Product Brief

Intel® Server Board S5500WB
Intel® Server System SR1690WB
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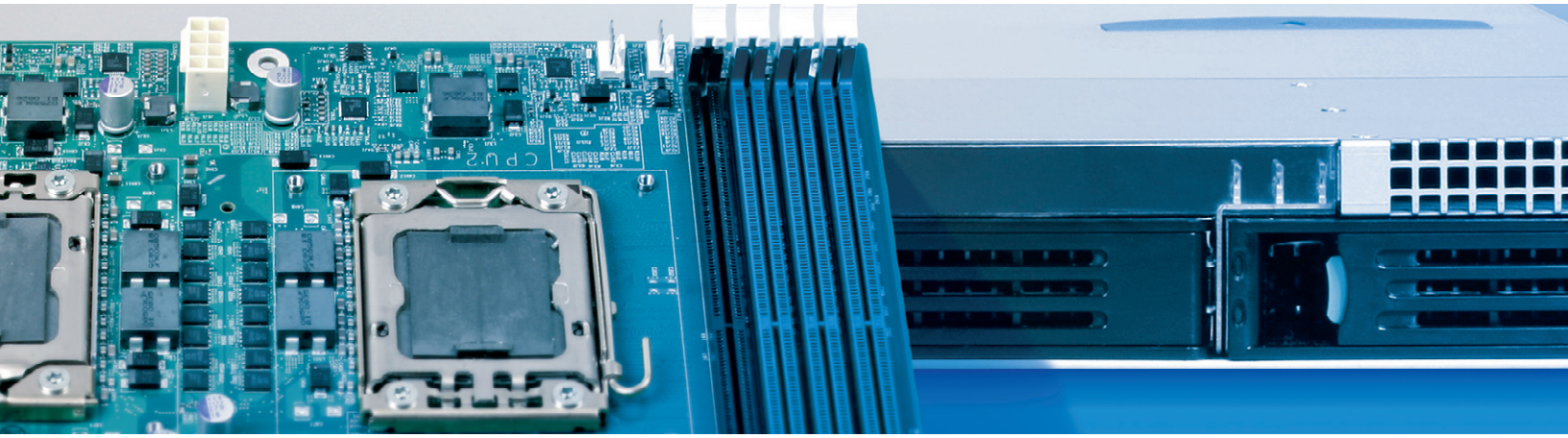


Rack-optimized server products, purpose-built for high energy efficiency and lowest total cost of ownership in dense computing applications.

Key Features

- Supports up to two Intel® Xeon® Processor 5500 or 5600 series
- Highly scalable DDR3 memory (8 DIMMs)
- One PCI Express* 2.0 x16 (x8 electrical) slot plus one Intel® I/O Expansion Module (PCI Express 2.0 x8)
- Flexible storage controller options
- Designed with state-of-the-art power and cooling optimizations for demanding data-center performance and reduced energy consumption
- Optimized for low TCO with policy-based power management through Intel® Intelligent Power Node Manager and integrated DCMI / IPMI 2.0 manageability

