Intel® Carrier Grade Server TIGH2U

Tested Hardware and Operating System List

This document is intended to provide users of the *Intel® Carrier Grade Server* ***TIGH2U*** with a list of the operating systems, adapter cards, and peripherals tested by Intel on these platforms. This server integrates the *Intel® Server Board* ***T5000PAL*** (similar to *Intel® Server Board S5000PAL)*

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Revision History

Date	Revision Number	Modifications
June 2007	1.0	Initial release
June 2007	1.1	Format/edit update.
September 2007	1.2	Add TIGH2U to document
October 2007	1.3	Updated SAS drive list
January 2008	1.4	Update HDD list, Add RHEL 5.1, Add EXPI940PT, Add PWLA8492MT, Add QLA2462, Add Z-U130

References

Item	Date	Reference
1	Jan/2008	Intel® Server Board S5000PAL – Tested Hardware and Operating System List – Rev. 3.0
2	Dec/2007	Intel® IP Network Server NSC2U – Tested Hardware and Operating System List – Rev. 1.4

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1. Introduction

This document is intended to provide users of the *Intel® Carrier Grade Server* ***TIGH2U*** with a list of the operating systems, adapter cards, and peripherals tested by Intel on this server platform. The *Intel® Carrier Grade Server* ***TIGH2U*** is integrated using the *Intel® Server Board* ***T5000PAL***.

This document will continue to be updated as new adapters, peripherals, and operating systems are tested or until the *Intel® Carrier Grade Server* ***TIGH2U*** is no longer in production. Each new release of the document will present updated information as well as continue to provide the information from previous releases.

The adapters and peripherals specified in this document may or may not have been tested on all available board/riser combinations that make up the **TIGH2U** product family. Intel will provide support for the adapters and peripherals listed when used within this family of products.

The *Intel® Carrier Grade Server* ***TIGH2U*** product family consists of the following server building blocks and integrated systems:

Product Code	Product Description
TLHA0201W	Intel® Carrier Grade Server TIGH2U, Server Board T5000PAL - Onboard SAS and SATA + DDR2-533 or DDR2-667 FBD Memory + One FH/FL PCI Riser + One LP Riser + 20 inch Chassis Depth + Six SAS HDD Support + AC Power + Two GbE Embedded Ports Rear NIC
TLHD0201W	Intel® Carrier Grade Server TIGH2U, Server Board T5000PAL - Onboard SAS and SATA + DDR2-533 or DDR2-667 FBD Memory + One FH/FL PCI Riser + One LP Riser + 20 inch Chassis Depth + Six SAS HDD Support + DC Power + Two GBE Embedded Ports Rear NIC

1.1 Test Overview

Testing performed on the server(s) is divided under two separate categories:

- Basic Operating System Installation Testing
- Adapter/Peripheral Compatibility testing and System Stress Testing.

1.1.1 Basic Installation Testing

Basic installation testing is performed with each supported operating system. Basic installation testing validates that the server board can install the operating system and that the base hardware feature set is functional. A small set of peripherals is used for installation purposes only. No add-in adapter cards are tested. Testing includes network connectivity and running of proprietary and industry standard test suites.

The latest version of an operating system signifies the latest supported version at the time of the actual test run. Each new release of this document may have a newly supported release of a given operating system. Previous releases of a supported operating system may not be tested beyond the basic installation test process.

1.1.1.1 Support Commitment for Basic Installation Testing

Intel commits to provide the following level of customer support for operating systems that receive only basic installation testing:

- Intel will provide and test operating system drivers for each of the server board's integrated controllers, provided that the controller vendor has a driver available upon request. Vendors will not be required by Intel to develop drivers for operating systems that they do not already support. This may limit the functionality of certain server board integrated controllers.
- Intel will support customer issues that involve installation and/or functionality of operating system with the server board's integrated controllers only if a driver has been made available.
- Intel will NOT provide support for issues related to use of any add-in adapters or peripherals installed in the server system when an operating system that received basic installation testing only is in use.
- Support is defined as assistance in root causing issues, and determining a customer acceptable resolution to the issue associated with the operating system. The resolution may include, but is not limited to, on-board controller driver changes, engaging the vendor for resolution, BIOS changes, firmware changes, or determining a customer acceptable workaround for the issue.

