

Kontron IP Network Server NSC2U

Product Guide

December 2009

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Revision History

Date	Revision	Description
December 2009	006	Kontron version, rev 1.4 Removed all references to Syscon and changed Intel Z-U130 to SMART Embedded USB Solid-State Drive
December 2008	005	Update art to reflect new PCI and CPU fan assemblies.
April 2008	004	Replaced SysCon information in Chapter 6 with installation instructions for Intel Z-U130 Valid Solid State Drive
May 2007	003	Updated Chapter 6, "Server Utilities" and reordered procedure steps; rev 1.1.
May 2007	002	Updated with review comments and new information; rev 0.8 and rev 1.0 In "Features", updated the "System Cooling" section to describe three cooling zones In "Optional Component Installations", added a section about installing an RJ45 GbE LAN card and revised "Installing an Optical Device" In "Server Component Replacements", added sections about replacing the fans, replacing the drive bay assembly, and replacing the SAS front panel board.
March 2007	001	Initial release; rev 0.5

1 Introduction

1.1 About this Manual

Thank you for purchasing and using the Kontron IP Network Server NSC2U.

This manual is for trained system technicians who are responsible for troubleshooting, upgrading, and maintaining this server. This document provides a brief overview of the features of the system, a list of accessories or other components you may need, troubleshooting information, and instructions on how to add and replace components on the NSC2U Server.

Always be sure to check the Support web site at <http://us.kontron.com/support/> for the latest version of this manual with possible updates since this version was published. (Search for NSC2U, click on Manuals, then Product Guide.)

1.1.1 Manual Organization

Chapter 2 provides a brief overview of the NSC2U Server. In this chapter, you will find a list of the server board features, chassis features, illustrations of the product, and product diagrams to help you identify components and their locations.

Chapter 3 provides instructions on adding and replacing hot-swappable and standard components such as processors and memory DIMMs. Use this chapter for step-by-step instructions and diagrams for installing or replacing components.

Chapter 4 provides instructions on adding optional components such as PCI add-in cards, I/O expansion modules, hardware RAID5 components, and optical devices. Use this chapter for step-by-step instructions and diagrams for installing components.

Chapter 5 provides instructions on replacing components such as fans, boards, the drive bay assembly, and the battery. Use this chapter for step-by-step instructions and diagrams for replacing components.

Chapter 6 provides instructions on using the utilities that are shipped with the board or that may be required to update the system. This includes how to navigate through the BIOS (Basic Input/Output System) setup screens, how to perform a BIOS update, and how to reset the password or CMOS (Complementary Metal Oxide Semiconductor). Information about the specific BIOS settings and screens is available in the *Intel® Server Board S5000PAL Technical Product Specification*.

Chapter 7 provides troubleshooting information. In this chapter, you will find BIOS error messages and POST (Power-on Self Test) code messages. You will also find suggestions for performing troubleshooting activities to identify the source of a problem.

1.2 What Your Server Includes

Your Kontron IP Network Server NSC2U includes the following components:

- One Intel® Server Board T5000PAL
- One 2U chassis
- Six internal hard disk drive trays in a removable drive bay assembly with SAS backplane board
- A riser card assembly for PCI-X* and PCI Express* (PCIe*) add-in cards
- DC or AC power subsystem: one hot-swappable PSU (for redundancy a separately orderable power supply is needed) and Power Distribution Board (PDB)
- Four dual-rotor fan assemblies for cooling the processor(s), DIMM(s), PCI slot(s), power supply modules, and other internal components
- SAS front panel (SFP) board
- Internal cables and connectors

See [Chapter 3](#) for initial system installation and configuration instructions.

1.3 Product Accessories

You may need or want to purchase one or more of the following items for your server as spares or for more processing power:

- Quad-core or dual-core processor(s) from the Intel® Xeon® processor 5000 sequence and appropriate heat sink(s)
- DDR2-667 FBD ECC memory DIMM(s) (system maximum = 32 Gbytes)
- SAS hard disk drives (system maximum = six HDDs)
- PCI-X or PCIe add-in cards
- Additional AC or DC power supply (for redundancy and hot-swapping)
- Intel® Remote Management Module (RMM) - Advanced Edition and GCM module
- I/O expansion module for dual-GbE or 4xSAS external drive support
- Intel® PRO/1000 AT Quad Port Bypass Adapter card and cables

For information about the accessories, memory, processors, and third-party hardware that have been tested and can be used with your system, and for ordering information for Kontron products, see the Configuration Guide on

<http://us.kontron.com/products/systems+and+servers+and+platforms/communication+rackmount+servers/ip+network+servers/ip+network+servers/ip+network+server+nsc2u.html>

Click on downloads, and then Ordering Guide.

1.4 Additional Information and Software

If you need more technical information about this product or information about the accessories that can be used with this NSC2U Server, see the Technical Product Specifications (for both the system and server board) and the test reports at <http://us.kontron/support/> for the following types of information:

- In-depth technical information about the server board included with this server, including BIOS settings and chipset information
- The latest product information
- Accessories or other server products

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- Hardware (peripheral boards, add-in cards) and operating systems that have been tested with this product
- DIMMs that have been tested with this product
- The power budget for this product
- Software to manage your server
- Diagnostics testing software
- Firmware and BIOS updates
- System drivers

2 Features

This chapter briefly describes the main features of the Kontron IP Network Server NSC2U. This chapter provides a diagram of the product, a list of the server features, and diagrams showing the location of important components and connections on the server system.

Figure 1 shows the IP Network Server NSC2U.

Figure 1. IP Network Server NSC2U

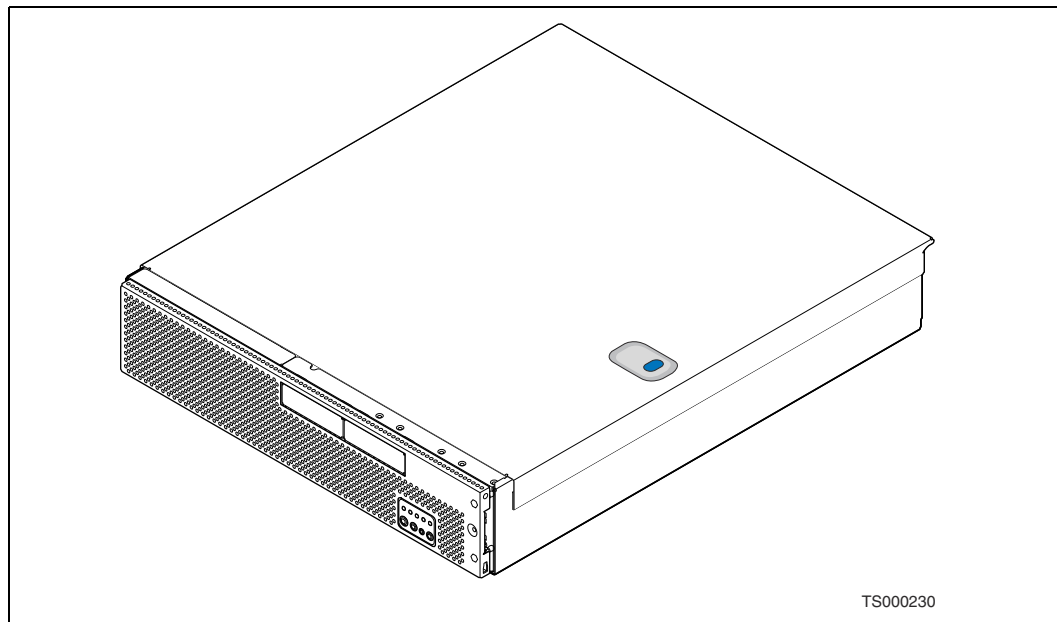


Table 1 summarizes the major features of the server system.

Table 1. IP Network Server NSC2U Features

Feature	Description
Compact, high-density system	Rack mount server with a height of 2U (3.5 inches, 8.9 cm) and a depth of 20.0 inches (50.8 cm)
Configuration flexibility	One- or two-way capability in low-profile and cost/value-effective packaging Stand-alone system Selected quad-core and dual-core processor models from the Intel® Xeon® 5000 Sequence
Serviceability	Rear access to hot-swappable power supplies Front access to hot-swappable SAS disk drives Front access to optional optical drive

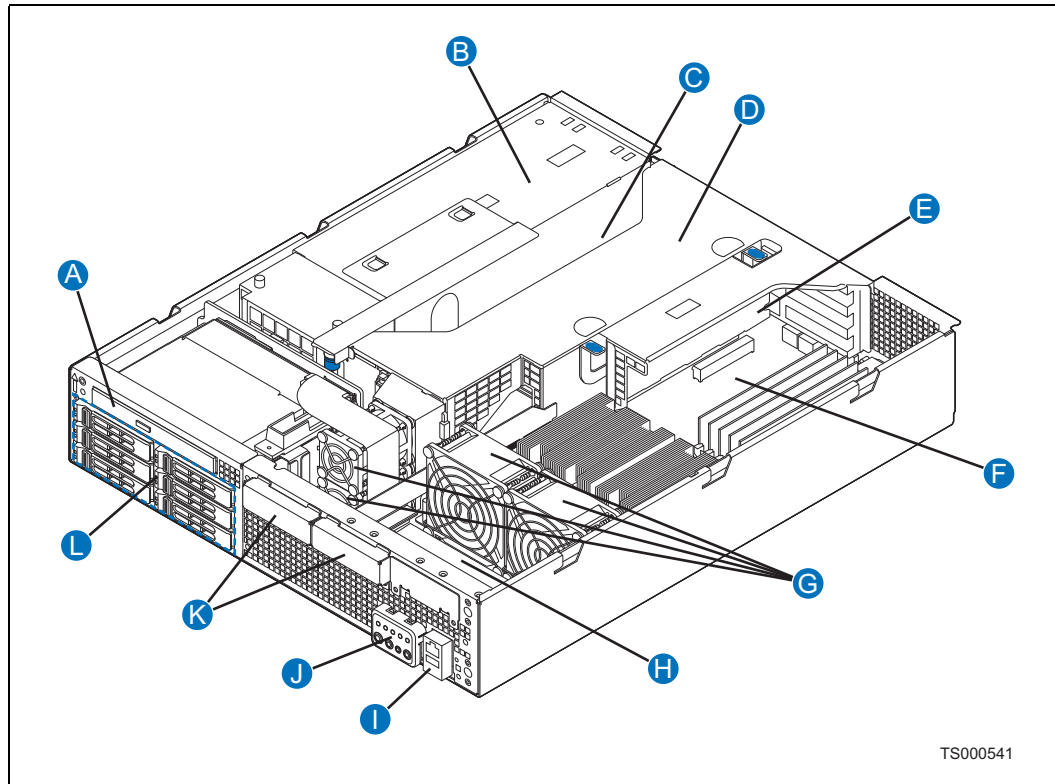
Table 1. IP Network Server NSC2U Features (Continued)

Feature	Description	
Availability	Two hot-swappable 600W power supplies in a redundant (1+1) configuration Disk subsystem configurable as hardware or software RAID Memory sparing and memory mirroring configurations supported	
Manageability	Remote management Emergency management port (serial and LAN) IPMI 2.0-compliant Remote diagnostics support Optional SMART Embedded USB Solid-State Drive (eUSB SSD)	
Upgradeability and investment protection	Supports selected quad-core and dual-core processor models from the Intel®Xeon® 5000 Sequence Multi-generational chassis Intel® 64 architecture support	
System-level scalability	Supports up to 32 GBytes FB-DIMM memory in non-mirrored mode Supports up to 16 GBytes FB-DIMM memory in mirrored mode Supports up to two Quad-Core Intel® Xeon® processor 5300 series Two full-height/full-length x4 PCI Express* (PCIe*) slots One full-height/full-length 64-bit x 133 MHz PCI-X slot Two low-profile/half-length x4 PCI Express slots Six internal hot-swappable SAS disk drives One optical drive (optional)	
Front panel	Switches: <ul style="list-style-type: none"> • Power switch • Reset switch • NMI switch • ID switch 	LEDs: <ul style="list-style-type: none"> • ID LED • NIC activity LED • Main power LED • HDD activity LED • Status LED
I/O	Front panel: <ul style="list-style-type: none"> • Serial B port (RJ45) • USB 2.0 port • Four or eight GbE ports (optional) 	Rear panel: <ul style="list-style-type: none"> • Dual PS/2 ports for keyboard and mouse • Serial B port (RJ45) • Two USB 2.0 ports • GCM 100 Mbps management port • Two RJ45 NIC connectors for 10/100/1000 Mbps connections • Video connector
Internal connection options	Internal connectors/headers: <ul style="list-style-type: none"> • One 44-pin ATA/100 connector (power and I/O) for optical drive • One Intel® Remote Management Module (Intel® RMM) connector • One Intel® I/O Expansion Module (optional) supporting either: <ul style="list-style-type: none"> - a dual GbE NIC connection - an external x4 SAS drive 	
Add-in card support	One full-height riser slot supporting 2U PCI-X* and PCI Express* (PCIe*) add-in cards One low-profile riser slot supporting PCIe add-in cards	

2.1 Server Components

Figure 2 shows the NSC2U Server with top cover and front bezel removed to show the internal components.

Figure 2. IP Network Server NSC2U Components

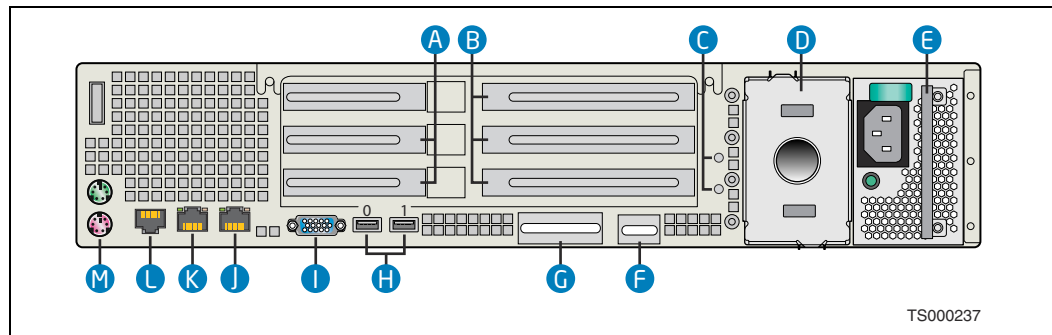


Item	Description	Item	Description
A	Optical drive (optional)	G	System fans
B	Power supply cage (contains one power supply module with provision for an optional second module)	H	SAS Front Panel (SFP) board; can include optional SMART eUSB SSD (which provides local memory storage)
C	Provision for PCI-X and PCI Express (PCIe) full-height and full-length add-in cards	I	RJ45 COM2 and USB port 2
D	Riser card assembly (containing riser cards for both full-height and low-profile add-in cards)	J	Control panel and status indicators
E	Provision for two PCI Express low-profile add-in cards	K	Two slots for 4x GbE NIC ports (optional)
F	Intel® Server Board T5000PAL	L	SAS disk drives (up to six)

2.2 NSC2U Server Back Panel

Figure 3 shows the back panel of the NSC2U Server.

Figure 3. NSC2U Server Rear View

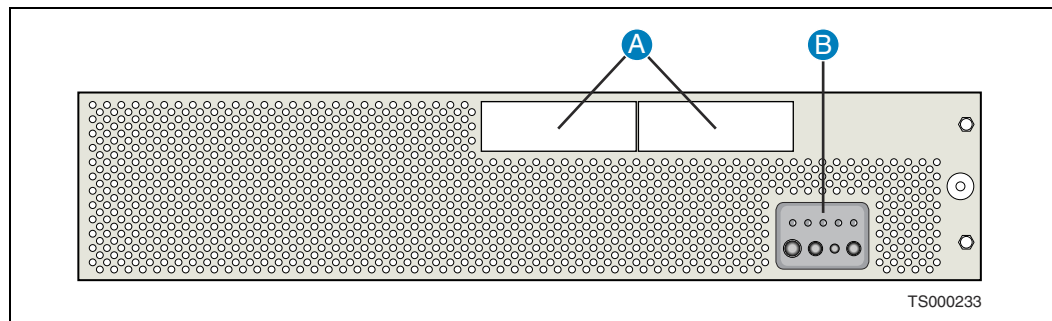


Item	Description	Item	Description
A	Low-profile PCI Express add-in cards (or filler panels)	H	USB 0 and USB 1 port connectors
B	Full-height PCI-X/PCI Express add-in cards (or filler panels)	I	Video connector
C	Ground studs (used for DC-input system)	J	GbE NIC 2 connector
D	Power supply 2 slot; filler panel shown	K	GbE NIC 1 connector
E	Power supply 1 †	L	RJ45 serial port connector
F	GCM port connector (optional) ††	M	PS/2 keyboard and mouse connectors
G	I/O expansion module connector (optional) †††		
†	In Figure 3, the power supply shown is an AC-input module. DC-input modules are also available.		
††	If GCM is not present, a filler panel occupies this space.		
†††	May be either an external SAS port connector or dual GbE port connector. If neither of the optional modules is installed, a filler panel occupies this space.		

2.3 NSC2U Server Front Panel

Figure 4 shows the front panel of the NSC2U Server with the bezel installed.

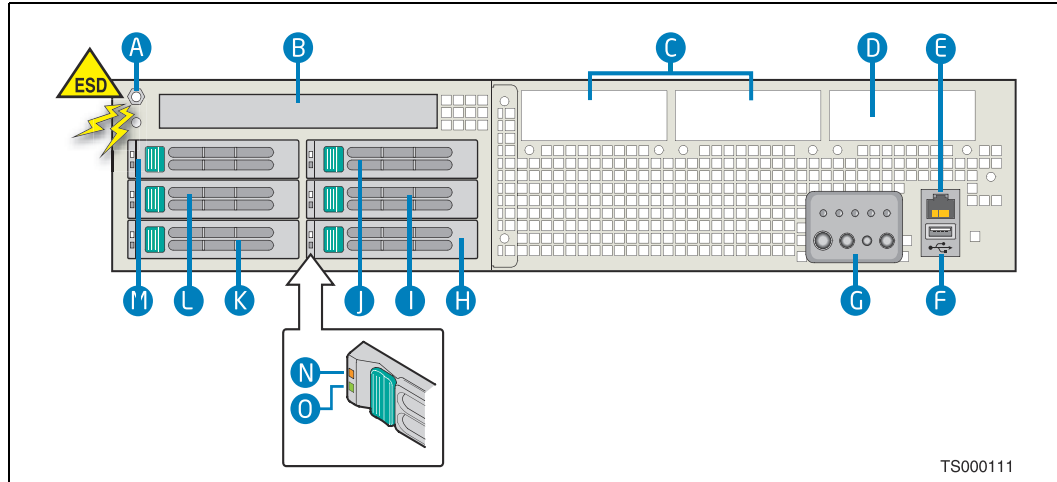
Figure 4. NSC2U Server Front View (Bezel Installed)



Item	Description	Item	Description
A	Two slots for 4x GbE NIC ports (optional); filler panels shown in illustration	B	Front panel control switches and status LEDs (see Figure 6 for details)

Figure 5 shows the front panel of the NSC2U Server with the bezel removed.

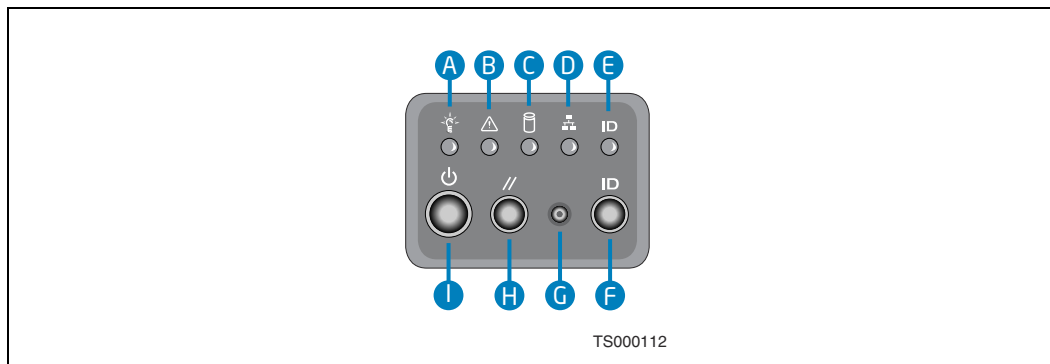
Figure 5. NSC2U Server Front View (Bezel Removed)



Item	Description	Item	Description
A	Anti-static connection point	H	Hard drive bay 0
B	Optical drive (optional) or filler panel if no drive is installed.	I	Hard drive bay 2
C	Two slots for 4x GbE NIC ports (optional); filler panels shown in illustration	J	Hard drive bay 4
D	Optional slot for future design use	K	Hard drive bay 1
E	Front-panel serial port connector (RJ45)	L	Hard drive bay 3
F	USB port 2 connector	M	Hard drive bay 5
G	Front panel control switches and status LEDs (see Figure 6 for details)	N	Drive fault indicator (one per hard drive)
		O	Drive activity indicator (one per hard drive)

Figure 6 shows the NSC2U Server control panel.

Figure 6. NSC2U Server Control Panel



Item	Feature	Description
Front Panel LEDs		
A	Main power LED (green)	When continuously lit, indicates the presence of power supply DC output power in the server. The LED turns off when the main output power from the power supply is turned off or the power source is disrupted.
B	System Status (green/amber)	Indicates system status as follows: <ul style="list-style-type: none"> Steady green indicates system in standby or ready for operation. Blinking green indicates degraded operation (e.g., power supply non-redundancy, part of system memory mapped out by BIOS). Blinking amber indicates one or more non-critical fault conditions. Steady amber indicates one or more critical fault conditions.
C	HDD Activity/Fault LED (green/amber)	Indicates HDD activity when green, or an HDD fault when amber. This is an aggregated indication for all hard disk drives (up to six) in the system. Each hard disk contains its own activity and fault indicators.
D	NIC activity LED (green)	Indicates NIC activity when lit
E	System ID LED (blue)	Indicates system identity LED can be toggled remotely or by front-panel ID switch for identification purposes
Front Panel Switches		
F	ID switch	Toggles system ID LED
G	NMI switch	Asserts NMI to the T5000PAL server board
H	Reset switch	Resets the system
I	Power switch	Toggles the system power

2.4 NSC2U Server Rear Panel Ethernet Ports

The NSC2U Server has two GbE NIC ports mounted on the baseboard that are accessible from the rear of the chassis.

Additional rear-accessible GbE NIC ports can be added to the system by using full-height PCI-X/PCIe add-in cards or low-profile PCIe add-in cards. The possible configurations of full-height PCI-X/PCIe add-in cards are given in [Table 2](#) and the possible configurations of low-profile PCIe add-in cards are given in [Table 3](#). Also, a dual GbE I/O option module is supported that adds two RJ45, 1 Gigabit Ethernet ports accessible on the rear panel.

Table 2. Full-Height Riser Card Configurations and Throughput

Configuration	Bottom Slot	Middle Slot	Top Slot
1 add-in card	PCI-X †	–	–
	–	x8 or x4 PCIe	–
	–	–	x4 PCIe
2 add-in cards	PCI-X †	x8 or x4 PCIe	–
	PCI-X †	–	x4 PCIe
	–	x4 PCIe	x4 PCIe
3 add-in cards	PCI-X †	x4 PCIe	x4 PCIe

Note: † Up to 133 MHz bus speed

Table 3. Low-profile PCI Add-in Card Configurations and Throughput

Configuration	Lower Slot	Upper Slot
1 add-in card	x4 PCIe	
		x4 PCIe
2 add-in cards	x4 PCIe	x4 PCIe

The GbE NIC ports are intended to be installed with shielded cabling that is grounded at both ends of the cable.

Warning: The intra-building port(s) of the equipment or subassembly is suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly **MUST NOT** be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

2.5 SAS Front Panel (SFP) Board

The SAS Front Panel (SFP) board is located between the front panel and the two 80 mm fans. The SAS drives connect into the SFP board for power and signals. The SFP board also provides fan power connectors and the user interface for the system's front panel.

2.5.1 SFP Board Features

The NSC2U Server SFP board has the following features:

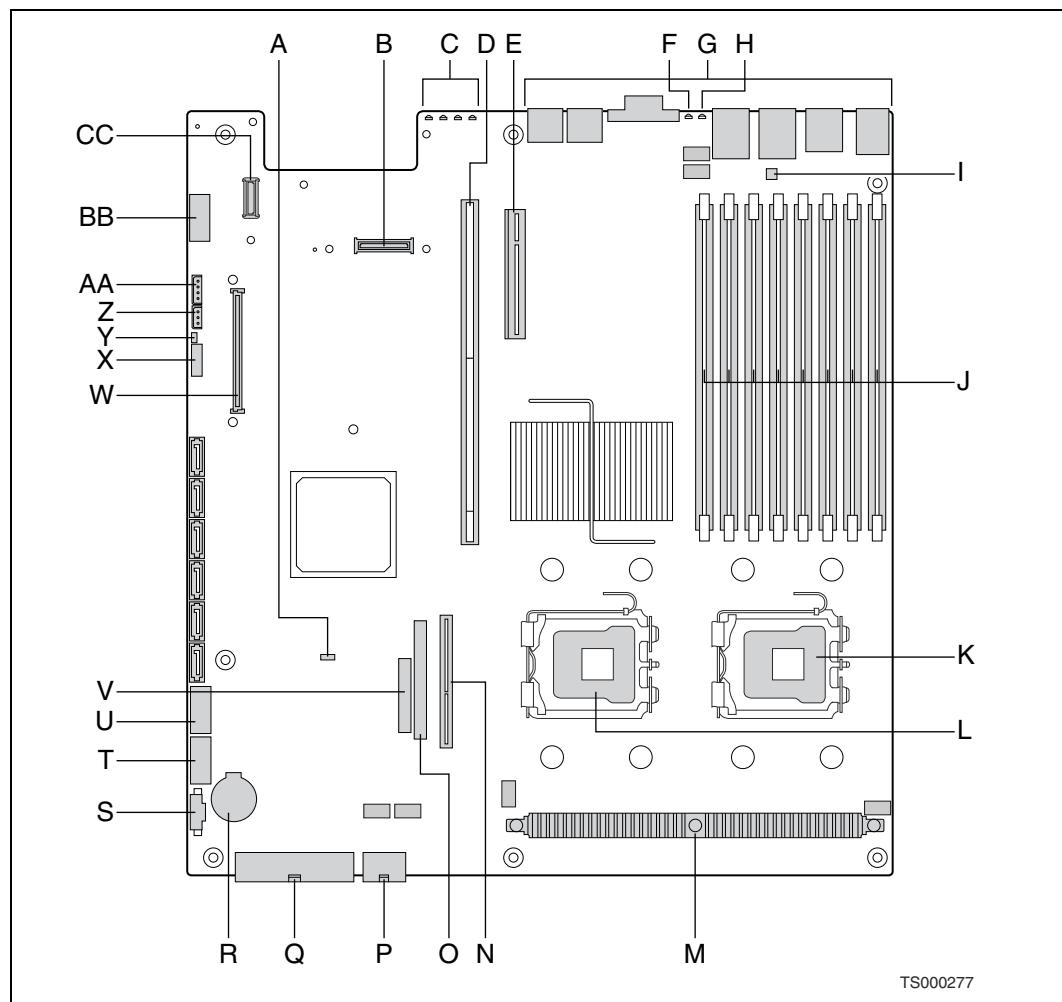
- four switches to control power-on, reset, NMI, and the system ID
- one system status LED that indicates the presence of DC power in the system
- two system activity LEDs that indicate power-on and NIC activity
- one dual-color, hard drive LED that indicates activity/fault status for all internal SAS drives
- one system ID LED that can be controlled remotely or by the system ID switch
- one RS-232 front panel port
- one USB2.0 front panel port

- one USB2.0 interface to the SMART Embedded USB Solid-State Drive, which provides local memory storage
- a single flex cable connection to the SAS backplane to support the interface to six independent 2.5-inch SAS hard drives
- a socket for a hardware RAID key, required to enable hardware RAID
- a socket for a DDR2 mini-DIMM that provides data caching for hardware RAID
- a connector for the Intelligent Battery Backup Unit (IBBU) that allows the contents of the DDR2 mini-DIMM to be preserved if power falls below specifications.
- four fan connectors to provide power, control, and monitoring for the four cooling fans
- four fan fault LEDs (not visible on front panel; for diagnostics purposes only)

2.6 Server Board Connector and Component Locations

Figure 7 shows the locations of connectors and components on the T5000PAL Server Board.

Figure 7. Server Board T5000PAL Diagram



	Description		Description
A	BIOS Bank Select Jumper	P	CPU Power Connector
B	IO Module Option Connector	Q	Main Power Connector
C	POST Code Diagnostic LEDs	R	Battery
D	Intel® Adaptive Slot – Full-height	S	Power Supply Management Connector
E	PCI Express Riser Slot – Low-profile	T	Dual Port USB 2.0 Header
F	System Identification LED - Blue	U	Serial Port Connector
G	External I/O Connectors	V	SSI 24-pin Control Panel Header
H	Status LED – Green/Amber	W	Intel® Remote Management Module (RMM) Connector
I	Serial 'B' Port Configuration Jumper	X	System Recovery Jumper Block
J	FBDIMM Slots	Y	Chassis Intrusion Switch Header
K	CPU #1 Connector	Z	3-pin IPMB Header
L	CPU #2 Connector	AA	Intel® Local Control Panel Header
M	Voltage Regulator Heat Sink	BB	Serial 'A' Header
N	Bridge Board Connector	CC	Intel® RMM NIC Connector
O	ATA-100 Optical Drive Connector (power and I/O)		
Note: In Figure 7, connectors shown but not called out are "not used".			

2.7 Hard Disk Drives

The NSC2U Server chassis supports up to six hot-swappable hard drive tray assemblies at the front of the chassis.

For information on how to install these drives, see [Section 3.3.1, "Installing or Replacing a Hard Drive"](#).

Note: The NSC2U Server does not support all SAS hard drives. For a list of validated hard drive manufacturers and hard drive types, see the *Tested Hardware and Operating Systems List* (THOL) at <http://us.kontron.com/support/> (Search for NSC2U, click on Product Downloads, then Compatibility Matrix.)

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

2.8 Riser Card Assembly

The IP Network Server NSC2U incorporates a PCI riser assembly that supports installation of PCI-X and PCI Express add-in boards. The assembly includes two riser cards that provide a total of five standard interface slots for add-in boards by connecting to two special slots on the T5000PAL server board.

- One of the riser card slots is a PCI super slot that contains all the signals necessary to support both PCI-X and PCI Express (PCIe) expansion slots. The riser card that connects to the super slot supports the connection of full-height, full-length PCI-X or PCIe add-in cards.

- The second riser card slot, a low-profile riser card, supports low-profile PCIe add-in boards.

See [Section 4.2, “Installing or Replacing a PCI Add-in Card” on page 51](#), for instructions describing how to install a PCI-X or PCIe add-in card. After the add-in cards are installed, the riser assembly is plugged back into the system and the I/O brackets of all the add-in cards are accessible through the rear panel of the server chassis.

2.8.1 Full-height PCI-X/PCIe Riser Card

The PCI-X/PCIe riser card plugs into the super slot on the the server board. For PCI-X add-in cards, the super slot riser card implements a 64-bit PCI-X slot with bus speeds of 66 MHz, 100 MHz, or 133 MHz. For PCIe cards, the super slot has eight PCIe lanes which can be used for a single x8 add-in card or for one or two x4 or x1 add-in cards. See [Table 2](#) for the supported configurations. For detailed information about the pinouts and electrical specifications, see the *Kontron IP Network Server NSC2U Technical Product Specification*.

2.8.2 Low-profile PCIe Riser Card

The low-profile PCIe riser card plugs into the server board and supports the connection of low-profile PCIe add-in cards only. The low-profile PCIe riser card implements two x4 link interfaces. Up to two low-profile PCIe add-in cards can be installed. See [Table 3](#) for the supported configurations. For detailed information about the pinouts and electrical specifications, see the *Kontron IP Network Server NSC2U Technical Product Specification*.

2.9 Power Supply

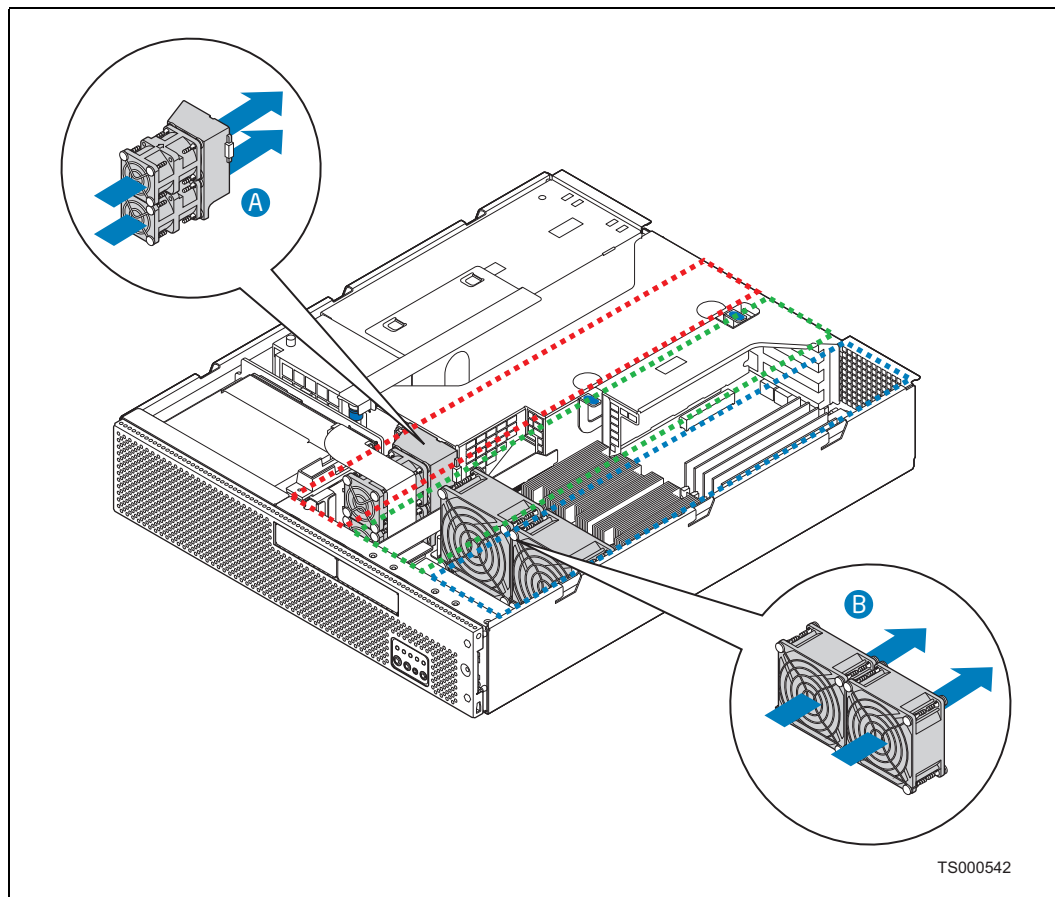
The power subsystem has up to two power supply modules capable of operating in redundant mode and a Power Distribution Board (PDB). A power supply filler panel for the empty power supply site is supplied for systems without redundancy.

The power supply is rated for 600W output capability in full AC (or DC) input voltage range.

2.10 System Cooling

There are three cooling areas (domains) in the NSC2U Server system:

- domain 1 - CPU 1 and memory; see area outlined in blue in [Figure 8](#)
- domain 2 - CPU 2, chipset, and any low-profile PCIe add-in cards; see area outlined in green in [Figure 8](#)
- domain 3 - any full length PCI-X or PCIe addin cards; see area outlined in red in [Figure 8](#)

Figure 8. NSC2U Server System Cooling Areas

2.10.1 CPU 1 and Memory Cooling Area

One of the system's big fans provides cooling for domain 1, outlined in blue in [Figure 8](#). This fan facilitates the flow of air through the front bezel over the SFP, through the fan, and over the server board, CPU 1, memory, and ultimately out through the rear of the chassis.

2.10.2 CPU 2 and Chipset Cooling Area

One of the system's big fans provides cooling for domain 2, outlined in green in [Figure 8](#). This fan facilitates the flow of air through the front bezel over the SFP, through the fan, and over the server board, CPU 2, chipset and any low-profile PCIe add-in cards, and ultimately out through the rear of the chassis.

2.10.3 PCI Cooling Area

The two 40×40×56 mm dual-rotor fans (A in [Figure 8](#)) facilitate the flow of air through the front bezel, through the fans, over the server board and any full-length PCI-X or PCIe add-in cards, and ultimately out through the rear of the chassis.

2.10.4 Hard Disk Drive and Power Supply Cooling

Airflow to cool the hard disk drives is provided by the fans that are integrated into the PSUs. The airflow is adequate even with a single PSU installed as long as a filler panel is installed in the other PSU slot.

2.10.5 Fan Speed Control

The server board contains Pulse Width Modulation (PWM) circuits, which control the 12 Vdc fan voltage to provide quiet operation when system ambient temperature is low and there are no fan failures. There is one PWM circuit for each cooling domain, resulting in one PWM being connected to each of the two 80×38 mm fans and the other PWM connected to the two dual-rotor 56×40 mm fans. Based on the ambient temperature, monitored by the front panel sensor, the fan speeds (PWM duty cycle) are set per Table 4.

Table 4. Fan Speed Settings

Temperature (°C)	CPU1 Fan PWM DC (%)	CPU2 Fan PWM DC (%)	PCI Fans PWM DC (%)
0 - 28	46	46	46
29	47	47	47
30	48	48	48
31	53	53	53
32	58	58	58
33	63	63	63
34	68	68	68
35	73	73	73
36	78	78	78
37	84	84	84
38	89	89	89
39	95	95	95
40	100	100	100

2.10.6 Cooling Summary

The four-fan cooling subsystem of the NSC2U Server is sized to provide cooling for:

- up to two server board processors
- up to 32 Gbytes of FB DIMM memory
- up to six SAS hard drives
- up to five PCI add-in cards consuming a maximum of 25W for each full-height PCI-X/PCIe add-in cards and 10W for each low-profile PCIe add-in card

The cooling subsystem is designed to meet acoustic and thermal requirements at the lower fan speed settings. At the higher fan speed settings, thermal requirements are met for the maximum ambient temperatures, but acoustic requirements are not met.

2.11 Hardware Requirements

To avoid integration difficulties and possible board damage, your system must meet the requirements outlined below. For a list of qualified components, see [Section 1.4, “Additional Information and Software”](#).

2.11.1 Processor

The server board accommodates two quad-core or dual-core processors from the Intel® Xeon® processor 5000 sequence. For a list of the currently supported processors, see the Configuration Guide at:

<http://us.kontron.com/products/systems+and+servers+and+platforms/communication+rackmount+servers/ip+network+servers/ip+network+server+nsc2u.html>

Click on Downloads, Ordering Guide.

2.11.2 Memory

On the T5000PAL server board, the Memory Controller Hub (MCH) accommodates four channels of Fully Buffered DIMM (FB-DIMM) memory. Each channel can support up to two Dual Ranked FB-DIMM DDR2 DIMMs. FB-DIMM memory channels are organized into two branches for support of RAID 1 (mirroring). See [Section 3.4.2, “Configuring Memory DIMMs”](#) for detailed information about population rules and instructions for installing DIMMs in the sockets on the server board.

3 Server Component Installations and Upgrades

3.1 Before You Begin

Before working with your server product, pay close attention to the safety instructions provided in this manual. See [Appendix A, "Safety Information"](#).

Warning: 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.

3.1.1 Tools and Supplies Needed

- #1 and #2 Phillips (cross-point) screwdrivers (or interchangeable tip screwdriver with #1 and #2 Phillips bits)
- Personal grounding device such as an anti-static wrist strap and a grounded conductive pad

3.1.2 System References

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

3.2 General Installation Procedures

The following sections present general installation and removal procedures that are required before removing or installing internal components that are not hot-swappable.

3.2.1 Removing the Chassis Cover

The NSC2U Server must be operated with the top cover in place to ensure proper cooling. You will need to remove the top cover to add or replace components inside of the server that are not hot-swappable from the front or rear panels.

Caution: 5V standby power is present inside the chassis whenever the PSU(s) are connected to a source of power.

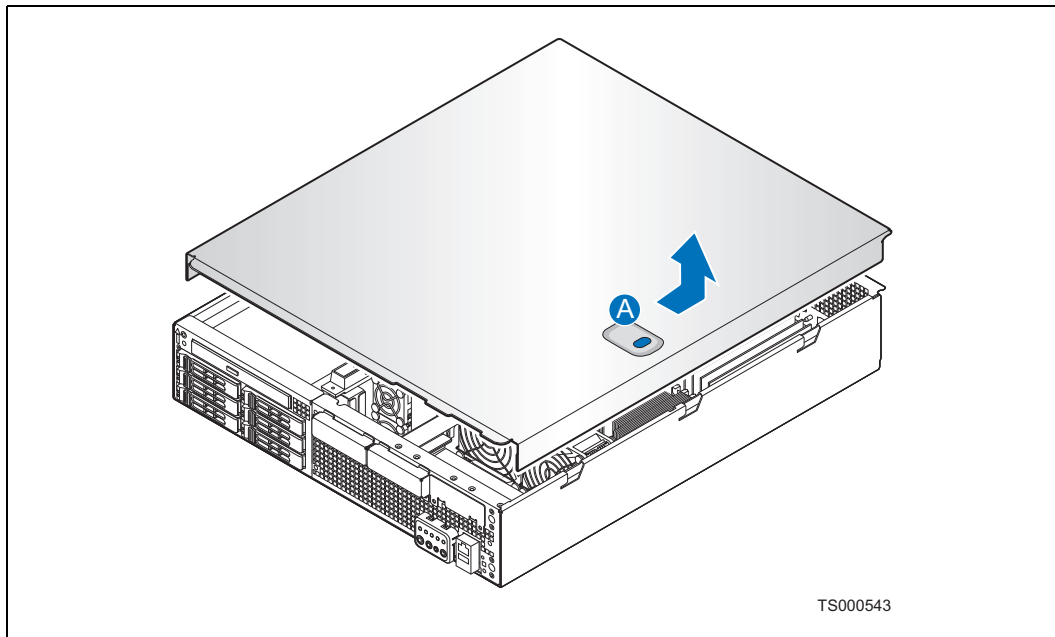
Before removing the top cover, power down the server system and unplug all peripheral devices and the power cable.

Note: A non-skid surface or a stop behind the server may be needed to prevent the server from sliding on your work surface.

1. Observe the safety and ESD precautions in Chapter [Appendix A, "Safety Information"](#).
2. Turn off all peripheral devices connected to the server. Turn off the server.

3. Disconnect the power cord(s).
4. Remove the shipping screw, if present.
5. While holding the blue button at the top of the chassis in ("A"), slide the top cover back until it stops.
6. Lift the cover straight up to remove it from the server.

Figure 9. Removing the Chassis Cover



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3.2.2 Installing the Chassis Cover

1. Place the cover over the chassis so that the side edges of the cover sit just inside the chassis side walls, with the front of the cover with about 1/8-inch (3-mm) gap showing between the chassis cover and the sheet-metal at the front of the chassis.
2. Press down slightly on the chassis cover behind the peripheral area and slide the cover forward until it clicks into place.
3. Install the shipping screw if tooling entry is required or if the system will be shipped.
4. Reconnect all peripheral devices and the power cord(s).

Caution: This unit must be operated only with the top cover installed to ensure proper cooling.

3.2.3 Removing the Front Bezel

Remove the front bezel to

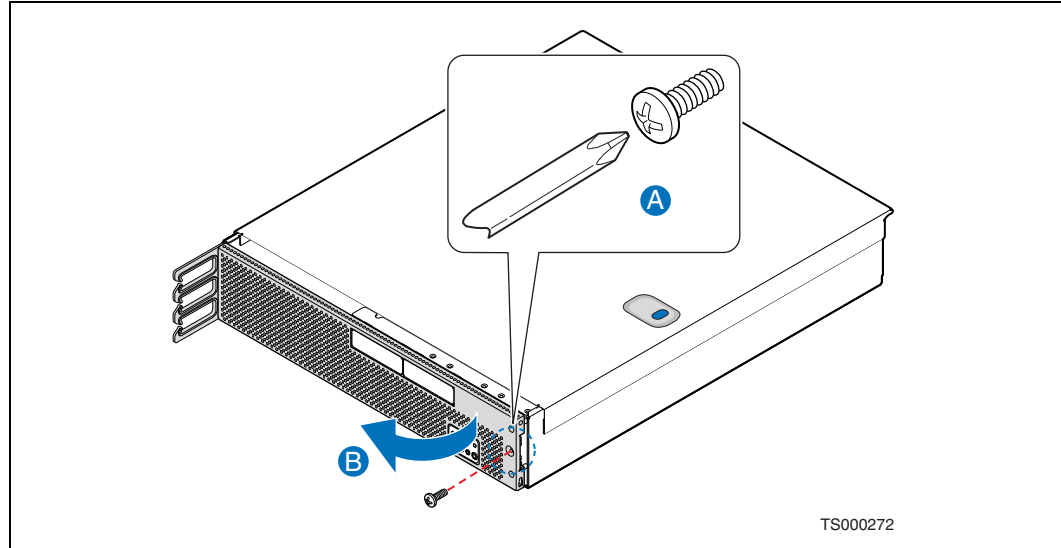
- install or remove hard drives, an optical device, or a 4xGbE connection
- access the front-panel serial port and USB connectors
- observe the individual HDD activity/fault indicators

Note: The server does not have to be powered down just to remove the front bezel.

1. Disconnect the cables from the front panel 4xGbE connectors if they are installed.

2. Remove the bezel retention screw (right side, if present). ("A")
3. Rotate the bezel outward as shown and remove. ("B")

Figure 10. Removing the Front Bezel



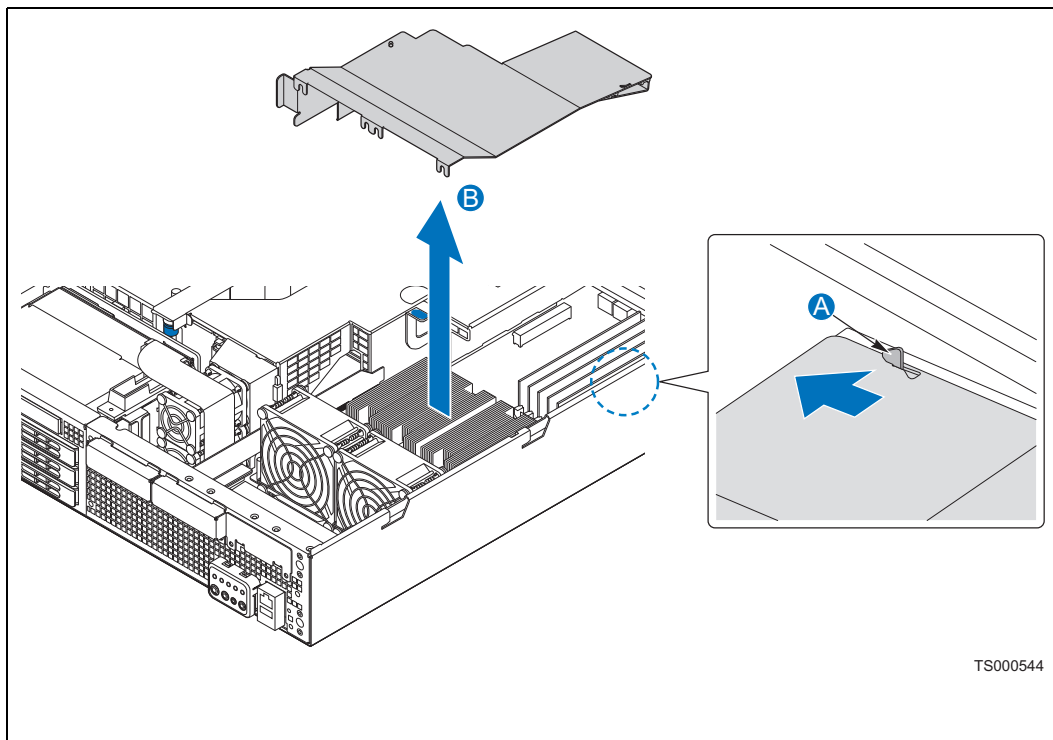
3.2.4 Installing the Front Bezel

1. Align the four tabs on the left of the bezel with the slots in the front panel and then rotate the free end of the bezel to the closed position.
2. Snap the front bezel into place and tighten the screw at the right edge of the bezel (if used).
3. Re-connect the 4xGbE cables if they are used.