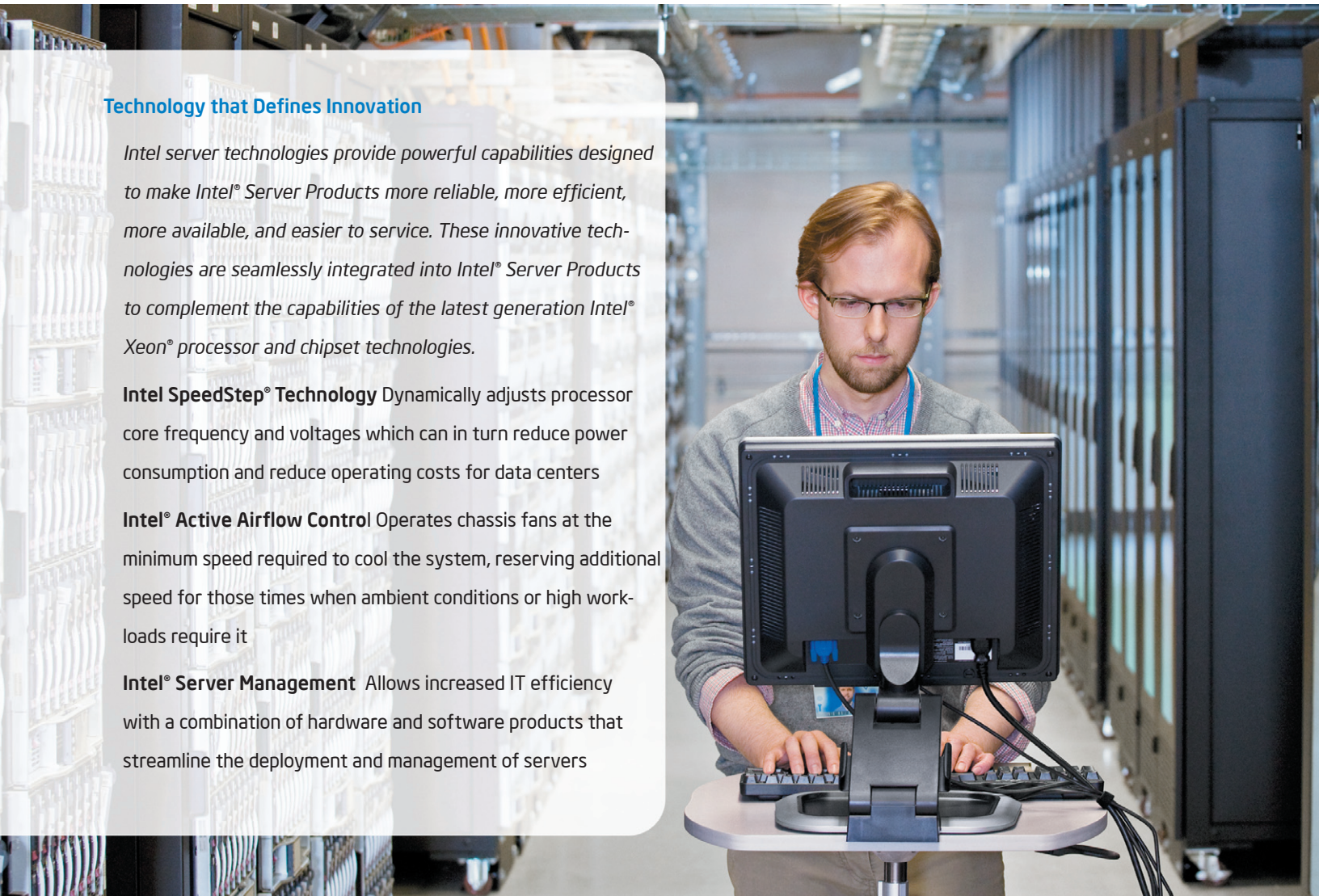
Target Applications: *High-density computing environments where energy costs and total cost of ownership are paramount such as Internet portal data centers, cloud computing and High Performance Computing (HPC).*

Board Features and Benefits

- **Support for one or two Intel® Xeon® Processor 5500 or 5600 series** Increase server performance with no increase in power consumption
- **Power efficient board architecture with optimized voltage regulator designs and a specialized layout for efficient cooling** Voltage-regulator optimization reduces the excess heat produced by inefficient and wasteful power conversion and a spread-core lay-out allows lower fan speeds, reducing the power used to move air across the board. Together these optimizations reduce power consumption
- **Fast, scalable and energy-efficient DDR3 memory** Eight, registered or unbuffered DIMMs at up to 1333 MHz, and 6 memory channels ensure energy-efficient performance for any application
- **Expandable I/O architecture** One PCIe 2.0 slot plus an optional Intel® I/O Expansion Module provide maximum flexibility in 1U rack mount applications
- **Multiple storage controller options** Six integrated 3 Gbps SATA ports or optional SAS via Intel® I/O Expansion Modules with either SAS or SAS RAID support maximize storage flexibility without consuming the PCI Express slot

