

Innovative, modular, scalable, mid-range system designed for the on demand world



IBM System p5 560Q server



16-core p5-560Q server

Highlights

- ***Dense Quad-Core Module (QCM) technology for outstanding price/performance***
- ***Up to 16-core scalability with modular architecture***
- ***Excellent for large applications, mid-sized databases and departmental HPC serving***
- ***Ideal as a Linux® operating system consolidation server***

The IBM System p5™ 560Q mid-range server implements outstanding price/performance, mainframe-inspired reliability and availability features, and scalability to 16-cores. Based on IBM POWER5+™ processors with simultaneous multithreading¹ and a scalable, 4U (EIA Units) building block package, the 19-inch rack-mount p5-560Q delivers performance, scalability and reliability features for commercial and technical applications. It is

well-suited for large single applications, mid-sized databases and departmental high performance computing (HPC) serving. As a Linux consolidation server, it is designed to provide superior availability while reducing infrastructure costs.

The System p5 560Q platform offers a powerful one or two building block system that scales from 4- to 16-cores. The system's modular architecture means you can start with a 4-core, single QCM system and easily add an additional QCM to upgrade to an 8-core system. A second building block with two additional QCMs can also be added when more processing power is needed to expand the server to 16-cores. With the System p5 560Q server, you have fewer management challenges because of its symmetric multiprocessor (SMP) building block technology. Additional I/O and storage capacity come standard with each building block added.

Modular building blocks provide flexible scalability

The p5-560Q is powered by 64-bit, 1.5 GHz or 1.8 GHz POWER5+ QCMs. Up to two QCMs may be installed per building block, each QCM containing 3.8MB of Level 2 (L2) and 72MB of Level 3 (L3) cache. These are packaged along with memory, media, disks, I/O adapters, power and cooling to create a balanced, high-performance rack-mount system. Connected by a cabling system at full bus speed, one or two building blocks can be integrated into a 19-inch rack as a single, symmetric multiprocessing server. At its maximum, the p5-560Q server may consist of 16 processors, 128GB of DDR2 memory, four media bays, 12 PCI-X slots and 12 internal disk bays accommodating up to 3.6TB of disk storage. In addition, up to eight optional I/O drawers may be attached, significantly adding to the PCI-X and disk storage bay capacity. And up to five fully configured 16-core 560Q servers (without optional I/O drawers) may be installed in a single 42U 19-inch rack.

Systems with a single building block (4- or 8-core) are known as System p5 560Q Express servers and may be ordered in specially packaged and priced IBM AIX 5L™ or Linux Express Editions. A p5-560Q Express server can be converted to a 16-core system.

Clients can cost-effectively build systems sized specifically for their processing needs by providing the infrastructure, such as power, room cooling and rack space, to support the number of building block modules required. Because the building block architecture enables clients to scale-out not only processing power but also cache, memory, internal storage and I/O capacity, the p5-560Q can provide tremendous capacity and flexibility for seamless application growth as computing demands increase.

In addition, as many as 64 p5-560Q servers may be included in a single HPC cluster. For the ultimate in IBM server availability, the p5-560Q can be clustered with IBM High Availability Cluster Multiprocessing (HACMP™) software designed to provide near continuous availability.

Virtualization technologies drive utilization and improve productivity

The p5-560Q server can utilize logical partitioning (LPAR) technology implemented via IBM System p™ virtualization technologies and the operating system (OS). Logical partitions allow the processors to run separate workloads in different partitions on the same server, thereby helping lower costs. p5-560Q partitions are designed to be shielded from each other to provide a high level of data security and increased application availability. The supported operating systems also implement dynamic LPAR, which allows clients to dynamically allocate many system resources to application partitions without rebooting, simplifying overall systems administration and workload balancing and enhancing availability.

The p5-560Q server optionally offers IBM Advanced POWER™ Virtualization (APV) including IBM Micro-Partitioning™ and Virtual I/O Server (VIOS) capabilities, which allow businesses to increase system utilization while helping to ensure applications

continue to get the resources they need. Micro-Partitioning technology helps lower costs by allowing the system to be finely tuned to consolidate multiple independent workloads. Micro-partitions can be defined as small as 1/10th of a processor and changed in increments as small as 1/100th of a processor. Using the Integrated Virtualization Manager (IVM) included with VIOS, companies can cost-effectively consolidate multiple partitions onto a single server. With its intuitive browser-based interface, IVM is easy to use and helps reduce the time and effort required to manage virtual devices and partitions.