3.2.5 Removing the Processor Air Duct

The air duct must be removed to access the processors, memory DIMMs, CPU fan assembly, the SFP board, or the inside of the front panel. The processor air duct is required for proper airflow within the chassis. Be sure the air duct is in place again before installing the chassis cover.

1. Power down the server system and unplug all peripheral devices and the AC power cable.
2. Remove the chassis cover. For instructions, see [Section 3.2.1, "Removing the Chassis Cover"](#).
3. Slide the duct several millimeters toward the rear panel until it stops. ("A")
4. Lift the air duct straight up and remove it from the chassis. ("B")

Figure 11. Removing the Processor Air Duct

3.2.6 Installing the Processor Air Duct

1. Place the processor air duct over the processor sockets and fan assembly, using caution to make sure you do not pinch any cables beneath the edges of the air duct.
2. Slide the air duct forward until it is flush with the front panel.
3. Ensure that the rear of the air duct is fastened to the metal tab on the chassis. ("A")
4. Replace the chassis cover if you have completed all work inside of the chassis.

3.3 Hot-Swappable Component Installation Procedures

The following components are hot-swappable and do not require powering down the system or removing the chassis cover:

- Hard disk drives
- AC and DC power supplies

3.3.1 Installing or Replacing a Hard Drive

Up to six hot-swappable SAS drives can be installed in your NSC2U Server. You must remove the front bezel to add or replace a hard drive in one of the six drive bays.

Caution: If you install fewer than six hard drives, the empty bays must have drive trays with baffles in them to maintain proper system cooling.

The IP Network Server NSC2U does not support all SAS hard drives. To see a list of validated manufacturers and hard drive types, refer to the *Tested Hardware and Operating System List (THOL)* at: <http://us.kontron.com/support/> (Search for NSC2U, click on Product Downloads, and then Compatibility Matrix.)

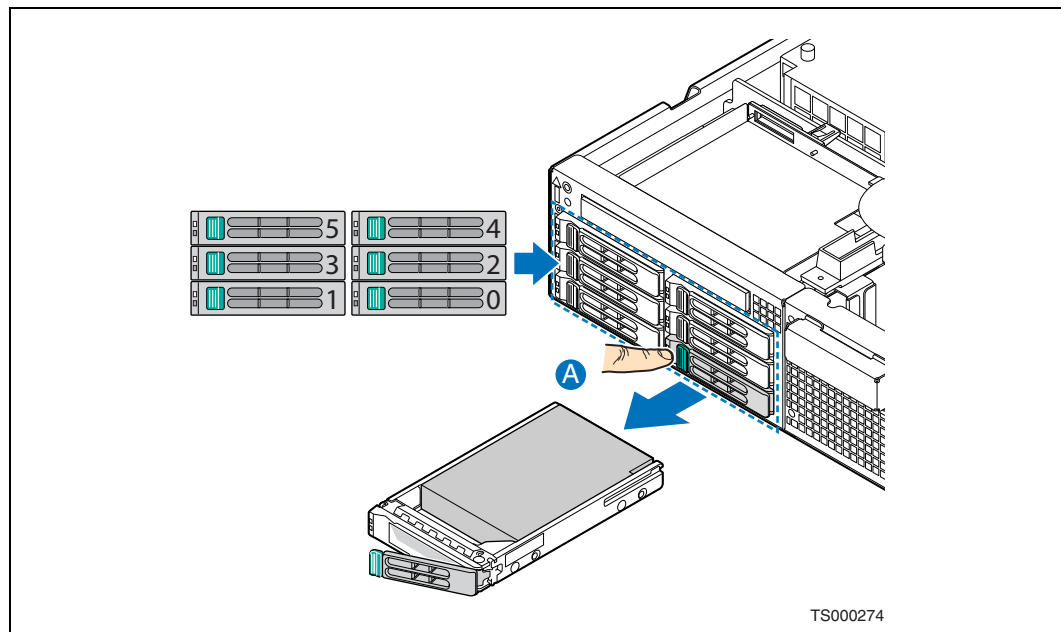
3.3.1.1 Removing a Hard Drive Tray from the Chassis

1. Remove the front bezel. For instructions, see [Section 3.2.3, "Removing the Front Bezel"](#).
2. Select the drive bay where you want to install the drive and remove the drive tray by pressing the green button to open the lever. ("A")

Note: If you will have fewer than six drives installed, drive bay 0 must be used first, then drive bay 1, and so forth.

3. Pull the drive tray assembly out of the chassis.

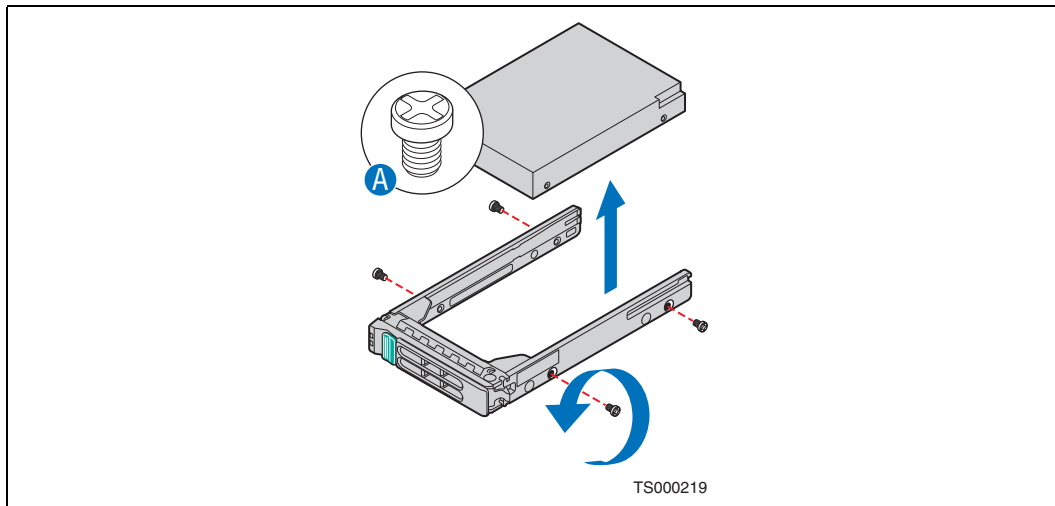
Figure 12. Removing a Drive Tray from the Chassis



3.3.1.2 Attaching a Hard Drive to the Drive Tray

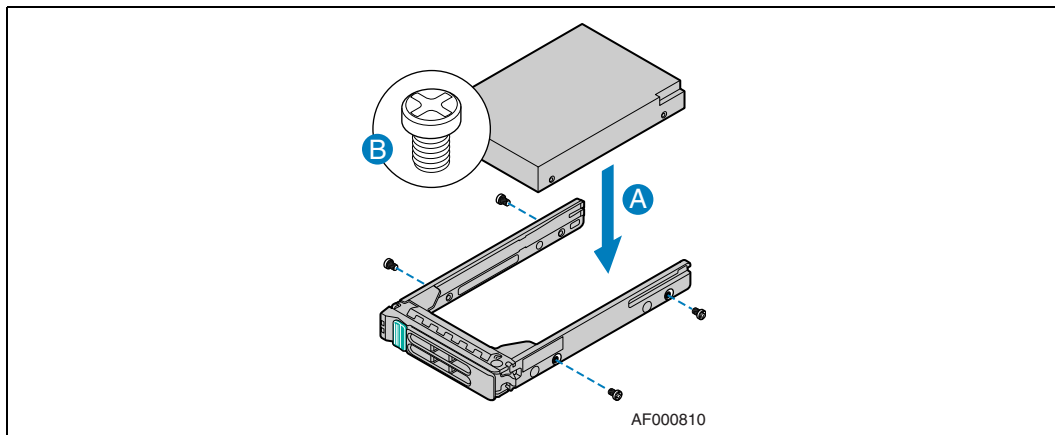
1. If a drive is already installed (that is, if you are replacing the drive), remove it by unfastening the four screws that attach it to the drive tray. ("A")

Figure 13. Removing a Hard Drive from the Drive Tray



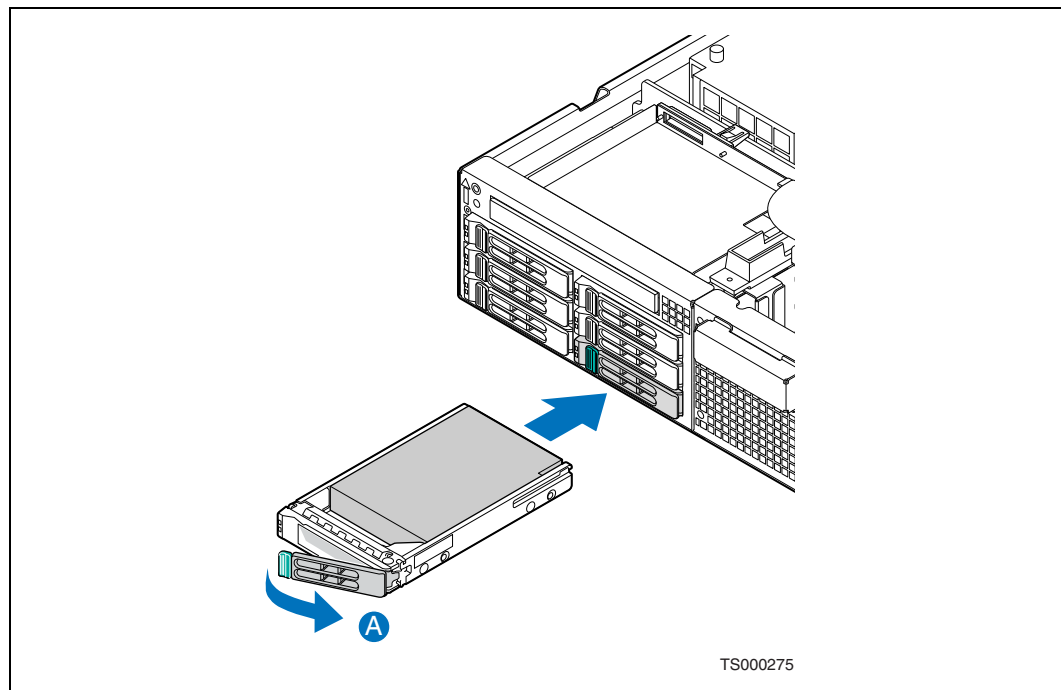
2. Install the new drive in the drive tray and secure the drive with the four screws that come with the drive tray. (Figure 14, "A" and "B")

Figure 14. Installing a Hard Drive in the Drive Tray



3. With the drive tray locking lever fully open, push the hard drive tray into the drive bay in the chassis until it stops. (Figure 15, "A")
4. Press the lever until it snaps shut to secure the drive in the bay.
5. Replace the front bezel.

Figure 15. Inserting a New SAS Drive Assembly into the Chassis



3.3.2 Replacing a Power Supply

Caution: Your server does not have a redundant power supply unless you have purchased the optional second power supply. If there is no second supply, before 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 power cord(s) from the system or wall outlet.

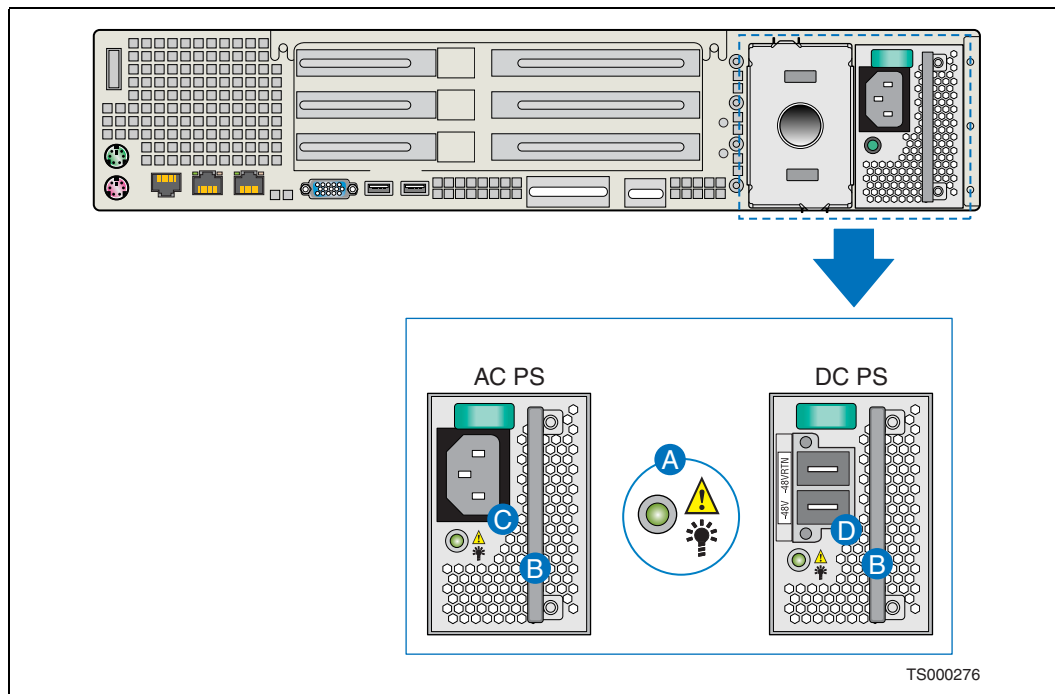
To maintain hot-swap capability, make sure that there is an active power supply module in both chassis slots before replacing (hot-swapping) a power supply module.

The NSC2U Server supports the use of either AC (Figure 16, "C") or DC ("D") power supply modules.

3.3.2.1 Removing the Power Supply Module

1. Check the status LED to determine which power supply has failed and disconnect the appropriate power cable. (Figure 16, "A")
2. Press and hold the green safety lock downward to disengage the power supply module.
3. Grasp the handle ("B") and pull the power supply module from the chassis.

Figure 16. AC and DC Power Supplies



3.3.2.2 Installing the Power Supply Module

1. Press and hold the green safety lock downward and slide the power supply module into the chassis slot.

3.3.2.3 Grounding a DC-Powered System

The DC chassis provides two #10-32 threaded studs for chassis enclosure grounding. A single 90° standard barrel, two-hole, compression terminal lug with 5/8-inch pitch suitable for a #14-10 AWG conductor (such as the Thomas & Betts* terminal lug, p/n 256-31426-141) must be used for proper safety grounding. See "C" in Figure 3 for the location of the ground studs.

A crimping tool may be needed to secure the terminal lug to the grounding cable.

3.4 Internal System Component Configuration and Installation Procedures

Note: The procedures in this section assume that you have powered down the server and removed the chassis cover as described in Section 3.2, "General Installation Procedures".

3.4.1 Configuring Jumpers on the Server Board

The jumpers are located on the T5000PAL server board, which is in the rear right section of the IP Network Server NSC2U chassis. To configure the jumpers on the server board, you must first remove the chassis cover and then the processor air duct

(see Section 3.2.5, “Removing the Processor Air Duct”) and the PCI riser card assembly (see Section 4.2.2, “Removing the PCI Riser Card Assembly” on page 53). All other components installed on the server board can remain in place.

3.4.1.1 Configuration Jumpers

The server board has several 2-pin and 3-pin jumper blocks (see Figure 17) that can be used to configure, protect, or recover specific features of the server board. Pin 1 on each jumper block is denoted by “*” or “ ”.

Figure 17. Recovery Jumper Blocks (J1D1, J1D2, J1D3)

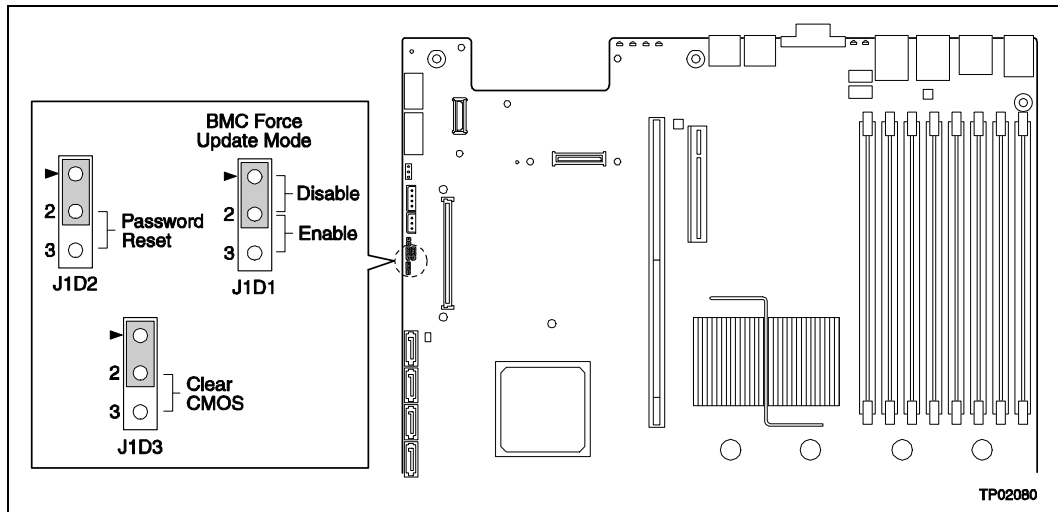


Table 5 gives the meaning of the various jumper positions and identifies the default configuration of each jumper.

Table 5. Recovery Jumpers

Jumper Name	Pins	What happens at system reset...
J1D1: BMC Force Update	1-2	BMC Firmware Force Update Mode – Disabled (Default)
	2-3	BMC Firmware Force Update Mode – Enabled
J1D2: Password Clear	1-2	These pins should have a jumper in place for normal system operation. (Default)
	2-3	If these pins are jumpered, administrator and user passwords will be cleared at the next system reset. These pins should not be jumpered for normal operation.
J1D3: CMOS Clear	1-2	These pins should have a jumper in place for normal system operation. (Default)
	2-3	If these pins are jumpered, the CMOS settings will be cleared at the next system reset. These pins should not be jumpered for normal operation.

3.4.1.2 BIOS Select Jumper

The jumper block at J3H1, located just to the left of the SSI control panel header (see Figure 18), is used to select which BIOS image the system will boot to. Pin 1 on the jumper is identified with a “ ”.

Figure 18. BIOS Select Jumper (J3H1)

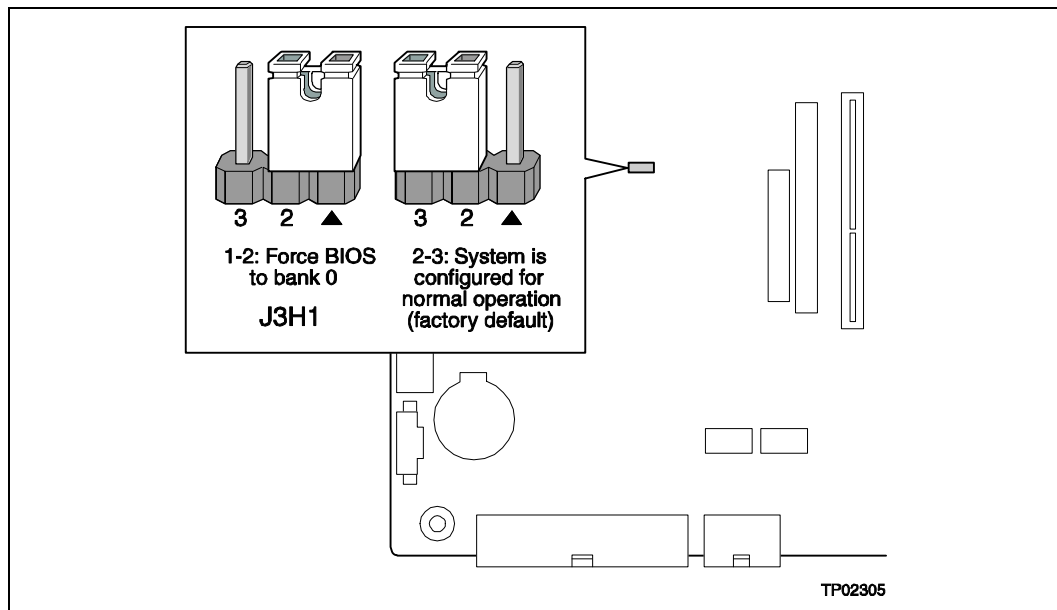


Table 6 gives the possible configuration options. This jumper should only be moved if you wish to force the BIOS to boot to the secondary bank, which may hold a different version of BIOS.

Table 6. BIOS Select Jumper

Pins	What happens at system reset...
1-2	Force BIOS to bank 0
2-3	System is configured for normal operation (Default)

The rolling BIOS feature of the baseboard automatically alternates the Boot BIOS to the secondary bank in the event that the BIOS image in the primary bank is corrupted and cannot boot for some reason.

Note: When performing a BIOS update procedure, the BIOS select jumper must be set to its default position (pins 2-3).

3.4.1.3 DCD/DSR Signal Select Jumper

Note: This jumper affects the rear panel serial port only.

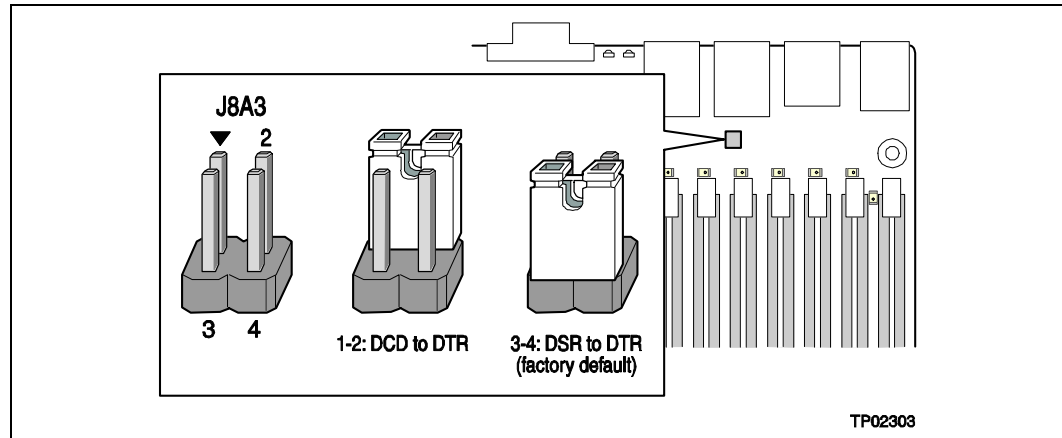
Various serial port concentrators may require either the DCD (Data Carrier Detect) or DSR (Data Signal Ready) signal on Pin 7 of the RJ45 connector. To allow support for either of these two serial port configuration standards, a jumper block (J8A3) located directly behind the rear RJ45 serial port (see Figure 19) must be configured appropriately according to the desired standard:

- For configurations that are compatible with Cisco serial concentrators and require a DSR signal, the jumper block must be configured with the serial port jumper over pins 3 and 4. This is the factory-installed default setting for this jumper.

- For configurations that are compatible with many modems and other serial devices that require a DCD signal, the jumper block must be configured with the serial port jumper over pins 1 and 2.

Pin 1 on the jumper is identified by “*”.

Figure 19. BIOS Select Jumper (J3H1)



3.4.2 Configuring Memory DIMMs

The memory DIMM slots are located on the T5000PAL server board at the rear right portion of the NSC2U Server chassis. See [Figure 33](#) for the location of the DIMM slots. The silkscreen on the board for the DIMMs displays DIMMA1, DIMMA2, DIMMA3, DIMMB1, DIMMB2 and DIMMB3, starting from the inside (left side) of the server board. DIMMB3 is the socket closest to the outside edge of the server board.

The Memory Controller Hub (MCH) on the T5000PAL server board provides for four channels of Fully Buffered DIMM (FB-DIMM) memory. Each channel can support up to two Dual Ranked FB-DIMM DDR2 DIMMs. FB-DIMM memory channels are organized into two branches for support of RAID 1 (mirroring). The MCH can support up to 8 DIMMs for a maximum memory size of 32 Gbytes of physical memory in non-mirrored mode and 16 Gbytes of physical memory in a mirrored configuration.

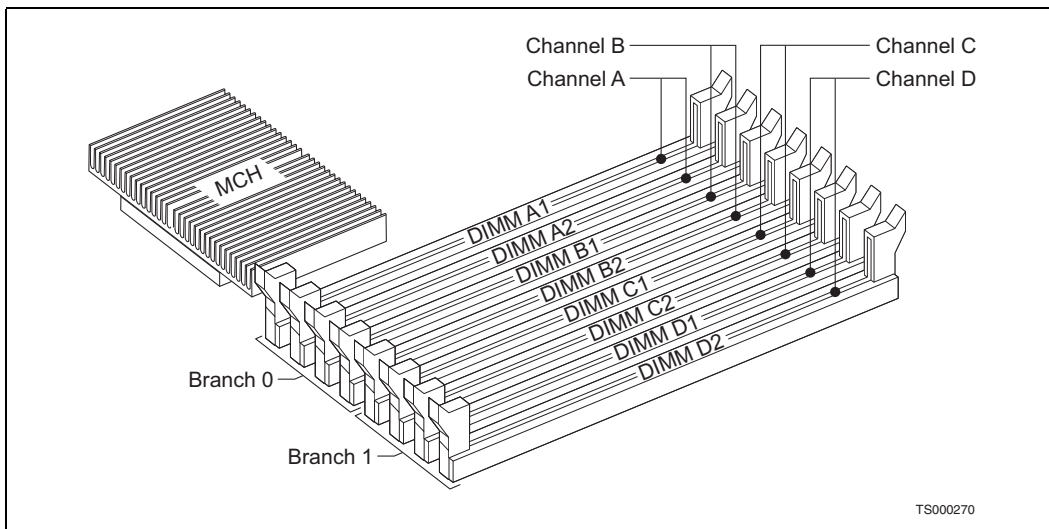
For DDR2 533 FB-DIMM memory, the read bandwidth for each FB-DIMM channel is 4.25 Gbytes/s, which gives a total read bandwidth of 17 Gbytes/s for four FB-DIMM channels. This provides 8.5 Gbytes/s of write memory bandwidth for four FB-DIMM channels.

For DDR2 667 FB-DIMM memory, the read bandwidth for each FB-DIMM channel is 5.3 Gbytes/s, which gives a total read bandwidth of 21 Gbytes/s for four FB-DIMM channels. This provides 10.7 Gbytes/s of write memory bandwidth for four FB-DIMM channels.

The total bandwidth is based on read bandwidth, so the total bandwidth is 17 Gbytes/s for DDR2 533 FB-DIMMs and 21.0 Gbytes/s for DDR2 667 FB-DIMMs.

On the T5000PAL server board, a pair of channels becomes a branch where Branch 0 consists of channels A and B, and Branch 1 consists of channels C and D. FBD memory channels are organized into two branches for support of RAID 1 (mirroring).

Figure 20. DIMM Slots and Channels



To boot the system, the system BIOS on the server board uses a dedicated I²C bus to retrieve the DIMM information needed to program the MCH memory registers. Table 7 provides the I²C addresses for each DIMM slot.

Table 7. I²C Addresses for Memory Module SMB

Device	Address
DIMM A1	0xA0
DIMM A2	0xA2
DIMM B1	0xA0
DIMM B2	0xA2
DIMM C1	0xA0
DIMM C2	0xA2
DIMM D1	0xA0
DIMM D2	0xA2

3.4.2.1 Memory RASUM Features

The MCH supports several memory Reliability, Availability, Serviceability, Usability, and Manageability (RASUM) features. These features include the Intel® x4 Single Device Data Correction (Intel® x4 SDDC) for memory error detection and correction, memory scrubbing, retry on correctable errors, memory built in self test, DIMM sparing, and memory mirroring. See the *Intel® S5000 Series Chipsets Server Board Family Datasheet* for more information describing these features.

3.4.2.2 Supported Memory

The server board supports up to eight DDR2-533 or DDR2-667 Fully Buffered DIMMs (FBD memory). The following tables show the maximum memory configurations supported using the specified memory technology.

Table 8. Maximum 8 DIMM System Memory Configuration - x8 Single Rank

DRAM Technology x8 Single Rank	Maximum Capacity Mirrored Mode	Maximum Capacity Non-Mirrored Mode
256 Mb	1 GB	2 GB
512 Mb	2 GB	4 GB
1024 Mb	4 GB	8 GB
2048 Mb	8 GB	16 GB

Table 9. Maximum 8 DIMM System Memory Configuration - x4 Dual Rank

DRAM Technology x4 Dual Rank	Maximum Capacity Mirrored Mode	Maximum Capacity Non-Mirrored Mode
256 Mb	4 GB	8 GB
512 Mb	8 GB	16 GB
1024 Mb	16 GB	32 GB
2048 Mb	16 GB	32 GB

Note: DDR2 DIMMs that are not fully buffered are **not** supported on the T5000PAL server board. See the Server Configurator at <http://www.cmtlabs.com/mbSearchResults.asp?sManuf=Kontron&sMem=FB-DIMM&sMN=S5000PAL&oSubmit=Search> for a complete list of supported memory.

3.4.2.3 DIMM Population Rules and Supported DIMM Configurations

DIMM population rules depend on the operating mode of the memory controller, which is determined by the number of DIMMs installed. DIMMs must be populated in pairs. DIMM pairs are populated in the following DIMM slot order:

1. A1 and B1
2. C1 and D1
3. A2 and B2
4. C2 and D2

DIMMs within a given pair must be identical with respect to size, speed, and organization. However, DIMM capacities can be different between different DIMM pairs.

For example, a valid mixed-DIMM configuration may have:

- 512 Mbyte DIMMs installed in DIMM slots A1 and B1
- 1 Gbyte DIMMs installed in DIMM slots C1 and D1

The supported DIMM configurations for the T5000PAL server board are given in [Table 10](#).

Table 10. Supported DIMM Configurations

Branch 0				Branch 1				Mirroring Possible	Sparing Possible
Channel A		Channel B		Channel C		Channel D			
DIMM A1	DIMM A2	DIMM B1	DIMM B2	DIMM C1	DIMM C2	DIMM D1	DIMM D2		
								Y (0)	
								Y	
								Y (0)	
								Y	
<p>■ = Supported and validated configuration; slot is populated. ■ = Supported, not validated configuration; slot is populated. ■ = Slot is not populated.</p>					<p>Mirroring: Y = Yes. Indicates that configuration supports memory mirroring. Sparing: Y(x) = Yes. Indicates that configuration supports memory sparing, where x is one of the following:</p> <ul style="list-style-type: none"> • 0: Sparing supported on Branch 0 only • 1: Sparing supported on Branch 1 only • 0,1: Sparing supported on both branches 				

The following restrictions apply:

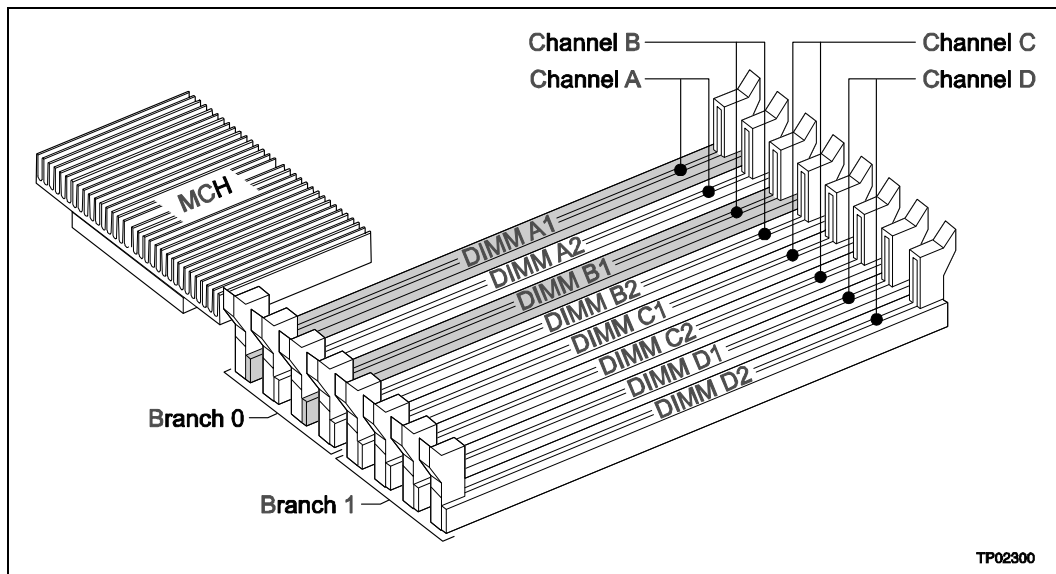
- Single channel mode is only tested and supported with a 512 Mbyte x8 FB-DIMM installed in DIMM Slot A1.
- The supported memory configurations must meet the population rules defined above.
- For best performance, the number of DIMMs installed should be balanced across both memory branches. For example: a four-DIMM configuration performs better than a two-DIMM configuration and should be installed in DIMM slots A1, B1, C1, and D1. An eight-DIMM configuration performs better than a six-DIMM configuration.

3.4.2.4 Non-mirrored Mode Minimum Configuration

The server board is capable of supporting a minimum of one installed DIMM. However, for system performance reasons, Kontron recommends that at least two DIMMs be installed.

Figure 21 shows the recommended minimum DIMM memory configuration. Populated DIMM slots are shown in grey.

Figure 21. Recommended Minimum Two DIMM Memory Configuration



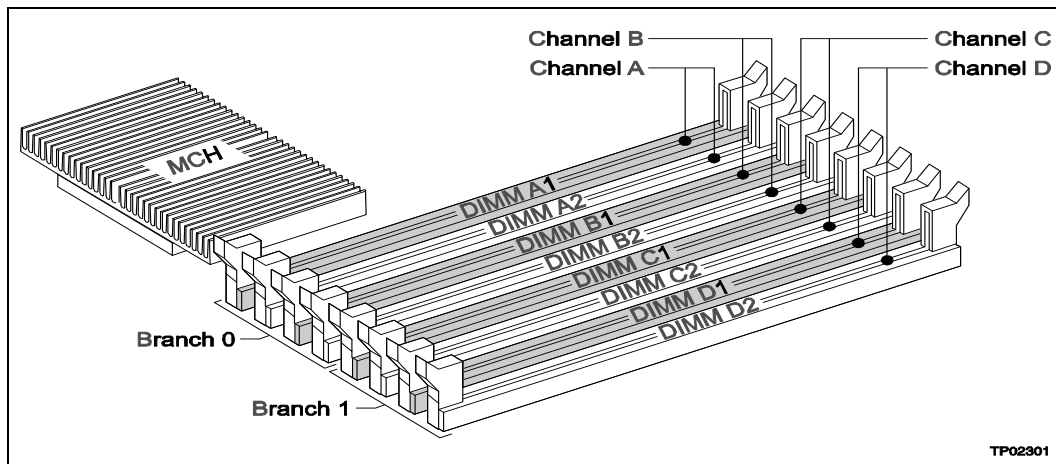
Note: The server board supports single DIMM mode operation. Kontron will only validate and support this configuration with a single 512 MB x8 FB-DIMM installed in DIMM slot A1.

3.4.2.5 Non-mirrored Mode Memory Upgrades

The minimum memory upgrade increment is two DIMMs per branch. The DIMMs must cover the same slot position on both channels. DIMM pairs must be identical with respect to size, speed, and organization. DIMMs that cover adjacent slot positions do not need to be identical.

When adding two DIMMs to the configuration shown in [Figure 21](#), the DIMMs should be populated in DIMM slots C1 and D1 as shown in [Figure 22](#). Populated DIMM slots are shown in grey.

Figure 22. Recommended Four DIMM Configuration



Functionally, DIMM slots A2 and B2 could also have been populated instead of DIMM slots C1 and D1. However, the system will not achieve equivalent performance. Figure 22 shows the supported DIMM configuration that is recommended because it allows both memory branches from the MCH to operate independently and simultaneously. FBD bandwidth is doubled when both branches operate in parallel.

3.4.2.6 Mirrored Mode Memory Configuration

When operating in mirrored mode, both branches operate in lock step. In mirrored mode, branch 1 contains a replicate copy of the data in branch 0. The minimum DIMM configuration to support memory mirroring is four DIMMs, populated as shown in Figure 22. All four DIMMs must be identical with respect to size, speed, and organization.

To upgrade a four DIMM mirrored memory configuration, four additional DIMMs must be added to the system. All four DIMMs in the second set must be identical to the first with the exception of speed. The MCH will adjust to the lowest speed DIMM.

3.4.2.7 DIMM Sparing Mode Memory Configuration

The MCH provides DIMM sparing capabilities. Sparing is a RAS feature that involves configuring a DIMM to be placed in reserve so it can be use to replace a DIMM that fails. DIMM sparing occurs within a given bank of memory and is not supported across branches.

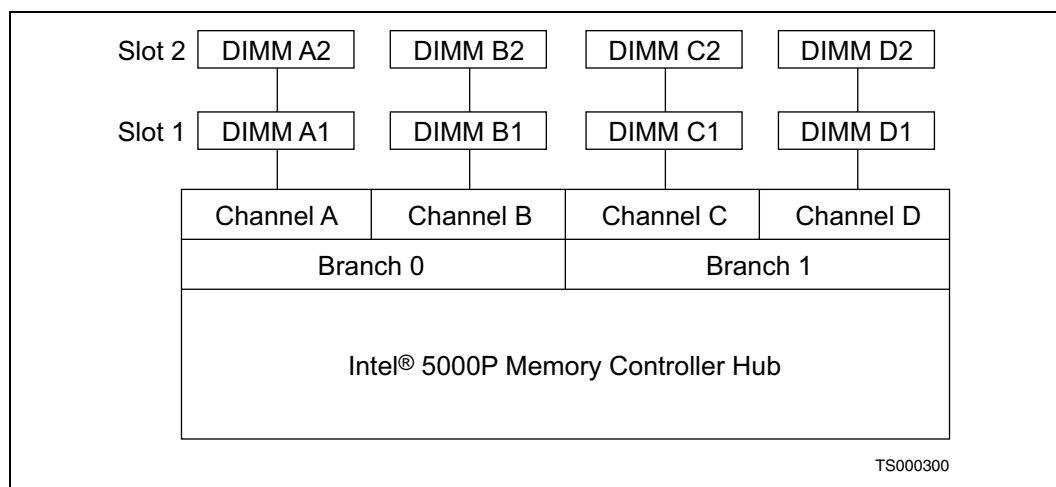
There are two supported Memory Sparing configurations:

- Single Branch Mode Sparing
- Dual Branch Mode Sparing

3.4.2.8 Single Branch Mode Sparing

Figure 23 shows the single branch memory sparing configuration.

Figure 23. Single Branch Mode Sparing DIMM Configuration



The following rules apply:

- DIMM A1 and DIMM B1 must be identical in organization, size and speed.
- DIMM A2 and DIMM B2 must be identical in organization, size and speed.

- DIMM A1 and DIMM A2 need not be identical in organization, size and speed.
- DIMM B1 and DIMM B2 need not be identical in organization, size and speed.
- Sparing should be enabled in BIOS setup. The BIOS configures Rank Sparing Mode.
- The larger of the pairs {DIMM A1, DIMM B1} and {DIMM A2, DIMM B2} will be selected as the spare pair unit.

3.4.2.9 Dual Branch Mode Sparing

Dual branch mode sparing requires that all eight DIMM slots be populated and must comply with the following population rules:

- DIMM A1 and DIMM B1 must be identical in organization, size and speed.
- DIMM A2 and DIMM B2 must be identical in organization, size and speed.
- DIMM C1 and DIMM D1 must be identical in organization, size and speed.
- DIMM C2 and DIMM D2 must be identical in organization, size and speed.
- DIMM A1 and DIMM A2 need not be identical in organization, size and speed.
- DIMM B1 and DIMM B2 need not be identical in organization, size and speed.
- DIMM C1 and DIMM C2 need not be identical in organization, size and speed.
- DIMM D1 and DIMM D2 need not be identical in organization, size and speed.
- Sparing should be enabled in BIOS setup. The BIOS configures Rank Sparing Mode.
- The larger of the pairs {DIMM A1, DIMM B1}, {DIMM A2, DIMM B2}, {DIMM C1, DIMM D1} and {DIMM C2, DIMM D2} will be selected as the spare pair units.

3.4.3 Installing DIMMs

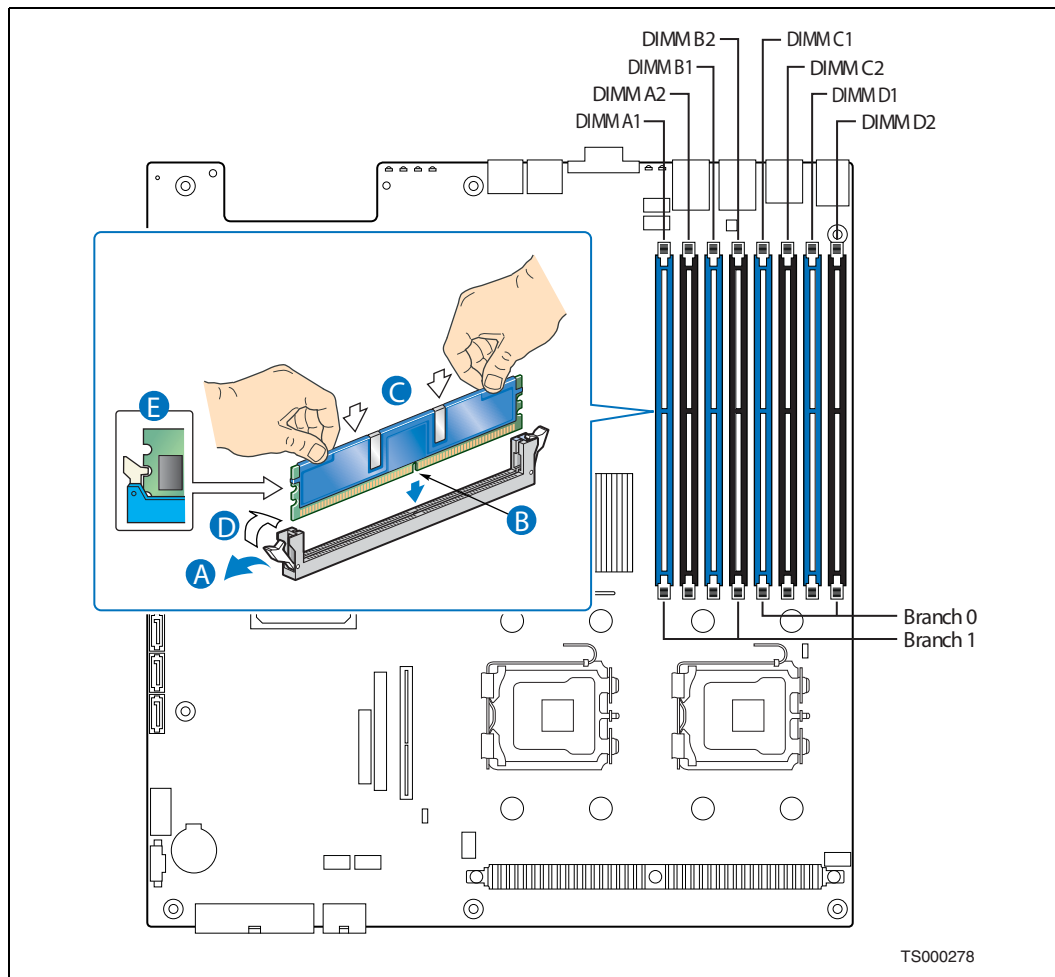
Reduce the risk of electrostatic discharge (ESD) damage to the processor by doing the following:

- Touch the metal chassis before touching the DIMM or server board.
- Keep part of your body in contact with the metal chassis to dissipate the static charge while handling the DIMM.
- Avoid moving around unnecessarily.
- Use a ground strap attached to the front panel (with the bezel removed.)

To install DIMMs in the T5000PAL server board slots, follow these steps:

1. Remove the chassis cover and the processor air duct. For instructions, see [Section 3.2.1](#) and [Section 3.2.5](#).
2. Locate the DIMM sockets on the server board. (See [Figure 7](#) and [Figure 24](#).)

Figure 24. Installing Memory DIMMs



3. Open both DIMM socket levers. ("A")
4. Note the location of the alignment notch. ("B")
5. Insert the DIMM making sure the connector edge of the DIMM aligns correctly with the slot. ("E")
6. Using both hands, push down firmly and evenly on both sides of the DIMM until it snaps into place and the levers close. ("C" and "D")
IMPORTANT: Visually check that each latch is fully closed and correctly engaged with notch on the DIMM edge. ("E")
7. Replace the air duct and chassis cover if you have completed all work inside of the server.

3.4.4 Removing Memory DIMMs

Reduce the risk of electrostatic discharge (ESD) damage to the DIMMs and server board by doing the following:

- Touch the metal chassis before touching the DIMM or server board.

- Keep part of your body in contact with the metal chassis to dissipate the static charge while handling the processor.
- Avoid moving around unnecessarily.
- Use a ground strap attached to the front panel (with the bezel removed.)

To remove a DIMM from a T5000PAL server board slot, follow these steps:

1. Remove the chassis cover and the processor air duct. For instructions, see [Section 3.2.1](#) and [Section 3.2.5](#).
2. Locate the DIMM(s) and select the ones to be removed. See [Figure 24](#).
3. Open the DIMM socket levers.
4. Holding the DIMM by the edges, lift it away from the socket, and store it in an anti-static package.
5. Replace the air duct and chassis cover if you have completed all work inside of the server.

3.4.5 Adding or Replacing a Processor

Note: Use the instructions provided below to add or replace a processor instead of using the instructions that came with the processor.

Caution: The processor must be appropriate: You could damage the server board if you install a processor that is inappropriate for your server. Go to <http://us.kontron.com/support/> for a list of compatible processors for the NSC2U Server.

Before you begin, remove the processor air duct from the chassis. For instructions, tap, “[Removing the Processor Air Duct](#)”.

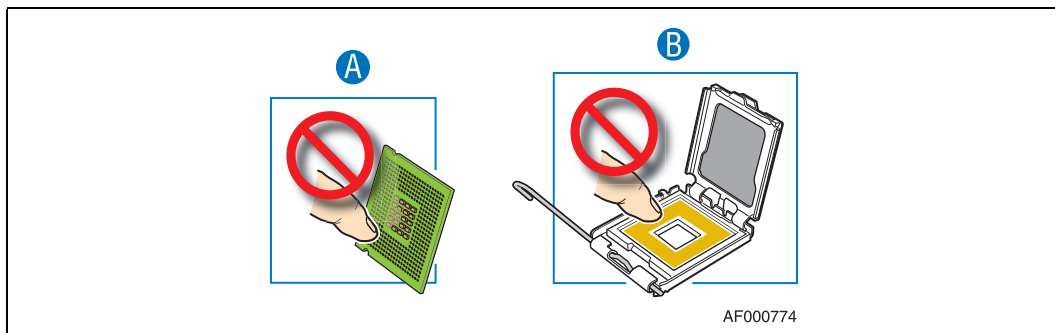
Follow the instructions below to remove and then install a processor, referring to [Figure 25](#) through [Figure 32](#).

3.4.5.1 ESD and Processor Handling Precautions

Be mindful of the following points when handling the processors and sockets:

- Reduce the risk of electrostatic discharge (ESD) damage to the processor by doing the following:
 - 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.
 - Avoid moving around unnecessarily.
 - Use a ground strap attached to the front panel (with the bezel removed.)
- When opening a socket, do not touch the gold socket wires.
- When unpacking a processor, hold it only at the edges to avoid touching the gold contacts.

