

Intel® Server System R1304BTSSFAN/R1304BTLSFAN/ R1304BTLSHBN Service Guide

**A Guide for Technically Qualified Assemblers of Intel® Identified
Subassemblies/Products**

Intel Order Number G21355-003

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Intel® server boards contain a number of high-density VLSI and power delivery components that need adequate airflow for cooling. Intel®'s own chassis are designed and tested to meet the intended thermal requirements of these components when the fully integrated system is used together. It is the responsibility of the system integrator that chooses not to use Intel developed server building blocks to consult vendor datasheets and operating parameters to determine the amount of airflow required for their specific application and environmental conditions. Intel Corporation can not be held responsible if components fail or the server board does not operate correctly when used outside any of their published operating or non-operating limits.

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Safety Information

Important Safety Instructions

Read all caution and safety statements in this document before performing any of the instructions. See also Intel Server Boards and Server Chassis Safety Information on the *Intel® Server Deployment Toolkit CD* and/or at <http://www.intel.com/support/motherboards/server/sb/cs-010770.htm>.

Wichtige Sicherheitshinweise

Lesen Sie zunächst sämtliche Warnund Sicherheitshinweise in diesem Dokument, bevor Sie eine der Anweisungen ausführen. Beachten Sie hierzu auch die Sicherheitshinweise zu Intel-Serverplatinen und Servergehäusen auf der *Intel® Server Deployment Toolkit CD* oder unter <http://www.intel.com/support/motherboards/server/sb/cs-010770.htm>.

Consignes de sécurité

Lisez attention toutes les consignes de sécurité et les mises en garde indiquées dans ce document avant de suivre toute instruction. Consultez Intel Server Boards and Server Chassis Safety Information sur le *Intel® Server Deployment Toolkit CD* ou bien rendez-vous sur le site <http://www.intel.com/support/motherboards/server/sb/cs-010770.htm>.

Instrucciones de seguridad importantes

Lea todas las declaraciones de seguridad y precaución de este documento antes de realizar cualquiera de las instrucciones. Vea Intel Server Boards and Server Chassis Safety Information en el *Intel® Server Deployment Toolkit CD* y/o en <http://www.intel.com/support/motherboards/server/sb/cs-010770.htm>.

重要安全指导

在执行任何指令之前，请阅读本文档中的所有注意事项及安全声明。和/或 <http://www.intel.com/support/motherboards/server/sb/cs-010770.htm> 上的 *Intel Server Boards and Server Chassis Safety Information* (《Intel 服务器主板与服务器机箱安全信息》)。

Warnings

Heed safety instructions: Before working with your server product, whether you are using this guide or any other resource as a reference, pay close attention to the safety instructions. You must adhere to the assembly instructions in this guide to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this guide. Use of other products/ components will void the UL listing and other regulatory approvals of the product and will most likely result in noncompliance with product regulations in the region(s) in which the product is sold.

System power on/off: The power button DOES NOT turn off the system AC power. To remove power from system, you must unplug the AC power cord from the wall outlet. Make sure the AC power cord is unplugged before you open the chassis, add, or remove any components.

Hazardous conditions, devices and cables: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

Electrostatic discharge (ESD) and ESD protection: ESD can damage disk drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground any unpainted metal surface on your server when handling parts.

ESD and handling boards: Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

Installing or removing jumpers: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that you can grip with your fingertips or with a pair of fine needle nosed pliers. If your jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool you use to remove a jumper, or you may bend or break the pins on the board.

Preface

About this Manual

Thank you for purchasing and using the Intel® Server System R1304BTSSFAN/R1304BTLSFAN/R1304BTLSHBN.

This manual is written for system technicians responsible for troubleshooting, upgrading, and repairing this server system. This document provides reference information, feature information, and step-by-step instructions on how to add and replace components on the server system.

Manual Organization

Chapter 1 provides an overview of the server system. In this chapter, you will find a list of the server system features, illustrations of the product, and product diagrams to help you identify components and their locations.

Chapter 2 provides instructions on using the utilities shipped with the board or that may be required to update the system. This includes how to navigate through the BIOS Setup screens, perform a BIOS update, and reset the password or CMOS. Information about the specific BIOS settings and screens is available in the *Intel® Server Board S1200BT Technical Product Specification*.

Chapter 3 provides instructions on adding and replacing components. Use this chapter for step-by-step instructions and diagrams for installing or replacing components such as the fans, power supply, drives, and other components.

At the back of this manual, you will find technical specifications, troubleshooting tips, regulatory information, complete safety information, “getting help” information, and the warranty.

Product Contents

The Intel® Server System R1304BTSSFAN ships with the Intel® Server Board S1200BTS. The Intel® Server System R1304BTLSFAN/R1304BTLSHBN ships with the Intel® Server Board S1200BTL.

There are three versions of this server system: the Intel® Server System R1304BTSSFAN, Intel® Server System R1304BTLSFAN and the Intel® Server System R1304BTLSHBN. The contents of each server system are listed below.

Intel® Server System R1304BTSSFAN Contents

Your Intel® Server System R1304BTSSFAN ships with the following items:

- One Intel® Server Board S1200BTS installed in the server system
- One 250-W power supply module, installed in the server system
- Three system fans, with attached cables, installed in the server system
- One passive heat sink, in the server system product box
- Four hard disk drive brackets, installed in the server system
- One PCI-E X 8 low profile riser card with supporting bracket, installed in the server system
- Rack handles, installed in the server system
- Standard front panel, installed in the server system
- Cables:
 - Four SATA cables for SATA HDDs
 - One front panel USB cable, installed in the server system
 - One front panel cable, installed in the server system
- Documentation, drivers, and installation CD

Intel® Server System R1304BTLSFAN Contents

Your Intel® Server System R1304BTLSFAN ships with the following items:

- One Intel® Server Board S1200BTL installed in the server system
- One 250-W power supply module, installed in the server system
- Three system fans, with attached cables, installed in the server system
- One passive heat sink, in the server system product box
- Four hard disk drive brackets, installed in the server system
- One PCI-E x 8 low profile riser card with supporting bracket, installed in the server system

- Rack handles, installed in the server system
- Standard front panel, installed in the server system
- Cables:
 - Four SATA cables for SATA HDDs
 - One front panel USB cable, installed in the server system
 - One front panel cable, installed in the server system
- Documentation, drivers, and installation CD

Intel® Server System R1304BTLSHBN Contents

Your Intel® Server System R1304BTLSHBN ships with the following items:

- One Intel® Server Board S1200BTL installed in the server system
- One 350-W power supply module, installed in the server system
- Three system fans, with attached cables, installed in the server system:
- One passive heat sink, in the server system product box
- Four hot-swap hard disk drive carriers, installed in the server system.
- One PCI-E x 8 low profile riser card with supporting bracket, installed in the server system.
- Rack handles, installed in the server system
- Standard front panel, installed in the server system
- Standard HDD backplane, installed in the server system.
- Cables:
 - Four SATA cables, installed in the server system
 - One front panel USB cable, installed in the server system
 - One front panel cable, installed in the server system
 - One SPGIO cable, installed in the server system
 - One I2C cable, installed in the server system
- Documentation, drivers, and installation CD

Server System References

If you need more information about this product or information about the accessories that you can use with this server chassis, use the following resources.

For this Information or Software	Use this Document or Software
Technical information about the server chassis, including sub-system overviews and mechanical drawings	<i>Intel® Server System R1304BTSSFAN/R1304BTLSFAN/R1304BTLSHBN Technical Product Specification</i> <i>Intel® Server System S1200BT Technical Product Specification</i> http://www.intel.com/support/motherboards/server/
If you just received this product and need to install it	<i>Intel® Server System R1304BTLSFAN/R1304BTLSHBN Quick Start User's Guide</i> in the product box.
Accessories or other Intel server products	<i>Spares/Parts List & Configuration Guide</i> This is available from your Intel field representative or on the Server Configurator Tool at: http://serverconfigurator.intel.com/default.aspx
Hardware (peripheral boards, adapter cards) and operating systems that have been tested with this product	For the Tested Hardware Operating Systems List, you can go to the Intel® Server Configurator Tool: http://serverconfigurator.intel.com/default.aspx
Processors that have been tested with this product	Supported processors can be found at: http://www.intel.com/support/motherboards/server/
DIMMs that have been tested with this product	Supported memory can be found at: http://www.intel.com/support/motherboards/server/
To make sure your system falls within the allowed power budget	Power Budget Tool http://www.intel.com/support/motherboards/server/
For software to manage your Intel® server	Intel® System Management http://www.intel.com/support/motherboards/server/
For drivers	Driver (for an extensive list of drivers available) Operating System Driver (for operating system drivers) http://www.intel.com/support/motherboards/server/
For firmware and BIOS updates	Firmware can be found at: http://www.intel.com/support/motherboards/server/
For diagnostics test software	Diagnostics http://www.intel.com/support/motherboards/server/

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1 Server System Features

This chapter briefly describes the main features of the server system. This chapter provides illustrations of the product, a list of the server system features, and diagrams showing the location of important components and connections on the server system.



Figure 1. Intel® Server System R1304BTSSFAN/R1304BTLSFAN

Note: Figure 1 is shown without an optional optical drive installed.



Figure 2. Intel® Server System R1304BTLSHBN

Note: Figure 2 is shown with an optional optical drive installed.

Table 1 summarizes the features of the server system.

**Table 1. Intel® Server System R1304BTSSFAN/R1304BTLSFAN/
R1304BTLSHBN Feature Summary**

Feature	Description
Dimensions	<ul style="list-style-type: none"> • 1.67 inches high (4.24 centimeters) • 17.25 inches wide (43.82 centimeters) • 20 inches deep (50.80 centimeters) • 33 pounds (15 kilograms)
Server Board	Intel® Server System R1304BTSSFAN <ul style="list-style-type: none"> • Intel® Server Board S1200BTS Intel® Server System R1304BTLSFAN/R1304BTLSHBN <ul style="list-style-type: none"> • Intel® Server Board S1200BTL
Processor	Support for one Xeon® E3-1200 Series Processor or Intel® Core™ Processor i3-2100 Series in FC-LGA 1155 socket package. <ul style="list-style-type: none"> • 2.5 GT/s point-to-point DMI interface to PCH • LGA 1155 pin socket • Max TDP 95W
Memory	Two memory channels with support for 1066/1333 ECC Unbuffered (UDIMM). <ul style="list-style-type: none"> • Up to 2 UDIMMs per channel • 32 GB max with x8 ECC UDIMM (2 Gb DRAM)
Chipset	Intel® Server Board S1200BTS <ul style="list-style-type: none"> • Support for Intel® C202 Platform Controller Hub (PCH) Intel® Server Board S1200BTL <ul style="list-style-type: none"> • Support for Intel® C204 Platform Controller Hub (PCH) • ServerEngines* LLC Pilot III BMC controller (Integrated BMC)
Peripherals	Slimline bay for slimline SATA optical drive. One PCI Express* x8 add-in card slot (Gen 2).
I/O Control	External connections: <ul style="list-style-type: none"> • DB-15 video connectors • DB-9 serial Port A connector • Four USB 2.0 connectors • Two USB 2.0 connectors (front)
Expansion Capabilities (optional accessory required)	One low-profile riser slot supporting one low-profile half-length PCI Express* 2.0 x8 add-in card.
Fans	Supports three system fans.

**Table 1. Intel® Server System R1304BTSSFAN/R1304BTLSFAN/
R1304BTLSHBN Feature Summary**

Feature	Description
Video	Intel® Server Board S1200BTS <ul style="list-style-type: none"> • Silicon Motion SM712GX04LF02-BA Intel® Server Board S1200BTL <ul style="list-style-type: none"> • Onboard ServerEngines* LLC Pilot III BMC Controller
LAN	<ul style="list-style-type: none"> • One Gigabit Ethernet device 82574L connect to PCI-E x1 interfaces on the PCH • One Gigabit Ethernet PHY 82579 connected to PCH through PCI-E x1 interface
Hard Drives	Intel® Server System R1304BTSSFAN/R1304BTLSFAN: <ul style="list-style-type: none"> • Four Fixed SATA drives Intel® Server System R1304BTLSHBN: <ul style="list-style-type: none"> • Four Hot-Swappable SATA/SAS drives (SAS drives are supported when a SAS add-on card is installed)
Peripherals	Slimline bay for SATA optical drive (optional).
Front panel	Standard front panel
Power Supply	Intel® Server System R1304BTSSFAN/R1304BTLSFAN: <ul style="list-style-type: none"> • Single 250-W power supply Intel® Server System R1304BTLSHBN: <ul style="list-style-type: none"> • Single 350-W power supply
System Management	Intel® Server System R1304BTLSFAN/R1304BTLSHBN: Onboard LLC Pilot III Controller (Integrated BMC) <ul style="list-style-type: none"> • Integrated Baseboard Management Controller (Integrated BMC), IPMI 2.0 compliant • Integrated 2D video controller on PCI-E x 1 • Optional Intel® Remote Management Module 4 (RMM4) lite and optional dedicated NIC module

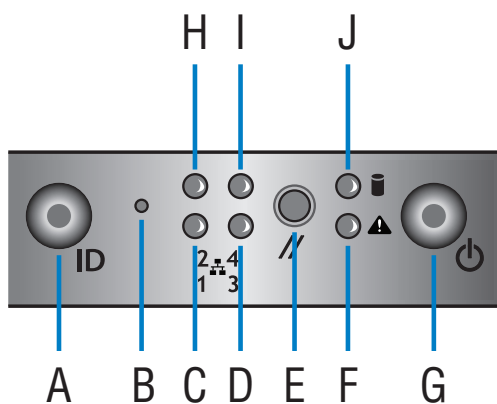
Chassis Component Identification

This section helps you identify the components of your server system. If you are near the system, you can also use the Quick Reference Label on the inside of the chassis cover to assist in identifying components.

System Front Panel

The front of the server system includes the following buttons and LEDs.

Note: The LAN3/4 LEDs are not used on the Intel® Server Systems R1304BTSSFAN/ R1304BTLFAN or R1304BTLHBN. Unstufferable ID Button with ID LED and Status/ Fault LED is not used on Intel® Server System R1304BTSSFAN.



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A. Unstufferable ID Button with ID LED	F. Status/Fault LED
B. NMI Button	G. Power Button with power LED
C. LAN1 LED	H. LAN2 LED
D. LAN3 LED	I. LAN4 LED
E. Reset Button	J. HDD LED

Figure 3. Front Controls and LEDs

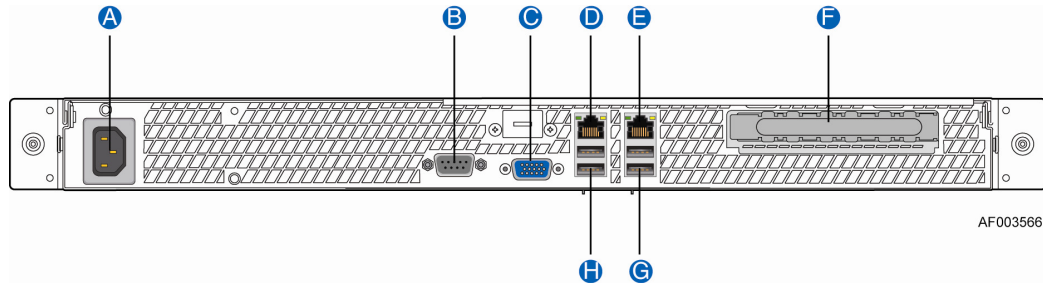
Table 2. Control Panel LED Functions

LED	Color	Condition	What It Means
Power/Sleep	Green	On	Power on or S0 sleep.
	Green	Blink	S1 sleep or S3 standby only for workstation baseboards.
		Off	Off (also sleep S4/S5 modes).

Table 2. Control Panel LED Functions

LED	Color	Condition	What It Means
Status	Green	On	System ready/No alarm.
	Green	Blink	System ready, but degraded: redundancy lost such as PS or fan failure; non-critical temp/voltage threshold; battery failure; or predictive PS failure.
	Amber	On	Critical alarm: Voltage, thermal, or power fault; CPU missing; insufficient power unit redundancy resource offset asserted.
	Amber	Blink	Non-Critical failure: Critical temp/voltage threshold; VDR hot asserted; min number fans not present or failed.
		Off	AC power off: System unplugged. AC power on: System powered off and in standby, no prior degraded\non-critical\critical state.
Global HDD Activity	Green	Blink	HDD access.
		Off	No access and no fault.
LAN 1-4 Activity/Link (LAN 1-2 for Intel® Server Board S1200BT)	Green	On	LAN link/no access.
	Green	Blink	LAN access.
		Off	Idle.
Chassis Identification	Blue	On	Front panel chassis ID button pressed.
	Blue	Blink	Unit selected for identification via software.
		Off	No identification.

System Rear



A. AC Power Connector	E. NIC 2 Connector (10/100/1000 MB)
B. Serial Port A	F. PCI Express* Slot
C. Video Connector	G. USB Ports
D. NIC 1 Connector (10/100/1000 MB)	H. USB Ports

Figure 4. Back Panel Connectors

The NIC LEDs at the right and left of each NIC provide the following information.

