IBM Power Systems

*Designed with open innovation to maximize
the value of data across the enterprise*

IBM

Highlights

- Built for your most complex, mission-critical business priorities
- Bring insights to the point of impact faster through a data-centric design
- Process big data in memory with up to 8 terabyte (TB) memory
- Improve IT economics and efficiently deliver business services with scalable, open private and hybrid cloud
- Minimize risk with secure, encrypted delivery of data and services on a proven, reliable platform
- Manage fluctuating business demands with dynamic, private cloud capacity on demand
- Simplify management of Linux applications using new, faster Power integrated facility for Linux (IFL)

Built to confidently support mission-critical business demands

Businesses today are transforming and seeking new ways to deliver value from IT. This is placing new demands on enterprise IT infrastructure. Cloud, big data, analytics, mobile solutions, and social business aren't simply remaking computing, they are remaking business and they are helping to revolutionize the way that IT is created and consumed. This new model represents an opportunity for organizations to reshape the value they deliver, but cost, complexity and risk are standing in the way. So how can companies capitalize on this opportunity?

We believe there's an answer—IBM® Power Systems™—the IT platform with the first processor designed for big data. Its open architecture offers efficiency and superior cloud economics, and is continuously infused with innovation from its open server ecosystem. Power servers offer an ideal architecture to deliver superior security and a stronger customer experience against your competition. With an integrated set of resources that are always available[2] and comprehensive data management capabilities, Power servers can align your technology to your business demands, uncover new value in your data to drive innovation, and securely and efficiently deliver business services to help reduce costs.

Power
Systems

Designed for the demands of big data and analytics

Businesses are amassing a wealth of data and Power Systems, built with innovation to support today's data demands, can store it, secure it and, most importantly, extract actionable insight from it. Power Systems are designed for big data. From operational business intelligence and data warehouses to predictive analytics and cognitive Watson solutions, Power servers are optimized for the compute intensive performance demands of database and analytics applications and can flexibly scale to support the demands of rapidly growing data. Power Systems' open, data-centric design combines computing power, big memory, memory bandwidth, and broad data pathways to process and move data through applications in ways that are easier to consume and manage.

And to resolve the need for security and privacy that comes with highly networked, data-intensive applications, Power offers built-in security competitors can't match. Real-time data encryption, sophisticated application isolation, and compliance alerts and reporting ensure that data is safe, company and industry compliance standards are met, and costs are minimized.

Optimized to run mission critical workloads in the cloud with confidence

IBM Power Systems enterprise servers are designed for enterprise private and hybrid cloud environments. Through enterprise-class security, efficient virtualization that drives

industry-leading workload density, and dynamic resource allocation and management – Power Systems confidently delivers consistently high service levels across hundreds of virtual workloads on a single system.

As organization seek to maximize their IT flexibility and drive efficiency by reducing systems management, Power Systems offer an ideal platform. With cloud management solutions that are built on open standards and OpenStack, a choice of leading operating systems, and virtualization that is built-in for security and efficiency, enterprise servers from IBM Power Systems are built to handle the rigor of managing complex, large-scale, mission-critical applications.

Deliver new capabilities for mobile applications
Core business systems such as enterprise resource planning (ERP) and customer relationship management (CRM) are crucial elements in responding to market needs. They manage and deliver data and provide the reliability, availability, and security that businesses—and their customers—demand. But increasingly, these Systems of Record are connected to employees and consumers through mobile and social Systems of Engagement designed to improve the user experience and drive competitive advantage. In this increasingly complex environment, mobile applications are now mission-critical and cannot run as isolated applications with their own set of data and demand higher levels of service and improved performance.

Power Systems offers the open technologies required by mobile applications plus the integration, higher qualities of service, improved economics, and security delivered that are characteristic of Power Systems enterprise servers. The computational speed, data bandwidth, low latency, and resiliency required to provide immediate, reliable responses to mobile users when they need it most makes Power an ideal platform for mobile applications. And for Linux-based applications, Power IFL offers integrated operations, improved performance & reliability, and a more secure server combined with scale-out market affordability. Power Systems offers versatility of deployment models so businesses can take advantage of the skills and

infrastructure they already have along with the ability to align technology to their business processes. They gain the best of both worlds—combining the advantages of shared IT infrastructure for core systems and extending engagement systems securely and reliably through mobile applications.