Figure 25. Cautions for Handling Processors

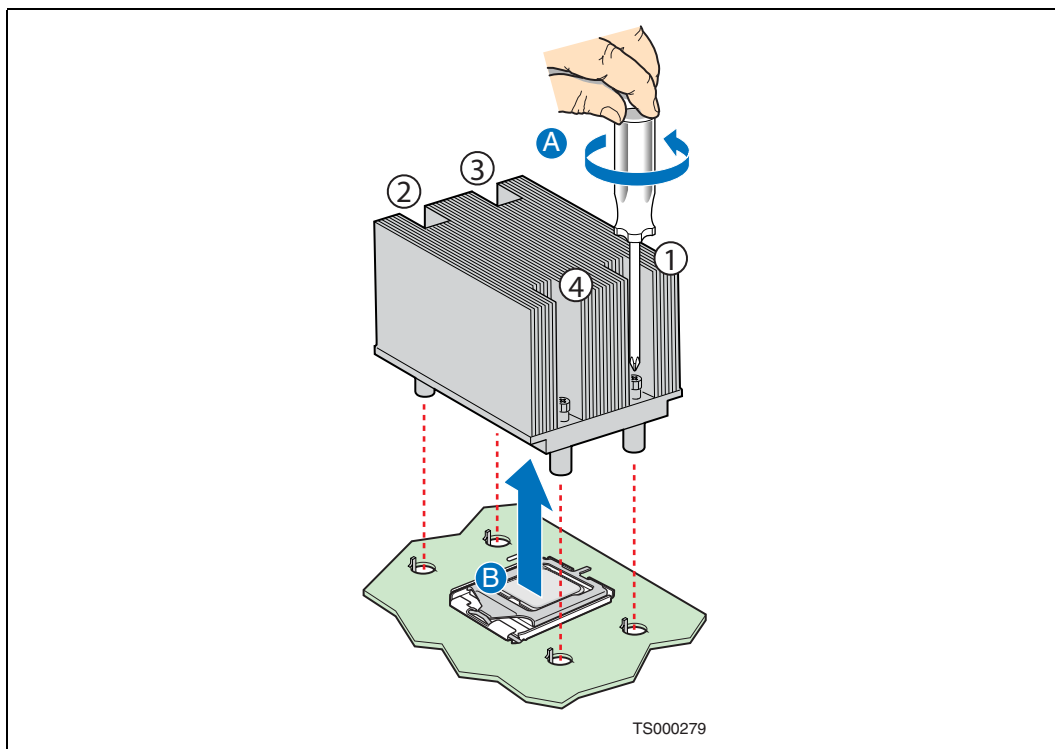


3.4.5.2 Removing a Processor

1. Loosen the four captive screws on the corners of the heat sink with a #2 Phillips screwdriver. (Section 26, "A")
2. Twist the heat sink slightly to break the seal between the heat sink and the processor. ("B")
3. Lift the heat sink from the processor. If it does not pull up easily, twist the heat sink again.

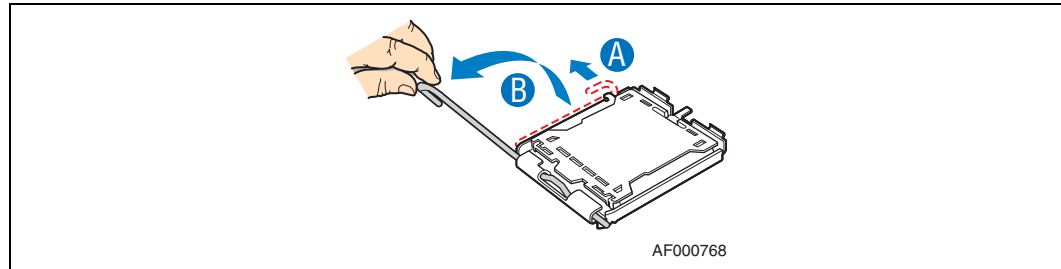
Note: Do not force the heat sink from the processor. Doing so could damage the processor.

Figure 26. Removing the Heat Sink



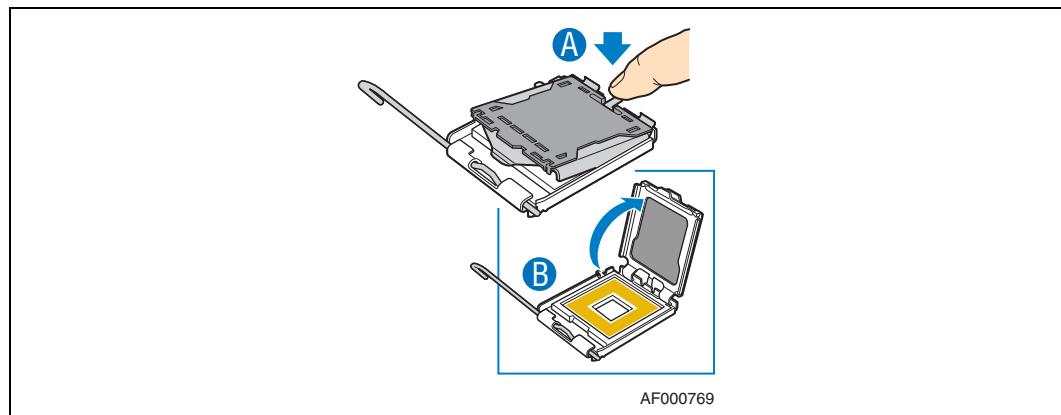
4. Open the socket by pushing the lever handle down and away from the socket to release it. ("A" and "B" in Figure 27)

Figure 27. Using the Socket Lever



5. Pull the lever and open the load plate all the way. ("A" and "B" in Figure 28)

Figure 28. Opening the Load Plate



6. Remove the processor.

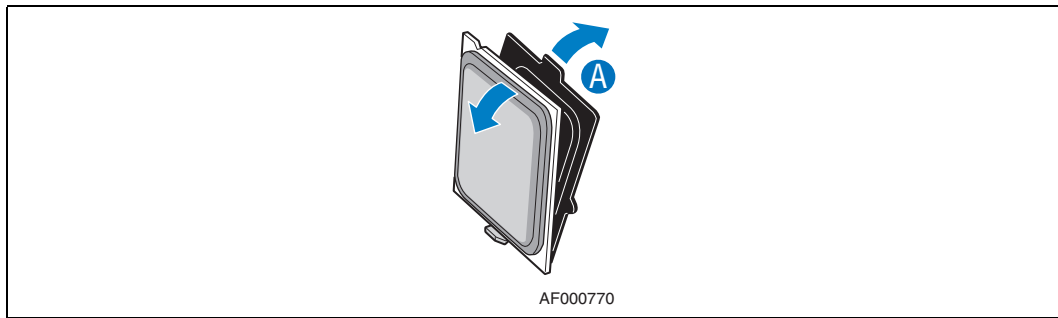
3.4.5.3 Installing a New Processor

Note: Follow the ESD precautions covered in Section 3.4.5.1.

To install a processor, follow these instructions:

1. Take the processor out of its packaging and remove the protective shipping cover. ("A")

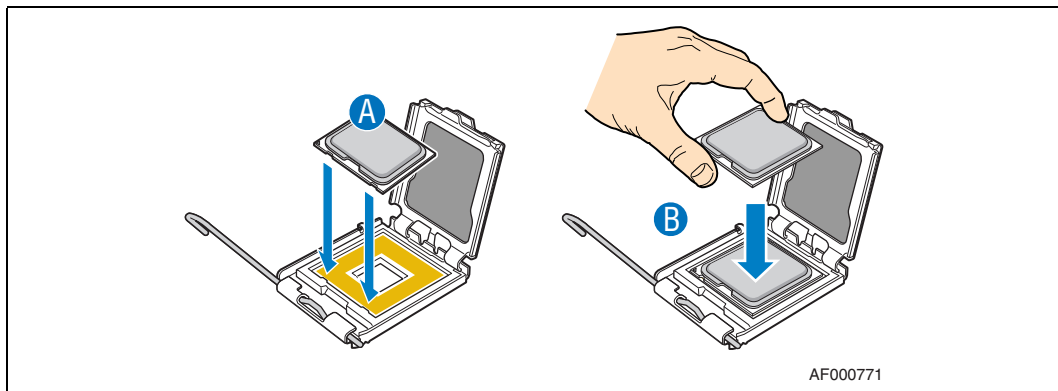
Figure 29. Removing the Processor Protective Cover



Caution: The underside of the processor has components that may damage the socket pins if installed improperly. The processor must align correctly with the socket opening before installation. Gently place the processor onto the socket surface. Do not drop the processor into the socket!

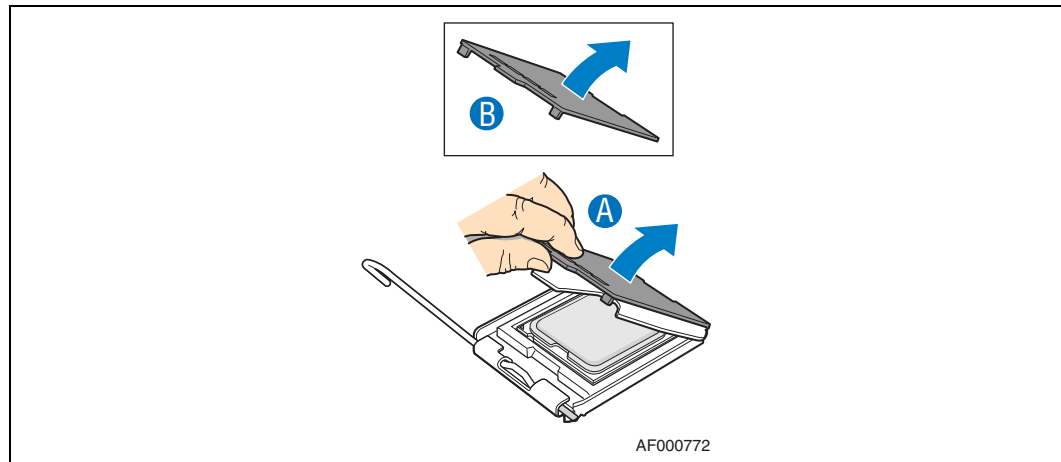
2. Orient the processor with the socket so that the processor cutouts match the socket notches. (See [Figure 30](#), "A".)
3. Gently place the processor in the socket. ("B")

Figure 30. Installing the Processor in the Processor Socket



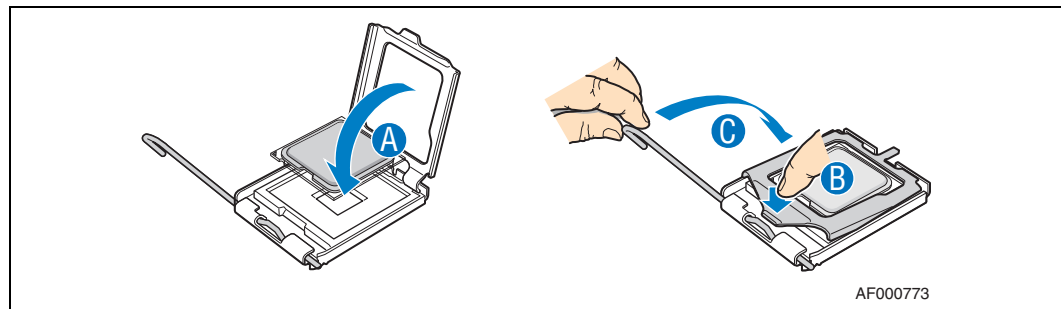
4. Remove the socket protective cover by grasping the cover tab and pulling it away from the load plate. Store the protective cover for future use. ("A" and "B")

Figure 31. Removing the Socket Protective Cover



5. Close the load plate completely. (Figure 32, "A")

Figure 32. Closing the Processor Load Plate and Socket Lever



6. Close the socket lever and ensure that the load plate tab engages under the socket lever when fully closed. ("B" and "C")

3.4.5.4 Inserting the Heat Sink

1. If this is a new heat sink (not the one you removed above), remove the protective film, if present, on the Thermal Interface Material (TIM) located on the bottom of the heat sink.
2. Set the heat sink over the processor, lining up the four captive screws with the four posts surrounding the processor. Align the heat sink fins to the front and back of the chassis for correct airflow (front to back). Use caution and make sure that cables are not pinched beneath the heat sink. (See Figure 26.)
3. Loosely screw in the captive screws on the heat sink corners by tightening one, then the one diagonally opposite, and so on.
4. Gradually and equally tighten each captive screw in diagonal order until each is firmly tightened. See Figure 26 for the order.

Caution: The torque spec for these screws is 8 inch-pounds. Be careful not to exceed it.

3.4.6 Other Installation and Upgrade Options

To install the server into a rack, see [Section 3.5](#). If you want to install other optional components, see [Chapter 4, “Optional Component Installations”](#).

If you are finished setting up your NSC2U Server, replace the front bezel, the top cover, and reconnect the external cables and power cord(s).

3.5 Installing the Server into a Rack

Installation instructions for the standard bracket kit and the optional rail kit are included with each kit. These instructions can also be found on the Kontron Deployment Assistant CD and at <http://us.kontron.com/support/> (Search for NSC2U, click on Product Downloads, and then Tools)

3.5.1 Connecting the Power Cord

Note: When using a rack, wait to install the power cord(s) until after the server is in the rack.

3.5.2 Equipment Rack Precautions

Caution: **ANCHOR THE EQUIPMENT RACK** — The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more servers are extended in front of it on slide assemblies. The equipment rack must be installed according to the manufacturer’s instructions. You must also consider the weight of any other device installed in the rack.

Mains power disconnect — The power cord(s) is considered the mains disconnect for the server and must be readily accessible when installed. If the individual server power cord(s) will not be readily accessible for disconnection then you are responsible for installing a power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire rack, not just to the server(s). To remove all power, two power cords must be removed.

Grounding the rack installation — To avoid the potential for an electrical shock hazard, for AC power you must include a third wire safety ground conductor with the rack installation. For DC power the two studs for chassis enclosure grounding must be used for proper safety grounding. See “C” in [Figure 3](#) for the location of the ground studs.

With AC power, if the server power cord is plugged into an outlet that is part of the rack, then you must provide proper grounding for the rack itself. If the server power cord is plugged into a wall outlet, the safety ground conductor in the power cord provides proper grounding only for the server. You must provide additional, proper grounding for the rack and other devices installed in it.

AC overcurrent protection — When AC power is used, the server is designed for a line voltage source with up to 20 amperes of overcurrent protection per cord feed. If the power system for the equipment rack is installed on a branch circuit with more than 20 amperes of protection, you must provide supplemental protection for the server. The overall current rating of a server configured with two power supplies is less than 4 amperes.

Caution: **Temperature** — The operating temperature of the server, when installed in an equipment rack, must not go below 5°C (41°F) or rise above 35°C (95°F). Extreme fluctuations in temperature can cause a variety of problems in your server.

Ventilation — The equipment rack must provide sufficient airflow to the front of the server to maintain proper cooling. It must also include ventilation sufficient to exhaust a maximum of 1200 BTU per hour for a fully loaded server system using the IP Network Server NSC2U.

It is important to note that this measurement is the maximum, and a minimum or typical system could use much less. You may want to calculate the BTU/hour measurement more accurately for your configuration. An extra 500 BTU/hour over many systems would translate into a large error calculating air conditioning capacity.

4 Optional Component Installations

4.1 Before You Begin

Before working with your server product, pay close attention to the safety instructions provided in this manual. See [Appendix A, "Safety Information"](#).

Warning: 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.

4.1.1 Tools and Supplies Needed

- #1 and #2 Phillips (cross-point) screwdrivers, or interchangeable-tip screwdriver with #1 and #2 Phillips bits
- Personal grounding device such as an anti-static wrist strap and a grounded conductive pad

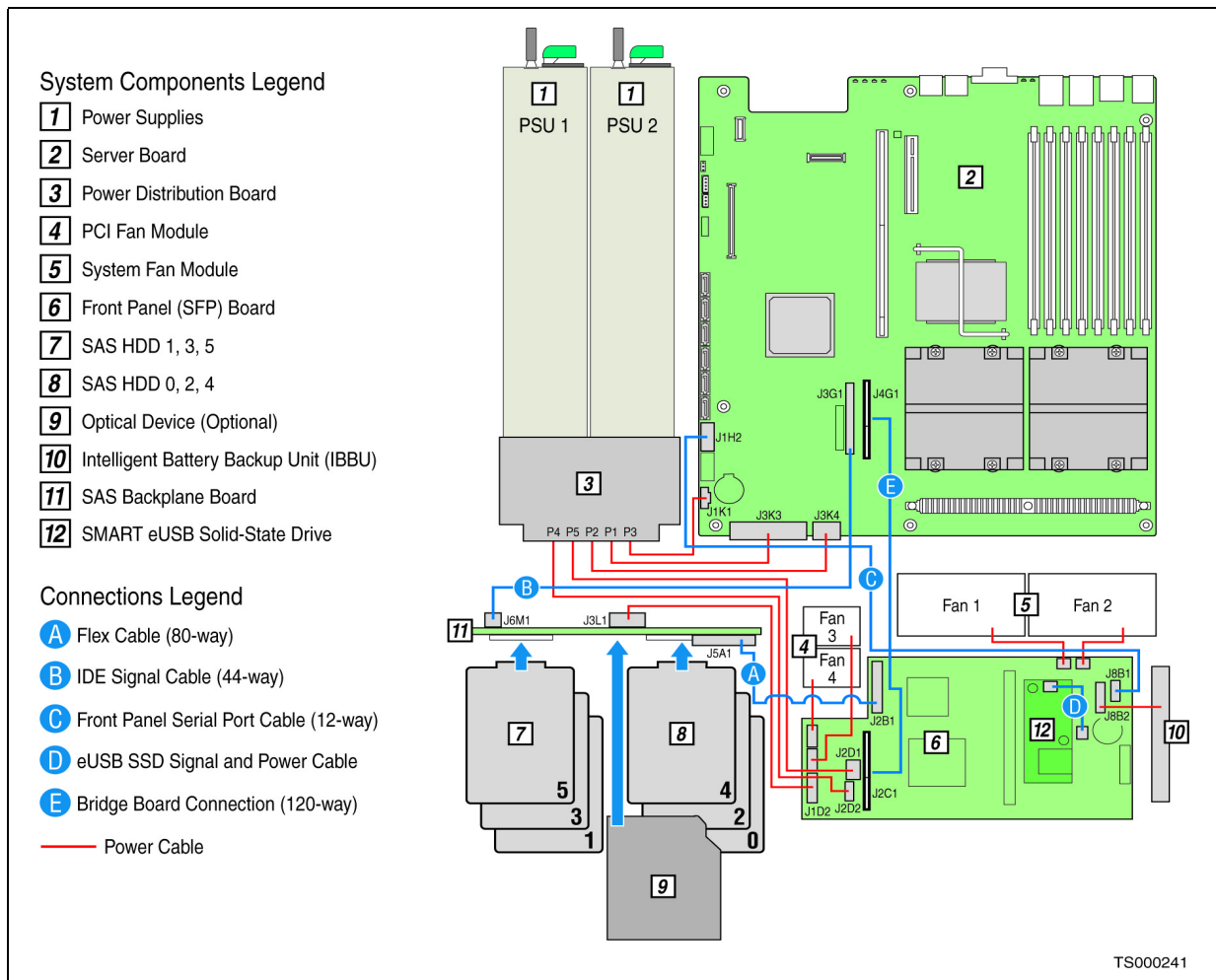
4.1.2 System References

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

4.1.3 Cable Routing Reference

It is important for cables to be connected correctly. See [Figure 33](#) and for more detailed information about cable connectors, see the *Kontron IP Network Server NSC2U Technical Product Specification*.

Figure 33. NSC2U Server System Cable Routing



4.2 Installing or Replacing a PCI Add-in Card

The IP Network Server NSC2U is delivered with a riser card assembly that includes the following two riser cards:

- A combination PCI-X*/PCI Express* (PCIe*) riser card for full-height add-in cards.
- A PCIe riser card with two slots for low-profile add-in cards

The riser card assembly is attached to the T5000PAL server board with two separate connectors in the middle of the server board. (See [Figure 7](#) for these locations.)

Note: PCI-X/PCI Express add-in cards are referred to generically as an “add-in card” in the following procedures.

To install an add-in card, you first need to remove the top cover, the processor air duct, and the riser card assembly from the system and remove the I/O filler panel from the slot where you will be installing the add-in card. Once the PCI-X or PCIe add-in card is attached to the appropriate riser card connector, this assembly is then plugged back into the connectors on the T5000PAL server board.

Note: Only PCI-X/PCIe cards tested and supported by Kontron are recommended. See the *Tested Hardware and Operating System List* (THOL) at <http://us.kontron.com/support/> for a list of tested and supported cards. (Search for NSC2U, click on Product Downloads, and then Compatibility Matrix.)

4.2.1 Riser Card Options

The T5000PAL server board has two riser slots capable of supporting riser cards for 2U system configurations. The full height riser slot (J4F1) implements Intel[®] Adaptive Slot technology and uses a 280-pin connector that meets both PCI-X and PCI Express technology specifications. When using a full height riser card, the NSC2U Server supports PCI-X, PCIe x1, PCIe x4, and PCIe x8. [Table 11](#) summarizes the possible board installation configurations.

Table 11. Full Height Riser Card Configurations and Throughput

Configuration	Bottom Slot	Middle Slot	Top Slot
1 add-in card	PCI-X †	–	–
	–	x8 or x4 PCIe	–
	–	–	x4 PCIe
2 add-in cards	PCI-X †	x8 or x4 PCIe	–
	PCI-X †	–	x4 PCIe
	–	x4 PCIe	x4 PCIe
3 add-in cards	PCI-X †	x4 PCIe	x4 PCIe
Note: † Up to 133 MHz bus speed			

The low-profile riser slot (J5B1) uses a 98-pin connector. It is capable of supporting up to two low-profile PCIe add-in cards. The NSC2U Server supports PCIe x4 only. [Table 12](#) shows the supported throughput and the number of add-in cards installed for each possible configuration.

Table 12. Low Profile Riser Card Configurations and Throughput

Configuration	Lower Slot	Upper Slot
1 add-in card	x4 PCIe	
		x4 PCIe
2 add-in cards	x4 PCIe	x4 PCIe

Note: There are no population rules for installing a single low-profile add-in card in the 2U low-profile riser card; a single add-in card can be installed in either PCI Express slot. While the slots can accommodate an x8 card physically, each slot only supports an x4 interface.

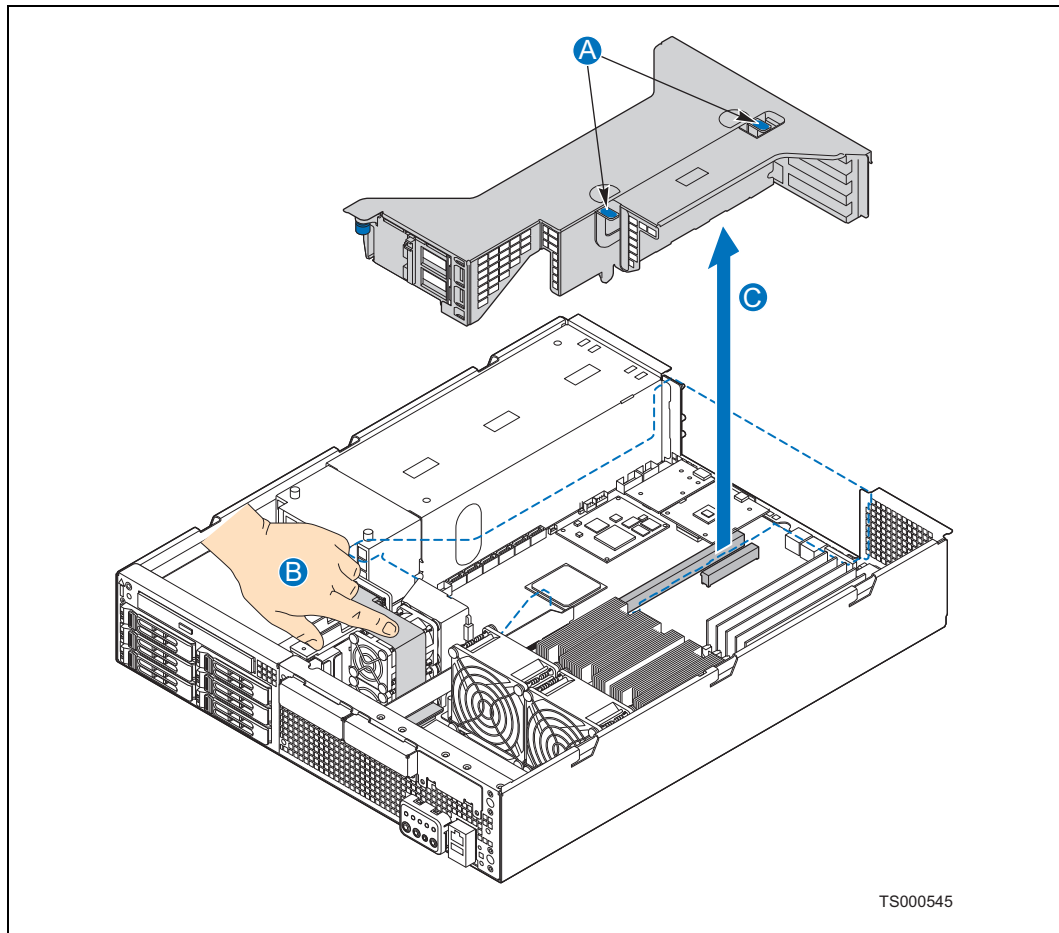
Refer to the *Intel[®] Server Board S5000PAL Technical Product Specification* for the electrical characteristics for the two PCI-X/PCIe riser card assembly slots.

4.2.2 Removing the PCI Riser Card Assembly

To remove the riser card assembly from the chassis, follow these steps:

1. Grasp the PCI riser card assembly using the two flexible blue handles. ("A")
2. Place a finger on the PCI Fan Assembly so that it will not be moved. ("B")
3. Carefully lift the assembly out of the chassis. ("C")

Figure 34. Removing the Riser Card Assembly

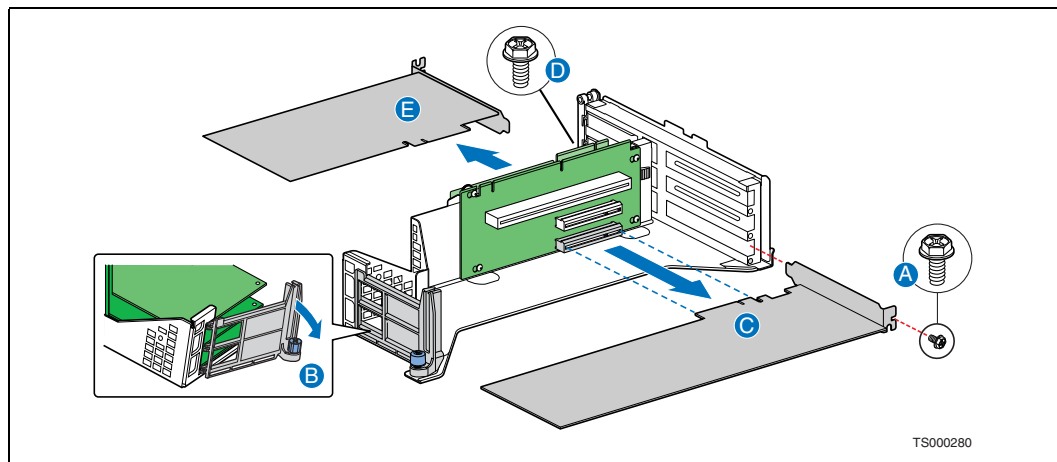


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4.2.3 Removing an Add-in Card from the Riser Card Assembly

Caution: When handling an add-in card, observe the normal safety and ESD precautions. (See Appendix A, "Safety Information" for more information.)

1. Turn the riser card assembly upside-down to remove the add-in card.
2. Remove the rear retention screw that fastens the riser card to the rear bracket. ("A" or "D")
3. When removing a full-height add-in card, remove the front retention clip by loosening the blue captive screw and rotating the clip outward. ("B") Disengage the three plastic tabs from the metal sidewall.
4. Remove the add-in card from the riser card socket. ("C" or "E")

Figure 35. Removing an Add-in Card from the Riser Card Assembly

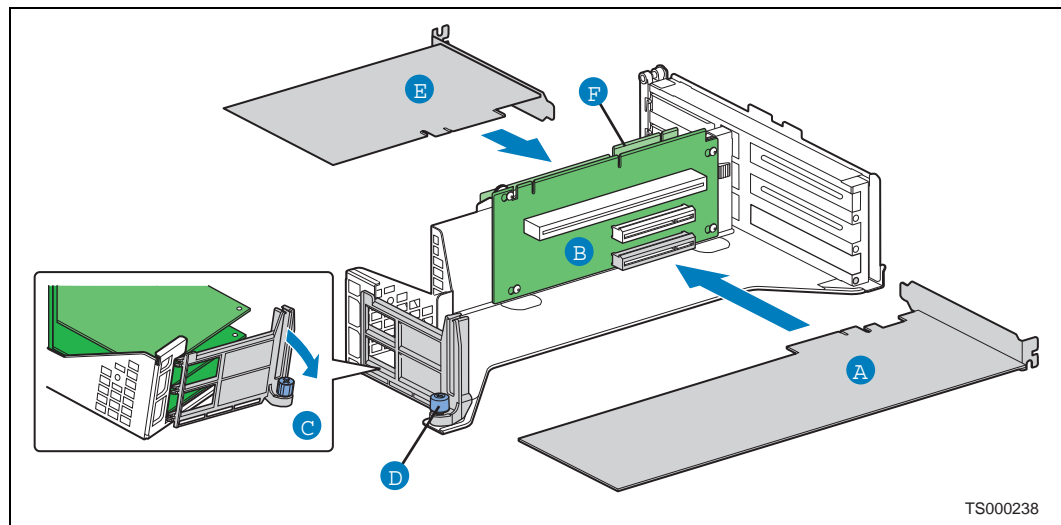
4.2.4 Installing an Add-in Card in the Riser Card Assembly

Caution: When handling an add-in card, observe the normal safety and ESD precautions. (See [Appendix A, "Safety Information"](#) for more information.)

See [Section 4.2.1, "Riser Card Options"](#) on page 52 for information about what cards can be used with the two riser cards in this assembly.

1. If the add-in card slot was empty before installing the new card, remove the add-in card filler panel.
2. For a full-height card, remove the front retention clip by loosening the blue captive thumbscrew and rotating the clip outward. (Figure 36, "D" and "C") Disengage the three plastic tabs from the metal sidewall.
3. With the riser card assembly upside-down, slide the add-in card onto the sheet metal and attach it to the appropriate riser card connector. ("B") Be sure that the add-in card edge connector is seated in the riser card connector correctly.
4. Fasten the add-in card to the riser card assembly bracket using the rear retention screw and for full-height cards, by also replacing the front retention clip and tightening the captive thumbscrew. ("D")

Figure 36. Adding a PCI-X/PCIe Card into the Riser Card Assembly



4.2.5 Replacing the Riser Card Assembly on the Server Board

1. Attach the riser card assembly to the server board by grasping the two blue handles and inserting the two riser card edge connectors into the superslot header and the smaller low-profile riser card header next to it on the server board. (See "A" in [Figure 34](#).)
2. Align the forks on the riser card assembly with the pins on the rear chassis panel. (See "B" in [Figure 34](#).)
3. If this is the last task you are performing, replace the processor air duct and the top cover of the chassis. Reconnect all the external devices and plug in the power cord(s).
For information about mounting the server in a rack, see [Section 3.5, "Installing the Server into a Rack"](#) on page 48

4.3 Installing an I/O Expansion Module

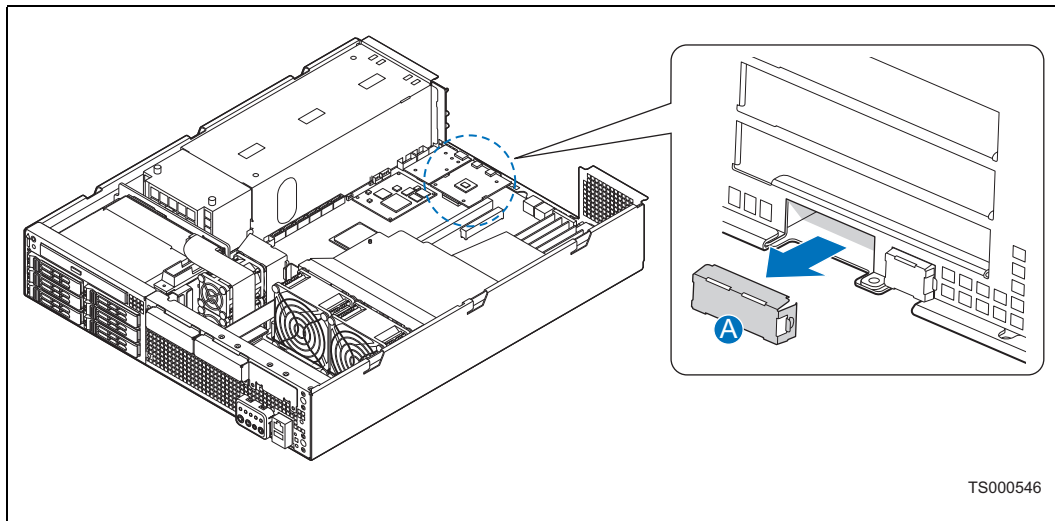
There are two types of optional I/O expansion modules available for the IP Network Server NSC2U:

- A dual GbE NIC module
- An external SAS hard disk drive module

Before installing an I/O expansion module you must remove the top cover, the processor air duct, and the PCI riser card assembly.

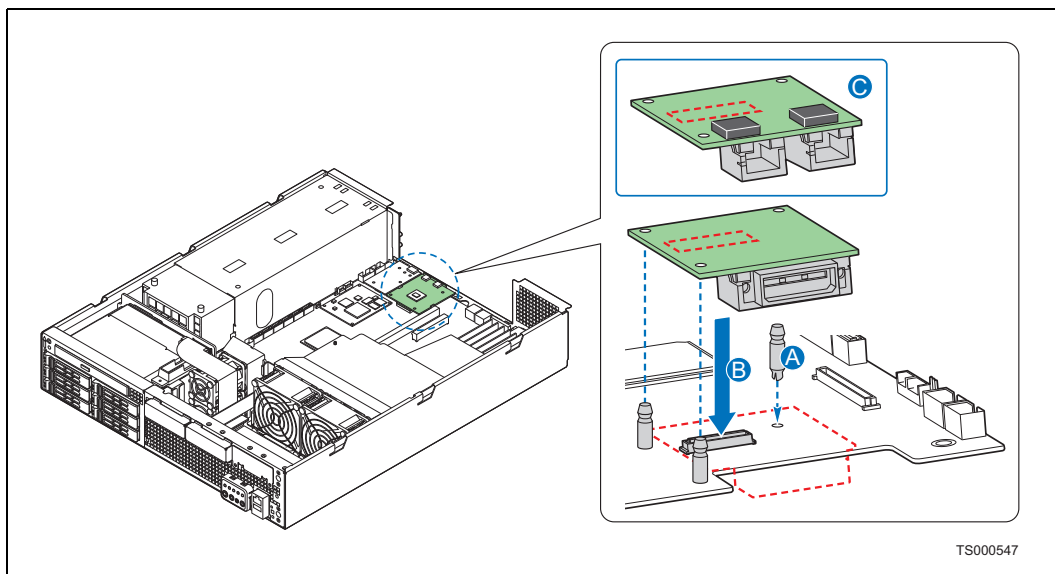
1. Remove the chassis top cover and the processor air duct. For instructions, see [Section 3.2.1](#) and [Section 3.2.5](#)
2. Remove the PCI riser card assembly to access the I/O expansion module site on the T5000PAL server board. For instructions, see [Section 4.2.2, "Removing the PCI Riser Card Assembly"](#) on page 53.
3. Squeeze the sides of the I/O expansion module filler panel to remove it from the rear panel of the chassis. ([Figure 37, "A"](#))

Figure 37. Removing the I/O Module Filler Panel



4. Snap the three I/O expansion module standoffs into the server board. (Figure 38, "A")
5. Attach the I/O expansion module to the server board connector ("B") and the standoffs.
6. If this is the last task you are performing, replace the riser card assembly, the processor air duct and the top cover of the chassis. Reconnect all the external devices and plug in the power cord(S). For information about mounting the server in a rack, see Section 3.5, "Installing the Server into a Rack" on page 48

Figure 38. Installing an I/O Expansion Module



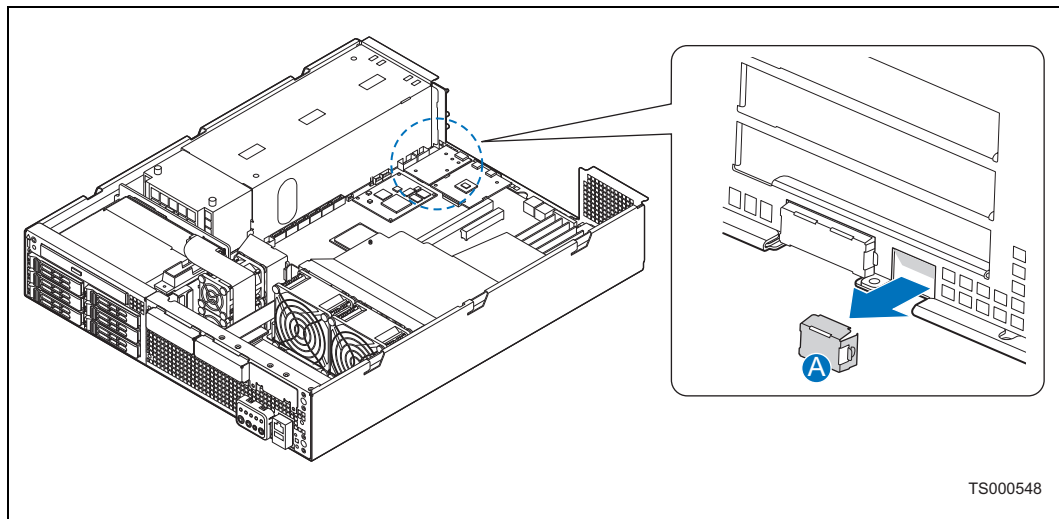
4.4 Installing Intel® Remote Management Modules

To install the GCM module and Remote Management Module (RMM), you must first remove the chassis top cover, the processor air duct, and PCI riser card assembly.

4.4.1 Installing the GCM Module

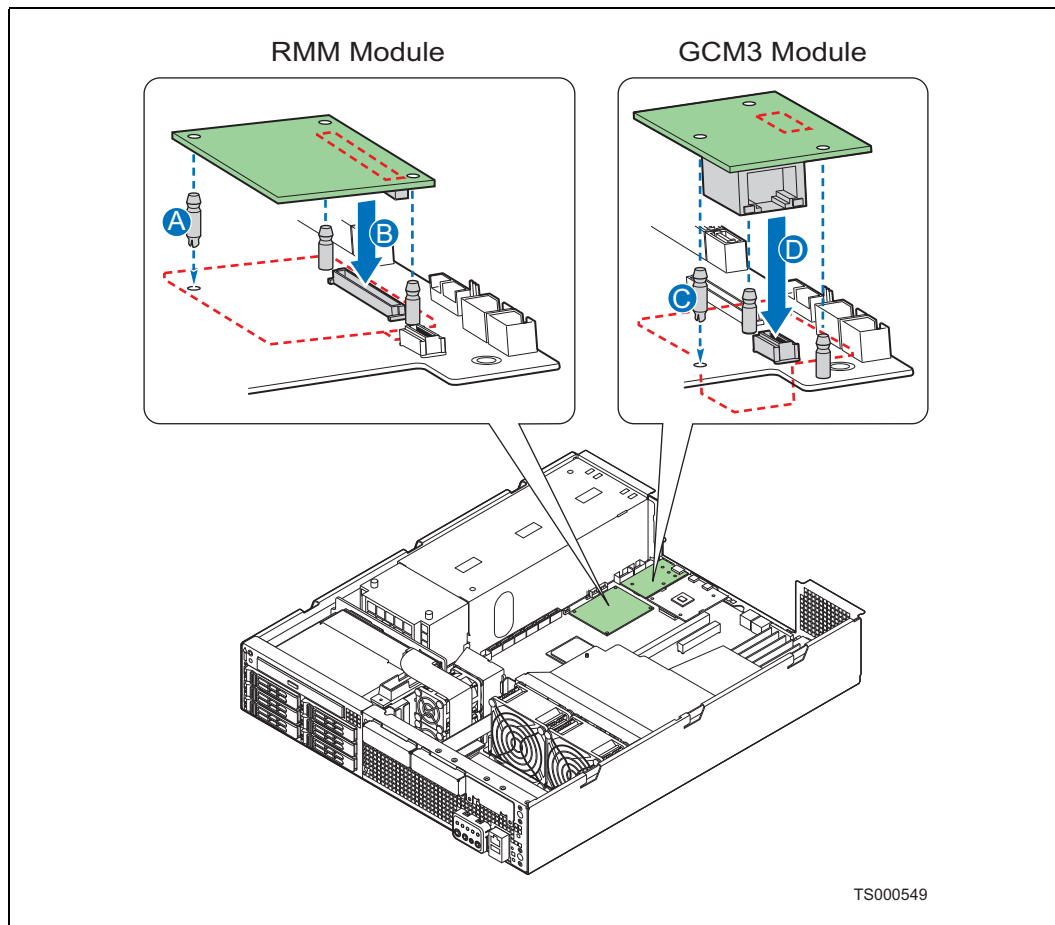
1. Remove the filler panel from the rear panel of the chassis by squeezing the side edges and pulling it out. (Figure 39)
2. Snap the two standoffs into the server board. (Figure 40, “C”)
3. Attach the module to the server board using the connector. (“D”)
4. If this is the last task you are performing, replace the riser card assembly, the processor air duct, and the top cover of the chassis. Reconnect all the external devices and plug in the power cord(s).
For information about mounting the server in a rack, see [Section 3.5, “Installing the Server into a Rack”](#) on page 48.

Figure 39. Removing the GCM Port Filler Panel



4.4.2 Installing the RMM Module

1. Remove the PCI riser card assembly to access the RMM site on the T5000PAL server board. (For instructions, see [Section 4.2.2, “Removing the PCI Riser Card Assembly”](#).)
2. Snap the standoff into the T5000PAL server board. (Figure 40, “A”)
3. Fasten the RMM module to the server board site using the connector (“B”) and the standoff hole.

Figure 40. Installing the Remote Management Module

4.5 Installing an RJ45 4xGbE LAN Card for Front Panel Access

The IP Network Server NSC2U supports 4xGbE LAN cards installed in the full-height riser card slots with connections routed to the front panel.

Note: The supported LAN card is the Intel®PRO/1000 AT Quad-Port Bypass Adapter.

The installation process consists of removing the chassis top cover and the processor air duct, installing the LAN card into the riser card assembly as described in [Section 4.2, "Installing or Replacing a PCI Add-in Card"](#), replacing one of the front panel filler panels with a 4xGbE escutcheon, and routing the LAN cables to the front panel where the 1x4 connector is fastened to the escutcheon.

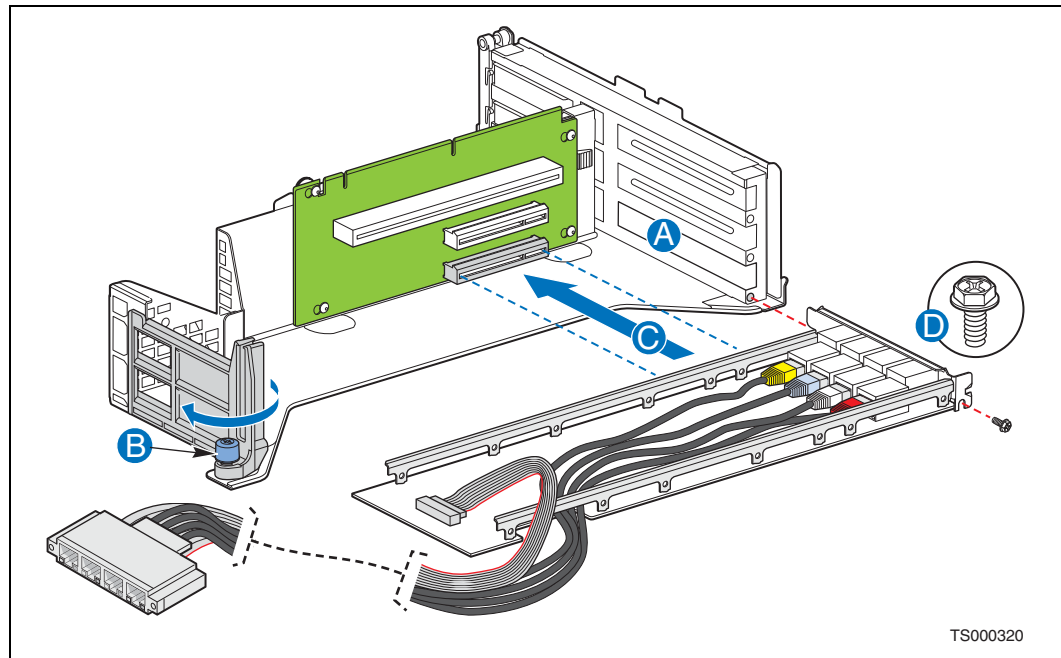
To route the cables to the front panel, the flex cable must be disconnected from the SAS backplane board and the PCI fan assembly removed. (See [Section 5.2.3, "Removing the PCI Fan Assembly"](#) on page 102.)

4.5.1 Installing the LAN Card into the Riser Card Assembly

1. Remove the riser card assembly from the chassis. For instructions, see [Section 4.2.2, "Removing the PCI Riser Card Assembly"](#) on page 53.

2. With the riser card assembly lying upside down, remove the filler panel for the full-height PCIe slot you will be using for the LAN card. (Figure 41, "A")
3. Loosen the blue thumbscrew on the retention clip and rotate the clip outward. ("B")
Disengage the three plastic tabs from the metal sidewall.
4. Slide the LAN card onto the sheet metal and attach it to the selected full-height PCI-Express riser card slot connector. ("C")
5. Fasten the LAN card to the riser card assembly bracket using the rear retention screw. ("D")

Figure 41. Installing the LAN Card into the Riser Assembly



4.5.2 Configuring the RJ45 GbE LAN Card

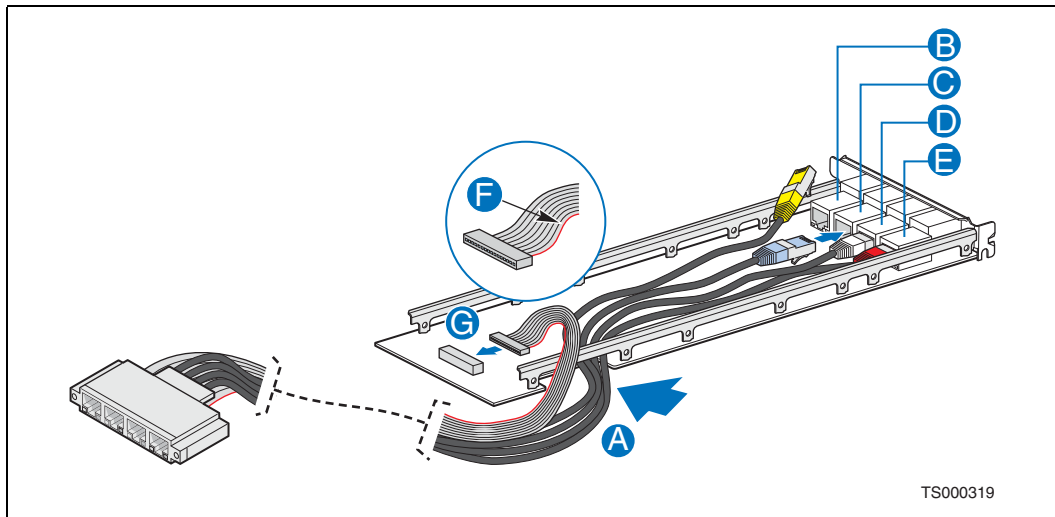
Caution: When handling the LAN card, observe the normal safety and ESD precautions. (See Appendix A, "Safety Information" for more information.)