1.1.2 Adapter/Peripheral Compatibility and Stress Testing

Adapter/Peripheral Compatibility and Stress testing is performed only on the most current release of a supported operating system at the time of a given validation run. The Adapter/Peripheral Compatibility and Stress testing process consists of three areas: Base Platform, Adapter Compatibility, and Stress.

Base Platform: Each base platform will successfully install a given operating system, successfully run a disk stress test, and successfully run a network stress test.

Adapter Compatibility: Adapter compatibility validation (CV) testing uses test suites to gain an accurate view of how the server performs with a wide variety of adapters under the primary supported operating systems. These tests are designed to show hardware compatibility between the add-in cards and the server platform and include functional testing only. No heavy stressing of the systems or the cards is performed for CV testing.

Stress Testing: This test sequence uses configurations that include add-in adapters in all available PCI slots for a minimum 72-hour test run without injecting errors. Each configuration passes an installation test, a Network/Disk Stress test, and tape backup test. Any fatal errors that occur will require a complete test restart.

1.1.2.1 Support Commitment for Adapter/Peripheral Compatibility and Stress Testing

Intel commits to provide the following level of customer support for operating systems that receive Adapter/Peripheral Compatibility and Stress testing:

- Intel will provide support for customer issues with these operating systems involving installation and/or functionality of the server board with or without the adapters and peripherals listed in this document as having been tested under the particular operating system.
- Support is defined as assistance in root causing issues, and determining a customer acceptable resolution to the issue associated with the operating system. The resolution may include, but is not limited to, on-board controller driver changes, engaging the

vendor for resolution, BIOS changes, firmware changes, or determining a customer acceptable workaround for the issue.

- Intel will provide and test operating system drivers for each onboard video, network, and storage controller.
- Intel will enable vendors to provide driver support for add-in adapters using these operating systems.
- Intel will go through some of the steps to achieve certification to ensure its customers do not run across any problems, but the actual certification is the responsibility of the individual customer.

For operating systems, adapter cards, and peripherals not listed in this document, there is no support commitment. Intel will consider support requests on a case-by-case basis

1.2 Pass/Fail Test Criteria

For each operating system, adapter, and peripheral configuration, a test passes if specific criteria are met. Specific configurations may have had particular characteristics that were addressed on a case-by-case basis. In general, a configuration passes testing if the following conditions are met:

- The operating system installed without error.
- Manufacturer's installation instructions or Intel's best-known methods were used for the operating system installation.
- No extraordinary workarounds were required during the operating system installation.
- The server system behaved as expected during and after the operating system installation.
- Application software installed and executed normally.
- Hardware compatibility tests ran to completion without error.
- Test software suites executed successfully
- Test and data files were created in the correct directories without error.
- Files copied from client to server and back compare to the original with zero errors reported.
- Clients remain connected to the server system.
- Industry standard test suites run to completion with zero errors reported.

2. Base System Definitions

The following table lists the base system configurations tested for a given validation test run. Each specific product/system software combination tested is assigned a Base System Identifier Number. These numbers are used in the lists of supported adapters and peripherals referenced in the following sections.

The adapters and peripherals specified in this document may or may not have been tested on all available board/riser combinations that make up the server(s) product family. However, Intel will provide support for the adapters and peripherals listed when used within this family of products

This table is updated when a new test run is performed and a new product/system software combination was used.

Intel will only provide support for adapters and peripherals under the specified operating systems versions with which they were tested The latest version of an operating system signifies the latest supported version at the time of the actual test run. Each new release of this document may have a newly supported release of a given operating system. Previous releases of a supported operating system may not be tested beyond the basic installation test process.