Table 3. NIC LED Descriptions

LED	LED State	LED State	NIC State
Left	Green	Off	LAN link is not established.
		On	LAN link is established.
		Blinking	LAN activity is occurring.
Right	N/A	Off	10 Mbit/sec data rate is selected
	Green	On	100 Mbit/sec data is selected
	Yellow	On	1000 Mbit/sec data rate is selected

Peripheral Devices (R1304BTSSFAN/R1304BTLSFAN)

The server system provides locations and hardware for installing hard drives, slimline CD-ROM drive, or DVD-ROM drive. You must purchase the drives separately. Available options include:

- Slimline Optical Drive Bay
- Hard Disk Drive Bay HDD0/HDD1/HDD2/HDD3

Peripheral Devices (R1304BTLSHBN)

The server system provides locations and hardware for installing hard drives, slimline CD-ROM drive, or DVD-ROM drive. You must purchase the drives separately. Available options include:

- Slimline Optical Drive Bay
- Four Hard Disk Drive Bays

Hard Disk Drives

The Intel® Server System R1304BTSSFAN/R1304BTLSFAN/R1304BTLSHBN provides six SATA ports.

For instructions on installing hard drives, see [“Installing and Removing a Hard Drive \(R1304BTSSFAN/R1304BTLSFAN\)”](#) on page 41 on Page 41.

Note: Each drive can consume up to 17 W of power. Drives must be specified to run at a maximum ambient temperature of 45°C.

Note: The Intel® Server System R1304BTSSFAN/R1304BTLSFAN/R1304BTLSHBN does not support all Serial ATA (SATA) hard drives. See [“Server System References”](#) on page xi on Page x for an Internet link to a list of supported hardware.

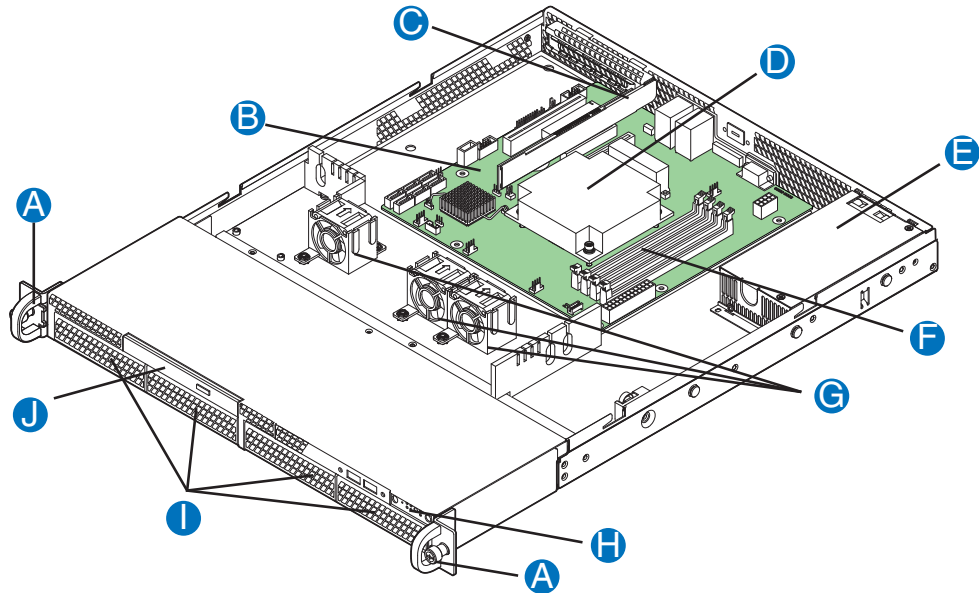
Slimline Optical Drive Carrier

One slimline drive carrier is included with your server system; you must purchase the optical drive separately. To use the slimline DVD drive provided by Intel, use order code AXXSATADVDRM. To use the slimline DVD CDRW drive provided by Intel, use order code AXXSATADVDRWROM.

Note: The Intel® Server System R1304BTSSFAN/R1304BTLSFAN/R1304BTLSHBN does not support all slimline optical drives. See [“Server System References”](#) on page xi for an Internet link to a list of supported hardware. Intel provides accessory kits for these drives.

For installation instructions for an optical drive, see [“Removing a Slimline Optical Drive”](#) on page 50.

Internal Components (R1304BTSSFAN)

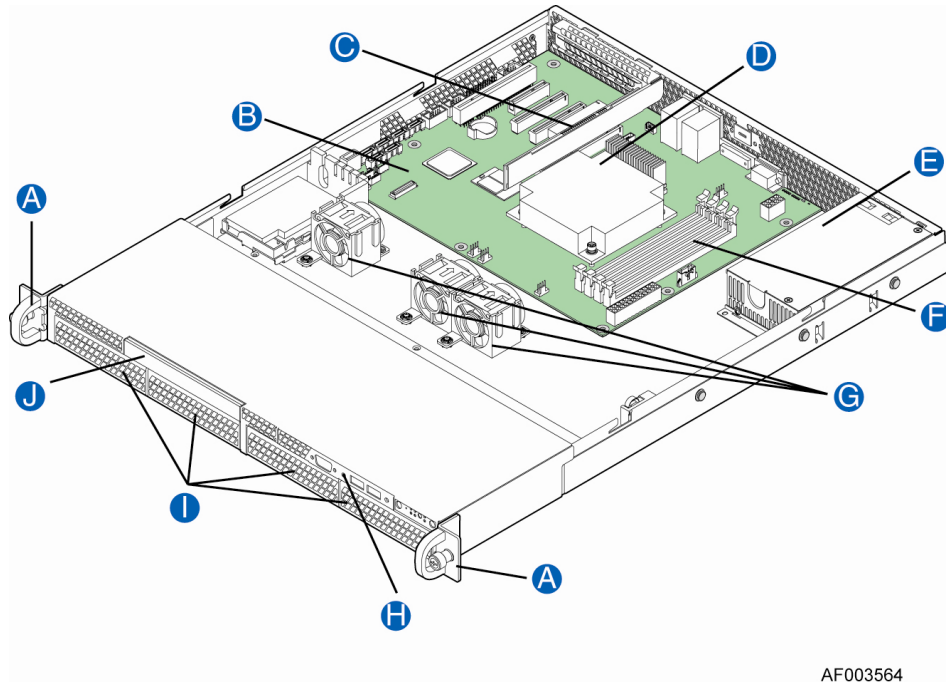


AF003908

A. Rack Handles (two)	F. System Memory DIMM Sockets
B. Server Board	G. Cooling Fans
C. PCIe* Riser Assembly	H. Front Panel
D. Processor and Heatsink	I. Hard Drive Bays
E. Power Supply	J. Front Panel Slimline Optical Drive

Figure 5. System Components (R1304BTSSFAN)

Internal Components (R1304BTLSFAN)

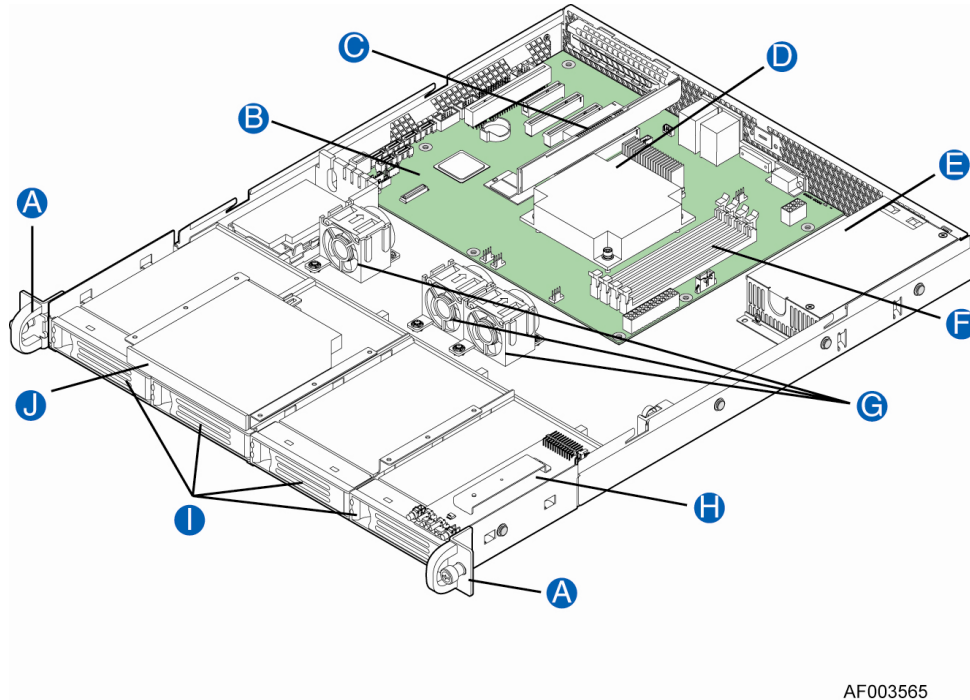


AF003564

A. Rack Handles (two)	F. System Memory DIMM Sockets
B. Server Board	G. Cooling Fans
C. PCIe* Riser Assembly	H. Front Panel
D. Processor and Heatsink	I. Hard Drive Bays
E. Power Supply	J. Front Panel Slimline Optical Drive

Figure 6. System Components (R1304BTLSFAN)

Internal Components (R1304BTLSHBN)

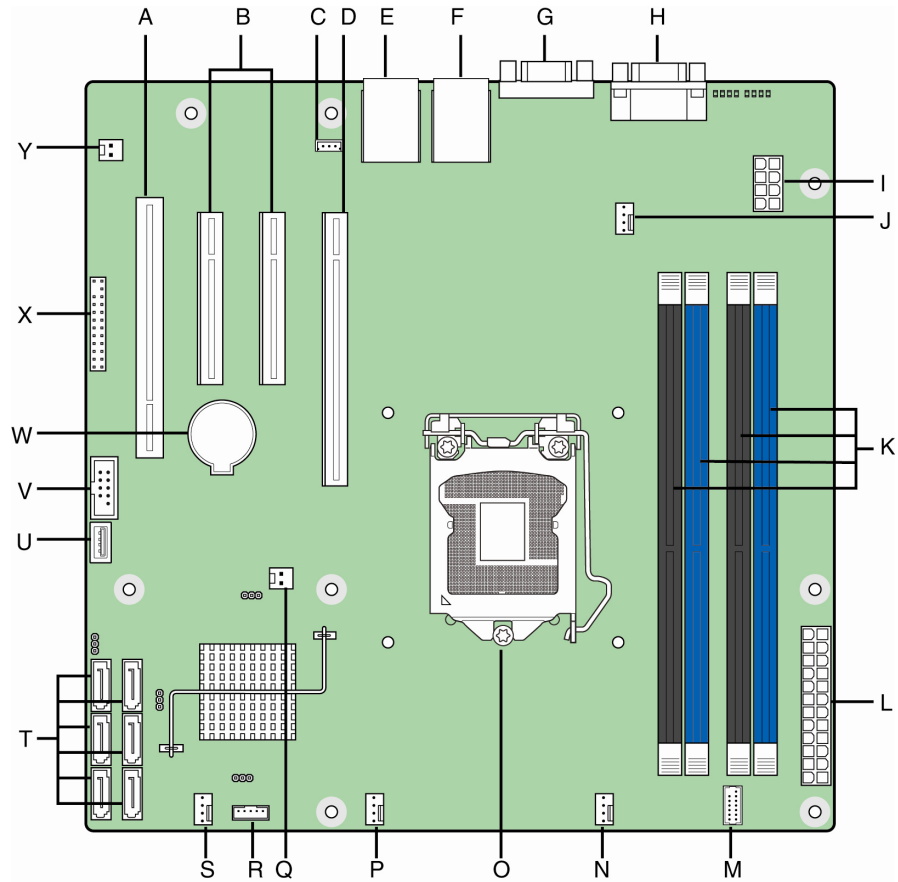


AF003565

A. Rack Handles (two)	F. System Memory DIMM Slots
B. Server Board	G. Cooling Fans
C. PCIe* Riser Assembly	H. Front Panel Board
D. Processor and Heatsink	I. Hard Drive Bays
E. Power Supply	J. Slimline Optical Drive

Figure 7. System Components (R1304BTLSHBN)

Server Board Connectors/Components (S1200BTS)



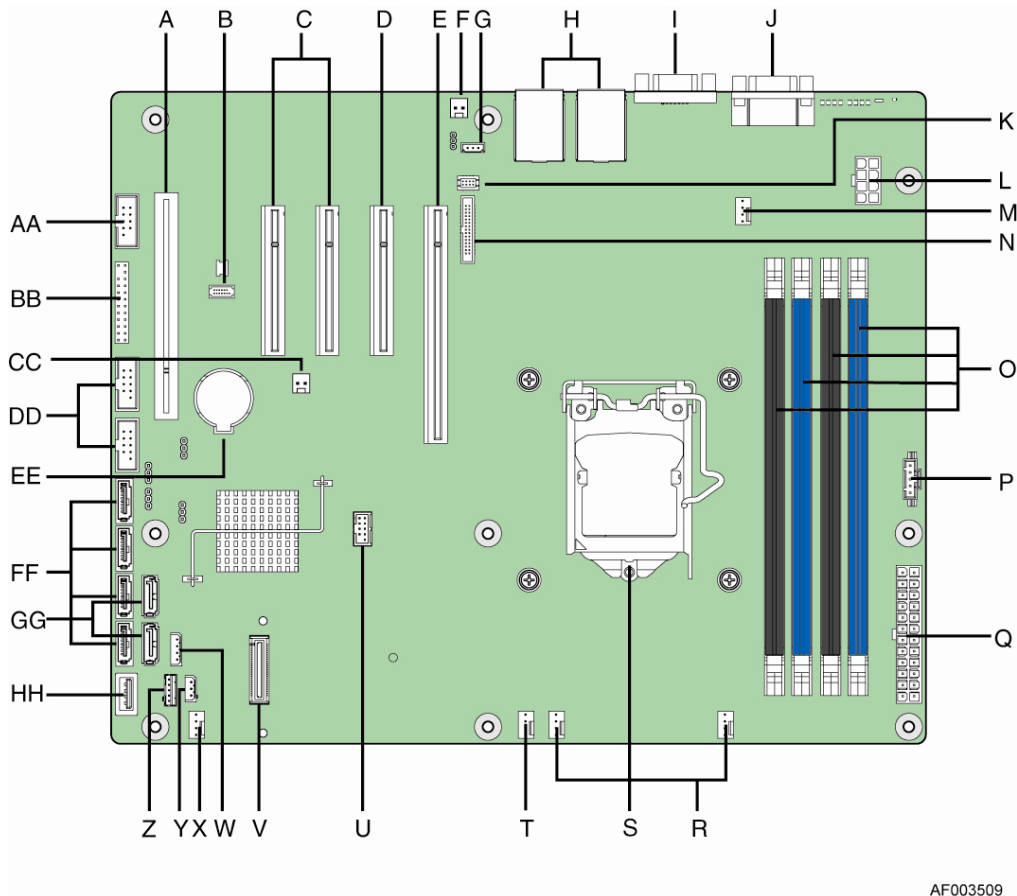
AF003624

A. Slot 4, 32 Mbit/33 MHz PCI	N. SYS_FAN_1
B. Slot 5/6, PCI Express* Gen2 x4 (x8 connector)	O. CPU connector
C. SATA_KEY	P. CPU Fan connector
D. Slot 7, PCI Express* Gen2 x8 (x16 connector)	Q. Chassis Intrusion
E. Ethernet and Dual USB COMBO	R. SATA_SGPIO
F. Ethernet and Dual USB COMBO	S. SYS_FAN_3
G. Video port	T. Six 3Gb/s SATA ports
H. External Serial port	U. Internal USB
I. CPU Power connector	V. Internal USB

J. SYS_FAN_2	W. CMOS battery
K. DIMM slots	X. Front Panel
L. MAIN power connector	Y. HDD LED
M. TPM connector	

Figure 8. Intel® Server Board S1200BTS Layout

Server Board Connectors/Components (S1200BTL)



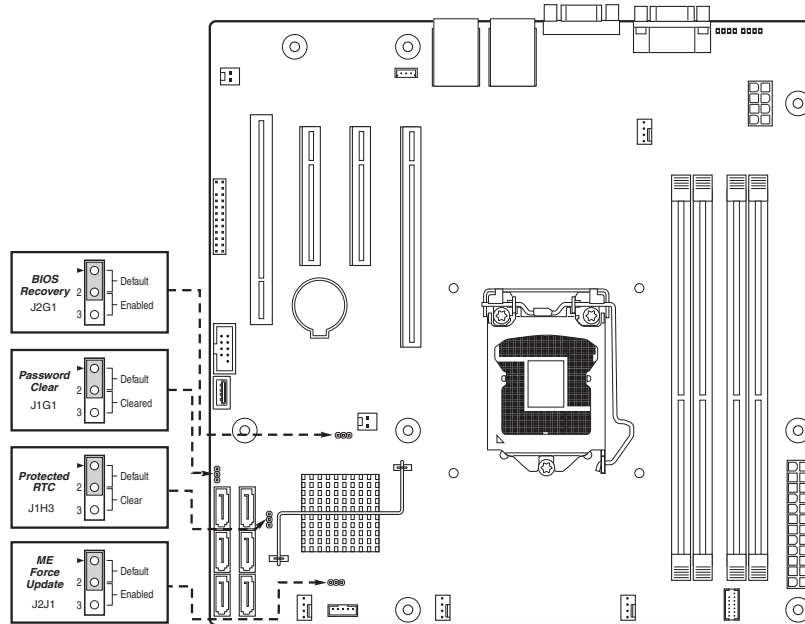
AF003509

A	Slot 1, 32 Mbit/33 MHz PCI	R	System FAN2 and System FAN3 Connector
B	TPM	S	CPU connector

