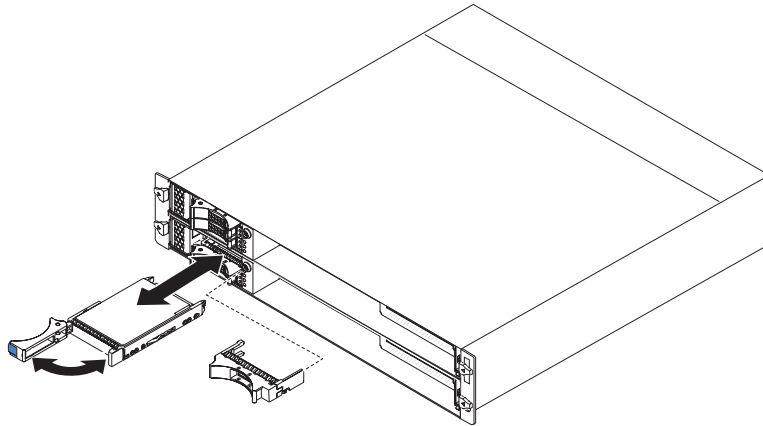
1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the system-board tray and all attached devices (see “Turning off the system-board tray” on page 22).
3. Remove the filler panel from the simple-swap hard disk drive bay.
4. Pull the loops of the drive toward each other; then, pull the drive out of the drive bay.

Note: A hard disk drive or filler panel must always be installed in each drive bay when the server is turned on. Simple-swap hard disk drives must always have a filler panel installed along with the hard disk drive.

5. Store the drive and filler panel for later use.

Removing a 2.5-inch hot-swap hard disk drive

Note: The following illustration shows how to remove a 2.5-inch hot-swap hard disk drive from a 2U chassis.



Note: You do not have to turn off the server to remove a hot-swap drive.

To remove a 2.5-inch hot swap hard disk drive, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Rotate the drive tray handle to the open position.
3. Grasp the handle; then, pull the drive out of the drive bay.

Note: A hard disk drive or filler panel must always be installed in each drive bay when the server is turned on.

4. Store the drive for later use.

Note: If you install or remove a hard disk drive, see the documentation that comes with your RAID adapter for information about reconfiguring the disk arrays.

Installing an adapter

The dx340 configurations support installation of one or two adapters. The following sections describe installing adapters for each type of configuration.

The following notes describe the types of adapters that the server supports and other information that you must consider when you install an adapter:

- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions in this section. If you have to change switch settings or jumper settings on the adapter, follow the instructions that come with the adapter.
- Read the documentation that comes with your operating system.
- The server comes with a one-slot or two-slot PCI Express (PCIe) riser card. The riser card connectors support the following types of adapters:
 - One-slot riser card: PCIe x16 (x8) adapters
 - Two-slot riser card: PCIe x16 (x8) adapters.

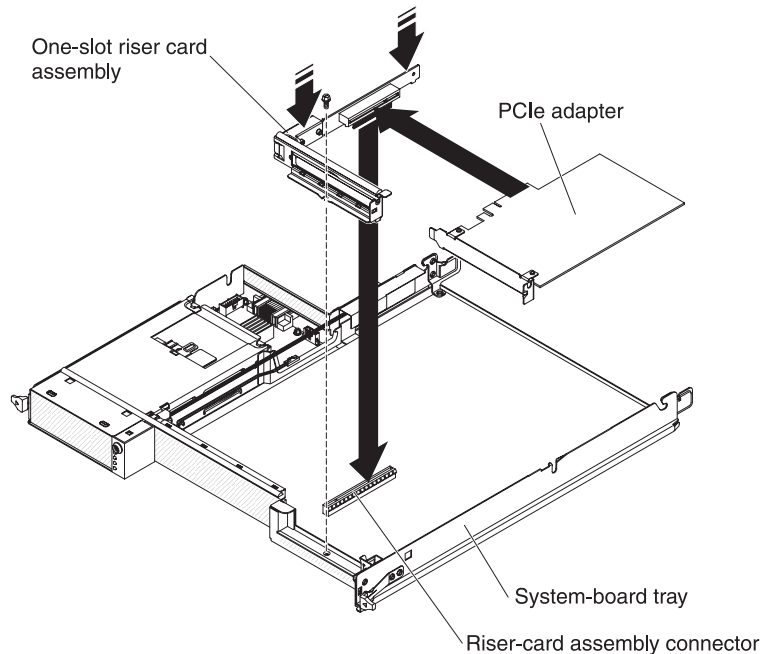
Important: The *(x8)* designation identifies an x16 connector that supports x8 adapters and x16 adapters that can downshift to operate at the x8 bandwidth. For example, if you install an x16 adapter that can downshift to the x8 bandwidth in the connector, the adapter will run at the x8 bandwidth. See the documentation that comes with the adapter for compatibility information.

- In configurations that have a two-slot riser card, the server scans the PCI Express adapters to assign system resources, following the boot sequence that is set in the BIOS configuration utility program.

Important: The maximum power consumption from all supply voltages for a single PCIe slot is the same as specified in PCI Local Bus Specification Revision 2.3 for conventional slots (25 W).

Installing an adapter in a one-slot riser card

Note: The one-slot riser card supports installation of only half-length, full-height adapters.



To install an adapter in a one-slot riser card, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the system-board tray and all attached devices (see “Turning off the system-board tray” on page 22).
3. If the system-board tray is installed in a chassis, remove it (see “Removing a system-board tray from a 2U chassis” on page 26 or “Removing a system-board tray from a 3U chassis” on page 27).
4. If an expansion enclosure is installed on the system-board tray, remove it (see “Removing an expansion enclosure” on page 29); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 28).
5. Remove the riser card retaining screw on the front of the chassis. Store the screw for future use.

Note: If an adapter is already installed in the riser card, the riser card and adapter are removed together.

6. Carefully grasp the one-slot riser card by its top edge or upper corners, and pull the riser card straight up and out of the system board.
7. Carefully set the riser card on a flat, static-protective surface. If an adapter is installed in the riser card, remove it.
8. Touch the static-protective package that contains the adapter that you are installing to any *unpainted* metal surface on the chassis or rack; then, remove the adapter from the static-protective package. Avoid touching the components and gold-edge connectors on the adapter.
9. Follow the instructions that come with the adapter to set any jumpers or switches.

- Carefully grasp the adapter by the top edge or upper corner and insert it in the one-slot riser card. Align the adapter with the connector on the riser card; then, press the adapter firmly into the connector.

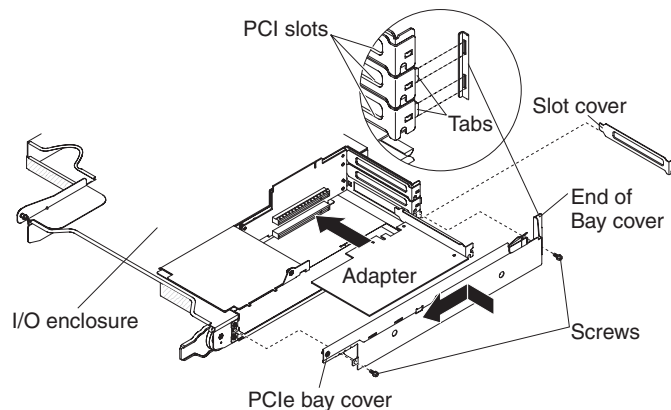
Note: Make sure that the adapter is inserted correctly. Improper installation of an adapter might damage the PCIe riser-card assembly or the adapter.

