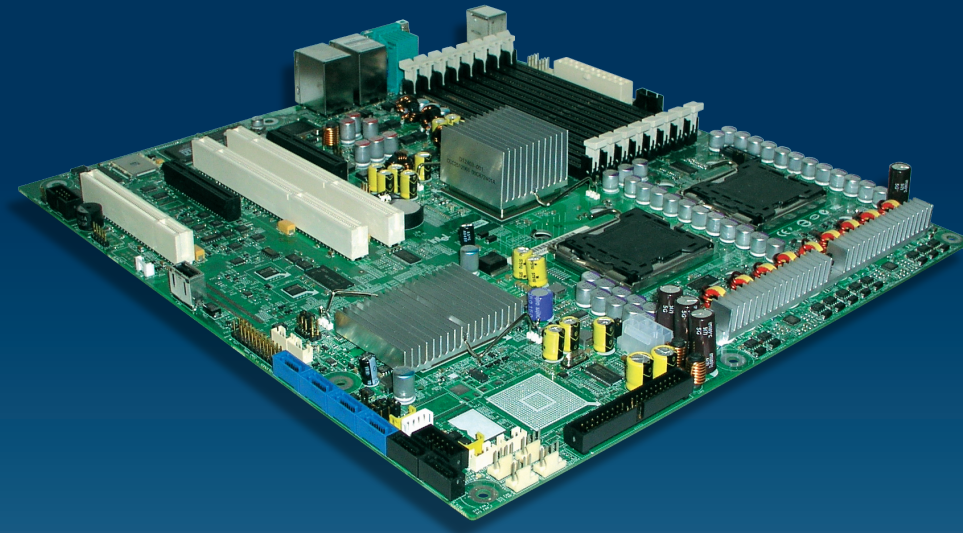# Intel® Server Board S5000VSA
Quick Start User's Guide

Thank you for buying the Intel® Server Board S5000VSA. The following information will help you integrate your new server board into a server chassis. The Intel® Server Board S5000VSA is designed for use with the Intel® Entry Server Chassis SC5299-E.

For details on these chassis or to select a third party chassis, please visit http://www.intel.com/go/serverbuilder and http://support.intel.com/support/motherboards/server.

When installing the server board into a reference chassis, refer to the reference chassis instructions.

User Guides are also available on the Intel® Server Deployment Toolkit 2.0 CD that accompanied your Intel® Server Board S5000VSA.

If you are not familiar with ESD (Electrostatic Discharge) procedures used during system integration, please see the Intel® Server Board S5000VSA User's Guide, available on the Intel® Server Deployment Toolkit 2.0 CD or at http://support.intel.com/support/motherboards/server/s5000vsa/howto.htm.

intel Xeon® inside™
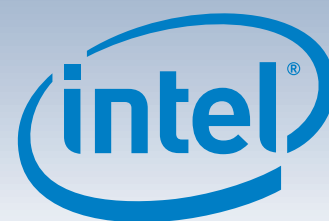
intel®

Minimum Hardware Requirements

To avoid integration difficulties and possible board damage, your system must meet the following minimum requirements:

- **Processor:** Dual-Core Intel® Xeon® processor 5000 sequence with compatible heat sink.
- **Memory Type:** Minimum of one 512MB, 240-pin DDR2 533/667 MHz FBDIMM.
- **Power:** Minimum of 550W with 3A of standby current, which meets the SSI EPS 12V specification.

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1 Preparing the Chassis

When using an Intel® Server Chassis, begin with the Quick Start User's Guide that came with your chassis. Return to this document when directed by the server chassis Quick Start User's Guide. If using a non-Intel server chassis, refer to the documentation that came with your chassis for preparatory steps.

Observe normal ESD (ElectroStatic Discharge) procedures. Place your Intel® Server Chassis on a flat anti-static surface to perform the following integration procedures. Always touch the chassis frame first, before reaching inside to make server board connections or to install components.

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3 Install Server Board Bumpers

IMPORTANT NOTE: If you are using a non-Intel server chassis, see your chassis documentation for preparatory steps prior to server board installation. Use the bumpers that came with your Intel® Server Board S5000VSA for a non-Intel chassis. If you are using an Intel® Server Chassis, use the bumpers that came with the chassis.