1. Insert the GbE cables through the side bracket of the LAN card. (Figure 42, "A")
2. Drape the LED cable over the side bracket, not through it like the GbE cables. ("B")
3. Connect the four GbE cables to the LAN card with the colors installed in the following order as shown in Figure 42:

B	Yellow
C	Blue
D	White
E	Red

4. Connect the LED ribbon cable to the LAN card connector with the red stripe on the side farthest away from the board's edge connector. ("F" and "G")

Figure 42. Configuring the LAN Card

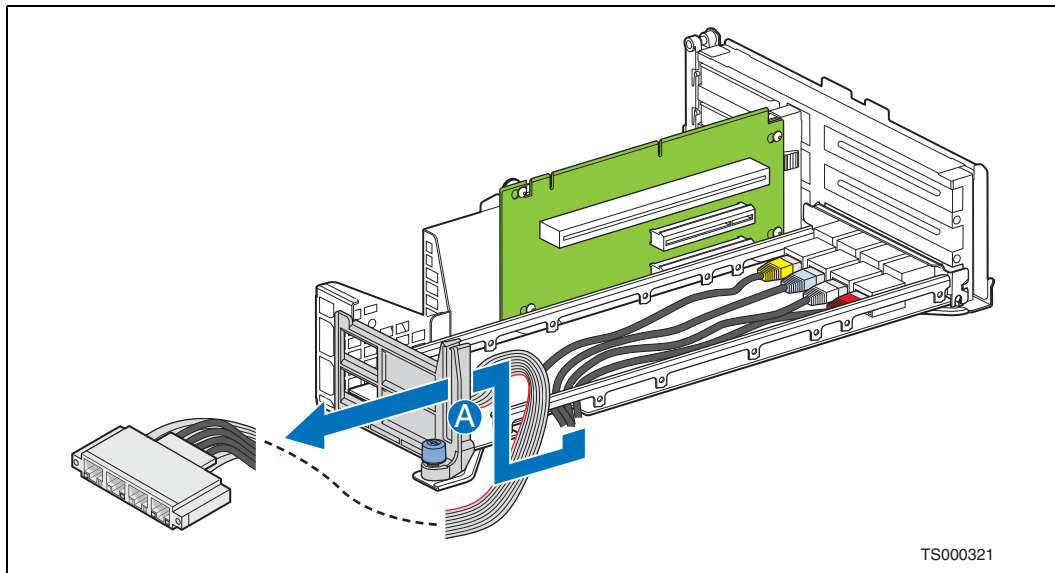


5. Route the end of the GbE cables going to the front panel through the retention clip. (Figure 43, "A")
6. Leave the LED ribbon cable out of the retention clip.

Note:

Do not fully re-install the riser card assembly in the chassis yet. The connection to the front panel must be set up first. Put the assembly in position without inserting the riser cards into the server board slots.

Figure 43. Routing the GbE Cables through the Retention Clip

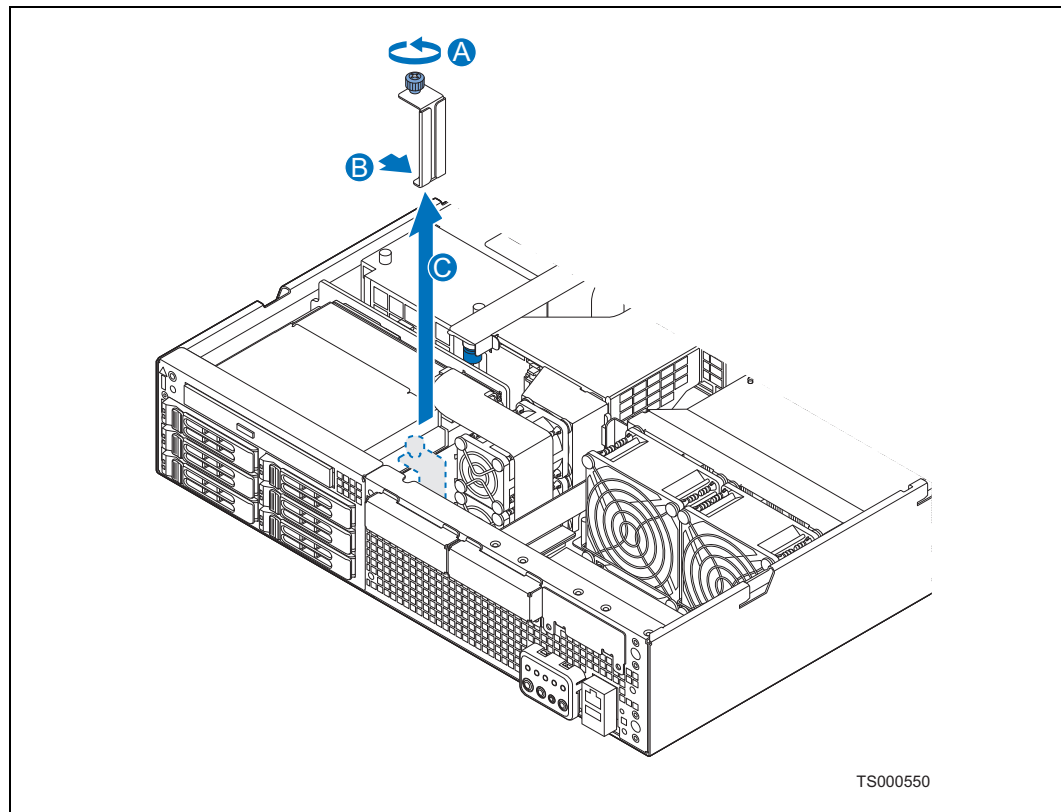


4.5.3 Routing the LAN Card Cables to the Front Panel

In order to access the front panel, the following components must be removed or disconnected:

- the flex cable
 - the PCI fan assembly
 - the cable management bracket
1. Disconnect the flex cable from the SAS backplane board at the rear of the drive bay assembly and move it out of the way of the PCI fan assembly. For instructions, see [Section 5.2.3, "Removing the PCI Fan Assembly" on page 102](#).
 2. Disconnect the PCI fan assembly power cables and remove the fan assembly from the chassis. For instructions, see [Section 5.2.3, "Removing the PCI Fan Assembly" on page 102](#)
 3. Remove the cable management bracket by loosening the blue thumbscrew and pulling the bracket out from under the drive bay assembly. (Figure 44, "A" and "B")
 4. Lift the bracket out of the chassis. ("C")

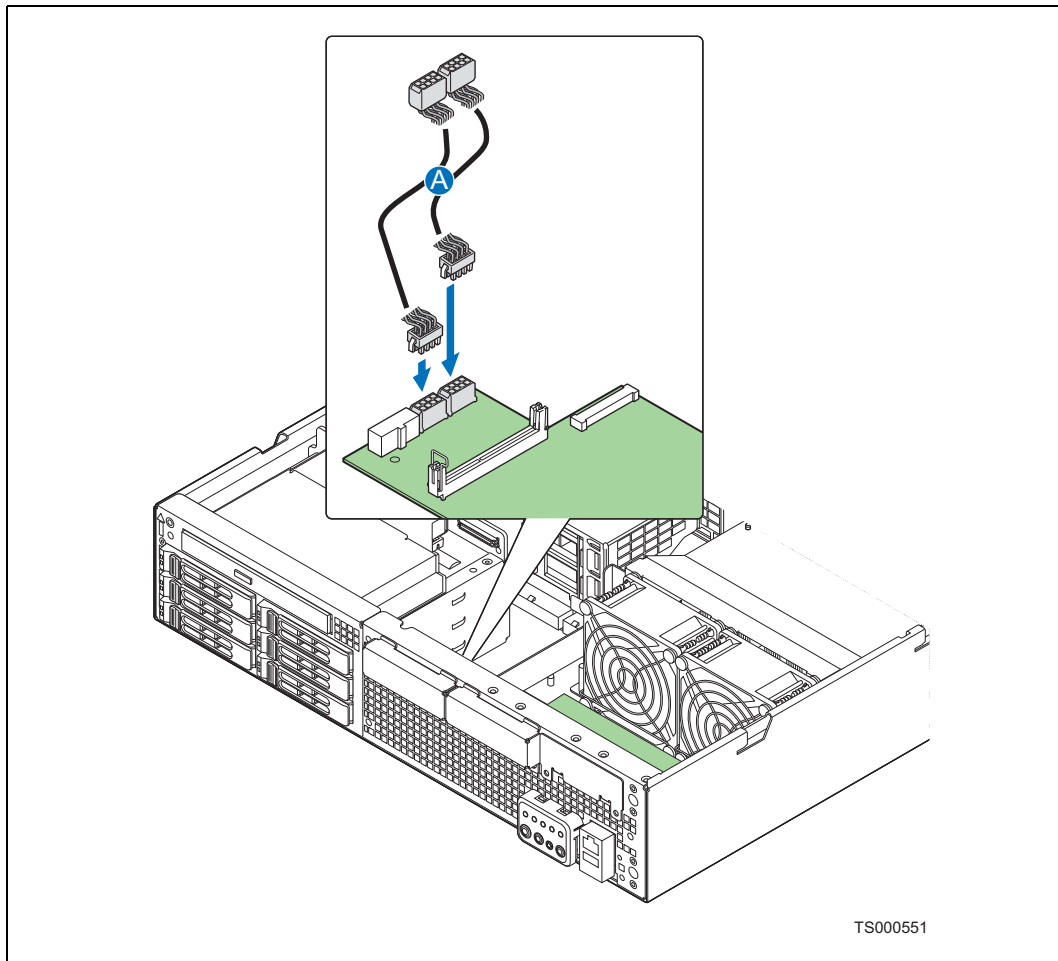
Figure 44. Removing the Cable Management Bracket



Once the LAN cables are routed to the front panel and installed there is not enough room to reconnect the PCI fan assembly power cables. Extensions are provided to enable the connections.

5. Attach the PCI fan assembly power cable extensions to the connectors on the front panel board. (Figure 45, "A")

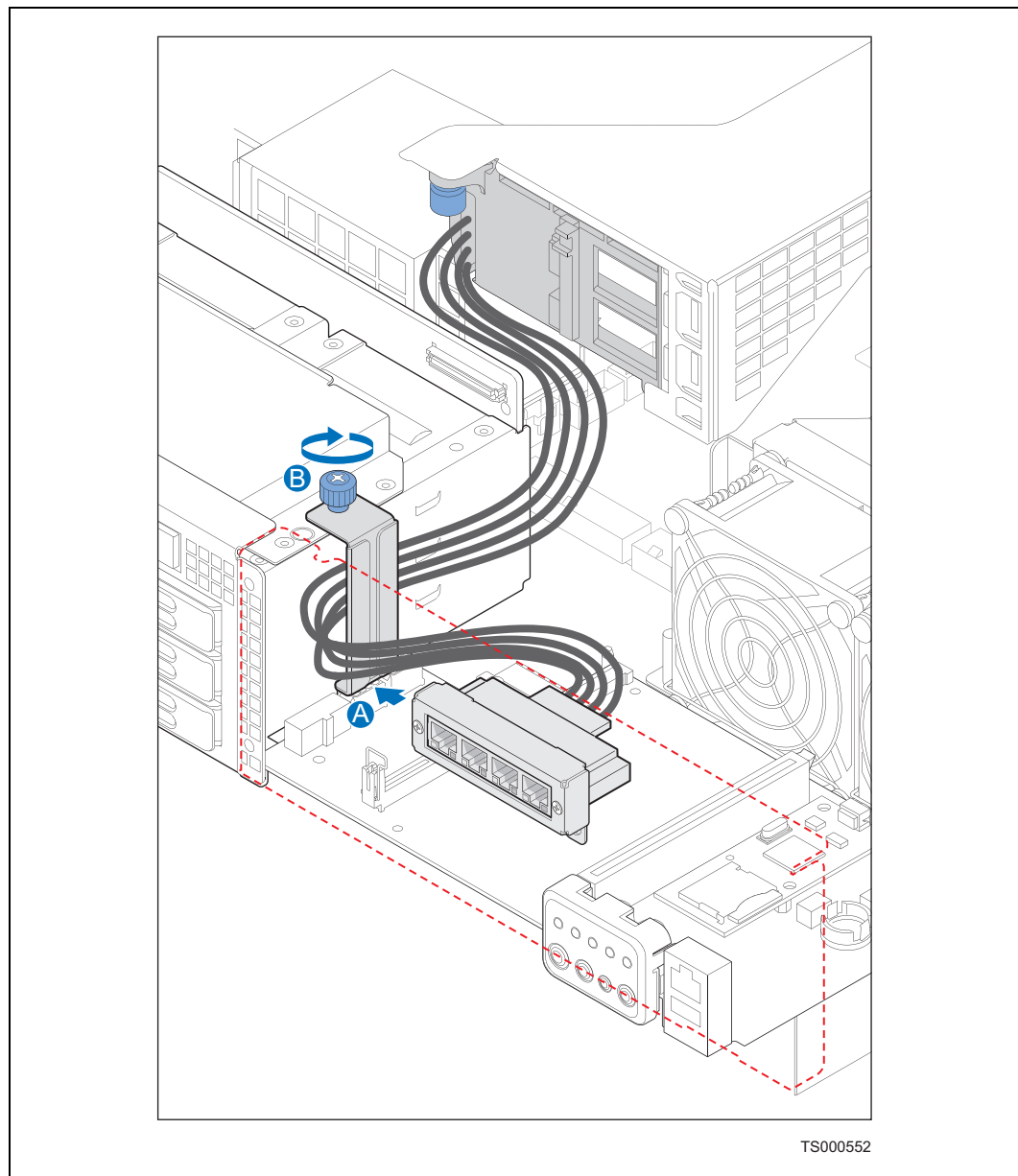
Figure 45. Installing the PCI Fan Assembly Extensions



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6. Fully install the PCI riser card assembly now and carefully route the GbE cables and LED ribbon cable to the front of the chassis.
7. Route the cables along the SAS backplane and along the right side of the SAS drive bay assembly.
8. Secure the GbE cables with the cable management bracket and re-fasten the cable management bracket to the side of the drive bay assembly. (Figure 46, "A" and "B")

Figure 46. Routing the GbE Cables through the Cable Management Bracket

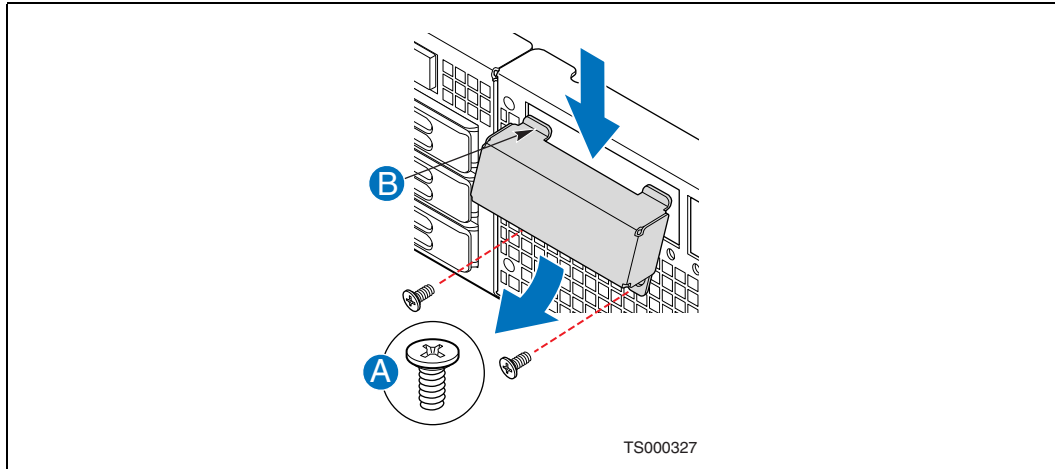


4.5.4 Connecting the GbE LAN Cables to the Front Panel

To connect the GbE cables for front panel LAN access, the filler panel must be removed and the GbE escutcheon installed. Then, the 4xGbE connector assembly can be attached to the escutcheon. Once these steps are done, the components that were removed from the chassis or disconnected are reinstalled and the chassis is closed up and the power reconnected.

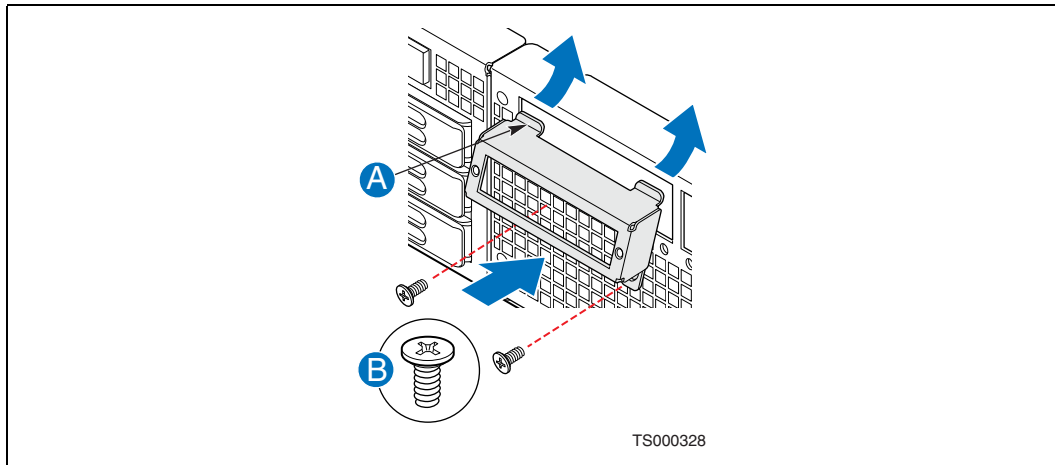
1. Remove the filler panel from one of the front panel 4xGbE port slots by loosening the two screws and pulling the filler panel down from the top edge and out. (Figure 47, "A" and "B")

Figure 47. Removing a 4xGbE Port Filler Panel



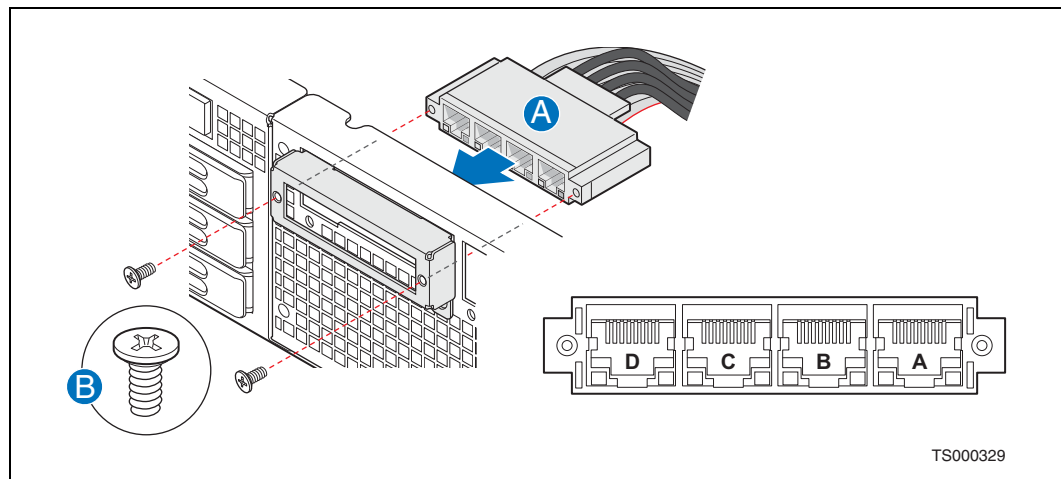
2. Insert the 4xGbE port escutcheon by first fitting the two tabs on the top into the front panel opening and then fastening the escutcheon with the two screws removed from the filler panel with a Phillips screwdriver. (Figure 48, "A" and "B")

Figure 48. Installing the 4xGbE Port Escutcheon



3. Insert the 4xGbE connector assembly in the escutcheon with the four ports (A through D) in the order illustrated in Figure 49. ("A")
4. Fasten the 4xGbE connector assembly to the escutcheon with the two screws, using a Phillips screwdriver. ("B")

Figure 49. Fastening the 4xGbE Connector Assembly to the Front Panel



After the connection is made to the front panel, all the components that were removed or disconnected for this installation must be replaced.

5. Replace the PCI fan assembly and connect the fan power cables using the extensions. For instructions, see [Section 5.2.5, "Installing the Fan Assembly Back into the Chassis"](#) on page 106.
6. Replace the flex cable over the PCI fan assembly and the support bracket and connect it to the SAS backplane board.
7. Install the PCI riser card assembly back into the chassis. For instructions, see [Section 4.2.5, "Replacing the Riser Card Assembly on the Server Board"](#) on page 55.
8. If this is the last task you are performing, replace the processor air duct, the front bezel, and the top cover of the chassis. Reconnect all the external devices and plug in the power cord(s).
For information about mounting the server in a rack, see [Section 3.5, "Installing the Server into a Rack"](#) on page 48

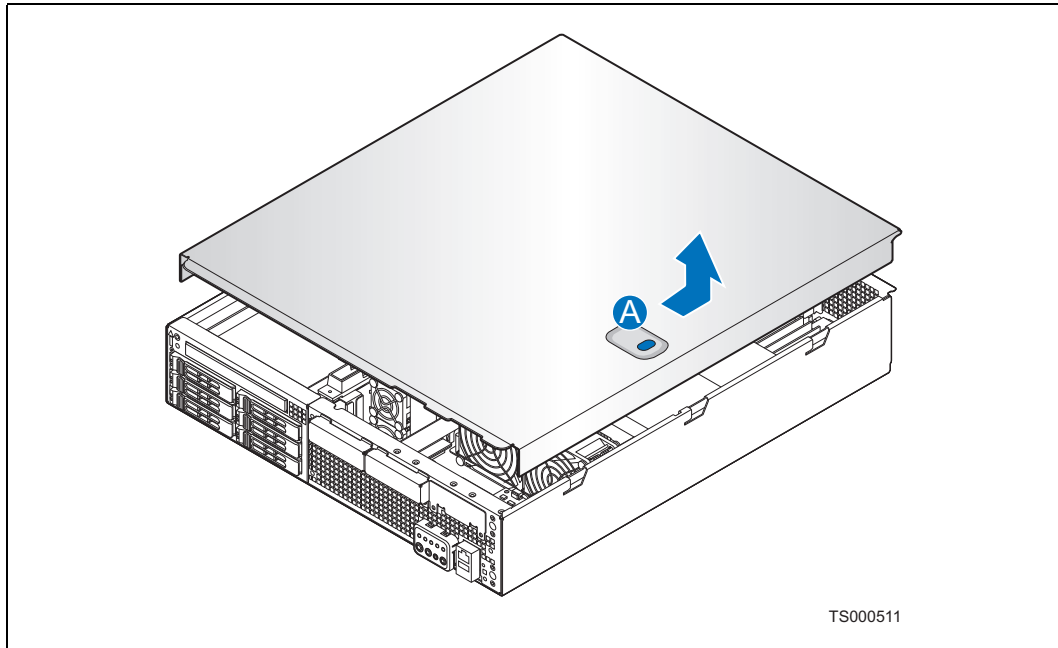
4.6 Installing a Fiber LAN Card for Front Panel Access

The IP Network Server NSC2U supports the Intel®PRO/1000 PF Quad-Port Bypass Adapter LAN card installed in the full-height riser card slots with connections routed to the front panel.

4.6.1 Preparing the chassis and removing the PCI card carrier assembly

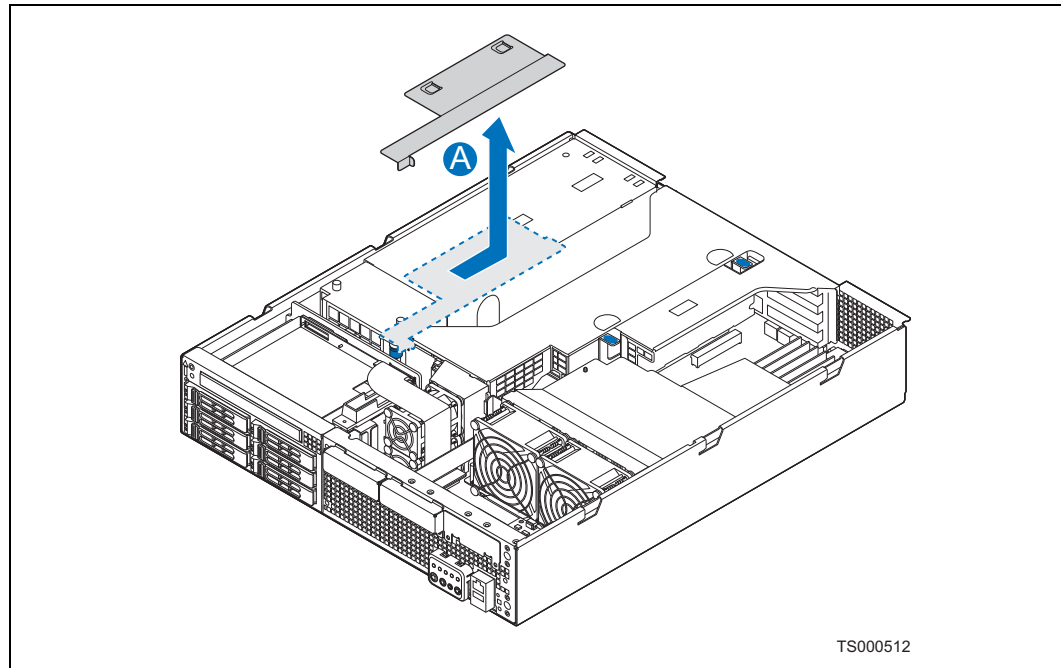
1. Remove the top cover as shown in [Figure 50](#).

Figure 50. Removing the top cover



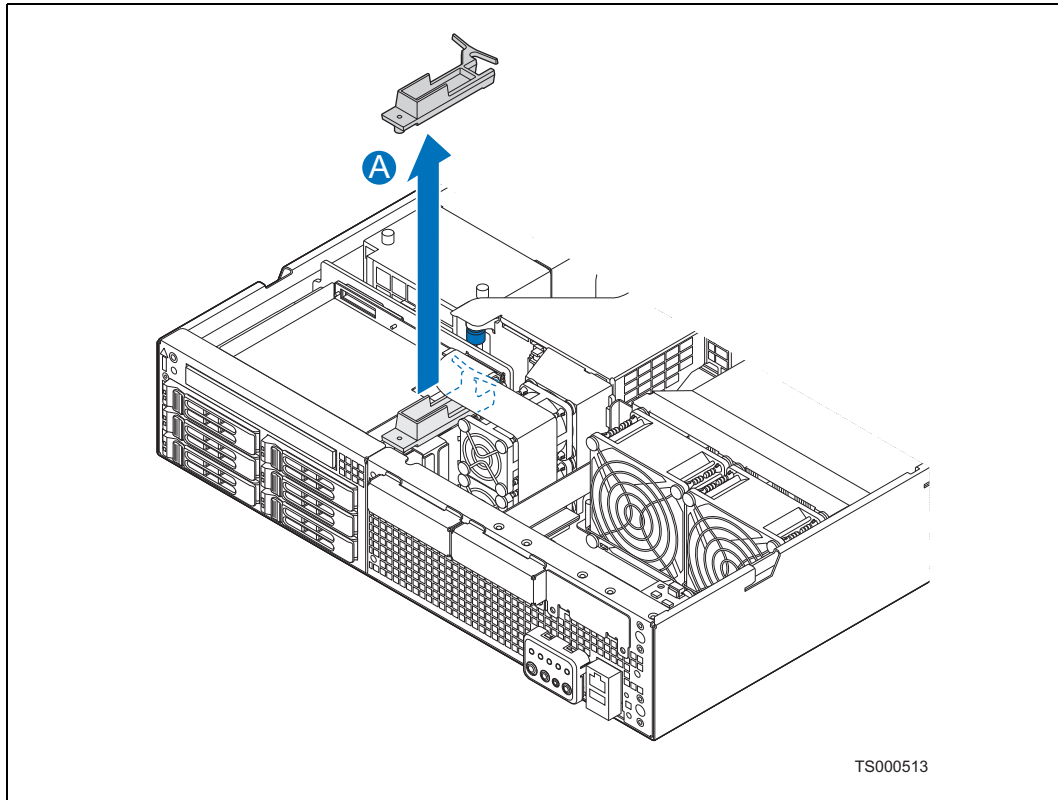
2. Remove the power supply support bracket as shown in [Figure 51](#).

Figure 51. Removing the power supply support bracket.



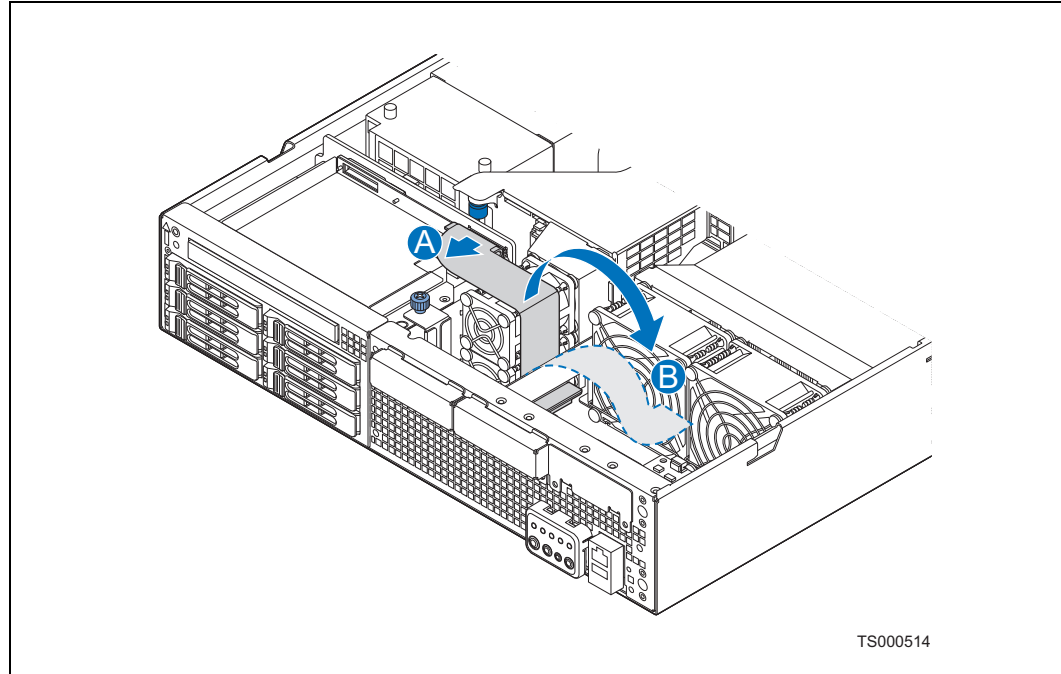
3. Remove the blue flex cable support as shown in [Figure 52](#).

Figure 52. Removing the Blue Flex Cable Support



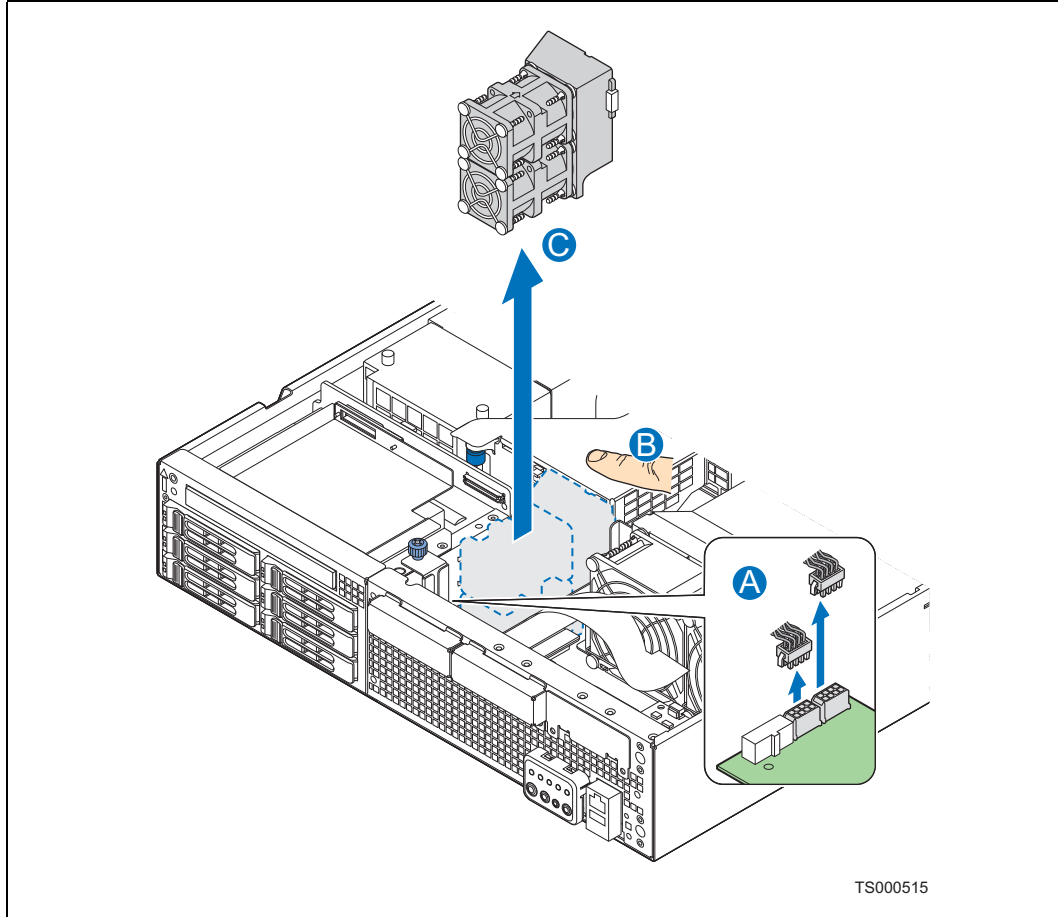
4. Disconnect the flex cable (letter "A" in Figure 53) and move it away from the PCI fan assembly ("B").

Figure 53. Disconnecting the flex cable



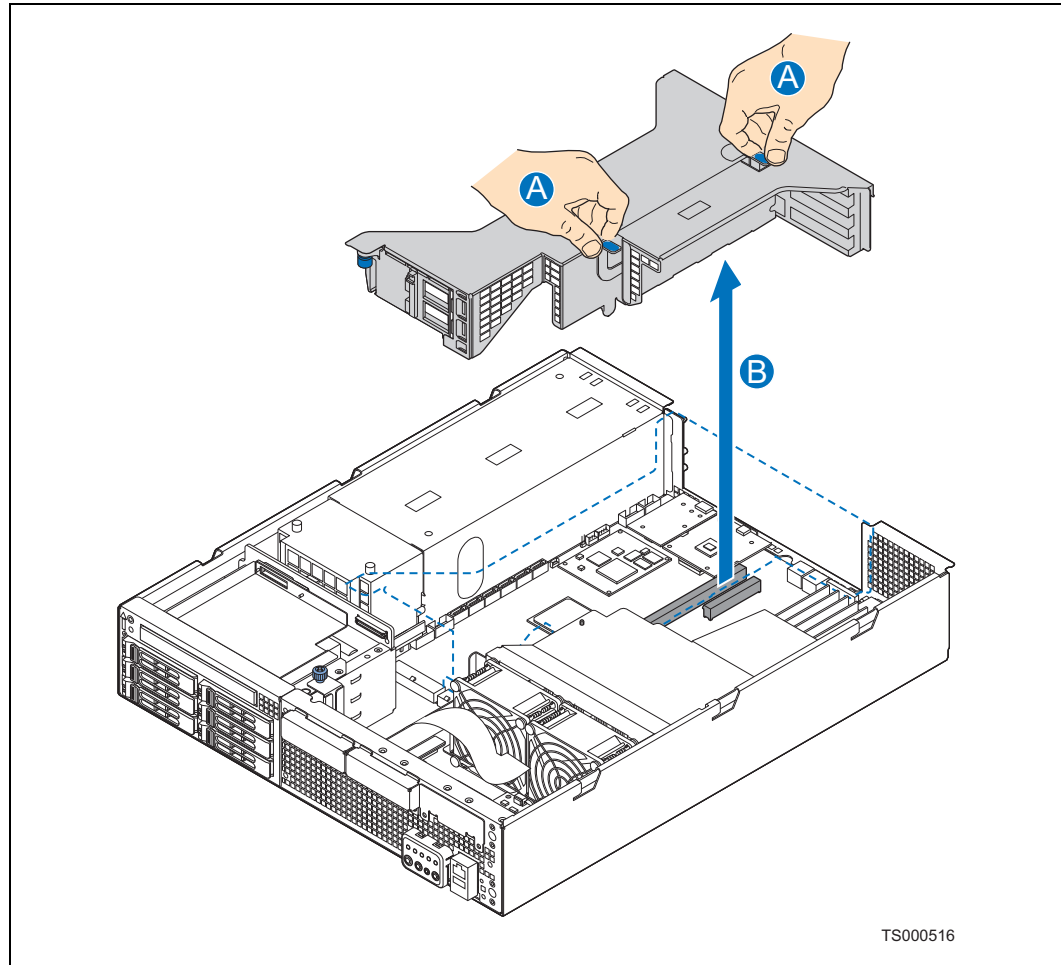
5. Unplug and remove the PCI fan assembly. Disconnect the power cables cables (letter "A" in Figure 54). Hold down the PCI card carrier assembly ("B") and lift out the PCI fan assembly ("C").

Figure 54. Removing the PCI Fan Assembly



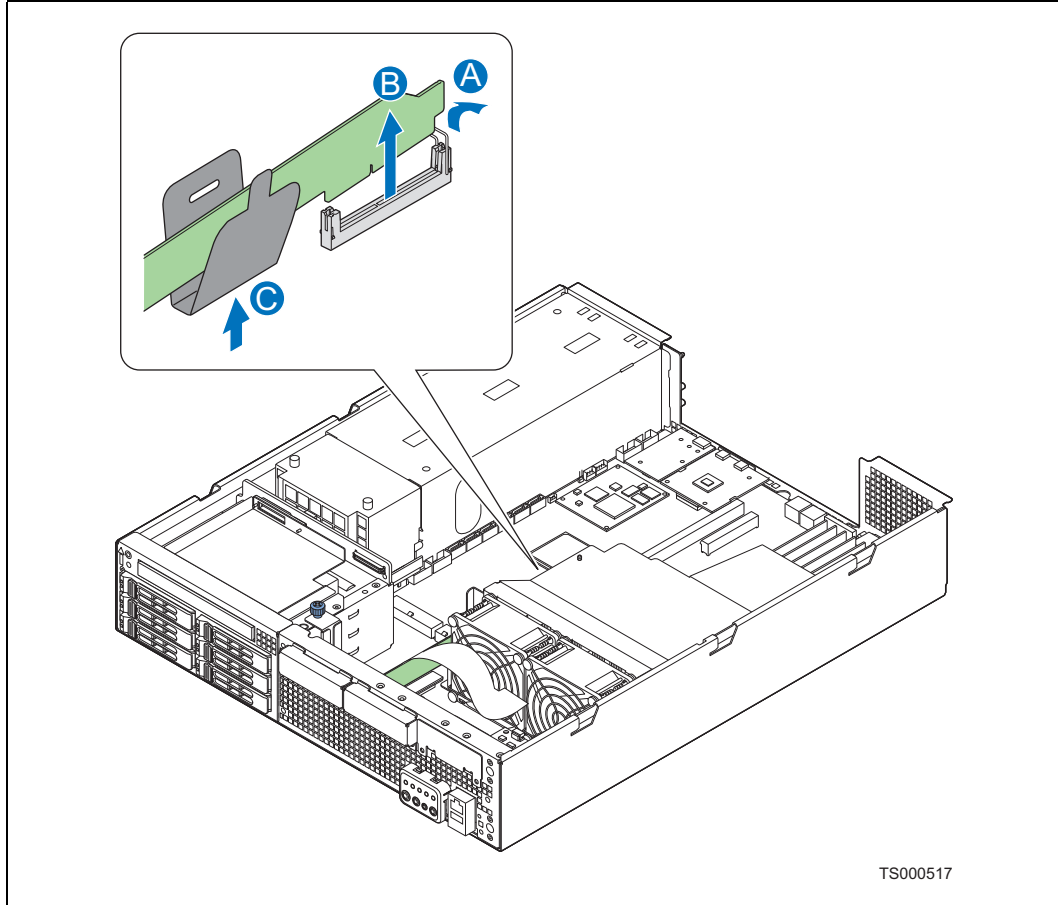
6. Press on the tabs (letter "A" in Figure 55) and lift out the PCI card carrier assembly ("B").

Figure 55. Removing the PCI Card Carrier Assembly



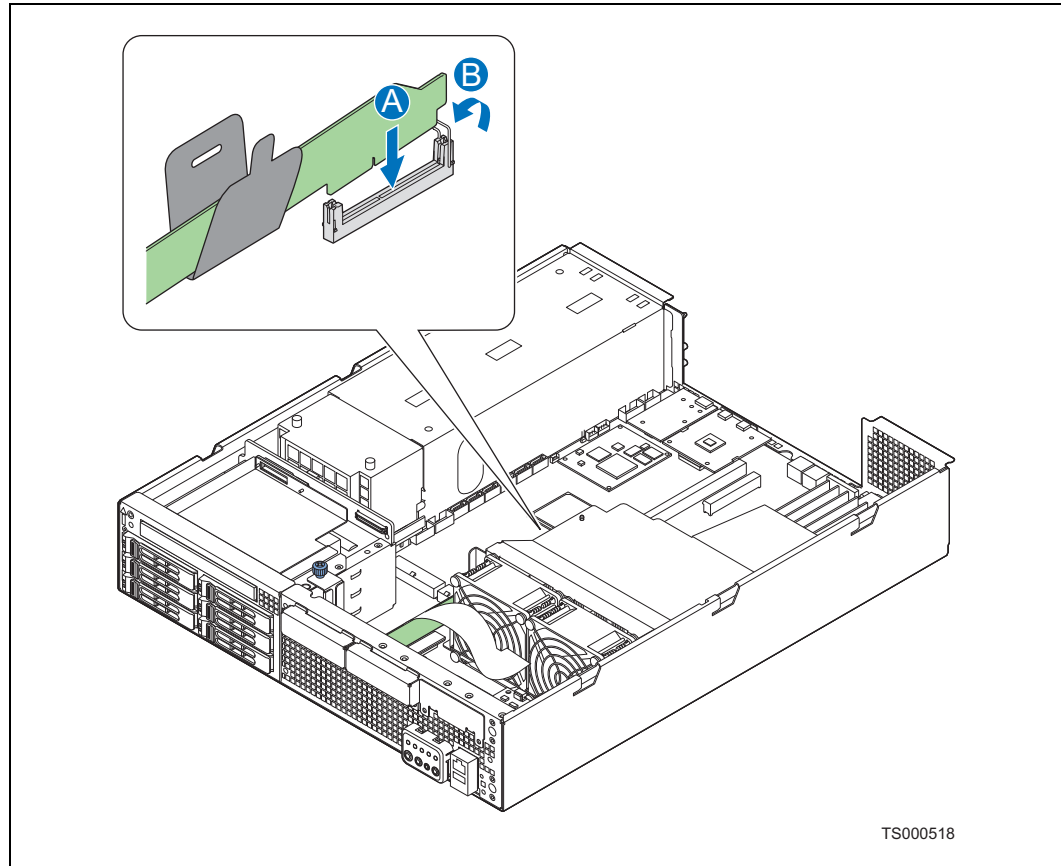
7. Open the retaining clip (letter "A" in Figure 56) and lift the end of the bridge board out of the connector ("B"). Install the fiber bundle retention clip around the bridge board ("C").

Figure 56. Installing the Fiber Bundle Retention Clip



8. Re-install the bridge board back into the connector (letter "A" in Figure 57) and close the retention clip ("B").

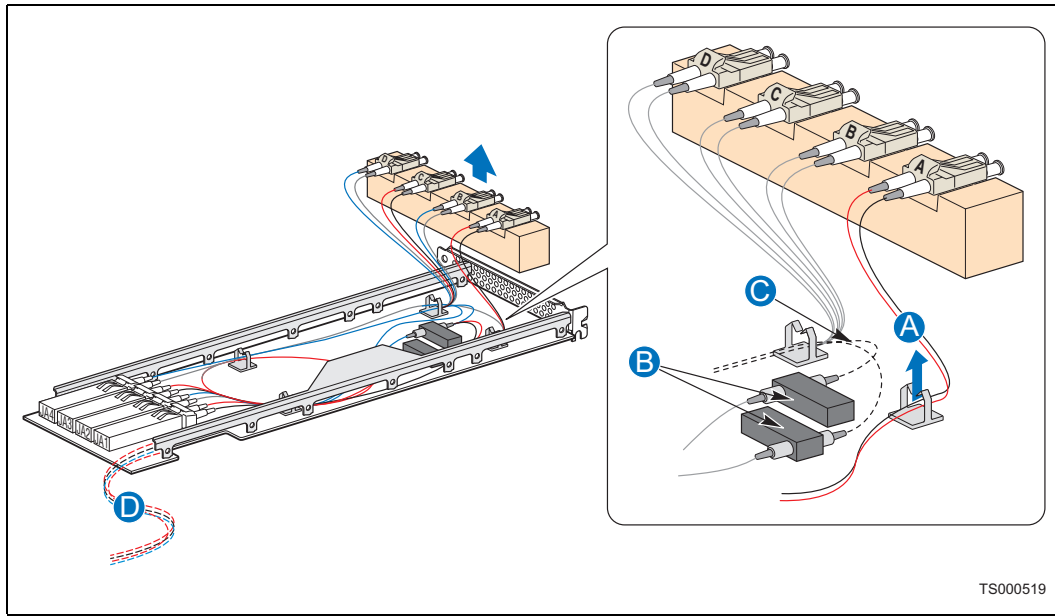
Figure 57. Re-installing the Bridge Board



4.6.2 Prepare the Fiber LAN Card and install it into the chassis

- Starting with Fiber pair A, remove the wires from the white cable clips (letter "A" in Figure 58) and trace the wires back to the pulse transformer ("B"). Route Fiber pairs B, C, and D to provide strain relief.

