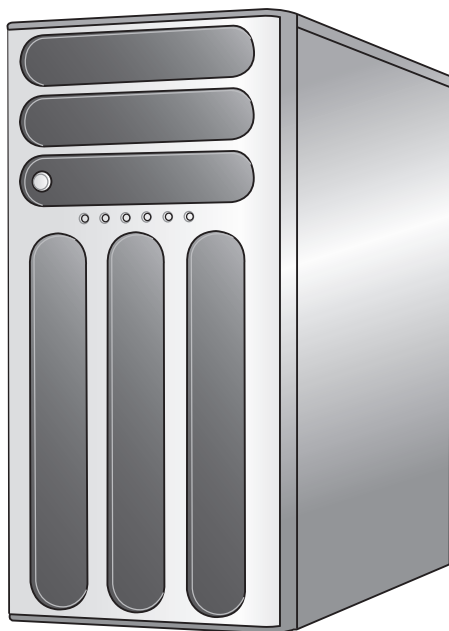




TS500-E5

Configuration Guide



E4105

First Edition V1

August 2008

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Revision history

Revision	Revision history	Date
V1	First release of TS500-E5 configuration guide	August 2008

Safety information

Electrical Safety

- Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.
- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing any additional devices to or from the system, contact a qualified service technician or your dealer. Ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you service.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your dealer.

Operation Safety

- Servicing of this product or units is to be performed by trained service personnel only.
- Before operating the server, carefully read all the manuals included with the server package.
- Before using the server, make sure all cables are correctly connected and the power cables are not damaged. If any damage is detected, contact your dealer as soon as possible.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Place the server on a stable surface.



This product is equipped with a three-wire power cable and plug for the user's safety. Use the power cable with a properly grounded electrical outlet to avoid electrical shock.

Lithium-Ion Battery Warning

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

CD-ROM Drive Safety Warning

CLASS 1 LASER PRODUCT

Heavy System

CAUTION! This server system is heavy. Ask for assistance when moving or carrying the system.

Chapter 1

This chapter describes the key features of TS500-E5. It includes the product overview and general specifications.

Product introduction

1.1 Key features

The ASUS TS500-E5 is a flexible expandability and high capacity storage server.

ASUS Innovative PIKE Upgrade Kit Provides Seamless RAID Solution

TS500-E5 is designed to work with a wide range of configurations. With ASUS innovative PIKE technology, TS500-E5 is able to support SAS RAID 0, 1, 1E, 10, 5, 50, 6, 60. The customers can choose the appropriate level of RAID protection with easy and cost-effective SAS upgrade kit.

ASUS Flex-E Technology Allows Flexible PCI-E Expansion

The ASUS Flex-E technology enables auto-switching of PCI-E slot bandwidth. TS500-E5 has four PCI-E slots in total, and one of which can be auto-switched between PCI-E x 16 (x 16 link) and PCI-E x 16 (x8 link). With PCI-E x 16 (x 16 link), the server is able to support professional graphics card.

Mass Storage with Hot-swap Design

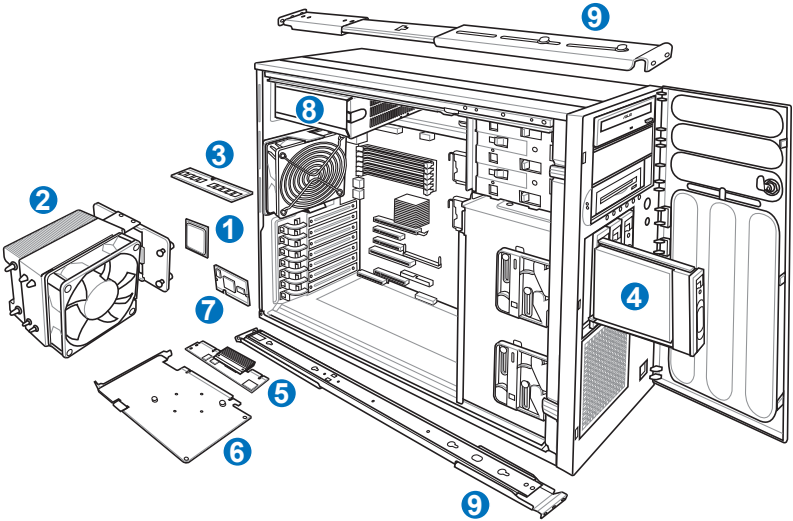
With ASUS PIKE, the server can be upgraded to support a maximum of 8 HDDs, providing mass storage capacity for customers. In addition, the hot-swap design of HDD bays supports online upgrade and maintenance.

Redundant Power Supply for Reliable Uptime

The TS500-E5 supports dual power supplies for redundant functionality, which makes the system reliable and provides non-stop service in business-critical applications.