Prepare Server Board

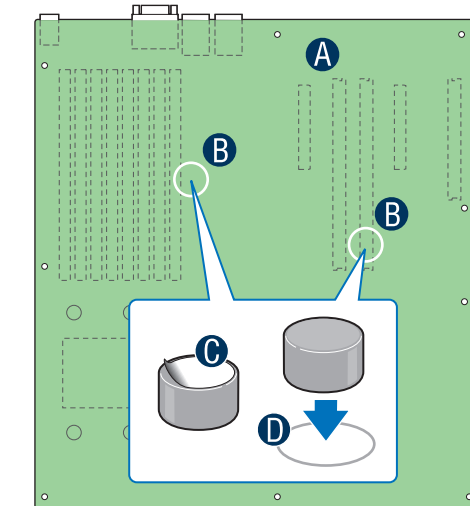**A** Rotate board to show underside and hold upright as shown.

⚠ CAUTION: To avoid damage to the board, do not lay flat with the component side down.

B Locate the two white-line circles as shown.

Attach the Bumpers

C Remove the backing from each bumper.

**D** Press a bumper onto each of the two white-line circles.

---

2 Installing the I/O Shield and Attach I/O Label

Note: The I/O shield and label installation procedures shown below apply to the Intel® Entry Server Chassis SC5299-E.

Prepare the I/O shield

You must remove the sheet metal plug for the video connector before installing the I/O shield. Use a flat-blade screwdriver if necessary, but do not deform the shield.
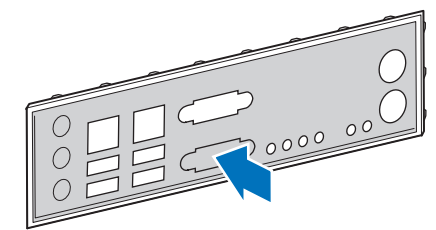
Attach the Labels to the I/O Shield (optional)

Labels on outside face of I/O shield

Note: Make sure you install the labels on the correct side of the I/O shield. Note the orientation of the cutouts in the drawing before attaching your labels.

A Remove the backing from one of the two I/O shield labels included with your server board.

B Press the label onto the I/O shield as shown.

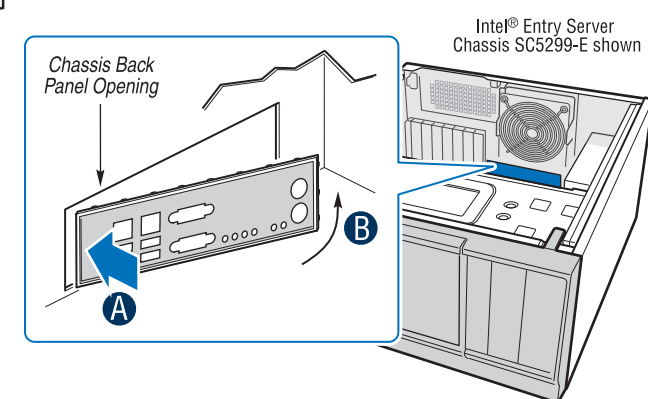**C** Repeat steps to install the second I/O shield label.
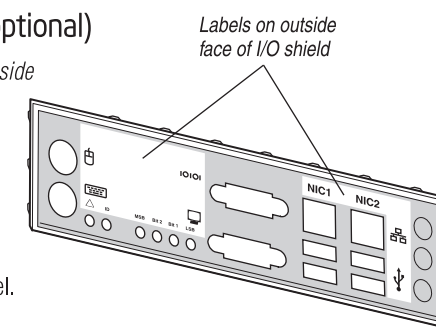
Install the I/O shield

Shield installs from **inside** of chassis, The labels should be visible from the outside of the chassis.

Chassis Back Panel Opening

Intel® Entry Server Chassis SC5299-E shown

A Insert one side edge of shield as shown.

B Push shield firmly into chassis opening until it clicks into place.
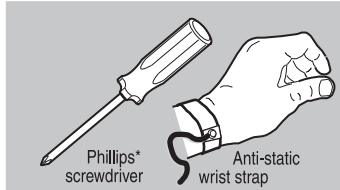
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4 Install the Server Board

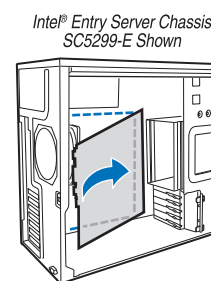IMPORTANT NOTE: If you are using a non-Intel server chassis, see your chassis documentation for preparatory steps prior to server board installation.

A. Insert the Server Board

Place the board into the chassis, making sure that back panel I/O shield openings and chassis standoffs align correctly.

- When using the Intel® Entry Server Chassis SC5299-E, insert the front of the board first, then slide the board back so the I/O connectors fit through the I/O shield.