- Follow the cabling instructions, if any, that come with the adapter. If possible, route the adapter cables before you install the adapter.
- Pinch the two sides of the one-slot riser card, and align the riser card with the riser-card connector on the system board; then, press the riser card firmly, evenly with both hands, into the connector.
- Install the riser card retaining screw at the front of the chassis.

If you have other devices to install or remove, do so now. Otherwise, go to “Completing the installation” on page 42.

Installing an adapter in a two-slot riser card

Note: The two-slot riser card is part of an optional expansion enclosure; the riser card and adapters are attached to the expansion enclosure. This procedure assumes that an expansion enclosure is already installed on the system-board tray.



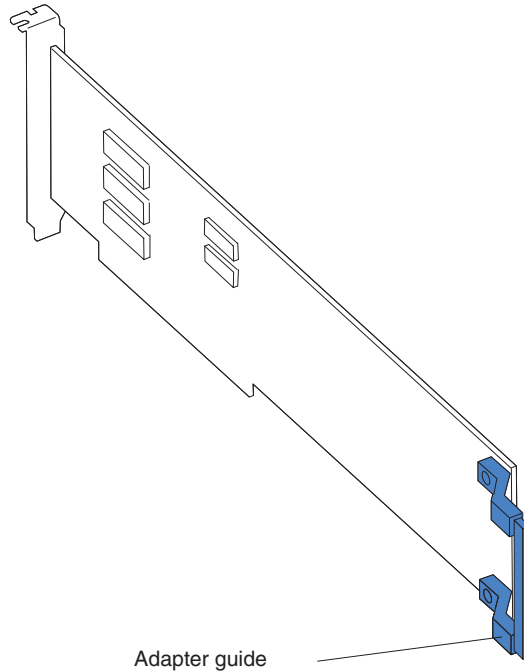
To install an adapter in a two-slot riser card, complete the following steps:

- Read the safety information that begins on page v and “Installation guidelines” on page 23.
- Turn off the system-board tray and all attached devices (see “Turning off the system-board tray” on page 22).
- If the system-board tray is installed in a chassis, remove it (see “Removing a system-board tray from a 2U chassis” on page 26).
- Remove the expansion enclosure (see “Removing an expansion enclosure” on page 29) and set it upside down on a flat, static-protective surface.

Note: If an adapter is already installed in the riser card, the riser card and adapter are removed together.

- Remove the screws, slide the PCIe adapter bay cover toward the front of the expansion enclosure, and remove it. Save the screws and the PCIe adapter bay cover for later use.
- If an adapter is installed in the connector on the riser card where you are installing the new adapter, remove it.

7. Touch the static-protective package that contains the adapter that you are installing to any *unpainted* metal surface on the chassis or rack; then, remove the adapter from the static-protective package. Avoid touching the components and gold-edge connectors on the adapter.
8. If you are installing a full-length adapter, remove the blue adapter guide (if any) from the end of the adapter.



9. Follow the instructions that come with the adapter to set any jumpers or switches.
10. Carefully grasp the adapter by the top edge or upper corner, and insert it in the two-slot riser card. Align the adapter with the connector on the riser card; then, press the adapter firmly into the connector.
11. If you have another adapter to install, do so now. Otherwise, continue with step 13.
12. If any cables need to be connected to an adapter, connect them. These cables should be routed through the hole at the side of the expansion enclosure.
13. Align the tabs on the PCIe adapter bay cover with the holes on the expansion enclosure; then, slide the PCIe adapter bay cover toward the rear of the expansion enclosure until it stops.
14. Install the PCIe adapter bay cover screws.
15. Follow the cabling instructions, if any, that come with the adapter. If possible, route the adapter cables before you install the expansion enclosure on the chassis.

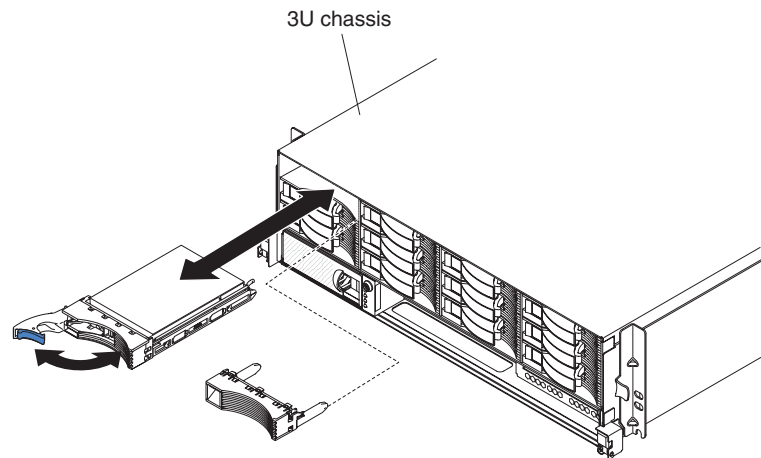
If you have other devices to install or remove, do so now. Otherwise, go to “Completing the installation” on page 42.

Installing a hard disk drive

The dx340 server configurations support installation of three hard disk drive types. The following sections describe installing each type of hard disk drive.

Installing a 3.5-inch hot-swap hard disk drive

Note: The following illustration shows how to install a 3.5-inch hot-swap hard disk drive in a 3U chassis.



To install a hot-swap hard disk drive, complete the following steps:

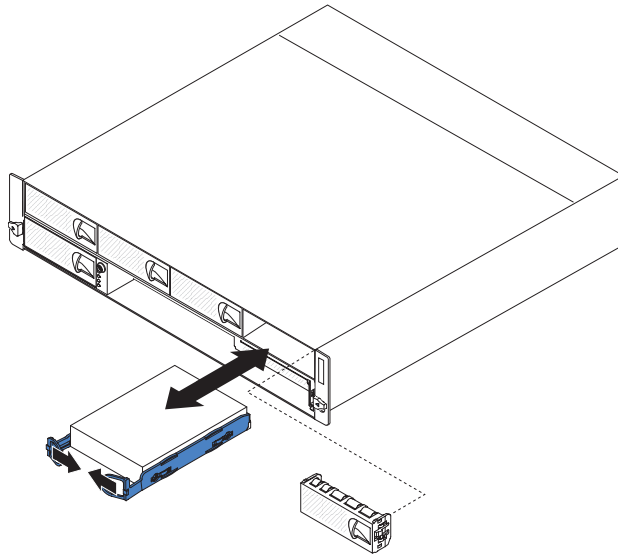
1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Touch the static-protective package that contains the hard disk drive to any *unpainted* metal surface on the chassis or rack; then, remove the hard disk drive from the package.
Attention: Do not press on the top of the drive. Pressing the top might damage the drive.
3. Make sure that the drive tray handle is in the open position.
4. Align the drive with the guide rails in the drive bay; then, carefully slide the drive into the bay until the drive stops.
5. Rotate the drive tray handle to the closed position.

Note: If you install or remove a hard disk drive, see the documentation that comes with your RAID adapter for information about reconfiguring the disk arrays.

Installing a 3.5-inch simple-swap hard disk drive

Notes:

1. Depending on your server configuration, you can install either 3.5-inch SAS simple-swap hard disk drives or 3.5-inch SATA simple-swap hard disk drives. You cannot use SAS simple-swap hard disk drives and SATA simple-swap hard disk drives in the same server.
2. The following illustration shows how to install a 3.5-inch simple-swap hard disk drive in a 2U chassis.



To install a simple-swap hard disk drive, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the server and all attached devices (see “Turning off the system-board tray” on page 22).
3. Remove the filler panel from the simple-swap hard disk drive bay.
4. Touch the static-protective package that contains the hard disk drive to any *unpainted* metal surface on the chassis or rack; then, remove the hard disk drive from the package.

