STL2 Server Board Troubleshooting Guide

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

Revision 1.0
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intel®

Revision History		
Date	**Rev**	**Modifications**
08/22/00	1.0	Initial Release

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STL2 TROUBLESHOOTING 4

STL2 Troubleshooting

Welcome to the STL2 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 assist you collecting the data we will need to identify and resolve the issue you are experiencing. 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 Customer Support website for updated versions of this document and additional product information at:
http://support.intel.com/support/motherboards/server/STL2

I. Boot Issues

1. **My server will not power on.**
    A. Please check for the following possibilities:
    - Is the server AC power cord securely plugged into the power supply?
    - Is the server plugged into a "powered on" power strip?
    - The SC5000 redundant power supply has two power switches on the back of the power supply next to the fan, are they switched on?
    - The chassis and power supply chosen for use with the STL2 server board needs to properly support the thermal, EMI and power requirements for the board. The system integrator should calculate a power budget for all items being integrated into the system to be sure that the available power is not exceeded. A worksheet for calculating the power budget is contained in the STL2 Product Guide. Failure to follow the power budget guidelines may result in a system that will not boot or may function erratically.
    - When integrating the STL2 server board into the chassis metal standoffs were used to support the server board. Verify that all standoffs are in the correct locations by consulting the board diagram in the Quick Start Guide or the Product Guide. All metal standoffs must be located under a board hole with a tinned ground plane ring around it. Improperly locating a standoff may result in the board shorting to the frame and may damage the board or its components.
    - The STL2 server board is designed for operation with Pentium® lll Processors utilizing133MHz front side bus. The system may not power on using non-compatible processors, use of non-compatible processors may damage the processors and/or server board. Supported processors are listed in the Technical Product Specification available on the support website: http://support.intel.com/support/motherboards/server/STL2
    - If you are using the redundant power version of the Intel SC5000 server chassis, the SSI compliant power supply includes a power supply signal plug that must be plugged on to the header on the server board labeled "Pwr Sup. Signal". This cable supplies the 3.3v sense signal to the logic of the power supply and must be connected or the power supply will not allow the system to power on. The power supply signal connector is located along the edge of the board near the secondary processor connector. Verify that the power supply cables are plugged in to the proper connectors.
    - The STL2 requires 0.8A of 5-volt standby power be supplied to the baseboard in order to power on. Most ATX compliant power supplies and all SSI compliant power supplies supply sufficient 5-volt standby current. Standby power is required to enable the server management features of the server board and the server board will NOT power on without it. The power supply of the SC5000 chassis provides this standby current. If you

are using a different power supply, verify that it provides the required 0.8A of 5-volt standby power.

- Remove all non-essential 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 memory reseat it, try different memory modules and be sure they are on the tested memory list. The STL2 server board requires the use of PC133 registered memory with a CAS latency of 2 or 3 meeting the JEDEC specification.
- Remove the Processor and Terminator card and reseat them.
- Verify that the Floppy and IDE data cables are properly connected so that pin 1 of the cable (the red edge of the ribbon cable is pin 1) is connected to pin 1 on the device and on the server board connection. Failure to properly orient these cables may result in the system not booting.

B. Though it is unlikely that the STL2 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 Intel Customer Support. Please note the answers to the questions below.

- What memory is being used? Is it on the tested memory list? See http://support.intel.com/support/motherboards/server/STL2 for the latest tested memory list.
- Are any front panel lights on the chassis you are using?
- Are the Power Supply Fans spinning? Are any system fans spinning?
- Does the system beep? See Issue 2
- Please note what is displayed on the monitor or what sounds are emanating from the server.
- If you have a post code card, note the Post Code where the system stops and report that information as well.

2. My server gives a beep code and halts.

A. Most likely, these beeps are what are known as "beep codes." They identify system events in case video fails to display. The following is a list of common "beep codes."