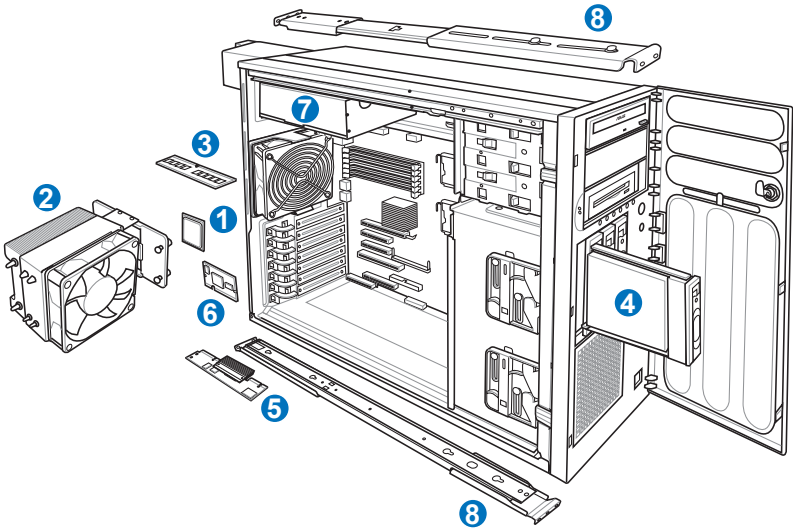
1.2 System overview

1.2.1 TS500-E5/PA4



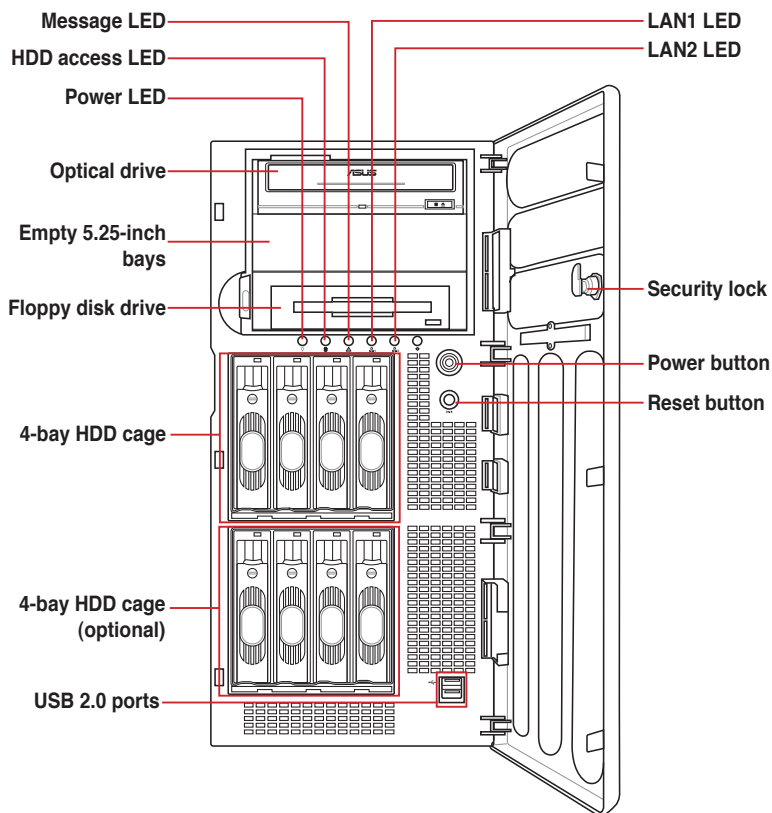
Items	Items
1. Central processing unit (CPU)	6. Graphics card (optional)
2. CPU heatsink and fan	7. ASUS Server management board (optional)
3. System memory	8. Single power supply
4. Hard disk drives	9. Rackmount rail kit (optional)
5. PIKE 1064E/1078 module (optional)	

1.2.2 TS500-E5/RX8



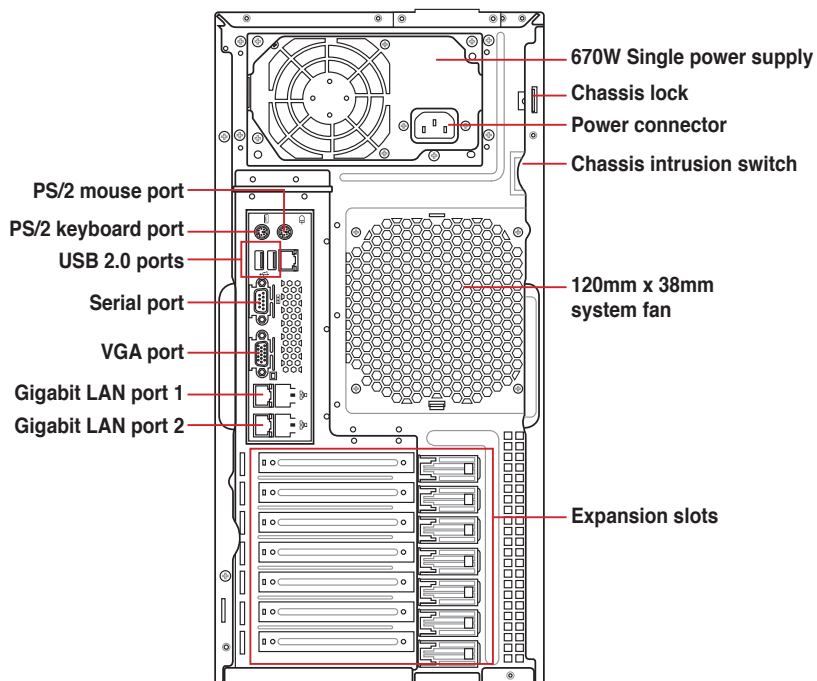
Items	Items
1. Central processing unit (CPU)	5. PIKE 1064E/1078 module (optional)
2. CPU heatsink and fan	6. ASUS Server management board (optional)
3. System memory	7. Redundant power supply module (optional)
4. Hard disk drives	8. Rackmount rail kit (optional)