Attention: Do not press on the top of the drive. Pressing the top might damage the drive.

5. Align the drive with the guide rails in the drive bay.
6. Pull the loops of the drive toward each other; then, carefully slide the drive into the bay until it stops, and release the loops.

Note: Do not release the loops on the drive until it is completely seated.

7. Install the filler panel in the simple-swap hard disk drive bay.

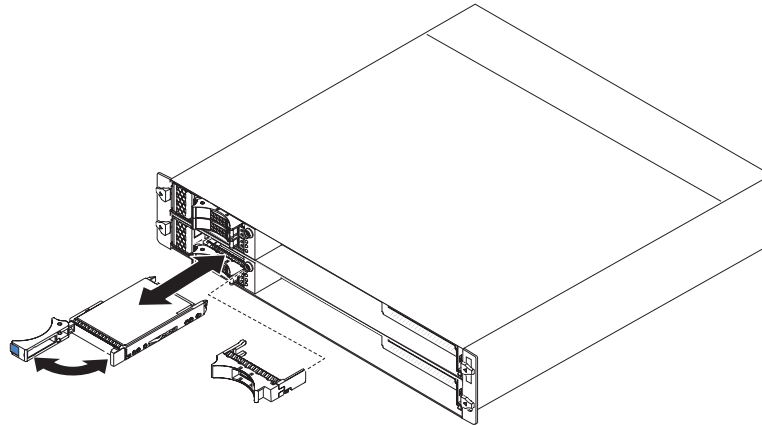
If you have other devices to install or remove, do so now. Otherwise, turn on the system-board tray (see “Turning on the system-board tray” on page 22).

Note: If the server has a PCIe RAID adapter and you install or remove a hard disk drive, see the documentation that comes with your RAID adapter for information about reconfiguring the disk arrays.

Installing a 2.5-inch hot-swap hard disk drive

Notes:

1. The 2.5-inch hot-swap hard disk drives can be installed only in system configurations that support this drive type.
2. The following illustration shows how to install a 2.5-inch hot-swap hard disk drive in a 2U chassis.



To install a 2.5-inch hot swap hard disk drive, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Touch the static-protective package that contains the hard disk drive to any *unpainted* metal surface on the chassis or rack; then, remove the hard disk drive from the package.
Attention: Do not press on the top of the drive. Pressing the top might damage the drive.
3. Make sure that the drive tray handle is in the open position.
4. Align the drive with the guide rails in the drive bay; then, carefully slide the drive into the bay until the drive stops.
5. Rotate the drive tray handle to the closed position.

Note: If you install or remove a hard disk drive, see the documentation that comes with your RAID adapter for information about reconfiguring the disk arrays.

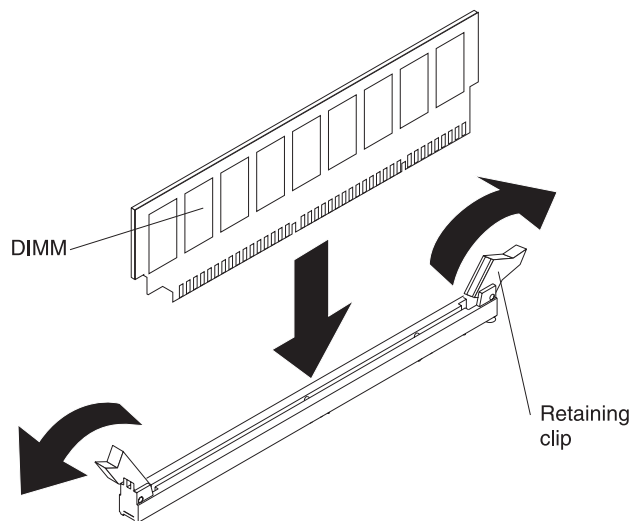
Installing a memory module

The following notes describe the types of dual inline memory modules (DIMMs) that the system-board tray supports and other information that you must consider when you install DIMMs:

- The system-board tray supports fully-buffered, DDR2, ECC, PC2-5300 FB-DIMMs with advanced memory buffering.
- When you install memory, you must install a pair of matched DIMMs.
- If you are replacing a faulty DIMM, make sure that the replacement DIMM is the correct type of memory.
- Install the DIMMs in the following order.

Pair	DIMM connectors
First (group 1)	DIMM 00 and DIMM 10
Second (group 2)	DIMM 20 and DIMM 30
Third (group 1)	DIMM 01 and DIMM 11
Fourth (group 2)	DIMM 21 and DIMM 31

- All DIMMs in a pair or group must be the same size, speed, type, technology, and physical design. You can use compatible DIMMs from different manufacturers.
- All DIMMs must have the same speed. However, different pairs or groups of DIMMs do not have to be of the same size, type, technology, and physical design.
- When you restart the system-board tray after you add or remove a DIMM, the system-board tray might display a message that the memory configuration has changed.



To install a DIMM, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Read the documentation that comes with the DIMM.
3. Turn off the system-board tray and all attached devices (see “Turning off the system-board tray” on page 22).

4. If the system-board tray is installed in a chassis, remove it (see “Removing a system-board tray from a 2U chassis” on page 26 or “Removing a system-board tray from a 3U chassis” on page 27).
5. If an expansion enclosure is installed on the system-board tray, remove it (see “Removing an expansion enclosure” on page 29); otherwise, remove the system-board tray cover (see “Removing the system-board tray cover” on page 28).
6. Locate the DIMM connectors (see “System-board connectors” on page 14). Determine the connectors into which you will install the DIMMs.
Attention: To avoid breaking the DIMM retaining clips or damaging the DIMM connectors, open and close the clips gently.
7. Open the retaining clips and, if necessary, remove any existing DIMM.
8. Touch the static-protective package that contains the DIMM to any *unpainted* metal surface on the system-board tray; then, remove the DIMM from the package.
9. Turn the DIMM so that the DIMM keys align correctly with the connector on the system board.
10. Insert the DIMM into the connector by aligning the edges of the DIMM with the slots at the ends of the DIMM connector. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is firmly seated in the connector. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly installed. Open the retaining clips, remove the DIMM, and then reinsert it.

If you have other devices to install or remove, do so now. Otherwise, go to “Completing the installation” on page 42.

Completing the installation

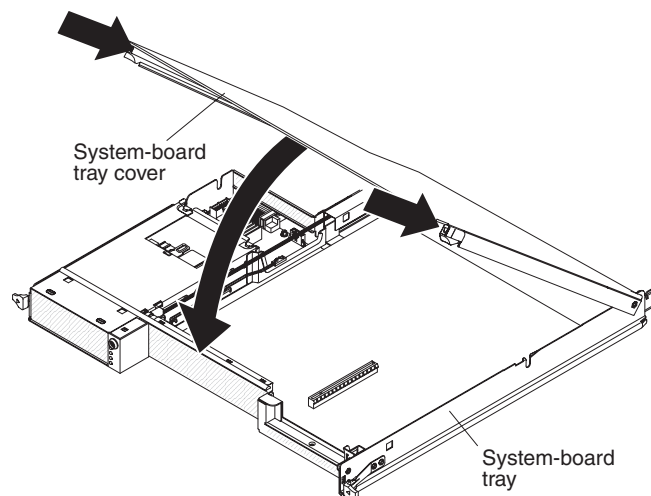
To complete the installation, complete the following tasks. Instructions for each task are in one of the following sections.