Revolutionizing the way IT is developed and delivered
POWER® architecture is the heart of the OpenPOWER™ Foundation, a growing community built around an open technology platform to foster new opportunities and design the next generation of applications and technologies. Leveraging open standards, Power Systems provides developers with tools tuned for a platform that boosts productivity and performance by removing constraints imposed by commodity architectures. With an architecture that supports open standards such as Linux and OpenStack—and with community innovation driven through Power Systems Linux Centers, Watson & Power development clouds, and the OpenPOWER Foundation— Power Systems delivers best-of-breed next-generation applications and services and a continuous infusion of innovation.

Optimized for the rigorous demands of enterprise computing
IBM understands that applications and business processes have differing demands and that one size does not fit all. To ensure that technology aligns to business rather than the other way around, IBM offers a full range of Power Systems servers each of which delivers leadership data capabilities, security, performance and scalability in its class. A totally integrated approach to the design, development, and testing of each and every Power server ensures the resiliency required for today's enterprise IT infrastructure.

All Power Systems server models include innovative reliability, availability and serviceability features that help avoid unplanned downtime. And, with Enterprise Pools, Capacity on Demand, and Active Memory Mirroring for Hypervisor—Power Systems enterprise servers ensure businesses can keep their most important applications available, even as they add capacity to handle new and growing business demands.

IBM offers a full range of IBM Power Systems software technologies that enable businesses to exploit Power Systems servers. Designed and optimized specifically for Power Systems, IBM offerings include IBM PowerVM virtualization software, PowerKVM the open virtualization choice for Power Systems, IBM PowerHA® software for high availability, PowerSC™ software for security and compliance, Power VP for intelligent performance management and Power VC for virtualization management based on OpenStack. IBM's integrated approach to developing the systems and software together enables high system utilization, high resiliency, strong security and simplified management. In addition, IBM Power Systems offers thousands of popular industry applications from ISVs running on a choice of AIX®, IBM i and industry-standard Linux operating systems.

Delivered with a superior client experience

Businesses that rely on IBM Power Systems servers don't just value leading technology and applications. They value the exceptional client experience that IBM provides throughout the business solution lifecycle that helps them drive rapid and lasting business value.

Clients can gain valuable insights and advice from fit-for-purpose infrastructure workshops to help them with architectural design choices. They also can take advantage of simple, pre-configured and pre-loaded offerings to get a fast start with deploying a private cloud or an analytics solution. The proven methodologies of the IBM Migration Factory, help clients accelerate moving a critical database or application from x86 commodity servers and competitive UNIX systems. The expertise of IBM Upgrade Factory enables clients to help take advantage of new technologies faster and improve systems resiliency. IBM Power servers even 'call home' if they detect an issue, so a potential problem may be fixed before it occurs.

IBM Power Systems Workload Center of Competency helps clients with a wide range of projects, including optimizing applications to run on Power Systems. The Center provides access to experts on application design, benchmarking and proof of concept studies, performance analysis and availability studies.

Clients can also tap into the deep security expertise of our IBM Global Technology Services and IBM Lab Services teams for a broad range of infrastructure design, implementation, management, and optimization projects. They also have the peace of mind that comes from working with the global network of experienced IBM Business Partners.

Built on POWER, virtualized with PowerVM

POWER processor technology is a reduced instruction-set computing (RISC) architecture that spans applications from consumer electronics to supercomputers. POWER processors are at the forefront of commercial, technical, and next-generation datacenter computing. So, in addition to excelling at commercial workloads like DB2 database and SAP applications, POWER is also behind many of today's top supercomputers. And with the OpenPOWER Foundation, POWER architecture is behind the efforts of leading technology companies to develop the next-generation in data center innovation. Through collab-orative and community-driven development, POWER is setting new standards and creating new opportunities for business innovation.

POWER processors provide the foundation for designing systems for both traditional transaction processing and compute and data- intensive workloads like Web, analytics, mobile and social applications. To achieve maximum performance, POWER processor-based systems are designed with optimization and virtualization technologies that enable the system to tune auto-matically to specific workloads. For example, Intelligent Threads

technology dynamically switches the processor-threading mode to deliver optimal performance for different workloads. Active Memory™ Expansion helps reduce memory costs by enabling physical memory to be logically expanded up to 100 percent for some workloads—such as SAP.