Beep Code	Meaning
1-2-2-3	BIOS ROM checksum error, update BIOS using BIOS recovery
1-3-4-1	RAM failure, reseat memory, try other tested memory, use Registered ECC PC133 memory
1-3-4-3	RAM failure, reseat memory, try other tested memory, use Registered ECC PC133 memory
1-3-3-1	RAM failure, reseat memory, try other tested memory, use Registered ECC PC133 memory
1-2	Video failure, remove all add in cards and test
1	One short beep before boot (Normal Operation)

3. I heard the drives spin up, and my floppy drive light turned on – but I'm not seeing video.

A. Check the following items:

- Remove any non-essential add in cards and check to see if the server boots. If successful, try adding the cards one at a time with a reboot in between to try and pinpoint a suspect card.

- Remove and reseat the memory modules.
- Remove and reseat the Processor / Terminator cards.
- The STL2 server board requires the use of two processors, or one processor and a processor terminator card. If a single processor is used, it must be installed in the primary processor slot and a processor termination card must be installed in the secondary processor slot. In addition, processors must be matched for speed and type, and must be within one stepping of the other.
- If you are using a switch box to select between different servers, is it switched to the correct machine?
- When integrating the STL2 server board into the chassis metal standoffs were used to support the server board. Verify that all standoffs are in the correct locations by consulting the board diagram in the Quick Start Guide or Product Guide. All metal standoffs must be located under a board hole with a tinned ground plane ring around it. Improperly locating a standoff may result in the board shorting to the frame and may damage the board or its components.

B. If you still can't get a video image, please fill out the included customer support form and call Intel Customer Support. Please note the answers to the questions below.
- Is your system making any noises? (see "Issue 2, My server gives a beep code and halts")
- Are any of your front-panel lights illuminated?
- Are the power supply fans turning? Are any system fans turning?
- If you have a post code card, note what post code the system halts on.

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

A. Wake On Lan* (WOL), and other server management features require full time "standby" power. This means that power is still provided to parts of the system even if the user has turned the system "off" via the front panel power switch. Additionally, there are signals in the PCI connectors that tell the system to boot (normally used by server management adapters/NICs). Plugging in the adapter with AC power cable still attached to the powersupply 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 front panel power switch.
- Unplug the AC cord from the back.

B. See also issue 5. If your server is booting automatically, but the helps specified in issue 4 or 5 do not resolve the problem, please fill out the included customer support form and call Intel Customer Support. Please pay special attention to the following information:
- What BIOS do you have loaded on the system? (the latest tested BIOS is posted to the Intel Customer Support Website http://support.intel.com/support/motherboards/server/STL2).
- What is the PBA or AA number of the baseboard? (The PBA / AA number is located on a white label near the edge of the board and is printed in the following format: PBA / AA xxxxxx-xxx).
- What memory is being used? Is it on the tested memory list? See http://support.intel.com/support/motherboards/server/STL2 for the latest tested memory list.

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

A. The STL2 can be configured to save the "last known power state" since the last AC power connection. The board can be configured so that if you remove AC power before powering down the system via the front panel power switch, your system will automatically attempt to come back to the "on" state it was in once you restore AC power.
- This option is configured in the BIOS setup under the System Menu, AC-Link Option.
- Please keep in mind that either unplugging the system or flipping a switch on the power strip removes AC power.
- Follow the correct A/C removal sequence: Press the front panel button, then remove the A/C power cord.

B. Allowing your system to fully power up and then power down the system by using the power switch would correct this problem. If neither of these options fix your problem, fill out the attached customer support form and call Intel Customer Support. 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 baseboard? (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 being used? Is it on the tested memory list? See http://support.intel.com/support/motherboards/server/STL2 for the latest tested memory list.

6. The boot up process takes too long.

A. What users typically term "booting" has multiple phases:
- BIOS Power On Self Test (POST): This includes the memory count and the keyboard/mouse check.
- Option-ROM loading: Each device may load a portion of its operating code or "option ROM" into memory. This is what the user may see as the messages that come up identifying the add-in device, e.g. SCSI 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 up screen.

B. 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.
- Multiple 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. Option ROM scan for non booting devices can be disabled to shorten the boot process, but care should be taken as this action can render the system not bootable.
- Numerous other adapters. Adapters in general take time to load their option ROMs into memory.

C. If you require additional support, please fill out the included customer support form and call Intel Customer Support. Please be prepared to provide the following information:
- Amount of memory in the system.
- What memory is being used? Is it on the tested memory list? See http://support.intel.com/support/motherboards/server/STL2 for the latest tested memory list.
- Number and type of adapters in the system (manufacturer and model number).