Intel® Entry Server Chassis SC5299-E Shown

B. Attach the Server Board

The directions below are for the Intel® Entry Server Chassis SC5299-E. *For a non-Intel server chassis, use the fasteners that came with your chassis.*

Your chassis has two snap-standoffs installed at the 2 locations indicated by the solid black arrows in the figure [◆].

Use screws to attach the board to the chassis at the 6 locations indicated by the solid blue arrows in the figure [◆].
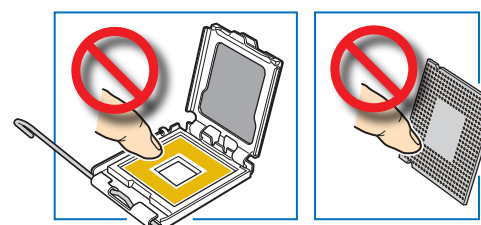
Be sure the server board engages the two snap-standoffs first, then proceed with attaching the server board with 6 screws.

Intel® Entry Server Chassis SC5299-E

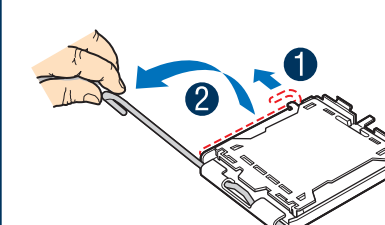Server Board Fastener

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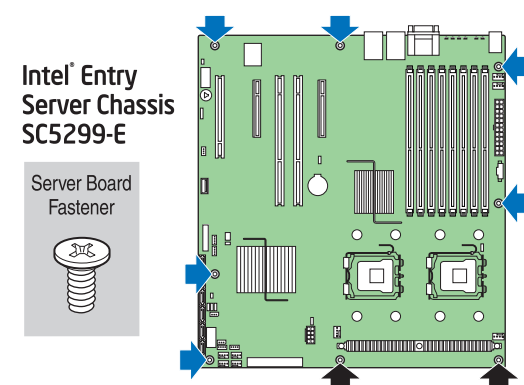
5 Install the Processor

Caution:

⚠ When unpacking a processor, hold by the edges only to avoid touching the contacts.
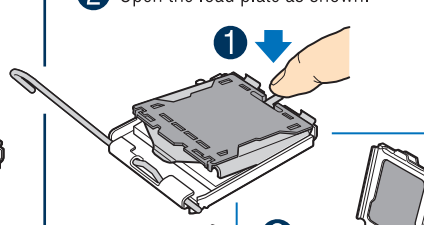
A. Open the Socket Lever

1 Push the lever handle down and away from the socket to release it.

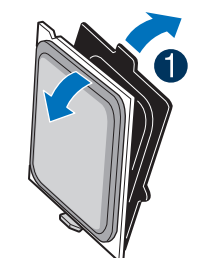**2** Pull the lever and open all the way.

B. Open the Load Plate

1 Push the rear tab with your finger tip to bring the front end of the load plate up slightly.
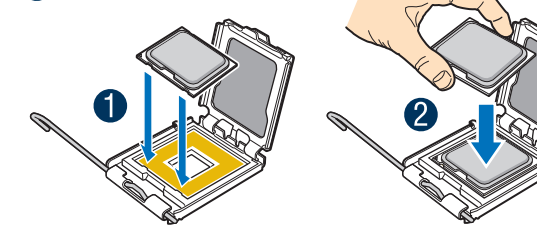
2 Open the load plate as shown.

C. Remove the Processor Protective Cover

**1** Take the processor out of the box and remove the protective shipping cover.

D. Install the Processor

1 Orient the processor with the socket so that the processor cutouts match the socket notches.

2 Install the processor as shown.

E. Remove Socket Protective Cover

1 Grasp the socket protective cover tab and pull away from the load plate as shown.

2 Remove the socket protective cover and store for future use.
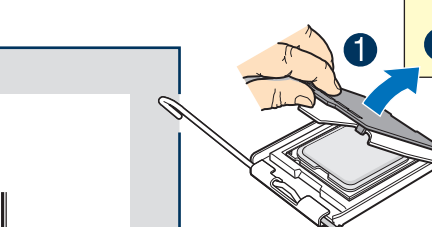
F. Close Load Plate and Socket Lever

1 Close the load plate all the way as shown.

2 With your finger, push down on the load plate as shown.

3 Close the socket lever and ensure that the load plate tab engages under the socket lever when fully closed.

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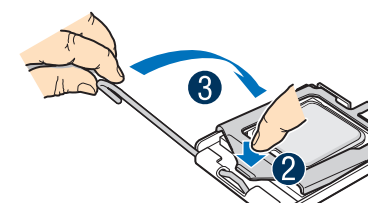
6 Install Active Heat Sink(s)

An active heat sink is required for the Intel® Entry Server Chassis SC5299-E DP and BRP. *A typical active heat sink is shown below.*

For a non-Intel chassis, see the documentation accompanying your chassis.