C	Slot 3/4, PCI Express* Gen2 x4 (x8 connector)	T	CPU Fan connector
D	Slot 5, PCI Express* Gen2 x4 (x8 connector)	U	USB connector for smart module
E	Slot 6, PCI Express* Gen2 x8 (x16 connector)	V	SAS Module connector
F	Chassis Intrusion	W	IPMB
G	SATA_KEY	X	SYS_FAN_1
H	Two Ethernet and Dual USB COMBO	Y	HSBP
I	Video port	Z	SATA_SGPIO
J	External Serial port	AA	Internal Serial Connector
K	RMM4 Lite Connector	BB	Front Panel Connector
L	CPU Power Connector	CC	HDD LED
M	SYS_FAN_4	DD	Internal USB Connector
N	RMM4 Dedicated NIC connector	EE	CMOS battery
O	Four DIMM Slots	FF	Four 3Gb/s SATA ports
P	P/S AUX	GG	Two 6Gb/s SATA ports
Q	MAIN POWER	HH	Smart module

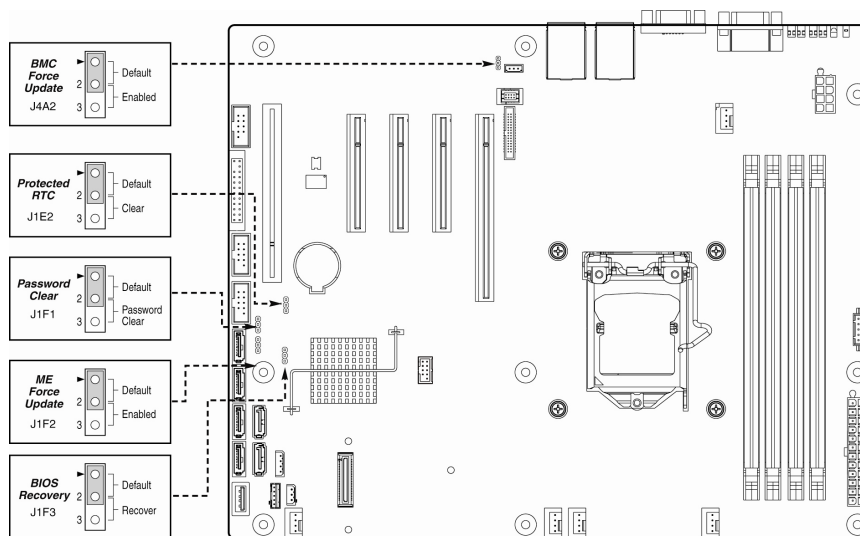
Figure 9. Intel® Server Board S1200BTL Layout

Configuration Jumpers



AF003618

Figure 10. Configuration Jumper Locations (S1200BTS)



AF003510

Figure 11. Configuration Jumper Locations

Jumper Name	Jumper Purpose
BIOS Recovery	<p>Jumper in normal position (pins 1-2) allows normal system operation with correct BIOS settings. System will POST normally.</p> <p>Jumper in maintenance mode (pins 2-3) allows Intel® AMT setting/ password reset.</p> <p>Jumper removed is used to recover from a corrupted BIOS. Bootable media with a valid BIOS ROM required.</p>
Password Clear	<p>Jumper in normal position (pins 1-2) allows the system to successfully POST and boot to the operating system environment. BIOS settings are kept intact.</p> <p>Jumper in clear position (pins 2-3) initiates a clearing of password.</p>
Protected RTC (CMOS clear)	<p>Jumper in normal position (pins 1-2) allows the system to successfully POST and boot to the operating system environment. BIOS settings are kept intact.</p> <p>Jumper in clear position (pins 2-3) initiates a clearing of NVRAM following POST. A system message confirms the Protected RTC (CMOS clear) operation was successful. This setting enforces default BIOS settings, which you can change by entering setup pressing F2, then exiting setup pressing F10 and saving changes.</p>
BMC Force Update	<p>Jumper in normal position (pins 1-2) disables BMC firmware force update.</p> <p>Jumper in clear position (pins 2-3) allows BMC firmware force update.</p>
ME Force Update	<p>Jumper in normal position (pins 1-2) disables ME firmware force update.</p> <p>Jumper in clear position (pins 2-3) allows ME firmware force update.</p>

Hardware Requirements

To avoid integration difficulties and possible board damage, your system must meet the following requirements outlined. For a list of qualified components, see the links under “[Server System References](#)” on page xi.

Processor

For a complete list of supported processors, see the links under “[Server System References](#)” on page xi.

Memory

The Intel® Server Board S1200BTS/S1200BTL supports a DDR3-based memory subsystem. The server board supports up to two DIMM sockets per channel.

Refer to the following table for channel slot configuration. For a complete list of supported memory DIMMs, see the links under “[Server System References](#)” on page xi.

Table 4. Memory Configuration Table

Configuration	DIMM_A1	DIMM_A2	DIMM_B1	DIMM_B2
1 DIMM Single Channel	A1 only Single Channel			
1 DIMM Single Channel			B1 only Single Channel	
2 DIMMs Single Channel	A1 Single Channel	A2 Single Channel		
2 DIMMs Single Channel			B1 Single Channel	B2 Single Channel
2 DIMMs Dual Channel Symmetric	A1 Dual Channel Symmetric		B1 Dual Channel Symmetric	
3 DIMMs Intel® Flex Memory	A1 Dual Channel Symmetric	A2 Dual Channel Asymmetric	B1 Dual Channel Symmetric	
3 DIMMs Intel® Flex Memory	A1 Dual Channel Symmetric		B1 Dual Channel Symmetric	B2 Dual Channel Asymmetric
4 DIMMs Dual Channel Symmetric	A1 Dual Channel Symmetric	A2 Dual Channel Symmetric	B1 Dual Channel Symmetric	B2 Dual Channel Symmetric

The Independent Channel Mode is the default Maximum Performance Mode preferred for Intel® Xeon® E3-1200 based platforms. All three channels may be populated in any order and have no matching requirements. All channels must run at the same interface frequency, but individual channels may run at different DIMM timings (RAS latency, CAS latency, and so on).

2 Server Utilities

Using the BIOS Setup Utility

This section describes the BIOS Setup Utility options, which are used to change server configuration defaults. You can run BIOS Setup with or without an operating system present. See the links under “[Server System References](#)” on page xi for a link to the *Intel® Server Board S1200BT Technical Product Specification* where you will find details about specific BIOS setup screens.

Starting Setup

You can enter and start BIOS Setup under several conditions:

- When you turn on the server, after POST completes the memory test.
- When you have moved the CMOS jumper on the server board to the “Clear CMOS” position (enabled).

In the two conditions listed previously, during the Power On Self Test (POST), you will see this prompt:

```
Press <F2> to enter SETUP
```

In a third condition, when CMOS/NVRAM is corrupted, you will see other prompts but not the <F2> prompt:

```
Warning: CMOS checksum invalid  
Warning: CMOS time and date not set
```

In this condition, the BIOS loads the default values for CMOS and attempts to boot.

If You Cannot Access Setup

If you cannot access the BIOS Setup, you might need to clear the CMOS memory. For instructions on clearing the CMOS, see “[Clearing the CMOS](#)” on page 24.

Setup Menus

Each BIOS Setup menu page contains a number of features. Except for those features that are provided only to display automatically configured information, each feature is associated with a value field that contains user-selectable parameters. A user can change these parameters if they have adequate security rights. If a value cannot be changed for any reason, the feature's value field is inaccessible.

“Setup Menu Key Use” describes the keyboard commands you can use in the BIOS Setup menus.

Table 5. Setup Menu Key Use

Key to Press	Description
<F1>	Pressing the <F1> key on any menu opens the general help window.
Left and right arrows	The left and right arrow keys are used to move between the major menu pages. The keys have no effect if a submenu or pick list is displayed.
Up arrow	Select Item up - The up arrow is used to select the previous value in a menu item's option list, or a value field pick list. Pressing <Enter> activates the selected item.
Down arrow	Select Item down - The down arrow is used to select the next value in a menu item's option list, or a value field pick list. Pressing <Enter> activates the selected item.
<F5> or <->	Change Value - The minus key or the <F5> function key is used to change the value of the current item to the previous value. This key scrolls through the values in the associated pick list without displaying the full list.
<F6> or <+>	Change Value - The plus key or the <F6> function key is used to change the value of the current menu item to the next value. This key scrolls through the values in the associated pick list without displaying the full list. On 106-key Japanese keyboards, the plus key has a different scan code than the plus key on the other keyboard, but it has the same effect.
<Enter>	Execute Command - The <Enter> key is used to activate submenus when the selected feature is a submenu, or to display a pick list if a selected feature has a value field, or to select a sub-field for multi-valued features like time and date. If a pick list is displayed, pressing <Enter> will undo the pick list, and allow another selection in the parent menu.
<Esc>	Exit - The <Esc> key provides a mechanism for backing out of any field. This key will undo the pressing of the <Enter> key. When <Esc> is pressed while editing any field or selecting features of a menu, the parent menu is re-entered. When <Esc> is pressed in any submenu, the parent menu is re-entered. When <Esc> is pressed in any major menu, the exit confirmation window displays and the user is asked whether they want to discard their changes.
<F9>	Setup Defaults - Pressing <F9> causes the following to display: <pre style="text-align: center;"> Setup Confirmation Load default configuration now? [Yes] [No] </pre> If “Yes” is selected and <Enter> is pressed, all Setup fields are set to their default values. If “No” is selected and <Enter> is pressed, or <Esc> is pressed, the user is returned to where they were before <F9> was pressed without affecting any existing field values.

Table 5. Setup Menu Key Use

Key to Press	Description
<F10>	<p>Save and Exit - Pressing <F10> causes the following message to display:</p> <pre> Setup Confirmation Save Configuration changes and exit now? [Yes] [No]</pre> <p>If “Yes” is selected and <Enter> is pressed, all changes are saved and Setup is exited. If “No” is selected and <Enter> is pressed, or <Esc> is pressed, the user is returned to where they were before <F10> was pressed without affecting any existing values.</p>

Upgrading the BIOS

The upgrade utility allows you to upgrade the BIOS in flash memory. The code and data in the upgrade file include the following:

- On-board system BIOS, including the recovery code, BIOS Setup Utility, and strings.
- On-board video BIOS, and other option ROMs for devices embedded on the server board.
- OEM binary area
- Microcode

Preparing for the Upgrade

The following steps explain how to prepare to upgrade the BIOS, including how to record the current BIOS settings and obtain the upgrade utility.

Note: *In the unlikely event that a BIOS error occurs during the BIOS update process, you may need to follow a recovery process to return the system to service. See “[Server System References](#)” on page xi for a link to necessary software and instructions.*

Recording the Current BIOS Settings

1. Boot the computer and press <F2> when you see the following message:
Press <F2> Key if you want to run SETUP
2. Write down the current settings in the BIOS Setup program.

Note: *Do not skip Step 2. You need these settings to configure your server at the end of the procedure.*

Obtaining the Upgrade

Download the BIOS image file to a temporary folder on your hard drive. See [“Server System References” on page xi](#) for a link to the update software.

Note: *Before attempting a BIOS upgrade, review the instructions and release notes provided in the readme file distributed with the BIOS image file. The release notes contain critical information regarding jumper settings, specific fixes, and other information to complete the upgrade.*

Upgrading the BIOS

Follow the instructions in the readme file that came with the BIOS upgrade. When the update completes, remove the bootable media from which you performed the upgrade.

Caution: *Do not power down the system during the BIOS update process!*

Note: *You may encounter a CMOS Checksum error or other problem after reboot. If this happens, shut down the system and boot it again. CMOS checksum errors require that you enter Setup, check your settings, save your settings, and exit Setup.*

Recovering the BIOS

If an update to the system BIOS is not successful or if the system fails to complete POST and the BIOS is unable to boot an operating system, it may be necessary to run the BIOS recovery procedure.

To place the baseboard into recovery mode, move the boot option jumper (located on the baseboard) to the recovery position. The BIOS can then execute the recovery BIOS (also known as the boot block) instead of the normal BIOS. The recovery BIOS is a self-contained image that exists solely as a fail-safe mechanism for installing a new BIOS image.

Note: *During the recovery mode, video is not initialized. One high-pitched beep announces the start of the recovery process. The entire process takes two to four minutes. A successful update ends with two high-pitched beeps. Failure is indicated by a long series of short beeps.*

Recovering the BIOS

The following steps boot the recovery BIOS and flashes the normal BIOS:

1. Power down and unplug the system from the AC power source.
2. Move the recovery jumper from the default location at pins 1 and 2 to cover pins 2 and 3. For location of the jumper, see [“Configuration Jumpers” on page 14](#).

3. Insert the bootable BIOS Recovery media containing the new BIOS image files. A BIOS recovery can be accomplished from SATA CD and USB Mass Storage device. Please note this platform does not support recovery from a USB floppy. The recovery media must contain the following files under the root directory:
 - ❖ FVMAIN.FV
 - ❖ UEFI iFlash32
 - ❖ *Rec.CAP
 - ❖ Startup.nsh (update accordingly to use proper *Rec.CAP file)
4. Plug the system into the AC power source and power it on.
5. The BIOS POST screen will appear displaying the progress, and the system will automatically boot to the EFI SHELL.
6. Remove the recovery media.
7. Power down and unplug the system from the AC power source.
8. Move the BIOS recovery jumper back to the original position, covering pins 1 and 2.
9. Plug the system into the AC power source and power it up to confirm the recovery was successful.
10. Do NOT interrupt the BIOS POST during the first boot.

Clearing the Password

11. If the user or administrator password(s) is lost or forgotten, moving the password clear jumper into the “clear” position clears both passwords. Before a new password(s) is set, you must restore the password clear jumper to its original position. For location of the jumper, see [“Configuration Jumpers” on page 14](#).
 1. Power down the system and disconnect the AC power.
 2. Open the server chassis.
 3. Move the jumper from the normal operation position, Password Clear Protect, at pins 1 and 2 to the Password Clear Erase position, covering pins 2 and 3.
 4. Reconnect the AC power, power up the system.
 5. Power down the system and disconnect the AC power.
 6. Return the Password Clear jumper to the Password Clear Protect position, covering pins 1 and 2.
 7. Reconnect the AC power and power up the server.
 8. Close the server chassis. The password is cleared and can be reset by going into the BIOS setup.

Clearing the CMOS

9. If you cannot access the BIOS setup screens, you must use the Protected RTC (CMOS clear) jumper to reset the configuration RAM. For location of the jumper, see [“Configuration Jumpers” on page 14](#).
1. Power down the system and disconnect the AC power.
2. Open the server chassis. For instructions, see your server chassis documentation.
3. Move the jumper from the default operating position (covering pins 1 and 2) to the reset/clear position (covering pins 2 and 3).
4. Wait five seconds.
5. Move the jumper back to default position, covering pins 1 and 2.
6. Close the server chassis.
7. Reconnect the AC power and power up the system. The CMOS is cleared and can be reset by going into the BIOS setup.

Updating the Integrated BMC

8. When performing the standard Integrated BMC firmware update procedure, the update utility places the Integrated BMC into an update mode, allowing the firmware to load safely onto the flash device. In the unlikely event the Integrated BMC firmware update process fails (due to the Integrated BMC not being in the proper update state), the server board provides an Integrated BMC Force Update jumper, which forces the Integrated BMC into the proper update state. You should complete the following procedure in the event the standard Integrated BMC firmware update process fails. For location of the jumper, see [“Configuration Jumpers” on page 14](#).

Note: *Normal Integrated BMC functionality is disabled with the Force Integrated BMC Update jumper set to the enabled position. The server should never be run with the Integrated BMC Force Update jumper set in this position. This jumper setting should only be used when the standard firmware update process fails. This jumper should remain in the default/disabled position when the server is running normally.*

1. Power down and remove the AC power cord.
2. Open the server chassis. For instructions, refer to your server chassis documentation.
3. Move the jumper from the default operating position (covering pins 1 and 2) to the enabled position (covering pins 2 and 3).
4. Close the server chassis.
5. Reconnect the AC cord and power up the server.
6. Perform the Integrated BMC firmware update procedure as documented in the README.TXT file included in the given Integrated BMC firmware update package. After successful completion of the firmware update process, the firmware

update utility may generate an error stating the Integrated BMC is still in update mode.

7. Power down and remove the AC power cord.
8. Open the server chassis.
9. Move jumper from the enabled position (covering pins 2 and 3) to the disabled position (covering pins 1 and 2).
10. Close the server chassis.
11. Reconnect the AC cord and power up the server.

Updating ME Firmware

When performing the standard ME force update procedure, the update utility places the ME into an update mode, allowing the ME to load safely onto the flash device. In the unlikely event ME firmware update process fails due to ME not being in the proper update state, the server board provides an Integrated BMC Force Update jumper, which forces the ME into the proper update state. The following procedure should be completed in the event the standard ME firmware update process fails.

1. Power down and remove the AC power cord.
2. Open the server chassis. For instructions, see your server chassis documentation.
3. Move jumper from the default operating position (covering pins 1 and 2) to the enabled position (covering pins 2 and 3).
4. Close the server chassis.
5. Reconnect the AC cord and power up the server.
6. Perform the ME firmware update procedure as documented in the README.TXT file that is included in the given ME firmware update package (same package as BIOS).
7. Power down and remove the AC power cord.
8. Open the server chassis.
9. Move jumper from the enabled position (covering pins 2 and 3) to the disabled position (covering pins 1 and 2).
10. Close the server chassis.
11. Reconnect the AC cord and power up the server.

3 Hardware Installations and Upgrades

Caution: No components in the Intel® Server System R1304BTSSFAN/R1304BTLSEFAN are hot-swappable. Before removing or installing any component in this server system, you must first take the server out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the AC power cord from the system or wall outlet.

Note: Some components in the Intel® Server System R1304BTLSEHBN are hot-swappable and are noted as such (where applicable) in the following instructions.