Businesses are leveraging virtualization and cloud technologies not only to reduce the costs and maximize their IT infrastructure investments but also to provide more flexibility, higher application availability and improve response time to business needs. PowerVM virtualization is designed and optimized specifically for the POWER processor and enables trusted and scalable virtualization of workloads based on AIX, IBM i and industry-standard Linux. PowerVM software enables companies to achieve very high levels of efficiency—capable of delivering sustained utilization in the 80 to 90 percent range—while delivering dynamic flexibility in deploying and managing hundreds of virtual machines.

PowerVM offers Micro-Partitioning® with the ability to run up to 20 partitions per POWER8 or POWER7+™ processor core, and dynamically move processor, memory, and I/O resources between partitions to support changing workload requirements. PowerVM Live Partition Mobility enables active partitions to move between servers—no matter what size of partition you are running—virtually eliminating application downtime for planned systems maintenance. Live partition mobility can also be used to migrate workloads between POWER6®, POWER7® and POWER7+ and POWER8™ processor-based servers without an application outage.

Enterprise Power Systems

IBM Enterprise Power Systems deliver fit-for-purpose technology that optimizes workloads, data and cloud to support your most critical business requirements and help you engage your customers—all while providing data security, efficient management, incredible availability and unmatched scalability.

Power servers are designed with an efficient and resilient architecture that effectively uses data from mobile, social and cloud to help you move your customer to the center of your business. By transforming your infrastructure to create efficiencies, you will benefit from an improved supply chain and stronger forecasting capabilities—as well as free up capital and staff to foster innovation and drive new business value.

IBM Power E880: New POWER8-based enterprise system that supports bigger data demands and the most complex, mission critical applications

IBM Power E870: Scalable, enterprise server for critical applications, with open innovation for private clouds

IBM Power 795: Up to 256 POWER7 processor cores and 16 TB of memory enables capability to consolidate up to 1,000 virtual machines.

IBM Power 780: Modular high-end system with up to 128 POWER7+ cores and 4 TB of memory in four nodes delivers leadership, flexibility, scalability and resiliency versus all other competitive servers.

IBM Power 770: Innovative modular server that provides non-disruptive growth from 4 to 64 POWER7+ processor cores, all with enterprise class RAS.

IBM Power 760: For virtualized consolidation of medium sized business workloads and demanding environments where uptime is critical, features 1 to 4 processor sockets and 12 to 48 POWER7+ processor cores, with processor Capacity Upgrade on Demand, and up to 2 TB of memory.

IBM Power 750: For server consolidation and virtualization projects, features 1 to 4 processor sockets and 8 to 32 POWER7+ processor cores.

Power Systems S class servers (scale-out, 1- and 2-socket)

IBM Power Systems S class servers are affordable, easy-to-deploy and energy efficient and they are backed by a trusted network of IBM Business Partners and industry solution providers. These servers offer an ideal choice for enterprises that need scale-out deployment options for business critical applications. Especially for those looking for a more efficient and lower cost scale-out environment than x86 commodity servers can deliver.

IBM Power S824: For analytics applications and small to mid-size database that can run on the same server platform with 1 or 2 processor sockets with up to 24 POWER8 processor cores and up to 2 TB of memory.

IBM Power S822: Designed for consolidation of multiple applications and infrastructure workloads in a virtualized environment with 1 or 2 processor sockets with up to 20 POWER8 processor cores and up to 1 TB of memory.

IBM Power S814: Designed for highly secure and scalable architecture providing a stable database and middleware platform for efficient deployment of business processing and mission critical applications with 1 processor socket and up to 8 POWER8 processor cores with up to 512 GB of memory.

IBM Power S812L: Affordable and optimized for Linux environments, a 2U rack form factor, 1-socket, high-performance, energy-efficient server with 12 POWER8 cores and up to 512 GB memory is ideal for running multiple application and infrastructure workloads in a virtualized environment.

IBM Power S822L: Affordable and optimized for Linux environments, a 2-socket, (up to 24 POWER8 processor cores) server lowering the entry cost of big data analytics, open infrastructure solutions and traditional scale-out Linux workloads.

IBM Power S824L: Leverage OpenPOWER technology, designed specifically to support the unique requirements of dual NVIDIA GPU accelerators, this 2-socket, (up to 24 POWER8 processor cores) server offers the potential for dramatic accelerations of targeted technical computing, big data, and Java workloads.