- The number and type of hard disk drives in the system (manufacturer and model number).

7. **I put 1 processor in my system but it doesn't boot.**
    A. Check the following:
- Verify that the processor is in the Primary processor slot. Refer to the Quick Start Guide or the Product Guide for proper installation procedure.
- Verify that the jumper settings for processor clock frequency are set properly. These jumpers must be must be set to the speed of the processor, the board may not boot or may behave erratically if these jumpers are not set correctly. They are the 5E1 located between the 32-bit PCI slot closest to the processors and the 64-bit slot next to it. Correct jumper settings are located on the configuration label, in the quick start guide, and in the product guide (on the CD) that shipped with the product. Additional processor and configuration information can be found on the Intel support web site at http://support.intel.com/support/motherboards/server/STL2.
- Verify that the processor is seated properly. Remove the processor and reseat it.
- Verify that the terminator card is installed. Remove the terminator card and reseat it.
- The STL2 server board is designed for operation with Pentium® III processors utilizing133MHz front side bus. The system may not power on using non compatible processors, use of non compatible processors may damage the processors and / or server board. Supported processors are listed in the Quick Start Guide, the Product Guide, and on the Configuration Label accompanying this product. An updated list of supported processors is available at: http://support.intel.com/support/motherboards/server/STL2
- Does the system beep? Refer to question 2.

    B. If you are still having no-boot issues, please fill out the included customer support form and call Intel Customer Support with the following information ready:
- Does the system beep? What beep code is it giving?
- Does the system show video?
- What memory is installed in the system? Is it on the Intel tested memory list? See http://support.intel.com/support/motherboards/server/STL2 for the latest tested memory list.
- What error does the system give?
- What add-in adapters are installed in your system? (Manufacturer and model number)

II. Other Issues

8. **The reset button does not function on the SC5000 chassis.**
    A. Verify that the reset cable plug is properly oriented on the connector P23 of the server board. The reset button will not function if this connector is improperly oriented. Refer to the Quick Start Guide or Product User guide for more information.

9. **The NMI switch on the front panel of my system does not work**
    A. The SC5000 Chassis is a universal chassis designed for compatibility with multiple Intel server boards. As such, not all features of the chassis function with all server boards. When the STL2 server board is integrated in the SC5000 chassis, the NMI switch on the front panel does not function. Instead, an NMI switch is located on the back I/O panel of the system via a small hole. To gain access to the NMI switch through the hole, inserting the tip of a pen, pencil, or some other non-conducting probe and apply a small amount of pressure.

10. My Hard Disk Drives don't show up in POST.

A. Check the following:

- Are you using 3rd party SCSI adapters? System memory limitations limit the number & size of option ROMs in the system. If you install to many adapters or adapters that take up too much space in memory, they may not be able to expand their ROMs and will not show the hard disk drives connected to them. In addition, some third party SCSI adapters or RAID controllers do not work together. Try the following:

  (i) Verify that the data cable is connected pin 1 to pin 1.

  (ii) Verify that the drive power cable is connected.

- If you disconnect your hard drives from the 3rd party adapter and connect them to the on-board controller, do they show up?
- Verify that the device power cable is firmly connected.
- Are your hard drives properly terminated? (If using the SC5000 chassis, the Ultra160/LVD SCSI hot swap backplane automatically terminates each device and is backward compatible with Ultra 2 drives.) However, if you are using Ultra2/Ultra160 drives without a hot swap backplane, a terminator needs to be placed in the last connector on the SCSI cable. Ultra 2/Ultra160 devices do not provide their own termination logic like Ultra Wide devices do.
- Check the SCSI ID numbers, SCSI devices must have a unique ID number. This number is set automatically when using a SCSI hot swap backplane but must be set at the drive if individually configuring drives on an SCSI cable. ID number should be set starting at 0 and must be set lower than 8 if the drive is to be booted from.
- Verify that the power budget requirements have not been exceeded; refer to question 1 above.
- Verify that the SCSI Option ROM is enabled.

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

- What add-in adapters do you have in your system (manufacturer and part number)?
- What type of hard drives are in the system (manufacturer and part number)?
- What is the termination status of each hard drive? (drives inserted in the SC5000 hot swap backplane are automatically terminated.)
- What are the SCSI ID's of the devices on the SCSI bus?
- How many SCSI channels are you using?