⚠ CAUTION: The heat sink has thermal interface material (TIM) on the underside of it. Use caution so that you do not damage the thermal interface material. *Use gloves to avoid sharp edges.*

A If a protective film covers the thermal interface material (TIM) on the underside of the heatsink, remove the protective film.

B Align heatsink fins to the front and back of the chassis for correct airflow. Airflow goes from front-to-back of chassis.

Each heatsink has four captive fasteners and should be tightened as follows:

C Using a #2 Phillips* screwdriver, finger-tighten each fastener diagonally, according to the white-circled numbers.

D Securely re-tighten each fastener again in the same order as performed in Step C.

E Attach fan power cable to server board as shown.

Note: Heatsink styles may vary.

⚠ Do not over-tighten fasteners.

Air Flow   TIM   Chassis Front

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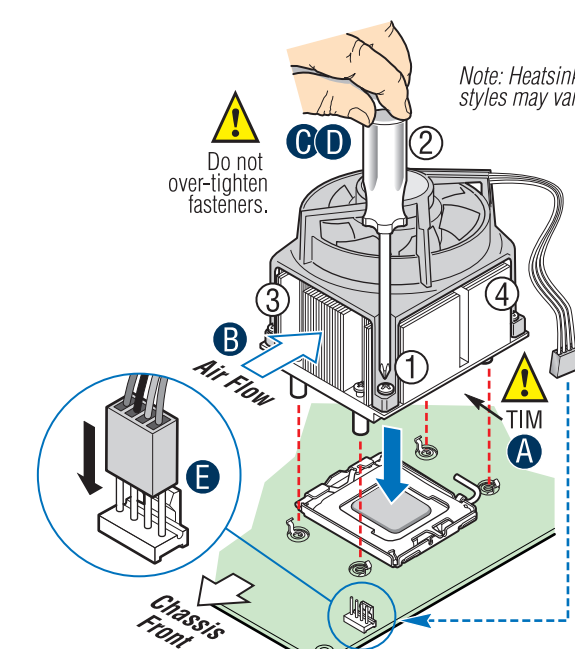
7 Install DIMM Memory Modules

DDR2 FBDIMM Memory Identification:

⚠ This server board supports up to eight DDR2-533 or DDR2-667 Fully Buffered DIMMs (FBD memory). DDR2 DIMMs that are not FBD memory are not supported on this server board.

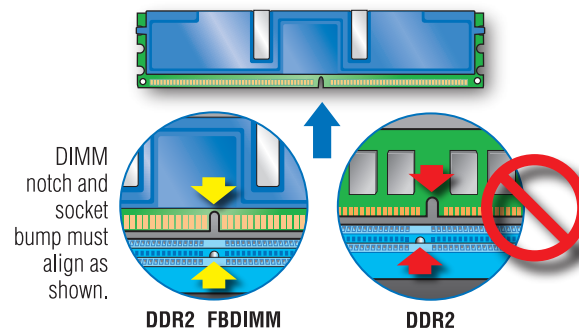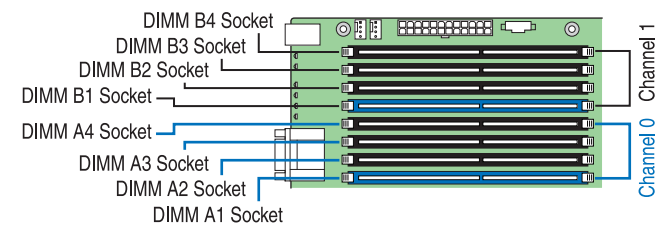⚠ FBDIMM DDR2 memory varies in height. Only use 1.2" DIMMs with an Intel® Server Chassis.

DIMM notch and socket bump must align as shown.

DDR2 FBDIMM   DDR2

Memory Configurations and Population Order:

DIMM B4 Socket
DIMM B3 Socket
DIMM B2 Socket
DIMM B1 Socket
DIMM A4 Socket
DIMM A3 Socket
DIMM A2 Socket
DIMM A1 Socket

Channel 1 / Channel 0

Memory Type: Minimum of one 512MB, DDR2 FBDIMM 533/667 MHz compliant 240-pin gold DIMM.

