intel

Intel® SDS2 Server Board Troubleshooting Guide

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

Revision 1.0
January 2002

Revision History		
Date	**Rev**	**Modifications**
January 2002	1.0	Initial Release

Information in this document is provided in connection with Intel® products. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Intel's terms and conditions of sale for such products, Intel assumes no liability whatsoever, and Intel disclaims any express or implied warranty, relating to sale and/or use of Intel products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright or other intellectual property rights. Intel products are not intended for use in medical, life saving, or life sustaining applications.

Intel may make changes to specifications and product descriptions at any time, without notice.

Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined". Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them.

The Intel® SDS2 server board may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Contact your local Intel sales office or your distributor to obtain the latest specifications before placing your product order.

Copies of documents which have an ordering number and are referenced in this document, or other Intel literature, may be obtained from:

> Intel Corporation
> P.O. Box 5937
> Denver, CO 80217-9808

or call in North America 1-800-548-4725, Europe 44-0-1793-431-155, France 44-0-1793-421-777, Germany 44-0-1793-421-333, other Countries 708-296-9333

Intel, Pentium, and Celeron are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

- Other brands and names may be claimed as the property of others.

SDS2 Troubleshooting

Welcome to the Intel® SDS2 server platform. In the unlikely event you do encounter issues, this guide will help you troubleshoot & identify possible problem areas.   If you are unable to resolve a problem using this guide, please call our help desk. This guide will help you collect the data we will need to help you through your issues. Each issue includes suggestions that may help you, and a list of information we will need to assist you should you need to call.   Please visit the Intel Support website for updated versions of this document:

http://support.intel.com/support/motherboards/server/Sds2/

Boot Issues

1) My server will not power on.

Check for the following possibilities:

- The SDS2 server board requires an ATX12V power supply with a 4-pin or 8-pin 12V power connector. The SDS2 will not power on with a standard ATX power supply without the 12V connector (CN51) on the SDS2 Server Board.
- Have you securely plugged the server AC power cord into the power supply?
- Have you plugged the server into a "powered on" power strip?
- Some ATX power supplies have a power switch on the back of the power supply next to the fan, is it switched on?
- Is the power supply set correctly to 110V or 235V depending on your power output?
- Remove all add-in cards and see if the server boots using just the on-board components. If successful, add the cards back in one at a time with a reboot in between to see if you can pinpoint a suspect card.
- Remove the processor(s) and reseat.
- Remove and reseat the memory modules. Try using memory modules from a known working server system.
- Ensure there are no extra stand-offs under the board that could potentially be shorting the board out and not allowing it to power on. Stand-offs should only be located beneath the board mounting holes.

Though it is unlikely that a server will not boot, there are many reasons why it may not boot. If you are unable to resolve this issue, please fill out the included customer support form and call your customer support representative. Please note the answers to the following questions below.

- What memory is the server using? Is it on the tested memory list? Visit the Intel support site for an updated memory list at http://support.intel.com/support/motherboards/server/Sds2/
- What chassis and power supply is the server using?
- If you are using a chassis with front panel lights, are there any front panel lights on?
- Is the power supply fan spinning?
- Does the system beep? See Issue 2.
- Please note what is displayed on the monitor or any sounds emanating from the server system.
- If the server will still not boot, please fill in the issue report form at the end of this document & contact your Intel customer support representative.

2) Upon booting, my server starts beeping.

Most likely, these beeps are "beep codes." They identify system events in case video fails to display. The following gives a description of possible beep codes for this board. For a complete list, please see the SDS2 Technical Product Specification at http://support.intel.com/support/motherboards/server/Sds2/

Table 3. Beep Codes

Beeps	Description
1-2-2-3	BIOS ROM checksum
1-3-1-1	Test DRAM refresh
1-3-1-3	Test 8742 Keyboard Controller
1-3-3-1	Autosize DRAM, system BIOS stops execution here if the BIOS does not detect any usable memory DIMMs
1-3-4-1	Base RAM failure, BIOS stops execution here if entire memory is bad
2-1-2-3	Check ROM copyright notice
2-2-3-1	Test for unexpected interrupts
1-2	Search for option ROMs. One long, two short beeps on checksum failure
1	One short beep before boot

3) My HDD lights went on, I heard the drives spin up, and my floppy drive light turned on, but I'm not seeing video.