System Features and Benefits

- **Purpose built, 1U rack server chassis** Energy efficient design optimized for integration with Intel® Server Board S5500WB
- **High efficiency power-supply options** Systems with either a 650-watt high efficiency (80 Plus) power supply or 450-watt high efficiency AC or DC (1+0) or redundant (1+1) power supply configurations, all PMBus capable supporting Intel® Intelligent Power Node Manager for policy-based power capping to enable increased rack densities and improved data center utilization
- **Optimized fan speed control & thermal solutions** BIOS optimizations include custom fan speed control that enables slower fan speeds, reducing system power requirements, saving energy and reducing TCO
- **Flexible storage configuration** Four hot swap SAS/SATA drive bays supporting either 3.5" or 2.5" HDD in the same drive carrier, providing the flexible storage configurations you need



Technology that Defines Innovation

Intel server technologies provide powerful capabilities designed to make Intel® Server Products more reliable, more efficient, more available, and easier to service. These innovative technologies are seamlessly integrated into Intel® Server Products to complement the capabilities of the latest generation Intel® Xeon® processor and chipset technologies.

Intel SpeedStep® Technology Dynamically adjusts processor core frequency and voltages which can in turn reduce power consumption and reduce operating costs for data centers

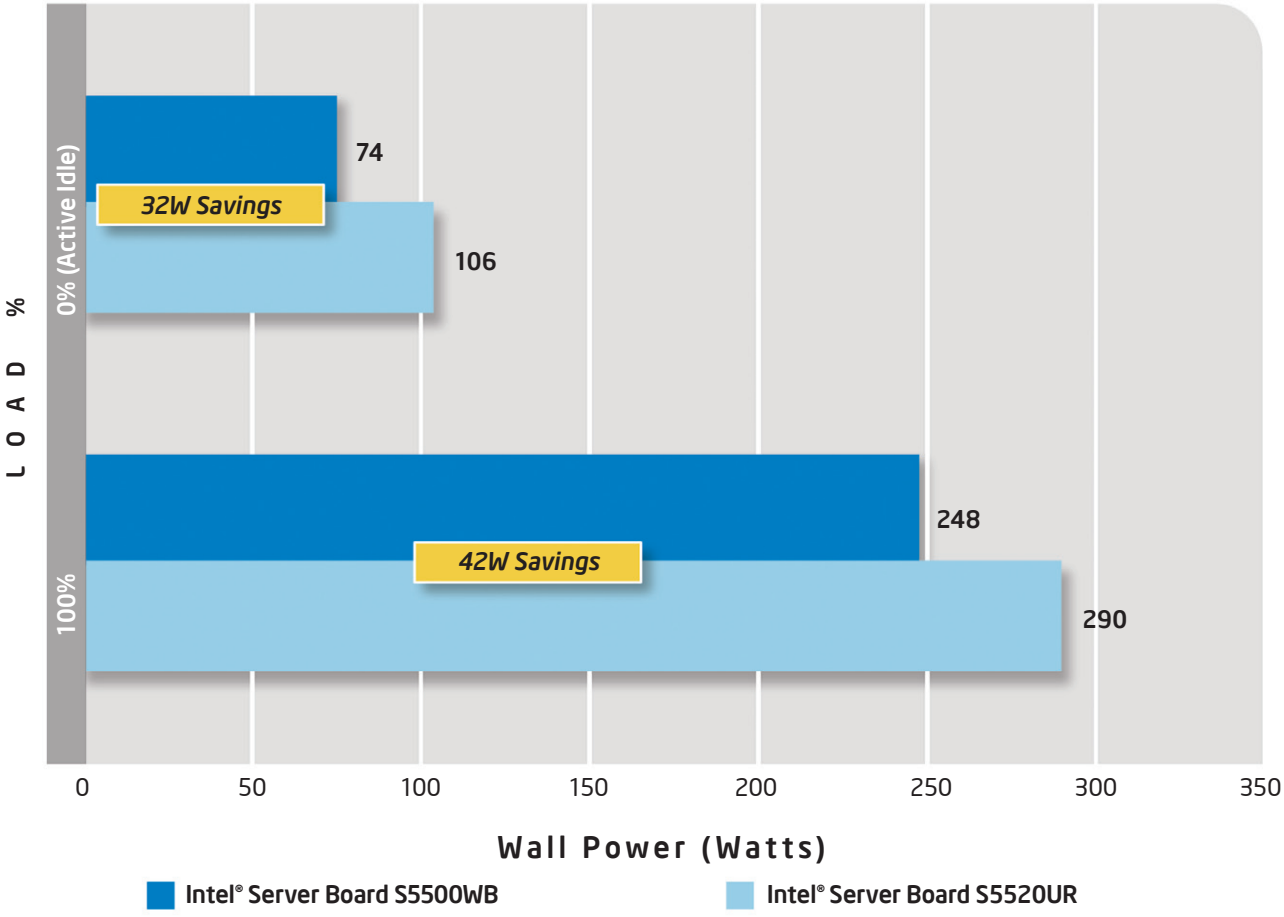
Intel® Active Airflow Control Operates chassis fans at the minimum speed required to cool the system, reserving additional speed for those times when ambient conditions or high workloads require it