11. My Hard Disk Drives don't show up under Windows NT*

A. Verify that your hard disks are detected during POST (see Question 8). IDE drives will be detected and listed on the screen by the server board BIOS and SCSI drives will be detected and listed on the screen by the SCSI BIOS. It may be necessary to press the ESC key during POST to remove the BIOS splash screen to view the POST diagnostics screen

B. Windows NT 4.0 does not ship with the latest drivers for the on-board Adaptec* AIC 7899 SCSI controller used on the STL2 server board. Windows NT 4.0 must be directed to the proper SCSI drivers manually. To do this, you must press F6 during installation startup at the sight of the first "installation blue screen", you will be prompted to manually install a driver. Use the driver available on the CD that shipped with the server board or you can obtain the latest driver at: <http://support.intel.com/support/motherboards/server/STL2. Additionally, you may need to manually load the ATAPI* CD-ROM drivers, as applicable.

C. If you still cannot see the on-board adapter or continue to have problems installing Windows NT, please fill out the included customer support form and call Intel Customer Support. Please pay special attention to the following information:

- Can you see the on-board Adaptec 7899 SCSI controller identify itself during POST?
- Can you see the drives getting logged during POST? (You should see the manufacturer's name and drive type during the Adaptec SCSI scan).
- Can you see other drives identify themselves during POST, such as IDE CDROMs, IDE hard drives, etc.
- What is the termination status of each hard disk drive? (Drives in the SC5000 server chassis SCSI hotswap backplane are automatically terminated.)

**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+**	**STL2**	**STL2**
S450NX	**SPKA4**	**AK450NX**	**A450NX**	**OPRF100**	

Other (specify)_____

Chassis:

Columbus II	**Columbus III**	**Astor**	**Astor II**	**Cabrillo**
Cabrillo C	**Cabrillo II**	**Cabot**	**Drake**	

SC5000 (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)

_____

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

*Operating System Language Version   _____
*Service Pack #   _____

Utilities Information

*ISC Version   _____
*EMP / DPC Console Version   _____
*Diagnostics Version (Testview, PCDiag, etc.)   _____

*SSU Version   _____
*FRU/SDR Loader Version   _____
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

	IN USE		Driver Rev.	IRQ #	I/O Base Addr.
*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)

Intel® Server Board Diagnostics
Installation and Operating Instructions

intel®

Revision History		
Date	**Rev**	**Modifications**
07/07/00	1.0	Initial Release
08/21/00	1.1	Minor updates.

CONTENTS

Introduction

The Intel® Server Board diagnostics package provides a method to determine if an Intel based server system is correctly assembled and functioning properly. The package provides tests for the onboard resources that can be run without user intervention. Reporting of results is directed to field replaceable units (FRUs), such as the installed processor modules, the server board, disks, and memory. There are three test suites in the package: the Quick Test, Comprehensive Test, and a continuous loop of the Comprehensive Test. The diagnostics probes for the hardware present at the start of each test and reports the identified components. In this way, the diagnostics will indirectly identify many assembly and cabling errors (cables broken or improperly seated, etc.) when installed components are not reported.

Conventions

In this document, user input is indicated by bold and underlined text (for example: **a\:testmenu**). Also, keys that have multiple character labels are enclosed in brackets (for example: **<ENTER>**). Combinations of keys that must be pressed together are enclosed in brackets with a plus (+) between the keys (for example **<CTRL+ALT+DEL>**).

Assumptions

It is assumed that the integrator has configured a server with an Intel based server board with the following minimum components. The Intel server board integrated in an approved chassis, a minimum of one Intel processor, a processor terminator card, at least one memory module selected from the tested memory list for that particular board, a floppy disk drive, and one hard disk drive. Refer to the server board tested memory document and the supported Hardware and Operating System document for Intel tested components. These documents can be found at the Intel Corporation support website
http://support.intel.com/support/motherboards/server/

Installing the Intel Server Board Diagnostic Archive

The diagnostic program files are available on the software CD which accompanied the board they are intended to be used with. Updates to this manual can be downloaded from the Intel support website at: http://support.intel.com/support/motherboards/server.