Check the following:

- Make sure the monitor is turned on and the video cable is plugged in completely.
- Remove all add-in cards and retry booting with just the on-board components. If successful, try adding the add-in Board one at a time with a reboot in between to try to pinpoint a suspect card.
- Remove and reseat memory modules. Try using memory from a known working system.
- Remove and reseat processor(s).
- If you are using a switch box to share a monitor between multiple servers, ensure switching to the proper server.
- Check in the BIOS setup to ensure that video has not been disabled. Access the BIOS setup by pressing F2 when the Intel BIOS logo screen appears. In BIOS setup, verify that Advanced -> Embedded Video Controller -> VGA Controller is set to "enabled" (default).
- Ensure there are no extra stand-offs under the board that could potentially be shorting the board out and not allowing video to display. Stand-offs should only be located beneath the board mounting holes.

If you are unable to get a video image, please fill out the included customer support form and call your customer support representative. Please note the answers to the following questions below.

- What memory is the system using? Is it on the tested memory list? Visit the Intel support site for an updated memory list at http://support.intel.com/support/motherboards/server/Sds2/
- What chassis and power supply is the system using?
- If the chassis has front panel lights, are any front panel lights on?
- Is the power supply fan spinning?
- Does the system beep? See Issue 2.
- Please note any sounds emanating from the server system.
- If you are using a third party video adapter, please have manufacturer and model number ready.
- If the server will still not boot, please fill in the issue report form at the end of this document & contact your Intel customer support representative.

4) I am installing adapters in my powered-down system, and my system boots up when I install a PCI adapter.

Server management features require full time "standby" power. This means that power is still "on" to parts of the system even if you have turned the system "off" via the power switch on the front panel.

Additionally, signals in the PCI connectors tell the system to boot (normally used by server management adapters/NICs). Plugging in the adapter with the AC power cord still connected can cause false signals to be transmitted commanding the system to boot. Before removing the cover to your chassis, you should always

- Turn off the server via the power switch on the front panel.
- Unplug the AC cord from the back.

5) My system boots up automatically when I power on my power strip.

Some server systems save the "last known power state" since the last AC power connection. If you remove AC power before powering down the system via the power switch on the front panel, your system may automatically attempt to come back to the "on" state it was in once you restore AC power.

- Please keep in mind that unplugging the system or flipping a switch on the power strip both remove AC power.
- Follow the correct A/C removal sequence: Press the front panel button, and then remove the A/C power cord.

Allowing your system to fully power up and then power down the system using the front panel power switch should correct this problem. If it does not, fill out the attached issue report form and call your customer support representative. Please have the following information available:

- What BIOS do you have loaded on the system? (The latest tested BIOS is posted to the Intel Customer Support Website)
- What is the PBA number of the server board? (The PBA number is located on a white label near the edge of the board and is printed in the following format: PBA xxxxxx-xxx)
- What memory is the server using? Is it on the tested memory list? Visit the Intel support site for an updated memory list at http://support.intel.com/support/motherboards/server/Sds2/
- What chassis and power supply is the system using?

6) Some of my hard drives show up during POST and some don't.

Check on the following:

- Are you using third party SCSI adapters? System memory limitations limit the number & size of option ROMs in the system. If you place too many adapters or adapters that take up too much space in memory, they may not install and show the hard drives connected to them.
- Verify that pin 1 on the data cable connects to pin 1 on the device. In most cases, if you orient the data cable so that the colored stripe on the cable is pointing towards the power connector on the device, you will have proper orientation.
- Verify that the device power cable is firmly connected.
- Check your SCSI ID numbers. SCSI devices must have their own unique ID on the SCSI bus. This number must be set with jumpers on the device. ID number should be set starting at 0 and must be set lower than 8 if booting from the drive.
- Check for proper termination on the SCSI bus.
- Ensure your option ROM is enabled for your particular controller card. For many SCSI cards, if you disable the option ROM, the hard drives won't show up during POST, but will still be available

to the operating system. These drives will not, however, be considered boot devices by the system.