Base System Configuration Identifier #	Board type	PBA Number	BIOS Revision	BMC Firmware Revision	HSC Firmware Revision	Notes
1	S5000PAL/ XAL	D13607-801 D46952-801	R0079	BMC59	Rev 2.04	S5000PAL
2	S5000PAL/ XAL	D13607-801 D46952-801	R0084	BMC62	Rev 2.05	S5000PAL
3	T5000PAL	D78511-201	R0074.30	BMC58	Rev 2.03	NSC2U/T5000PAL
4	T5000PAL	D78511-202	R0079	BMC59	Rev 2.04	NSC2U/T5000PAL
5	T5000PAL	D78511-202	R0079	BMC59	Rev 2.04	TIGH2U/T5000PAL (Beta Systems)
6	T5000PAL	D78511-202	R0079	BMC59	Rev 2.04	TIGH2U/T5000PAL (Silver Systems)
7	T5000PAL	D78511-203	R0084	BMC62	Rev 2.04	TIGH2U/T5000PAL

Base System 1 & 2 – *Testing information for these systems has come from reference 1.*

Base System 3 & 4 - *Testing information for these systems has come from reference 2.*

3. Supported Operating Systems

The following table provides a list of supported operating systems. Each of the listed operating systems was tested for compatibility in the base system configurations listed in section 2 of this document. Operating systems are supported only with the specified base system configuration(s) with which they were tested.

The following table also indicates whether each operating system received Basic Installation testing, or Adapter/Peripheral Compatibility and Stress testing. For information on the support commitments for Basic Installation Testing vs. Adapter/Peripheral Compatibility and Stress Testing, please reference Section 1 of this document.

Any variations to the standard operating system installation process are documented in the Installation Guidelines section of this document. If there are no installation guidelines noted in the following table, then the operating system installed as expected using manufacturer's installation instructions or Intel's best-known methods.

Operating systems supported by Intel® Server Management software or LANDesk Client Manager software may be different than the operating systems supported by the Intel® Server Board S5000PAL. Please reference the Readme and User Guide documents that are included as part of each Intel Server Management and LANDesk* Client Manager distribution for operating systems that are supported by that release.*

Operating System	Base System Configuration Tested / Type of Testing	Notes
Microsoft Windows Server 2003, Enterprise Edition, R2 (32-bit & 64 bit)	Configuration # - 1,2,3 Compatibility and Stress	
Red Hat Enterprise Linux 4.0, Update 4 (32-bit & 64 bit)	Configuration # - 3 Compatibility and Stress	See installation note 6.1
Red Hat Enterprise Linux 5.0 (32-bit & 64 bit)	Configuration # - 1,2 Basic Installation	See installation note 6.2
Red Hat Enterprise Linux 5.1 (32-bit)	Configuration # - 4,6 Basic Installation	See installation note 6.2
SuSE Enterprise Linux 9 SP3 (32-bit & 64-bit)	Configuration # - 3 Compatibility and Stress	
SuSE Enterprise Linux 10 SP1 (32-bit & 64-bit)	Configuration # - 1,2 Compatibility and Stress	
Solaris* 10 08/07	Configuration # - 2 Compatibility and Stress	

3.1 Operating System Certifications

Listed below are the operating systems that Intel will certify with the *Intel® Carrier Grade Server* ***TIGH2U***. However, the customer is responsible for their own certification from the individual operating system vendors. In many cases, the customer may leverage their operating system certifications from Intel's testing. See the "Comments" section next to each operating system in the table below for additional information. Intel's certifications, pre-certification, and operating system testing may help reduce some of the risk in achieving customer certifications with the operating system vendors.

Operating System	Certification Listing	Comments
Microsoft Windows Server 2003* R2 (32 bits and 64 bits)	√ Intel® Server Board S5000PAL √ Intel® IP Network Server NSC2U X Intel® Carrier Grade Server TIGH2U	OEM must request certification by Microsoft for their specific product. URL – http://www.windowsservercatalog.com/
Red Hat* Enterprise Linux 4.0, Update 4 (32 bits and 64 bits)	√ Intel® Server Board S5000PAL √ Intel® IP Network Server NSC2U X Intel® Carrier Grade Server TIGH2U	Red Hat checks Intel's results, certifies (if appropriate), and posts the certificate on their web site. Customer can leverage the Intel certification, if customer product meets the operating system vendor standard.
SuSE* Enterprise Linux Server 9 SP3 (32 bits and 64 bits)	X Intel® Server Board S5000PAL √ Intel® IP Network Server NSC2U X Intel® Carrier Grade Server TIGH2U	Novell* checks Intel's test results, certifies (if appropriate), and posts the certificate on their web site. Customer can leverage the Intel certification, if customer product meets the operating system vendor standard.
SuSE* Linux Enterprise Server 10 (32 bits and 64 bits)	√ Intel® Server Board S5000PAL X Intel® IP Network Server NSC2U X Intel® Carrier Grade Server TIGH2U	Novell* checks Intel's test results, certifies (if appropriate), and posts the certificate on their web site. Customer can leverage the Intel certification, if customer product meets the operating system vendor standard.
Solaris* 10 08/07	√ Intel® Server Board S5000PAL X Intel® IP Network Server NSC2U X Intel® Carrier Grade Server TIGH2U	Sun* checks Intel's results, certifies (if appropriate), and posts the certificate on their web site. http://www.sun.com/bigadmin/hcl/