Populate DDR2 FBDIMMs beginning with A1(single FBDIMM only). Second FBDIMM must be in socket B1. Additional FBDIMMs must be populated only in pairs in the following order: A2 - B2, A3 - B3 and A4 - B4.

DIMM pairs must be identical with respect to size, speed, and organization.

Note: For additional memory configurations, see the User's Guide on the CD that accompanied your Intel® Server Board S5000VSA, or go to:
http://support.intel.com/support/motherboards/server/s5000vsa

Memory sizing and configuration is guaranteed only for qualified DIMMs approved by Intel®.

To Install DIMMs:

⚠ CAUTION: Avoid touching contacts when handling or installing DIMMs.

A Open both DIMM socket levers.
B Note location of alignment notch.
C Insert DIMM making sure the connector edge of the DIMM aligns correctly with the slot.
D Push down firmly on the DIMM until it snaps into place and both levers close.

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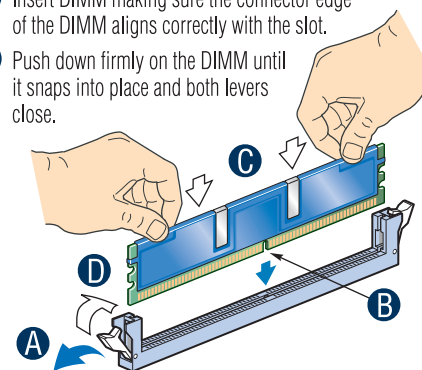
8 Make Server Board Power Connections

A Attach the CPU power connector.
B Attach the main power connector.
C Attach the AUX power connector if you are using the Intel® Entry Server Chassis SC5299-E BRP.
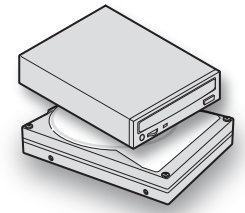
⚠ CAUTION:
Note the location of the latch on each power cable connector and align it with the matching tab on each server board socket.

IMPORTANT NOTE: If you are using a non-Intel server chassis with an ATX power supply, see the documentation that came with your chassis for installation information.
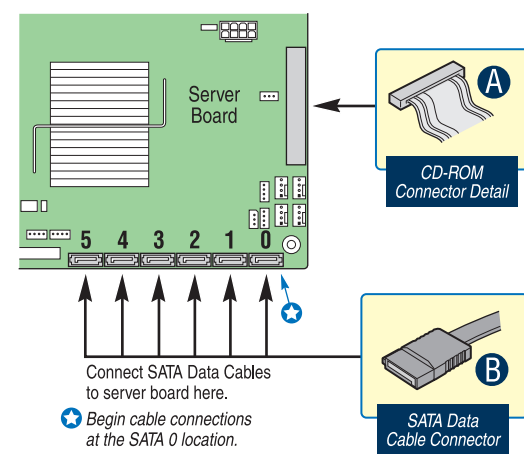
Server Board

Main Power Connector Detail

CPU Power Connector Detail
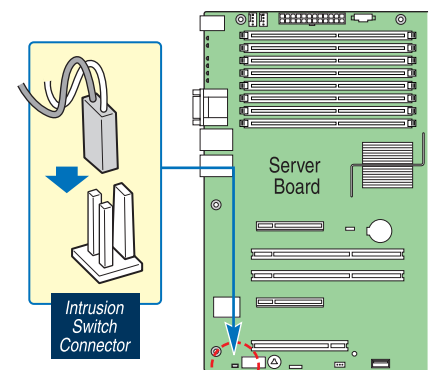
Latch / Tab

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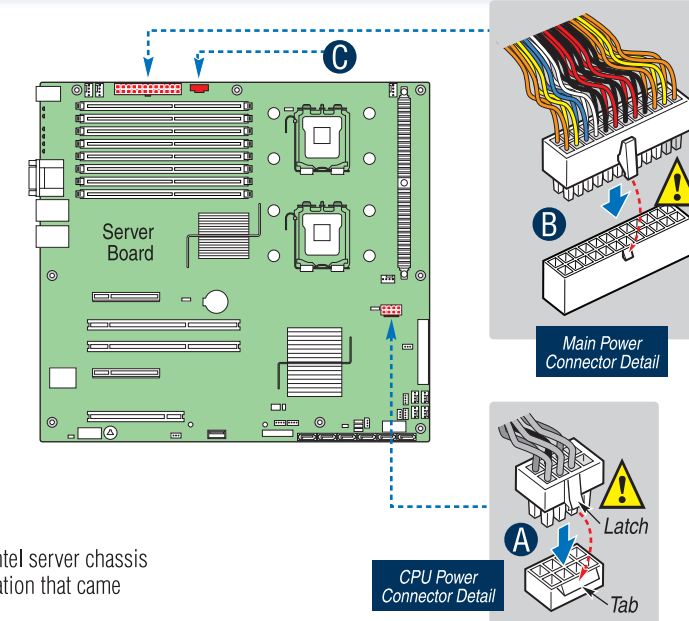
9 Install Optical Drive and Hard Drive(s)

See the documentation that came with your server chassis for drive installation.