Note: Most of the illustrations in this chapter show the Intel® Server System R1304BTLSEFAN with an optional optical drive installed. Unless otherwise noted, the instructions for removing and installing components are the same for the Intel® Server System R1304BTSSFAN/R1304BTLSEHBN. When instructions differ, separate illustrations are shown for the Intel® Server System R1304BTSSFAN or R1304BTLSEHBN.

Before You Begin

Before working with your server product, pay close attention to the “[Safety Information](#)” on page iii.

Tools and Supplies Needed

- Phillips* (cross head) screwdriver, #1 bit and #2 bit
- Antistatic wrist strap and conductive foam pad (recommended)

System References

All references to the left, right, front, top, and bottom assume the reader is facing the front of the server system as it would be positioned for normal operation.

Removing and Installing the Server Cover

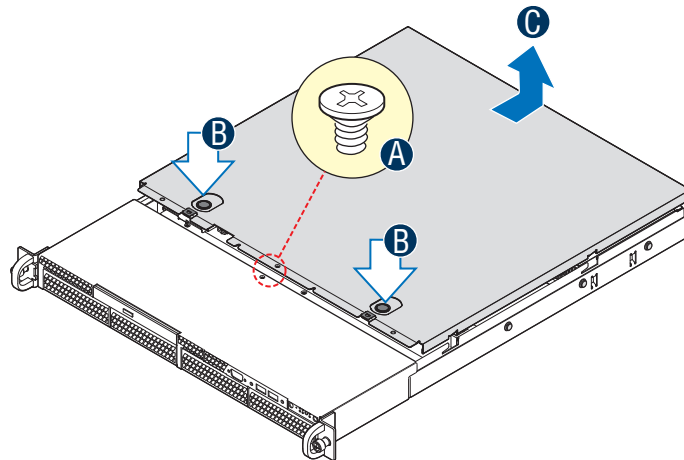
Removing the Server System Cover

You must operate the server system with the server system cover in place to ensure proper cooling. You must remove the cover to add or replace components inside of the server.

None of the internal components are hot-swappable. Before removing the server system cover, power down the server and unplug all peripheral devices and the AC power cable.

Note: You may need a non-skid surface or a stop behind the server system to prevent the server system from sliding on your work surface.

1. Observe the safety and ESD precautions at the beginning of this book. See “[Safety Information](#)” on page iii.
2. Turn off all peripheral devices connected to the server. Turn off the server.
3. Disconnect the AC power cord.
4. Remove the screw at the front of the chassis. See letter “A” in Figure 12.
5. Push down the two buttons, then push rearward. See letter “B” in Figure 15. Slide the cover back until it stops and then lift the cover upward to remove it. See letter “C” in Figure 12.

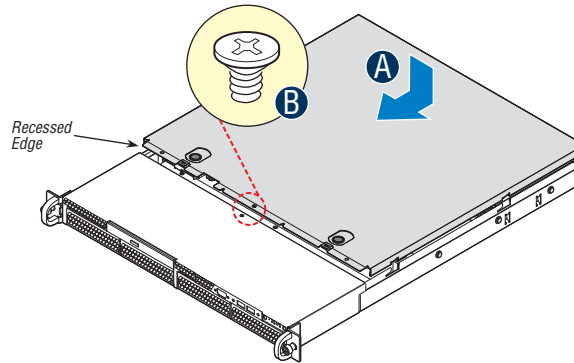


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Figure 12. Removing the Server System Cover

Installing the Server System Cover

1. Observe the safety and ESD precautions at the beginning of this book. See “[Safety Information](#)” on page iii.
2. Place the cover over the server system so that the side edges of the cover sit just inside the server system sidewalls. Slide the cover forward. See letter “A” in Figure 13.
3. Install the screw at the front of the server. See letter “B” in Figure 13.



AF003703

Figure 13. Installing the Server System Cover

4. Reconnect all peripheral devices and the AC power cord.

Removing and Installing the Processor Air Duct

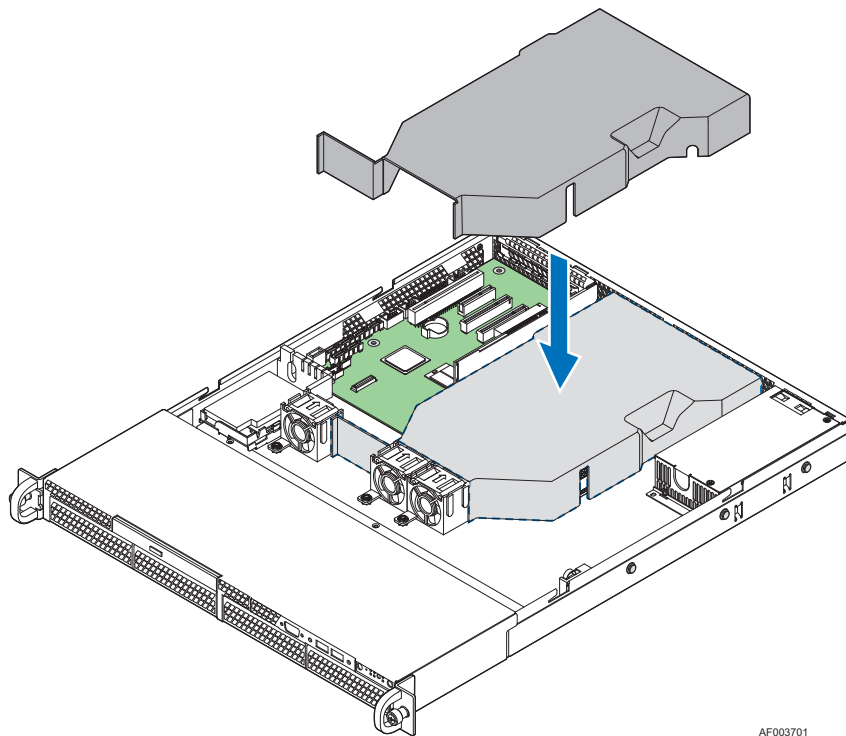
Always operate your server system with the processor air duct in place. The air duct is required for proper airflow within the server system.

Removing the Processor Air Duct

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information” on page iii](#).
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover” on page 28](#).
4. Lift the processor air duct from its location.

Installing the Processor Air Duct

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information”](#) on page iii.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover”](#) on page 28.
4. Lower the air duct into place, insert the two hooks at the front of the processor air duct into the corresponding slots on the bracket. Use caution not to pinch or disengage cables that may be near or under the air duct.
5. Install the server system cover. For instructions, see [“Installing the Server System Cover”](#) on page 29.



AF003701

Figure 14. Installing the Processor Air Duct

Installing and Removing Memory

Caution: *The memory is NOT hot-swappable. Before removing or replacing any memory DIMM, you must first take the server out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the AC power cord from the system or wall outlet.*

The silkscreen on the board for the DIMMs displays DIMM A1, DIMM A2, DIMM B1, and DIMM B2 starting from the center of the board. See [“Memory” on page 16](#) for a discussion of the memory requirements and options. See [“Server System References” on page xi](#) for a link to the list of tested DIMMs.

Installing DIMMs

To install DIMMs, follow these steps:

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information” on page iii](#).
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover” on page 28](#).
4. Locate the DIMM sockets. See Figure 15.

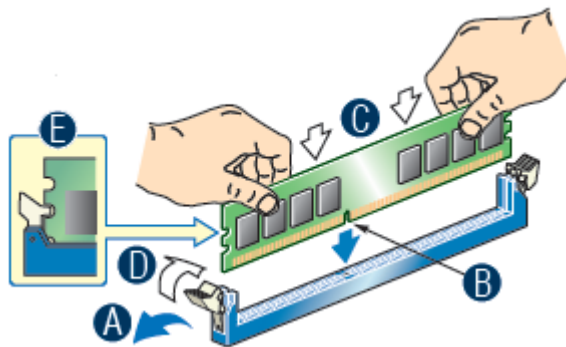


Figure 15. Installing the Memory

5. Make sure the clips at both ends of the DIMM socket(s) are pushed outward to the open position. See letter “A” in Figure 15.
6. Holding the DIMM by the edges, remove it from its anti-static package.
7. Position the DIMM above the socket. Align the notch on the bottom edge of the DIMM with the key in the DIMM socket. See letter “B” in Figure 15.
8. Insert the bottom edge of the DIMM into the socket. See letter “C” in Figure 15.
9. When the DIMM is correctly positioned, push down on the top edge of the DIMM until the retaining clips snap into place.
10. Make sure the clips are firmly in place. See letter “D” in Figure 15.
11. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29](#).

Removing DIMMs

To remove a DIMM, follow these steps:

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information” on page iii](#).

2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover” on page 28](#).
4. Locate the DIMM sockets. See Figure 15.
5. Gently spread the retaining clips at each end of the socket. The DIMM lifts from the socket.
6. Holding the DIMM by the edges, lift it from the socket, and store it in an anti-static package.
7. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29](#).

Replacing the Processor

Note: This manual assumes a processor is already installed and you are referring to these steps to replace your processor. If you are setting up this system for the first time, see the *Quick Start User's Guide* included in the product box.

Caution: Use only processors validated to work with this server board. See [“Server System References”](#) on page xi for a link to the list of compatible processor(s).

Caution: ESD and handling processors: Reduce the risk of electrostatic discharge (ESD) damage to the processor by doing the following: (1) Touch the metal chassis before touching the processor or server board. Keep part of your body in contact with the metal chassis to dissipate the static charge while handling the processor. (2) Avoid moving around unnecessarily.

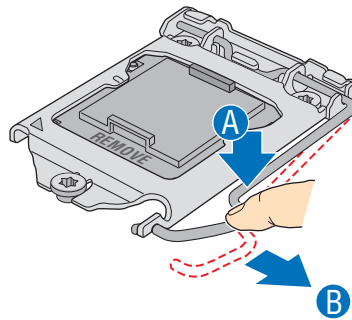
Removing the Heat Sink and Processor

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information”](#) on page iii.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover”](#) on page 28.
4. Loosen the four captive screws on the corners of the heat sink.
5. Twist the heat sink slightly to break the seal between the heat sink and the processor.
6. Lift the heat sink from the processor. If it does not pull up easily, twist the heat sink again. Do not force the heat sink from the processor. Doing so could damage the processor.
7. Lift the processor lever.
8. Raise the CPU load plate.
9. Remove the processor.
10. If installing a replacement processor, see [“Installing the Processor”](#) on page 36. Otherwise, install the protective socket cover over the empty processor socket and then reinstall the chassis cover.

Installing the Processor

To install a processor, follow these instructions:

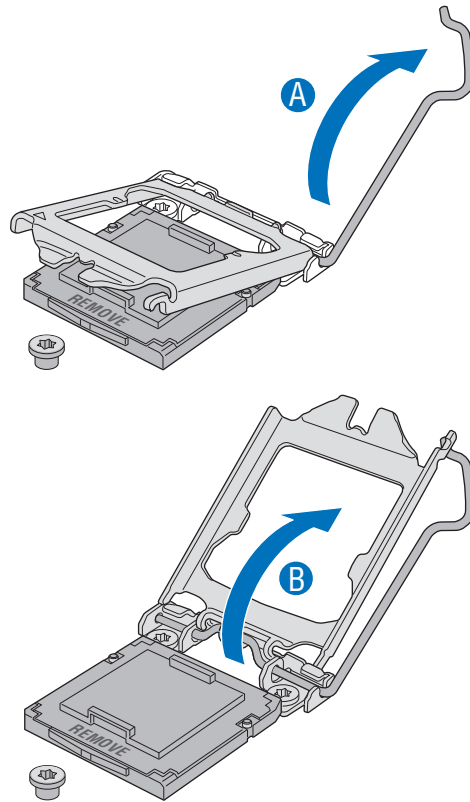
1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information” on page iii](#).
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover” on page 28](#).
4. Locate the processor socket and raise the socket handle completely. See [Figure 16](#).



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Figure 16. Lifting the Processor Socket Handle

5. Push the rear tab with your finger to slightly lift the front of the load plate. Raise the load plate completely. Raise the CPU load plate (see [Figure 17](#)).

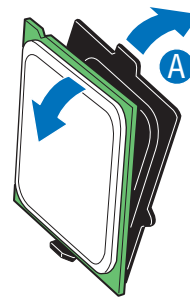


AF003187

Figure 17. Opening the Load Plate

Caution: Do not touch the socket pins; they are very sensitive and easily damaged.

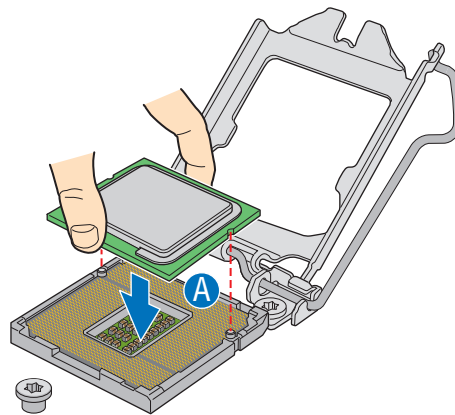
6. Remove the processor from the packaging box and remove the protective shipping cover. See [Figure 18](#).



AF003189

Figure 18. Removing the Shipping Cover

7. Orient the processor with the socket so the processor cutouts match the socket notches. See letter “A” in [Figure 19](#).
8. Set the processor into place as shown by letter “B” in [Figure 19](#).

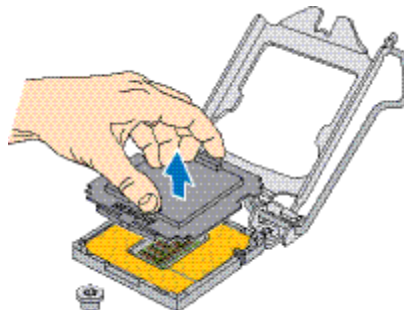


AF003190

Figure 19. Installing the Processor

Note: Make sure the alignment triangle mark and the alignment triangle cutout align correctly.

9. Remove the protective socket cover. See [Figure 20](#).



AF003188

Figure 20. Removing the Protective Socket Cover

Note: Retain the protective socket cover for use when removing a processor that will not be replaced.

10. Lower the CPU load plate.
11. Lower the socket lever.
12. Install the heat sink. For instructions, see “[Installing the Heat Sink](#)” on page 39.

Installing the Heat Sink

Before installing the heat sink, you must install your processor. For instructions, see “Installing the Processor” on page 36.

Caution: The heat sink has Thermal Interface Material (TIM) located on the bottom of it. Use caution when you unpack the heat sink so you do not damage the TIM.

1. Remove the protective cover from the TIM on the underside of the heat sink. Do not touch the TIM.
2. Orient the heat sink over the processor as shown in Figure 21. You must position the fins as shown to provide correct airflow through the system.
3. Set the heat sink over the processor, lining up the four captive screws with the four posts surrounding the processor.
4. Loosely screw in the captive screws on the heat sink corners in a diagonal manner as shown by the four circled numbers in Figure 21. Do not fully tighten one screw before tightening another.
5. Gradually and equally tighten each captive screw in the same order until each is firmly tightened.

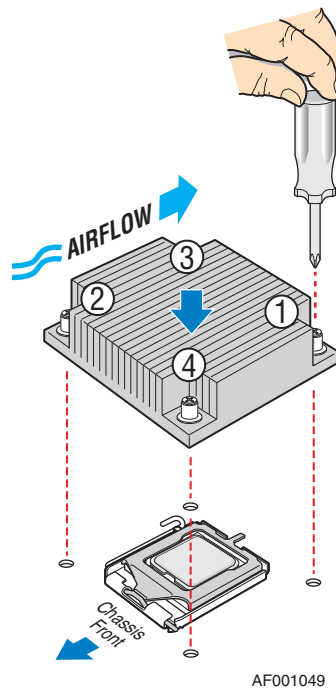


Figure 21. Installing the Heat Sink

6. Reinstall and reconnect any parts you removed or disconnected to reach the processor sockets.

7. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29](#).

Installing and Removing a Hard Drive (R1304BTSSFAN/R1304BTLSFAN)

Caution: *The hard drives are NOT hot-swappable. Before removing or replacing a hard drive, you must first take the server out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the AC power cord from the system or wall outlet.*

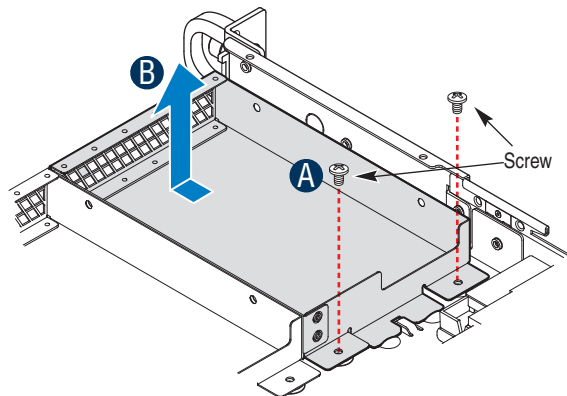
You can install up to four SATA drives. The HDD0 drive bay is at the left side of the chassis. The HDD1 drive bay is at the right side of HDD0. You do not need to install the drives in order; you can install HDD1, HDD2, or HDD3 before HDD0.