1. Install the system-board tray cover (see “Reinstalling the system-board tray cover”) or expansion enclosure (see “Reinstalling an expansion enclosure” on page 43).
2. Install the system-board tray in the chassis (see “Reinstalling a system-board tray in a 2U chassis” on page 44 or “Reinstalling a system-board tray in a 3U chassis” on page 45).
3. Connect the cables. For more information, see “Connecting the cables” on page 47.
4. For some devices, run the server BIOS configuration utility program. For more information, see “Updating the server configuration” on page 47.

Reinstalling the system-board tray cover

Attention: You cannot install the system-board tray into the chassis until the cover is installed and closed or an expansion enclosure is installed. Do not attempt to override this protection.

Note: If an expansion enclosure is installed on the system-board tray, the system-board tray cover is not used.

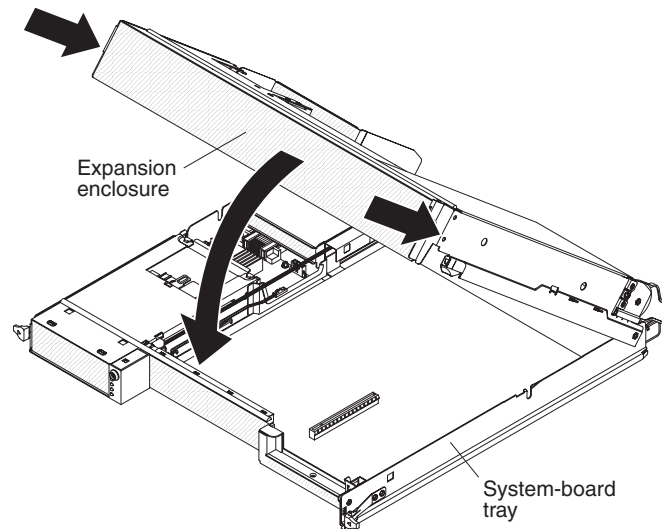


To reinstall the system-board tray cover, complete the following steps:

1. Lower the cover so that the pins at the rear slide down into the slots at the rear of the system-board tray. Before you close the cover, make sure that all components are installed and seated correctly, all internal cables are correctly routed, and you have not left loose tools or parts inside the system-board tray.
2. Pivot the cover to the closed position until it clicks into place.
3. Install the system-board tray in the chassis (see “Reinstalling a system-board tray in a 2U chassis” on page 44 or “Reinstalling a system-board tray in a 3U chassis” on page 45).

Reinstalling an expansion enclosure

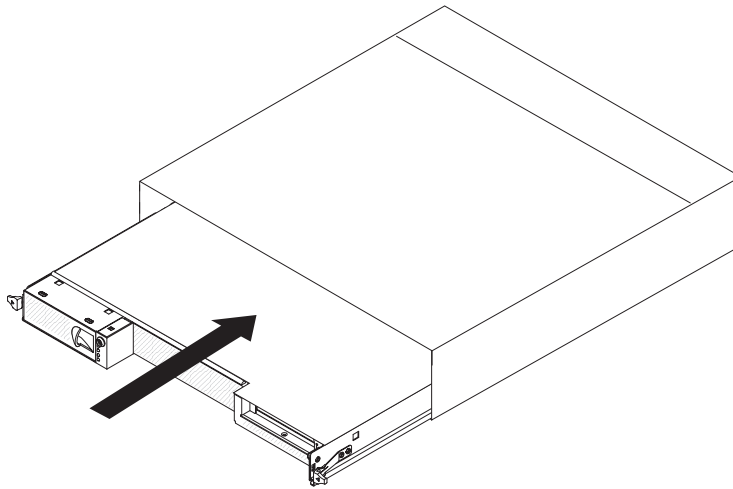
Attention: You cannot install the system-board tray into the chassis until the cover is installed and closed or an expansion enclosure is installed. Do not attempt to override this protection.



To reinstall an expansion enclosure, complete the following steps:

1. Orient the expansion enclosure above the system-board tray.
2. Lower the expansion enclosure so that the pins at the rear slide down into the slots at the rear of the system-board tray. Before you close the cover, make sure that all components are installed and seated correctly, all internal cables are correctly routed, and you have not left loose tools or parts inside the system-board tray.
3. If you disconnected cables when you removed the enclosure, reconnect them.
4. Pivot the expansion enclosure down onto the system-board tray until it clicks into place.
5. Install the system-board tray in the chassis (see “Reinstalling a system-board tray in a 2U chassis” on page 44).

Reinstalling a system-board tray in a 2U chassis

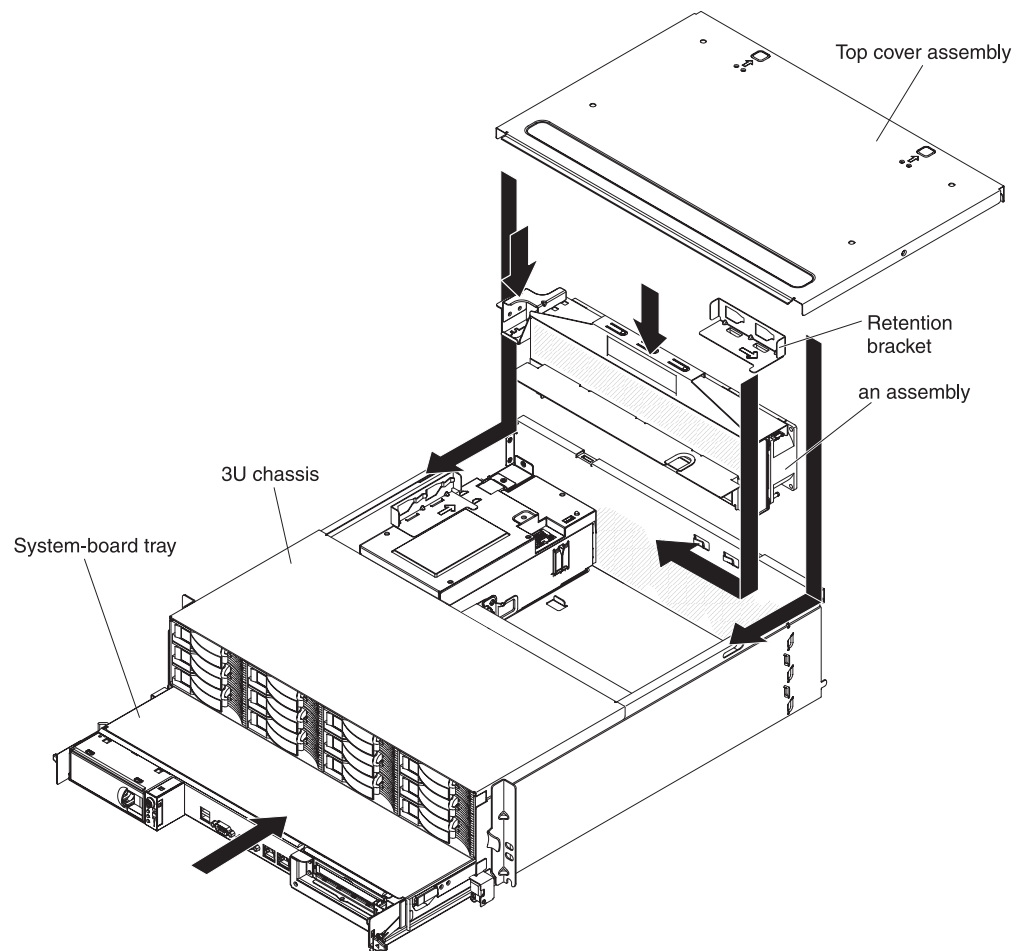


To reinstall a system-board tray in a 2U chassis, complete the following steps:

1. If an expansion enclosure is installed on the system-board tray, make sure that the blue air damper actuator is parallel to the system-board tray before you slide the assembly into the chassis.
2. Slide the system-board tray into the chassis until it stops and the release handles click into place.
3. Reconnect the cables on the front of the system-board tray.
4. Turn on the system-board tray (see “Turning on the system-board tray” on page 22).
5. Make sure that the power-on LED on the system-board tray operator panel is lit continuously, indicating that the system-board tray is receiving power and is turned on.

