Intel® Server Board Platform Confidence Test

Installation and Operating Instructions

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Introduction

The Intel® Server Board Platform Confidence Test package provides a method to determine if an Intel-based server system is correctly assembled and functioning properly. The package provides three test suites for the onboard resources. The test suites included in the package are: the Quick Test, the Comprehensive Test, and a continuous loop of the Comprehensive Test. These tests can be run without user intervention.

At the start of each test, the Platform Confidence Test package probes for the hardware present and reports the identified components. The probe will indirectly identify many assembly and cabling errors, such as broken or improperly seated cables, because the associated hardware component will not be located.

Test results are reported directly to field replaceable units (FRUs), such as the installed processor modules, the server board, disks, and memory. Upon completion of the test, the test results are saved to the RESULT.LOG for viewing.

Conventions

In this document the following conventions are used:

• Selections you need to make from a screen are indicated in bold type, such as **run file from current location**

• Input that you need to type on your keyboard is indicated by bold and underlined text, such as **a\: testmenu**

• When you need to press a specific key on the keyboard, the text indicating the key that you should press is enclosed between brackets, such as **<ENTER>**

• Combinations of keys that must be pressed together are enclosed in brackets with a plus (+) between the keys, such as **<CTRL+ALT+DEL>**)

Assumptions

It is assumed that the integrator has configured a server with an Intel-based server board and has worked with the following minimum components:

• The Intel server board integrated in an approved chassis

• At least one Intel processor

• A processor terminator (if necessary)

• A minimum memory configuration or greater, selected from the tested memory list for the board to be tested

• A hard disk drive

• Unless absolutely necessary, all Add-In cards must be removed (some add-in cards can cause unwanted behavior from the Platform Confidence Test)

Refer to the server board tested memory document and the tested 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/

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Installing the Server Board Platform Confidence Test Package

The Platform Confidence Test program files are available on the software CD that accompanies the server board. Updates to this manual can be downloaded from the Intel support website at: http://support.intel.com/support/motherboards/server/

WARNING: Each Intel server board has a Platform Confidence Test package specific to that board. Do not attempt to run the wrong Platform Confidence Test package on your server board. Running the wrong set of tests could cause unreliable results and may damage components on the server board.

1. Insert the Deployment Assistant CD/Resource CD into a Windows* based system and allow the autorun feature launch the graphical user interface. If autorun does not launch the GUI, launch it manually by double clicking on your CD-ROM drive.

2. On the top menu, under Tools for Setup and Configuration, choose **PCT Zip file with EFI Utilities**.

3. Download, and extract the files from the zip file to a USB thumb drive.

4. Insert the USB drive that you created in Step 3 into the server you want to test.

5. Power on the server and allow the system to boot the EFI Shell.

6. When the EFI Shell has booted, you will be presented with a menu of five options:

    *   Quick Test
    *   Comprehensive Test
    *   Comprehensive Test with continuous looping
    *   Display Help Text
    *   Exit

These menu options are discussed in greater detail below.

Summary of Available Tests

Quick Tests

The quick test suite runs a small subset of available tests. This suite identifies the processor type, speed, and the number of processors present. It also identifies the base and total memory sizes and external L2 cache size.

When running the quick test, verify that the configuration that is displayed following the probe includes all of the hard disks, memory, and processors that are installed in the system. If the configuration does not identify all of these items, exit by pressing **<CTRL+BREAK> or <F10>** and review the troubleshooting section later in this document.

The quick test duration is dependent upon the number of processors and the amount of memory installed. With a 3.0GHz processor and 1 GB of memory the quick test will run to completion in about 2 minutes. Additional memory will cause the test to take longer.
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, the floppy drive, and the onboard video controller with its memory. The system will identify drives attached to any SAS/SATA/SCSI controllers in the system, not just the onboard controller. When running the comprehensive test, verify that the configuration that is displayed following the probe includes all of the hard disks, memory, and processors that are installed in the system. If the configuration does not identify all of these items, exit by pressing **<CTRL+BREAK> or <F10>** and review the troubleshooting section later in this document.
An example of a comprehensive test configuration is shown below in the Using the Intel Server Board Platform Confidence Test section.
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.
The comprehensive test duration is dependent upon the number of processors and the amount of memory installed. With a 3.0GHz processor and 1 GB of memory the comprehensive test will run to completion in about 5 minutes. Additional memory will cause the test to take longer. The video tests drive the monitor using what appears as random test patterns.
On completion of the test and after the test results are displayed, the program returns to the main menu.