1.3 Front panel features

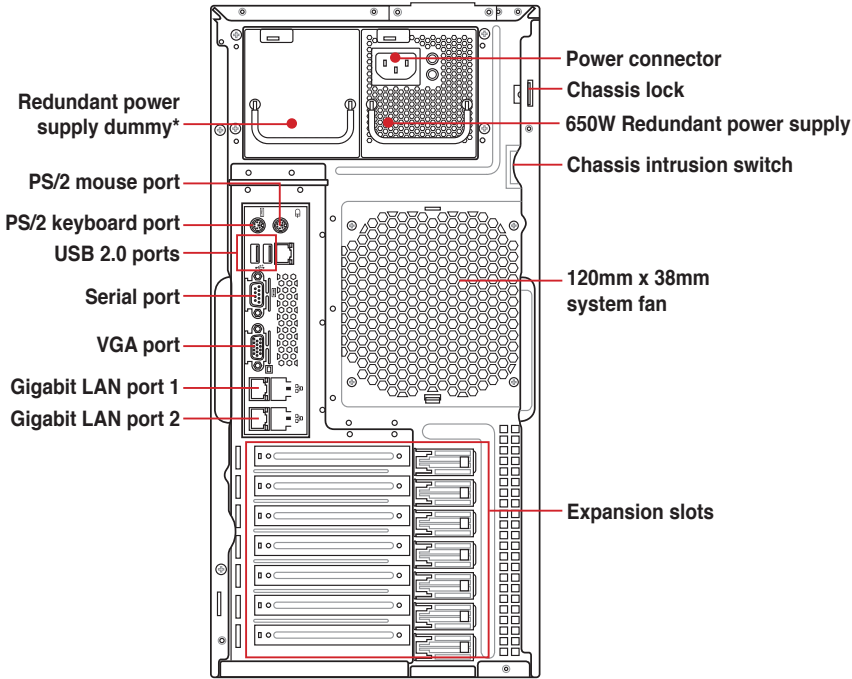


1.4 Rear panel features

1.4.1 TS500-E5/PA4



1.4.2 TS500-E5/RX8



* The second redundant power supply is an optional item.

1.5 System specifications

Model Name	TS500-E5/PA4	TS500-E5/RX8
Processor support	Quad-Core Intel® Xeon® 5400 Series Dual-Core Intel® Xeon® 5200 Series	
FSB	1333 / 1066 MHz	
Core Logic	Intel® 5100 MCH + Intel® ICH9R	
Memory	6-DIMM support up to 24GB DDR2 667 / 533 Registered, ECC	
Storage	4 x Hot-swap HDD bays (upgradable to 8 HDD bays with 2nd HDD cage kit)	
RAID support	Default support: S/W SATA RAID 0, 1, 5, 10 for Windows® S/W SATA RAID 0, 1, 10 for Windows® and Linux Option: SAS/SATA RAID 0, 1, 1E support with optional PIKE 1064E module H/W SAS/SATA RAID 0, 1, 5, 6, 10, 50, 60 support with optional PIKE 1078 module or LSI 8708ELP RAID card	
NIC	2 x Broadcom® 5721 PCI-E GbE LAN	
Onboard Gfx	XGI Z9s VGA Controller / 32MB	
Expansion Slot	Workstation Mode: 1 x PCI-E x16 slot (x16 link) 1 x PCI-E x8 slot (x8 link) 1 x PCI-E x8 slot (x4 link) 1 x PCI 32-bit/33MHz slot Server Mode: 1 x PCI-E x16 slot (x8 link) 2 x PCI-E x8 slot (x8 link) 1 x PCI-E x8 slot (x4 link) 1 x PCI 32-bit/33MHz slot	Workstation Mode: 1 x PCI-E x16 slot (x16 link) 1 x PCI-E x8 slot (x8 link) 1 x PCI-E x8 slot (x4 link) or (Auto disable if PIKE slot is occupied) 1 x PCI 32-bit/33MHz slot Server Mode: 1 x PCI-E x16 slot (x8 link) 2 x PCI-E x8 slot (x8 link) 1 x PCI-E x8 slot (x4 link) or (Auto disable if PIKE slot is occupied) 1 x PCI 32-bit/33MHz slot
Power Supply	670W Single Power Supply	650W 1+1 Redundant Power Supply*
Dimension (HH x WW x DD)	450mm x 212mm x 550mm	

*The second redundant power supply is an optional item.