AIX – The future of UNIX

According to IDC, the IBM Power Systems platform with AIX technology is the leader in worldwide UNIX server revenue share.[1] The introduction of the POWER7 and POWER7+ processors helped accelerate migrations to the Power Systems and AIX platform from Oracle Solaris and HP-UX and now with the introduction of POWER8, is poised to take enterprise computing to new levels. An open standards–based UNIX operating system, IBM AIX software exploits decades of IBM technology innovation. According to ITIC's 2013 survey, the IBM AIX operating system delivered the highest reliability scores among different server operating system platforms, including Linux and other UNIX operating systems.[1]

AIX technology offers deep integration and optimization with PowerVM virtualization, PowerHA high availability software, PowerSC security and compliance software as well as optimization through IBM's broader middleware and software stack, including IBM DB2® software, IBM WebSphere® Application Server software and IBM Rational compilers and development tools.

The latest AIX 7.1 release features new cluster-aware integration with PowerHA, as well the ability to run AIX 5.2 and AIX 5.3 Workload Partitions to facilitate application migration and reuse. The AIX operating system is available in three editions for a range of capability and flexibility for both mid-sized and large enterprises.

AIX 7 and the previous release, AIX 6, are binary compatible with previous versions of AIX including AIX 5L™. This means that applications that ran on earlier versions will continue to run on AIX 7 or 6—guaranteed.[3]

IBM i – A system designed for business

IBM i running on IBM Power Systems servers offers an integrated, simple-to-manage platform for business applications with a proven reputation for exceptional resilience and low operational costs. Running applications based on IBM i has helped companies over many years to focus on innovation and on delivering new value to their business, and to lower the costs of managing their IT operations.

IBM i provides a fully integrated and optimized combination of relational database, trusted role and object based security model, as well as integrated networking and storage management capabilities required to run business applications. The integrated SQL standards-compliant DB2 for IBM i database includes a range of advanced database management utilities. IBM i also includes additional integrated middleware components such as multiple file systems, directory, an HTTP Web-server powered by Apache, a Web application server and a Web-services environment.

More than 150,000 midsize businesses rely on the simplicity, resiliency and cost-effectiveness of IBM i to run thousands of applications from ISVs serving virtually every industry. Its reputation for security, resiliency and ease of use derives from the integration of IBM i with its built-in DB2 database, web services, networking and storage management capabilities.

The IBM i 7.1 release includes significant enhancements to DB2 for i, including integrated XML support and column level encryption. Solid State Disk (SSD) drives can be utilized with the IBM i operating system, which automatically moves frequently accessed data for optimal application performance. With regular and easy-to-deploy Technology Refreshes, IBM continues to extend the capabilities of IBM i 7.1, with new capabilities such as PowerVM Partition Suspend/Resume and Live Partition Mobility.

And IBM i 7.2 brings significant value to clients with more granular security options for critical business data, additional system management functionality as well as many other enhancement designed with performance and usability in mind. IBM i clients will be able to run IBM i 7.2 on POWER7 and POWER8 systems, providing the key reliability, availability, scalability and performance characteristics to which they are accustomed.

Linux – Extending the value of POWER to industry-standard Linux

Red Hat (RHEL), SUSE (SLES), and Canonical (Ubuntu) Linux run on POWER processor-based systems, offering a scalable Linux alternative for open source applications. Reducing server sprawl through consolidation and virtualization is a key priority for many companies today and Linux with PowerVM provides a scalable, optimized, and cost competitive alternative to running Linux on commodity x86 servers.

POWER processors provide optimal performance for big data analytics projects. Using IBM software, Linux on Power helps businesses gain new insights from big data with solutions like IBM InfoSphere® BigInsights™ to analyze data-at-rest and InfoSphere Streams to analyze data-in-motion. Using the IBM Linux Big Data Solution for Apache Hadoop, application developers can take advantage of optimizations designed by IBM engineers to allow Hadoop to excel on Power. The deep integration and optimization of analytics workload performance of Linux on Power enables businesses to deliver Linux analytics services faster.

Increasingly, companies are also relying on Linux for business applications designed for their industry and customized to their specific business needs. Linux on Power provides a highly secure, resilient and fully optimized stack for industry applications. With optimized systems tuned for Linux on Power, businesses can deliver Linux services with higher quality compared to x86 commodity servers.

Today, Linux is also the low cost deployment platform of choice for vital applications like web, email, and social media collaboration services. Linux on Power offers competitively priced POWER scale-out servers and Power IFL virtual servers plus a more efficient server virtualization with PowerVM versus x86 commodity server alternatives. With scalable and secure PowerVM virtualization, Linux on Power helps businesses deliver Linux application services with superior economics.