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10 Connect Hard Drives/CD-ROM to Server Board

Server Board

A CD-ROM Connector Detail

5 4 3 2 1 0

Connect SATA Data Cables to server board here.

✦ Begin cable connections at the SATA 0 location.

B SATA Data Cable Connector

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11 Attach Intrusion Switch Cable (Non-Intel Chassis Only)

Server Board

Intrusion Switch Connector

For a non-Intel chassis, see your chassis documentation for intrusion switch requirements.

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12 Attach Front Panel, Serial and USB Connections

Server Board

Serial B (EMP)   Front Panel   USB 4-5
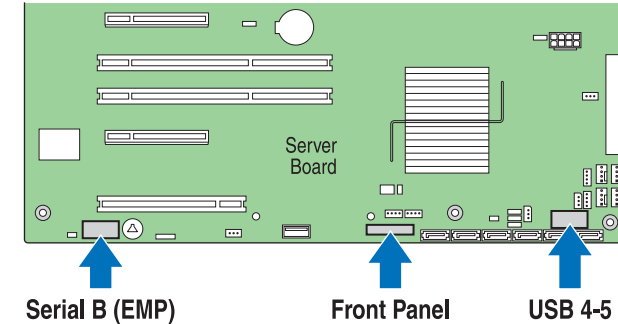
Note: For a non-Intel chassis, see your chassis documentation for front panel features and server board connection requirements.

IMPORTANT NOTE: Return to your Intel® Server Chassis Quick Start User's Guide, or your non-Intel chassis documentation to finish installation and configuration of your Intel® Server Board S5000VSA.

Return to this document to finish up, including software, BIOS, drivers and operating system installation.

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13 Chassis Fan Connections

Server Board

Attach fans with 3 or 4-pin connectors here.
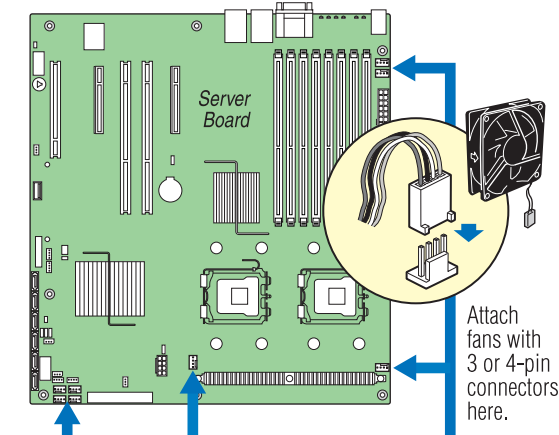
For a non-Intel server chassis, see the "Making Connections ... Quick Reference" section below, and the documentation accompanying your chassis for specific chassis fan connection requirements.

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14 Install Add-in Cards

See the documentation that came with your server chassis for add-in card installation.

For the Intel® Server Chassis SC5299-E, see the Quick Start User's Guide accompanying the chassis.
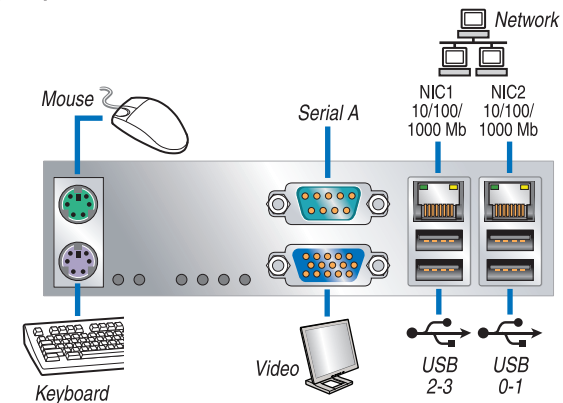
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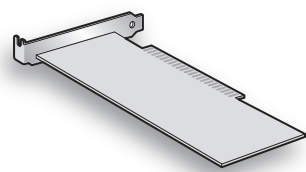
15 Finishing Up

Before installing your operating system, you must finish your chassis installation, make I/O connections and plug in AC power.

See your chassis documentation for AC power and grounding requirements.