4. Adapters and Peripherals

Add-in adapter card and peripheral compatibility and stress testing will only be performed with the latest version of an operating system at the time the validation testing occurred. The following table shows the operating system and base system configurations used to validate each device. The adapters are divided into categories based on their functionality. All integrated on-board devices are tested by default and are therefore not included in the following tables.

Note that not all adapter cards were tested under all operating systems. The following notations are used in the tested adapters and peripherals table below to indicate the support level that Intel provides for a particular adapter under a particular operating system:

Number (i.e. 1)	This adapter or peripheral has been tested and is supported under the specific configuration identified in the Base System Configurations Table in Section 2 of this document.
Number in brackets (i.e. [1])	This adapter or peripheral has been tested, but is NOT supported under the specific configuration identified in the Base System Configurations Table in Section 2 of this document.
NT	This adapter or peripheral has not been tested under this operating system and is not supported under this operating system.
ND	This adapter or peripheral has not been tested under this operating system due to limitations in IHV driver availability, and is not suported under this operating system.
SA (Similar Adapter) Referenced in the "Comments" column for each adapter that is supported but not tested.	This adapter is supported, but not tested. This adapter model has not been tested with this server board, but Intel will support it based on successful testing of a similar adapter from the same adapter family. Intel has high confidence that this adapter will function correctly with the server board. This adapter uses the same firmware and drivers, and has a nearly identical system interface to another adapter of the same family that has been successfully tested with this server board. In addition, Intel has secured IHV commitment to support the similar adapters equally. Customers should always test adapters as part of the final system configuration prior to deployment. All installation guidelines for the tested adapter also apply to the similar adapter.

Any variations to the standard adapter installation process or to expected adapter functionality are documented in the Installation Guidelines section of this document. If there are installation guidelines affecting a particular adapter and operating system combination, these are referenced in the following table. If there are no installation guidelines noted in the following table, then the adapter installed and functioned as expected using manufacturer's installation instructions or Intel's best-known methods.

Testing of adapters cards normally is performed with unused add-in adapters and onboard controller expansion ROMs disabled in BIOS Setup. Intel recommends that customers disable the option ROM for add-in controllers and/or the on-board controllers when not booting from the controller or needing to use its built in utilities.