Note: *The server system does not support all hard drives. See “[Server System References](#)” on [page xi](#) for an Internet link to a list of supported hardware.*

Installing a Hard Disk Drive (R1304BTSSFAN/R1304BTLSFAN)

Note: *If you are replacing a hard drive, see “[Installing and Removing a Hard Drive \(R1304BTSSFAN/R1304BTLSFAN\)](#)” on [page 41](#) for instructions first. Return to these steps when directed.*

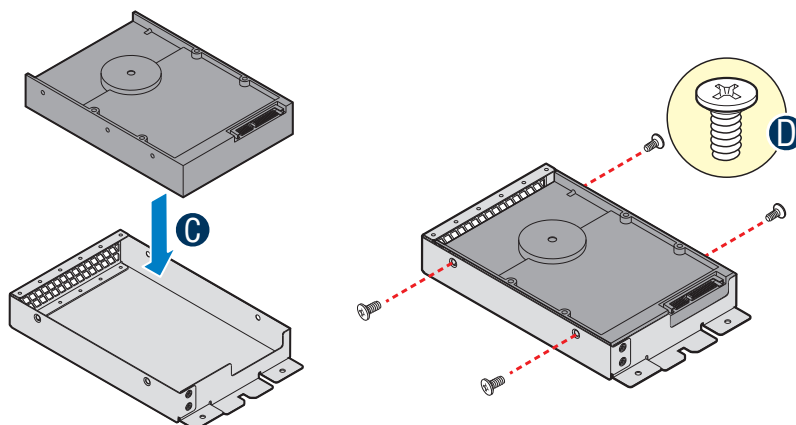
1. Observe the safety and ESD precautions at the beginning of this book. See “[Safety Information](#)” on [page iii](#).
2. Power down the server. Unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see “[Removing the Server System Cover](#)” on [page 28](#).
4. Locate the drive position you want to use.
5. Remove the screws that holds the hard drive bracket to the chassis. See letter “A” in [Figure 22](#). Save the screws. You will use them to reinstall the drive assembly later.
6. Slide-out the drive carrier from the chassis. See letter “B” in [Figure 22](#).



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Figure 22. Removing Drive Carrier from the Server System (R1304BTLFAN)

7. Insert hard drive into the carrier with the bottom-side of the drive facing up.
8. Attach the hard drive to the carrier with four screws as shown.
9. Re-install the hard drive/carrier assembly into the chassis.



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Figure 23. Installing Drive into Drive Carrier (R1304BTSSFAN/ R1304BTLFAN)

10. Secure the hard drive/carrier assembly with the screws.
11. Connect the data cables to the drive(s).
12. Connect the power cables to the drive(s).
13. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29](#).

Removing a Hard Disk Drive (R1304BTSSFAN/ R1304BTL SFAN)

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information” on page iii](#).
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover” on page 28](#).
4. Disconnect the power and data cables from the drive.
5. Remove the screws that holds the hard drive bracket to the chassis. Save this screw. You will use it to reinstall the drive assembly later.
6. Remove the drive carrier from the chassis.
7. Remove the four screws that attach the hard drive to the drive carrier. Lift the drive from the carrier. Store the drive in an anti-static bag.
8. If you are installing a new drive, skip the rest of these steps and instead see [“Installing and Removing a Hard Drive \(R1304BTSSFAN/R1304BTL SFAN\)” on page 41](#), beginning with step 7.
9. Insert the screws that held the drive in the carrier into the screw-locations on the carrier for future use.
10. Set the drive assembly into place in the chassis.
11. Attach the drive assembly to the chassis with the screws that you removed in Step 5.

Note: *You must install the assembly that contains the optical drive bracket at the left side of the system.*

12. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29](#).

Installing and Removing a Hot-Swap SATA Drive (R1304BTLSHBN)

You can install up to three hot swappable SATA drives. The HDD0 drive bay is at the left side. You do not need to install the drives in order; you can install HDD1 before HDD0.

Cautions: *If you install less than four drives or devices, the empty drive bays must be occupied by carriers with baffles to maintain proper system cooling.*

Note: *The server system does not support all hard drives. See “Server System References” on page xi for an Internet link to a list of supported hardware.*

Installing a Hot-Swap SATA Drive (R1304BTLSHBN)

1. If it is installed, remove the front bezel.
2. Locate the drive position you want to use.
3. Open the latch at the front of the hard drive carrier. See letter "A" in Figure 24.

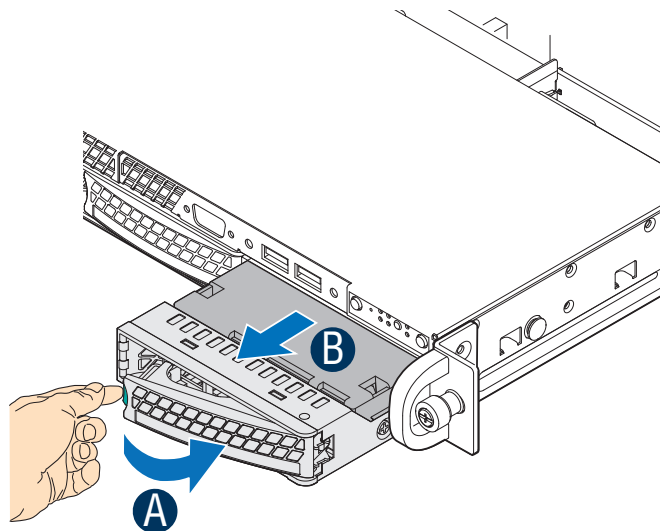
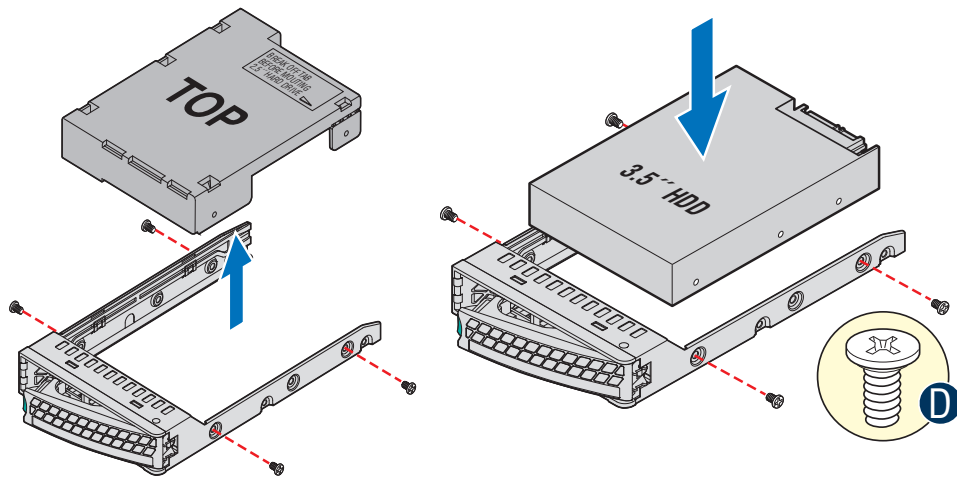


Figure 24. Removing the Drive Carrier (R1304BTLSHBN)

4. Pull out on the black lever and slide the carrier from the server system.
5. Remove the four screws that attach the plastic retention device or the previously installed hard drive to the drive carrier. Two screws are at each side of the retention device or the hard drive. Store the plastic retention device for future use.
6. Remove the hard drive from its wrapper and place it on an antistatic surface.
7. Set any jumpers and/or switches on the drive according to the drive manufacturer's instructions.

8. With the drive circuit-side down, position the connector end of the drive so it is facing the rear of the drive carrier.
9. Align the holes in the drive to the holes in the drive carrier and attach it to the carrier with the screws that were attached to the plastic retention device. See letter “D” in [Figure 25](#).

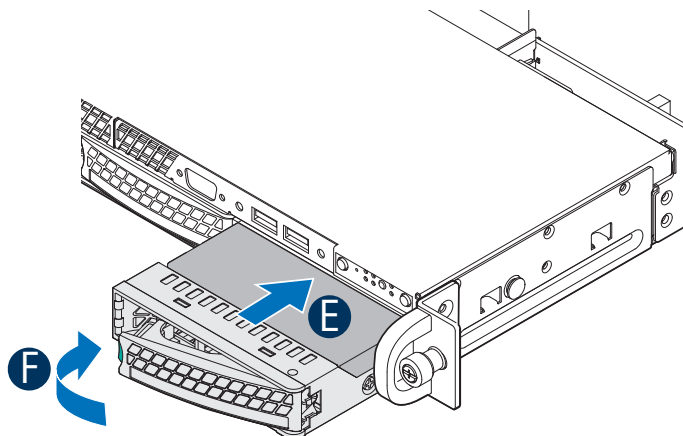


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Figure 25. Installing Drive into Drive Carrier (R1304BTL SHBN)

10. With the black lever in the fully open position, slide the drive assembly into the server system (see letter “E” in [Figure 26](#)). The green latch at the front of the drive carrier must be to the right. Do not push on the black drive carrier lever until the lever begins to close by itself.
11. When the black drive carrier lever begins to close by itself, push on it to lock the drive assembly into place (see letter “F” in [Figure 26](#)).



AF003723

Figure 26. Install Drive Assembly into the Server System (R1304BTLSHBN)

12. Install the server system cover. For instructions, see “Installing the Server System Cover” on page 29.
13. (Optional) Install the front bezel.
14. Plug all peripheral devices and the AC power cable into the server.

Removing a Hot-Swap SATA Drive (R1304BTLSHBN)

1. If it is installed, remove the front bezel. For instructions.
2. Press in on the green latch at the front of the hard drive carrier.
3. Pull out on the black lever to slide the carrier from the server system.
4. Remove the four screws that attach the hard drive to the drive carrier. Lift the drive from the carrier. Store the drive in an anti-static bag.
5. If you are not installing a new drive, place the plastic retention device into the drive carrier, using the four screws you removed from the hard drive.
6. Insert the screws that held the drive in the carrier into the screw locations on the carrier for future use.
7. With the black lever in the fully open position, slide the drive carrier into the server system. The green latch must be to the right. Do not push on the black lever until the lever begins to close by itself.

Note: *For proper airflow, you must replace the hard drive carrier in the server system, even if no hard drive is installed in it.*

8. When the black lever begins to close by itself, push on it to lock the drive carrier into place.
9. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29](#).
10. (Optional) Install the front bezel.
11. Plug all peripheral devices and the AC power cable into the server.

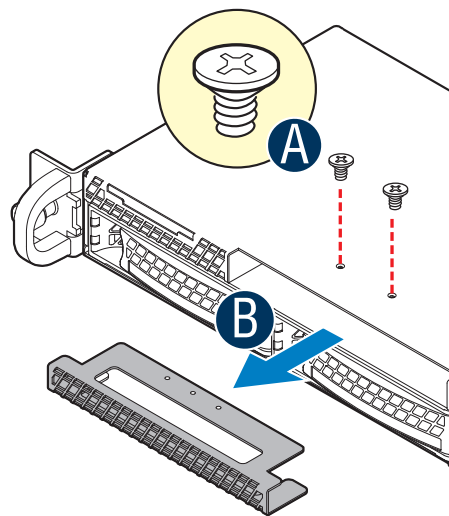
Installing or Removing a Slimline Optical Drive

Caution: The optical drive is NOT hot-swappable. Before removing or replacing the optical drive, you must first take the server out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the AC power cord from the system or wall outlet.

Installing a Slimline Optical Drive

Notes:

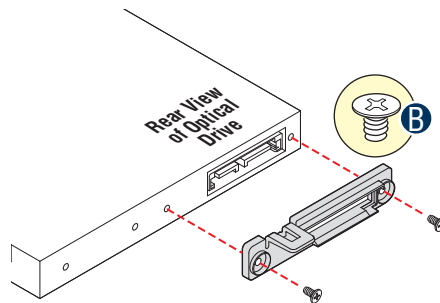
- If you are replacing an optical drive, see “[Installing a Slimline Optical Drive](#)” on [page 48](#) for instructions first. Return to these steps when directed.
1. Observe the safety and ESD precautions at the beginning of this book. See “[Safety Information](#)” on [page iii](#).
 2. Power down the server and unplug all peripheral devices and the AC power cable.
 3. Remove two screws secured the Filler Panel.
 4. Remove the Filler Panel.



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Figure 27. Removing the Knock-out from the Sheet Metal Panel

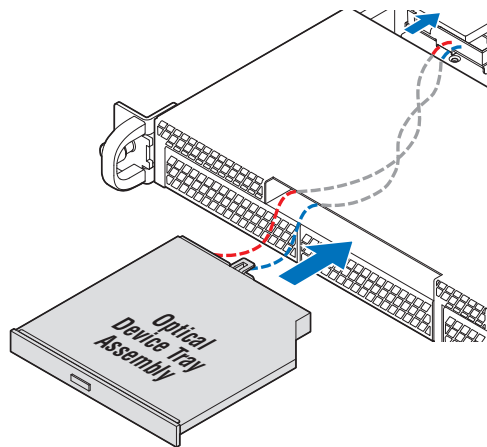
5. Attach the latch to the optical drive as shown, using two screws.



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Figure 28. Attaching the latch to the Optical Drive

6. Pull the power and data cables through the front of the chassis opening.
7. Connect the mini SATA power connector on the optical drive.
8. Connect the data cable to the optical drive and to the SATA connector on the server board.
9. Slide the optical drive assembly in, through the front of the chassis.



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Figure 29. Installing the Optical Drive into the System

10. Install the server system cover. For instructions, see “[Installing the Server System Cover](#)” on page 29.
11. Plug all peripheral devices and the AC power cable into the server.

Removing a Slimline Optical Drive

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information” on page iii](#).
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover” on page 28](#).
4. Press down the latch and then Slide the optical drive out through the front of the system.
5. Disconnect the optical drive power and data cables.
6. Remove the screws that secure the latch to the optical drive. Save these screws for future use.
7. If you are installing a replacement optical drive, skip the rest of these steps and instead continue with [“Installing a Slimline Optical Drive” on page 48](#), Step 5 on page 48.
8. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29](#).

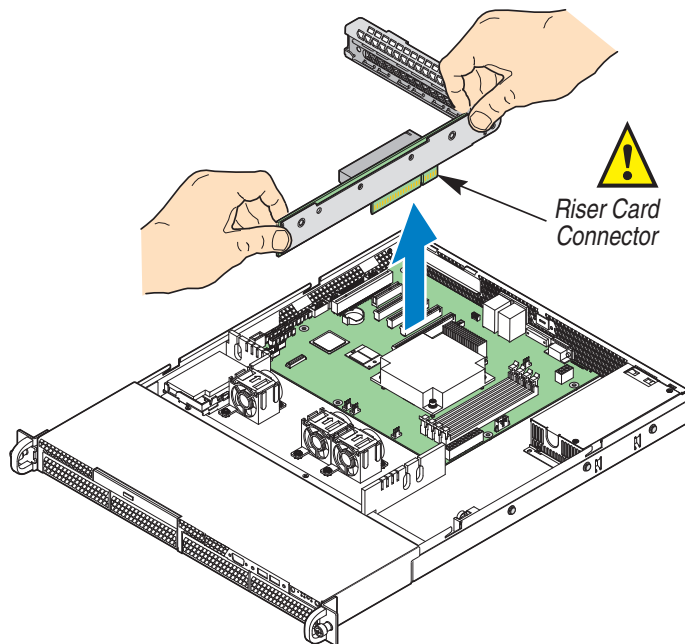
Installing and Removing the PCIe* Riser Assembly

Caution: The PCIe* riser assembly is NOT hot-swappable. Before removing or replacing the PCIe* riser assembly, you must first take the server out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the AC power cord from the system or wall outlet.

Removing the PCIe* Riser Assembly

To remove the PCIe* riser assembly, use the following instructions.

1. Observe the safety and ESD precautions at the beginning of this book. See “[Safety Information](#)” on page iii.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see “[Removing the Server System Cover](#)” on page 28.
4. Disconnect any cables attached to any add-in cards.
5. Lift riser assembly up to remove it. Use caution to gently ease the riser card from the add-in card slot so you do not damage the slot or the riser card. See [Figure 30](#).



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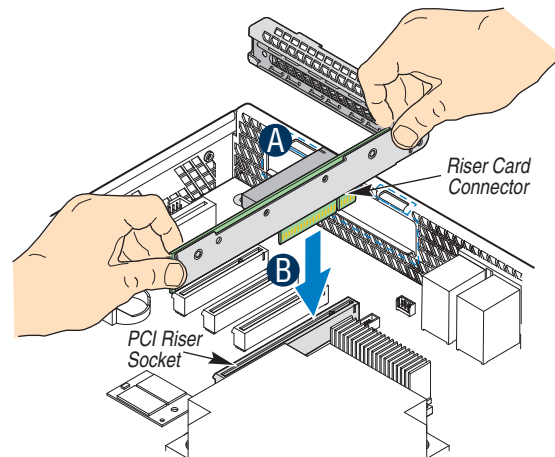
Figure 30. Removing PCIe* Riser Assembly from the Server System

6. If you need to add or replace a PCIe* Riser connector, see [“Installing and Removing a PCI Add-in Card”](#) on page 55.
7. If you need to add or replace a PCI add-in card, see [“Installing and Removing a PCI Add-in Card”](#) on page 55.
8. If you removed the PCIe* Riser assembly for another procedure, continue with that procedure.

Installing the PCIe* Riser Assembly

Note: For clarity, the figures in this series of instructions does not show an attached add-in card. If you are installing an add-in card, do so before installing the PCIe* riser assembly into your server system.

1. Lower the riser assembly into place over the add-in card slot. See letter “B” in [Figure 31](#).
2. Align the three hooks in the riser assembly with the matching slots at the back of the server system. See letter “A” in [Figure 31](#).