Comprehensive Test with Continuous Looping

The comprehensive test with continuous looping is identical to the comprehensive test, but it continuously loops through the tests until the user presses **<CTRL+BREAK> or <F10>**. This mode of operation will help to identify intermittent failures in a Field Replaceable Unit. When the test is halted, the normal comprehensive test result summary is displayed, but the status reflects the sum of all tests. Therefore, 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 Platform Confidence Test

To begin the Platform Confidence Tests boot the server from the bootable media described above. The system displays the menu below.

Note: The **"PCT v4.2; Telco S5x00x v1.05"** in the title of the screen will be replaced by the name of the board being tested. "Ver. X" will be replaced by the Version number of the test package.
The "Comprehensive Test" option is highlighted by default. When one of the first two options is selected, the test system probes the hardware to determine which tests in the suite are applicable to the current hardware configuration.

Selecting the option **Display Help Text** results in a display of the help text file for the test options. Selecting **EXIT** saves the test results in a RESULT.LOG file and returns you to the DOS prompt. Typing **testmenu** at the prompt will restart the menu system.

Select the test desired with the cursor and press **<ENTER>**. If the system under test is not supported by the Platform Confidence Test package being used, the following message is displayed:

> **This motherboard is not supported by this Platform Confidence Test.**
> **Press any key to exit.**

The hardware configuration test will begin. Upon completion, a configuration summary is displayed. Below is an example of the hardware configuration results for the "Comprehensive "Test." The results for the "Quick Test" are similar, but not as detailed. Test results will vary, depending on the system configuration.

The following is an example of the configuration summary for a Comprehensive Test:

```
Hardware Test Configuration
Base Memory Size: 639 KB
CPU Type: Intel® Xeon® CPU E5320 @ 1.86GHz microprocessor
CPU Speed: 1862 MHz
CORES_PER_SOCKET: 0x4
Number of physical processors 0x8
No SATA2 device found 0
Hard Drive 1 LBA Sectors: 321672960 Total Size: 157066MB
PCIeDev00_Vendor_ID 8086h
PCIeDev00_Device_ID 25D4h
PCIeDev00_LinkWidth 04
PCIeDev00_PortNum 00
PCIeDev00_Vendor_ID 8086h
PCIeDev00_Device_ID 25F7h
PCIeDev00_LinkWidth 08
PCIeDev00_PortNum 02
PCIeDev00_Vendor_ID 8086h
PCIeDev00_Device_ID 25E3h
PCIeDev00_LinkWidth 00
PCIeDev00_PortNum 03
Press any key to continue <MORE>
```

If configuration is correct press **ENTER** to continue or **<CTRL+BREAK>** to quit

Confirm that the configuration displayed is correct, then press **<ENTER>** to begin the Platform Confidence Test. A scrolling display of test details is displayed. 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. Use this display as a progress indicator; a summary of the results is displayed at the end of the test run. An excerpt of the progress log is as follows.

```
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
```

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The following is an example of the test results summary for a Quick Test:

```
                        Test Result Summary
                                                 Pass Count=1
FRU= CPU PASSED
PASSED CPU Module                    PASSED Multi Processor Test


FRU= BASEBOARD PASSED
PASSED CACHE Controller and Memory    PASSED Memory Controler Hub
PASSED Real Time Clock

FRU= MEMORY Controller-DIMM PASSED
PASSED Extended MEMORY

Press Any Key to Continue <DONE>
```

The following is an example of the test results summary for a Comprehensive Test:

```
                        Test Result Summary
                                                 Pass Count=1
FRU= CPU PASSED
PASSED CPU Module                    PASSED Multi Processor Test


FRU= BASEBOARD PASSED
PASSED Baseboard Management Controller  PASSED CACHE Controller and Memory
PASSED COM 1 & 2 Serial Controller      PASSED Direct Memory Access Controller
PASSED Chipset ICH5 South Bridge        PASSED Memory Controler Hub
PASSED Onboard Intel Pro1000 NIC #1     PASSED Onboard Intel Pro1000 NIC #2
PASSED PCI Bus Controller               PASSED PCIe Controller
PASSED PCIX Controller                  PASSED Primary Interrupt Controller
PASSED Programable Interval Timer       PASSED Power On Self Test
PASSED Real Time Clock                  PASSED Super IO Controller
PASSED Universal Serial Bus Controller  PASSED ATI Rage XL Video Controller


FRU= MEMORY Controller-DIMM PASSED
PASSED Extended MEMORY

Press Any Key to Continue <DONE>
```

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. The file can be opened and viewed with a text editor. Save the test results to a new file to prevent overwriting the contents the next time the tests are run.