Manufacturer	Model Number	Model Name	Interface	Comments	Microsoft Windows 2003* EE/R2, SP1	Microsoft Windows 2003* EE x64/R2, SP1	Red Hat* Enterprise Linux 4.0, Update 4 (Intel® EM64T Edition)	Red Hat* Enterprise Linux 4.0, Update 4(Intel® EM64T Edition)	Red Hat* Enterprise Linux 5 32-bit	Red Hat* Enterprise Linux 5 64-bit	SuSE* Enterprise Linux 9 SP3 32-bit	SuSE* Enterprise Linux 9 SP3 64-bit	SuSE* Enterprise Linux 10 SP1 32-bit	SuSE* Enterprise Linux 10 SP1 64-bit	Solaris* 10 08/07
4.1 PCI Fibre Channel															
Emulex*	LP10000DC	LP10000DC-M2	PCI-X133 Universal		1				1	1				1	2
Emulex	LP10000	LP10000-M2	PCI-X133 Universal		SA				SA	SA				SA	SA
Emulex	LP1050	LP1050-M2	PCI-X133 Universal		SA				SA	SA				SA	SA
Emulex	LP1050DC	LP1050DC-M2	PCI-X133 Universal		SA				SA	SA				SA	SA
Emulex	LP10000ExDC	LP10000ExDC-M2	PCI Express x4	Dual channel, 2Gb FC, PCI Express					2			3			2
Emulex	LP1050Ex	LP1050Ex-F2	PCI Express x4	Similar Adapter LP10000ExDC; Single channel, 2Gb FC, PCI Express								SA			
Qlogic*	QLA2342	QLA2342	PCI-X133 Universal	Dual channel 2Gb FC Optical, 2312 chip	1	2	3		1	1				1	2
Qlogic	QLA2340	QLA2340	PCI-X133 Universal	Similar Adapter QLA2342; Single channel 2Gb FC Optical, 2312 chip			SA								
Qlogic	QLA2462	QLA2462	PCI-X266 Universal	Dual channel 4Gb FC HBA, PCI-X 2.0, LC Multi-mode Optic, enterprise	4,6	4,6	4,6	4,6	4,6						
Qlogic	QLE2464	QLE2464	PCI Express x4	**On Order** Quad channel 4Gb FC HBA, PCI express, LC Multi-mode Optic, enterprise; 2 X 2432 + Bridge chip											
(S) LSI Logic	LSI7204EP-LC	LSI7204EP-LC	PCI Express		1	1			1	1			1	2	
4.2 PCI NIC															
Intel	PILA8470D3	PRO/100+ S Server	PCI-32/33 Universal	Southbend II, 10/100baseT + Security	1,2				1	1				1,2	2
Intel	PILA8472C3	PRO/100+ Dual Port	PCI-64/66 Universal	Gainesville, 10/100baseT, Dual port	SA	2			SA	SA				SA	SA
Intel	PWLA8490MT	PRO/1000MT Gigabit Server Adapter	PCI-X133 Universal	10/100/1000baseT, Copper, No bridge	1	2		1	1	1				1	2

Manufacturer	Model Number	Model Name	Interface	Comments	Microsoft Windows 2003* EE/R2, SP1	Microsoft Windows 2003* EE x64/R2, SP1	Red Hat* Enterprise Linux 4.0, Update 4 (Intel® EM64T Edition)	Red Hat* Enterprise Linux 4.0, Update 4(Intel® EM64T Edition)	Red Hat* Enterprise Linux 5 32-bit	Red Hat* Enterprise Linux 5 64-bit	SuSE* Enterprise Linux 9 SP3 32-bit	SuSE* Enterprise Linux 9 SP3 64-bit	SuSE* Enterprise Linux 10 SP1 32-bit	SuSE* Enterprise Linux 10 SP1 64-bit	Solaris* 10 08/07
Intel	PWLA8492MT	PRO/1000 MT Dual Port Server Adapter	PCI-X133	10/100/1000baseT, Dual Port, Copper, No bridge	4,6	1,4, 6	4,6	4,6	1,4 ,6	1		1	1		2
Intel	PWLA8490MF	PRO/1000MF Gigabit Server Adapter	PCI-X133 Universal	Similar Adapter PWLA8490MT; 1000baseLC, Fibre, No bridge	SA	SA			SA	SA			SA		
Intel	PWLA8492MF	1000MT Dual Port Gigabit Server Adapter	PCI-X 133		SA	SA			SA	SA			SA		
Intel	EXPI9300PT	Intel® PRO/1000 PT Desktop Adapter	PCI Express		1,2				1	1				1	2
Intel	EXPI9400PT	PRO/1000PT Server Adapter	PCI Express			1			1,2	1			1		2
Intel	EXPI9400PF	PRO/1000PF Server Adapter	PCI Express			SA			SA	SA			SA		SA
Intel	EXPI9402PT	Intel® PRO/1000 PT Dual Port Server Adapter	PCI Express			1			1	1			1,2	1	2
Intel	EXPI9402PF	Intel® PRO/1000 PT Dual Port Server Adapter	PCI Express			SA			SA	SA			SA	SA	SA
Intel	EXPI9404PT	PRO/1000 PT Quad Port Server Adapter	PCI Express x4	1000baseT, Quad port, copper, 2x82571EB, I/OAT Enabled	4,6	4,6	4,6	4,6	4,6						
Intel	PWLA8494GT	PRO/1000 GT Quad Port Server Adapter	PCI-X133 Universal	Kingsport III, 1000 GT Quad Port, copper	3										
Intel	EXPI9404PT	PRO/1000 PT Quad Port Server Adapter	PCI Express x4	Kirkwood, Quad port copper, 1GbE, I/OAT Enabled			3								
Intel	EXPI9014PFBLK	PRO/1000 AF Quad Port Bypass for Fiber Rear panel, 5-pak	PCI Express x4	1000baseT, Rear NIC, Quad Port, Fiber, Bypass support	3							3			
Intel	EXPI9024PFBLK	PRO/1000 AF Quad Port Bypass for Fiber Front panel, 5-pak	PCI Express x4	1000baseT, Front NIC, Quad Port, Fiber, Bypass support			3								
Intel	EXPI9024PTBLK	PRO/1000 AT Quad Port Bypass for Copper Rear panel, 5-pak	PCI Express x4	1000baseT, Rear NIC, Quad Port, Copper, Bypass support	3	3									