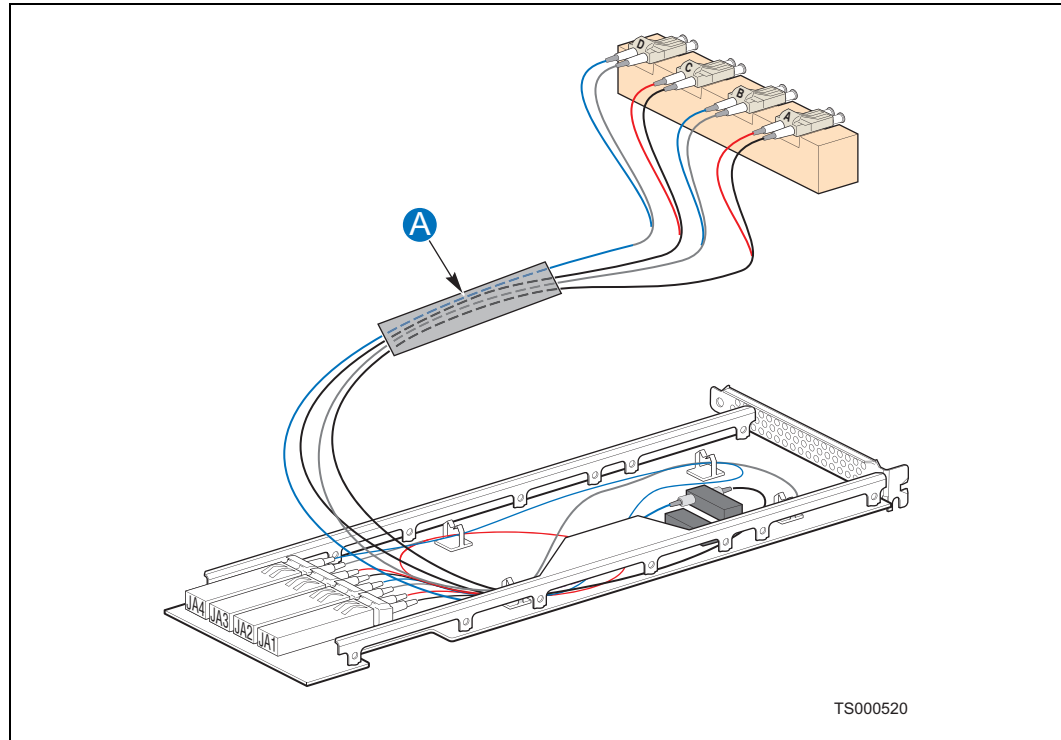
Figure 58. Routing Fiber Pairs



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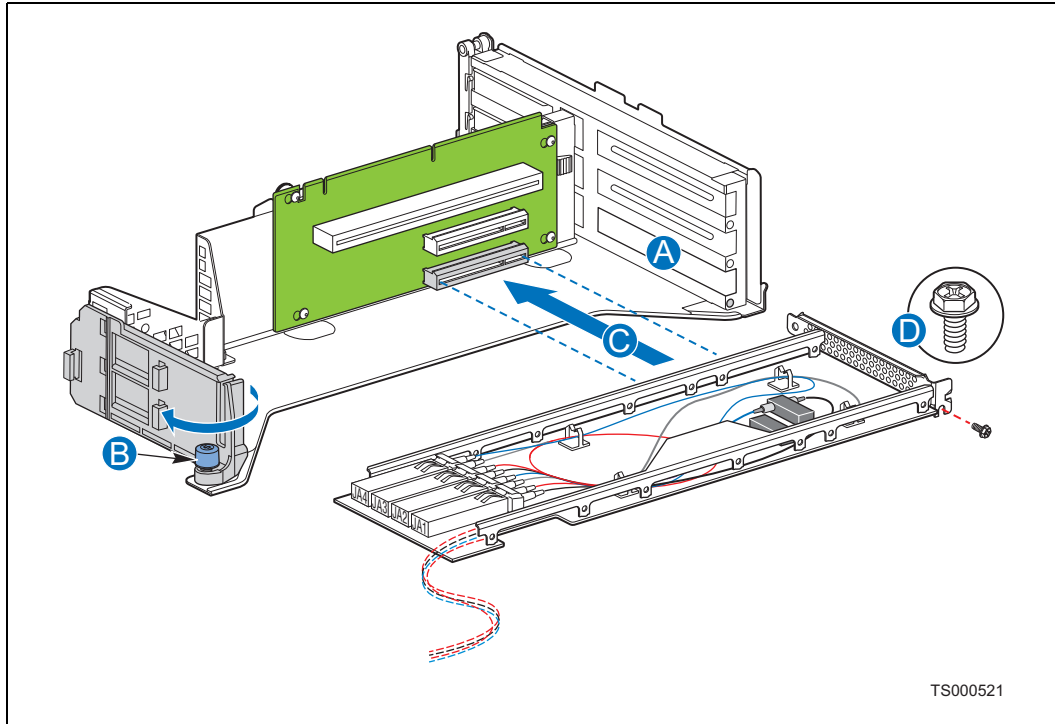
10. Install the cable management sheath around the four Fiber pairs as shown in Figure 59.

Figure 59. Installing the Cable Management Sheath



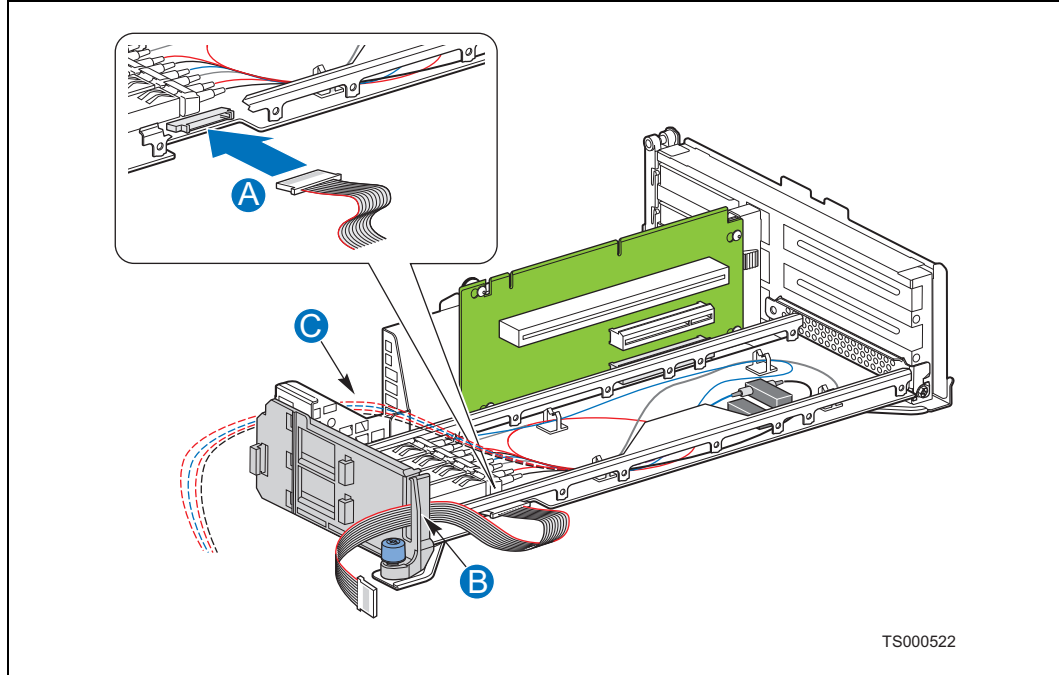
11. Remove the riser card assembly from the chassis. Remove the filler panel for the slot you'll be using for the Fiber LAN card ("A" in Figure 60). Loosen the blue thumbscrew on the retention clip and rotate the clip outward ("B"). Insert the LAN card into the selected full-height PCI Express riser card slot connector ("C"). Fasten the LAN card to the riser assembly bracket using the rear retention screw ("D").

Figure 60. Installing the Fiber LAN card into the PCI Card Carrier Assembly



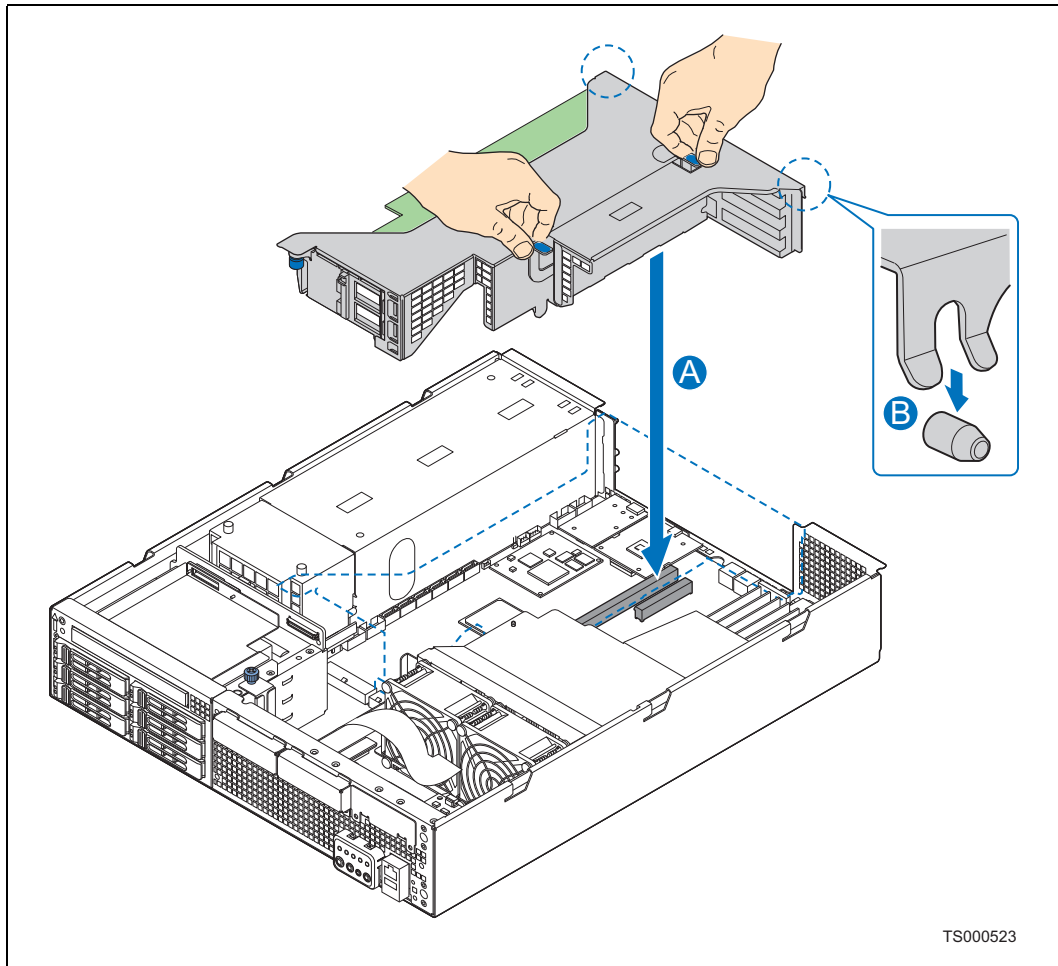
12. Plug the ribbon cable into the LAN card ("A" in Figure 61). Route the cable through the clip in the card retention mechanism ("B"). Route the fiber cables over the correct edge ("C").

Figure 61. Routing the Ribbon Cable and the Fiber Cables



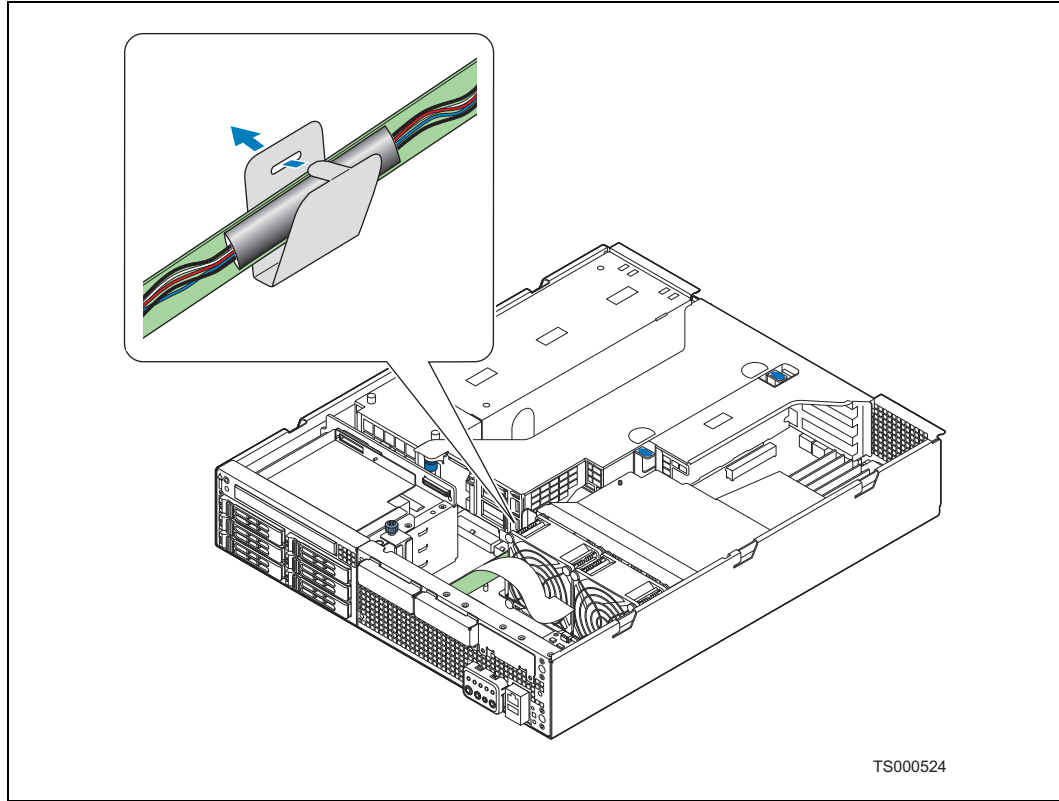
13. Grasp the PCI riser card assembly using the two flexible blue handles and carefully re-insert the assembly into the chassis ("A" in Figure 62). Note the pins on each side of the rear panel opening where the riser card assembly bracket forks attach ("B").

Figure 62. Re-installing the PCI Card Carrier Assembly



14. Route the fiber cable bundle alongside the bridge board. Secure the two using the fiber bundle retention clip as shown in [Figure 63](#).

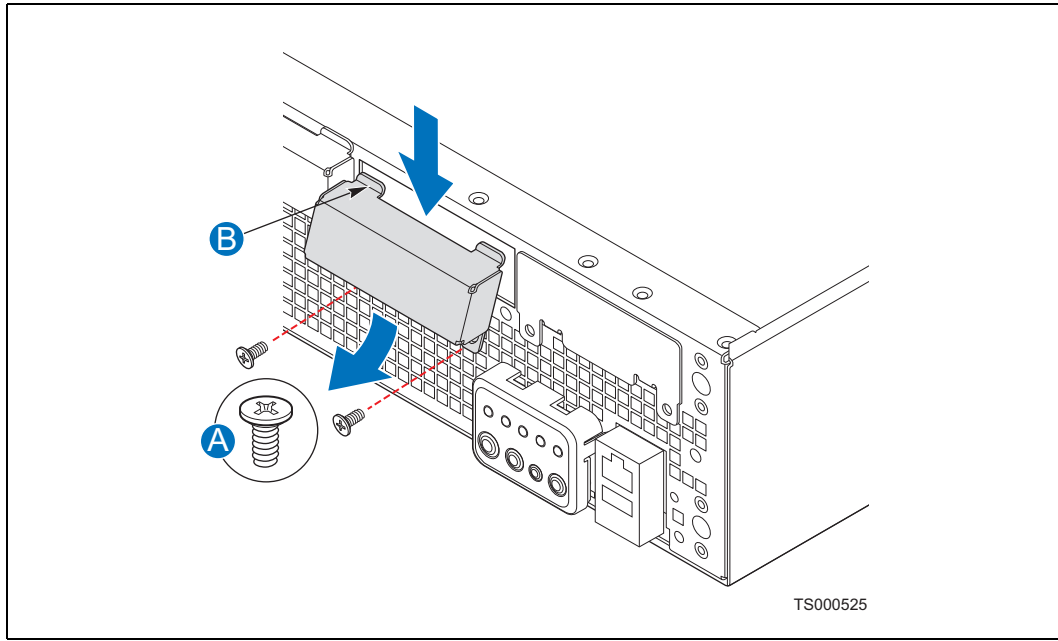
Figure 63. Securing the Fiber Cables in the Retention Clip



4.6.3 Install the Front Panel Escutcheon and Connect the Fiber Cables

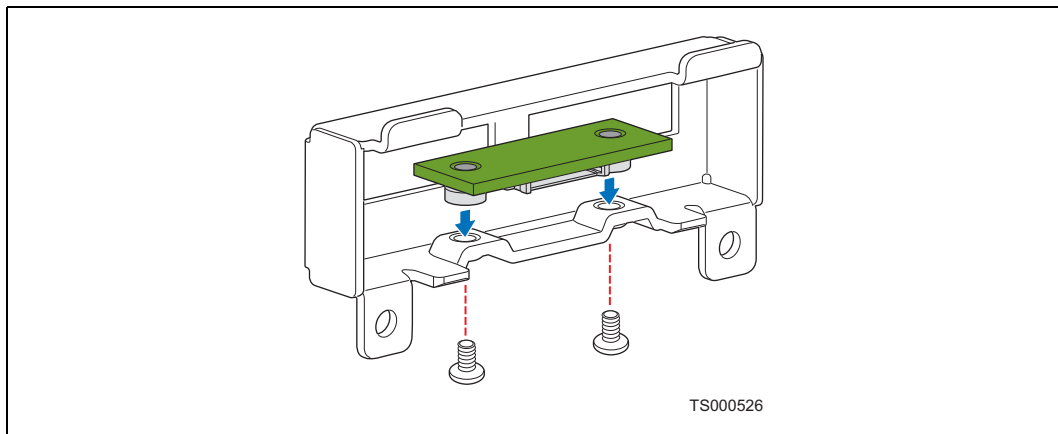
15. Remove the screws holding the blank front panel cover (letter "A" in [Figure 64](#)). Slide the blank cover off ("B").

Figure 64. Removing the Blank Front Panel Cover



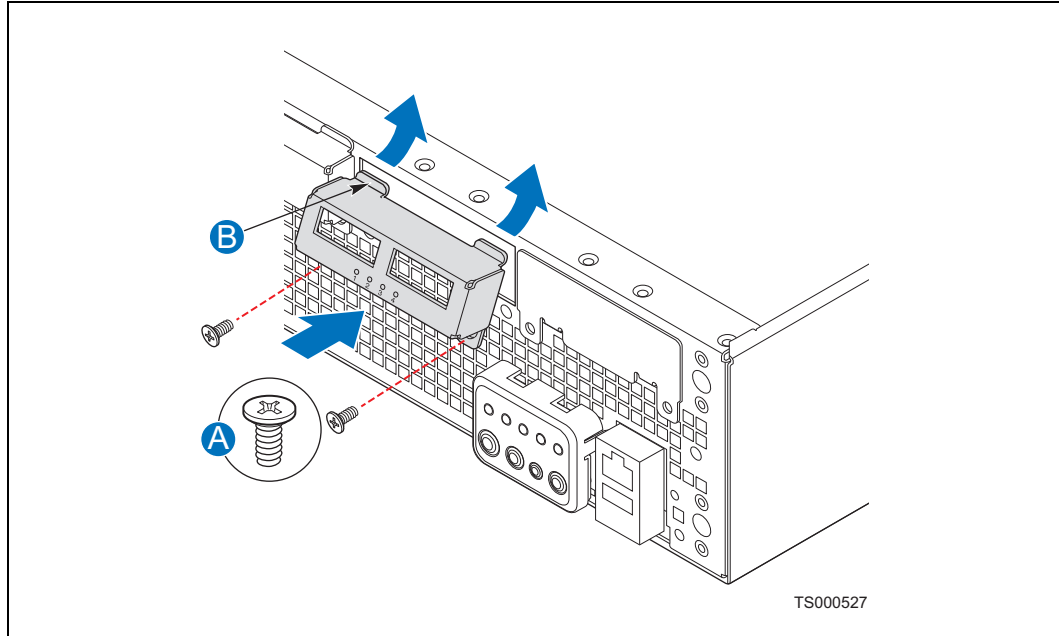
16. Install the interposer LED board onto the fiber escutcheon as shown in [Figure 65](#).

Figure 65. Installing the Interposer LED Board



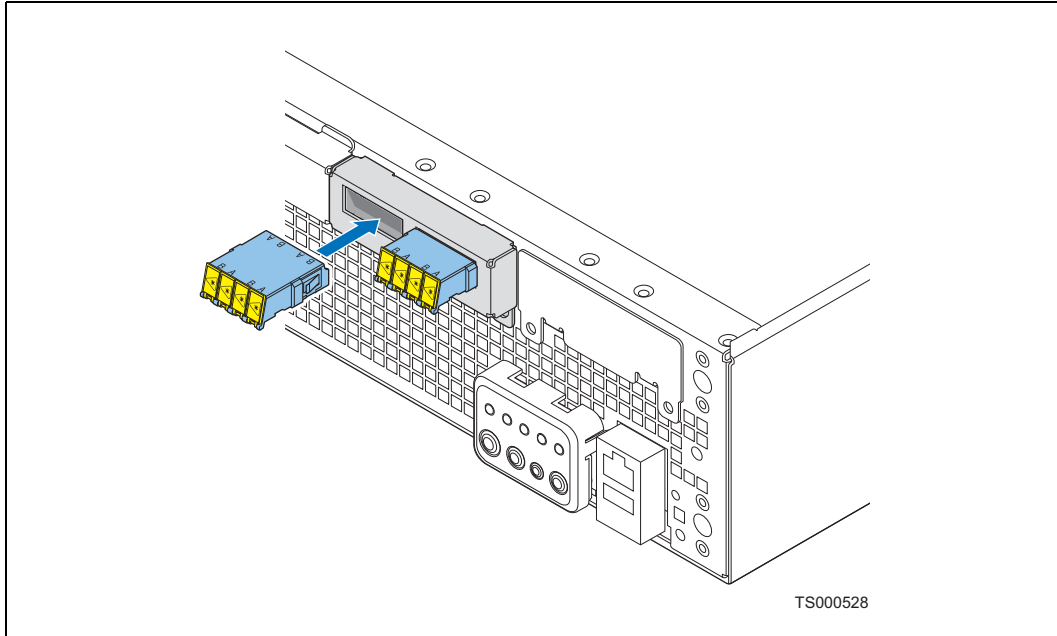
17. Install the fiber escutcheon into the front of the chassis ("A" in Figure 66). Secure the escutcheon using two screws ("B").

Figure 66. Installing the Fiber Escutcheon



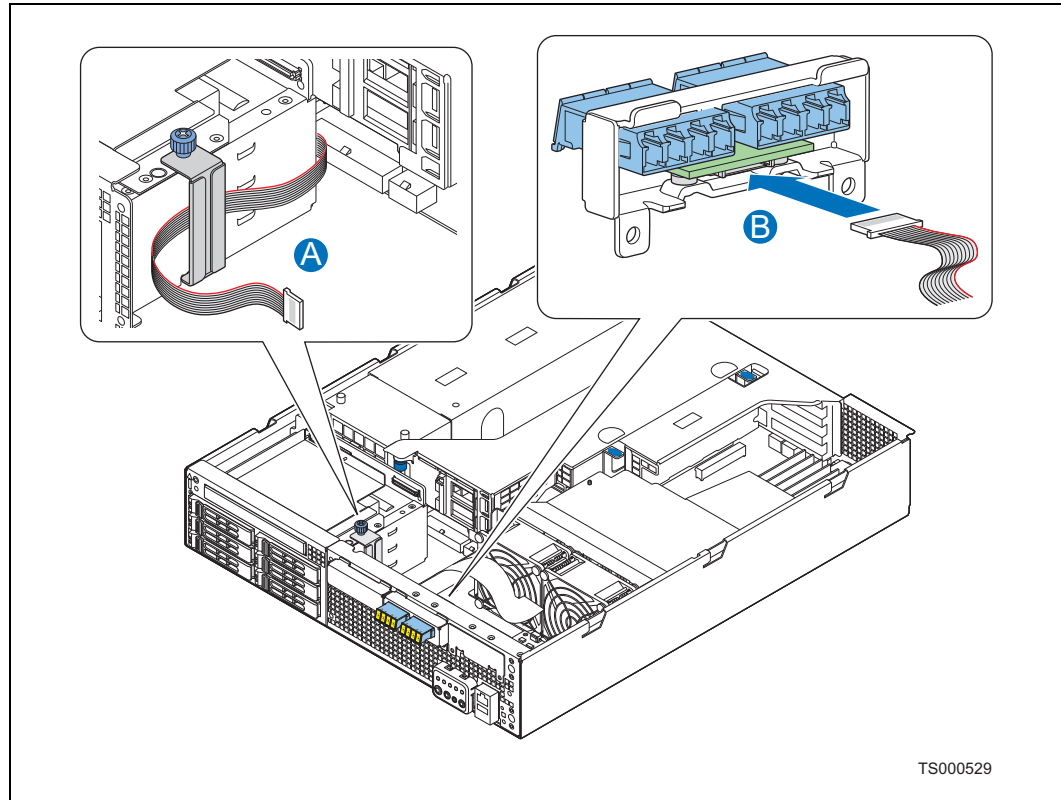
- Slide the blue fiber connectors into the escutcheon as shown in [Figure 67](#). Slide the connectors in until you hear the retaining clips snap.

Figure 67. Sliding the Fiber Connectors into the Escutcheon



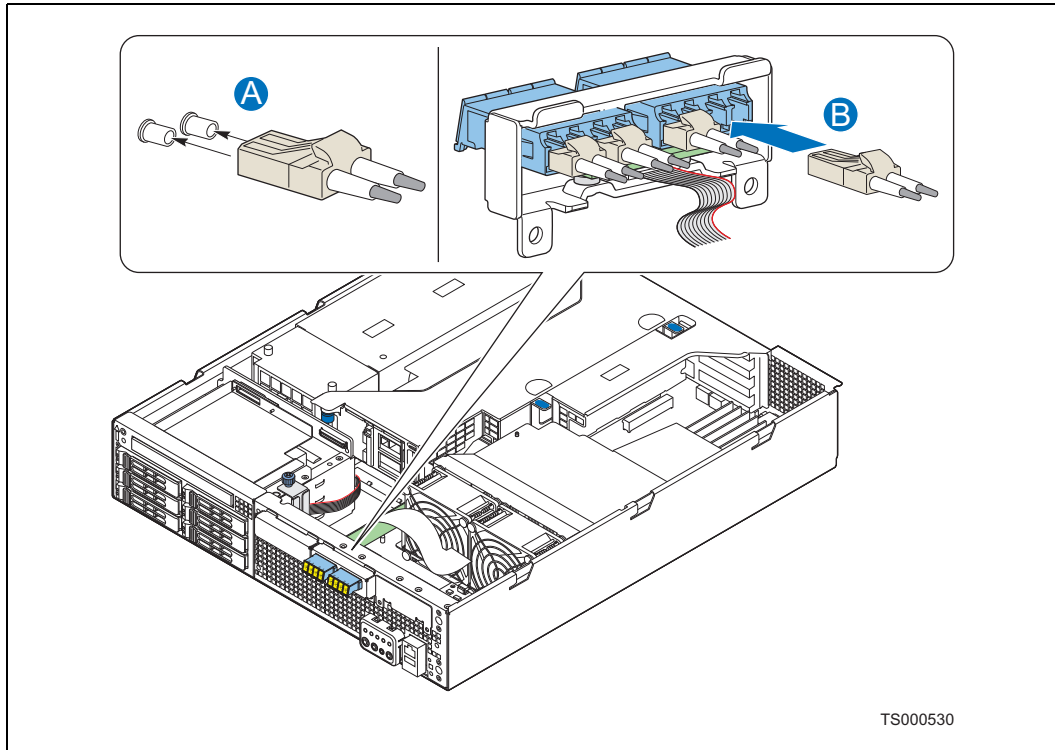
19. Route the ribbon cable through the cable retention mechanism ("A" in Figure 68). Plug the ribbon cable into the interposer board ("B").

Figure 68. Routing the Ribbon Cable to the Interposer Board



20. Remove the white protective caps from the ends of the fiber cable pairs ("A" in Figure 69). Slide the cables into the blue fiber connectors on the escutcheon ("B").

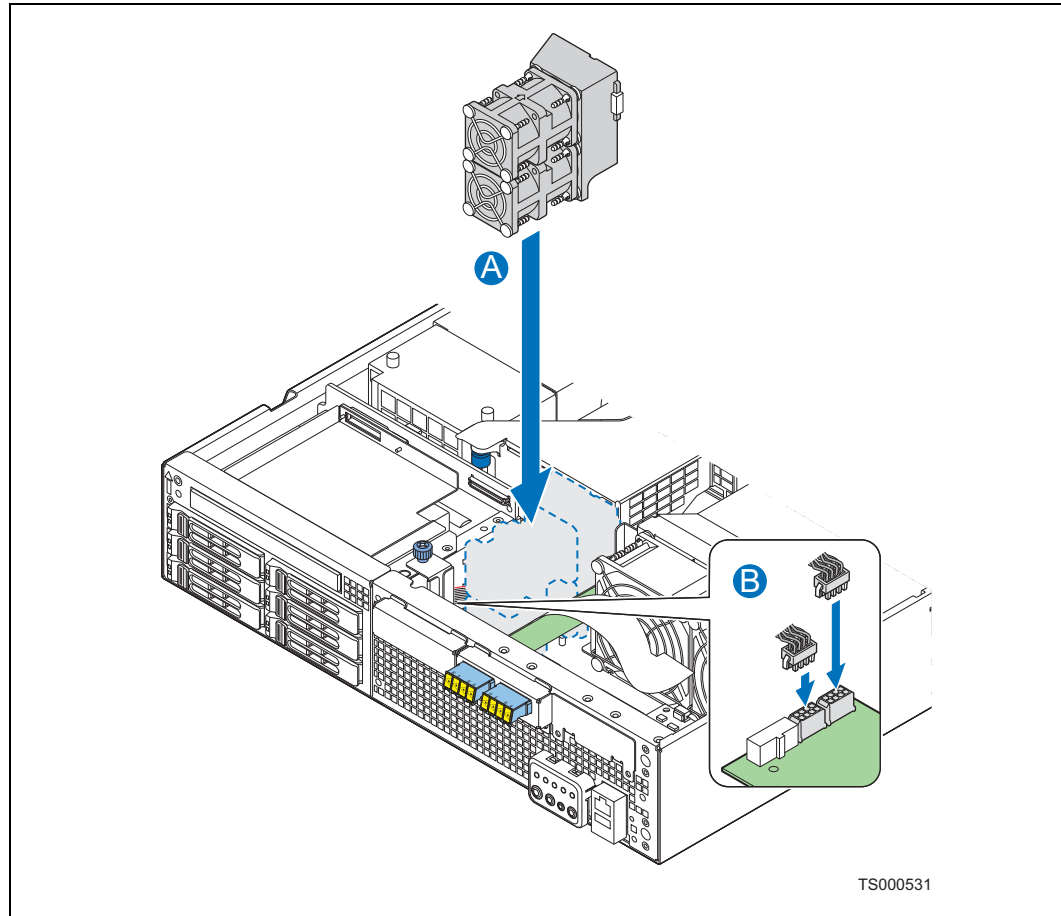
Figure 69. installing the Fiber Cable Pairs into the Escutcheon



4.6.4 Re-assemble the System

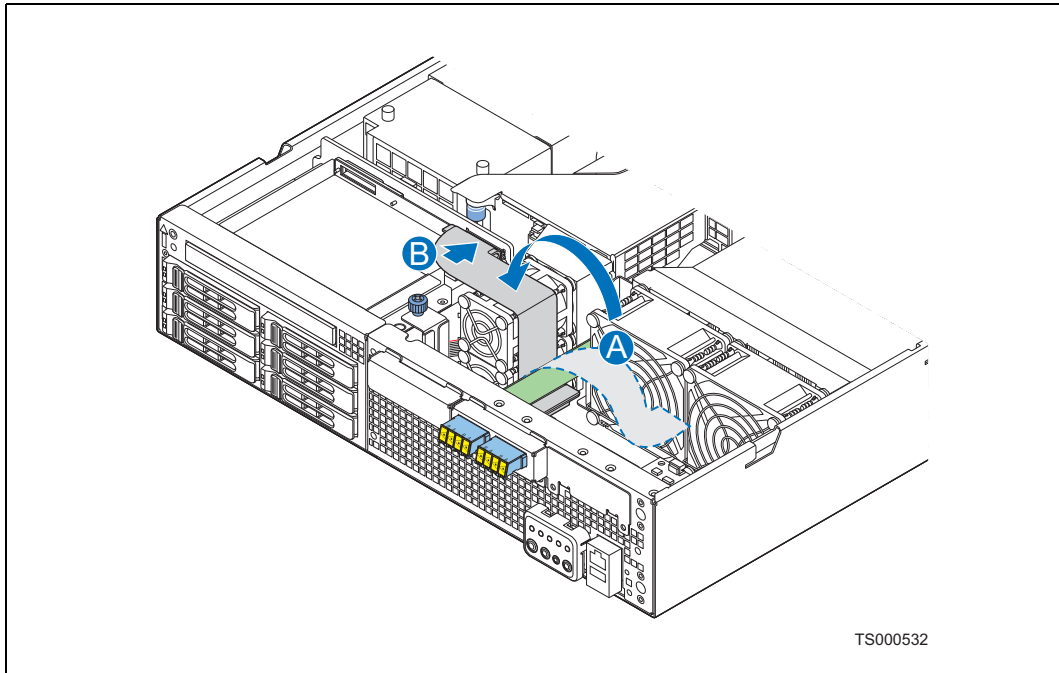
21. Re-install the PCI fan assembly ("A" in [Figure 70](#)) and plug in the power connectors ("B").

Figure 70. Re-installing the PCI Fan Assembly



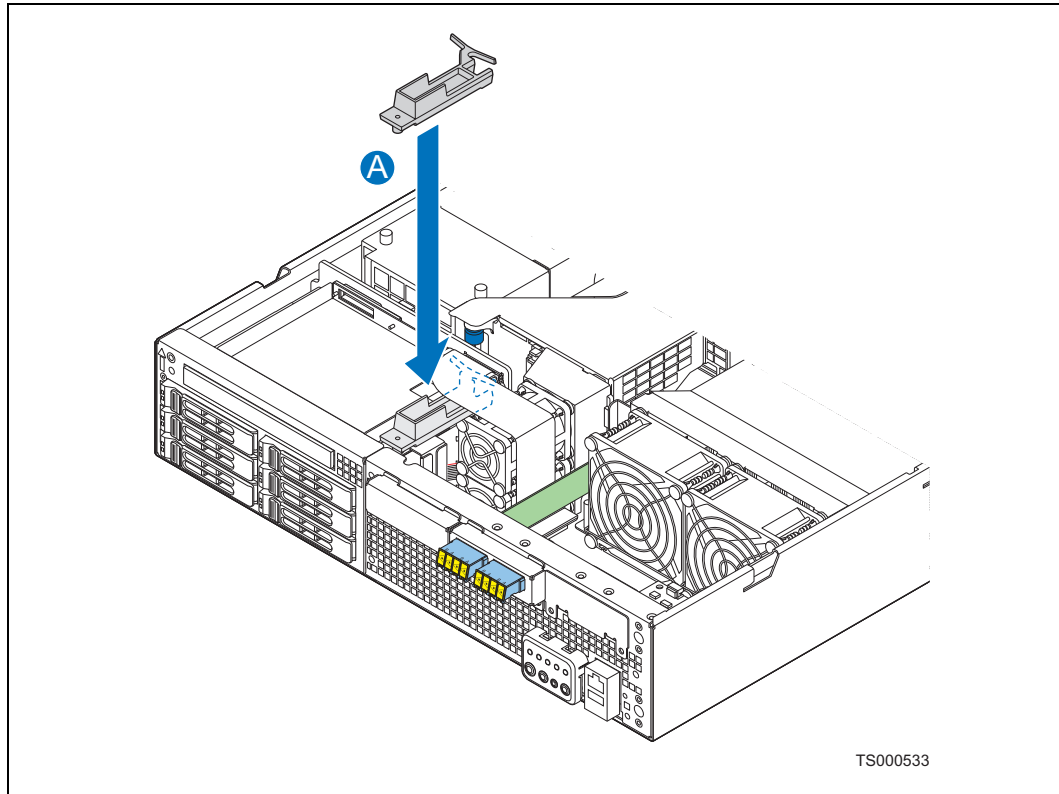
22. Move the flex cable back into position ("A" in Figure 71) and reconnect it ("B").

Figure 71. Reconnecting the Flex Cable



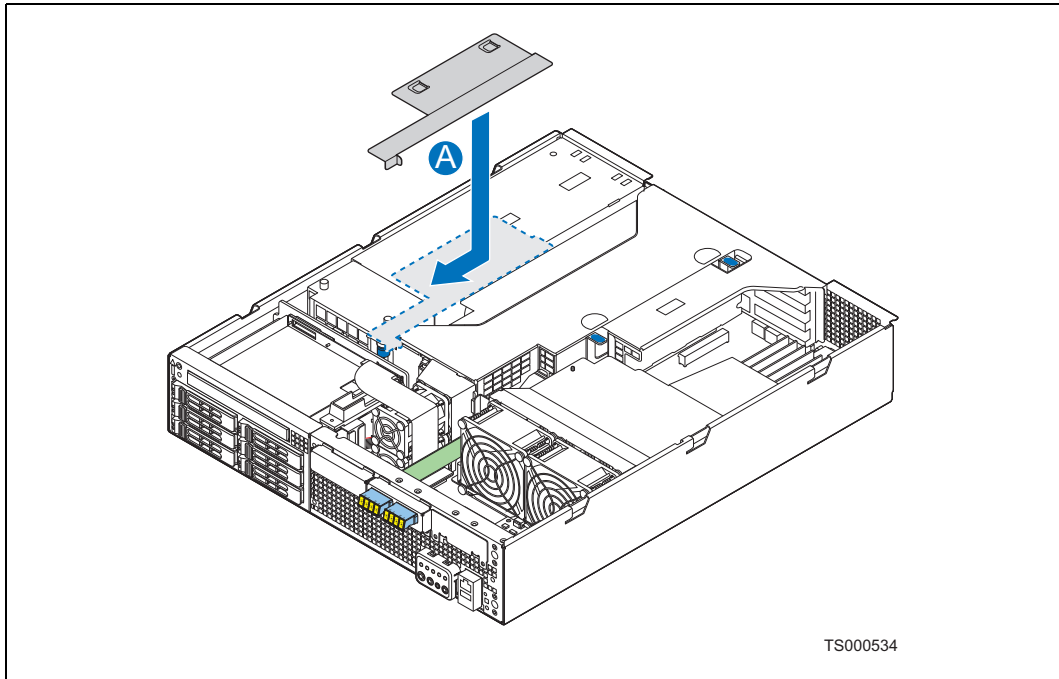
23. Re-install the blue flex cable support as shown in [Figure 72](#).

Figure 72. Re-installing the Blue Flex Cable Support



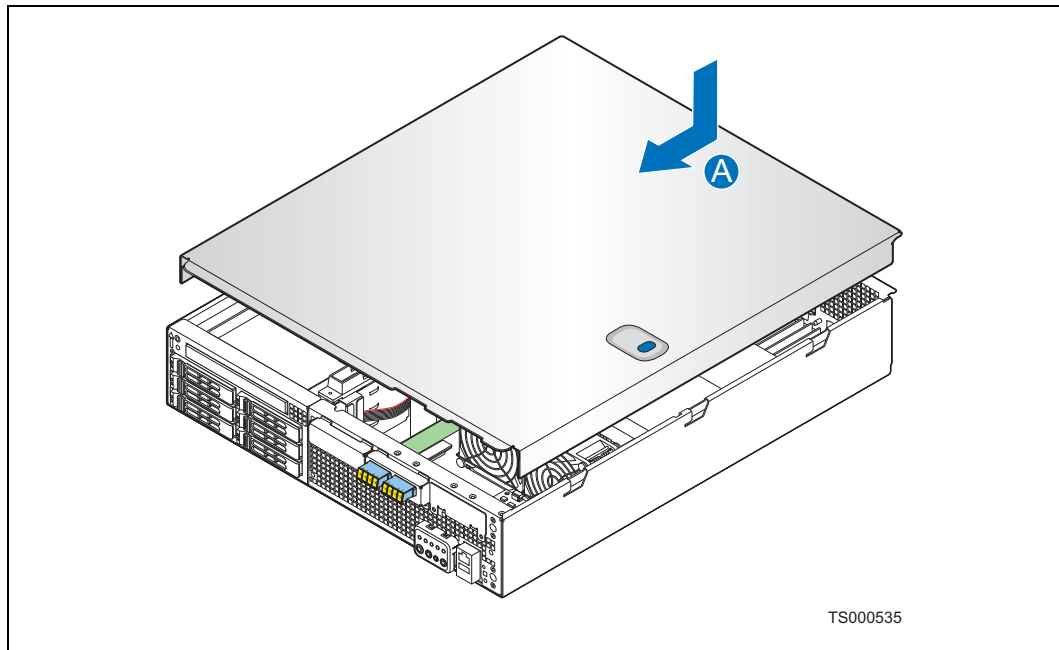
24. Re-install the power supply support bracket as shown in Figure 73.

Figure 73. Re-Installing the Power Supply Support Bracket



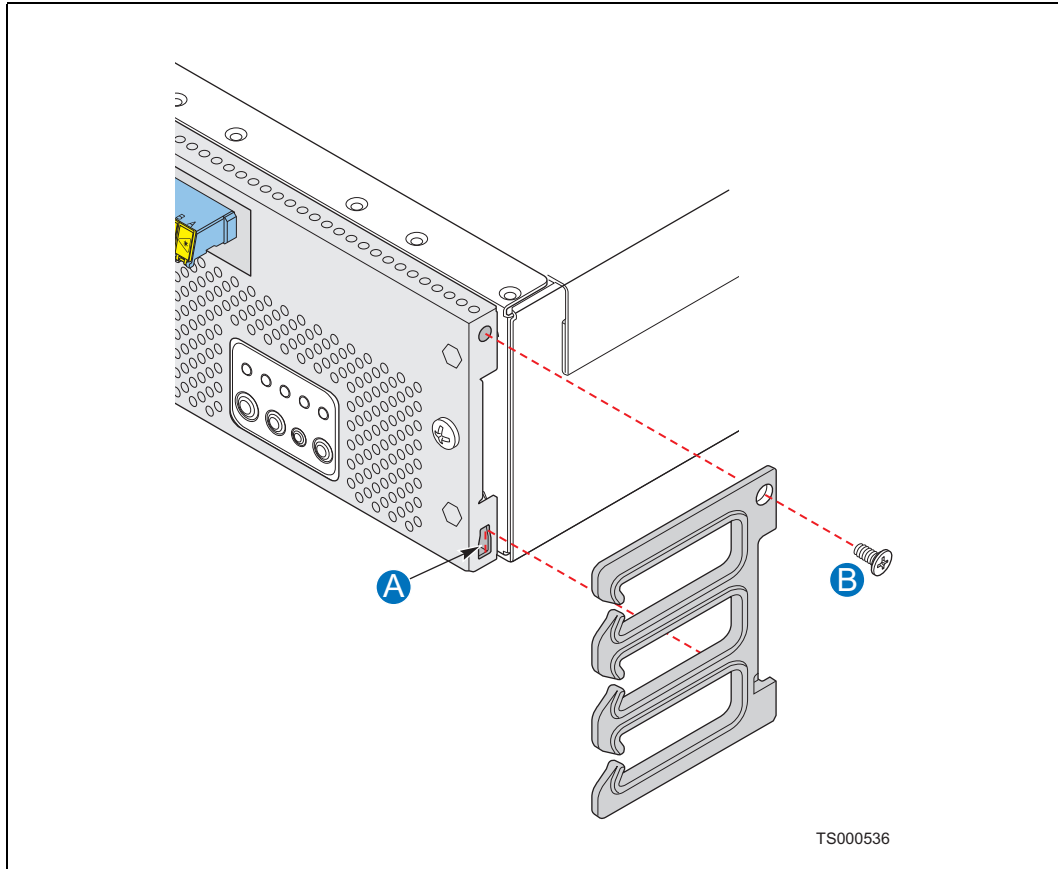
25. Re-install the top cover as shown in Figure 74.

Figure 74. Re-installing the Top Cover



26. OPTIONAL: If needed, you can install the optional cable management bracket. The bracket provides a means for routing and managing LAN cables connected to the front of the system chassis. The bracket is symmetrical and can be mounted on either side of the bezel. To attach the bracket on the right side of the bezel, insert the tab of the bracket into the slot on the bezel ("A" in Figure 75) and secure the bracket using the 6-32 screw ("B").

Figure 75. Installing the Optional Cable Management Bracket

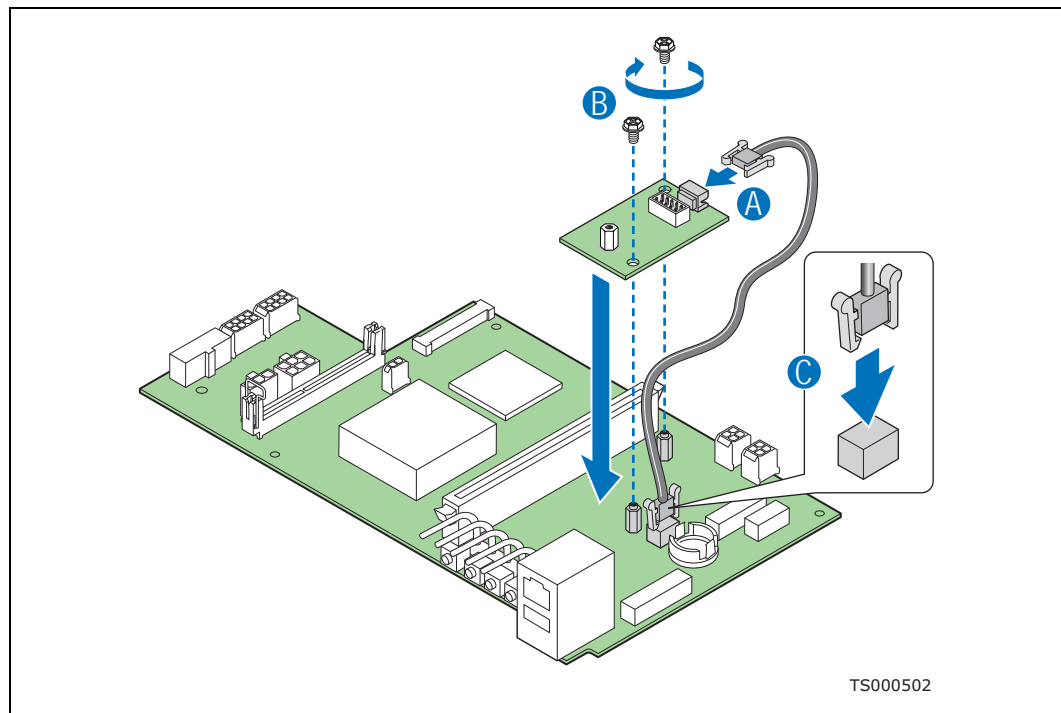


4.7 Installing a SMART Embedded USB Solid-State Drive

The optional SMART Embedded USB Solid-State Drive (eUSB SSD) provides local memory storage for various options such as system information, diagnostic partitions, and configuration data. It is positioned on the SAS front panel board between the RAID DIMM connector and the RAID key socket and behind the control panel LED light pipes. Before you install an SSD, you must remove the chassis top cover, the front bezel, and the processor air duct.