If you have changed the configuration of the system-board tray, you might have to update the server configuration through the BIOS configuration utility program (see “Updating the server configuration” on page 47).

Reinstalling a system-board tray in a 3U chassis



Note: You must remove the 3U chassis from the iDataPlex rack before you install the system-board tray (see “Removing a 3U chassis from an iDataPlex rack” on page 25).

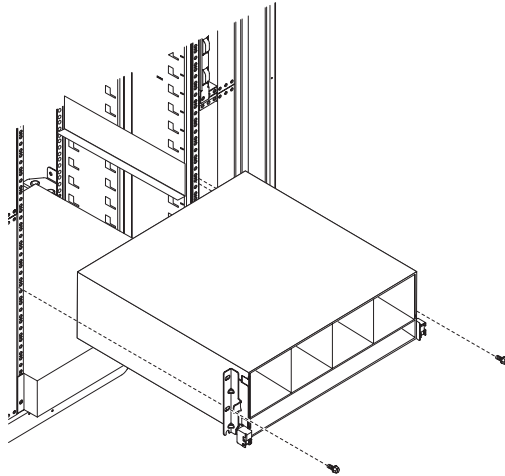
To reinstall a system-board tray in a 3U chassis, complete the following steps:

1. Slide the system-board tray into the 3U chassis until it stops.
2. Reconnect the cables that connect the system-board tray and optional adapter to the 3U chassis.
3. Turn the fan assembly so that the connector aligns correctly with the connector in the power supply.
4. Insert the fan assembly into the 3U chassis. Firmly press the fan assembly straight down into the chassis by applying pressure on both fan-assembly handles simultaneously.
5. Reinstall the retention bracket.
6. Align the top-cover assembly with the rear of the 3U chassis; then, slide it forward until it clicks into place.
7. Reinstall the 3U chassis in the iDataPlex rack (see “Reinstalling a 3U chassis in an iDataPlex rack” on page 46).
8. Install the hard disk drives (see “Installing a hard disk drive” on page 37).
9. Reconnect the cables on the front of the system-board tray.

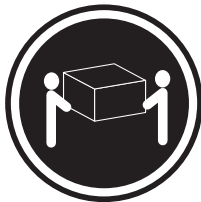
10. Turn on the system-board tray (see “Turning on the system-board tray” on page 22).
11. Make sure that the power-on LED on the system-board tray operator panel is lit continuously, indicating that the system-board tray is receiving power and is turned on.

If you have changed the configuration of the system-board tray, you might have to update the server configuration through the BIOS configuration utility program (see “Updating the server configuration” on page 47).

Reinstalling a 3U chassis in an iDataPlex rack



Statement 4:



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

CAUTION: Use safe practices when lifting.

To reinstall a 3U chassis in an iDataPlex rack, complete the following steps:

1. Align the 3U chassis with the rails on the iDataPlex rack; then, slide the 3U chassis into the rack until it is fully seated.
2. Install the M6 screws that secure the chassis to the rack.
3. Install the hard disk drives (see “Installing a hard disk drive” on page 37).
4. Reconnect the cables on the front of the system-board tray.
5. Turn on the system-board tray (see “Turning on the system-board tray” on page 22).

6. Make sure that the power-on LED on the system-board tray operator panel is lit continuously, indicating that the system-board tray is receiving power and is turned on.

If you have changed the configuration of the system-board tray, you might have to update the server configuration through the BIOS configuration utility program (see “Updating the server configuration”).

Connecting the cables

Attention: To prevent damage to equipment, connect cables before you turn on the system-board tray.

All cable connections, other than power, are on the front of the server. See “Operator panel controls, LEDs, connectors, and power” on page 20 for connector locations.

Updating the server configuration

When you start the server for the first time after you add or remove a device, you might receive a message that the configuration has changed. The BIOS configuration utility program starts automatically so that you can save the new configuration settings. For more information, see Chapter 4, “Configuring the dx340 server,” on page 49.

Some optional devices have device drivers that you must install. For information about installing device drivers, see the documentation that comes with each device.

If the server has an optional RAID adapter and you have installed or removed a hard disk drive, see the documentation that comes with the RAID adapter for information about reconfiguring the disk arrays. For more information about the RAID controller, go to <http://www-304.ibm.com/jct01004c/systems/support/supportsite.wss/docdisplay?Indocid=MIGR-65723&brandind=5000008> or complete the following steps.

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to <http://www.ibm.com/systems/support/>.
2. Under **Product support**, click **Hardware upgrades**.
3. Under **Product family**, click **RAID**.
4. Under **Type**, click on the type of RAID controller that is installed in your server.

For information about configuring the integrated Gigabit Ethernet controller, go to “Configuring the Gigabit Ethernet controller” on page 53.

Chapter 4. Configuring the dx340 server

To update the firmware, you might have to use an external USB CD-RW/DVD drive. To run the BIOS configuration utility or the Dynamic System Analysis (DSA) Preboot diagnostic programs, you must have the following additional hardware:

- Monitor
- Combination USB keyboard and pointing device such as IBM part number 40K5372
- External USB CD-RW/DVD drive such as the IBM and Lenovo part number 73P4515 or 73P4516

The following configuration programs come with the dx340 server:

- **BIOS configuration utility program**

The BIOS configuration utility program is part of the basic input/output system (BIOS). Use it to configure low-level system settings, such as the startup-device sequence, date and time, and passwords. For information about using this program, see “Using the BIOS configuration utility program” on page 50.

- **Ethernet controller configuration**

For information about configuring the Ethernet controller, see “Configuring the Gigabit Ethernet controller” on page 53.

- **IBM Electronic Service Agent™**

IBM Electronic Service Agent is a software tool that monitors the server for hardware error events and automatically submits electronic service requests to IBM service and support. Also, it can collect and transmit system configuration information on a scheduled basis so that the information is available to you and your support representative. It uses minimal system resources, is available free of charge, and can be downloaded from the Web. For more information and to download Electronic Service Agent, go to <http://www.ibm.com/support/electronic/>.

- **LSI Logic Configuration Utility program**

Some server configurations use the LSI Logic Configuration Utility program to configure the integrated SCSI controller with RAID capabilities and the devices that are attached to it. For information about using this program, see “Using the LSI Logic Configuration Utility program” on page 54.

- **Preboot Execution Environment (PXE) boot agent utility program**

The PXE boot agent utility program is part of the BIOS. Use it to change network startup (boot) protocols and startup order and to select operating-system wake-up support. For information about using this program, see “Using the PXE boot agent utility program” on page 54.

- **IBM Advanced Settings Utility (ASU)**

Use ASU to modify firmware settings from the command line without the need to restart the system to access the BIOS configuration utility program. You can also use ASU to issue selected baseboard management controller setup commands. The ASU supports scripting environments through its batch-processing mode. For more information and to download the Advanced Settings Utility, go to <http://www.ibm.com/systems/support/>.

- **IBM Dynamic System Analysis (DSA) Preboot Diagnostic CD**

The server has an *IBM Dynamic System Analysis Preboot Diagnostic* CD that you can download from the Web. Downloadable images will be available for external USB storage devices, such as an external USB CD-ROM drive. Use the DSA diagnostic programs to diagnose problems.