Manufacturer	Model Number	Model Name	Interface	Comments	Microsoft Windows 2003* EE/R2, SP1	Microsoft Windows 2003* EE x64/R2, SP1	Red Hat* Enterprise Linux 4.0, Update 4 (Intel® EM64T Edition)	Red Hat* Enterprise Linux 4.0, Update 4(Intel® EM64T Edition)	Red Hat* Enterprise Linux 5 32-bit	Red Hat* Enterprise Linux 5 64-bit	SuSE* Enterprise Linux 9 SP3 32-bit	SuSE* Enterprise Linux 9 SP3 64-bit	SuSE* Enterprise Linux 10 SP1 32-bit	SuSE* Enterprise Linux 10 SP1 64-bit	Solaris* 10 08/07
Intel	EXPI9014PTBLK	PRO/1000 AT Quad Port Bypass for Copper Front panel, 5-pak	PCI Express x4	1000baseT, Front NIC, Quad Port, Copper, Bypass support	3	3	3					3			
Mellanox	MHGA28-XTC		PCI-E X8		1	1,2			1	1,2			1,2	1	2
Mellanox	MHGS18-XTC		PCI-E X8												2
4.3 Telephony															
Dialogic*	DM/V600BTEP	Intel® Dialogic® Dual Span Voice Series	PCI-32/33 Universal	Dual E1/T1 ISDN Network Interface with 60 Ports of Voice Processing and 120 Ports of Telephony Signaling	3	NT	ND	ND			ND	ND			
4.4 Input															
Microsoft*	B75-00092	Intellimouse Optical	PS/2 and USB	mouse	2										
4.5 CD ROM/DVD Drives															
HLDS*	GWA-4082N	GWA-4082N	IDE/Slimline	DVD±R/RW CD-R/RW	1				1	1					
Liteon *	SOSC-2482K	SOSC-2482K	IDE/Slimline	CD-RW/DVD-ROM Combo Drive	SA	SA	SA		SA	SA			SA	SA	
Liteon	SOSC-2483K	SOSC-2483K	IDE/Slimline	CD-RW/DVD-ROM Combo Drive	3	SA	3		SA	SA			SA	SA	
Liteon	SOSC-2485K	SOSC-2485K	IDE/Slimline	CD-RW/DVD-ROM Combo Drive	SA	SA	SA		SA	SA			SA	SA	
Mitsumi*	SR244W1	SR244W1	IDE/Slimline	CD-ROM	1,2				1	1				1	
TEAC	DV-28E-V	DV-28E-V	IDE/Slimline	CD-RW / DVD-ROM	2	1			1,4	1,4			1		2
Toshiba*	SD-C2732	SD-C2732	IDE/Slimline	DVD ROM					1	1			1,2		2
4.6 Removable Media															
Lexar*	JD1GB-80-231	1GB USB Flash Drive	USB 2.0	1 GB Flash drive	2	1			1	1			1		2
Memina*	829222120101	1GB Pocket Rocket Flash Drive	USB 2.0		1				1,2	1				1	2