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Figure 31. Installing PCIe* Riser Assembly into the Server System

3. Press down uniformly until the two hooks on the rear of the PCIe* riser assembly engage the server system back panel slots. The riser cards will seat into the matching sockets on the server board.
4. Connect any cables to add-in cards that require them. See your add-in card documentation for information and add-in card requirements.
5. Install the server system cover. For instructions, see [“Installing the Server System Cover”](#) on page 29.

Installing or Replacing a PCIe* Riser Card

Caution: The PCIe* Riser card is NOT hot-swappable. Before removing or replacing the PCIe* Riser card, you must first take the server out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the AC power cord from the system or wall outlet.

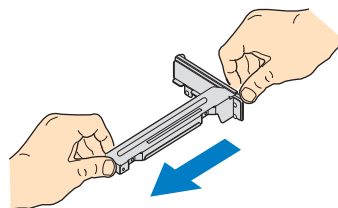
You have the option to install one of two PCIe* Riser cards into your server system:

- A low-profile PCI Express* riser with one PCI Express x16 slot.

Note: To eliminate the possibility of installing the replacement connector on the wrong side of the PCIe* Riser assembly, replace one connector at a time.

Removing a PCIe* Riser Card

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information”](#) on page iii.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover”](#) on page 28.
4. Disconnect any cables attached to any add-in cards.
5. Remove the PCIe* Riser assembly. For instructions, see [“Removing the PCIe* Riser Assembly”](#) on page 51.
6. Remove any add-in cards from the PCIe* Riser connector. For instructions, see [“Removing a PCI Add-in Card”](#) on page 56.
7. Remove the two screws that attach the riser card to the riser assembly. See Figure 32. Save these screws to be used later.



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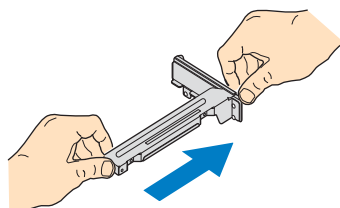
Figure 32. Removing Riser Card from Riser Assembly

8. Install the replacement riser connector, if desired. For instructions, see [“Installing a PCIe* Riser Card”](#) on page 54.
9. Install the PCIe* Riser assembly into the server system. For instructions, see [“Installing the PCIe* Riser Assembly”](#) on page 52.

10. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29](#).
11. Plug all peripheral devices and the AC power cable into the server.

Installing a PCIe* Riser Card

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information” on page iii](#).
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover” on page 28](#).
4. Disconnect any cables attached to any add-in cards.
5. Remove the PCIe* Riser assembly. For instructions, see [“Removing the PCIe* Riser Assembly” on page 51](#).
6. Remove any add-in cards from the PCIe* Riser connector. For instructions, see [“Removing a PCI Add-in Card” on page 56](#).
7. Use two screws to attach the riser card to the riser assembly. See [Figure 33](#).



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Figure 33. Installing Riser Card onto Riser Assembly

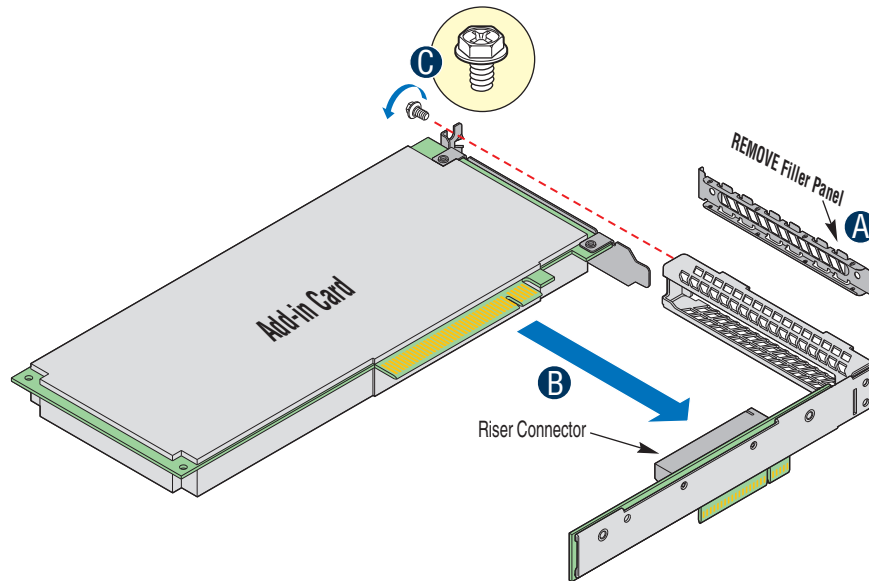
8. Install an PCI add-in card if desired. For instructions, see [“Installing a PCI Add-in Card” on page 55](#).
9. Install the PCIe* Riser assembly into the server system. For instructions, see [“Installing the PCIe* Riser Assembly” on page 52](#).
10. Connect any cables to add-in cards that require them. See your add-in card documentation for information and add-in card requirements.
11. Re-install the processor air duct. For instructions, see [“Installing the Processor Air Duct” on page 31](#).
12. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29](#).
13. Plug all peripheral devices and the AC power cable into the server.

Installing and Removing a PCI Add-in Card

Caution: *The add-in cards are NOT hot-swappable. Before removing or replacing an add-in card, you must first take the server out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the AC power cord from the system or wall outlet.*

Installing a PCI Add-in Card

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information” on page iii](#).
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover” on page 28](#).
4. Remove the PCIe* Riser assembly. For instructions, see [“Removing the PCIe* Riser Assembly” on page 51](#).
5. Remove the screw at the rear of the riser assembly. See letter “A” in [Figure 34](#). Save this screw. You will reinstall it later.
6. If a filler panel is installed over the opening at the rear of the riser assembly, lift it from the riser assembly. See letter “B” in [Figure 34](#). Save the filler panel in case you later need to remove the add-in card.
7. Insert the add-in card into the socket in the riser assembly. Push the add-in card into place firmly until it seats in the riser card connector, but use caution so you do not twist or bend the card. See letter “C” in [Figure 34](#).
8. Re-install the screw you removed in Step 5. See letter “A” in [Figure 34](#).



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Figure 34. Installing an Add-In Card

9. Install the PCIe* Riser assembly into the server system. For instructions, see [“Installing the PCIe* Riser Assembly” on page 52.](#)
10. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29.](#)
11. Plug all peripheral devices and the AC power cable into the server.

Removing a PCI Add-in Card

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information” on page iii.](#)
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover” on page 28.](#)
4. Remove the PCIe* Riser assembly. For instructions, see [“Removing the PCIe* Riser Assembly” on page 51.](#)
5. Remove the screw at the rear of the riser assembly. You will use it later.
6. Pull the add-in card from the socket in the riser assembly. You may need to wriggle the card from front to back to remove it, but use caution so you do not twist or bend the card.
7. Install a filler panel over the opening at the rear of the riser assembly.

8. Re-install the screw you removed in step 5.

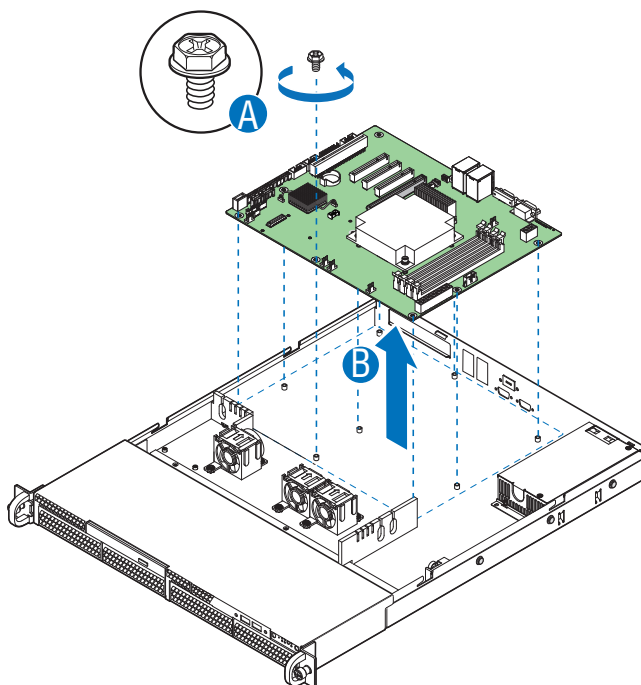
Note: *Make sure that all empty add-in card slots have filler panels installed.*

9. Install the PCIe* Riser assembly into the server system. For instructions, see [“Installing the PCIe* Riser Assembly” on page 52](#).
10. Install the processor air duct. For instructions, see [“Installing the Processor Air Duct” on page 31](#).
11. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29](#).
12. Plug all peripheral devices and the AC power cable into the server.

Replacing the Server Board

Removing the Server Board

1. Observe the safety and ESD precautions at the beginning of this book. See “[Safety Information](#)” on page iii.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see “[Removing the Server System Cover](#)” on page 28.
4. Remove the processor air duct. For instructions, see “[Removing the Processor Air Duct](#)” on page 30.
5. Remove the PCIe* Riser assembly. For instructions, see “[Removing the PCIe* Riser Assembly](#)” on page 51.
6. Detach all cables connected to the server board.
7. Remove the heat sink and the processor. For instructions, see “[Removing the Heat Sink and Processor](#)” on page 35.
8. Remove the DIMMs. For instructions, see “[Removing DIMMs](#)” on page 33.
9. Remove the nine screws from the server board and lift the server board from the server system.



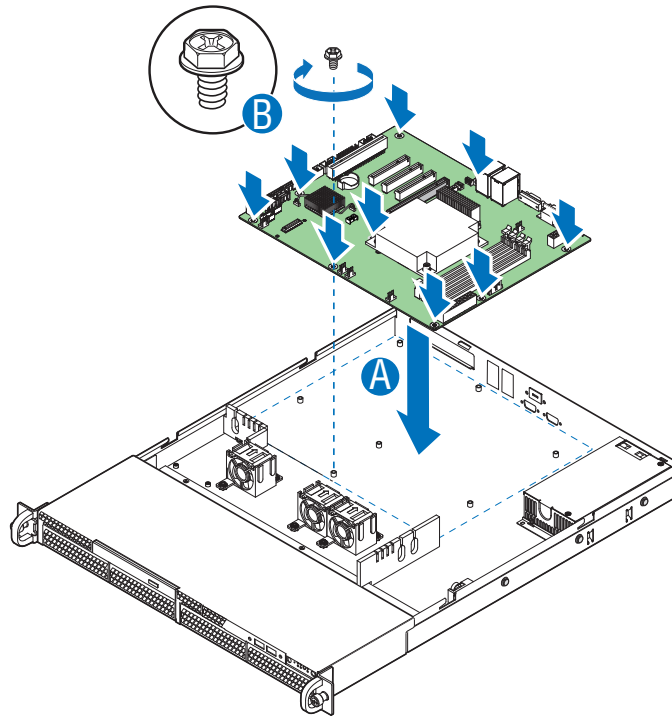
AF003739

Figure 35. Removing the Server Board

10. Replace the server board. For instructions, see [“Installing the Server Board” on page 59](#).
11. Install the processor. For instructions, see [“Installing the Processor” on page 36](#).
12. Install the DIMMs. For instructions, see [“Installing DIMMs” on page 33](#).
13. Install the PCIe* Riser assembly. For instructions, see [“Installing the PCIe* Riser Assembly” on page 52](#).
14. Reconnect all cables to the server board.
15. Install the processor air duct. For instructions, see [“Installing the Processor Air Duct” on page 31](#).
16. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29](#).
17. Plug all peripheral devices and the AC power cable into the server.

Installing the Server Board

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information” on page iii](#).
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover” on page 28](#).
4. Remove the processor air duct. For instructions, see [“Removing the Processor Air Duct” on page 30](#).
5. Remove the PCIe* Riser assembly. For instructions, see [“Removing the PCIe* Riser Assembly” on page 51](#).
6. Place the server board into the server system as shown by letter “A” in [Figure 36](#).
7. Attach the server board with nine screws. See letter “B” in [Figure 36](#).



AF003738

Figure 36. Installing the Server Board

8. Install the processor and the heat sink. For instructions, see [“Installing the Processor” on page 36](#).
9. Install the system memory. For instructions, see [“Installing DIMMs” on page 33](#).
10. Connect the data cables. For data cable routing information, see .
11. Connect the power cables. For power cable routing information, see [“Cable Routing” on page 69](#).
12. Install the PCIe* Riser assembly. For instructions, see [“Installing the PCIe* Riser Assembly” on page 52](#).
13. Install the processor air duct. For instructions, see [“Installing the Processor Air Duct” on page 31](#).
14. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29](#).
15. Plug all peripheral devices and the AC power cable into the server.

Replacing the CMOS Battery

Caution: *The CMOS battery is NOT hot-swappable. Before removing or replacing the CMOS battery, you must first take the server out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the AC power cord from the system or wall outlet.*

The lithium battery on the server board powers the RTC in the absence of power. When the battery starts to weaken, it loses voltage, and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. For a list of approved devices, contact your customer service representative or dealer.

Warning: *Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.*

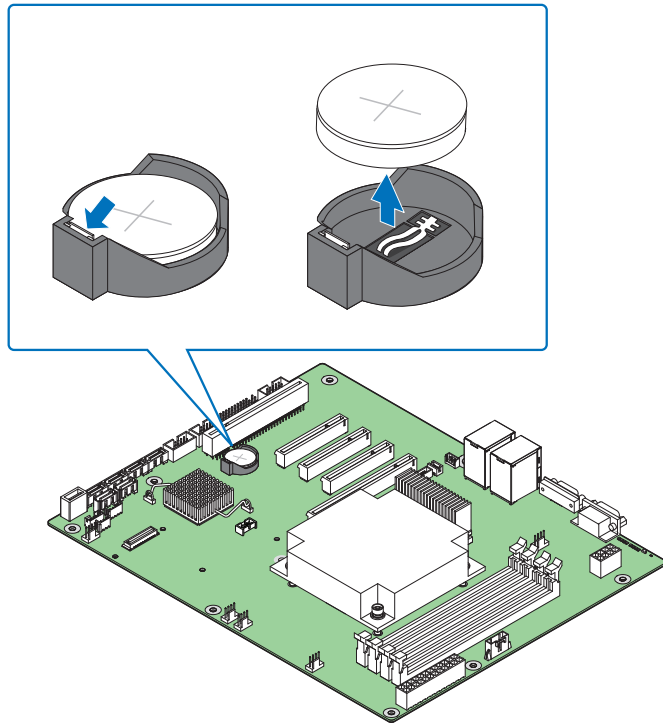
Advarsel: Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

Advarsel: Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

Warning: Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

Varoitus: Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information” on page iii](#).
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover” on page 28](#).
4. Remove the server's cover and locate the battery. See [Figure 37](#).
5. Pull back gently on the metal tab at the top of the battery.
6. Remove the battery from its socket.



AF003525

Figure 37. Replacing the CMOS Battery

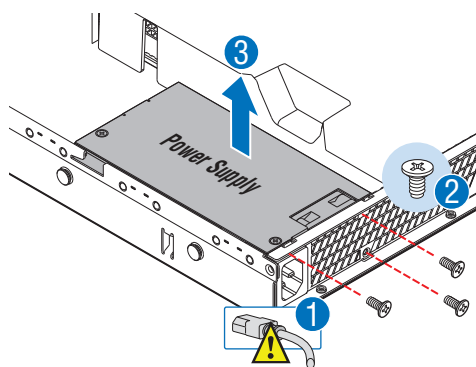
7. Dispose of the battery according to local ordinance.
8. Remove the new lithium battery from its package, and, being careful to observe the correct polarity, insert it in the battery socket.
9. Close the chassis.
10. Run the BIOS Setup utility to restore the configuration settings.

Replacing the Power Supply

Caution: The power supply is NOT hot-swappable. Before removing or replacing the power supply, you must first take the server out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the AC power cord from the system or wall outlet.

You can replace the power supply if it fails or if one of the integrated fans in it fails. To replace the power supply, use the following instructions.

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information” on page iii](#).
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see [“Removing the Server System Cover” on page 28](#).
4. Disconnect all power cables connected to the server board and peripherals.
5. Remove the screws secured the power supply.
6. Lift up the power supply from the chassis.



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Figure 38. Removing Power Supply

7. Insert the replacement power supply into the server.
8. Secure the screw you removed in Step 5 to attach the power supply to the server system.
9. Connect the power supply cables to the server board and peripherals. See [Figure 38](#).
10. Install the server system cover. For instructions, see [“Installing the Server System Cover” on page 29](#).
11. Plug all peripheral devices and the AC power cable into the server.

Replacing a System Fan

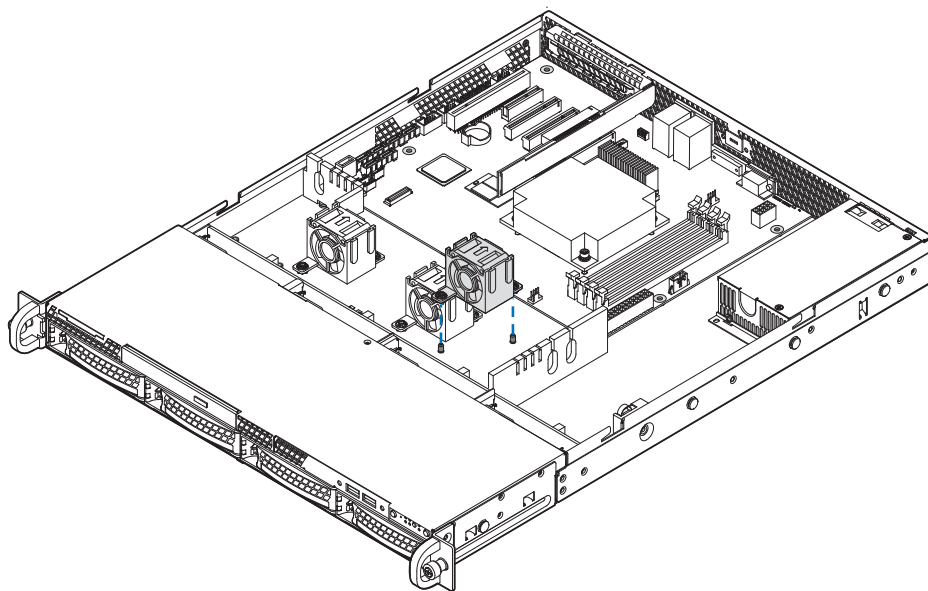
Caution: The fans are NOT hot-swappable. Before removing or replacing a fan, you must first take the server out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the AC power cord from the system or wall outlet.