Notes:

1. To run the preboot DSA program, you must have the following additional hardware:
 - Monitor.
 - Combination USB keyboard and pointing device such as IBM part number 40K5372.
 - External USB CD-RW/DVD drive such as the IBM and Lenovo part number 73P4515 or 73P4516. See “Firmware updates” on page 57 for additional instructions about using an external USB CD-RW/DVD drive.
2. You can also select to download images of the DSA program for other external USB storage devices, such as a USB memory key.

For additional information about the DSA diagnostic programs, see the *Problem Determination and Service Guide* on the IBM Documentation CD.

- **IBM Storage Configuration Manager (SCM)**

Use SCM to manage the storage configuration of your virtual environment from a single console. SCM is part of the Virtualization Manager extension to IBM Director. For more information and to download the Storage Configuration Manager, go to <http://www.ibm.com/systems/support/>.

Using the BIOS configuration utility program

Use the BIOS configuration utility program to perform the following tasks:

- View configuration information
- View and change assignments for devices and I/O ports
- Set the date and time
- Set and change passwords
- Set the startup characteristics and the order of startup devices
- Set and change settings for advanced hardware features
- View and clear event logs
- Change interrupt request (IRQ) settings
- Configure memory features

Starting the BIOS configuration utility program

To start the BIOS configuration utility program, complete the following steps:

1. Turn on the server.
2. When the prompt Press F1 for Configuration/Setup is displayed, press F1. If you have set both a power-on password and an administrator password, you must type the administrator password to access the full BIOS configuration utility menu. If you do not type the administrator password, a limited BIOS configuration utility menu is available.
3. Select settings to view or change.

BIOS configuration utility menu choices

Note: Some options in the BIOS configuration menus might not be supported in all server configurations.

The following choices are on the BIOS configuration utility menu at the top of the screen. Depending on the version of the BIOS code, some menu choices might differ slightly from these descriptions. Depending on how passwords are configured,

certain BIOS configuration utility fields might not be editable by all users. See “Passwords” on page 52 for additional information.

- **Main**

Select this choice to perform the following tasks:

- View and set the system date.
- View and set the system time in 24-hour format (*hour.minute:second*).
- Configure hard disk drive support.
- View information about the system. When you make changes through other choices in the BIOS configuration utility program, some of those changes are reflected in the system information; you cannot change settings directly in the system information. Information includes the model of the system-board tray, the revision level or issue date of the BIOS code that is stored in electrically erasable programmable ROM (EEPROM), and the type, speed, and cache sizes of the microprocessors and the amount of installed memory.

- **Advanced**

Important: The server might malfunction if these settings are incorrectly configured. Follow the instructions on the screen carefully.

Select this choice to perform the following tasks:

- Configure advanced microprocessor features, such as virtualization and thermal management
- Configure memory features, such as interleaving
- Configure PCI and USB devices and I/O ports
- Configure system-board tray power-on features

- **Server**

Select this choice to set options for console redirection, event logging, and IPMI communications.

You can view the system-event log that contains all the system-error, warning, and informational messages that have been generated. To get more information about error codes that occur, run the diagnostics program. For instructions, see the *Problem Determination and Service Guide*. To clear the event log, select

Clear all DMI event logs.

In the **IPMI** section, you can view the BMC system event log, which contains system error and warning messages that were generated by the BMC controller. The IP address of the BMC is set in the **IP Address** field. You can then use this IP address for remote management of the BMC using IBM Director or an IPMI 2.0 compliant management tool.

- **Security**

Select this choice to set passwords and other security options. The server supports two password levels:

- **User Password**

Select this choice to set or change a user password. For more information, see “User password” on page 52.

- **Supervisor Password**

Select this choice to set or change a supervisor password. A supervisor password is intended to be used by a system administrator; it limits access to some BIOS configuration utility fields. If a supervisor password is set, all BIOS configuration utility fields that can be modified are available for edit only if you type the supervisor password at the password prompt. For more information, see “Supervisor password” on page 52.

For more information about passwords, see “Passwords” on page 52.

- **Boot**

Select this choice to view or change the start options and boot device priority. Changes take effect when you restart the server.

The startup sequence specifies the order in which the server checks devices to find a boot record. The server starts from the first boot record that it finds.

- **Exit**

Select this choice to exit from the BIOS configuration utility program. You can perform the following tasks:

- Save changes and exit
- Discard changes and exit
- Discard changes
- Load setup defaults

Passwords

From the **Security** choice, you can set, change, and delete a user password and a supervisor password. Depending on how passwords are configured, certain BIOS configuration utility fields might not be editable by all users, and you might have to type a password to complete system startup.

Supervisor password

If you set only a supervisor password, you must type the supervisor password to access all editable fields in the BIOS configuration utility program. You can also configure the system to require entry of this password to complete the system startup. If a supervisor password is set, you can also set a user password. You can use any combination of up to seven characters (A - Z, a - z, and 0 - 9) for the supervisor password.

If you forget the supervisor password, you can clear the password by using the clear RTC RAM jumper. See the *Problem Determination and Service Guide* for instructions.

User password

If you set a supervisor password for a system administrator and a user password for a user, a system administrator who types the supervisor password has access to change all editable BIOS configuration utility fields. A user who types the user password can view all BIOS configuration utility fields but can change values in a subset of those fields that are editable by the system administrator. If the system is configured to require entry of a password to complete the system startup, you can type either password to complete the system startup. You can use any combination of up to seven characters (A - Z, a - z, and 0 - 9) for the password.

If you forget the user password, you can regain access to the server in any of the following ways:

- If a supervisor password is set, type the supervisor password at the password prompt. Start the BIOS configuration utility program and reset the user password.
- Clear the password by using the clear RTC RAM jumper (see the *Problem Determination and Service Guide* for instructions).

Configuring the Gigabit Ethernet controller

The Ethernet controller is integrated on the system board. It provides an interface for connecting to a 10 Mbps, 100 Mbps, or 1 Gbps network and provides full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on the network. If the Ethernet ports in the server support auto-negotiation, the controller detects the data-transfer rate (10BASE-T, 100BASE-TX, or 1000BASE-T) and duplex mode (full-duplex or half-duplex) of the network and automatically operates at that rate and mode.

You do not have to set any jumpers or configure the controller. However, you must install a device driver to enable the operating system to address the controller. For device drivers and information about configuring the Ethernet controller, see the *Intel Ethernet Software CD* that comes with the server. To find updated information about configuring the controller, complete the following steps.

Notes:

1. Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.
2. To install the device driver for the Ethernet controller, you might need to use an external USB CD-RW/DVD drive such as the IBM and Lenovo part number 73P4515 or 73P4516. See “Firmware updates” on page 57 for additional instructions about using an external USB CD-RW/DVD drive.
3. Go to <http://www.ibm.com/systems/support/>.
4. Under **Product support**, click **System x**.
5. Under **Popular links**, click **Software and device drivers**.
6. From the **Product family** menu, select **System x iDataPlex dx340 server** and click **Go**.

Using the PXE boot agent utility program

Use the Preboot Execution Environment (PXE) boot agent utility program to enable or disable operating-system wake-up support.

Note: The server does not support changing the network boot protocol or specifying the startup order of devices through the PXE boot agent utility program.

Starting the PXE boot agent utility program

To start the PXE boot agent utility program, complete the following steps:

1. Turn on the server.
2. When the initializing prompt, Initializing Intel (R) Boot Agent Version X.X.XX PXE 2.0 Build XXX (WfM 2.0), is displayed, press Ctrl+S. You have 2 seconds (by default) to press Ctrl+S after the prompt is displayed.
3. To select a choice from the menu, use the arrow keys and press Enter.
4. To change the setting of the selected item, follow the instructions on the screen.