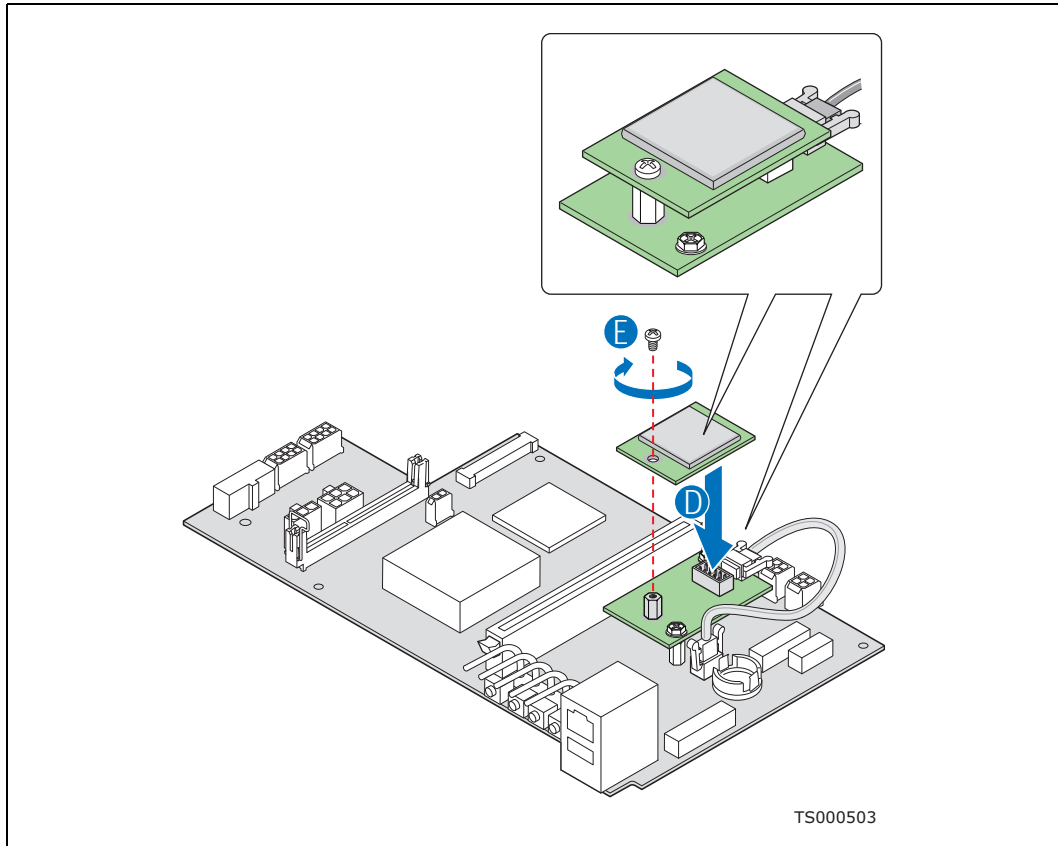
1. Remove the chassis top cover and the processor air duct. For instructions see [Section 3.2.1](#) and [Section 3.2.5](#).
2. Plug one end of the cable labeled "SysCon" into the rear of the interposer card as shown ("A"). (The cable has identical connectors on both ends.)
3. Attach the interposer card to the SFP board by inserting and tightening the two screws that come with the VSSD into the two threaded standoffs on the SFP board. ("B")
4. Plug the other end of the cable into the connector header on the SFP board. ("C")

Figure 76. Installing the Interposer Card



5. Attach the eUSB SSD to the interposer card as shown ("D").
6. Insert and tighten the screw that will hold the VSSD in place on the interposer card as shown ("E").

Figure 77. Installing the Value Solid State Drive



7. If this is the last task you are performing, replace the processor air duct and the top cover of the chassis. Reconnect all the external devices and plug in the power cord(s).
For information about mounting the server in a rack, see [Section 3.5, "Installing the Server into a Rack"](#) on page 48

4.8 Installing Hardware RAID 5 Components

The RAID5 Kit includes the following three components for hardware RAID support:

- Hardware RAID activation key
- RAID DIMM
- RAID Intelligent Battery Backup Unit (IBBU)

The optional hardware RAID 5 components are installed on the SAS front panel (SFP) board in the front right side of the chassis. Before installing the RAID components, you must first remove the chassis top cover and the processor air duct. For instructions, see [Section 3.2.1](#) and [Section 3.2.5](#). To install the IBBU, you must also remove the front panel bezel. For instructions, see [Section 3.2.3](#).

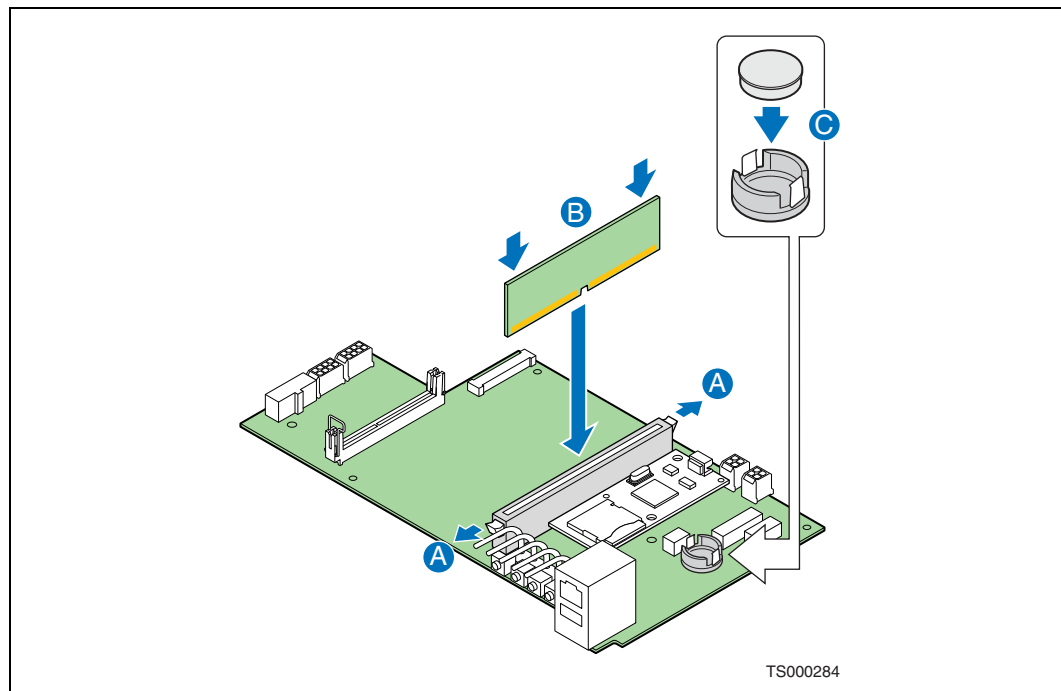
4.8.1 Installing the RAID Key and RAID DIMM

1. Install the RAID activation key by inserting it into the socket. (Figure 78, "C")
The wider rim is the top side of the key and faces up in the socket.
Make sure the metal clips on the socket snap securely over the edge of the RAID key top rim.

Caution: Observe proper ESD and safety procedures when handling the RAID DIMM and the SFP board.

2. Open the latches on both ends of the RAID DIMM connector header. (Figure 78, "A")
3. Note the location of the alignment notch ("B") and insert the DIMM.
Make sure the edge connector on the DIMM aligns properly with the connection header.
4. Using both hands, press down firmly and evenly on both sides of the DIMM until it snaps into place and both latches on the connector header close.

Figure 78. Installing the RAID DIMM and RAID Key



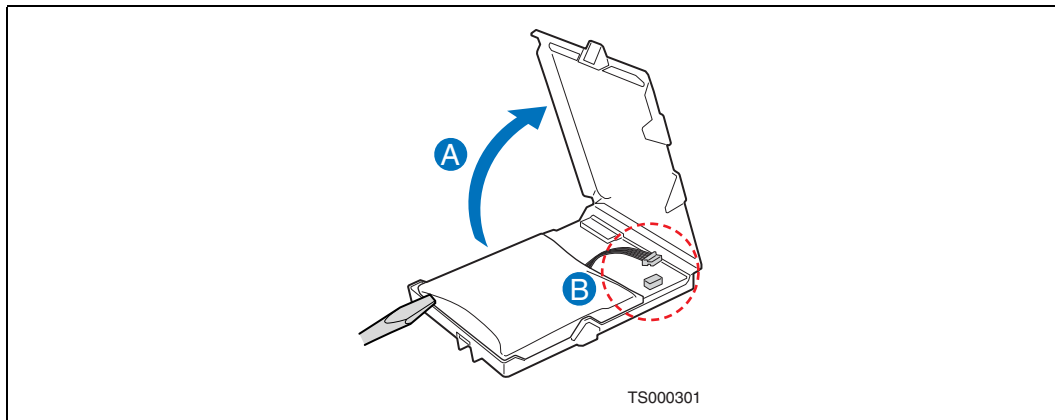
4.8.2 Installing the RAID Intelligent Battery Backup Unit (IBBU)

The RAID IBBU is installed on the side wall of the chassis by the SAS Front Panel (SFP) board. The connector, C8B3, is on the far right-most end of the SFP board. Before you install it, be sure to remove the front panel bezel.

The IBBU has an internal battery power cable that must be connected.

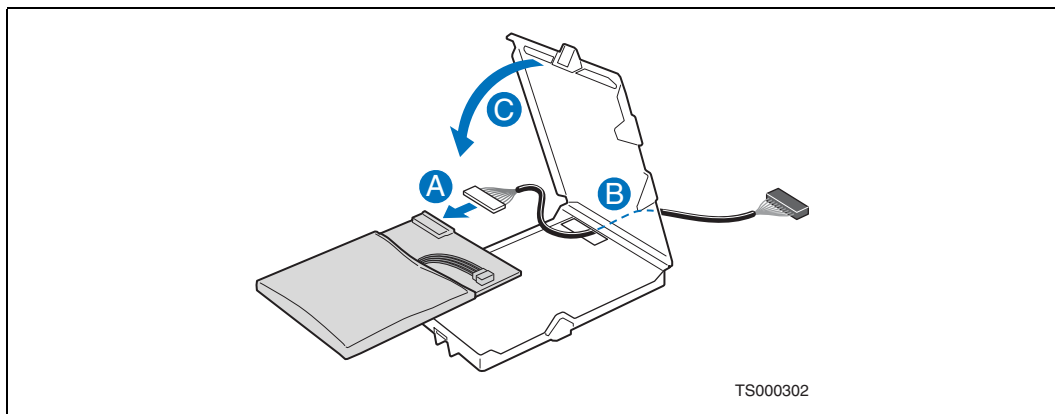
1. Open the IBBU case lid. If necessary, use a small flat-blade screwdriver to pry open the lid at the corners. (Figure 79, "A")
2. If the battery power cable is not connected, connect it now. ("B")

Figure 79. Connecting the IBBU Power Cable



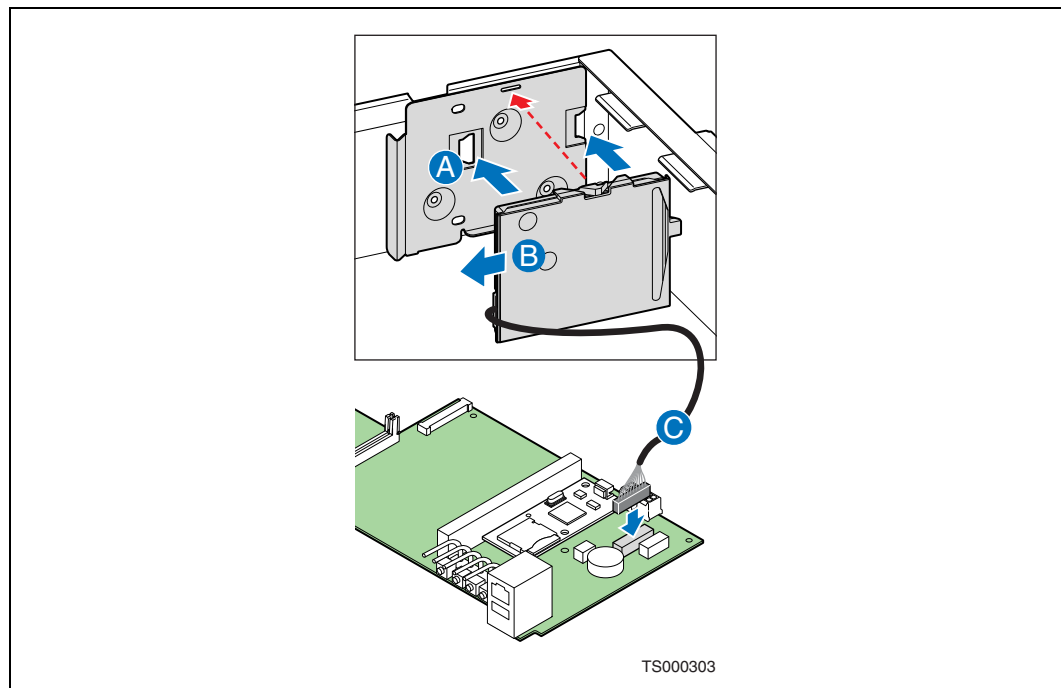
3. Lift the battery assembly out of the case and insert the battery cable through the opening in the bottom of the case. ([Figure 80](#), "B")
4. Attach the battery cable to the connector on the back of the battery assembly. ("A")
5. Put the battery assembly back into the case and close and latch the case lid. ("C")

Figure 80. Connecting the IBBU Cable through the Battery Case



6. Place the IBBU on the bracket on the side wall of the chassis. ([Figure 81](#), "A")
7. Slide the IBBU away from the front panel to lock it into place. The plastic tab on the IBBU case goes into the slot in the chassis (See the red arrow in [Figure 81](#)). ("B")
8. Connect the cable from the IBBU to the connector on the SFP board. ("C")
9. Re-install the front panel bezel. For instructions, see [Section 3.2.4, "Installing the Front Bezel" on page 27](#)
10. If this is the last task you are performing, replace the processor air duct and the top cover of the chassis. Reconnect all the external devices and plug in the power cord(s).
For information about mounting the server in a rack, see [Section 3.5, "Installing the Server into a Rack" on page 48](#)

Figure 81. Installing the RAID Battery (IBBU)



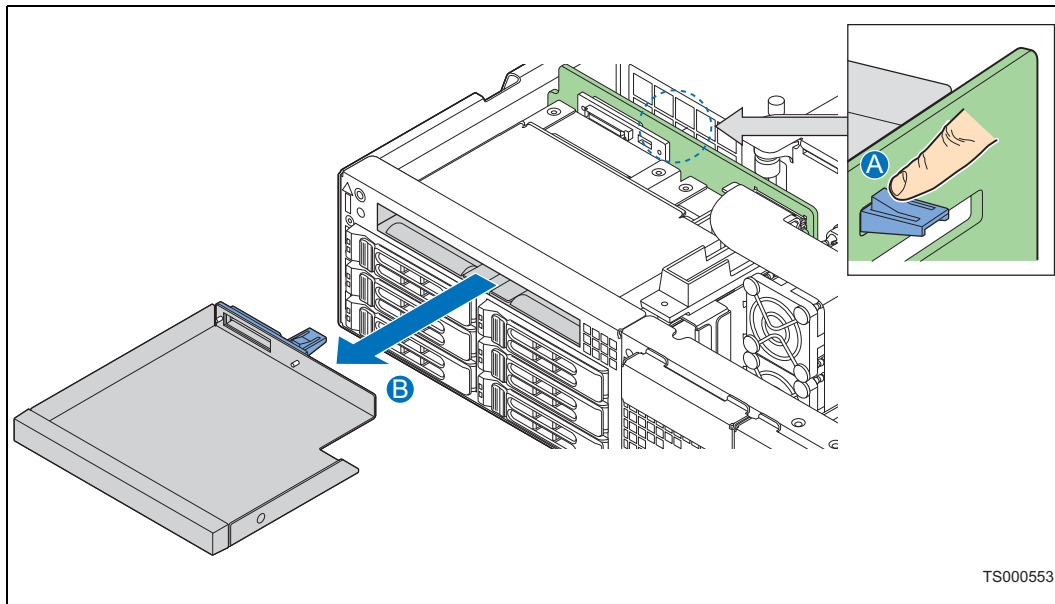
4.9 Installing an Optical Device

The optical device is not hot-swappable. To replace a previously installed device or install a new one, you must first power down the system and remove the chassis cover and front bezel as described in [Section 3.2, "General Installation Procedures"](#) on page 25.

4.9.1 Removing the Optical Device Filler Panel from the Chassis

1. Remove the chassis top cover.
2. Remove the front panel bezel from the chassis to access the optical device slot.
3. Detach the retention clip from the filler panel engagement guide behind the SAS backplane board. Save it for use on the optical drive.
4. Press on the latch on the back of the engagement guide to release the optical device filler panel from the backplane. ("A")
5. Remove the filler panel from the chassis. ("B")

Figure 82. Removing the Optical Device Filler Panel from the Chassis



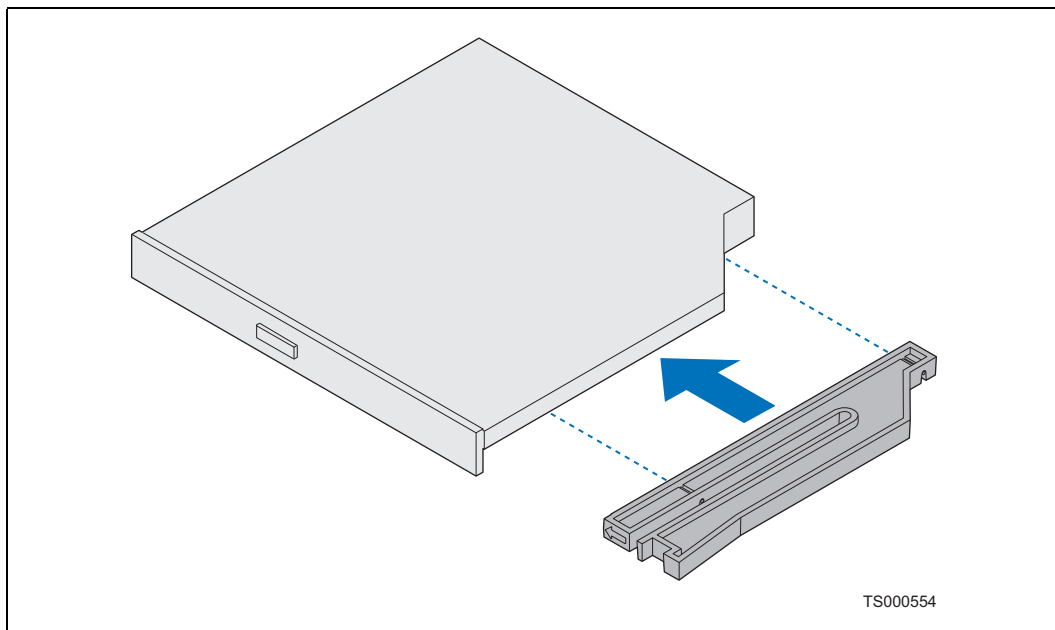
TS000553

6. Remove the engagement guide from the back of the filler panel.
Save the guide and the two screws for use on the new optical device.

4.9.2 Installing a New Optical Device

1. Align the pins in the retention mechanism to the corresponding holes in the side of the optical device.

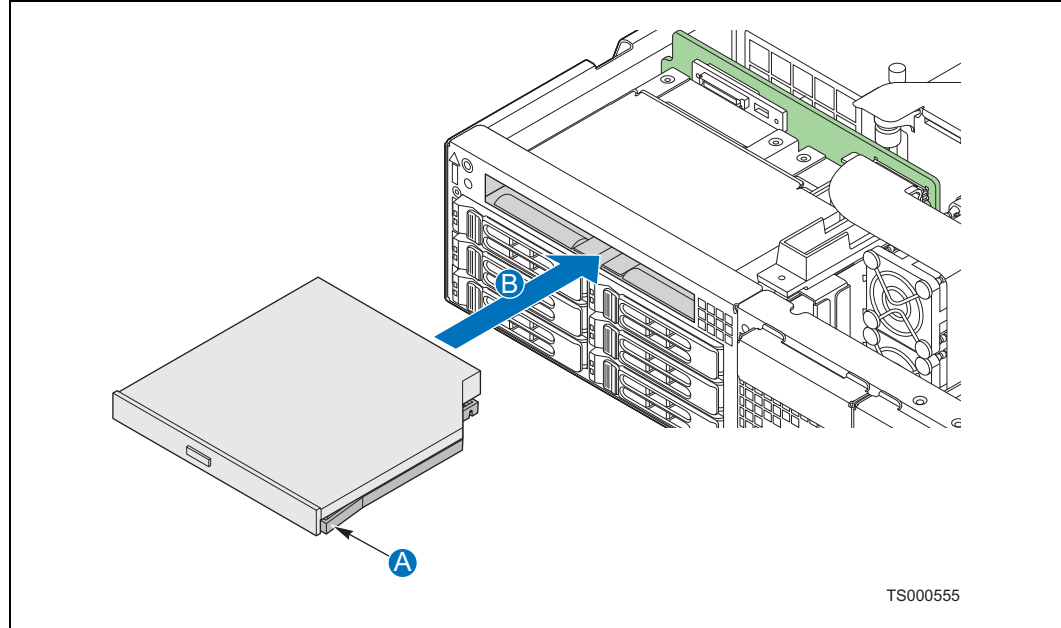
Figure 83. Attaching the Retention Mechanism to the Optical Device



TS000554

2. Slide the optical drive into the open slot until the latch pops up to secure the drive in the properly aligned position ("A")

Figure 84. Installing the Optical Device into the Chassis



3. If this is the last task you are performing, replace the processor air duct and the top cover of the chassis. Reconnect all the external devices and plug in the power cord(s). For information about mounting the server in a rack, see [Section 3.5, "Installing the Server into a Rack"](#) on page 48

5 Server Component Replacements

5.1 Before You Begin

Before working with your server product, pay close attention to the safety instructions provided in this manual. See [Appendix A, “Safety Information”](#).

Warning: 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.

5.1.1 Tools and Supplies Needed

- #1 and #2 Phillips (cross-point) screwdrivers, or interchangeable tip screwdriver with #1 and #2 Phillips bits
- Personal grounding device such as an anti-static wrist strap and a grounded conductive pad

5.1.2 System References

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

5.1.3 Cable Routing Reference

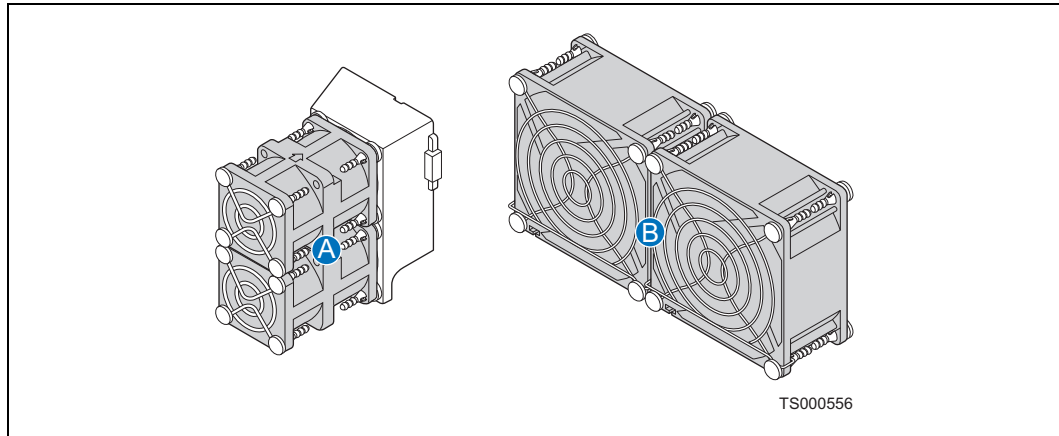
It is important for cables to be connected correctly. See [Figure 33](#) in [Section 4.1.3, “Cable Routing Reference”](#) on [page 50](#) and for more detailed information about cable connectors, see the *Kontron IP Network Server NSC2U Technical Product Specification*.

5.2 Replacing the Fan Assemblies

Caution: Your server does not have hot-swappable fans. Before replacing any of the fan assemblies, 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 power cord(s) from the system or wall outlet.

The replacement/spare fan set consists of two dual-rotor PCI fans ("A"), two dual-rotor CPU fans ("B"), and the push rivets to attach them to the fan brackets.

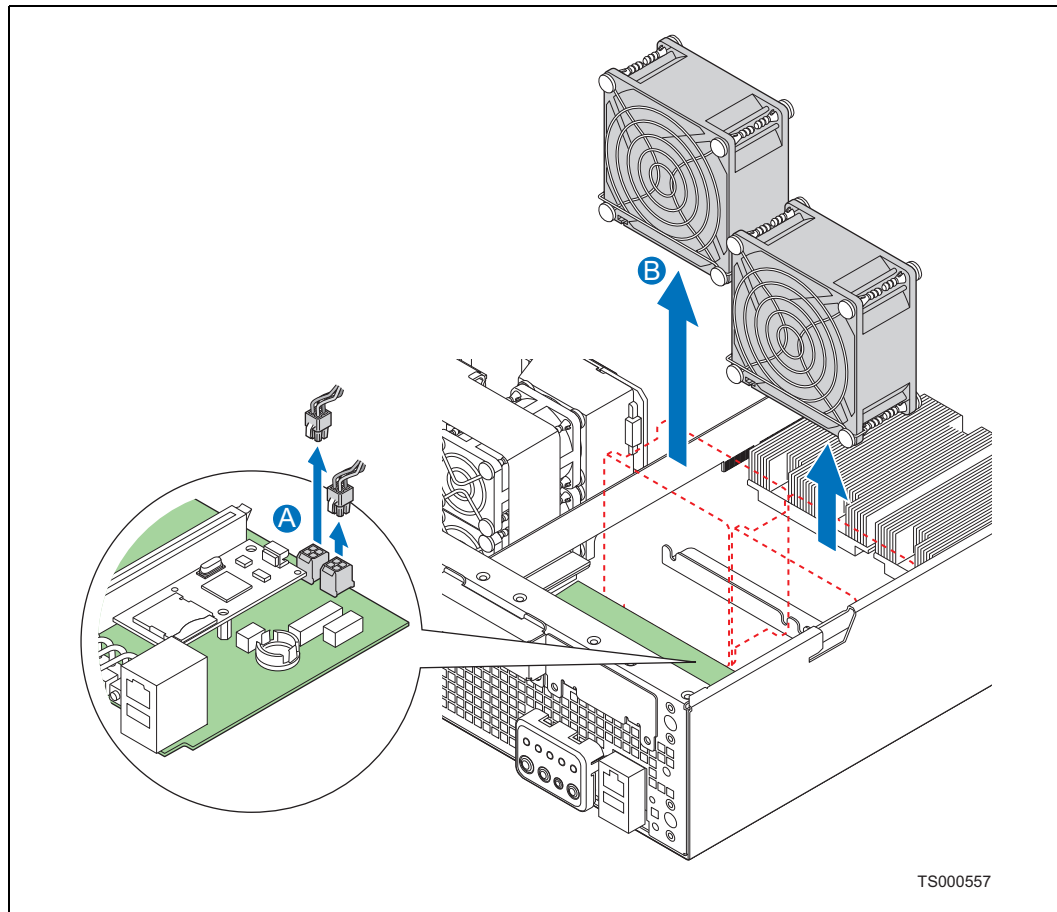
Figure 85. PCI Fan and CPU Fan Assemblies



5.2.1 Removing the CPU Fans

1. Remove the chassis top cover and the processor air duct that covers the fans. For instructions, see [Section 3.2.1](#) and [Section 3.2.5](#).
2. Unplug the CPU fan power cables from the front panel board. (Figure 86, "A")
3. Lift the fans out of the chassis. ("B")

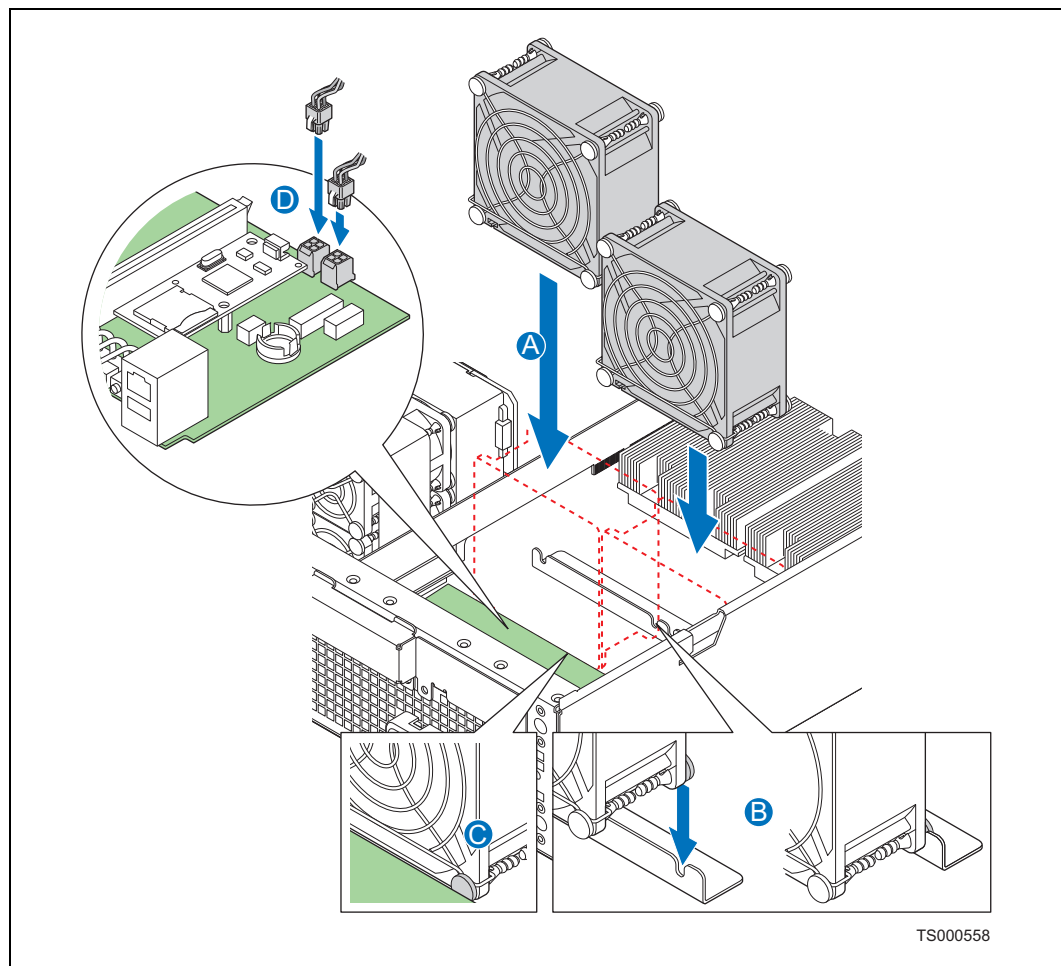
Figure 86. Removing the CPU Fans from the Chassis



5.2.2 Replacing the CPU Fans

1. Lower the CPU fans into the chassis. ("A")
2. Set the fans in the fan alignment bracket so that the shaft of the grommet (not the head of the grommet) rests within the notch in the bracket. ("B")
3. Make certain that the grommet heads on the other side of the fans rest near (or against) the SAS Front Panel Board. ("C")
4. Plug the fan power cables back into the SAS Front Panel board connectors. ("D")
5. If this is the last task you are performing, replace the processor air duct and the top cover of the chassis. Reconnect all the external devices and plug in the power cord(s).

Figure 87. Replacing the CPU Fans

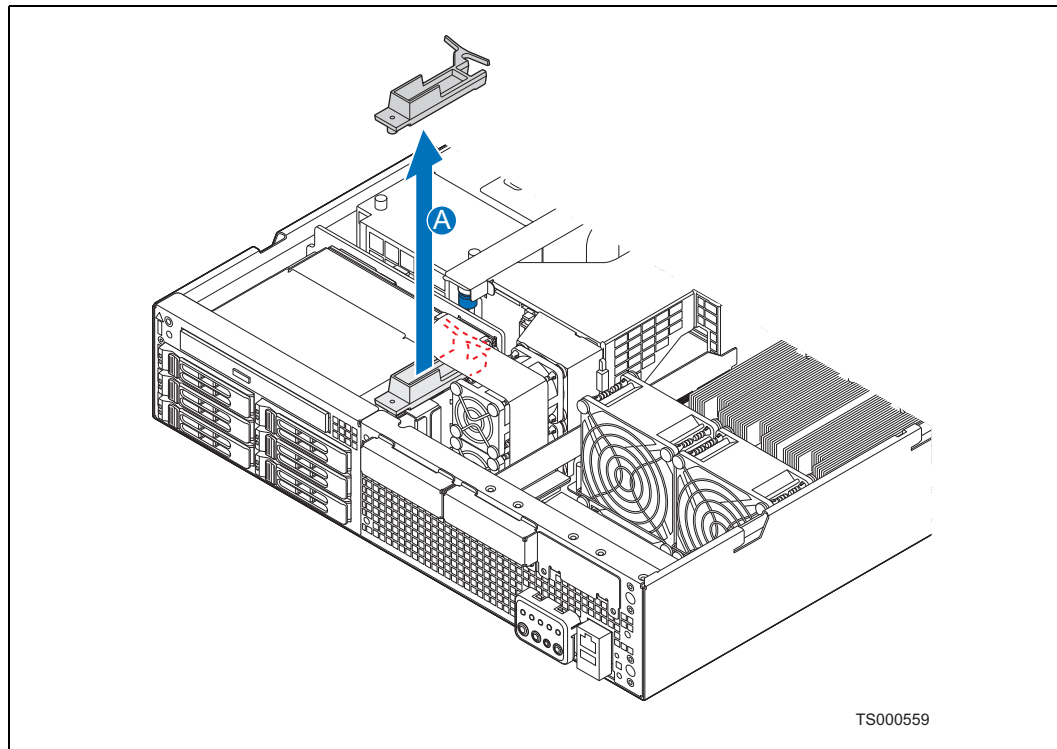


5.2.3 Removing the PCI Fan Assembly

Before the PCI fan assembly can be removed from the chassis, the chassis cover must be removed and the flex cable that runs across the fan bracket must be disconnected.

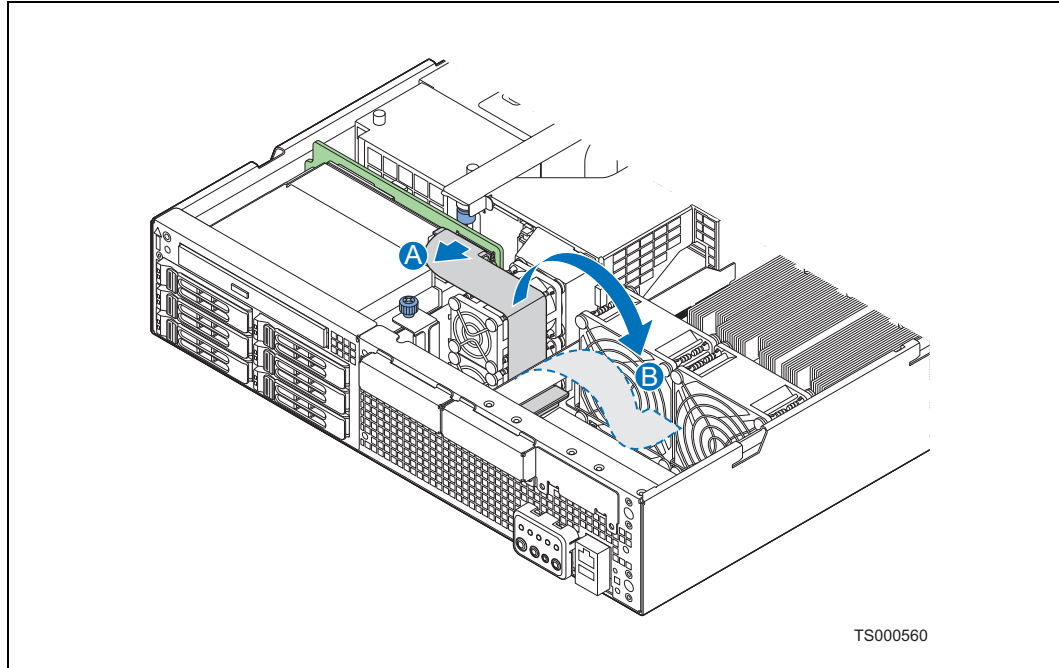
1. Remove the flex cable support bracket from the chassis. (Figure 88, "A")

Figure 88. Removing the Flex Cable Support Bracket



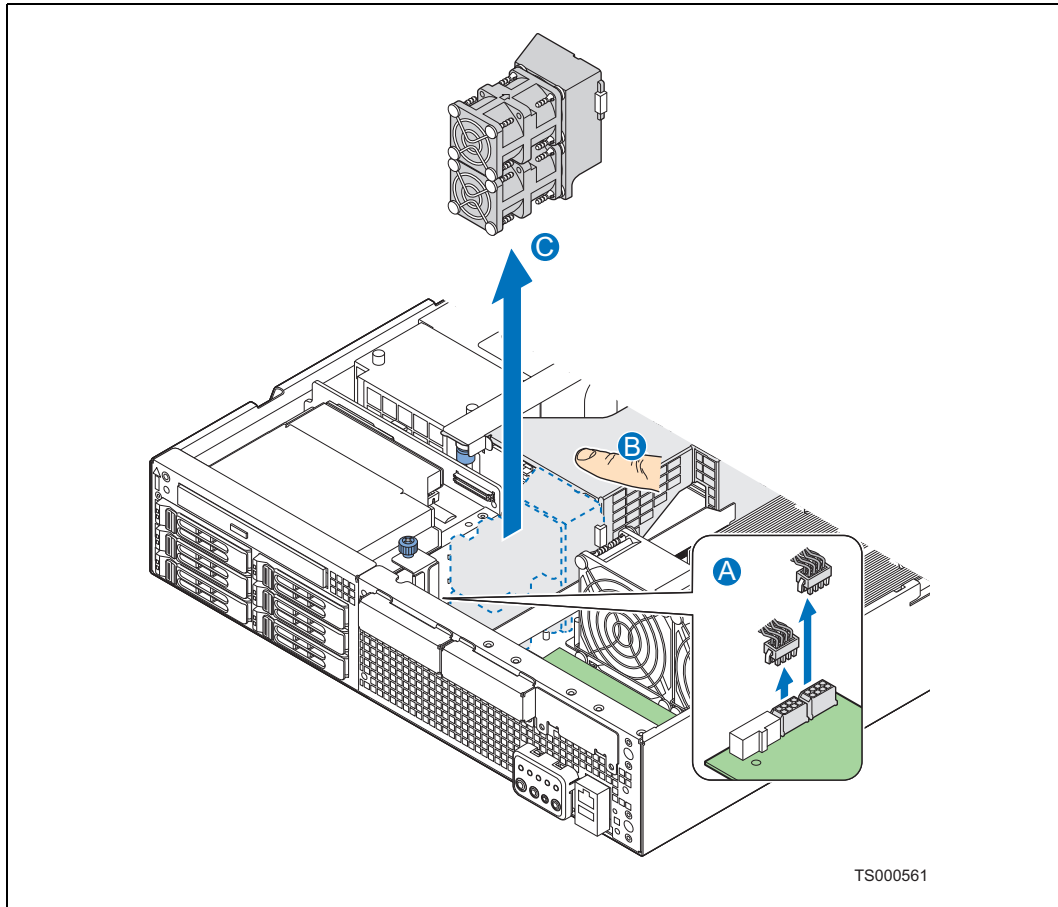
2. Disconnect the flex cable from the SAS backplane board and lift the cable off of the PCI fan assembly. (Figure 89, "A" and "B")

Figure 89. Removing the Flex Cable from over the PCI Fan Assembly



3. Disconnect the PCI fan assembly power cables from the SAS front panel (SFP) board. (Figure 90, "A")
4. Hold down the PCI cardcage assembly. ("B")
5. Lift the fan assembly out of the chassis. ("C")

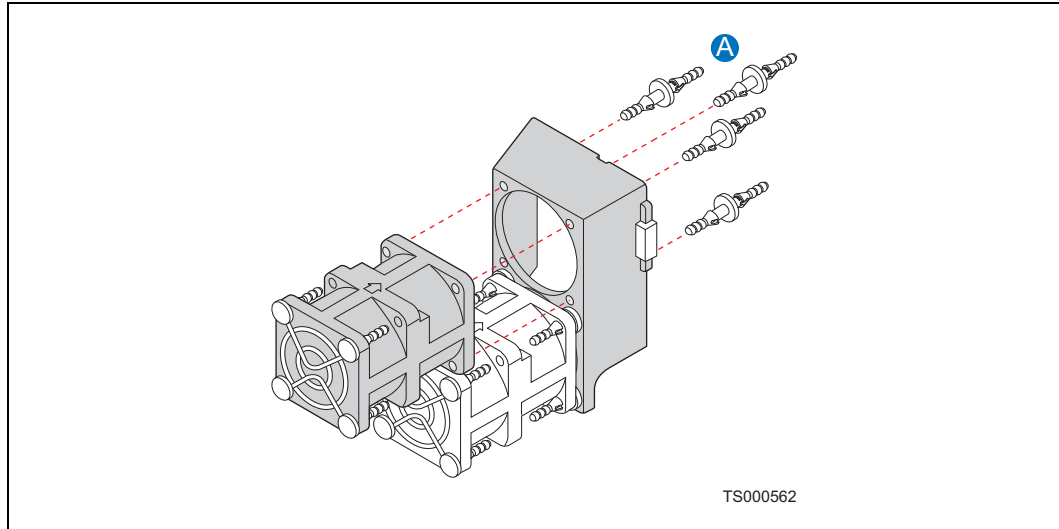
Figure 90. Removing the PCI Fan Assembly



5.2.4 Replacing the PCI Fans in the Fan Shroud

1. Remove the old fans from the fan shroud.
2. Align the new fans into the fan shroud with the airflow arrows pointing toward the back of the chassis. (Figure 91, "A").
3. Fasten each fan into the shroud using four grommets. ("A") Note that the heads of the grommets should be between the fans and the shroud.

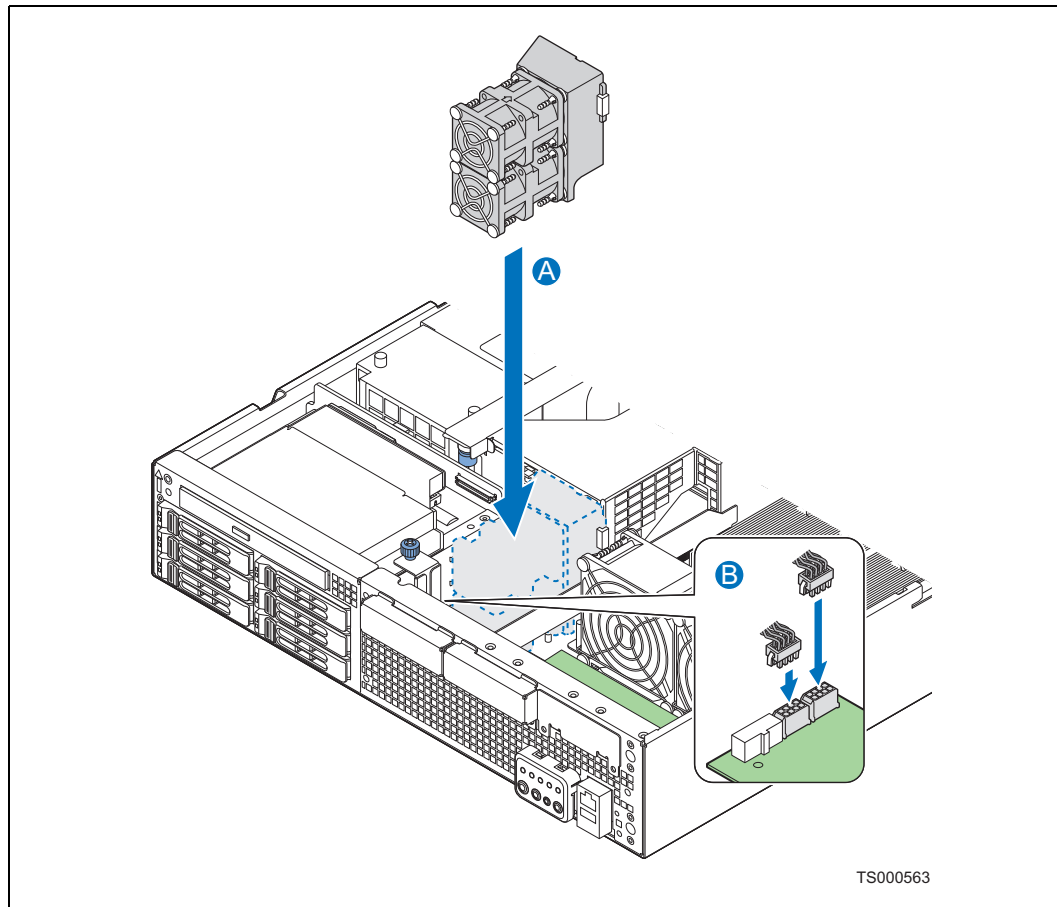
Figure 91. Installing the PCI Fans into the Shroud



5.2.5 Installing the Fan Assembly Back into the Chassis

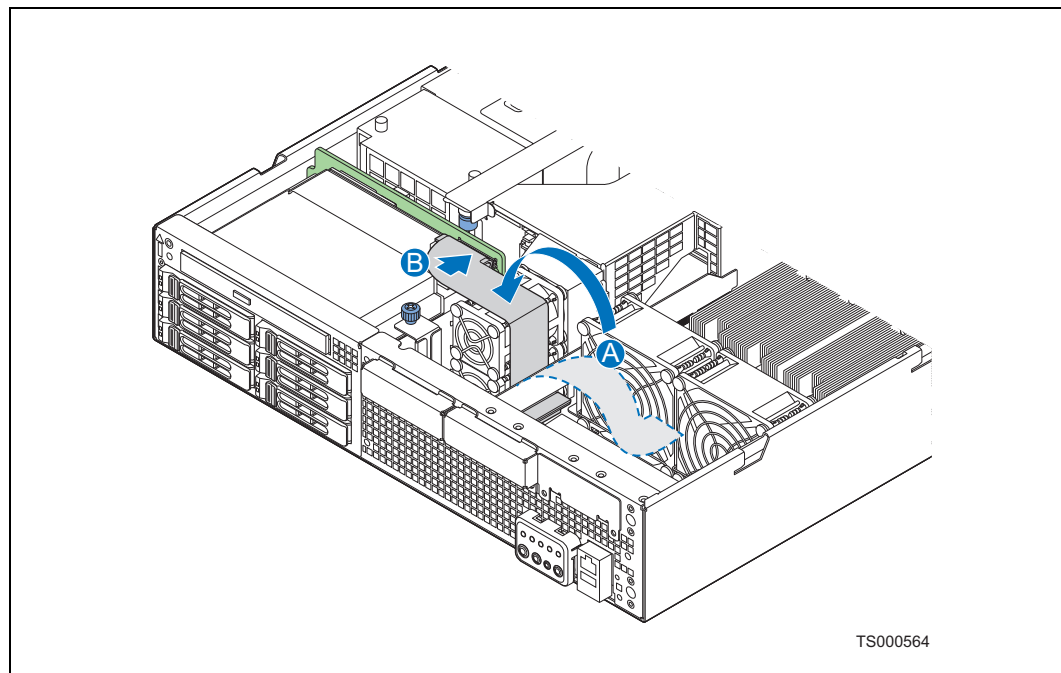
1. Place the fan assembly back into the chassis. (Figure 92, "A")
2. Plug the PCI fan power cables into the connectors on the SFP board. ("B")

Figure 92. Installing the PCI Fan Assembly into the Chassis



3. Run the cable back over the PCI fan assembly. (Figure 93, "A")
4. Reconnect the flex cable to the SAS backplane board. ("B")
5. Re-install the flex cable support bracket.
6. If this is the last task you are performing, replace the top cover of the chassis. Reconnect all the external devices and plug in the power cord(s). For information about mounting the server in a rack, see [Section 3.5, "Installing the Server into a Rack"](#) on page 48.

Figure 93. Connecting the Flex Cable to the Backplane Board



5.3 Replacing the SAS Front Panel Board

The SAS Front Panel (SFP) board provides an interface to the controls at the front of the system, the power interconnect for the server board, the USB2 and Serial B interface, and the front-panel LEDs. It also houses the optional hardware RAID 5 components and optional SMART Embedded USB Solid-State Drive (eUSB SSD).

