SKA4 Server Board Troubleshooting Guide

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

Revision 1.0
October 2000

Revision History		
Date	**Rev**	**Modifications**
10/25/00	1.0	Initial Draft

SKA4 Troubleshooting

Welcome to the SKA4 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 be aware that only the Intel SC7000 and SC4000 server chassis are supported, the SKA4 server board is a high performance product with specific power, cooling, and EMI requirements and the SC7000 and SC4000 chassis meet these requirements. Please visit the Intel Customer Support website for updated versions of this document. http://support.intel.com/support/motherboards/server/SKA4

Boot Issues

1) My server will not power on

Check for the following possibilities:

- 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 front panel power switch cable properly connected to the front panel header pins on the server board located at J9E3, pins 2 and 16?
- If you are using a SSI compliant power supply, make sure the proper power supply connector attaches to the auxiliary signal connector. SSI power supplies require a 3-volt sense signal to properly power on and have a special 5-pin by 2-row connector for that purpose. If that connector is available with your power supply, make sure it firmly seats in the Auxiliary Signal connector located at J9B2 on the server board.
- 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 and terminator card and reseat them.
- Remove and reseat the memory modules. Try using memory modules from a known working server system. Use memory in fours.

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? Contact your customer service representative for the latest tested memory list.
- 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.

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 list is an excerpt of available beep codes. Contact your customer service representative for a complete list of beep codes.

Table 1. Standard BIOS Port-80 Codes

CP	Beeps	Reason
xx	1-1-1-1	There are no processors present in the system, or the processors are so incompatible that the system BIOS cannot run (like mismatched cache voltages).
16	1-2-2-3	BIOS ROM checksum.
20	1-3-1-1	Test DRAM refresh.
22	1-3-1-3	Test 8742 Keyboard Controller.
28	1-3-3-1	Autosize DRAM, system BIOS stops execution here if the BIOS does not detect any usable memory DIMMs.
2C	1-3-4-1	Base RAM failure, BIOS stops execution here if entire memory is bad.
46	2-1-2-3	Check ROM copyright notice.
58	2-2-3-1	Test for unexpected interrupts.
98	1-2	Search for option ROMs. One long, two short beeps on checksum failure.
B4	1	One short beep before boot.

Table 2. Recovery BIOS Port-80 Codes

CP	Beeps	Reason
xx	1-1-1-1	There are no processors present in the system, or the processors are so incompatible that the system BIOS cannot run (like mismatched cache voltages).

Table 3. BMC Beep Codes

Beeps	Reason
1-5-2-1	Empty processor slot or processor in memory board slot
1-5-2-2	No processors installed or processor SEEPROM inaccessible.
1-5-3-1	P2XP L2 cache voltage ID mismatch, modules 1&2
1-5-3-2	P2XP L2 cache voltage ID mismatch, modules 3&4
1-5-1-1	FRB failure
1-5-4-2	Power fault: DC power unexpectedly lost
1-5-4-3	Chipset power control failure (no response)
1-5-4-4	Power control fault

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:

- Remove all add-in cards and retry booting with just the on-board components. If successful, try adding the add-in boards 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 and terminator card.
- If you are using a switch box to share a monitor between multiple servers, ensure switching to the proper server.

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? Contact your customer service representative for the latest tested memory list.
- 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.

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 AC power still applied 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 will 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, 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, refer to Issue 3. If neither of these options fix your problem, fill out the attached customer support 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? Contact your customer service representative for the latest tested memory list.
- What chassis and power supply is the system using?

6) The bootup process takes too long

What most people typically consider "booting" actually involves multiple phases:

- BIOS Power-On Self Test (POST): includes the memory count and the keyboard/mouse and IDE drive check.
- Option-ROM loading: Each device may load a portion of its operating code or "option ROM" into memory. This is what you may see as the messages that come up identifying the add-in device such as a SCSI card ROM.
- Operating system boot: During this time, the operating system takes control of the server and performs whatever checks & setups are necessary for operation. An example of this is the Windows NT "blue boot screen."

A slow-down at any of these three points can produce what users perceive as a "slow boot." The following is a list of items that can produce a slower boot:

- Large memory configurations. Large memory installations can take 1-2 minutes to check. Extended memory test can be disabled in BIOS setup to speed up the boot process when performing service which requires multiple reboots, however this memory test should be enabled for normal system operation.
- Multiple SCSI adapters. SCSI adapters take time to load their option ROMs and execute their code that scans for drives.
- Numerous SCSI devices. SCSI device adapters, like many other adapters, have option ROMs that must be loaded into memory. Detection & option ROM loading takes additional time.
- Numerous other adapters. Many adapters have an option ROM that takes time to load into memory.

If your system does not have any of these items and you still experience an extended boot time, please fill out the included customer support form and call your customer support representative. Please pay special attention to the following information:

- Amount of memory in the system.
- What memory is the system using? Is it on the tested memory list? Contact your customer service representative for the latest tested memory list.
- Number and type of adapters in the system (manufacturer and model number).
- The number and type of hard drives in the system (manufacturer and model number).

7) I put one processor in my system, but it doesn't boot

Check the following:

- Is the processor a 100MHz system bus or 133MHz system bus processor? The SKA4 server board only supports Intel® Pentium® III Xeon™ processors designed for the 100MHz system bus.
- Is the processor in the primary processor slot? Refer to the configuration label or the Technical Product Specification for details on which slot is the primary.
- Do each additional processor slots contain a terminator card? The Pentium III processor architecture requires termination of the non-populated processor slots. Without proper termination, the signals do not maintain their electrical integrity & may cause errors. Some server products prevent boot up if they do not detect a terminator card.
- Are the processor and terminator cards firmly seated? The retention mechanism is designed to hold the processor and term cards firmly in place. Ensure that the processor and termination cards have "snapped" into the retention mechanism.
- Does the system beep? Refer to Issue 2.