If the hard drives still do not show, please fill out the included issue report form and call your customer support representative. Please pay special attention to the following information:

- What add-in adapters do you have in your system (manufacturer and model number)?
- What types of hard drives are in the system (manufacturer and model number)?
- What kind of terminator do you have at the end of the cable? (Manufacturer and type e.g. Ultra 160)
- What are the SCSI IDs of the devices on your SCSI bus?
- How many SCSI channels are you using?
- What memory is the system using? Is it on the tested memory list? Visit the Intel support site for an updated memory list at http://support.intel.com/support/motherboards/server/Sds2/

Other Questions

General Questions

1) **What is Flip Chip Pin Grid Array (FC-PGA)?**
   FC-PGA is a processor package that was developed to improve the thermal dissipation of the heat generated by faster speed processors. The die has been flipped so that the heat is directed away from the server board. This feature, when combined with active heat sinks is an optimal cooling solution.

2) **How many expansion slots does the boxed Intel Server Board SDS2 contain?**
   The boxed Intel Server Board SDS2 has six dedicated PCI connectors. Four PCI slots are 64-bit/66MHz (Slots 1,2, 5, 6) and two PCI slots are 32-bit/33MHz (Slots 3 and 4). All PCI slots support bus-mastering devices and allow for full-length PCI cards to be populated.

3) **What type of battery is used in Intel Server Board SDS2?**
   A standard coin cell (3 volt, CR2032 or equivalent) is used to supply power to the Real Time Clock (RTC) when power is not available from the power supply.

4) **How do I disable the integrated components?**
   Onboard features can be disabled through Server Board SDS2 BIOS setup. To enter BIOS setup, press F2 when prompted during the boot up process

Memory Questions

1) **What memory configurations are supported on the Intel® Server Board SDS2?**
   Server Board SDS2 has slots for six 168-pin Registered ECC Dual Inline Memory Modules (DIMMs) and can support a minimum system memory configuration of 128 MB and a maximum system memory configuration of 6GB of Registered ECC PC-133 SDRAM. Server Board SDS2 supports DIMM sizes of 64 MB, 128 MB, 256 MB, 512 MB and 1GB. The DIMMs must be populated in pairs according to the silkscreen notation on the server board (DIMM 1a & 1b, DIMM 2a & 2b, DIMM 3a & 3b).

2) **What kind of problems might occur in an SDRAM-based system that uses non-compliant DIMMs?**
   The most extreme example is memory failure, when the system hangs while booting. This can happen when the system is unable to communicate properly with the memory. In less extreme cases, the memory may generate intermittent errors or fail during stress.

Processor Questions

1) **What processors are supported on the Intel® Server Board SDS2?**
   The Server Board SDS2 supports the Intel® Pentium® III processor for servers with 256K cache (1 GHz) and 512K cache (1.13 GHz and higher). These processors can only be in the FC-PGA2 package. For a complete list of supported processors, visit the Intel Support website.

2) **What heatsink should I use?**
   The boxed processor comes with the appropriate heatsink for integration into the Intel Server Chassis SC5100.

3) **Does it matter which processor is populated first?**

Not necessarily. Processor 1 (CPU1) is the processor closest to the edge of the board. The Intel Server Board SDS2 is designed in such a way that it can boot from either processor. Remember that in a single processor configuration, a terminator is necessary in the secondary socket.

Jumpers and BIOS Setup Options

1) **How should the jumpers be set on Intel Server Board SDS2?** SDS2 server board jumper headers provide various configuration options, as shown in the figure below. All jumper headers except the Chassis Intrusion header (CN50) are located near the front of the board, between the coin-cell battery socket and the IDE connectors. The Chassis Intrusion header is located near the back corner of the board, next to the PCI Slot 6 connector.