PXE boot agent utility menu choices

The following choices are on the PXE boot agent utility menu:

- **Network Boot Protocol**
PXE is the default setting. Do not change this setting; the server does not support any other network boot protocols.
- **Boot Order**
The server does not support this choice. Use the **Start Options** choice in the BIOS configuration utility program to specify the startup sequence.
- **Show setup prompt**
Select this choice to enable or disable the PXE setup prompt. When the prompt is enabled, the prompt Press Ctrl+S to enter the setup menu is displayed under the initializing prompt. **Disable** is the default setting.
- **Setup time wait menu**
Select this choice to specify the amount of time (in seconds) that the server will wait for you press Ctrl+S after the prompt is displayed. You can select 2 (default), 3, 5, or 8 seconds.

Using the LSI Logic Configuration Utility program

Note: The LSI Logic Configuration Utility program will be available only if an optional RAID adapter is installed in the server.

Use the LSI Logic Configuration Utility program to configure and manage redundant array of independent disks (RAID) arrays. Be sure to use the program as described in this document. Use the LSI Logic Configuration Utility program to perform the following tasks:

- Perform a low-level format of a SCSI hard disk drive
- View or change SCSI IDs for attached devices
- Set a SCSI device scan order
- Set SCSI protocol parameters on SCSI hard disk drives
- Configure arrays
- View your RAID configuration and associated devices

- Monitor operation of your RAID controllers
- Create a mirrored pair of SCSI hard disk drives with or without a hot-spare drive

The integrated SCSI controller with RAID capabilities supports redundant array of independent disks (RAID) arrays. You can use the LSI Logic Configuration Utility program to configure RAID level-1 for a single pair of attached devices. If you install a different type of RAID adapter, follow the instructions in the documentation that comes with the adapter to view or change SCSI settings for attached devices.

You can download an LSI command-line configuration program (CFG1030) from <http://www.ibm.com/systems/support/>. For more information about the RAID controller, go to <http://www-304.ibm.com/jct01004c/systems/support/supportsite.wss/docdisplay?Indocid=MIGR-65723&brandind=5000008> or complete the following steps.

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to <http://www.ibm.com/systems/support/>.
2. Under **Product support**, click **Hardware upgrades**.
3. Under **Product family**, click **RAID**.
4. Under **Type**, click on the type of RAID controller that is installed in your server.

When you use the LSI Logic Configuration Utility program to configure and manage arrays, review the following information:

- The integrated SCSI controller with RAID capabilities in the server supports only RAID level-1 with a hot-spare drive installed. Installing an optional ServeRAID controller provides additional RAID levels.
- You cannot use the *ServerGuide Setup and Installation* CD to configure the integrated SCSI controller with RAID capabilities.
- When you create a RAID level-1 (mirrored) pair, all drives must be on the same channel.
- Hard disk drive capacities affect how you create arrays. The drives in an array can have different capacities, but the RAID controller treats them as if they all have the capacity of the smallest hard disk drive.
- You can set up a mirror after the operating system is installed on the primary drive only if you are using an integrated SCSI controller with RAID capabilities. You must make sure that the primary drive has the lower SCSI ID (for example, 0).

Important: If you use an integrated SCSI controller with RAID capabilities to configure a RAID level-1 (mirrored) array after you have installed the operating system, you will lose access to any data or applications that were previously stored on the secondary drive of the mirrored pair.

- To update the firmware and BIOS code for an optional ServeRAID controller, you must use the IBM *ServeRAID Support* CD that comes with the controller.

Note: To update the firmware and BIOS code for an optional ServeRAID controller, you might need to use an external USB CD-RW/DVD drive such as the IBM and Lenovo part number 73P4515 or 73P4516. See “Firmware updates” on page 57 for additional instructions about using an external USB CD-RW/DVD drive.

- If you install a different type of RAID controller, follow the instructions in the documentation that comes with the controller to view or change SCSI settings for attached devices.

The following sections provide instructions for starting the LSI Logic Configuration Utility program and performing selected functions.

Starting the LSI Logic Configuration Utility program

To start the LSI Logic Configuration Utility program, complete the following steps:

1. Turn on the server.
2. When the prompt <<< Press <CTRL><C> to start LSI Logic Configuration Utility >>> is displayed, press Ctrl+C. If you have set an administrator password, you are prompted to type the password.
3. To select a controller (channel) from the list of adapters, use the arrow keys and press Enter.
4. To change the settings of the selected items, follow the instructions on the screen. If you select **Device Properties** or **Mirroring Properties**, additional screens are displayed.

When you have finished changing settings, press Esc to exit from the program; select **Save** to save the settings that you have changed.

Formatting a SCSI hard disk drive

Low-level formatting removes all data from the hard disk. If there is data on the disk that you want to save, back up the hard disk before you perform this procedure.

Note: Before you format a SCSI hard disk, make sure that the disk is not part of a mirrored pair. From the list of adapters, select the controller (channel) for the drive that you want to format. Select **Mirroring Properties** and make sure that the mirroring value for the drive is **None**.

To format a drive, complete the following steps:

1. From the list of adapters, select the controller (channel) for the drive that you want to format.
2. Select **Device Properties**.
3. To highlight the drive that you want to format, use the Up Arrow and Down Arrow keys. To scroll left and right, use the Left Arrow and Right Arrow keys or the End key.
4. To start the low-level formatting operation, select **Format** and press Enter.

Creating a mirrored pair of SCSI hard disk drives

To create a mirrored pair of SCSI hard disk drives, complete the following steps:

1. From the list of adapters, select the controller (channel) for the drives that you want to mirror.
2. Select **Mirroring Properties**.
3. Use the arrow keys to highlight the first drive in the pair; then, press the Minus key to change the mirroring value to **Primary**.
4. Use the arrow keys to highlight the second drive in the pair; then, press the Minus key to change the mirroring value to **Secondary**.

5. To establish a third drive that will take over the function of either mirrored drive in the event of a failure, use the arrow keys to highlight the drive that you want to use for that purpose; then, press the Minus key to change the mirroring value to **Hot Spare**.

Firmware updates

IBM periodically makes BIOS, service processor (BMC), and other firmware updates available for the your server. Before you install the server, go to <http://www.ibm.com/systems/support/> to download the latest firmware for the server. Install the updates, using the instructions that are included with the downloaded files.

Important: To avoid problems and to maintain proper system performance, always make sure that the BIOS, service processor (BMC), and other firmware levels are consistent for all iDataPlex servers.

To update the firmware, you might need to use an external USB CD-RW/DVD drive such as the IBM and Lenovo part number 73P4515 or 73P4516. To use an external USB CD-RW/DVD drive to update the firmware, complete the following steps:

1. If the system-board tray is running, turn off the system-board tray and all attached devices.
2. Connect a USB CD or DVD drive to a USB connector on the front of the system-board tray.
3. Turn on all attached devices; then, turn on the system-board tray.
4. When the prompt **Press F1 For BIOS Setup** is displayed, press F1.
5. From the BIOS configuration utility menu, select **Boot**.
6. From the **Boot** menu, select **Boot Device Priority**.
7. Note the device that is selected as the first startup device. Later, you must restore this setting.
8. Select **CD/DVD-ROM** as the first startup device.
9. Press Esc two times to return to the BIOS configuration utility menu.
10. Insert the CD or DVD containing the firmware update into the CD or DVD drive.
11. Select **Save Changes and Exit** and follow the prompts.