**Specifications are subject to change without notice.

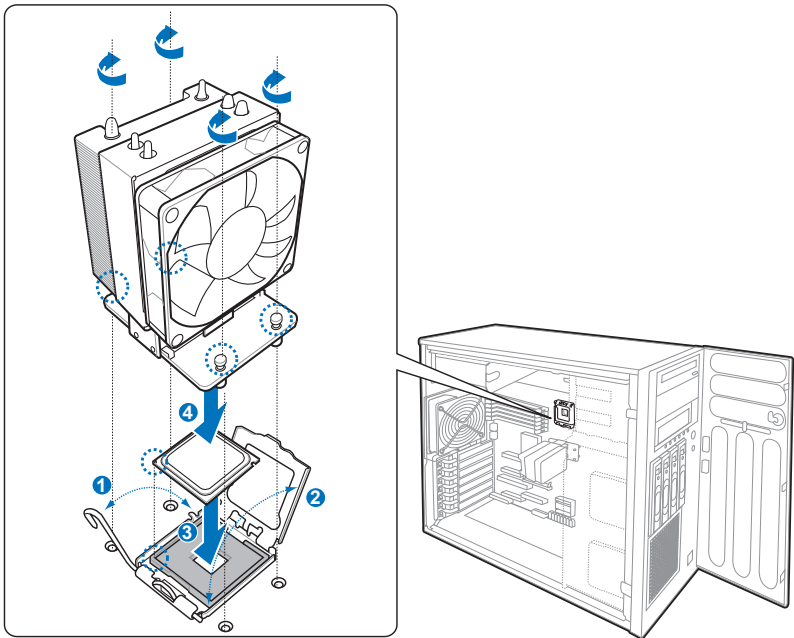
Chapter 2

This chapter lists the key components and optional accessories for the server system.

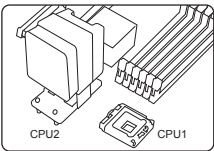
Components

2.1 Upgrading CPU and CPU heatsink

The ASUS TS500-E5 supports 1–2 Dual-core / Quad-core Intel® Xeon® 5400 / 5200 series processor.



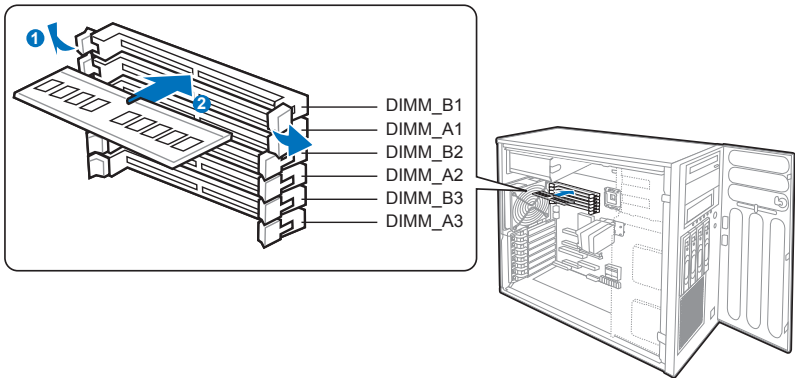
- If you install only one CPU, install the CPU to the CPU2 socket only. The system will not boot and the CPU warning LED will light up if a single CPU is installed on the CPU1 socket.
- We recommend to install CPUs with the same frequency.



Order P/N	Description
90-S4Q0U0070T	Quad Core Intel Xeon E5450 3.00G, FSB 1333, 12M L2 (with TS500-E5 Heatsink)
90-S4Q0U0060T	Quad Core Intel Xeon E5440 2.83G, FSB 1333, 12M L2 (with TS500-E5 Heatsink)
90-S4Q0U0050T	Quad Core Intel Xeon E5430 2.66G, FSB 1333, 12M L2 (with TS500-E5 Heatsink)
90-S4Q0U0040T	Quad Core Intel Xeon E5420 2.50G, FSB 1333, 12M L2 (with TS500-E5 Heatsink)
90-S4Q0U0030T	Quad Core Intel Xeon E5410 2.33G, FSB 1333, 12M L2 (with TS500-E5 Heatsink)
90-S4Q0U0020T	Quad Core Intel Xeon E5405 2.00G, FSB 1333, 12M L2 (with TS500-E5 Heatsink)
90-S4Q0U0080T	Dual Core Intel Xeon E5205 1.86G, FSB 1333, 12M L2 (with TS500-E5 Heatsink)

2.2 Upgrading system memory

The motherboard comes with six (6) Double Data Rate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets.