IBM System Storage™ technology offers additional virtualization and partitioning capabilities within the storage infrastructure for the p5-560Q server. Storage virtualization via the IBM SAN Volume Controller complements and provides flexibility within the storage backbone, allowing clients to move physical devices, create storage pools across multiple devices and provide a central point-of-control.

Flexibility, reliability, security features

The System p5 560Q server is designed to give clients the flexibility to run the AIX 5L and Linux operating systems concurrently in micro-partitions.

AIX 5L, IBM's industrial-strength UNIX® OS, is built on a tradition of reliability, availability, security and open standards for business-critical applications. It is available on the p5-560Q Express models via the AIX 5L Edition. The Linux OS is known for its extensive set of open source applications and ability to rapidly deploy new or customized solutions. Linux distributions from Red Hat Inc. and SUSE Linux are supported on the Express models via the OpenPower™ Edition.

The p5-560Q server includes many of the same RAS features as larger IBM System p5 models, helping keep the system up and running around the clock. It extends the System p5 heritage of world-class RAS capabilities to a mid-range system by including a sophisticated service processor; hot-plug, hot-swappable and redundant components; IBM Chipkill™ ECC and bit-steering memory; and dynamic deallocation of system components. The resulting increase in system availability allows more work to be processed.

Security is no longer just desirable; it is an absolute requirement. The p5-560Q server can ease the worry associated with providing a secure operating



p5-560Q Express rack drawer

environment. The system is designed to prevent applications running in logical partitions from violating the security and privacy policies across partitions. It also comes with enhanced network filtering for better network security and intrusion detection.

The 560Q as a powerful application server

The p5-560Q server is an excellent choice for those clients running the Linux operating system and consolidating applications onto dense 19-inch racks. It provides the ability to reduce IT expense and helps simplify the administration and management of multiple hosted applications. Each p5-560Q server is scalable to a 16-core configuration using two 4U rack-mount building blocks. Up to five p5-560Q servers can be installed in single 19-inch rack, resulting in a total of 80 cores in the rack, each capable of supporting 10 micro-partitions. These application partitions can share I/O adaptors, so there can be significantly less physical hardware required to support those

applications. Each p5-560Q has up to 3.6TB of internal disk and 12 PCI-X slots, meaning that the rack of five servers has 18TB of data capacity and 60 PCI-X slots.

The net result is a super-dense configuration for Linux infrastructure and Web serving applications in the footprint of one 19-inch rack. Use of APV technologies, with its Virtual I/O and shared processor pool, lets the system respond to applications' fluctuating processing requirements with minimal operator intervention. Mainframe-inspired RAS features keep these applications available and help to meet service level agreements, thus avoiding costly penalties for unexpected application outages.

The System p5 560Q is also an excellent choice for clients who demand high availability and who want to simplify the administration of their UNIX application, database and departmental HPC servers. The combination of the powerful 1.8 GHz processor QCM, mainframe-inspired RAS features and APV technologies may allow clients to maximize their IT budgets and resource utilization.

Express offerings deliver price advantage

The p5-560Q Express models are available in specially priced packages—Express Editions—designed to deliver outstanding business value to mid-sized businesses and departments of large enterprises while meeting the needs of many mission-critical applications. The System p5 560Q Express, AIX 5L Edition and the System p5 560Q Express, OpenPower Edition, include popular, easy to order configurations with financial incentives on the hardware as well as the ability to order a discounted AIX 5L or Linux OS. Additional memory, disk drives or adapters—or displays and external storage—can be easily added to the package without impacting the original savings.

Complementary offerings

The System p5 560Q server can be enhanced to a complete systems solution by including complementary offerings from IBM and IBM partners. These include IBM System Storage and TotalStorage® I/O products, Licensed Program Products (LPPs) and IBM Global Services (IGS) consulting and services. A large portfolio of products from Independent Software Vendors (ISVs) is also supported on the

p5-560Q. IBM integrated offerings combine these products into tested, proven solutions which are easier to install, manage and operate.

IBM I/O products include the DS family of disk products and are complemented by a full range of capabilities like advanced copy services, management tools and virtualization services to help protect data and provide infrastructure flexibility. System Storage Area Network (SAN) products and solutions provide integrated SMB and enterprise SAN solutions with multi-protocol local, campus, metropolitan and global storage networking. Tape products, network attached storage and a variety of software offerings are also available to meet business and end user requirements.

IBM Tivoli® offers a variety of LPPs to enhance the effectiveness and efficiency of managing the p5-560Q server. These products assist clients with asset management, security, data and information management, and other functions. IBM also offers leadership database and Web commerce software.