Intel® Server Management Allows increased IT efficiency with a combination of hardware and software products that streamline the deployment and management of servers

According to the Climate Savers Computing Initiative, *the typical server wastes 30-40% of its input power. This wasted power is given off as heat in the data center which adds significantly to the air conditioning load of the data center and makes the true cost of ownership of inefficient servers much higher than just the power it consumes. In a traditional data center, each Watt of power dissipated requires an additional Watt of electricity in air handling and chilling, so the impact can be doubled.*

http://www.climatesaverscomputing.org/about/faq/

UP TO 30% WALL POWER SAVINGS[1]



An optimized system built around the Intel® Server Board S5500WB saves 32W at the wall over a typical 1U server such as the Intel® Server System SR1600UR. This equates to total data center power savings of 64W (in a typical data center with PUE of 2.0)[2] Over a four year life, with electricity cost of $0.10 per KWh, that would amount to over $224 in power costs saving for each server deployed.[3]

Intel® ESAA Makes it Easy

Getting components from different vendors to work seamlessly in a single, reliable solution can be a challenge. The Intel® Enabled Server Acceleration Alliance (Intel® ESAA) gives system builders access to pre-verified solution configuration guides ("recipes") for Intel® Server Products that are jointly developed with ISVs around the globe. Applications include HPC, virtualization, storage, backup and recovery, database, and more.

Available exclusively for Intel® Server Products, Intel® ESAA recipes provide detailed hardware and software requirements and comprehensive configuration and deployment instructions to help meet complex customer requirements rapidly.

For added customer confidence, resellers can request a certificate stating that Intel and the application vendor stand behind their branded Intel Server Product-based solution. VMware, Red Hat, Citrix, and EMC solutions may also qualify for free pass-through branded system certification and listing on the vendor's Hardware Compatibility List (HCL).

Intel® Cluster Ready (ICR) Certification is also available for the Intel® Server Board S5500WB family of products. The ICR program defines a common basis for clusters in collaboration with OEMs, channel members, and ISVs. Intel ESAA offers recipes that detail the configuration of HPC clusters on Intel® Server Products for validation with ICR tools.

Available recipes for the Intel® Server Board S5500WB, Intel Server System SR1690WB and Intel Server System SR1695WB include:

High-Performance Computing (HPC) Deployments:

- Platform Cluster Manager* 1.2 and Intel® Cluster Ready Configuration on Red Hat Enterprise Linux* 5.3
- QLogic TrueScale InfiniBand* HPC Cluster on Linux*
- Voltaire InfiniBand* Interconnect for Linux* HPC Cluster:

OS Certifications:

- Oracle Enterprise Linux* 5.3
- Red Hat Enterprise Linux* 5.3
- Red Hat Enterprise Linux* 5.3 with Integrated Virtualization

Pass Through System Certifications:

- VMware Infrastructure 3 for ESX* 3.5
- VMware vSphere 4 for ESX* 4.0/ ESXi 4.0 Installable*
- EMC* Storage
- Citrix XenServer* 5.5

With help from the Intel ESAA program, you can get to market early with leading-edge solutions based on the Intel® Server Board S5500WB family of products—and stay ahead of the competitive curve.