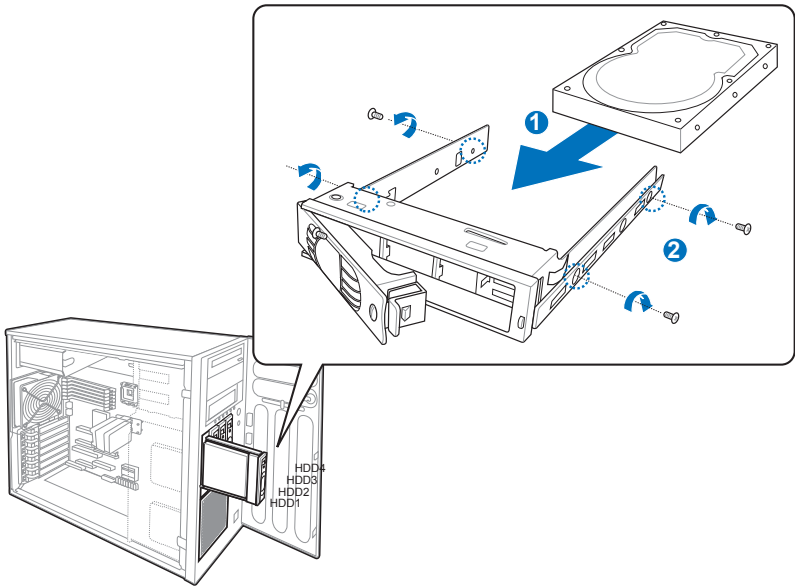
Recommended memory configurations

DIMM_A3	DIMM_B3	DIMM_A2	DIMM_B2	DIMM_A1	DIMM_B1
-	-	-	-	1 GB	-
-	-	-	-	1 GB	1 GB
-	-	1 GB	1 GB	1 GB	1 GB
1 GB	1 GB	1 GB	1 GB	1 GB	1 GB
-	-	-	-	2 GB	-
-	-	-	-	2 GB	2 GB
-	-	2 GB	2 GB	2 GB	2 GB
2 GB	2 GB	2 GB	2 GB	2 GB	2 GB
-	-	-	-	4 GB	-
-	-	-	-	4 GB	4 GB
-	-	4 GB	4 GB	4 GB	4 GB
4 GB	4 GB	4 GB	4 GB	4 GB	4 GB

Order P/N	Description
90-S000I0200T	1GB DDR2 667 ECC REG / ASUS
90-S000I0210T	2GB DDR2 667 ECC REG / ASUS
90-S000I0220T	4GB DDR2 667 ECC REG / ASUS

2.3 Upgrading hard disk drives

The system supports four hot-swap SATAII/SAS hard disk drives, which could be upgraded to eight HDDs with the optional hard disk drive cage.