If you are still having no-boot issues, please fill out the included customer support form and call your customer support representative. Have the following information ready:

- Does the system beep? What beep code is it giving?
- Does the system show video?
- What memory is the system using? Is it on the tested memory list? Contact your customer service representative for the latest tested memory list.
- What error does the system give if any?
- What add-in adapters does your system have? (manufacturer and model number)
- Processor speed and type.
- Chassis and power supply (or supplies) manufacturer and model number.

Other Issues

1) 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.
- If you disconnect your hard drives from the third party adapter and connect them to the on-board adapter, do they show up?
- 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.
- Have you properly terminated all your hard drives? If you are using Ultra 2 or Ultra 160 drives without a hot-swap backplane, place a terminator in the last connector on the SCSI cable. Ultra 2/Ultra 160 devices do not provide their own termination logic like Ultra Wide devices did.
- Check your SCSI ID numbers. SCSI devices must have their own unique ID on the SCSI bus. This number is set automatically when using an Intel SCSI hot-swap backplane, but must be set with jumpers on the device when using a SCSI cable. ID number should be set starting at 0 and must be set lower than 8 if booting from the drive.

If your hard drives still do not show, please fill out the included customer support 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)?
- If you are using a SCSI cable to attach your drives, 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?
- Are you using a hot-swap backplane with your third party adapter?
- What memory is the system using? Is it on the tested memory list? Contact your customer service representative for the latest tested memory list.

2) My hard drives don't show up under Windows NT

Verify that the system detects all your drives during POST (see Issue 8). IDE devices list on the screen by the server board BIOS. SCSI drives will list on the screen by the SCSI BIOS.

Windows NT 4.0 does not ship with the latest drivers for some SCSI controllers. Because of this, direct Windows NT installation to the proper drivers during installation. To do this, you must press the F6 key during installation start up at the sight of the first "installation blue screen." This will allow you to skip auto-detection and manually install a driver. The other way to perform a manual install is to use the three boot floppies. When asked to perform an auto detection of mass storage devices or do it manually, choose to do it manually and you will be asked to choose from a list or provide the driver from a floppy. If you are unsure about what you should choose from the list, contact your customer service representative.

If your system can still not see the onboard adapter or your hard drives, please fill out the included customer support form and call your customer support representative. Please pay special attention to the following information:

- Does the SCSI controller identify itself during POST?
- Can you see either the drives identified at POST by the system BIOS or the SCSI BIOS? (You should see the manufacturer's name and drive type during the Adaptec SCSI scan).
- If you are using a SCSI cable to attach your drives, what kind of terminator do you have at the end of the cable? (manufacturer and type e.g. ultra 160)
- What memory is the system using? Is it on the tested memory list? Contact your customer service representative for the latest tested memory list.
- What are the number and type of processors in the system?

3) During boot-up, a populated PCI slot powers up, then immediately powers off.

- Verify that a valid PCI card is being used (supports PCI configuration space, for example). Some test cards (such as LAI adapters) will need a valid PCI card installed in their onboard connector before they can be recognized and powered on.
- A power fault condition can also produce this behavior.

If your system still cannot recognize the PCI card or still powers off, please fill out the included customer support form and call your customer support representative. Please pay special attention to the following information:

- What manufacturer and model type is your PCI card?
- What PCI slot is your card installed in?
- What BIOS release is installed on your system (you can identify this during POST)?
- What memory is the system using? Is it on the tested memory list? Contact your customer service representative for the latest tested memory list.

4) The PHP push button functions under DOS, but is non-functional under an OS.

- The OS-specific PHP drivers must be loaded for push button functionality.

If the PHP push button still does not function under the OS, please fill out the included customer support form and call your customer support representative. Please pay special attention to the following information:

- What OS is loaded on your hard drive?
- Which PHP driver version are you using?

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

Intel SPD Problem 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:

- **N440BX** • **NL440BX/T440BX** • **L440GX+** • **C440GX+** • **SKA4** • **STL2**
- **S450NX** • **AK450NX** • **A450NX** • **OPRF100**
- **Other (specify)_____**

Chassis:

- **Columbus II** • **Columbus III** • **Astor** • **Astor II** • **Cabrillo**
- **Cabrillo C** • **Cabrillo II** • **Cabot** • **Drake**
- **SC7000** • **SC4000 (specify contents – HSDrive Bay – Redundant Power – Rack Mount)**

_____

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

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

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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_____/_____/_____/_____/_____/_____ *Processor #2_____/_____/_____/_____/_____/_____

S-Spec# Speed Stepping Cache size CPUID#

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

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

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

S-Spec# Speed Stepping Cache size CPUID#

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

*Processor #6_____/_____/_____/_____/_____
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)

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)

* Module Type (module vendor/vendor part numbers/ Intel part numbers):

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*Memory module configuration
(In Card 2)

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)

* Module Type (module vendor/vendor part numbers/ Intel part numbers):

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O/S Information

*Operating System _____
*O/S Version _____
*MP Spec _____

*Operating System Language Version _____
*Service Pack # _____

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					

	IN USE	ONBOARD DEVICE		
*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)