For more information go to: www.intel.com/go/esaa

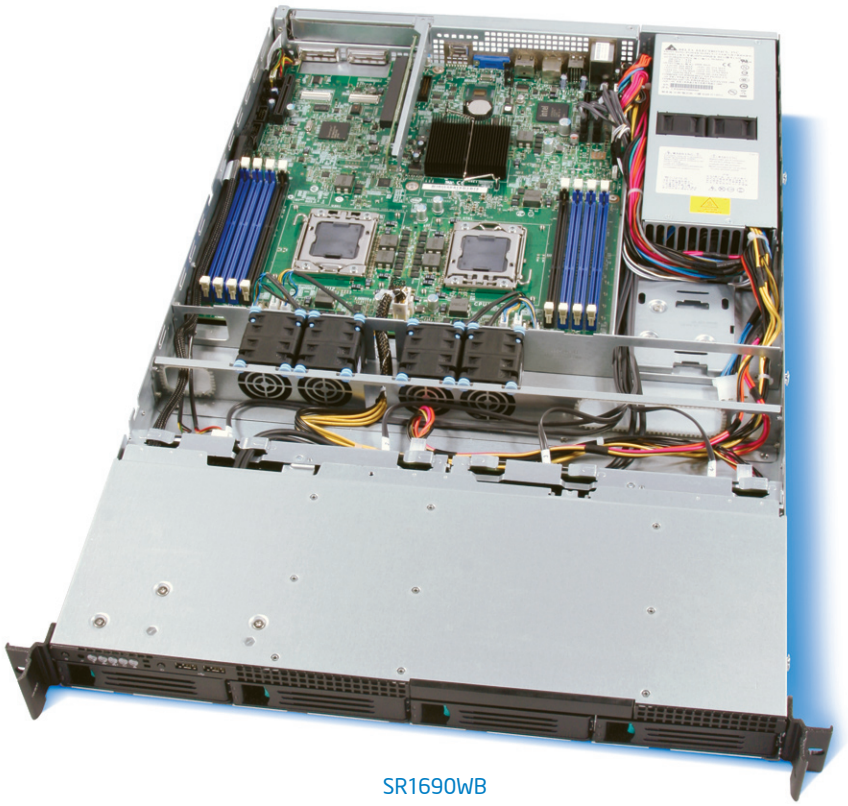
ORACLE® EMC² where information lives redhat. vmware® CITRIX ready™