CN42	DEFAULT	FUNCTION		CN48	DEFAULT	FUNCTION
① ②	OPEN	CLOSED = CMOS Clear		① ②	OPEN	CLOSED = FRB3 Timer Disable
③ ④	OPEN	CLOSED = Password Disable				
⑤ ⑥	OPEN	CLOSED = RSV		CN49	DEFAULT	FUNCTION
⑦ ⑧	OPEN	CLOSED = RSV		① ②	OPEN	CLOSED = BMC Force Update
⑨ ⑩	OPEN	CLOSED = BIOS Recovery				
⑪ ⑫	OPEN	CLOSED = RSV		CN50	DEFAULT	FUNCTION
				① ②	CABLED	CLOSED = Chassis Instrusion Disable

CN45	DEFAULT	FUNCTION
① ②	OPEN	CLOSED = RSV

CN46	DEFAULT	FUNCTION
① ②	OPEN	CLOSED = RSV

CN47	DEFAULT	FUNCTION
① ②	OPEN	CLOSED = RSV

The following tables describe each jumper option.

Option	Description
CMOS Clear	When CN42's pins 1 and 2 are OPEN (default), CMOS contents are preserved through the system reset. When they are CLOSED, CMOS contents are set to manufacturing default during system reset.
Password Disable	When CN42's pins 3 and 4 are OPEN (default), the current system password is maintained during a system reset. When they are CLOSED, the password is cleared / disabled on reset.
BIOS Recovery Enable	When CN42's pins 9 and 10 are OPEN (default), the system attempts to boot using the BIOS programmed in the Flash memory. When they are CLOSED, the BIOS attempts a recovery boot, loading BIOS code from a floppy disk into the Flash device. This is typically used when the BIOS code has been corrupted.
Chassis Intrusion Disable	When CN50's pins 1 and 2 are cabled to the chassis (default), a switch installed on the chassis indicates when the cover has been removed. When they are CLOSED, the chassis intrusion feature is disabled.
BMC Forced Update Mode	When CN49's pins 1 and 2 are OPEN (default), the BMC enters operational mode upon the negation of its reset. When they are CLOSED, the BMC enters force update mode upon the negation of its reset.
FRB3 Timer Disable	When CN48's pins 1 and 2 are OPEN (default), FRB operation is enabled. This allows the system to boot from another processor if Processor 1 fails. When they are CLOSED, FRB2 and FRB3 are disabled.

**If you must contact customer support, please fill
out the following support form and have it ready.**

Intel Server Issue Report

Please Complete All That Apply

Company Name: _____   **Date Submitted: _____**

Contact: _____   **Email Address: _____**

Telephone #: _____   **Priority: _____**
(1-Hot, 2-Critical, 3-High, 4-Low)

Intel Baseboard Product:

☐STL2   ☐ SBT2   ☐ SAI2   ☐ SJP2   ☐ SDS2   ☐ S815EBM1

☐ SCB2   ☐ SKA4   ☐ SRPL8   ☐ SRPM8   ☐ OPRF100

☐ Other (specify)_____

Chassis:

☐ SC7000   ☐ SR4000   ☐ SC5000   ☐ SC5100

☐ SR1200   ☐ SR2000   ☐ SR2050   ☐ SR2100   ☐ SR2200

_____

☐ Other (specify chassis manufacturer & part number, power supply manufacturer & part number, type & amount
of chassis fans used, fan manufacturers & part numbers)

_____

Problem Description (complete details of the problem setup, problem description, error messages, recreation steps, troubleshooting
steps completed, etc.)

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Server System Configuration Information (* indicates required information)

Hardware Information

* Main Board Part Number (PBA#/AA#)	_____	* System BIOS Version	_____
* CPU Board Part Number (PBA#/AA#)	_____	* I/O Board Part Number (PBA#/AA#)	_____
* Front Panel Board PNumber (PBA#/AA#)	_____	* Midplane Board Part Number (PBA#/AA#)	_____
* Mezzanine Board PNumber (PBA#/AA#)	_____	* I/O Riser Board Part Number (PBA#/AA#)	_____
* System BMC Firmware Version	_____	* SCSI Backplane PBA#/HSC Firmware Version	_____
* System FPC Firmware Version	_____	* SMIC Firmware Version	_____
* Power Share/Dist. Board PBA#	_____	* Chipset Stepping	_____

*Processor #1_____/_____/_____/_____/_____
              S-Spec#   Speed   Stepping Cache size CPUID#

*Processor #2_____/_____/_____/_____/_____
              S-Spec#   Speed   Stepping Cache size CPUID#

*Processor #3_____/_____/_____/_____/_____
              S-Spec#   Speed   Stepping Cache size CPUID#