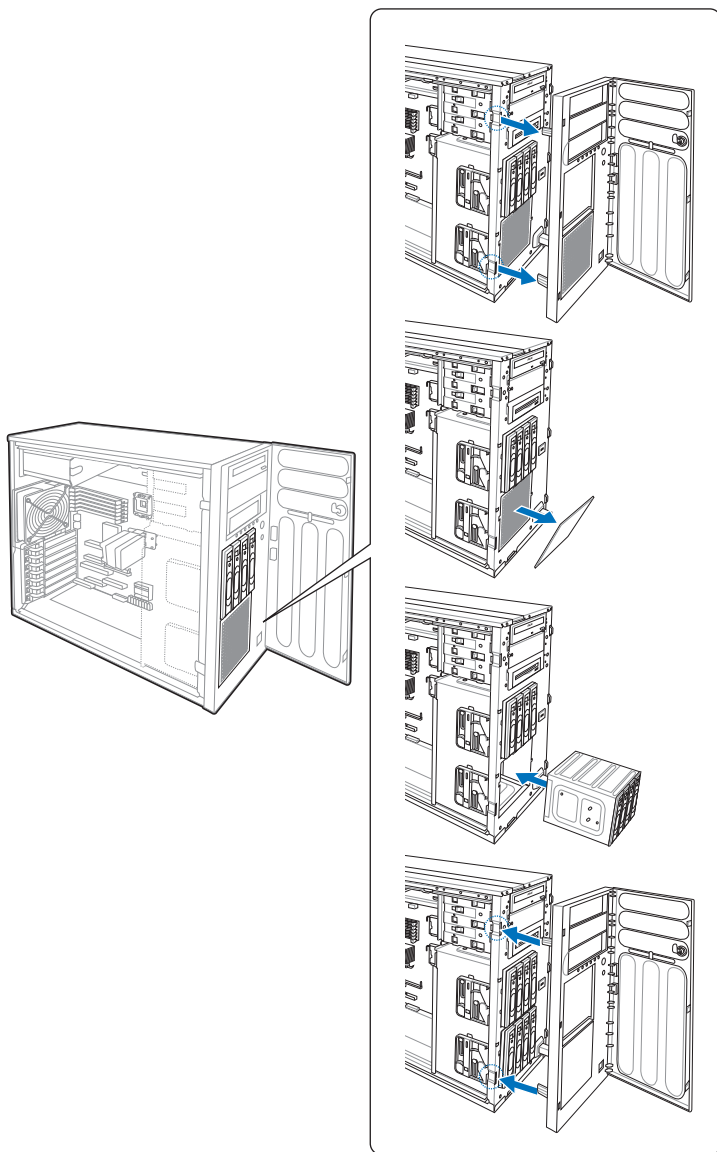


We recommend that you install identical drives of the same model and capacity for RAID configuration.

Order P/N	Description
SAS HDD	
90-S000H0040	300GB, 3.5" SAS HDD / ASUS
90-S000H0030	146GB, 3.5" SAS HDD / ASUS
90-S000H0020	73GB, 3.5" SAS HDD / ASUS
SATAII HDD	
90-S000H5500T	1TB, 3.5" SATAII HDD / ASUS
90-S000H5400	750GB, 3.5" SATAII HDD / ASUS
90-S000H5300	500GB, 3.5" SATAII HDD / ASUS
90-S000H5000	250GB, 3.5" SATAII HDD / ASUS

2.4 Upgrading hard disk drive cage

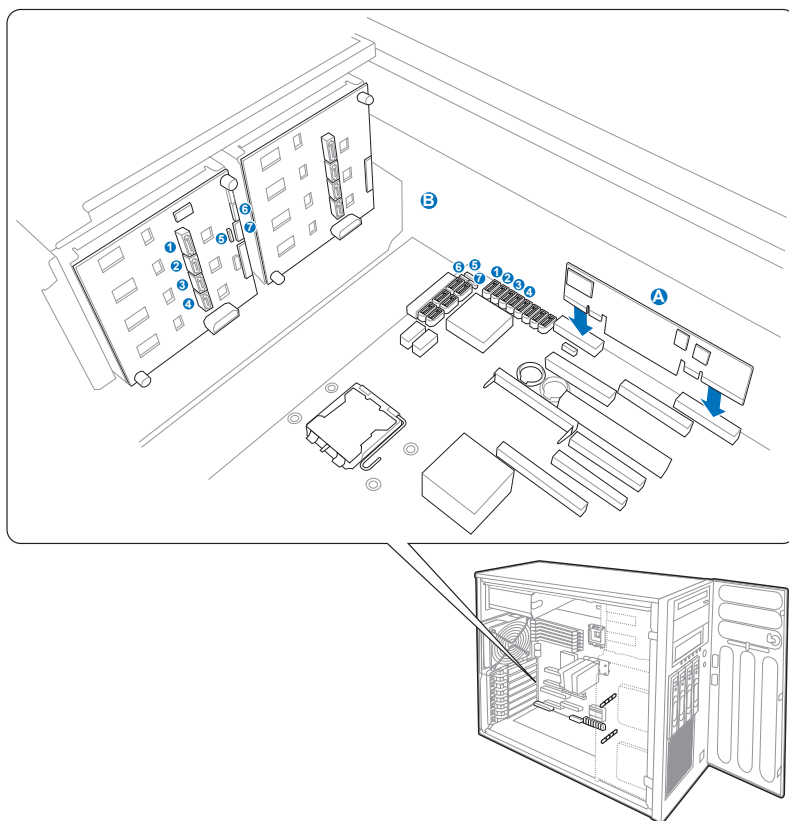
With the optional hard disk drive cage, the system could be upgraded up to eight hot-swap SATAII/SAS hard disk drives.



Order P/N	Description
90-S4R0H000T	Cage Kit, SAS/SATA HDD Cage Kit (including Cage/Backplane/Cables)

2.5 Installing ASUS PIKE 1064E module

The ASUS PIKE 1064E module allows users to create RAID 0, 1 and 1E from SAS hard disk drives connected to the SAS connectors on the motherboard.