To replace the SFP board, the following components must be removed:

- The chassis top cover
- All cable connections on the SFP board and selected connections from other board components, such as optional 4xGbE LAN card cables connected to the front panel
- Add-in Card Riser Assembly
- PCI fan assembly
- CPU fan assembly and air duct

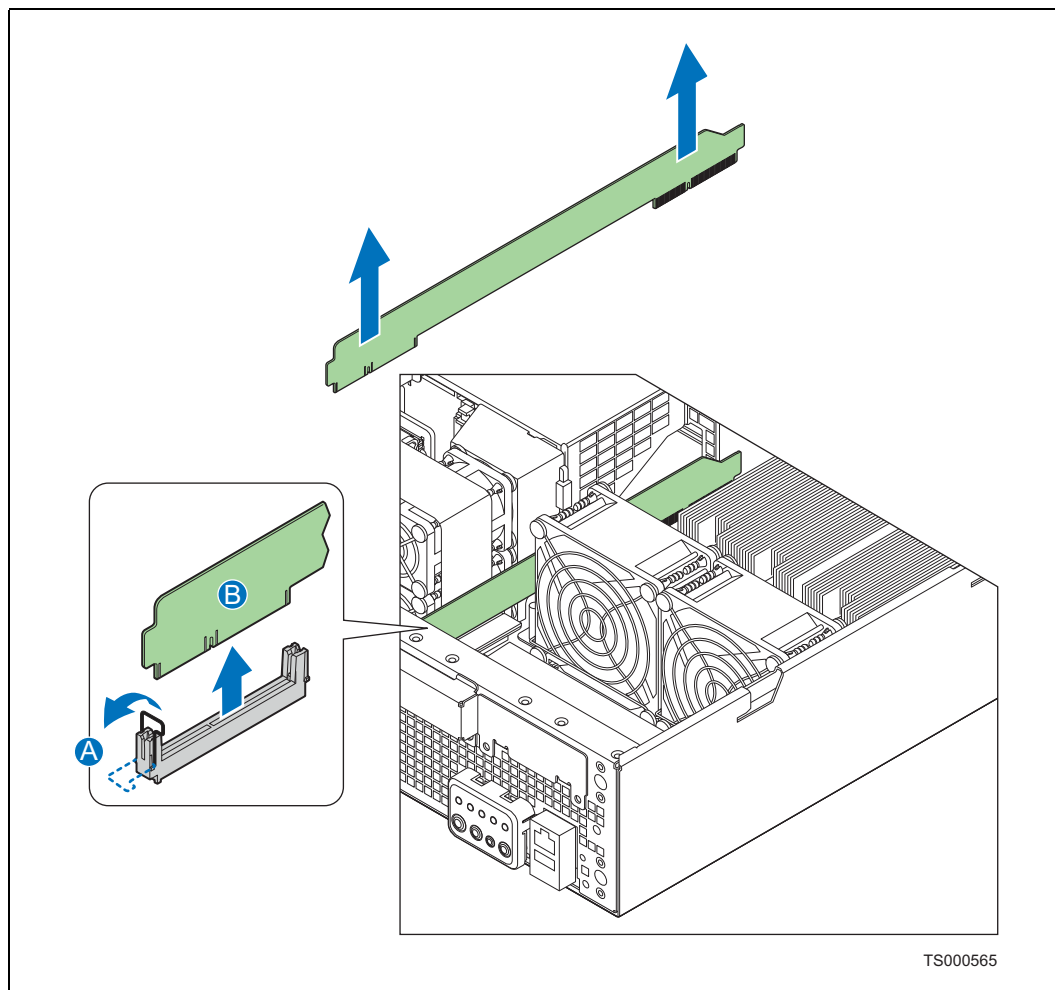
Caution: Before replacing any of the boards on the NSC2U Server, you must first take the server out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the power cord(s) from the system or wall outlet.

When handling the SFP board, observe the normal safety and ESD precautions. (See [Appendix A, "Safety Information"](#) for more information.)

1. Remove the chassis cover and processor air duct. For instructions, see [Section 3.2.1](#) and [Section 3.2.5](#).
2. Remove the add-in card riser assembly. For instructions, see [Section 4.2.2, "Removing the PCI Riser Card Assembly"](#) on page 53.

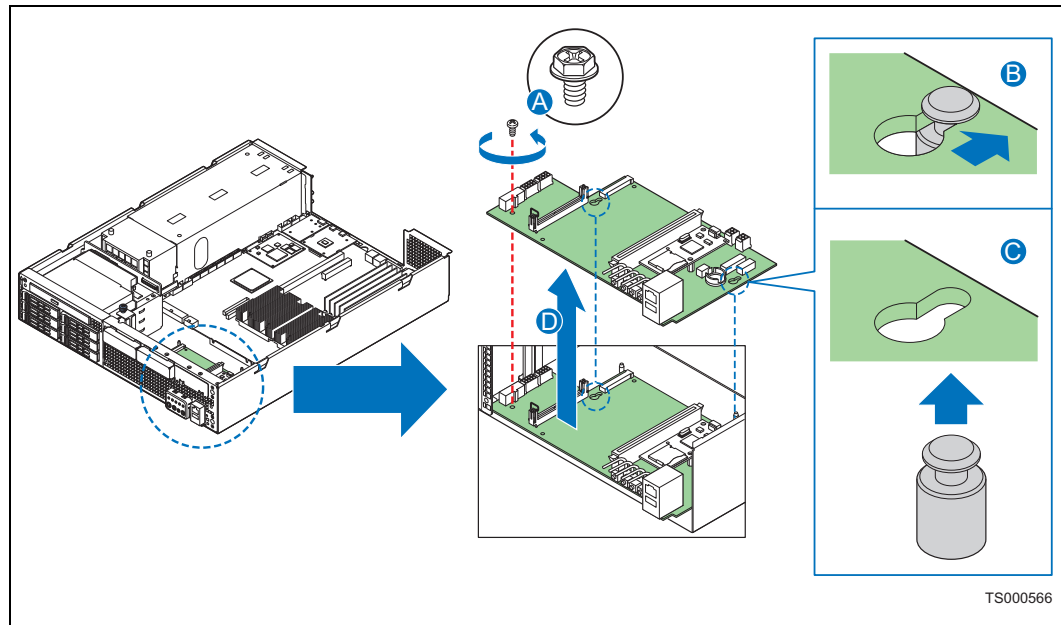
3. Remove the PCI fan assembly, including the flex cable that covers it. For instructions, see [Section 5.2.4, “Replacing the PCI Fans in the Fan Shroud”](#) on page 105.
4. Remove the CPU fan assembly. For instructions, see [Section 5.2.1, “Removing the CPU Fans”](#) on page 100.
5. Disconnect all of the cables connected to the SFP board:
 - SAS backplane power cable
 - All four fan power cables
 - Two power input cables from the power distribution board
 - Flex cable
 - RAID IBBU cable, if installed
 - Front serial port cable
 Use [Section 33, “NSC2U Server System Cable Routing”](#) on page 51 as a reference for all of the connectors.
6. Remove the bridge board by opening the connector latch ([Figure 94, “A”](#)) and lifting the board up from both ends. (“B”)

Figure 94. Removing the Bridge Board



7. Remove the screw (Figure 95, "A").
8. Remove the embedded USB solid state drive (eUSB SSD), if installed.
9. Remove the two threaded standoffs for the VSSD.
10. Gently work the SFP board backward ("B"), toward the rear of the chassis to disengage the LED light pipe assembly from behind the front control panel.
11. Pull the SFP board up over the placement peg ("C") and lift it from the chassis ("D").
12. Remove any other components you have installed on the SFP board, such as a hardware RAID key and DIMM, and put them aside for re-installation on the new replacement SFP board.

Figure 95. Removing the Front Panel Board from the Chassis



5.3.1 Removing the LED Light Pipe Assembly

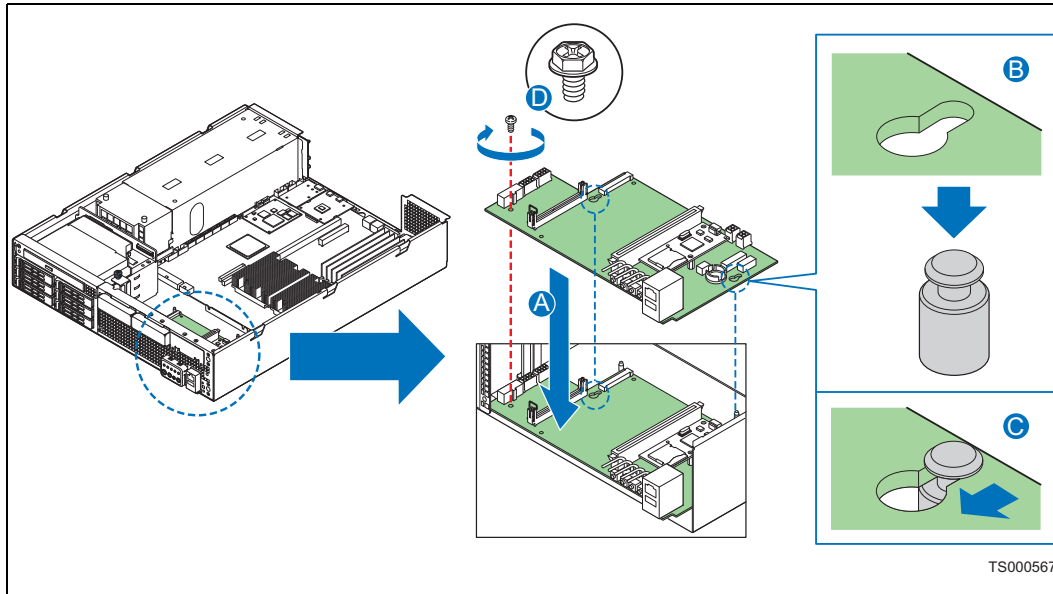
1. Note the position of the light pipe assembly so that you will be able to correctly position it (or a replacement) on the new SFP board during the re-installation process.
The light pipes extend outward from the SFP board to the front panel control panel.
2. Remove the light pipe assembly by gently pressing the four plastic clips from the under-side of the SFP board until the bottom of the clips are flush with the bottom of the SFP board.
3. Gently ease the light pipe assembly from the SFP board.
4. Insert the four plastic clips on the light pipe assembly into the matching holes in the new SFP board. Insert the clips gently and evenly; do not insert one clip fully without first partially pressing the others into place.

5.3.2 Installing the Front Panel Board Back into the Chassis

1. Lower the replacement front panel board into the chassis. (Figure 96, "A")

2. While holding the rear edge of the board, ease the board forward, sliding the serial port connector and the LED light pipes through the matching cutouts in the front panel of the chassis.
3. Lower the rear of the board into position, fitting the board over the placement peg. ("B")
4. Push the board forward, locking the board onto the placement peg. ("C")
5. Replace the screw you removed previously. ("D")

Figure 96. Installing the Front Panel Board



6. Re-install any optional components you removed from the old front panel board, such as the eUSB SSD or hardware RAID 5 components.
7. Re-install the PCI fan assembly. For instructions, see [Section 93, "Connecting the Flex Cable to the Backplane Board"](#) on page 107
8. Re-connect the flex cable.
9. Re-install the CPU fan assembly. For instructions, see [Section 5.2.2, "Replacing the CPU Fans"](#) on page 101.
10. Re-connect all the power cables and the bridge board.
11. Re-connect the RAID IBBU. For instructions, see [Section 4.8.2, "Installing the RAID Intelligent Battery Backup Unit \(IBBU\)"](#) on page 93.
12. If this is the last task you are performing, replace the top cover of the chassis. Reconnect all the external devices and plug in the power cord(s). For information about mounting the server in a rack, see [Section 3.5, "Installing the Server into a Rack"](#) on page 48.

5.4 Replacing the Removable Drive Bay Assembly and the SAS Backplane Board

The drive bay assembly can be removed from the chassis and placed in another server if anything goes wrong in the system or swapped out for another assembly with all the same HDD drives added to it.

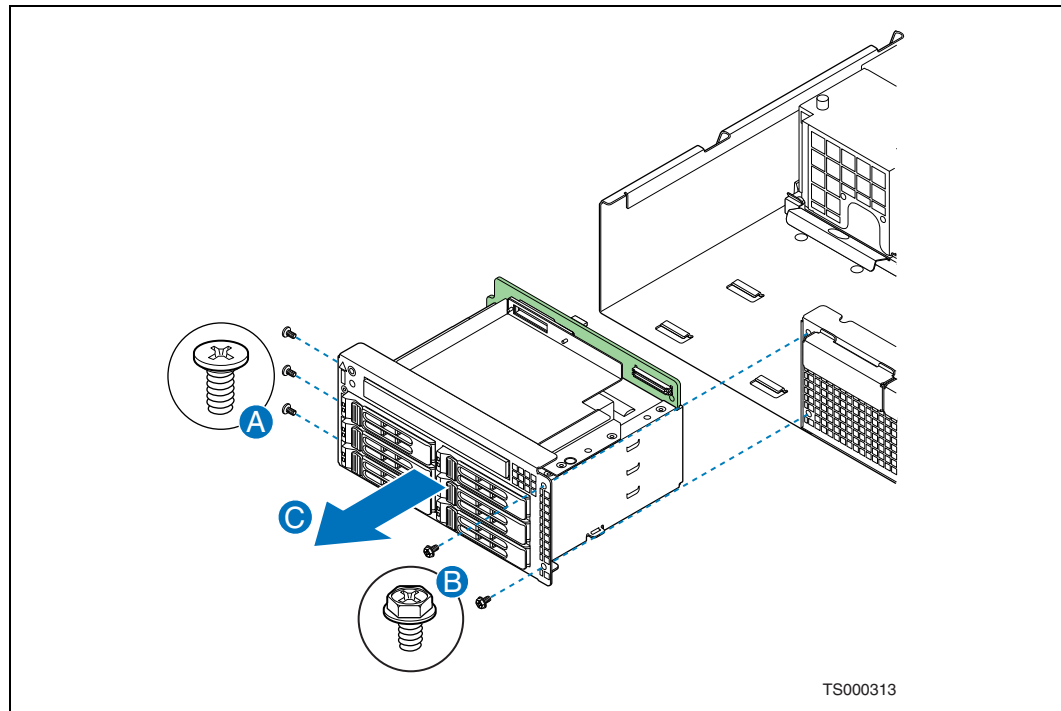
The drive bay assembly is also removed if the SAS backplane board or Power Distribution Board (PDB) module need to be replaced.

Caution: Before replacing any of the boards in the NSC2U Server, 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 power cord(s) from the system or wall outlet.

5.4.1 Removing the Drive Bay Assembly

1. Disconnect the following cables that are attached to the SAS backplane board at the rear of the drive bay assembly:
 - flex cable
 - power cable from the SFP board
 - IDE cable from the server board
2. Remove the three screws that attach the drive bay front panel to the side of the chassis. (Figure 97, "A")
3. Remove the two screws on the right side of the drive bay front panel that attach it to the chassis front panel. ("B")
4. Pull the drive bay assembly out of the chassis. ("C")

Figure 97. Removing the Drive Bay Assembly

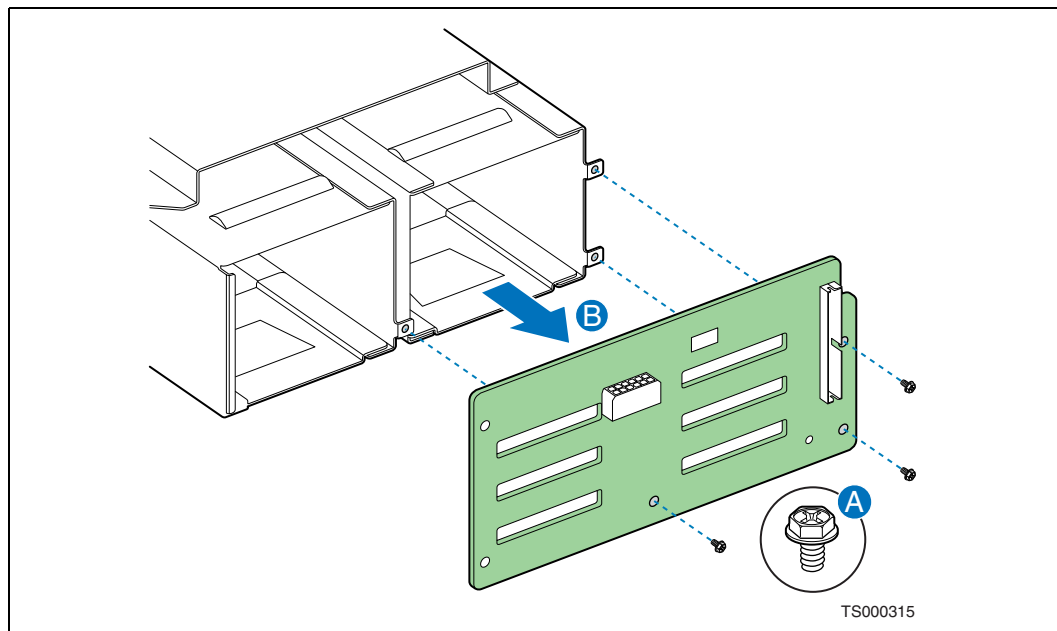


5.4.2 Removing the SAS Backplane Board from the Drive Bay Assembly

If you need to replace the SAS Backplane Board or use it on another drive bay assembly, follow these steps:

1. Detach all drives or filler blanks attached to the backplane board. For instructions, see [Section 3.3.1](#) and [Section 4.9.1](#)
2. Loosen the three screws that fasten the backplane board to the drive bay assembly. (Figure 98, "A")
3. Pull the backplane board off of the rear of the drive bay assembly

Figure 98. Removing the SAS Backplane Board

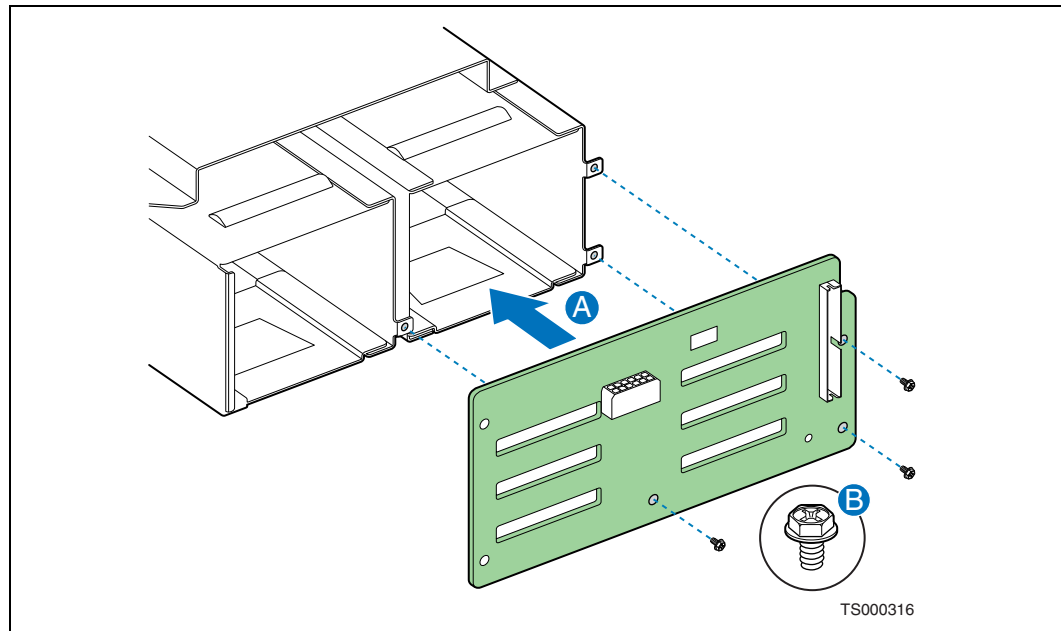


5.4.3 Installing a New SAS Backplane Board

To install a new backplane board, the drive bay assembly must be removed from the chassis and the old backplane board removed first. See the procedures above in [Section 5.4.1](#) and [Section 5.4.2](#).

1. Line up the new backplane board with the back of the drive bay assembly. (Figure 99 "A")
2. Fasten the backplane board to the drive bay assembly with three screws, as shown. ("B")

Figure 99. Installing the SAS Backplane Board



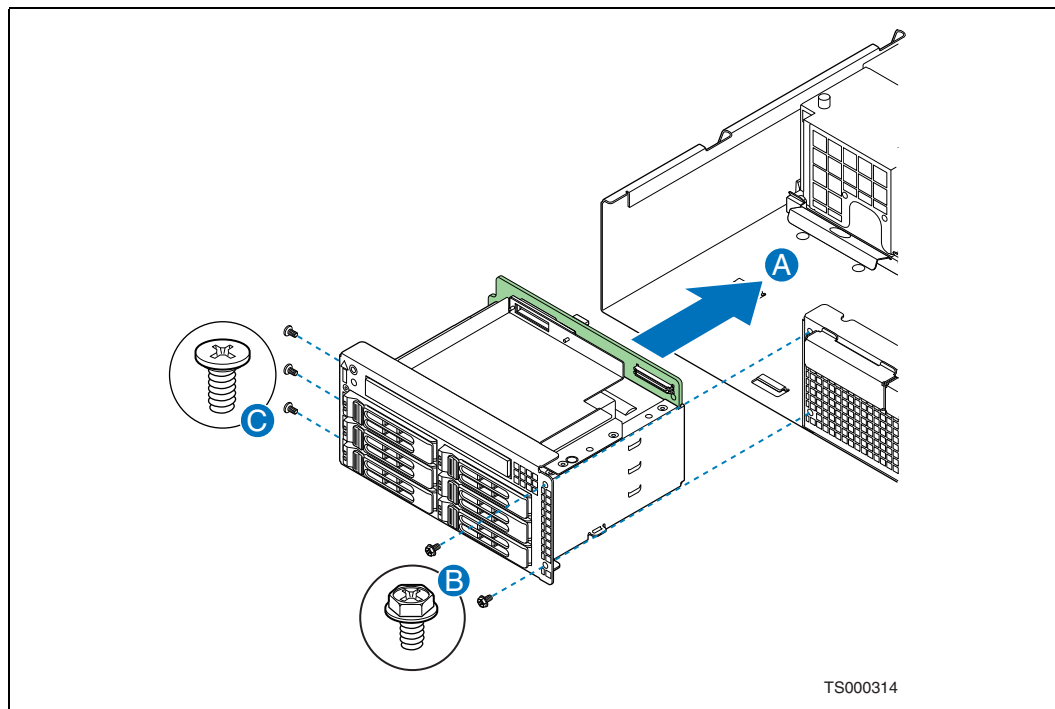
5.4.4 Installing the Drive Bay Assembly

Note:

Once the SAS backplane is attached to the drive bay assembly, the HDD drives and an optical device (or filler blanks if not all slots are used) can be installed into the drive bay assembly either before or after the assembly is installed in the chassis.

1. Insert the drive bay assembly into the chassis. (Figure 100, "A")
2. Secure the drive bay assembly to the chassis by fastening the screws on both sides. ("B")
3. Reconnect the SFP power cable, the flex cable, and the IDE cable that were attached to the backplane board before this replacement.

Figure 100. Installing the Drive Bay Assembly



- If this is the last task you are performing, replace the top cover of the chassis. Reconnect all the external devices and plug in the power cord(s). For information about mounting the server in a rack, see [Section 3.5, “Installing the Server into a Rack”](#) on page 48.

5.5 Replacing the Power Distribution Board

The power distribution board (PDB) routes power from the power supply to the rest of the server system through an integral wiring harness. The PDB is covered by a metal cage for safety, ventilation, and heat dissipation reasons. It is this whole assembly that must be removed and replaced, not just the board.

Caution: Before replacing any of the boards in the NSC2U Server, 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 power cord(s) from the system or wall outlet.

When handling this board, observe the normal safety and ESD precautions. (See [Appendix A, “Safety Information”](#) for more information.)

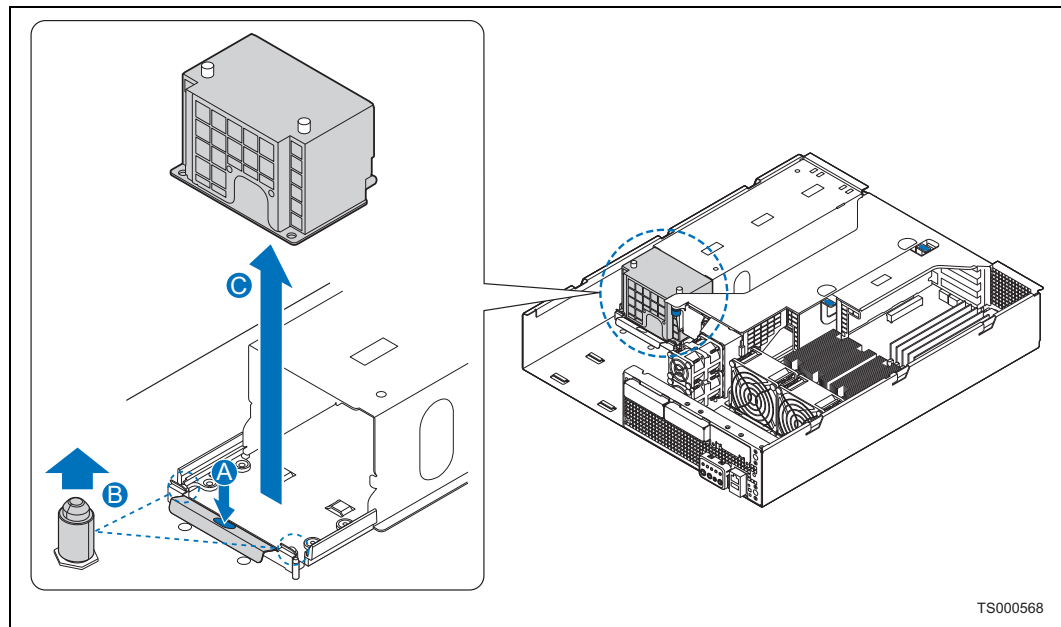
To safely remove the PDB, you must first remove the chassis top cover, the front panel bezel, and the drive bay assembly, which sits in front of the PDB module in the chassis.

5.5.1 Removing the Power Distribution Board

- Power down the server system and unplug all peripheral devices and the power cable.

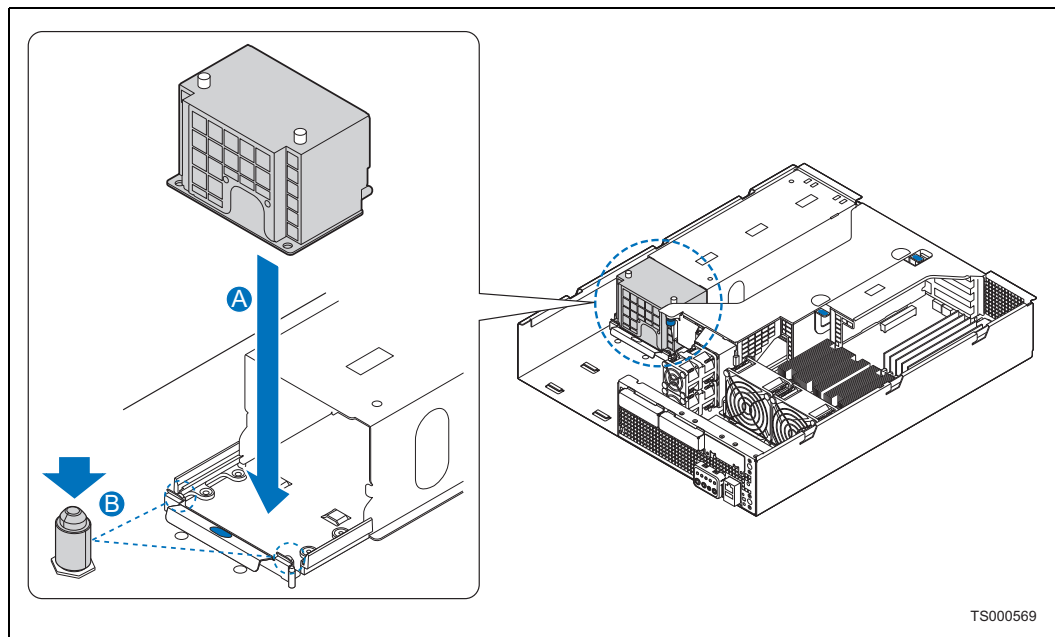
2. Remove the chassis cover, the front panel bezel, and the processor air duct. For instructions, see [Section 3.2.1](#), [Section 3.2.3](#), and [Section 3.2.5](#).
3. Remove the drive bay assembly. For instructions, see [Section 5.4.1](#), "Removing the Drive Bay Assembly" on page 111.
4. Remove the power supply module(s). For instructions, see [Section 3.3.2](#), "Replacing a Power Supply" on page 31.
5. Remove the PCI riser card assembly. For instructions, see [Section 4.2.2](#), "Removing the PCI Riser Card Assembly" on page 53.
6. Remove the PCI fan assembly. For instructions, see [Section 5.2.3](#), "Removing the PCI Fan Assembly" on page 102.
7. Remove the CPU fan assembly. For instructions, see [Section 5.2.1](#), "Removing the CPU Fans" on page 100.
8. Disconnect the cable harnesses at the other ends on the T5000PAL server board and the SFP board.
9. Press down on the metal clip at the base of the PDB assembly to free the PDB assembly. ([Figure 101](#), "A")
10. Gently pull the PDB assembly off of the placement pegs. ("B").
11. Lift the PDB from the chassis ("C").

Figure 101. Removing the PDB



5.5.2 Installing the Power Distribution Board Back into the Chassis

1. Lower the replacement power distribution board (PDB) into place. ([Figure 102](#), "A")
2. Make sure that the PDB is placed over the placement pegs and gently push down. ("B")

Figure 102. Installing the PDB

3. Connect the five power supply harness connectors on the server board and the SFP board.
4. Replace the drive bay assembly.
5. Replace the PCI riser card assembly.
6. Replace the PCI fan assembly and the CPU fan assembly and processor air duct.
7. If this is the last task you are performing, replace the top cover of the chassis. Reconnect all the external devices and plug in the power cord(s). For information about mounting the server in a rack, see [Section 3.5, “Installing the Server into a Rack”](#) on page 48.

5.6 Replacing the Server Board

The IP Network Server NSC2U uses the Intel® Server Board T5000PAL. To replace the server board, the following components must be removed:

- Processor air duct
- CPU fan assembly
- PCI riser assembly and add-in cards
- Any I/O expansion module or RMM module
- Cables connected to the board and the bridge board
- The HDD drive bay assembly

In addition, you may want to remove the following components on the board to re-use them on the replacement board if it isn't already populated:

- Heat sink(s)
- Processor(s)

- All DIMMs

Caution: Before replacing any of the NSC2U Server boards, 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 power cord(s) from the system or wall outlet.

When handling this board or any of the components on it, observe the normal safety and ESD precautions. (See [Appendix A, "Safety Information"](#) for more information.)

5.6.1 Removing the Server Board

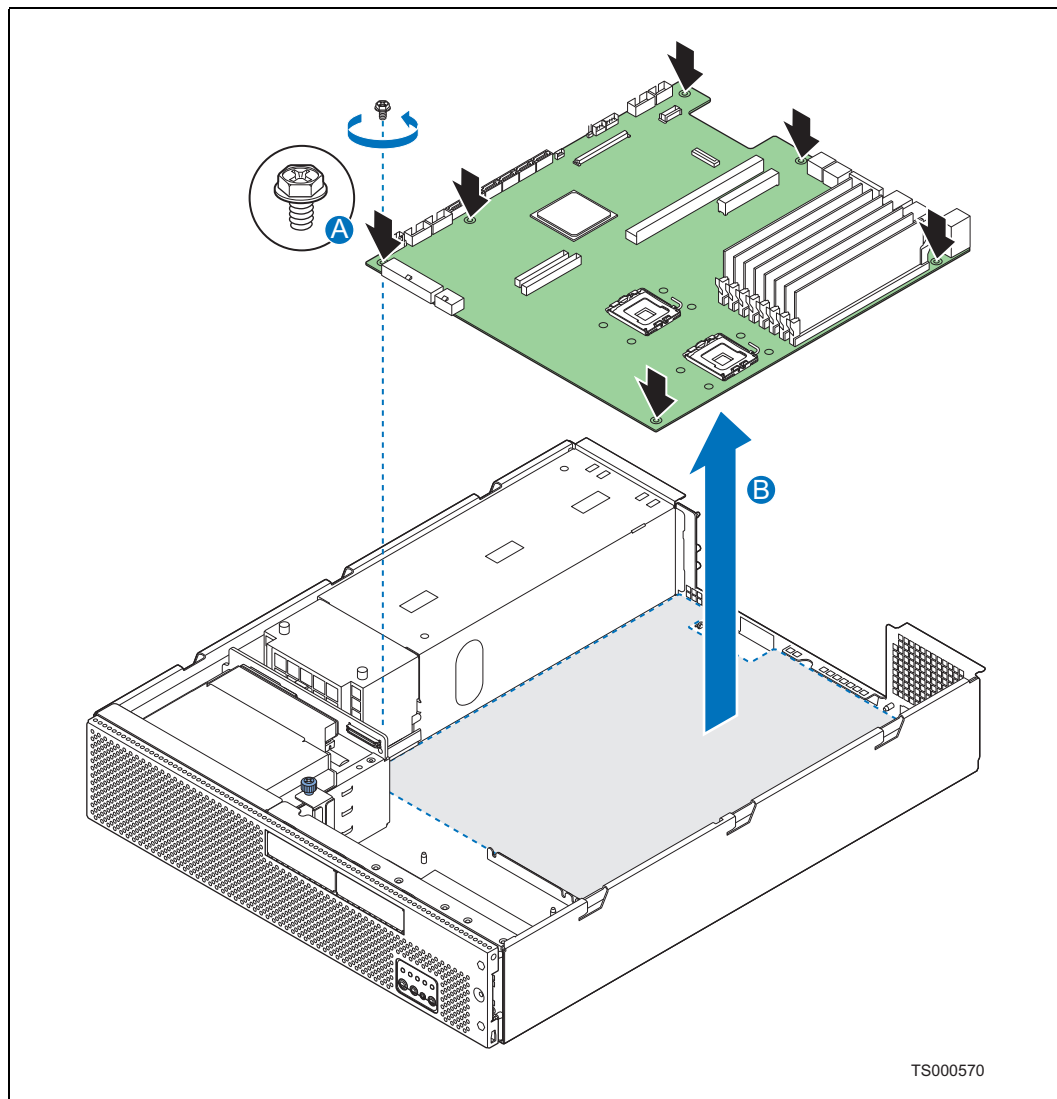
To replace the server board, use the following instructions.

1. Power down the server system and unplug all peripheral devices and the power cable.
2. Remove the chassis cover and processor air duct. For instructions, see [Section 3.2.1](#) and [Section 3.2.5](#).
3. Remove the PCI riser assembly. For instructions, see [Section 4.2.2, "Removing the PCI Riser Card Assembly"](#) on page 53.
4. Remove the CPU fan assembly. For instructions, see [Section 5.2.1, "Removing the CPU Fans"](#) on page 100.
5. Remove the drive bay assembly. For instructions, see [Figure 97, "Removing the Drive Bay Assembly"](#) on page 111.
6. Disconnect all cables and the bridge board from the server board. Use [Figure 33](#), as a reference.

If you want to re-use components from this server board on the replacement board you can remove them now or after you have removed the server board from the chassis.

- To remove an I/O expansion module or remote management modules, see [Section 4.3, "Installing an I/O Expansion Module"](#) on page 55 or [Section 4.4, "Installing Intel® Remote Management Modules"](#) on page 57.
 - To remove DIMMs, see [Section 3.4.4, "Removing Memory DIMMs"](#) on page 42.
 - To remove the heat sink(s) and processor(s), see [Section 3.4.5.2, "Removing a Processor"](#) on page 44.
7. Remove the six screws that attach the server board to the chassis. ([Figure 103, "A"](#))
 8. Tilt the server board at the front edge and lift it from the chassis. ("B") Use caution in pulling it out from beneath the Serial B connector at the rear of the chassis.

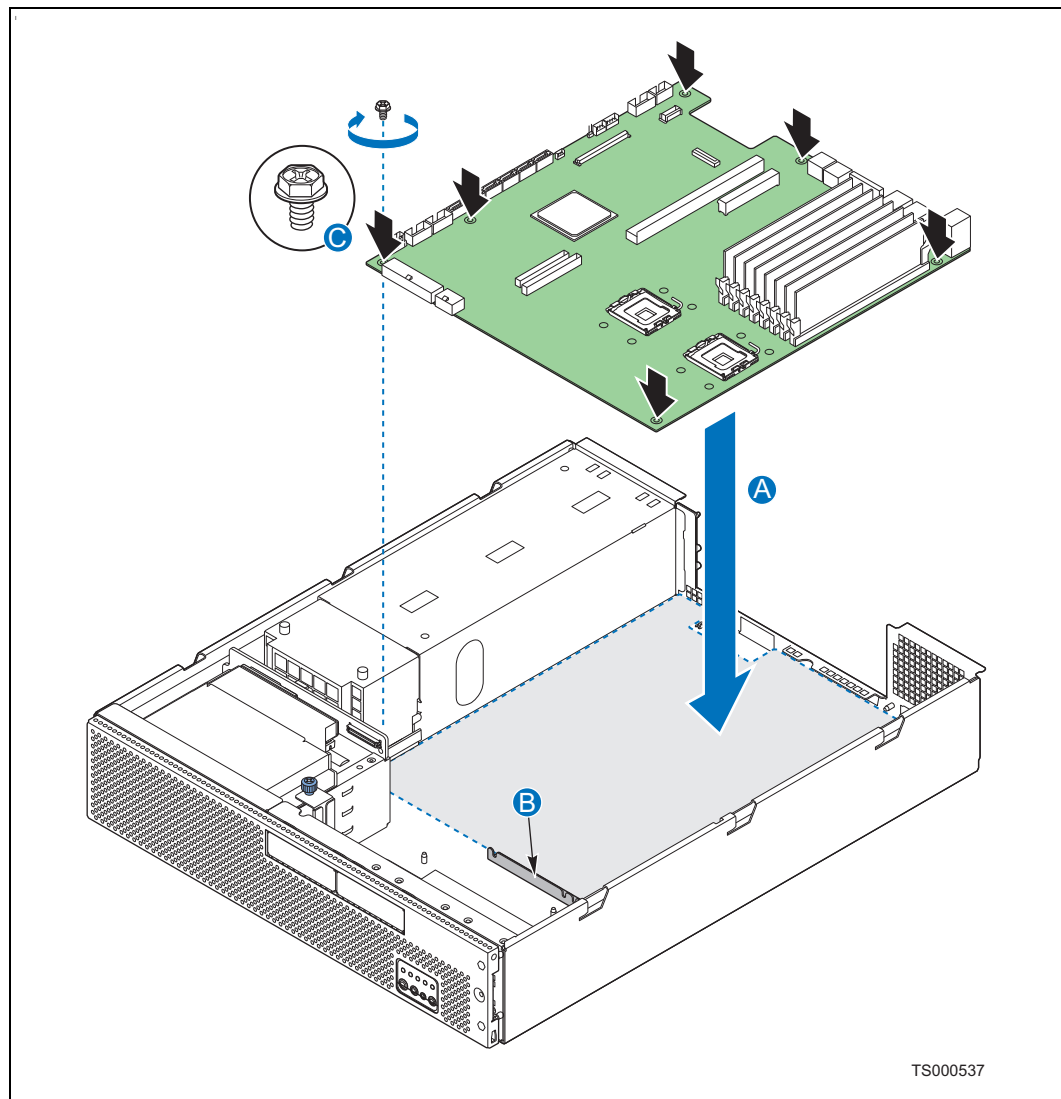
Figure 103. Removing the Server Board



5.6.2 Installing the Server Board Back into the Chassis

1. Set the replacement board into place (Figure 104, "A"), using caution to make sure no cables are pinched under the board. Insert the rear edge of the board first, and line up the I/O ports at the rear of the system.
2. When placing the board into the chassis, make certain that the board does not catch on the fan alignment bracket ("B"). Note the that bracket must reside under the insulator.
3. Make sure the standoff locations line up correctly and reinsert the six screws removed previously. ("C")

Figure 104. Installing the Server Board



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4. If the replacement board does not have these components pre-installed and you are re-using components from the old server board, do the following:
 - a. Install the processor(s) and heat sink(s). For instructions, see [Section 3.4.5.3, "Installing a New Processor" on page 45](#).
 - b. Install all DIMMs. For instructions, see [Section 3.4.3, "Installing DIMMs" on page 41](#).
 - c. Install any I/O expansion modules or remote management modules. For instructions see [Section 4.3, "Installing an I/O Expansion Module" on page 55](#) or [Section 4.4, "Installing Intel® Remote Management Modules" on page 57](#).
5. Install the PCI riser assembly. For instructions, see [Table 4.2.5, "Replacing the Riser Card Assembly on the Server Board" on page 55](#).

6. Install the CPU fan assembly. For instructions, see [Section 5.2.2, “Replacing the CPU Fans” on page 101](#).
7. Install the drive bay assembly. For instructions, see [Figure 100, “Installing the Drive Bay Assembly” on page 114](#).
8. Connect all cables and the bridge board to the server board. Use [Figure 33, “NSC2U Server System Cable Routing” on page 51](#) as a reference.
9. Install the processor air duct. For instructions, see [Section 3.2.6, “Installing the Processor Air Duct” on page 28](#).
10. If this is the last task you are performing, replace the top cover of the chassis. Reconnect all the external devices and plug in the power cord(s). For information about mounting the server in a rack, see [Section 3.5, “Installing the Server into a Rack” on page 48](#).

5.7 Replacing the Backup Battery on the Server Board

The lithium battery on the server board powers the real-time clock (RTC) for up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage, and the server settings (for example, the date and time) stored in CMOS RAM in the RTC may be wrong. Contact your Kontron sales representative for a list of approved devices.

Caution: Before replacing the 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 power cord from the system or wall outlet.

WARNING

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

WARNING

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.

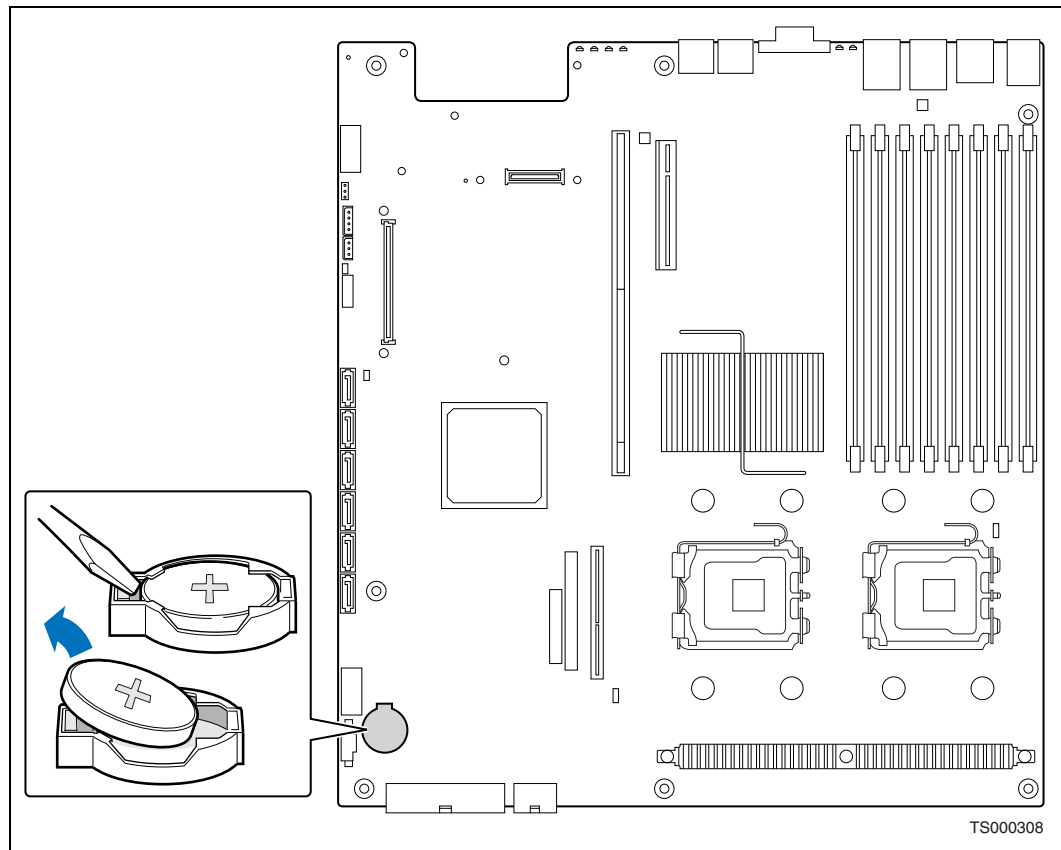
VAROITUS

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

1. Power down the server system and unplug all peripheral devices and the power cable.
2. Remove the chassis cover. For instructions, see [Section 3.2.1, “Removing the Chassis Cover” on page 25](#).
3. Remove the processor air duct. For instructions, see [Section 3.2.5, “Removing the Processor Air Duct” on page 27](#).
4. Locate the battery. (See [Figure 105](#).)

5. Remove the riser card assembly. For instructions see [Section 4.2.2, "Removing the PCI Riser Card Assembly"](#) on page 53.
6. Insert the tip of a small flat bladed screwdriver, or better yet an equivalent non-metallic tool, under the tab in the plastic retainer. Gently push down on the screwdriver to lift the battery.
7. Remove the battery from its socket.

Figure 105. Replacing the Battery



8. Dispose of the battery according to local ordinance.
9. Remove the new lithium battery from its package, and, being careful to observe the correct polarity, insert it in the battery socket.
10. Re-install the processor air duct, riser card assembly, and the chassis cover.
11. Run Setup to restore the configuration settings to the RTC.

6 Server Utilities

6.1 Using the BIOS Setup Utility

This section describes the BIOS Setup Utility options, which is used to change configuration defaults for the Kontron IP Network Server NSC2U. You can run BIOS Setup with or without an operating system present. See the *Kontron IP Network Server NSC2U Technical Product Specification* for details about specific BIOS setup screens.

6.1.1 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 above, during the Power On Self Test (POST), you will see the prompt

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

In a third condition, when CMOS/NVRAM has been 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 will load default values for CMOS and attempt to boot.

6.1.2 If You Cannot Access Setup

If you are not able to access BIOS Setup, you might need to clear the CMOS memory. For instructions on clearing the CMOS, see [Section 6.5, “BMC Force Update Procedure”](#).

6.1.3 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. These parameters can be changed if the user has adequate security rights. If a value cannot be changed, the feature's value field is inaccessible.

[Table 13](#) describes the keyboard commands you can use in the BIOS Setup menus.

Table 13. Keyboard Commands

Key	Description
<F1>	Help - Pressing F1 on any menu invokes the general Help window.
← →	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.
↑	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 the Enter key activates the selected item.
↓	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 the Enter key activates the selected item.
F5/-	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/+	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, the Enter key 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 the ESC key is pressed while editing any field or selecting features of a menu, the parent menu is re-entered. When the ESC key is pressed in any submenu, the parent menu is re-entered. When the ESC key is pressed in any major menu, the exit confirmation window is displayed and the user is asked whether changes can be discarded.
<F9>	Setup Defaults - Pressing F9 causes the following to appear: Setup Confirmation Load default configuration now? [Yes] [No] If "Yes" is selected and the Enter key is pressed, all Setup fields are set to their default values. If "No" is selected and the Enter key is pressed, or if the ESC key is pressed, the user is returned to where they were before F9 was pressed without affecting any existing field values.
<F10>	Save and Exit - Pressing F10 causes the following message to appear: Setup Confirmation Save Configuration changes and exit now? [Yes] [No] If "Yes" is selected and the Enter key is pressed, all changes are saved and Setup is exited. If "No" is selected and the Enter key is pressed, or the ESC key is pressed, the user is returned to where they were before F10 was pressed without affecting any existing values.

6.2 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, SCSI BIOS, and other option ROMs for devices embedded on the server board.
- OEM binary area
- Microcode
- A means to change the BIOS Language

6.2.1 Preparing for the Upgrade

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

Note: In the unlikely event that a BIOS error occurs during the BIOS update process, a recovery process may need to be followed to return the system to service. See [Section 1.4, “Additional Information and Software”](#) for additional information.