Note: You cannot replace the fans integrated into the power supply separately. If one of the fans in the power supply fails, you must replace the power supply.

If one of the fans fails, you can individually replace them. If a fan in the power supply fails, you must replace the power supply. Use the following steps to replace a system fan or the CPU cooling fan.

Replacing the System Fans

1. See “[Safety Information](#)” on page iii.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. Remove the server system cover. For instructions, see “[Removing the Server System Cover](#)” on page 28.
4. Remove the processor air duct. For instructions, see “[Removing the Processor Air Duct](#)” on page 30.
5. Disconnect the fan cables from the server board.
6. Lift the fan holder from the server.



AF003568

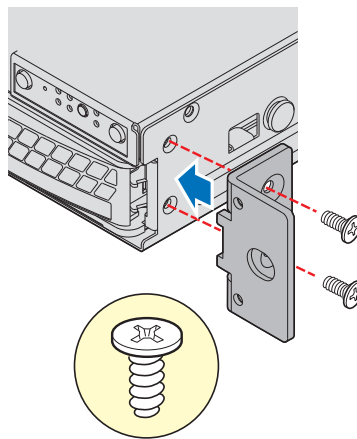
Figure 39. Removing Bracket and System Fans from Server System.

7. Lift the fan from the fan-holder.
8. Install the replacement fan.
9. Set the fan assembly into the system. Use caution to make sure you do not pinch any cables.
10. Route the cable from the fan at the right around the right side of the assembly and under the clip at the front of the fan bracket.
11. Connect the fans to the server board.
12. Install the processor air duct. For instructions, see [“Installing the Processor Air Duct” on page 31](#).

Installing and Removing the Rack Handles

Installing the Rack Handles

1. Observe the safety and ESD precautions at the beginning of this book. See “[Safety Information](#)” on page iii.
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. If it is installed, remove the front bezel if it is installed.
4. Attach the rack handle to the server system with two screws as shown in Figure 40.



AF003729

Figure 40. Installing the Rack Handle

5. Repeat Step 4 on the opposite side of the server.
6. (Optional) Install the front bezel, if desired.
7. Plug all peripheral devices and the AC power cable into the server.

Removing the Rack Handles

1. Observe the safety and ESD precautions at the beginning of this book. See [“Safety Information” on page iii](#).
2. Power down the server and unplug all peripheral devices and the AC power cable.
3. If it is installed, remove the front bezel.
4. Remove the two screws holding the rack handle in place, and remove the rack handle from the server system.
5. Repeat Step 4 on the opposite side of the system.
6. (Optional) Install the front bezel, if desired.
7. Plug all peripheral devices and the AC power cable into the server.

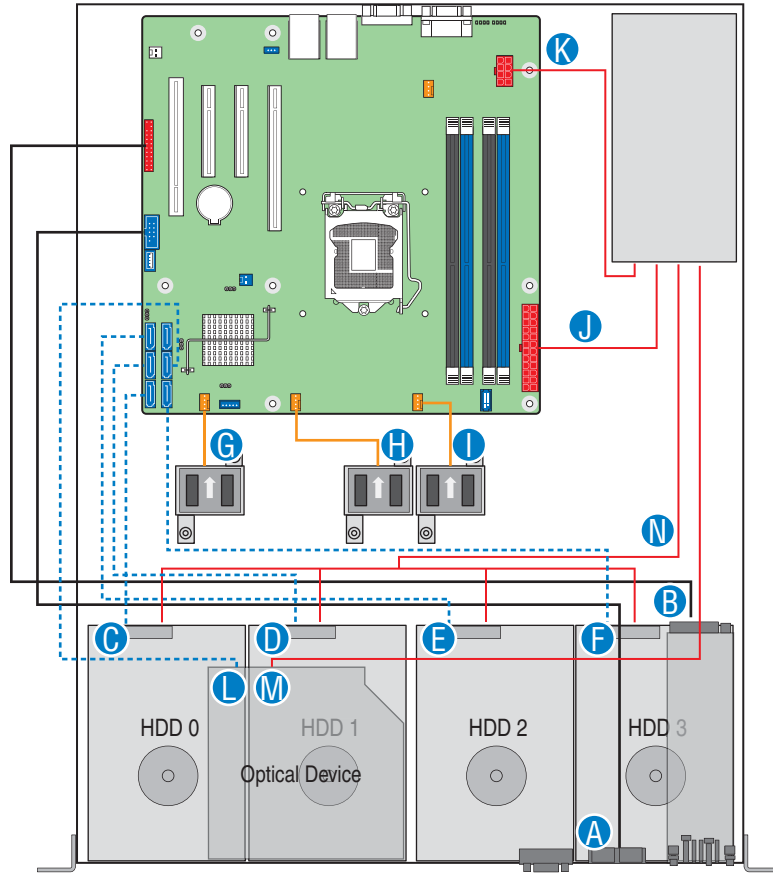
Appendix A: Technical Reference

Cable Routing

When you add or remove components from your server system, make sure your cables are routed correctly before reinstalling the server system cover. Use caution to make sure no cables or wires are pinched and that the airflow from the fans is not blocked. Use the following figures to determine the correct cable routing.

For readability, separate figures for power cable routing and data cable routing are included. Make sure all necessary power and data cables are connected and routed as shown. Dashed lines in the drawings indicate a location where a cable is routed beneath a component and each connector end is labeled with the same letter. For example, the PCI cooling fan cable is labeled with the letter “C” both where it connects to the server board and at the PCI cooling fan itself.

Cable Routing (R1304BTSSFAN)

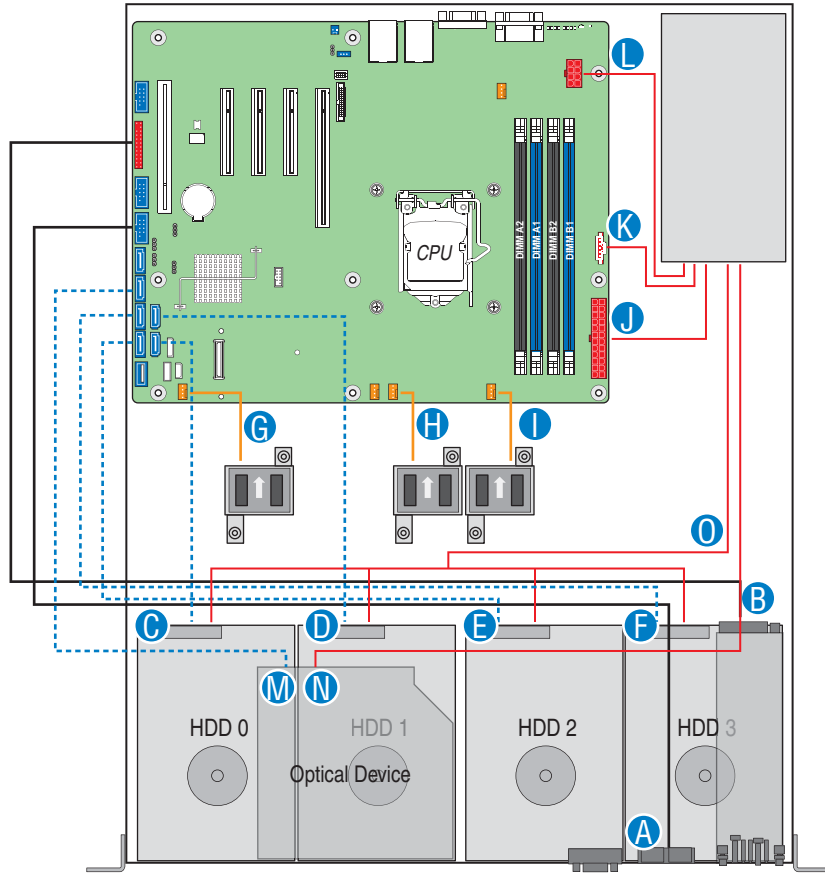


AF003909

A. Internal USB to Front	H. System FAN2
B. Front Panel	I. System FAN3
C. SATA port to HSBP HDD0	J. Power Supply to Main Power
D. SATA port to HSBP HDD1	K. Power Supply to CPU Power
E. SATA port to HSBP HDD2	L. ODD to SATA Port
F. SATA port to HSBP HDD3	M. Power Supply to ODD
G. System FAN1	N. Power Supply to HDDs

Figure 41. Cable Routing (R1304BTSSFAN)

Cable Routing (R1304BTLFAN)

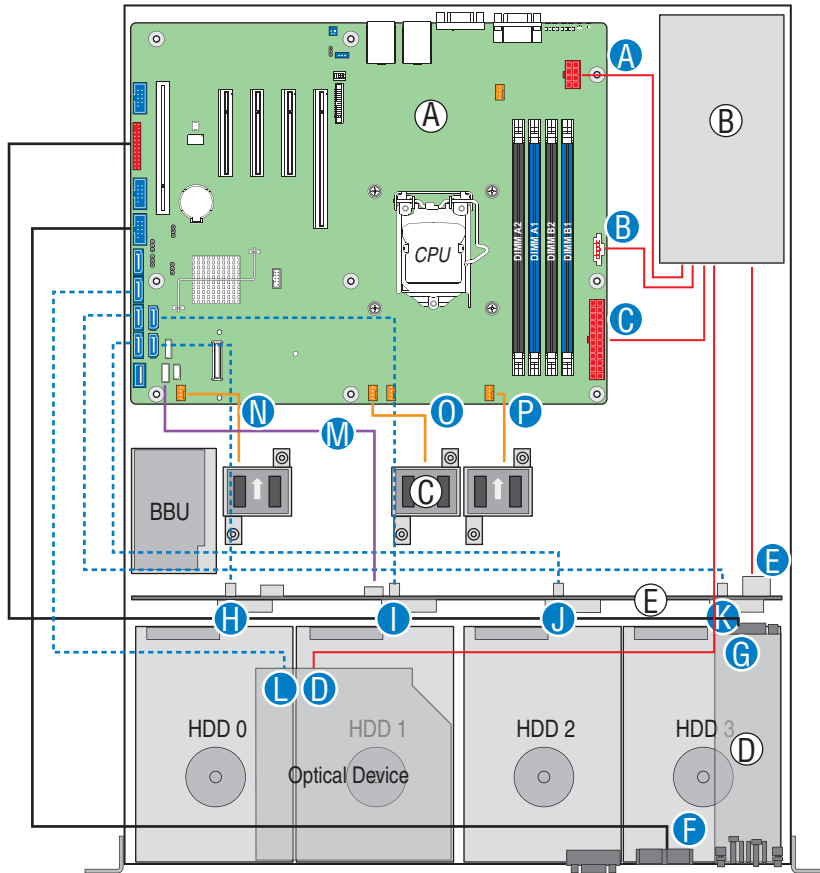


AF003910

A. Internal USB to Front	I. System FAN3
B. Front Panel	J. Power Supply to Main Power
C. SATA port to HSBP HDD0	K. Power Supply to P/S AUX
D. SATA port to HSBP HDD1	L. Power Supply to CPU Power
E. SATA port to HSBP HDD2	M. ODD to SATA Port
F. SATA port to HSBP HDD3	N. Power Supply to ODD
G. System FAN1	O. Power Supply to HDDs
H. System FAN2	

Figure 42. Cable Routing (R1304BTLFAN)

Cable Routing (R1304BTLSHBN)



AF003730

A. Power Supply to CPU Power	I. SATA port to HSBP HDD1
B. Power Supply to P/S AUX	J. SATA port to HSBP HDD2
C. Power Supply to Main Power	K. SATA port to HSBP HDD3
D. Power Supply to ODD	L. ODD to SATA Port
E. Power Supply to HDDs	M. SGPIO
F. Internal USB to Front	N. System FAN1
G. Front Panel	O. System FAN2
H. SATA port to HSBP HDD0	P. System FAN3

Figure 43. Cable Routing (R1304BTLSHBN)

350-W Single Power Supply Input Voltages

- 100 - 127 V at 50/60 Hz 6.0 A
- 200 - 240 V at 50/60 Hz 3.0 A

350-W Single Power Supply Output Voltages

Table 6 lists the total wattage available from the power subsystem for each voltage. For information about calculating the power usage for your configuration, see “Calculating Power Usage.”

Table 6. Power Supply Output Capability

Voltage	Maximum Current
+3.3 V	14 A
+5.0 V	18 A
+5 V Standby	2 A
+12.0	24 A
-12.0 V	0.3 A

Warning: Do not exceed a combined power output of 90 W for the +5 V and +3.3 V outputs. Exceeding a combined 90 W will overload the power subsystem and may cause the power supplies to overheat and malfunction.

System Environmental Specifications

Table 7. System Environmental Specifications

Temperature	
Non-operating	-40° to 70°C
Operating	10° to 35°C, with the maximum rate of change not to exceed 10°C per hour
Humidity	
Non-operating	90% relative humidity, non-condensing at 35°C
Shock	
Operating	2.0 g, 11 msec, 1/2 sine
Packaged	Operational after an 24-inch free fall.
Acoustic noise	7 Bels in sound power for a typical office ambient temperature (65 to 75 °F). Your selection of peripherals may change the noise level.
Electrostatic discharge (ESD)	Tested to 8 Kilovolts (KV) contact discharge, 12 kilovolts (KV) air discharge; no component damage.

Appendix B: Troubleshooting

This chapter helps you identify and solve problems that might occur while you are using the system.

For any issue, first ensure you are using the latest firmware and files. Firmware upgrades include updates for the BIOS, Baseboard Management Controller (BMC), and hot-swap controller (HSC). See [“Server System References” on page xi](#) for a link to the software updates. In addition to the server firmware and files, also update any drivers used for components you installed in your system, such as video drivers, network drivers, and SATA drivers.

Intel provides a package called the “Platform Confidence Test” that may help with your diagnostics. See [“Server System References” on page xi](#) for a link to this software.

If you cannot resolve your server problems on your own, see [“Getting Help” on page 89](#) for assistance.

Resetting the System

Before going through in-depth troubleshooting, attempt first to reset your system using one of the methods below.

Table 8. Resetting the System

To do this	Press
Soft boot reset to clear the system memory and reload the operating system	<Ctrl+Alt+Del>
Clear system memory, restart POST, and reload the operating system	Reset button
Cold boot reset. Turn the system power off and then on. This clears system memory, restarts POST, reloads the operating system, and halts power to all peripherals	Power off/on button
Reset the BMC and get it back to a stable state	Remove AC power from the server for one minute

Problems following Initial System Installation

Problems that occur at initial system startup are usually caused by an incorrect installation or configuration. Hardware failure is a less frequent cause. If the problem you are experiencing is with a specific software application, see [“Problems with Newly Installed Application Software”](#) on page 82.

First Steps Checklist

- Is AC power available at the wall outlet?
- Are the power supplies plugged in? Check the AC cable(s) on the back of the chassis and at the AC source.
- Are all cables correctly connected and secured?
- Are the processors fully seated in their sockets on the server board?
- Are all standoffs in the proper location and not touching any components, causing a potential short?
- Are all add-in PCI boards fully seated in their slots on the server board?
- Are all jumper settings on the server board correct?
- Are all jumper and switch settings on add-in boards and peripheral devices correct? To check these settings, refer to the manufacturer's documentation that comes with them. If applicable, ensure there are no conflicts (for example, two add-in boards sharing the same interrupt).
- Are all peripheral devices installed correctly?
- If the system has a hard disk drive, is it properly formatted or configured?
- Are all device drivers properly installed?
- Are the configuration settings made in Setup correct?
- Is the operating system properly loaded? See the operating system documentation.
- Did you press the system power on/off switch on the front panel to turn the server on (power on light should be lit)?
- Is the system power cord properly connected to the system and plugged into a NEMA 5 15R outlet for 100-120 V or a NEMA 6-15R outlet for 200-240 V?
- Are all integrated components from the tested components lists? Check the tested memory and chassis lists, as well as the supported hardware and operating system list. See [“Server System References”](#) on page xi for links to the tested component lists.

Hardware Diagnostic Testing

This section provides a more detailed approach to identifying a hardware problem and locating its source.

Caution: *Turn off devices before disconnecting cables: Before disconnecting any peripheral cables from the system, turn off the system and any external peripheral devices. Failure to do so can cause permanent damage to the system and/or the peripheral devices.*

1. Turn off the system and all external peripheral devices. Except for the keyboard and video monitor, disconnect each device from the system.
2. Make sure the system power cord is plugged into a properly grounded AC outlet.
3. Make sure your video display monitor and keyboard are correctly connected to the system. Turn on the video monitor. Set its brightness and contrast controls to at least two thirds of their maximum ranges (see the documentation supplied with your video display monitor).
4. If the operating system normally loads from the hard disk drive, make sure there is no CD-ROM/DVD disk in the optical drive.
5. If the power LED does light, attempt to boot from a USB floppy or from a CD-ROM disk.
6. Turn on the system. If the power LED does not light, see [“Power Light Does Not Light” on page 78](#).