*Processor #4_____/_____/_____/_____/_____
              S-Spec#   Speed   Stepping Cache size CPUID#

*Processor #5_____/_____/_____/_____/_____
              S-Spec#   Speed   Stepping Cache size CPUID#

*Processor #6_____/_____/_____/_____/_____
              S-Spec#   Speed   Stepping Cache size CPUID#

*Processor #7_____/_____/_____/_____/_____
              S-Spec#   Speed   Stepping Cache size CPUID#

*Processor #8_____/_____/_____/_____/_____
              S-Spec#   Speed   Stepping Cache size CPUID#

*Memory module configuration
(On board or in Card 1)

	* Module Type (module vendor/vendor part numbers/ Intel part numbers):
J1 _____MB (MODULE#1)	_____
J2 _____MB (MODULE#2)	_____
J3 _____MB (MODULE#3)	_____
J4 _____MB (MODULE#4)	_____
J5 _____MB (MODULE#5)	_____
J6 _____MB (MODULE#6)	_____
J7 _____MB (MODULE#7)	_____
J8 _____MB (MODULE#8)	_____
J9 _____MB (MODULE#9)	_____
J10_____MB (MODULE#10)	_____
J11_____MB (MODULE#11)	_____
J12_____MB (MODULE#12)	_____
J13_____MB (MODULE#13)	_____
J14_____MB (MODULE#14)	_____
J15_____MB (MODULE#15)	_____
J16_____MB (MODULE#16)	_____

*Memory module configuration
(In Card 2)

	* Module Type (module vendor/vendor part numbers/ Intel part numbers):
J1 _____MB (MODULE#1)	_____
J2 _____MB (MODULE#2)	_____
J3 _____MB (MODULE#3)	_____
J4 _____MB (MODULE#4)	_____
J5 _____MB (MODULE#5)	_____
J6 _____MB (MODULE#6)	_____
J7 _____MB (MODULE#7)	_____
J8 _____MB (MODULE#8)	_____
J9 _____MB (MODULE#9)	_____
J10_____MB (MODULE#10)	_____
J11_____MB (MODULE#11)	_____
J12_____MB (MODULE#12)	_____
J13_____MB (MODULE#13)	_____
J14_____MB (MODULE#14)	_____
J15_____MB (MODULE#15)	_____
J16_____MB (MODULE#16)	_____

O/S Information

*Operating System _____

*Operating System Language Version _____

*O/S Version _____

*Service Pack # _____

*MP Spec _____

Utilities Information

*ISC Version _____

*SSU Version _____

*EMP / DPC Console Version _____

*FRU/SDR Loader Version _____

*Diagnostics Version (Testview, PCDiag, etc.) _____

Other _____

AGP/PCI/ISA Configuration

ALLOCATED RESOURCES
PLUG IN DEVICES

Card Type	Slot#	Card Description	Driver Rev.	IRQ #	I/O Base Addr.	FW Rev#
AGP	AGP	_____	_____	____	_____	
PCI	Slot#_____	_____	_____	____	_____	
PCI	Slot#_____	_____	_____	____	_____	
PCI	Slot#_____	_____	_____	____	_____	
PCI	Slot#_____	_____	_____	____	_____	
PCI	Slot#_____	_____	_____	____	_____	
PCI	Slot#_____	_____	_____	____	_____	
PCI	Slot#_____	_____	_____	____	_____	
PCI	Slot#_____	_____	_____	____	_____	
ISA	ISA 2	_____	_____	____	_____	
ISA	ISA 1	_____	_____	____	_____	_____

ONBOARD DEVICE

	IN USE			
*On-Board Video	☐	_____	____	_____
*On-Board NIC	☐	_____	____	_____
*On-Board SCSI-1	☐	_____	____	_____
*On-Board SCSI-2	☐	_____	____	_____

RAID ☐   RAID Level: _____(0-5)   Caching Method: ____ (RB/WT)   # of Drives Used: _____

IDE Drive Type(s): _____ (Make/Model)

SCSI Drive Type(s): _____ (Make/Model)

Other Device Type(s){CD-ROM, Tape Drive, etc.}: _____ (Make/Model)