WARNING: Each board has it's own specific diagnostics package. Do not attempt to run the wrong diagnostics package on the wrong board. This could cause unreliable results and could damage components on the board itself.

1. Insert a blank formatted diskette in floppy disk drive a.
2. Run the ****DIAG.exe (where **** refers to the code for a particular board) program downloaded from the web, this will cause the bootable disk image to be copied onto a diskette.
3. Insert the diskette into the Intel based server system and boot to the floppy.
4. You will be asked to agree to a licensing agreement prior to the actual file expansion occurring. The agreement is the file LEGAL.TXT.
5. The ROM DOS operating system creates a ramdrive into which the diagnostic tests are copied.
6. When the copy process is complete, you will be presented with a menu of five options. These menu options are discussed in greater detail below.

1

Summary of Available Tests

Quick Tests

The quick test suite runs a small subset of available tests. It identifies the processor type, speed, and the number present. Additionally, the base and total memory sizes, external L2 cache size, and the attached hard disks are also identified. For the quick test, you should verify that the configuration displayed after the probe includes all the hard disks, memory and processors you have installed in the system. The system will identify drives attached to any SCSI controllers in the system, not just the onboard controller. It will not identify any other SCSI devices (CDROM, Tape, etc.). If the configuration does not identify all the processors, memory and hard disks you have installed, exit by pressing **<CTRL+BREAK>** and review the troubleshooting section later in this document.

The test duration is dependent upon the number of processors and the amount of memory installed. With a 800MHz processor and 64 MB of memory the quick test takes about 1 minute. Each additional 64 MB of memory adds about 1 minute to the test time.

On completion of the test and after the test results are displayed, the program returns to the main menu.

Comprehensive Tests

The comprehensive test probes for the same items as the Quick Test, but in greater depth. In addition, it identifies the keyboard and mouse, the COM1 and COM2 ports, the LPT port, memory, the floppy drive, and the onboard video controller with its memory. The tests executed are a superset of the quick tests. The processor floating point unit (FPU) is tested and more extensive tests are run on the memory and cache. Extensive tests are also run on the onboard peripheral controllers, integrated components and the chipset.

You should verify that the displayed configuration after the probe includes all the disks, memory and processors you have installed in the system. The system will identify drives attached to any SCSI controllers in the system, not just the onboard controller. If it does not, exit by pressing **<CTRL+BREAK>** and begin at the troubleshooting section later in this document. An example of a comprehensive test configuration is shown below in the *Using the Intel Server Board Diagnostics* section.

The test duration is dependent on the number of processors and the amount of memory installed. With a 800MHz processor and 64 MB of memory the comprehensive test takes about 2.5 minutes and each additional 64 MB adds about 2 minutes to the test time (due to much more extensive testing). The video tests drive the monitor with varying resolutions and patterns that may not appear sensible.

On completion of the test and after the test results are displayed, the program returns to the main menu.

Comprehensive Test with Continuous Looping

This test is identical to the comprehensive test, but it continuously loops through the tests until the user presses **<CTRL+BREAK>**. This mode of operation is intended to allow identification of an intermittent failure in a Field Replaceable Unit for replacement. The normal comprehensive test result summary is displayed, but the status reflects the sum of all tests. Thus, if a test failed one or more times during the run, it will be reported as failing. The number of times the test cycle was repeated is displayed in the result summary screen.

Using the Intel Server Board Diagnostics

To start the diagnostics boot the server from the bootable diskette described above. The system should display the following menu (Note: the **** in the title of the screen will be replaced by the name of the actual board being tested).

**** Diagnostics. Ver 1.0

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Server Diagnostic Options

Quick Test

Comprehensive Test (DEFAULT)

Comprehensive Test with continuous looping

Display Help Text

EXIT

Highlight your selection using Cursor UP/DOWN and press ENTER

On entry the "Comprehensive Test" option is highlighted, as the default.

Selecting any of the first three options results in the test system probing the hardware to determine which tests in the suite are applicable to the current hardware configuration. If the system under test is not an supported by the diagnostics package being used, the message "This motherboard is not supported by these diagnostics. Press any key to exit" will appear.

Selecting the "Display Help Text" option results in a display of the help text file for the test options.