⚠ CAUTION: See your chassis documentation for AC power and grounding requirements.

Mouse / Serial A / Network / NIC1 10/100/1000 Mb / NIC2 10/100/1000 Mb
Keyboard / Video / USB 2-3 / USB 0-1

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16 Software • BIOS, Drivers, and Operating System Installation

A. Confirm BIOS Version: Look on the Server/System Management screen in the BIOS Setup Utility to determine the installed BIOS version. Compare this to the versions at:
http://support.intel.com/support/motherboards/server/s5000vsa
If new versions are available, update the BIOS on your server. See the User Guide on the Intel® Server Deployment Toolkit 2.0 CD for update instructions.

B. Configure your RAID Controller: Use the instructions provided with the RAID controller.

C. Install your Operating System: Use the instructions provided with the RAID controller and with the operating system.

D. Install Operating System Drivers: With the operating system running, insert the Intel® Server Deployment Toolkit 2.0 CD. If using a Microsoft* Windows* operating system, the Intel® Deployment Assistant will autorun and allow you to select the appropriate drivers to install. On other operating systems, browse the CD folders to locate and install the driver files.

E. Install Intel® SMaRT Tool (optional):
With the operating system running, insert the Intel® Server Deployment Toolkit 2.0 CD. The Express Installer will autorun. Click Intel® SMaRT Tool at the left side of the screen. Follow the on-screen instructions. For information about Intel® SMaRT Tool, see
http://developer.intel.com/design/servers/smarttool/index.htm.

Reference

Accessories and Order Codes

Intel® Entry Server Chassis SC5299-E with 550W fixed power supply	SC5299DP
Intel® Entry Server Chassis SC5299-E with 650W 1+0 hot-swap power supply	SC5299BRP
Intel® Entry Server Chassis SC5299-E with 550W fixed power supply and North American power cord	SC5299DPNA
Intel® Entry Server Chassis SC5299-E with 650W 1+0 hot-swap power supply and North American power cord	SC5299BRPNA
Optional 650W power supply for the Intel® Entry Server Chassis SC5299-E BRP	APP4650WPSU

A complete list of accessories and spares can be found at:
www.intel.com/go/serverbuilder

Common Problems and Solutions

For a list of hardware components that have been tested with this system, see: http://support.intel.com/support/motherboards/server/s5000vsa/

The system does not boot or show video at power-on.
- Check that +12V CPU power connector is plugged in. Without this cable the processor will not have any power.
- Beep code 4-3-2-1 in a system using a Dual-Core Intel® Xeon® processor 5000 sequence (minimum of 2.8 GHz) means you have unrecognized or bad memory.
- Remove and replace DIMMs one bank at a time to isolate which one is causing problems.
- Remember, all DIMMs must be:
  - FBDIMM1 533/667 MHz compliant 240-pin DIMMs.
  - The same speed.
  - From the same manufacturer.
  - Installed beginning with DIMM A1.
  - Your power supply must provide a minimum of 550W with 3A standby current, which complies with the SSI EPS 12V specification.

The system sometimes works, but is exhibiting erratic behavior.
- This is typically the result of using an under-rated power supply. Make sure you are using at least a 550W power supply.