Manufacturer	Model Number	Model Name	Interface	Comments	Microsoft Windows 2003* EE/R2, SP1	Microsoft Windows 2003* EE x64/R2, SP1	Red Hat* Enterprise Linux 4.0, Update 4 (Intel® EM64T Edition)	Red Hat* Enterprise Linux 4.0, Update 4(Intel® EM64T Edition)	Red Hat* Enterprise Linux 5 32-bit	Red Hat* Enterprise Linux 5 64-bit	SuSE* Enterprise Linux 9 SP3 32-bit	SuSE* Enterprise Linux 9 SP3 64-bit	SuSE* Enterprise Linux 10 SP1 32-bit	SuSE* Enterprise Linux 10 SP1 64-bit	Solaris* 10 08/07
Teac*	FD05PUB	FD05PUB	USB – External Bootable	3.5-inch Floppy	1,3	2,3	3	3	1	1			NT	1	2
TEAC	CDW-552G	CDW-552G	USB 2.0	**On Order** External CD Writer (52x32x52 USB 2.0)											
Intel	Z-U130	SSDUSM0002GL10	USB 2.0	Value Solid State Drive 2 GB Low Profile			4,6	4,6	4,6	4,6					
Intel	Z-U130	SSDUSM0001GL10	USB 2.0	Value Solid State Drive 1 GB Low Profile			4,6	4,6	4,6	4,6					
Intel	Z-U130	SSDUSM0004GL10	USB 2.0	Value Solid State Drive 4 GB Low Profile			4,6	4,6	4,6	4,6					
Mitsumi	D353FUE	D353FUE	USB			1			1	1,2			1		
Maxtor	E01G300	E01G300	USB 2.0			1			1	1,2			1		2
4.7 KVM															
Avocent*	Autoview 3100	3100	Digital KVM Switch		3	3	3	3			3	3			

5. Hard Disk Drives

The hard drives listed in the following table have been tested with the server board by Intel in its validation labs and/or by individual drive vendors. The following operating system identifiers are used in the table to specify which OS each drive was tested under.

Identifier number / Base Configuration	Operating System
1	Microsoft Windows Server 2003, Enterprise Edition, R2
2	Microsoft Windows Server 2003, Enterprise x64 Edition, R2
3	Red Hat* Enterprise Linux 4.0, Update 4
4	Red Hat Enterprise Linux 4.0, Update 4 (Intel® EM64T Edition)
5	SuSE Enterprise Linux 9 SP3 32-bit
6	SuSE Enterprise Linux 9 SP3 64-bit
7	Red Hat Enterprise Linux 5.1 32-bit
8	Red Hat Enterprise Linux 5.1 64-bit
9	SLES 10 32-bit
10	SLES 10 64-bit

Note: For the definition of the *Base Configuration* number see the table describing the *Base System Configuration Identifier #* in section two of this document.

Note: the tested hardware will only support enterprise class SATA disk drives.

Note that not all hard drives were tested under all operating systems. The following notation is used in the tested hard drives table below to indicate the support level that Intel provides for a particular hard drive with a particular operating system:

Number (i.e. 1)	This hard drive has been tested and is supported under the operating system identified by the operating system identification number.
Number in brackets (i.e. [1])	This hard drive has been tested, but is NOT supported under the operating system identified by the operating system identification number.
SD (Similar Drive)	The hard disk drive is supported, but not tested. This hard drive model/capacity has not been tested with this server board, but Intel will support it based on successful testing of a larger capacity hard drive from the same hard drive family. Intel has high confidence that this hard drive will function correctly with the server board. This drive uses the exact same firmware and drivers as a larger capacity hard drive that has been successfully tested with this server board. The only difference between this drive and the one that was used in testing is the storage capacity. Intel provides the same level of support for all hard drives listed in this document, regardless of whether the drive was tested or not. Customers should always test hard drives as part of the final system configuration prior to deployment. Given the fact that a larger capacity hard drive from the same drive family has successfully completed testing on this server board, this particular hard drive capacity point will not be tested.
IHVT (IHV Tested)	The hard disk drive was tested according to Intel-approved guidelines and test procedures by the Independent Hardware Vendor (IHV) that manufactured the drive. Intel provides the same level of support for all hard drives listed in this document, regardless of whether the drive was tested in an Intel lab or not. IHV test reports remain the property of the IHV (Intel cannot provide copies of these reports).