Verifying Proper Operation of Key System Lights

As POST determines the system configuration, it tests for the presence of each mass storage device installed in the system. As each device is checked, its activity light should turn on briefly. Check for the following:

- Does the drive activity light turn on briefly? If not, see [“Drive Activity Light Does Not Light” on page 80](#).

Confirming Loading of the Operating System

Once the system boots up, the operating system prompt displays on the screen. The prompt varies according to the operating system. If the operating system prompt does not display, see [“No Characters Appear on Screen” on page 78](#).

Specific Problems and Corrective Actions

This section provides possible solutions for these specific problems:

- Power light does not light.
- No characters appear on screen.

- Characters on the screen appear distorted or incorrect.
- System cooling fans do not rotate.
- Diskette drive activity light does not light.
- Hard disk drive activity light does not light.
- CD-ROM drive activity light does not light.
- There are problems with application software.
- The bootable CD-ROM is not detected.

Try the following solutions in the order given. If you cannot correct the problem, contact your service representative or authorized dealer for help.

Power Light Does Not Light

Check the following:

- Did you press the power-on button?
- Is the system operating normally? If yes, the power LED might be defective or the connection from the front panel to the server board might be loose.
- Have you securely plugged the server AC power cord into the power supply?
- Some ATX power supplies have a power switch on the back of the power supply. If your system has one, is it turned on?
- Remove all add-in cards and see if the system boots. If successful, add the cards back in one at a time with a reboot between each addition.
- Make sure the memory DIMMs comply with the system requirements.
- Make sure the memory DIMMs have been populated according to the system requirements.
- Remove the memory DIMMs and re-seat them.
- Make sure the processor(s) comply with the system requirements.
- Make sure the processor(s) have been populated according to the system requirements.
- Remove the processor(s) and re-seat them.
- Make sure the chassis standoffs are installed only below mounting holes. Misplaced standoffs can contact the pins on the bottom of the server board and cause a short.

No Characters Appear on Screen

Check the following:

- Is the keyboard functioning? Test it by turning the “Num Lock” function on and off to make sure the Num Lock light is functioning.

- Is the video monitor plugged in and turned on? If you are using a switch box, is it switched to the correct system?
- Are the brightness and contrast controls on the video monitor properly adjusted?
- Is the video monitor signal cable properly installed?
- Does this video monitor work correctly if plugged into a different system?
- Is the onboard video controller enabled in the BIOS?
- Remove all add-in cards and see if the video returns. If successful, add the cards back in one at a time with a reboot between each addition.
- Make sure the memory DIMMs comply with the system requirements.
- Make sure the memory DIMMs have been populated according to the system requirements.
- Remove the memory DIMMs and re-seat them.
- Make sure the processor(s) comply with the system requirements.
- Make sure the processor(s) have been populated according to the system requirements.
- Remove the processor(s) and re-seat them.

If you are using an add-in video controller board, do the following:

1. Verify the video works using the onboard video controller.
2. Verify the video controller board is fully seated in the server board connector.
3. Reboot the system for changes to take effect.
4. If there are still no characters on the screen after you reboot the system and POST emits a beep code, write down the beep code you hear. This information is useful for your service representative.
5. If you do not receive a beep code and characters do not display, the video display monitor or video controller may have failed. Contact your service representative or authorized dealer for help.

Characters Are Distorted or Incorrect

Check the following:

- Are the brightness and contrast controls properly adjusted on the video monitor? See the manufacturer's documentation.
- Are the video monitor's signal and power cables properly installed?
- Does this video monitor work correctly if plugged into a different system?

System Cooling Fans Do Not Rotate Properly

If the system cooling fans are not operating properly, it is an indication of possible system component failure.

Check the following:

- Is the power-on light lit? If not, see [“Power Light Does Not Light” on page 78](#).
- Are any other front panel LEDs lit?
- Have any of the fan motors stopped? Use the server management subsystem to check the fan status.
- Have your fans speeded up in response to an overheating situation?
- Have your fans speeded up in response to a fan that has failed?
- Are the fan power connectors properly connected to the server board?
- Is the cable from the front panel board connected to the both the front panel board and to the server board?
- Are the power supply cables properly connected to the server board?
- Are there any shorted wires caused by pinched-cables or have power connector plugs been forced into power connector sockets the wrong way?

Drive Activity Light Does Not Light

Check the following:

- Are the drive's power and signal cables properly installed?
- Are all relevant switches and jumpers on the drive set correctly?
- Is the drive properly configured?
- Is the drive activity light always on? If so, the signal cable may be plugged in incorrectly.

CD-ROM Drive or DVD-ROM Drive Activity Light Does Not Light

Check the following:

- Are the CD-ROM/DVD-ROM drive's power and signal cables properly installed?
- Are all relevant switches and jumpers on the drive set correctly?
- Is the drive properly configured?

Cannot Connect to a Server

- Make sure the network cable is securely attached to the correct connector at the system back panel.
- Try a different network cable.
- Make sure you are using the correct and the current drivers. See [“Server System References” on page xi](#) for a link to the current drivers.

- Make sure the driver is loaded and the protocols are bound.
- Make sure the hub port is configured for the same duplex mode as the network controller.
- Make sure the correct networking software is installed.
- If you are directly connecting two servers (without a hub), you will need a crossover cable.
- Check the network controller LEDs next to the NIC connectors.

Problems with Network

The server hangs when the drivers are loaded

- Certain drivers may require interrupts that are not shared with other PCI drivers. For these drivers, it may be necessary to alter settings so that interrupts are not shared. See the documentation that came with your PCI card(s) for information on changing interrupts.

Diagnostics pass but the connection fails

- Make sure the network cable is securely attached.
- Make sure you specify the correct frame type in your NET.CFG file.
- The controller stopped working when an add-in adapter was installed.
- Make sure the cable is connected to the port from the onboard network controller.
- Make sure your BIOS is current. See [“Server System References”](#) on page xi for a link to the current version.
- Make sure the other adapter supports shared interrupts. Make sure your operating system supports shared interrupts.
- Try reseating the add-in adapter.

The add-in adapter stopped working without apparent cause

- Reseat the adapter.
- The network driver files may be corrupt or deleted. Delete and then reinstall the drivers.
- Run diagnostics.

System Boots when Installing PCI Card

System Management features require full-time “standby” power. This means some parts of the system have power going to them whenever the power cord is plugged in, even if you have turned the system power off with the power button on the front panel. If you install a PCI card with the AC power cord plugged in, a signal may be sent to command the system to boot. Before installing a PCI card, you should always:

- Turn off the server power by using the power button on the front of the system.
- Unplug the AC power cord(s) from the server.

Problems with Newly Installed Application Software

Problems that occur when you run new application software are usually related to the software, not the server hardware. Faulty equipment is unlikely, especially if other software runs correctly.

Check the following:

- Make sure the system meets the minimum hardware requirements for the software. See the software documentation.
- Make sure the software is properly installed and configured for the system. See the software documentation.
- Use only an authorized copy. Unauthorized copies often do not work.
- If you are running the software from a CD-ROM or DVD-ROM, try a different disk.
- Make sure the correct device drivers installed.

If the problems persist, contact the software vendor's customer service representative.

Problems with Application Software that Ran Correctly Earlier

Problems that occur after the system hardware and software have been running correctly sometimes indicate equipment failure. However, they can also be caused by file corruption or changes to the software configuration.

Check the following:

- If you are running the software from a CD-ROM or DVD-ROM, try a different disk.
- Check your system for a virus infection.
- Uninstall and reinstall the software. Make sure all necessary files are installed.
- If the problems are intermittent, there may be a loose cable, dirt in the keyboard (if keyboard input is incorrect), a marginal power supply, or other random component failures.
- If you suspect a transient voltage spike, power outage, or brownout might have occurred, reload the software and try running it again. Symptoms of voltage spikes

include a flickering video display, unexpected system reboots, and the system not responding to user commands.

***Note:** Random errors in data files: If you are getting random errors in your data files, they may be getting corrupted by voltage spikes on your power line. If you are experiencing any of the above symptoms that might indicate voltage spikes on the power line, you may want to install a surge suppressor between the power outlet and the system power cord.*

Devices are not Recognized under Device Manager (Microsoft Windows* Operating System)

The Microsoft Windows* operating systems do not include all of the drivers for the Intel® chipsets, onboard NICs, and other components. See “[Server System References](#)” on [page xi](#) for a link to the current drivers and chipset files.

Hard Drive(s) are not Recognized

Check the following:

- Make sure the drive is not disabled in BIOS Setup.
- Make sure the drive is connected correctly and that is plugged into the power supply.
- Make sure the drive is compatible. See “[Server System References](#)” on [page xi](#) for a link to the tested drives.
- Make sure you have not exceeded the power budget for the server. See “[Server System References](#)” on [page xi](#) for a link to software to check your power budget.
- If using SCSI drives, verify that each SCSI ID number is unique on the SCSI bus. See your drive documentation for details on setting the SCSI ID for your drives.
- If using ATA drives, verify that the master/slave settings are set correctly. See your drive documentation for details on setting the master/slave settings.
- If using a RAID configuration with SCSI or SATA drives, make sure the RAID card is installed correctly.

Bootable CD-ROM Disk Is Not Detected

Check the following:

- Make sure the BIOS is configured to allow the CD-ROM to be the first bootable device.

LED Information

The Intel® Server System R1304BTLSFAN/R1304BTLSHBN includes LEDs that can aid in troubleshooting your system. Table 9 lists these LEDs and provides a description of their use.

Table 9. LED Information

LED Name	Function	Location	LED Color	Notes
ID	Aid in server identification from the back panel	Front panel and board rear left corner	Blue	Press ID LED button or use Server Management software to turn the LED on and off.
System Fault	Visible fault warning	Front panel and board rear left corner	Green or Amber	<ul style="list-style-type: none"> • On = No Fault • Green Blink = degraded • Amber = non-critical
Disk Activity	Front panel	Front panel and board left side	Green	Blinking = Activity. No action required.
POST Code 1-8	Display boot 80 POST code	Left rear of board	Each LED can be Off, Green, Amber, or Red	See the POST code table.
5-V Standby	Identify 5-V standby power on state	Front left board	Amber	On = 5-V standby power on
Power LED	Identify the power state of the system	Front panel	Green	<ul style="list-style-type: none"> • Off = Power is off (off or S5) • On = Power on or S0) • Slow Blink = Low power state (S1 - S3)

BIOS POST Beep Codes

Table 10 lists the POST error beep codes. Prior to system video initialization, the BIOS uses these beep codes to inform users of error conditions. Please note that not all error conditions are supported by BIOS beep codes.

Table 10. POST Error Beep Codes

Number of Beeps	Reason for Beeps and Action to Take
3	System halted because a fatal error related to the memory was detected.

Appendix C: Warranty

Limited Warranty for Intel® Chassis Subassembly Products

Intel warrants that the Products (defined herein as the Intel® chassis subassembly and all of its various components and software delivered with or as part of the Products) to be delivered hereunder, if properly used and installed, will be free from defects in material and workmanship and will substantially conform to Intel's publicly available specifications for a period of three (3) years after the date the Product was purchased from an Intel authorized distributor. Software of any kind delivered with or as part of products is expressly provided "as is" unless specifically provided for otherwise in any software license accompanying the software.

If any Product furnished by Intel which is the subject of this Limited Warranty fails during the warranty period for reasons covered by this Limited Warranty, Intel, at its option, will:

- REPAIR the Product by means of hardware and/or software; OR
- REPLACE the Product with another Product; OR
- REFUND the then-current value of the Product if Intel is unable to repair or replace the Product.

If such Product is defective, transportation charges for the return of Product to buyer within the USA will be paid by Intel. For all other locations, the warranty excludes all costs of shipping, customs clearance, and other related charges. Intel will have a reasonable time to make repairs or to replace Product or to refund the then-current value of the Product.

In no event will Intel be liable for any other costs associated with the replacement or repair of Product, including labor, installation or other costs incurred by buyer and in particular, any costs relating to the removal or replacement of any product soldered or otherwise permanently affixed to any printed circuit board.

This Limited Warranty, and any implied warranties that may exist under state law, apply only to the original purchaser of the Product.

Extent of Limited Warranty

Intel does not warrant that Products to be delivered hereunder, whether delivered stand-alone or integrated with other Products, including without limitation semiconductor components, will be free from design defects or errors known as "errata." Current characterized errata are available upon request.

This Limited Warranty does not cover damages due to external causes, including accident, problems with electrical power, usage not in accordance with product instructions, misuse, neglect, alteration, repair, improper installation, or improper testing.

Warranty Limitations and Exclusions

These warranties replace all other warranties, expressed or implied including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Intel makes no expressed warranties beyond those stated here. Intel disclaims all other warranties, expressed or implied including, without limitation, implied warranties of merchantability and fitness for a particular purpose. Some jurisdictions do not allow the exclusion of implied warranties, so this limitation may not apply.

All expressed and implied warranties are limited in duration to the limited warranty period. No warranties apply after that period. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so this limitation may not apply to you.

Limitations of Liability

Intel's responsibility under this, or any other warranty, implied or expressed, is limited to repair, replacement, or refund, as set forth above. These remedies are the sole and exclusive remedies for any breach of warranty. Intel is not responsible for direct, special, incidental, or consequential damages resulting from any breach of warranty under another legal theory including, but not limited to, lost profits, downtime, goodwill, damage to or replacement of equipment and property, and any costs of recovering, reprogramming, or reproducing any program or data stored in or used with a system containing this product. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This limited warranty gives you specific legal rights, and you may also have other rights that vary from jurisdiction to jurisdiction.

Any and all disputes arising under or related to this Limited Warranty shall be adjudicated in the following forums and governed by the following laws: for the United States of America, Canada, North America, and South America, the forum shall be Santa Clara, California, USA, and the applicable law shall be that of the State of California, USA; for the Asia Pacific region, the forum shall be Singapore and the applicable law shall be that of Singapore; for Europe and the rest of the world, the forum shall be London and the applicable law shall be that of the United Kingdom.

In the event of any conflict between the English language version and any other translated version(s) of this Limited Warranty, the English language version shall control.

How to Obtain Warranty Service

To obtain warranty service for this Product, you may contact Intel or your authorized distributor.

- North America and Latin America To obtain warranty repair for the product, please go to the following Web site to obtain instructions: <http://support.intel.com/support/motherboards/draform.htm>
- In Europe and in Asia Contact your original authorized distributor for warranty service.

Any replacement Product is warranted under this written warranty and is subject to the same limitations and exclusions for the remainder of the original warranty period.

Telephone Support

If you cannot find the information you need on Intel's World Wide Web site (<http://www.intel.com/>), call your local distributor or an Intel Customer Support representative. See “[Getting Help](#)” for telephone numbers.

Returning a Defective Product

Before returning any product, call your authorized dealer/distribution authority.

Appendix D: Getting Help

World Wide Web

<http://www.intel.com/support/motherboards/server/>

Telephone

All calls are billed per incident, levied in local currency at the applicable credit card exchange rate plus applicable taxes. (Intel reserves the right to change the pricing for telephone support at any time without notice).

Before calling, fill out an Intel[®] Server Issue Report Form. You can find a sample form at: <http://www.intel.com/support/motherboards/server/>.
For the fastest service, please submit your form via the Internet.

For an updated support contact list, see <http://www.intel.com/support/9089.htm/>.

U.S. and Canada

916-377-7000

Europe

Belgium 02 714 3182

Denmark ... 38 487077

Finland 9 693 79297

France..... 01 41 918529

Germany ... 069 9509 6099

Holland 020 487 4562

Italy..... 02 696 33276

Norway 23 1620 50

Spain 91 377 8166

Sweden..... 08 445 1251

UK..... 870 6072439

In Asia-Pacific region

Australia.... 1800 649931
Cambodia.. 63 2 636 9797 (via Philippines)
China 800 820 1100 (toll-free)
..... 8 621 33104691 (not toll-free)
Hong Kong 852 2 844 4456
India..... 0006517 2 68303634 (manual toll-free. You need an IDD-equipped telephone)
Indonesia ... 803 65 7249
Korea 822 767 2595
Malaysia 1 800 80 1390
Myanmar... 63 2 636 9796 (via Philippines)
New Zealand 0800 444 365
Pakistan.... 632 63684 15 (IDD via Philippines)
Philippines 1 800 1 651 0117
Singapore .. 65 6213-1311
Taiwan 2 2545-1640
Thailand 1 800 631 0003
Vietnam 632 6368416 (IDD via Philippines)

Japan

Domestic.... 0120 868686
Outside country ... 81 298 47 0800

Latin America

Argentina .. Contact AT&T USA at 0-800 222 1288. Once connected, dial 800 843 4481
Brazil 001-916 377 0180
Chile
Easter Island. Contact AT&T USA at 800 800 311. Once connected, dial 800 843 4481
Mainland and Juan .. Contact AT&T USA at 800 225 288. Once connected, dial 800 843 4481

Colombia... Contact AT&T USA at 01 800 911 0010. Once connected, dial 800 843 4481

Costa Rica . Contact AT&T USA at 0 800 0 114 114. Once connected, dial 800 843 4481

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(Andimate) Contact AT&T USA at 1 999 119. Once connected,
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(Pacifictel) Contact AT&T USA at 1 800 225 528. Once connected, dial
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Guatemala. Contact AT&T USA at 99 99 190. Once connected, dial 800 843 4481

Mexico Contact AT&T USA at 001 800 462 628 4240. Once connected, dial 800 843
4481

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Panama..... Contact AT&T USA at 00 800 001 0109. Once connected, dial 800 843 4481

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