Selecting the "EXIT" option saves the test results in a RESULT.LOG file and returns you to the DOS prompt. Typing "testmenu" (without the quotes) at the prompt will restart the menu system.

Select the test desired with the cursor and press **<ENTER>.** The hardware configuration test will begin and upon completion, a configuration summary will be displayed.

Below is an example of the hardware configuration results for the "Comprehensive "Test." The results for the "Quick Test" are similar, yet not as detailed.

Hardware Configuration results for a "Comprehensive Test:" *(Results will vary depending on the system configuration)*

Hardware Test Configuration

Base Memory Size:	640 KB
CPU Type:	A Pentium® Xeon™ III microprocessor
CPU Speed:	800 MHz
CPU SMP #0:	Present
CPU SMP #1:	Present

NUMBER_OF_SCSI_CHANNELS: 2
KEYBOARD_TYPE: 101_KEY
RTC RAM SIZE: 128
PC97317   Found
COM1 at Port Address: 3F8 is enabled
COM2 at Port Address: 2F8 is enabled
LPT1 Ox378
Floppy cfg.Drive A: 1.4Mb (3.5 Inch)
Hard Drive 0 Cylinders: 1023 Heads: 64 Sectors: 63 Total Size: 2014MB
External Cache size: 256 KB
Video Subsystem: VGA-compatible controller, 256KB Ram
Video Controller: Any ATI Controller Config_Chip_AD 0X7A004756
Video Bios: Vesa 2.0 ATI Mach64
Video Memory: 4MB

If configuration is correct press ENTER to continue or CTRL+BREAK to quit
----

Pressing **<ENTER>** will start the diagnostics and a scrolling display of test details will be seen. In this display, white entries are for information only (tests starting, test progress, internal messages, etc.), green entries indicate successful completion of the test and red entries indicate test failures. You can generally ignore this display, except as a progress indicator, since a summary is displayed at the end of the run. An excerpt of the progress log follows.

An example of tests in progress:

CACHE.PERFORMANCE-RATIO PASSED
MEMORY.ADDRESS-PATTERNS (1-17-00 18:49:09)
MEMORY.ADDRESS-PATTERNS PASSED
MEMORY.ADDRESS RIPPLE (1-17-00 18:52:17)
MEMORY.ADDRESS RIPPLE PASSED
MEMORY.RANDOM-PATTERNS (1-17-00 18:52:18)
MEMORY.RANDOM PATTERNS PASSED
MEMORY.CACHE -RANDOM PATTERNS (1-17-00 18:55:38)
MEMORY.CACHE -RANDODCPATTERNS PASSED
MEMORY.CACHE -PSEUDO - RANDOM PATTERNS (1-17-00 18:55:55)
MEMORY.CACHE -PSEUDO - RANDOM-PATTERNS PASSED
MEMORY.CACHE -CHECKERBOARD PATTERNS (1-17-00 18:57:19)
MEMORY.CACHE -CHECKERBOARD-PATTERNS PASSED
MEMORY.CACHE -ADDRESS-PATTERNS (1-17-00 18:57:53)
MEMORY.CACHE -ADDRESS PATTERNS PASSED
MEMORY.CACHE - 32KB ACCESS (1-17-00 18:58:01)
MEMORY.CACHE - 32KB ACCESS PASSED

The test results summary uses similar conventions with the FRUs listed in bright green for passing (with submodules listed in darker green) and red for failures

An example of the test results summary for a "Quick Test:": *(Results will vary depending on the system configuration)*

Test Result Summary

| FRU= CPU | PASSED | | |
| CPU Module | PASSED SMP Processor 0 | | PASSED |

| FRU= BASEBOARD | PASSED | | |
| Power On Self Test | PASSED CACHE Controller and memory | | PASSED |

| FRU= MEMORY DIMM | PASSED | | |
| MEMORY Controller, SIMM, DIMM | PASSED Extended Memory Controller, Dimm | | PASSED |

| FRU= HARD DISK DRIVES | PASSED | | |
| Hard Disk Drive 0 | PASSED | | |

Press Any Key to Continue <DONE>

An example of the test results summary for a "Comprehensive Test:": *(Results will vary depending on the system configuration)*