Updating IBM Director

If you plan to use IBM Director to manage the server, you must check for the latest applicable IBM Director updates and interim fixes.

To install the IBM Director updates and any other applicable updates and interim fixes, complete the following steps.

Notes:

1. Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.
2. To update IBM Director software, you might need to use an external USB CD-RW/DVD drive such as the IBM and Lenovo part number 73P4515 or 73P4516. See “Firmware updates” on page 57 for additional instructions about using an external USB CD-RW/DVD drive.
1. Check for the latest version of IBM Director:
 - a. Go to <http://www.ibm.com/systems/management/downloads.html>.
 - b. If a newer version of IBM Director than what comes with the server is shown in the drop-down list, follow the instructions on the Web page to download the latest version.
2. Install the IBM Director program.
3. Download and install any applicable updates or interim fixes for the server:
 - a. Go to <http://www.ibm.com/systems/support/>.
 - b. Under **Product support**, click **System x**.
 - c. Under **Popular links**, click **Software and device drivers**.
 - d. Under **Related downloads**, click **IBM Director**.
 - e. Select any applicable update or interim fix that you want to download.
 - f. Click the file link for the executable file to download the file, and follow the instructions in the readme file to install the update or interim fix.
 - g. Repeat steps 3e and 3f for any additional updates or interim fixes that you want to install.

Appendix A. Getting help and technical assistance

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

Before you call

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Problem Determination and Service Guide* on the *IBM Documentation CD* that comes with your system.
- Go to the IBM support Web site at <http://www.ibm.com/systems/support/> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

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

Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/systems/support/> and follow the instructions. Also, some documents are available through the IBM Publications Center at <http://www.ibm.com/shop/publications/order/>.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM systems, optional devices, services, and support. The address for IBM System x[®] and xSeries[®] information is <http://www.ibm.com/systems/x/>. The address for IBM iDataPlex information is <http://www.ibm.com/systems/x/hardware/idadaplex/index.html>. The address for IBM BladeCenter[®] information is <http://www.ibm.com/systems/bladecenter/>.

You can find service information for IBM systems and optional devices at <http://www.ibm.com/systems/support/>.

Software service and support

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

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

Hardware service and support

You can receive hardware service through IBM Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. See <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.

IBM Taiwan product service

台灣 IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路 7 號 3 樓
電話：0800-016-888

IBM Taiwan product service contact information:

IBM Taiwan Corporation
3F, No 7, Song Ren Rd.
Taipei, Taiwan
Telephone: 0800-016-888

Appendix B. Notices

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Active PCI	IntelliStation	Tivoli Enterprise
Active PCI-X	NetBAY	Update Connector

AIX	Netfinity	Wake on LAN
Alert on LAN	PowerExecutive	XA-32
BladeCenter	Predictive Failure Analysis	XA-64
Chipkill	ServeRAID	X-Architecture
e-business logo	ServerGuide	XpandOnDemand
@server	ServerProven	xSeries

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Important notes

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

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

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

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

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

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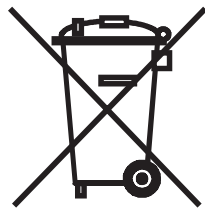
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Some software might differ from its retail version (if available) and might not include user manuals or all program functionality.

Product recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet sites at <http://www.ibm.com/ibm/recycle/us/index.shtml> and <http://www.ibm.com/ibm/environment/products/index.shtml>.

Esta unidad debe reciclarse o desecharse de acuerdo con lo establecido en la normativa nacional o local aplicable. IBM recomienda a los propietarios de equipos de tecnología de la información (TI) que reciclen responsablemente sus equipos cuando éstos ya no les sean útiles. IBM dispone de una serie de programas y servicios de devolución de productos en varios países, a fin de ayudar a los propietarios de equipos a reciclar sus productos de TI. Se puede encontrar información sobre las ofertas de reciclado de productos de IBM en el sitio web de IBM <http://www.ibm.com/ibm/recycle/us/index.shtml> y <http://www.ibm.com/ibm/environment/products/index.shtml>.



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

This appliance is labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

この機器には、EU 諸国に対する廃電気電子機器指令 2002/96/EC(WEEE) のラベルが貼られています。この指令は、EU 諸国に適用する使用済み機器の回収とリサイクルの骨子を定めています。このラベルは、使用済みになった時に指令に従って適正な処理をする必要があることを知らせるために種々の製品に貼られています。

Remarque : Cette marque s'applique uniquement aux pays de l'Union Européenne et à la Norvège.

L'étiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques (DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.

Battery return program

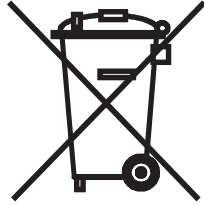
This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to <http://www.ibm.com/ibm/environment/products/index.shtml> or contact your local waste disposal facility.

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

For Taiwan: Please recycle batteries.



For the European Union:



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

Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

Les batteries ou emballages pour batteries sont étiquetés conformément aux directives européennes 2006/66/EC, norme relative aux batteries et accumulateurs en usage et aux batteries et accumulateurs usés. Les directives déterminent la marche à suivre en vigueur dans l'Union Européenne pour le retour et le recyclage des batteries et accumulateurs usés. Cette étiquette est appliquée sur diverses batteries pour indiquer que la batterie ne doit pas être mise au rebut mais plutôt récupérée en fin de cycle de vie selon cette norme.

バッテリーあるいはバッテリー用のパッケージには、EU 諸国に対する廃電気電子機器指令 2006/66/EC のラベルが貼られています。この指令は、バッテリーと蓄電池、および廃棄バッテリーと蓄電池に関するものです。この指令は、使用済みバッテリーと蓄電池の回収とリサイクルの骨子を定めているもので、EU 諸国にわたって適用されます。このラベルは、使用済みになったときに指令に従って適正な処理をする必要があることを知らせるために種々のバッテリーに貼られています。

In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury, and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and treatment of batteries and accumulators. Customer participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances. For proper collection and treatment, contact your local IBM representative.

This notice is provided in accordance with Royal Decree 106/2008 of Spain: The retail price of batteries, accumulators, and power cells includes the cost of the environmental management of their waste.

For California:

Perchlorate material – special handling may apply. See <http://www.dtsc.ca.gov/hazardouswaste/perchlorate/>.

The foregoing notice is provided in accordance with California Code of Regulations Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate Materials. This product/part may include a lithium manganese dioxide battery which contains a perchlorate substance.

German Ordinance for Work gloss statement

The product is not suitable for use with visual display work place devices according to clause 2 of the German Ordinance for Work with Visual Display Units.

Das Produkt ist nicht für den Einsatz an Bildschirmarbeitsplätzen im Sinne § 2 der Bildschirmarbeitsverordnung geeignet.

Electronic emission notices

Federal Communications Commission (FCC) statement

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

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

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

Industry Canada Class A emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Australia and New Zealand Class A statement

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

United Kingdom telecommunications safety requirement

Notice to Customers

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

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

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

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

European Community contact:
IBM Technical Regulations
Pascalstr. 100, Stuttgart, Germany 70569
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E-mail: tjahn@de.ibm.com

Taiwanese Class A warning statement

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

Chinese Class A warning statement

声 明
此为 A 级产品。在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

Japanese Voluntary Control Council for Interference (VCCI) statement

この装置は、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。

VCCI-A

Korean Class A warning statement

이 기기는 업무용으로 전자파 적합등록을 받은 기기
이오니, 판매자 또는 사용자는 이점을 주의하시기
바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에
서 비업무용으로 교환하시기 바랍니다.

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Part Number: 69Y3931

Printed in USA

(1P) P/N: 69Y3931