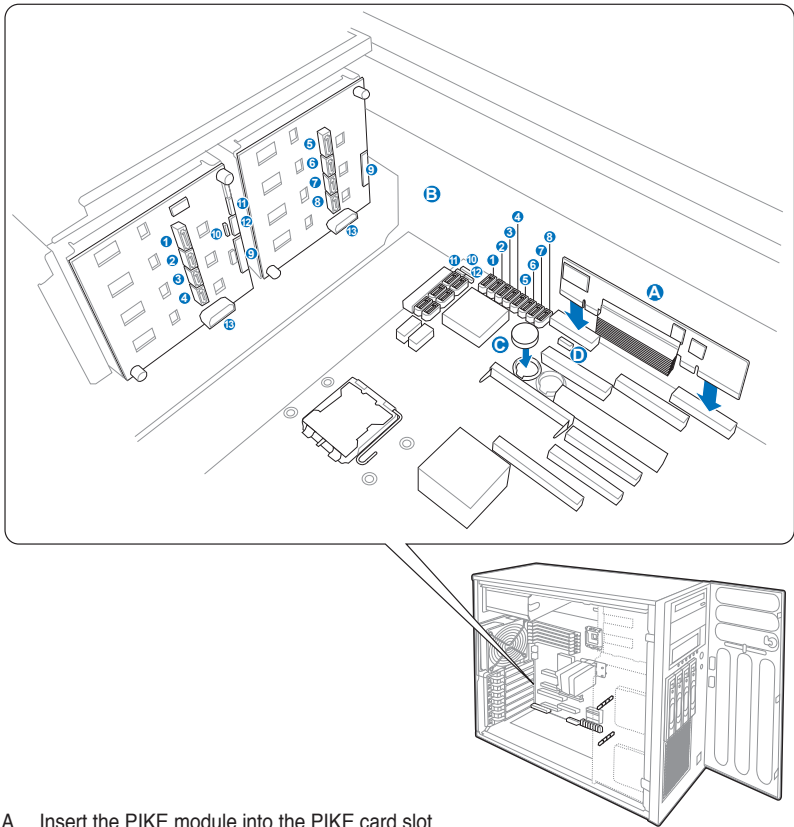
- A. Insert the PIKE module into the PIKE card slot.
- B. Connect the SAS cables to the SAS connectors on the motherboard and SATAII/SAS backplane board*.

* Use the SAS1–4 connectors on the motherboard when installing PIKE 1064E module.

Order P/N	Description
90-C1SCM0-00UAY00Z	ASUS PIKE 1064E 4-port SAS Module (Support Integrated RAID 0, 1, 1E)

2.6 Installing ASUS PIKE 1078 module

The ASUS PIKE 1078 module allows users to create RAID 0, 1, 5, 6, 10, 50 and 60 from SAS hard disk drives connected to the SAS connectors on the motherboard.



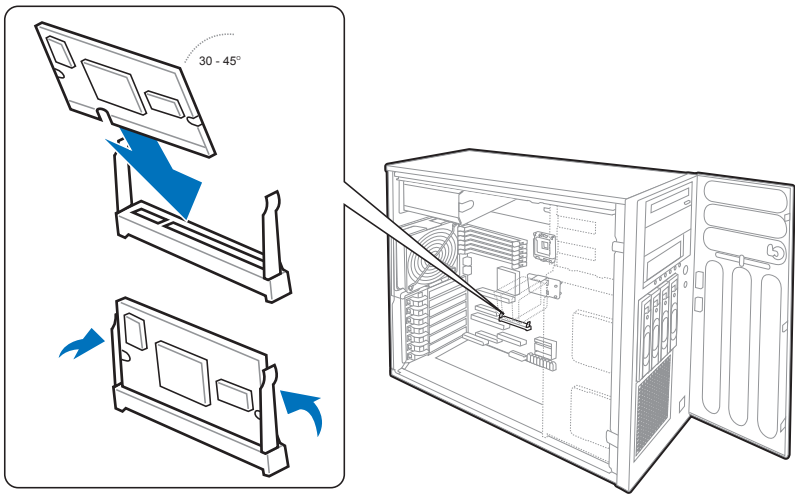
- A. Insert the PIKE module into the PIKE card slot.
- B. Connect the SAS cables to the SAS connectors on the motherboard and SATAII/SAS backplane board*.
- C. Install the iButton**.
- D. Ensure that the jumper caps are placed on pins 1–2 of the IBTN_SEL1 jumper.

* The connectors 9–12 are used for transferring SGPIO signals. Ensure to connect the connectors 9 between the two backplanes when installing the second HDD cage. Refer to user manual for details.

** PIKE 1078 module won't function if the iButton is not installed.

Order P/N	Description
90-C1SCN5-00UAY10Z	ASUS PIKE 1078 8-port SAS RAID Module (Support Hardware RAID 0, 1, 5, 6, 10, 50, 60)

2.7 Installing ASUS Server Management Board



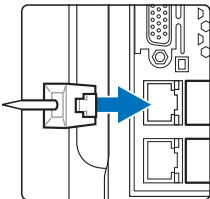
ASMB3-SOL PLUS

ASUS Server Management Board is an Intelligent Platform Management Interface (IPMI) 2.0-compliant board that allows users to monitor, control and manage a remote server from the local or central server in local area network (LAN).