Clustercorp Mellanox TECHNOLOGIES Platform Computing

Intel® Server Board S5500WB Technical Specifications

Form Factor	SSI EEB (12" x 13")
Processor	Supports one or two Intel® Xeon® Processor 5500 or 5600 series[4]
Chipset	Intel® 5500 chipset with Intel® ICH10R
Intel® Quick Path Technology	4.8GT/s, 5.86GT/s and 6.4GT/s
Memory Capacity	Eight DDR3 DIMM sockets (Registered or Unbuffered) • Six channel native (800/1066/1333MHz)
Storage	• Six SATA ports (3 Gbps) via ICH10R with Intel® Embedded Server RAID Technology • Modular four-port SAS and SAS RAID options via Intel® I/O Expansion Module
Intel® RAID Support	Integrated SATA • Intel® Embedded Server RAID Technology with host-based SW RAID levels 0/1/10 Optional SW RAID 5 with activation key Optional internal SAS modules do not consume a valuable PCI slot like a traditional add-in card: • Intel® SAS Module AXX4SASMOD with RAID 0, 1, 1E, 10, and optional host-based SW RAID 5 • Intel® RAID Controller SROMBSASMR with RAID 0, 1, 5, 6, 10, 50 and 60 and optional Intel® RAID Smart Battery Validated with Intel® RAID Controllers[5]
Expansion Slots	Up to two expansion slots in a 2U chassis: • 1 PCI Express* 2.0 x8 slot (x16 mechanical) • 1 PCI Express 2.0 x4 slot (x8 mechanical) One expansion slot in a 1U chassis: • 1 PCI Express 2.0 x8 slot (x16 mechanical) Either 1U or 2U chassis can also accommodate one Intel I/O Expansion Module (PCI Express 2.0 x8) Optional Intel® I/O Expansion Modules include: • 4 port external or internal SAS (based on LSI* 1064e) • 4 port internal SAS RAID (see Intel® RAID Support above) • Dual-port 10 Gigabit Ethernet • Dual and Quad-port Gigabit Ethernet • InfiniBand* (Mellanox*)
Integrated LAN	Embedded Intel® Dual Gigabit Controller 82576EB with support for Intel® Virtualization Technology[6]
Integrated Graphics	Server Engine* LLC Pilot II* Controller with 64 MB DDR2 memory, 8MB allocated to graphics
Management Hardware	Integrated IPMI 2.0 Baseboard Management Controller • Fan speed control • Diagnostic LEDs • Temperature monitoring and recovery • SMASH CLP (command line interface) • Email alerting • Power management with Intel® Intelligent Power Node Manager • Support for the Data Center Manageability Interface (DCMI 1.0) Optional Intel® Remote Management Module • KVM & Virtual Media redirection • Dedicated 3rd NIC • Remote Power on/off • Embedded Web UI • Event log and configuration
Management Software	Intel® Deployment Assistant • Wizard based UI to deploy, configure and update server • BIOS, BMC and RAID array configuration • Unattended OS install • Online patch updates Intel® Server Management Software • View critical or warning events • Power on/off/reset • View sensor (fan speeds, temperature, power) • Full IPMI 2.0 interface • Chassis Intrusion detection • Serial Over LAN (Text Console Redirection)
Chassis	Intel® Server System SR1690WB or SR1695WB See support.intel.com for 3rd party chassis option

Purpose-built Energy Efficiency in Dense Computing Applications



SR1690WB

Intel® Server System SR1690WB Technical Specifications

Order Code	SR1690WB SR1690WBNA
Form Factor	1U Rack
Server Board	S5500WB
Drive Bays	Four hot-swap SAS/SATA drive bays supporting either 3.5" or 2.5" HDDs in the same drive carrier
System Cooling	Four non-redundant fans
Power Supply	650-watt non-redundant high efficiency (80 Plus) PMBus capable
Add-in Card Support	One PCI Express* 2.0 x8 through riser card
I/O Expansion Module Support	Yes[7]
Dimensions (H x W x D)	1.7" x 17" x 26" (43mm x 432mm x 659mm)
Components Included	• Intel® Server Board S5500WB • Intel® Server Chassis SR1690 • 650-watt non-redundant power supply • One PCI Express* riser card • Four 3.5" hard drive carriers • Pre-routed cables • Hot-swap SATA/SAS backplane • Four high-speed fans
Management Hardware	Integrated IPMI 2.0 baseboard management controller Optional Intel® Remote Management Module
Management Software	Intel® Deployment Assistant Intel® Server Management Software