6.2.1.1 Recording the Current BIOS Settings

1. Boot the computer and press <F2> when you see the 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 will need these settings to configure your computer at the end of the procedure.

6.2.1.2 Obtaining the Upgrade

Download the BIOS image file to a temporary folder on your hard drive. See [Section 1.4, “Additional Information and Software”](#) for additional information.

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

6.2.2 Updating 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.

Note: Do not power down the system during the BIOS update process! The system will reset automatically when the BIOS update process is completed.

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.

6.3 Clearing the CMOS

If you are not able to access the BIOS setup screens, the CMOS Clear jumper will need to be used to reset the configuration RAM. The CMOS clear jumper (J1D3) is shown in [Figure 17, “Recovery Jumper Blocks \(J1D1, J1D2, J1D3\)” on page 33](#).

1. Power down the system and disconnect the power cord.
2. Open the server. See [Section 3.2.1, “Removing the Chassis Cover”](#) for instructions.
3. Move jumper (J1D3) from the normal operation position, CMOS Clear by BMC, at pins 1 and 2 to the CMOS Clear Force Erase position, covering pins 2 and 3.
4. Wait five seconds.
5. Move the jumper (J1D3) back to the default position (pins 1-2).
6. Close the server chassis. See [Section 3.2.2, “Installing the Chassis Cover”](#) for instructions.
7. Reconnect the power and power up the system.

6.4 Clearing the Password

If the user or administrator password(s) is lost or forgotten, moving the password clear jumper into the "clear" position clears both passwords. The password clear jumper must be restored to its original position before a new password(s) can be set. The password clear jumper (J1D2) is shown in [Figure 17, "Recovery Jumper Blocks \(J1D1, J1D2, J1D3\)" on page 33](#).

1. Power down the system and disconnect the power.
2. Open the server chassis. See [Section 3.2.1, "Removing the Chassis Cover"](#) for instructions.
3. Move the jumper (J1D2) 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 power, power up the system.
5. Power down the system and disconnect the power cord.
6. Return the Password Clear jumper (J1D2) to the Password Clear Protect position, covering pins 1 and 2.
7. Close the server chassis. See [Section 3.2.2, "Installing the Chassis Cover"](#) for instructions.
8. Reconnect the power and power up the server.

6.5 BMC Force Update Procedure

When performing a standard BMC firmware update procedure, the update utility places the BMC into an update mode to allow the firmware to load safely onto the flash device. In the unlikely event that the BMC firmware update process fails because the BMC is not in the proper update state, the server board provides a BMC Force Update jumper that can force the BMC into the proper update state. Use the following procedure if the standard BMC firmware update process fails.

Once the firmware update process completes successfully, the firmware update utility may generate an error stating that the BMC is still in update mode. Use the following procedure to get out of Update mode:

1. Power down and remove the power cord.
2. Open the server chassis (remove the top cover).
3. Locate jumper block J1D1 and move the jumper to the Enable position (pins 2-3).
4. Close the server chassis.
5. Reconnect the power and restart the system.

Now perform the standard BMC firmware update procedure as documented in the README.TXT file included in the BMC Firmware Update package.

Note:

Normal BMC functionality is disabled when the Force BMC Update jumper is populated. The server should never be run with the BMC Force Update jumper populated and this header should only be used when the standard firmware update process fails. This header should remain unpopulated by default when the server is running normally.

6. When the update has finished, power down the system and remove the power cord.
7. Open the server chassis (remove the top cover).
8. Close the server chassis.
9. Reconnect the power and restart the system.
10. Locate jumper block J1D1 and move the jumper to the Disable position (pins 1-2).

7 Troubleshooting

This chapter helps you identify and solve problems that might occur while you are using the Kontron IP Network Server NSC2U.

For any issue, first ensure you are using the latest firmware and files. Firmware upgrades include updates for BIOS and the baseboard management controller (BMC). Go to <http://us.kontron.com/support/> for information about the latest updates. In addition to the server firmware and files, also update any drivers used for components you have installed in your system, such as video drivers, network drivers, and SCSI drivers.

There is a package called the “Platform Confidence Test” that may help with your diagnostics. Go to <http://us.kontron.com/products/systems+and+platforms/commuication+rackmount+servers/ip+network+server+nsc2u.html> Click on Downloads, Tools, PCT

If you are unable to resolve your server problems on your own, see [Appendix C, “Getting Help”](#) for assistance.

7.1 Resetting the System

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

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

7.2 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 [Section 7.4.10, “Problems with Newly Installed Application Software”](#).

7.2.1 First Steps Checklist

- Is power available at the source?
- Are the power supplies plugged in? Check the power cable on the back of the server and at the power source.
- Is the system power cord properly connected to the system? For AC-powered systems, is the power cord plugged into a NEMA (National Electrical Manufacturing Association) 5-15R outlet for 100-120V or a NEMA 6-15R outlet for 200-240V?
- 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 PCI-X* and PCI Express* (PCIe*) add-in cards fully seated in their slots in the respective riser cards?
- ❑ 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 that there are no conflicts—for example, two add-in boards sharing the same interrupt.
- ❑ Are all peripheral devices installed correctly?
- ❑ Are the hard disk drives (up to 6) properly formatted or configured?
- ❑ Are all device drivers properly installed?
- ❑ Are the configuration settings made in Setup correct?
- ❑ Is the operating system properly loaded? Refer to 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)?
- ❑ Are all integrated components from the tested components lists? Check the tested memory list and the supported hardware and operating system list. Go to <http://us.kontron.com/support/> for links to the tested component lists.

7.3 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. Disconnect each of devices from the system, except for the keyboard and the video monitor.
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. Turn on the system. If the power LED does not light, see [Section 7.4.1, "Power Light does not Light"](#).

7.3.1 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:

- ❑ If system LEDs are illuminated, see [Section 7.5, "LED Information"](#) for a description of the LED lights and steps that need to be taken to correct the problem.

7.3.2 Confirming the Operating System Load

Once the system boots up, the operating system prompt appears on the screen. The prompt varies according to the operating system. If the operating system prompt does not appear, see [Section 7.4.2, “No Characters Appear on Screen”](#).

7.4 Specific Problems and Corrective Actions

This section provides possible solutions for specific problems:

Try the solutions below in the order given. If you cannot correct the problem, contact your service representative or authorized dealer for help. See [Appendix C, “Getting Help”](#) for contact details.

7.4.1 Power Light does not Light

Check the following:

- Did you press the power-on button?
- Is the system operating normally? If so, the power LED might be defective or the cable from the front panel to the server board might be loose.
- Have you securely plugged the server power cord into the power supply?
- For AC, will other items plugged into the same power outlet function correctly?
- Remove all add-in cards and see if the system boots. If successful, re-insert the cards 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 complies with the system requirements.
- Remove the processor and re-seat it.

7.4.2 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, re-insert the cards 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 complies with the system requirements.
- Remove the processor and re-seat it.

7.4.3 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?

7.4.4 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 [Section 7.4.1, "Power Light does not Light"](#).
- 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 the fans sped up in response to an overheating situation?
- Have the fans sped up in response to a fan that has failed?
- Are the fan power connectors properly connected to the SFP 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 SFP board?
- Are there any shorted wires caused by pinched-cables or have power connector plugs been forced into power connector sockets the wrong way?

7.4.5 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. Go to <http://us.kontron.com/support/> for a link to the 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.

7.4.6 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.

7.4.7 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. Go to <http://us.kontron.com/support/> for a link to the current version.
- ❑ Try reseating the add-in adapter.

7.4.8 The Add-in Adapter Stopped Working Without Apparent Cause

- ❑ Try reseating the adapter first; then try a different slot if necessary.
- ❑ The network driver files may be corrupt or deleted. Delete and then reinstall the drivers.
- ❑ Run the diagnostics.

7.4.9 System Boots When Installing a PCI Card

System Server 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 power cord plugged in, a signal may be sent to command the system to boot. Before installing a PCI card, you should always:

1. Turn off the server power by using the power button on the front of the system.
2. Unplug the power cord from the server.

7.4.10 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.
- ❑ Make sure the correct device drivers installed.

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

7.4.11 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:

- ❑ 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 that 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: For AC power, 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.

7.4.12 Devices are not Recognized under Device Manager (Windows* OS)

The Windows* operating systems do not include all of the drivers for the Intel® chipsets, onboard NICs, and other components. See <http://us.kontron.com/support/> for a link to the current drivers and chipset files.

7.4.13 Hard Drive(s) are not Recognized

Check the following:

- ❑ Make sure the drive is not disabled in BIOS Setup.
- ❑ Make sure the drive is compatible. Go to <http://us.kontron.com/support/> for a link to the list tested drives.
- ❑ Make sure you have not exceeded the power budget for the server. Go to <http://us.kontron.com/support/> for a link to software to check your power budget.

7.5 LED Information

The Intel® Server Board T5000PAL includes LEDs that can aid in troubleshooting your system. Table 14 defines these LEDs with a description of their use.

Table 14. LED Definitions (Sheet 1 of 2)

LED Name	Function	Location	Color	Notes
ID	Aid in server identification from the back panel	Control panel and rear left corner of server board	Blue	Press ID LED button or user Server Management software to turn on the LED.
System fault	Visible fault warning	Control panel and rear left corner of server board	Green or Amber	Green = No Fault Green blinking = degraded Amber = critical error or non-recoverable Amber blinking = non-critical error
ATA drive activity	Control panel	Control panel	Green	Blinking = Activity. No action required.
Memory fault 1-6	Identify failing memory module	DIMM end rear of server board	Amber	On = Fault
Diagnostic LEDs. 1-4 (LSB, bit1, bit2, MSB)	Displays port 80 POST codes	Center back edge of server board	Each LED can be Off, Green, Amber, Red	See the POST code table
CPU 1 & 2 Fan Fault	Identify fan failure	Front center of server board	Amber	On = Fault

Table 14. LED Definitions (Sheet 2 of 2)

LED Name	Function	Location	Color	Notes
CPU 1 & 2 Fault	Identify processor failure	1" behind processor socket	Amber	On = Fault
5v Standby	Identify 5v standby power on state	Front left of server board	Amber	On = 5v standby power on
Power LED	Identify the power state of the system	Control Panel	Green	Off = Power is off (off or S5) On = Power on or S0) Slow Blink = Low power state (S1 - S3)

7.6 BIOS Error Messages

When a recoverable error occurs during the POST, the BIOS displays an error message describing the problem. See [Table 15](#)

Table 15. BIOS Error Messages (Sheet 1 of 2)

Error Message	Explanation
GA20 Error	An error occurred with Gate A20 when switching to protected mode during the memory test.
Pri Master HDD Error Pri Slave HDD Error Sec Master HDD Error Sec Slave HDD Error	Could not read sector from corresponding drive.
Pri Master Drive - ATAPI Incompatible Pri Slave Drive - ATAPI Incompatible Sec Master Drive - ATAPI Incompatible Sec Slave Drive - ATAPI Incompatible	Corresponding drive is not an ATAPI (Advanced Technology Attachment Packet Interface) device. Run Setup to make sure device is selected correctly.
A: Drive Error	No response from diskette drive.
CMOS Battery Low	The battery may be losing power. Replace the battery soon.
CMOS Display Type Wrong	The display type is different from what has been stored in CMOS. Check Setup to make sure type is correct.
CMOS Checksum Bad	The CMOS checksum is incorrect. CMOS memory may have been corrupted. Run Setup to reset values.
CMOS Settings Wrong	CMOS values are not the same as the last boot. Either these values have been corrupted or the battery has failed.
CMOS Date/Time Not Set	The time and/or date values stored in CMOS are invalid. Run Setup to set correct values.
DMA Error	Error during read/write test of DMA (Direct Memory Access) controller.
FDC Failure	Error occurred trying to access diskette drive controller.
HDC Failure	Error occurred trying to access hard disk controller.
Checking NVRAM.....	NVRAM (Non-Volatile Random Access Memory) is being checked to see if it is valid.
Update OK!	NVRAM was invalid and has been updated.
Updated Failed	NVRAM was invalid but was unable to be updated.
Keyboard Error	Error in the keyboard connection. Make sure keyboard is connected properly.
KB/Interface Error	Keyboard interface test failed.

Table 15. BIOS Error Messages (Sheet 2 of 2)

Error Message	Explanation
Memory Size Decreased	Memory size has decreased since the last boot. If no memory was removed, then memory may be bad.
Memory Size Increased	Memory size has increased since the last boot. If no memory was added, there may be a problem with the system.
Memory Size Changed	Memory size has changed since the last boot. If no memory was added or removed, then memory may be bad.
No Boot Device Available	System did not find a device to boot.
Off Board Parity Error	A parity error occurred on an off-board card. This error is followed by an address.
On Board Parity Error	A parity error occurred in onboard memory. This error is followed by an address.
Parity Error	A parity error occurred in onboard memory at an unknown address.
NVRAM / CMOS / PASSWORD cleared by Jumper	NVRAM, CMOS, and passwords have been cleared. The system should be powered down and the jumper removed.
<CTRL_N> Pressed	CMOS is ignored and NVRAM is cleared. User must enter Setup.

7.6.1 BIOS POST Beep Codes

Table 16 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 16. POST Error Beep Codes

Number of Beeps	Reason for the beeps and action to take
1, 2, or 3	Memory error. Reseat the memory or replace the DIMMs with known good modules.
4 - 7 or 9 - 11	Fatal error indicating a possible serious system problem. Remove all add-in cards and re-start the system. If the error still occurs, contact your system manufacturer. If the beep codes are not generated after the add-in cards are removed, insert the cards one at a time, booting the system between each card addition, until the beeps again occur to reveal the malfunctioning card.
8	Replace or reseat the system video add-in card. If on-board video is being used, the server board may be faulty.

In addition to the beep codes above, additional beep codes are provided if an Intel[®] Remote Management Module (RMM) is installed. The RMM provide the following additional beep codes.

Table 17. Error Beep Codes Provided by a Remote Management Module (Sheet 1 of 2)

Beep Code	Reason for the beeps and action to take
1	Control panel CMOS clear has been initiated.
1-5-1-1	Processor failure. Reseat or replace the failed processor.
1-5-2-1	No processor is installed or the CPU 1 socket is empty. Reseat or replace the failed processor.
1-5-2-3	Processor configuration error or CPU 1 socket is empty. Reseat or replace the failed processor. In a two-processor system, make sure the processors are identical.
1-5-2-4	Front-side bus select configuration error.

Table 17. Error Beep Codes Provided by a Remote Management Module (Sheet 2 of 2)

Beep Code	Reason for the beeps and action to take
1-5-4-2	DC power unexpectedly lost.
1-5-4-3	Chipset control failure.
1-5-4-4	Power control failure.

8 Warranty

This Kontron product is warranted against defects in material and workmanship for the warranty period from the date of shipment. During the warranty period, Kontron will at its discretion decide to repair or replace defective products. Within the warranty period, the repair of products is free of charge as long as warranty conditions are observed. The warranty does not apply to defects resulting from improper or inadequate maintenance or handling by the buyer, unauthorized modification or misuse, operation outside of the product's environmental specifications or improper installation or maintenance.

Kontron will not be responsible for any defects or damages to other products not supplied by Kontron that are caused by a faulty Kontron product.

Appendix A: Safety Information

Warning: Although you may be using this guide or another resource as a reference, before working with your server product pay close attention to these 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.

A.1 Emissions Disclaimer

To ensure EMC (Electromagnetic Compatibility) compliance with your local regional rules and regulations, the final configuration of your end system product may require additional EMC compliance testing. For more information, please contact your local Kontron Representative.

See [Appendix B, "Regulatory and Certification Information"](#) for product Safety and EMC regulatory compliance information. This is an FCC (Federal Communications Commission) Class A device.

A.2 Intended Uses

This product was evaluated as Information Technology Equipment (ITE), which may be installed in Central Offices, Telecommunication Centers, offices, schools, computer rooms, and similar commercial type locations. The suitability of this product for other product categories and environments (medical, industrial, telecommunications, residential, alarm systems, test equipment, etc.), other than an ITE application, may require further evaluation.

Warning: Anchor the equipment rack: The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more servers are extended in front of the rack on slides. You must also consider the weight of any other device installed in the rack. A crush hazard exists should the rack tilt forward which could cause serious injury.

A.2.1 If AC power supplies are installed:

Mains AC power disconnect: The AC power cord(s) is considered the mains disconnect for the server and must be readily accessible when installed. If the individual server power cord(s) will not be readily accessible for disconnection then you must install an AC power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire rack, not just to the server(s).

Grounding the rack installation: To avoid the potential for an electrical shock hazard, you must include a third wire safety ground conductor with the rack installation. If the server power cord is plugged into an AC outlet that is part of the rack, then you must provide proper grounding for the rack itself. If the server power cord is plugged into a

wall AC outlet, the safety ground conductor in the power cord provides proper grounding only for the server. You must provide additional, proper grounding for the rack and other devices installed in it.

Overcurrent protection: The server is designed for an AC line voltage source with up to 20 amperes of overcurrent protection per cord feed. If the power system for the equipment rack is installed on a branch circuit with more than 20 amperes of protection, you must provide supplemental protection for the server. The overall current rating of a configured server is less than 6 amperes.

Warning: Do not attempt to modify or use an AC power cordset that is not the exact type required. You must use a power cordset that meets the following criteria:

- Rating: In the U.S. and Canada, cords must be UL (Underwriters Laboratories, Inc.) Listed/CSA (Canadian Standards Organization) Certified type SJT, 18-3 AWG (American Wire Gauge). Outside of the U.S. and Canada, cords must be flexible harmonized (<HAR>) or VDE (Verband Deutscher Elektrotechniker, German Institute of Electrical Engineers) certified cord with 3x 0.75 mm conductors rated 250 VAC.
- Connector, wall outlet end: Cords must be terminated in grounding-type male plug designed for use in your region. The connector must have certification marks showing certification by an agency acceptable in your region and for U.S. must be listed and rated for 125% of the overall current rating of the server.
- Connector, server end: The connectors that plug into the AC receptacle on the server must be an approved IEC (International Electrotechnical Commission) 320, sheet C13, type female connector.
- Cord length and flexibility: Cords must be less than 4.5 meters (14.8 feet) long.

A.2.2 If DC power supplies are installed:

Connection with a DC (Direct Current) source should only be performed by trained service personnel. The server with DC input is to be installed in a Restricted Access Location in accordance with articles 110-26 and 110-27 of the National Electric Code, ANSI/NFPA 70. The DC source must be electrically isolated from any hazardous AC source by double or reinforced insulation. The DC source must be capable of providing up to 300 watts of continuous power per feed pair.

Mains DC power disconnect: You are responsible for installing a properly rated DC power disconnect for the server system. This mains disconnect must be readily accessible, and it must be labeled as controlling power to the server. The UL listed circuit breaker of a centralized DC power system may be used as a disconnect device when easily accessible and should be rated no more than 10 amps.

Grounding the server: This server is intended for installation with an isolated DC return (DC-I per NEBS GR-1089, Issue 3). To avoid the potential for an electrical shock hazard, you must reliably connect an earth grounding conductor to the server. The earth grounding conductor must be a minimum 14 AWG connected to the earth ground stud(s) on the rear of the server. The safety ground conductor should be connected to the chassis stud with a Listed closed two-hole crimp terminal having 5/8-inch pitch. The nuts on the chassis earth ground studs should be installed with a 10 in-lbs of torque. The safety ground conductor provides proper grounding only for the server. You must provide additional, proper grounding for the rack and other devices installed in it.

Overcurrent protection: Overcurrent protection UL Listed circuit breakers must be provided as part of each host equipment rack and must be incorporated in the field wiring between the DC source and the server. The branch circuit protection shall be rated minimum 75 Vdc, 10A maximum per feed pair. If the DC power system for the

equipment rack is installed with more than 10 amperes of protection, you must provide supplemental protection for the server. The overall current rating of a maximum configured server is 8 amperes.

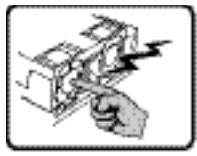
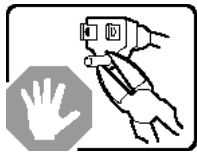
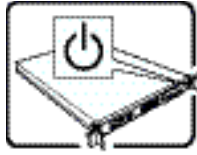

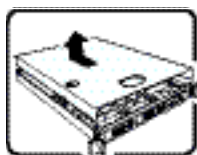
A.2.3 Temperature and Ventilation

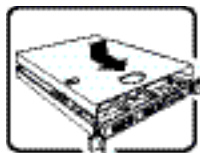
Caution: Temperature -- The temperature, in which the server operates when installed in an equipment rack, must not go below 5°C (41°F) or rise above 35°C (95°F). Extreme fluctuations in temperature can cause a variety of problems in your server.

Caution: Ventilation -- The equipment rack must provide sufficient airflow to the front of the server to maintain proper cooling. The rack must also include ventilation sufficient to exhaust a maximum of 1023 BTUs (British Thermal Units) per hour for the server. The rack selected and the ventilation provided must be suitable to the environment in which the server will be used.

A.3 Safety Cautions

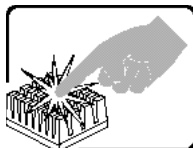
Read all caution and safety statements in this document before performing any of the instructions. See also the most current Server Boards and Server Chassis Safety Information which is provided at <http://us.kontron.com/support/>

	<p>The power supply in this product contains no user-serviceable parts. There may be more than one supply in this product. Refer servicing only to qualified personnel.</p>
	<p>Do not attempt to modify or use the supplied AC power cord if it is not the exact type required. A product with more than one power supply will have a separate AC power cord for each supply.</p>
	<p>The power button on the system does not turn off system AC power. To remove AC power from the system, you must unplug each AC power cord from the wall outlet or power supply.</p> <p>The power cord(s) is considered the disconnect device to the main (AC) power. The socket outlet that the system plugs into must be installed near the equipment and must be easily accessible.</p>
	<p>SAFETY STEPS: Whenever you remove the chassis covers to access the inside of the system, follow these steps:</p> <ol style="list-style-type: none"> 1. Turn off all peripheral devices connected to the system. 2. Turn off the system by pressing the power button. 3. Unplug all AC power cords from the system or from wall outlets. 4. Label and disconnect all cables connected to I/O connectors or ports on the back of the system. 5. Provide electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground of the system—any unpainted metal surface—when handling components. 6.
	<p>After you have completed the six SAFETY STEPS_{above}, you can remove the system covers. To do this:</p> <ol style="list-style-type: none"> 1. Unlock and remove the padlock from the back of the system if a padlock has been installed. 2. Remove and save all screws from the covers. 3. Remove the covers. 4. Do not operate the system with the chassis covers removed.

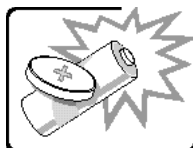


For proper cooling and airflow, always reinstall the chassis covers before turning on the system. Operating the system without the covers in place can damage system parts. To install the covers:

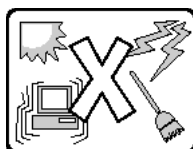
1. Check first to make sure you have not left loose tools or parts inside the system.
2. Check that cables, add-in boards, and other components are properly installed.
3. Attach the covers to the chassis with the screws removed earlier, and tighten them firmly.
4. Insert and lock the padlock to the system to prevent unauthorized access inside the system.
5. Connect all external cables and the AC power cord(s) to the system.



A microprocessor and heat sink may be hot if the system has been running. Also, there may be sharp pins and edges on some board and chassis parts. Contact should be made with care. Consider wearing protective gloves.



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

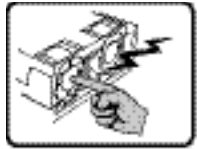
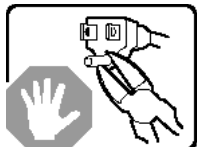
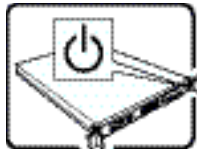

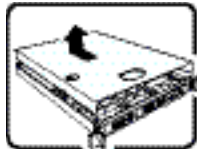
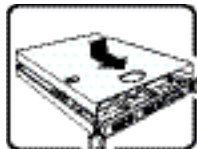


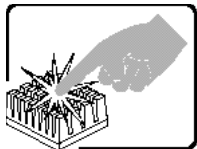
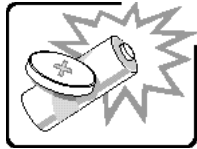
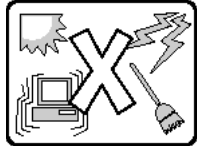
The system is designed to operate in a typical office environment. Choose a site that is:

- Clean and free of airborne particles (other than normal room dust).
- Well ventilated and away from sources of heat including direct sunlight.
- Away from sources of vibration or physical shock.
- Isolated from strong electromagnetic fields produced by electrical devices.
- In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppressor and disconnect telecommunication lines to your modem during an electrical storm.
- Provided with a properly grounded wall outlet.
- Provided with sufficient space to access the power supply cord(s), because they serve as the product's main power disconnect.

Wichtige Sicherheitshinweise

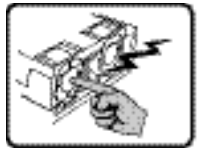
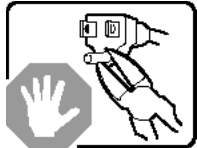
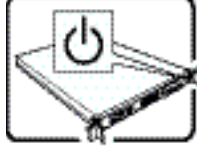
Lesen Sie zunächst sämtliche Warn- und Sicherheitshinweise in diesem Dokument, bevor Sie eine der Anweisungen ausführen. Beachten Sie hierzu auch die Sicherheitshinweise zu Serverplatinen und -Servergehäusen unter <http://us.kontron.com/support/>


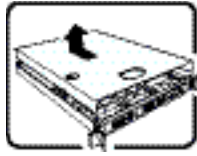
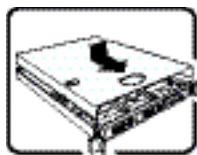
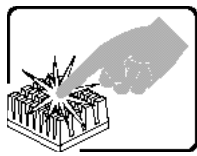
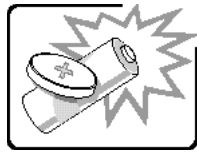
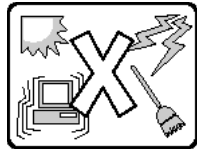
	Benutzer können am Netzgerät dieses Produkts keine Reparaturen vornehmen. Das Produkt enthält möglicherweise mehrere Netzgeräte. Wartungsarbeiten müssen von qualifizierten Technikern ausgeführt werden.
	Versuchen Sie nicht, das mitgelieferte Netzkabel zu ändern oder zu verwenden, wenn es sich nicht genau um den erforderlichen Typ handelt. Ein Produkt mit mehreren Netzgeräten hat für jedes Netzgerät ein eigenes Netzkabel.
	Der Wechselstrom des Systems wird durch den Ein-/Aus-Schalter für Gleichstrom nicht ausgeschaltet. Ziehen Sie jedes Wechselstrom-Netzkabel aus der Steckdose bzw. dem Netzgerät, um den Stromanschluß des Systems zu unterbrechen.
	<p>SICHERHEISSMASSNAHMEN: Immer wenn Sie die Gehäuseabdeckung abnehmen um an das Systeminnere zu gelangen, sollten Sie folgende Schritte beachten:</p> <ol style="list-style-type: none"> 1. Schalten Sie alle an Ihr System angeschlossenen Peripheriegeräte aus. 2. Schalten Sie das System mit dem Hauptschalter aus. 3. Ziehen Sie den Stromanschlußstecker Ihres Systems aus der Steckdose. 4. Auf der Rückseite des Systems beschriften und ziehen Sie alle Anschlußkabel von den I/O Anschlüssen oder Ports ab. 5. Tragen Sie ein geerdetes Antistatik Gelenkband, um elektrostatische Ladungen (ESD) über blanke Metallstellen bei der Handhabung der Komponenten zu vermeiden. 6. Schalten Sie das System niemals ohne ordnungsgemäß montiertes Gehäuse ein.
	<p>Nachdem Sie die oben erwähnten ersten sechs SICHERHEITSSCHRITTE durchgeführt haben, können Sie die Abdeckung abnehmen, indem Sie:</p> <ol style="list-style-type: none"> 1. Öffnen und entfernen Sie die Verschlusseinrichtung (Padlock) auf der Rückseite des Systems, falls eine Verschlusseinrichtung installiert ist. 2. Entfernen Sie alle Schrauben der Gehäuseabdeckung. 3. Nehmen Sie die Abdeckung ab.
	<p>Zur ordnungsgemäßen Kühlung und Lüftung muß die Gehäuseabdeckung immer wieder vor dem Einschalten installiert werden. Ein Betrieb des Systems ohne angebrachte Abdeckung kann Ihrem System oder Teile darin beschädigen. Um die Abdeckung wieder anzubringen:</p> <ol style="list-style-type: none"> 1. Vergewissern Sie sich, daß Sie keine Werkzeuge oder Teile im Innern des Systems zurückgelassen haben. 2. Überprüfen Sie alle Kabel, Zusatzkarten und andere Komponenten auf ordnungsgemäßen Sitz und Installation. 3. Bringen Sie die Abdeckungen wieder am Gehäuse an, indem Sie die zuvor gelösten Schrauben wieder anbringen. Ziehen Sie diese gut an. 4. Bringen Sie die Verschlusseinrichtung (Padlock) wieder an und schließen Sie diese, um ein unerlaubtes Öffnen des Systems zu verhindern. 5. Schließen Sie alle externen Kabel und den AC Stromanschlußstecker Ihres Systems wieder an.

	<p>Der Mikroprozessor und der Kühler sind möglicherweise erhitzt, wenn das System in Betrieb ist. Außerdem können einige Platinen und Gehäuseteile scharfe Spitzen und Kanten aufweisen. Arbeiten an Platinen und Gehäuse sollten vorsichtig ausgeführt werden. Sie sollten Schutzhandschuhe tragen.</p>
	<p>Bei falschem Einsetzen einer neuen Batterie besteht Explosionsgefahr. Die Batterie darf nur durch denselben oder einen entsprechenden, vom Hersteller empfohlenen Batterietyp ersetzt werden. Entsorgen Sie verbrauchte Batterien den Anweisungen des Herstellers entsprechend.</p>
	<p>Das System wurde für den Betrieb in einer normalen Büroumgebung entwickelt. Der Standort sollte:</p> <ul style="list-style-type: none"> • sauber und staubfrei sein (Hausstaub ausgenommen); • gut gelüftet und keinen Heizquellen ausgesetzt sein (einschließlich direkter Sonneneinstrahlung); • keinen Erschütterungen ausgesetzt sein; • keine starken, von elektrischen Geräten erzeugten elektromagnetischen Felder aufweisen; • in Regionen, in denen elektrische Stürme auftreten, mit einem Überspannungsschutzgerät verbunden sein; während eines elektrischen Sturms sollte keine Verbindung der Telekommunikationsleitungen mit dem Modem bestehen; • mit einer geerdeten Wechselstromsteckdose ausgerüstet sein; • über ausreichend Platz verfügen, um Zugang zu den Netzkabeln zu gewährleisten, da der Stromanschluß des Produkts hauptsächlich über die Kabel unterbrochen wird.

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 Server Boards and Server Chassis Safety Information sur le site <http://us.kontron.com/support/>

	<p>Le bloc d'alimentation de ce produit ne contient aucune pièce pouvant être réparée par l'utilisateur. Ce produit peut contenir plus d'un bloc d'alimentation. Veuillez contacter un technicien qualifié en cas de problème.</p>
	<p>Ne pas essayer d'utiliser ni modifier le câble d'alimentation CA fourni, s'il ne correspond pas exactement au type requis. Le nombre de câbles d'alimentation CA fournis correspond au nombre de blocs d'alimentation du produit.</p>
	<p>Notez que le commutateur CC de mise sous tension /hors tension du panneau avant n'éteint pas l'alimentation CA du système. Pour mettre le système hors tension, vous devez débrancher chaque câble d'alimentation de sa prise.</p>

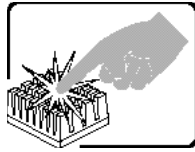
	<p>CONSIGNES DE SÉCURITÉ -Lorsque vous ouvrez le boîtier pour accéder à l'intérieur du système, suivez les consignes suivantes:</p> <ol style="list-style-type: none"> 1. Mettez hors tension tous les périphériques connectés au système. 2. Mettez le système hors tension en mettant l'interrupteur général en position OFF (bouton-poussoir). 3. Débranchez tous les cordons d'alimentation c.a. du système et des prises murales. 4. Identifiez et débranchez tous les câbles reliés aux connecteurs d'E-S ou aux accès derrière le système. 5. Pour prévenir les décharges électrostatiques lorsque vous touchez aux composants, portez une bande antistatique pour poignet et reliez-la à la masse du système (toute surface métallique non peinte du boîtier). 6. Ne faites pas fonctionner le système tandis que le boîtier est ouvert.
	<p>Une fois TOUTES les étapes précédentes accomplies, vous pouvez retirer les panneaux du système. Procédez comme suit:</p> <ol style="list-style-type: none"> 1. Si un cadenas a été installé sur à l'arrière du système, déverrouillez-le et retirez-le. 2. Retirez toutes les vis des panneaux et mettez-les dans un endroit sûr. 3. Retirez les panneaux.
	<p>Afin de permettre le refroidissement et l'aération du système, réinstallez toujours les panneaux du boîtier avant de mettre le système sous tension. Le fonctionnement du système en l'absence des panneaux risque d'endommager ses pièces. Pour installer les panneaux, procédez comme suit:</p> <ol style="list-style-type: none"> 1. Assurez-vous de ne pas avoir oublié d'outils ou de pièces démontées dans le système. 2. Assurez-vous que les câbles, les cartes d'extension et les autres composants sont bien installés. 3. Revissez solidement les panneaux du boîtier avec les vis retirées plus tôt. 4. Remettez le cadenas en place et verrouillez-le afin de prévenir tout accès non autorisé à l'intérieur du système. 5. Rebranchez tous les cordons d'alimentation c. a. et câbles externes au système.
	<p>Le microprocesseur et le dissipateur de chaleur peuvent être chauds si le système a été sous tension. Faites également attention aux broches aiguës des cartes et aux bords tranchants du capot. Nous vous recommandons l'usage de gants de protection.</p>
	<p>Danger d'explosion si la batterie n'est pas remontée correctement. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le fabricant. Disposez des piles usées selon les instructions du fabricant.</p>
	<p>Le système a été conçu pour fonctionner dans un cadre de travail normal. L'emplacement choisi doit être:</p> <ul style="list-style-type: none"> • Propre et dépourvu de poussière en suspension (sauf la poussière normale). • Bien aéré et loin des sources de chaleur, y compris du soleil direct. • A l'abri des chocs et des sources de vibrations. • Isolé de forts champs électromagnétiques générés par des appareils électriques. • Dans les régions sujettes aux orages magnétiques il est recommandé de brancher votre système à un supresseur de surtension, et de débrancher toutes les lignes de télécommunications de votre modem durant un orage. • Muni d'une prise murale correctement mise à la terre. • Suffisamment spacieux pour vous permettre d'accéder aux câbles d'alimentation (ceux-ci étant le seul moyen de mettre le système hors tension).

Instrucciones de seguridad importantes

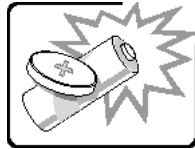
Lea todas las declaraciones de seguridad y precaución de este documento antes de realizar cualquiera de las instrucciones. Vea **Server Boards and Server Chassis Safety Information** en

<http://us.kontron.com/support/>

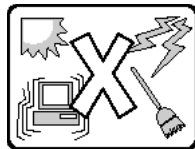
	<p>El usuario debe abstenerse de manipular los componentes de la fuente de alimentación de este producto, cuya reparación debe dejarse exclusivamente en manos de personal técnico especializado. Puede que este producto disponga de más de una fuente de alimentación.</p>
	<p>No intente modificar ni usar el cable de alimentación de corriente alterna, si no corresponde exactamente con el tipo requerido. El número de cables suministrados se corresponden con el número de fuentes de alimentación de corriente alterna que tenga el producto.</p>
	<p>Nótese que el interruptor activado/desactivado en el panel frontal no desconecta la corriente alterna del sistema. Para desconectarla, deberá desenchufar todos los cables de corriente alterna de la pared o desconectar la fuente de alimentación.</p>
	<p>INSTRUCCIONES DE SEGURIDAD: Cuando extraiga la tapa del chasis para acceder al interior del sistema, siga las siguientes instrucciones:</p> <ol style="list-style-type: none"> 1. Apague todos los dispositivos periféricos conectados al sistema. 2. Apague el sistema presionando el interruptor encendido/apagado. 3. Desconecte todos los cables de alimentación CA del sistema o de las tomas de corriente alterna. 4. Identifique y desconecte todos los cables enchufados a los conectores E/S o a los puertos situados en la parte posterior del sistema. 5. Cuando manipule los componentes, es importante protegerse contra la descarga electrostática (ESD). Puede hacerlo si utiliza una muñequera antiestática sujeta a la toma de tierra del chasis - o a cualquier tipo de superficie de metal sin pintar. 6. No ponga en marcha el sistema si se han extraído las tapas del chasis.
	<p>Después de completar las seis instrucciones de SEGURIDAD mencionadas, ya puede extraer las tapas del sistema. Para ello:</p> <ol style="list-style-type: none"> 1. Desbloquee y extraiga el bloqueo de seguridad de la parte posterior del sistema, si se ha instalado uno. 2. Extraiga y guarde todos los tornillos de las tapas. 3. Extraiga las tapas.
	<p>Para obtener un enfriamiento y un flujo de aire adecuados, reinstale siempre las tapas del chasis antes de poner en marcha el sistema. Si pone en funcionamiento el sistema sin las tapas bien colocadas puede dañar los componentes del sistema. Para instalar las tapas:</p> <ol style="list-style-type: none"> 1. Asegúrese primero de no haber dejado herramientas o componentes sueltos dentro del sistema. 2. Compruebe que los cables, las placas adicionales y otros componentes se hayan instalado correctamente. 3. Incorpore las tapas al chasis mediante los tornillos extraídos anteriormente, tensándolos firmemente. 4. Inserte el bloqueo de seguridad en el sistema y bloquéelo para impedir que pueda accederse al mismo sin autorización. 5. Conecte todos los cables externos y los cables de alimentación CA al sistema.



Si el sistema ha estado en funcionamiento, el microprocesador y el disipador de calor pueden estar aún calientes. También conviene tener en cuenta que en el chasis o en el tablero puede haber piezas cortantes o punzantes. Por ello, se recomienda precaución y el uso de guantes protectores.



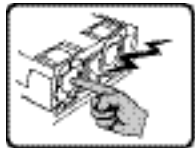
Existe peligro de explosión si la pila no se cambia de forma adecuada. Utilice solamente pilas iguales o del mismo tipo que las recomendadas por el fabricante del equipo. Para deshacerse de las pilas usadas, siga igualmente las instrucciones del fabricante.



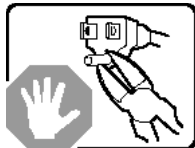
El sistema está diseñado para funcionar en un entorno de trabajo normal. Escoja un lugar:

- Limpio y libre de partículas en suspensión (salvo el polvo normal).
- Bien ventilado y alejado de fuentes de calor, incluida la luz solar directa.
- Alejado de fuentes de vibración.
- Aislado de campos electromagnéticos fuertes producidos por dispositivos eléctricos.
- En regiones con frecuentes tormentas eléctricas, se recomienda conectar su sistema a un eliminador de sobrevoltage y desconectar el módem de las líneas de telecomunicación durante las tormentas.
- Provisto de una toma de tierra correctamente instalada.
- Provisto de espacio suficiente como para acceder a los cables de alimentación, ya que éstos hacen de medio principal de desconexión del sistema.

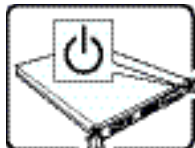
Informazioni di Sicurezza importanti



Rivolgersi ad un tecnico specializzato per la riparazione dei componenti dell'alimentazione di questo prodotto. È possibile che il prodotto disponga di più fonti di alimentazione.



Non modificare o utilizzare il cavo di alimentazione in c.a. fornito dal produttore, se non corrisponde esattamente al tipo richiesto. Ad ogni fonte di alimentazione corrisponde un cavo di alimentazione in c.a. separato.

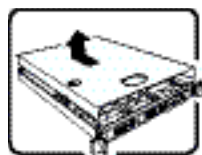


L'interruttore attivato/disattivato nel pannello anteriore non interrompe l'alimentazione in c.a. del sistema. Per interromperla, è necessario scollegare tutti i cavi di alimentazione in c.a. dalle prese a muro o dall'alimentazione di corrente.



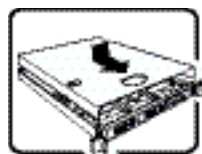
PASSI DI SICUREZZA: Qualora si rimuovano le coperture del telaio per accedere all'interno del sistema, seguire i seguenti passi:

1. Spegner tutti i dispositivi periferici collegati al sistema.
2. Spegner il sistema, usando il pulsante spento/acceso dell'interruttore del sistema.
3. Togliere tutte le spine dei cavi del sistema dalle prese elettriche.
4. Identificare e sconnettere tutti i cavi attaccati ai collegamenti I/O od alle prese installate sul retro del sistema.
5. Qualora si tocchino i componenti, proteggersi dallo scarico elettrostatico (SES), portando un cinghia anti-statica da polso che è attaccata alla presa a terra del telaio del sistema - qualsiasi superficie non dipinta - .
6. Non far operare il sistema quando il telaio è senza le coperture.



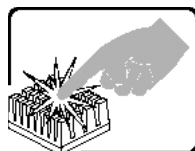
Dopo aver seguito i sei passi di SICUREZZA sopracitati, togliere le coperture del telaio del sistema come segue:

1. Aprire e rimuovere il lucchetto dal retro del sistema qualora ve ne fosse uno installato.
2. Togliere e mettere in un posto sicuro tutte le viti delle coperture.
3. Togliere le coperture.

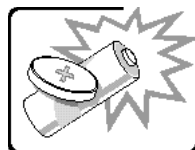


Per il giusto flusso dell'aria e raffreddamento del sistema, rimettere sempre le coperture del telaio prima di riaccendere il sistema. Operare il sistema senza le coperture al loro proprio posto potrebbe danneggiare i componenti del sistema. Per rimettere le coperture del telaio:

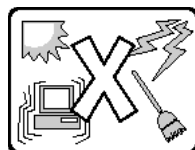
1. Controllare prima che non si siano lasciati degli attrezzi o dei componenti dentro il sistema.
2. Controllare che i cavi, dei supporti aggiuntivi ed altri componenti siano stati installati appropriatamente.
3. Attaccare le coperture al telaio con le viti tolte in precedenza e avvitarle strettamente.
4. Inserire e chiudere a chiave il lucchetto sul retro del sistema per impedire l'accesso non autorizzato al sistema.
5. Ricollegare tutti i cavi esterni e le prolunghe AC del sistema.



Se il sistema è stato a lungo in funzione, il microprocessore e il dissipatore di calore potrebbero essere surriscaldati. Fare attenzione alla presenza di piedini appuntiti e parti taglienti sulle schede e sul telaio. È consigliabile l'uso di guanti di protezione.



Esiste il pericolo di un esplosione se la pila non viene sostituita in modo corretto. Utilizzare solo pile uguali o di tipo equivalente a quelle consigliate dal produttore. Per disfarsi delle pile usate, seguire le istruzioni del produttore.



Il sistema è progettato per funzionare in un ambiente di lavoro tipo. Scegliere una postazione che sia:

- Pulita e libera da particelle in sospensione (a parte la normale polvere presente nell'ambiente).
- Ben ventilata e lontana da fonti di calore, compresa la luce solare diretta.
- Al riparo da urti e lontana da fonti di vibrazione.
- Isolata dai forti campi magnetici prodotti da dispositivi elettrici.
- In aree soggette a temporali, è consigliabile collegare il sistema ad un limitatore di corrente. In caso di temporali, scollegare le linee di comunicazione dal modem.
- Dotata di una presa a muro correttamente installata.
- Dotata di spazio sufficiente ad accedere ai cavi di alimentazione, i quali rappresentano il mezzo principale di scollegamento del sistema.

Appendix B: Regulatory and Certification Information

B.1 Product Regulatory Compliance

B.1.1 Product Safety Compliance

The IP network server complies with the following safety requirements:

- UL60950-1 /CSA 60950-1 (USA / Canada)
- EN60950-1 (Europe)
- IEC60950-1 (International), CB Certificate & Report including all international deviations
- GS Certificate (Germany)
- GOST R Approval (Russia)
- CE - Low Voltage Directive 73/23/EEE (Europe)
- CCC Certification (China)
- BSMI CNS 13436 (Taiwan)

B.1.2 Product EMC Compliance - Class A Compliance

The IP network server has been tested and verified to comply with the following electromagnetic compatibility (EMC) regulations.

- FCC /ICES-003 - Emissions (USA/Canada)
- CISPR 22 - Emissions (International)
- EN55022 - Emissions (Europe)
- EN55024 - Immunity (Europe)
- EN61000-3-2 - Harmonics (Europe)
- EN61000-3-3 - Voltage Flicker (Europe)
- CE- EMC Directive 89/336/EEC (Europe)
- VCCI Emissions (Japan)
- AS/NZS: CISPR 22 Emissions (Australia / New Zealand)
- BSMI CNS13438 Emissions (Taiwan)
- GOST R Approval Emissions and Immunity (Russia)
- RRL Approval (Korea)
- CCC Certification (China)

B.1.3 Certifications / Registrations / Declarations

- UL Listing (US/Canada)
- CE Declaration of Conformity (Europe)

- FCC/ICES-003 Class A Verification Report (USA/Canada)
- VCCI Certification (Japan)
- C-Tick Declaration of Conformity (Australia)
- BSMI Certification (Taiwan)
- GOST R Certification / License (Russia)
- RRL Certification (Korea)
- CNCA Certification (China)
- Ecology Declaration (International)

B.2 Electromagnetic Compatibility Notices

B.2.1 FCC (USA)

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

For questions related to the EMC performance of this product, contact your Kontron Sales Representative.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

Only peripherals (computer input/output devices, terminals, printers, etc.) that comply with FCC Class A or B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.

All cables used to connect to peripherals must be shielded and grounded. Operation with cables connected to peripherals that are not shielded and grounded may result in interference to radio and TV reception.

B.2.2 Industry Canada (ICES-003)

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadien des Communications.

English translation of the notice above:

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of the Canadian Department of Communications.

B.2.3 Europe (CE Declaration of Conformity)

This product has been tested in accordance to, and complies with, the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

B.2.4 VCCI (Japan)

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

English translation of the notice above:

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

B.2.5 BSMI (Taiwan)

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

The BSMI Certification Marking and EMC warning is located on the outside rear area of the product.

B.2.6 Regulated Specified Components

To maintain the UL listing and compliance to other regulatory certifications and/or declarations, the following conditions must be adhered to and the following regulated components must be used. Interchanging or using other components will void the UL listing and other product certifications and approvals.

1. Add-in boards must have a printed wiring board flammability rating of minimum UL94V-1. Add-in boards containing external power connectors and/or lithium batteries must be UL recognized or UL listed. Any add-in board containing modem telecommunication circuitry must be UL listed. In addition, the modem must have the appropriate telecommunications, safety, and EMC approvals for the region in which it is sold.
2. Peripheral Storage Devices must be a UL recognized or UL listed accessory and TUV or VDE licensed. Maximum power rating of any one device is 19 watts. Total server configuration is not to exceed the maximum loading conditions of the power supply.

Appendix C: Getting Help

C.1 World Wide Web

Technicians and engineers from Kontron and/or its subsidiaries are available for technical support. We are committed to making our product easy to use and will help you use our products in your systems.

Please consult our Web site at [.http://us.kontron.com/support/](http://us.kontron.com/support/) for the latest product documentation, utilities, drivers and support contacts or to obtain an RMA/return form.

C.2 Telephone

(800) 480-0044

C.3 Email

support@us.kontron.com