Manufacturer	Model Number	Product Family	Interface	RPM	Drive size GB / Inches	Tested Operating Systems	Notes
SAS Hard Drives							
Fujitsu*	MAV2036RC	AL9SE	SAS-300	10,000	36 GB/ 2.5-inch	1	Pass
Fujitsu	MAV2073RC	AL9SE	SAS-300	10,000	36 GB/ 2.5-inch	SD	SD MAV2036RC
Fujitsu	MAY2036RC	AL9SE (RoHS)	SAS-300	10,000	36 GB/ 2.5-inch	3	Pass
Fujitsu	MAY2070RC	AL9SE (RoHS)	SAS-300	10,000	36 GB/ 2.5-inch	SD	SD MAY2036RC
Fujitsu	MAY2073RC	AL9SE	SAS-300	10,000	73 GB/ 2.5-inch	5	Pass
Fujitsu	MBB2073RC	AL10Se(RoHS)	SAS-300	10,000	73 GB/ 2.5-inch	SD	SD MBB2147RC
Fujitsu	MBB2147RC	AL10Se(RoHS)	SAS-300	10,000	147 GB/ 2.5-inch	1,2,3,4,5,6	Pass
Seagate*	ST936701SS	Savio 10K.1	SAS-300	10,000	36 GB/ 2.5-inch	1	Pass
Seagate	ST973401SS	Savio 10K.1	SAS-300	10,000	73 GB/ 2.5-inch	3	Pass
Seagate	ST9146802SS	Savio 10K.2	SAS-300	10,000	146 GB/ 2.5-inch	1,2,5,6,7,8,9,10	Pass
Seagate	ST973402SS	Savio 10K.2	SAS-300	10,000	73 GB/ 2.5-inch	SD	SD ST9146802SS
Seagate	ST936751SS	Savio 15K.1	SAS-300	15,000	36 GB/ 2.5-inch	SD	SD ST973451SS
Seagate	ST973451SS	Savio 15K.1	SAS-300	15,000	73 GB/ 2.5-inch	6	Pass

6. Installation Guidelines and Test Notes

6.1 Red Hat* Enterprise Linux 4 U4, 4 U5, 3 U8

Issue: The system may experience an IERR when running Red Hat Enterprise Linux 4.0, Update 4 on the server.

Implication: Intel testing proved stressing the video controller on a server running RHEL4U4 can result in a system IERR. When the IERR occurs there is no system response (the mouse and keyboard do not respond). Register dumps can be obtained if the system is instrumented for NMI. The system can only be rebooted by removing the power cord. This issue has been root caused to ROB timeout errors caused by the video driver - ati_drv.o 6.5.6 variant. This video driver will be loaded by default on the following Linux operating systems:

RHEL 4 U4:
- Xorg 6.8.2 variant
- ati_drv.o 6.5.6 variant
- radeon_drv.o 4.01variant

RHEL 4 U5:
- Xorg 6.8.2 variant
- ati_drv.o 6.5.6 variant
- radeon_drv.o 4.01variant

RHEL 3 U8
- XFree86 4.3.0 variant
- ati_drv.o 6.5.6 variant
- radeon_drv.o 4.01variant

Guideline: During the installation of RHEL4U4 on the server the ATI video driver will be installed by default. To avoid the possibility of experiencing an IERR on the server Intel suggests selecting the VESA video driver when installing RHEL4U4 on the server.

Status: Using the VESA video driver when running RHEL4U4 is recommended.

6.2 Red Hat* Enterprise Linux 5 U1

Issue: During the boot process you may see the message "Memory for crash kernel (0x0 to 0x0) not within permissible range".

Implication: This message may be concerning.

Guideline: Work through your Operating System vendor to come to resolution with this configuration.