The following is an example of the test results log for a Quick Test:

```
C:\WINDOWS\system32\cmd.exe - edit result.log                    _ □ ×
  File  Edit  Search  View  Options  Help
                           G:\EFI_PCT\RESULT.LOG
PCT v4.2; S5x00x v1.11


        ***** BIOS ID *****

S5000VCL
S5000.86B-S5000VCL
S5000-S5000VCL
S5000.86B
S5000
S5000.86B.10.00.0088.031420081550


        ***** SELF-SENSE CONFIGURATION *****

CACHE.SIZE_00 = 4194304
CACHE.TYPE_00 = UNIFIED
CACHE.SET_ASSOCIATIVITY_00 = 16
CACHE.LINE_SIZE_00 = 0
CACHE.SKIP_00 = 5
CACHE.SIZE_01 = 32768
CACHE.TYPE_01 = INSTRUCTION
CACHE.SET_ASSOCIATIVITY_01 = 8
CACHE.LINE_SIZE_01 = 0
CACHE.SKIP_01 = 1
SMP.CPU1_STEPPING = 0x6
SMP.CPU1_MODEL = 0xf
MEMORY.begin_address_00 = 0x2


        ***** HARDWARE CONFIGURATION *****

External Cache size: = 4 MB
Cpu Type: = Intel(R) Xeon(R) CPU        5140  @ 2.33GHz microprocessor
Cpu Speed: = 2328 MHz
CORES_PER_SOCKET = 0x2
Number of physical processors = 0x2


        ***** TEST SUMMARY FILE *****

--- test.sum file ---------------  Pass  Fail  Errors   Last run on/at
HARDWARE_CONFIG.SYSTEM_CONFIGURATI   1     0     0      11-13-08 14:35:47
CACHE.FIND_CACHE_TYPE                1     0     0      11-13-08 14:35:47
CACHE.PAGE_FAULT                     1     0     0      11-13-08 14:35:47
CACHE.RANDOM_PATTERNS                1     0     0      11-13-08 14:35:48
CACHE.ADDRESS_PATTERNS               1     0     0      11-13-08 14:35:48
CACHE.INTENSIVE_LINE                 1     0     0      11-13-08 14:35:55
CACHE.INTENSIVE_SET                  1     0     0      11-13-08 14:36:17
CACHE.RANDOM_ADDRESS                 1     0     0      11-13-08 14:36:19
F1=Help                                        |  Line:45      Col:1
```

Troubleshooting

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 system experiencing problems has just been assembled, a first step should be to check the system against the assembly procedures in the printed "Quick Start User's Guide," and the electronic Product Guide that is provided on the CD provided with the system. In addition, a troubleshooting guide is available on the CD and on the support website http://support.intel.com/support/motherboards/server

Troubleshooting Information	
Problem	**Possible Solution**
System fails to boot	Make sure the system is plugged into an AC power supply. Power off the system and make sure the cabling, connectors, and components are properly seated. Remove all components except form the minimum required memory and minimum required processors and reboot. If possible check individual components (especially processors and memory) in a known good system. 1. Check for approved memory DIMM modules. See the tested memory list at: http://support.intel.com/support/motherboards/server 2. Make sure 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). 3. If applicable, verify the 3.3v sense (2x5pin) power connector is attached to the power supply signal connector located next to the server board power connector. 4. 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 Deployment Assistant CDROM/Resource CDROM	An incorrect BIOS Boot priority order is set. Press <F2> during POST and configure the boot order in BIOS setup.
"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 tests for the board you are installing or testing. Ensure you have updated the board with the latest version of BIOS and firmware. The latest versions of the software are located at http://support.intel.com/support/motherboards/server
Probe did not identify all expected devices	Make sure the system is plugged into an AC power supply. Power off the system and make sure the cabling, connectors, and components are properly seated. If possible, install individual components, especially processors, disks, and memory, into a known good system to determine if the device is recognized in a different system.
Platform Confidence Test hangs during probe process	If the test software hangs during the probe for processors, memories, or disks, check the BIOS, Firmware revisions, and update if necessary or remove/replace the device. Otherwise, replace server board.
Platform Confidence Test hangs during test execution	Note the most recent test message to determine which FRU (Field Replaceable Unit) is failing. Unless the test is specifically for processors, memory or disk, the probable cause is baseboard failure. Replace the failing component as necessary.
Other	For further support information, check http://support.intel.com/support/motherboards/server