Making Connections to the Server Board ... *Quick Reference*

Required Connections for Selected Chassis — Intel® Entry Server Chassis SC5299-E

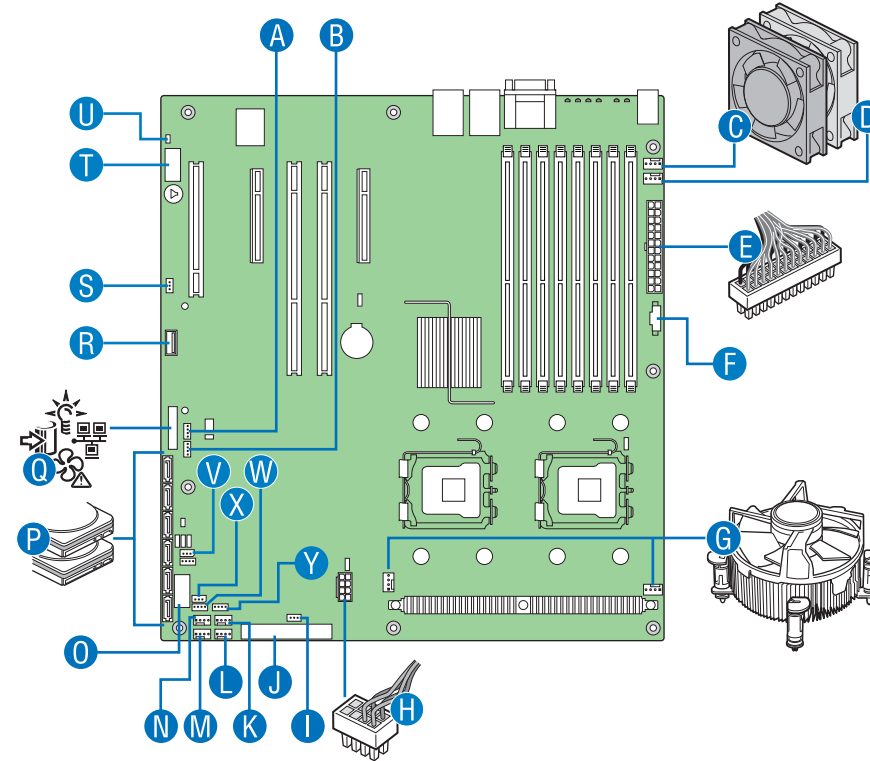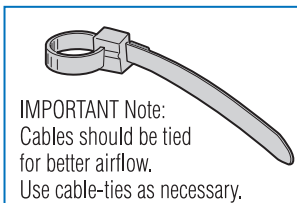|	
H. +12V CPU Power Connector	■
E. Main Power Connector	■
F. Auxiliary Power Connector	■
Q. Front Panel Header	■

Note: Auxiliary Power Connector (F) is not available on the Intel® Server Chassis SC5299-DP.

CPU/System Fan Connections for Selected Chassis — Intel® Entry Server Chassis SC5299-E

C. System Fan 6 Header (Rear Chassis Fan)	■
D. System Fan 5 Header	
G. CPU1 Fan Header [right] Connect CPU2 Fan Header [left] if CPU2 present	■
K. System Fan 3 Header	
L. System Fan 4 Header	
M. System Fan 2 Header	
N. System Fan 1 Header (Drive Bay Fan)	

Optional Connections for Selected Chassis — Intel® Entry Server Chassis SC5299-E

A. HSBP_A	■
B. HSBP_B	■
I. SAS RAID 5 Key	■
J. CD-ROM/IDE Connector	■
O. USB 4-5	■
P. SATA connectors	■
R. USB 6	■
S. SATA RAID 5 Key	■
T. Serial B (EMP)	■
U. Chassis Intrusion Header	■
V. IPMB	■
W. SATA SGPIO	■
X. SAS_SES2	■
Y. SAS SGPIO	■

Notes: Not all optional connections are shown in this diagram. Refer to the Reference section of this Quick Start User's Guide, your Intel® Server Board S5000VSA User's Guide, and your server chassis documentation for additional connection information.

For a non-Intel Chassis, see your chassis documentation for server board connection information.

IMPORTANT Note: Cables should be tied for better airflow. Use cable-ties as necessary.

Intel® Server Board S5000VSA Component Layout

A. PCI 32/33 Slot 1
B. PCIe* x4 Slot 3
C. PCI-X* 64/133 Slot 4
D. PCI-X* 64/100 Slot 5
E. PCIe* x4 Slot 6
F. Back Panel I/O Ports
G. Diagnostic LEDs (1)
H. System ID LED (1)
I. System Status LED (1)
J. System Fan 6
K. System Fan 5
L. Main Power Connector
M. Auxiliary Signal Connector
N. DIMM Sockets (2)
O. CPU 1 Socket
P. CPU 2 Socket
Q. CPU Fan 2 Header
R. CPU Fan 1 Header
S. CPU Voltage Regulator
T. Battery
U. CPU Power Connector
V. IPMB
W. SAS RAID 5 Key (3)
X. IDE Connector

Y. LCP
Z. SAS_SES2 (3)
AA. SAS SGPIO (3)
BB. System Fan 3
CC. System Fan 4
DD. System Fan 2
EE. System Fan 1
FF. SATA SGPIO
GG. USB 4-5
HH. SATA 0 Connector
II. SATA 1 Connector
JJ. SATA 2/SAS 0 Connector
KK. SATA 3/SAS 1 Connector
LL. SATA 4/SAS 2 Connector
MM. SATA 5/SAS 3 Connector
NN. HSBP_B
OO. Front Panel Header
PP. HSBP_A
QQ. USB 6 (1)
RR. SATA RAID 5 Key
SS. Speaker
TT. Serial B EMP Connector
UU. Chassis Intrusion

(1) Not available on S5000VSA4DIMMR
(2) S5000VSA4DIMMR only has 4 DIMM sockets
(3) Only available on S5000VSASASR