IBM combines these offerings with ISV offerings and Services from IGS to help tailor your environment into tested, proven solutions. With support across the entire System p product line including the p5-560Q, these offerings recommend common starter configurations to cover a range of user requirements and provide blueprints on how to design, set-up, install and deploy an optimal infrastructure for common IT and industry-specific tasks.

IBM System p5 560Q: Scalable server for growth

Use the p5-560Q as a Linux consolidation system. Its RAS, scalability and virtualization features are designed for super-dense configurations in a 19-inch rack with excellent performance. Use the System p5 560Q server for large single applications, mid-sized databases and HPC processing when you need room to grow. Like all System p5 Express servers, you can choose from an easy to buy, install and manage pre-configured AIX 5L Edition or

OpenPower Edition. Modular architecture and thousands of available AIX 5L and Linux applications help make the System p5 560Q server an outstanding choice for service provider, financial services, insurance, HPC, industrial, distribution, public sector, retail and communications organizations. Based on these qualities, the System p5 560Q server is designed to give enterprise-class on demand computing without compromising availability, performance or security features.

p5-560Q at a glance

Configurations options	Express models	Standard model
Microprocessors	One or two QCMs (4- or 8-core) in a single building block with 64-bit, 1.5 GHz or 1.8 GHz POWER5+ processors	Four QCMs (16-core) in two building blocks with 64-bit, 1.5 GHz or 1.8 GHz POWER5+ processors
Level 3 (L3) cache	72MB per QCM	288MB
RAM (memory)	2GB to 64GB of DDR2 SDRAM	8GB to 128GB of DDR2 SDRAM
Processor-to-memory bandwidth (peak)	42.2 GBps	84.4 GBps
L2-to-L3 cache bandwidth (peak)	115.2 GBps	230.4 GBps
GX+ I/O subsystem bandwidth (peak)	9.6 GBps	19.2 GBps
Internal disk bays	Six on a split backplane (3+3)	12 (two split backplanes)
Internal disk storage	Up to 1.8TB (16.2TB with optional I/O drawers)	Up to 3.6TB (32.4TB with optional I/O drawers)
Media bays	Two hot-plug slimline	Four hot-plug slimline
PCI-X adapter slots	Six hot-plug 64-bit 133 MHz (34 with optional I/O drawers)	12 hot-plug 64-bit 133 MHz (68 with optional I/O drawers)
Standard features		
Integrated I/O adapters	One 2-port 10/100/1000 Ethernet; Dual channel Ultra320 SCSI controller; One 2-port USB, two HMC, two system ports	Two 2-port 10/100/1000 Ethernet; Two dual channel Ultra320 SCSI controllers; Two 2-port USB, two HMC, two system ports
Expansion features		
I/O expansion (optional) ¹	Up to four I/O drawers (combination of 7311-D11 and 7311-D20)	Up to eight I/O drawers (combination of 7311-D11 and 7311-D20)
Connectivity support (optional)	2 Gigabit Fibre Channel; 10 Gigabit Ethernet; 4x InfiniBand	
System p virtualization technologies		
POWER Hypervisor	Dynamic LPAR; Virtual LAN ²	
Advanced POWER Virtualization ² (optional)	Micro-Partitioning; Shared processor pool; VIOS with IVM; Partition Load Manager (AIX 5L only)	
Operating systems	AIX 5L V5.2 or later ³ SUSE LINUX Enterprise Server 9 for POWER (SLES 9) or later ³ Red Hat Enterprise Linux AS 4 for POWER (RHEL AS 4) or later ³	
Power requirements	200v to 240v AC	
System dimensions	Building block: 6.85"H (4U) x 19.0"W x 31.1"D (174.1mm x 485mm x 790mm); weight 140.0 lb (63.6 kg) ⁴	
Warranty	8 A.M. to 5 P.M., next-business-day for three years (limited) at no additional cost; on-site for selected components; CRU (customer replaceable unit) for all other units (varies by country). Warranty service upgrades and maintenance are available.	

For more information

To learn more about the IBM System p5 560Q server, please contact your IBM marketing representative or IBM Business Partner, or visit the following Web sites:

- ibm.com/systems/p
- ibm.com/servers/aix
- ibm.com/linux/power
- ibm.com/systems/p/solutions
- ibm.com/common/ssi



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When referring to storage capacity, 1TB equals total GB divided by 1000; accessible capacity may be less.

¹ Supported on 1.8 GHz models only

² Not supported using 5L V5.2

³ Available as Express Editions on 4- and 8-core models

⁴ Weight will vary when disks, adapters and peripherals are installed