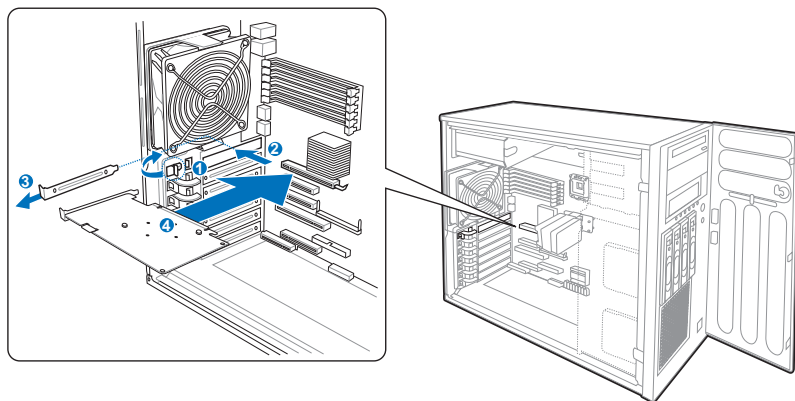
Order P/N	Description
90-C1SCT5-00UAN00Z	ASMB3-SOL PLUS IPMI 2.0 Module



Use the LAN1 port for server management.

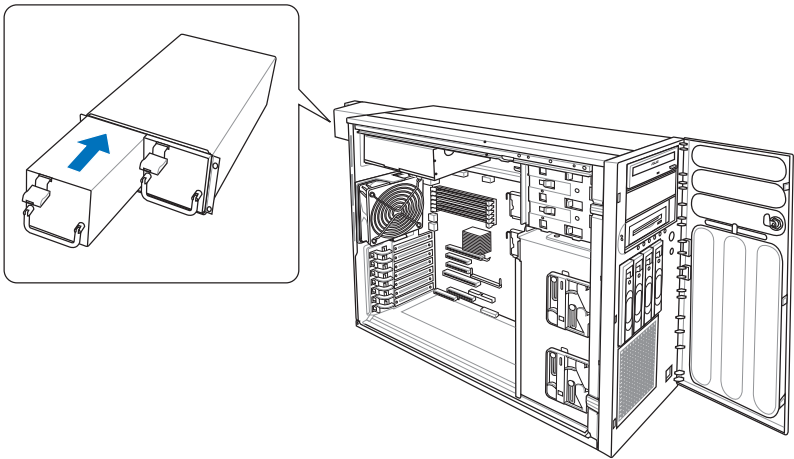


2.8 Upgrading graphics card



Contact local distributors for workstation SKU.

2.9 Upgrading power supply unit

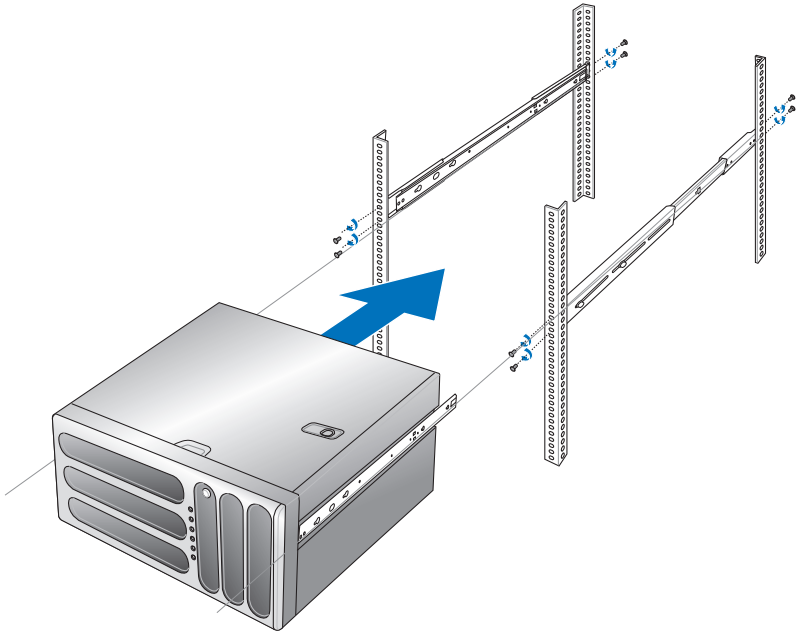


Order P/N	Description
90-S4QPW0010T	650W Redundant Power Supply Module



Remove the dummy power supply module before installing the second redundant power supply.

2.10 Rackmount rail kit



Order P/N	Description
90-S00SP0020T	Rail Kit (Ball Bearing) for TS500-E5 Series

2.11 OS support list

OS support list
Windows® Server 2003 R2 Enterprise 32-bit
Windows® Server 2003 R2 Enterprise 64-bit
RedHat® Enterprise Linux 32-bit
RedHat® Enterprise Linux 64-bit
SuSE® Linux Enterprise Server 32-bit
SuSE® Linux Enterprise Server 64-bit

Order P/N	Description
90-S00SW7120T	OS, Microsoft® Windows® Server 2003 R2 Standard 1-4 CPU, 5 CAL (32bit) (Traditional Chinese)
90-S00SW7130T	OS, Microsoft® Windows® Small Business Server 2003 R2 STD 1-2 CPU, 5 CAL (32bit) (Chinese)