Test Result Summary

Pass Count = 1

| FRU= CPU | PASSED | | |
| CPU Module | PASSED | Math Coprocessor (FPU) | PASSED |

FRU= BASEBOARD	PASSED		
Power On Self Test	PASSED	Primary Interrupt Controller	PASSED
Keyboard Controller	PASSED	Real Time Clock	PASSED
PCI Bus Controller	PASSED	Programmable Interval Timer	PASSED
Direct Memory Access Controller	PASSED	SIO308 Super I/O Controller	PASSED
AIC78xx SCSI Controller	PASSED	COMM1 INS8250 Serial Controller	PASSED
COMM2 INS8250 Serial Controller	PASSED	Parallel Port 1 Controller	PASSED
ATI Video Controller	PASSED	CACHE Controller and Memory	PASSED
VGA Video Adapter	PASSED		

| FRU= MEMORY DIMM | PASSED | | |
| MEMORY Controller, SIMM, DIMM | PASSED | MEMORY Cont, SIMM, DIMM stress | PASSED |

| FRU= Hard Disk Stress | PASSED | | |
| Hard Disk Drive 0 | PASSED | | |

Press Any Key to Continue

Upon completion of the test and after the test results are displayed, the program returns to the main menu. When the EXIT option is selected, the most recent test results are saved to the RESULT.LOG file in the current directory, or floppy drive a:, if the program is running from a ramdrive. For ease in viewing, copy the RESULT.LOG file to another diskette and open with a text editor. It is important to save the test results because after each subsequent test run, the RESULT.LOG is overwritten.

5

Troubleshooting

1. This section is not intended to be a tutorial on repair and system troubleshooting. It is intended to provide hints for the technician. If the problem system has just been assembled, a first step should be to check the system against the assembly procedures in the printed Server Board "Quick Start Guide," and the electronic Server Board Product Guide. Both guides are provided on the Server Resource CD in the Server Board kit, and on the Intel Corporation's support website. In addition, a troubleshoot guide is available on the CD and on the support website.
http://support.intel.com/support/motherboards/server/

Trouble Shooting Information	
Problem	**Possible Solution**
System fails to boot	General: Check power. Check cabling, connectors and socketed components are properly seated. Remove all components except minimal memory and a processor and reboot. If possible check individual components (especially processors and memory) in a known good system. 1. Check for processor termination card in the empty secondary processor slot. 2. Check for approved memory DIMM modules. See the tested memory list at: http://support.intel.com/support/motherboards/server/ 3. Check to assure that the power supply connector is correctly attached to the 24 pin (ATX 20pin +4) power connector. Intel Server Chassis use a 24 pin SSI compliant power connector, but most third party chassis use 20 pin ATX power connectors. Refer to the printed "Quick Start Guide" or the electronic product guide also available on the CD that ships with the product. For further information, both of these documents are also available on the Intel Customer Support Website (see URL below). 4. If applicable, verify the 3.3v sense (2x5pin) power connector is attached to the power supply signal connector located next to the serverboard power connector. 5. Ensure the power supply being used is at least 800mA of +5V standby current to support WOL and is required for proper operation.
System will not boot from the server board resource CDROM	Incorrect BIOS Boot priority order. Press <F2> during the server's POST and configure in BIOS set-up under the Boot drop down menu.
"motherboard is not supported" message at test start	Each server board has a unique diagnostic package. Ensure you have downloaded and are using the proper version of the diagnostic for the particular board you are installing. Additionally, ensure you have updated the board with the latest version of BIOS and firmware before running the diagnostics. To locate the latest versions of all the software, visit the support website at http://support.intel.com/support/motherboards/server. If problem persists, replace baseboard.
Probe did not identify all expected devices	Check power. Check cabling, connectors and socketed components are properly seated. Check individual components (especially processors, disks and memory) in a known good system.
Diagnostics hang during probe process	If probe hangs during probe for processors, memory or disk, remove/replace the device. Otherwise, replace server board.
Diagnostics hang during test execution	Note most recent test start message to determine FRU (Field Replaceable Unit) failing. Unless test is specifically for processors, memory or disk, probable cause is baseboard failure. Replace the failing FRU.
Other	For further support information, check http://support.intel.com/support/motherboards/server/