Redundant AC or DC Power Supply Options in High Efficiency 1U Chassis

SR1695WB

Intel® Server System SR1695WB Technical Specifications

Order Code	SR1695WB SR1695WBNA
Form Factor	1U Rack
Server Board	S5500WB
Drive Bays	Four hot-swap SAS/SATA drive bays supporting either 3.5" or 2.5" HDDs in the same drive carrier
System Cooling	Four non-redundant fans
Power Supply	AC or DC 450-watt non-redundant (1+0) or redundant (1+1) high efficiency (80 Plus) PMBus capable
Add-in Card Support	One PCI Express* 2.0 x8 through riser card
I/O Expansion Module Support	Yes[7]
Dimensions (H x W x D)	1.7" x 17.75" x 26.5" (43mm x 451mm x 673mm)
Components Included	• Intel® Server Board S5500WB • Intel® Server Chassis SR1695 • 450-watt AC or DC power supply options • One PCI Express* riser card • Four 3.5" hard drive carriers • Pre-routed cables • Hot-swap SATA/SAS backplane • Four high-speed fans
Management Hardware	Integrated IPMI 2.0 baseboard management controller Optional Intel® Remote Management Module
Management Software	Intel® Deployment Assistant Intel® Server Management Software

Safety and EMC Regulatory Compliance

Regulatory compliance for an Intel host system is based on the use of an Intel server base board that was tested in the host chassis and found compliant. Intel server base boards and host chassis are tested to Class A EMC requirements. Intel server products comply with RoHS (Restriction of Hazardous Substances).

Region (Compliance Obtained)	Board Markings	Host Chassis Markings
Argentina (IRAM)	Regulation N/A	
Australia (ACA) / New Zealand (MED)		
Belarus	Regulation N/A	
Canada		
	ICES-003	
Europe (EU Directives) - LVD & EMC require CE mark; No mark required for RoHS; WEEE marking added voluntarily for end integrator convenience		
Germany GS for Chassis Only; German Green Dot (Duales System Deutschland) for Board Packaging Only		
International Compliance (CB Report & CISPR Emission & Immunity)	Marking Not Required	
Japan (VCCI for chassis only) & Japan Recycling Marks on Board Retail Packaging Only	Regulation N/A	
		Marking Not Required
Korea (KCC)		
Russia (GOSSTANDART)	Regulation N/A	
Taiwan (BSMI)		
Ukraine (UKRTEST)	Regulation N/A	Marking Not Required
United States NRTL & FCC (For Board Products FCC Notation May Be in Documentation)		
	This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation	

Build an Eco-Smart Environment with
Intel Server Products.
Worldwide Programs Supported Include:

Energy Star*

Climate Savers Computing*

Restriction of Hazardous Substances Directive*

80 PLUS*

Select compatible components for a complete server system: www.intel.com/go/serverconfigurator

Why choose Intel® Server Products? Quality, flexibility, support. Learn more: www.intel.com/go/serverproducts

[1] Power benchmark data from SPECpower_ssj2008. http://www.spec.org/specpower/ Measurements were taken on pre-production systems (January 2009) that were configured with identical memory, processors and hard disk drive, operating system and JVM. Variables were fan configuration, cooling duct design, fan speed control and power supply wattage and efficiency rating.

[2] PUE = Power Usage Effectiveness. A PUE of 2.0 means that for every 2 watts in at the utility meter, only one watt is delivered out to the IT load (the server in this case). PUE ratio of 2.0 is the average value across all U.S. data centers. Source: http://www.energystar.gov/ia/partners/prod_development/downloads/EPA_Datacenter_Report_Congress_Final1.pdf

[3] Calculation backup: 32W x 4 years x 365 days x 24 hours/1000 = 1,121 Kilo Watt Hours (KWh). At a PUE of 2.0, that becomes 2,241 KWh x $0.10/ KWh = $224.

[4] When installing two processors, both processors must be from the same processor series; either two Intel® Xeon® processor 5500 series or two Intel® Xeon® processor 5600 series. Out of the box support for the Intel Xeon 5600 series processors will be indicated by the addition of the letter "R" at the end of the Product Order Code. For boards and systems currently supporting the Intel Xeon 5500 series, a BIOS update is required before installing the 5600 series processor(s). Refer to http://support.intel.com for more information.

[5] For tested Intel® RAID Controller options go to http://support.intel.com/support/motherboards/server/compat_matrix.htm

[6] Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM) and, for some uses, certain computer system software enabled for it. Functionality, performance or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

[7] For optional Intel® I/O Modules go to http://www.intel.com/products/server/io/index.htm