PowerHA – Resiliency without downtime

Smarter computing by nature requires businesses to raise their services delivery levels, fueling 24×7 high availability demands for their applications and IT infrastructure. PowerHA SystemMirror for AIX and IBM i is a high availability clustering solution for both data center and multisite resiliency. PowerHA can protect business applications from outages of virtually any kind, helping ensure round-the-clock business operations.

The best high availability and disaster recovery plans involve an integrated approach to resiliency spanning across applications, operating systems, servers and storage. That's why PowerHA software offers deep integration and optimization between PowerHA SystemMirror software and AIX and IBM i. The PowerHA solution is optimized for IBM System Storage devices, such as the DS8000 system (for large enterprises) and the Storwize V7000 system (for midsize businesses), as well as our IBM storage software solutions such as Metro Mirror, Global Mirror, IBM System Storage SAN Volume Controller and IBM FlashCopy technologies.

PowerSC – Security and compliance: trusted and automated

Security and compliance are intrinsic to today's business processes, development and daily operations and should be factored in to the initial design of any IT or critical infrastructure solution, not added after the fact. By building security and compliance into the overall design of a system, application or cloud infrastructure, businesses are better able to deploy innovative solutions that reduce risk while cost-effectively addressing audit requirements.

IBM offers solutions to protect data from threats and unauthorized access on Power Systems servers running AIX, IBM i, and Linux applications. Data encryption capabilities to protect file systems, data and backup are an integral part of the AIX and IBM i operating systems, both of which also support role-based access control. Whether you want to manage the security of your Power servers, or include other elements in your infrastructure—IBM solutions provide intuitive administration that helps you to define, enforce and audit your business security policy.

In addition, IBM PowerSC software provides a security and compliance solution optimized for virtualized environments on Power Systems servers running PowerVM, AIX, and Linux software. PowerSC helps companies enhance compliance management and demonstration through industry profiles and policy-based security compliance reporting with real-time alerts for compliance violations. PowerSC software enables automation of compliance standards and includes reporting for compliance measurement and audit. Compliance automation features include prebuilt system profiles that facilitate compliance with a variety of industry standards, such as the Payment Card Industry Data Security Standard. Additional PowerSC functionality includes compliance monitoring for network segregation, system trust status and system patch policy compliance.

IBM services and financing for your Smarter Computing projects

From online self-evaluation tools and workshops to comprehensive assessments and complete migration services, IBM services teams and IBM Business Partner experts around the world can help you determine where to begin or how to make the most of your current Power Systems solutions.

Work with IBM Global Finance to explore the financing options most appropriate for your business. For more information on great rates, flexible payment plans and loans, and asset buyback and disposal, visit: **ibm.com**/financing

IBM Enterprise Power Systems

	Power 750	Power 760	Power 770	Power 780	Power 795	Power E870	Power E880
System package	5U, 19-inches rack	5U, 19-inches rack	4U/node, 19-inches rack (1 - 4 nodes)	4U/node, 19-inches rack (1 - 4 nodes)	24-inches system frame (1 - 8 processor books)	5U/node + 2U System Control Unit 19-inches rack	5U/node + 2U System Control Unit 19-inches rack
Processor Options GHz : # of cores	POWER7+ 3.5 GHz 8, 16, 24, 32 POWER7+ 4.0 GHz 8, 16, 24, 32	POWER7+ 3.1 GHz: 12, 24, 36, 48 POWER7+ 3.4 GHz : 12, 24, 36, 48 min 8 cores active	POWER7+ 3.8 GHz (8-core) 4 - 64 POWER7+ 4.2 GHz (6-core) 4 - 48	POWER7+ 3.72 GHz (8-core) 4 - 128 POWER7+ 4.42 GHz (4-core) 4 - 64	POWER7 3.7 GHz (6-core) 24 - 192 POWER7 4.0 GHz (8-core) 24 - 256 POWER7 4.25 GHz (4-core) 24 - 128	POWER8 4.0 GHz (8-core) 8 - 64 POWER8 4.19 GHz (10-core) 8 - 80	POWER8 4.35 GHz (8-core) 8 - 64
IBM i level	6.1.1 [4], 7.1, 7.2	6.1.1 [4], 7.1, 7.2	6.1.1, 7.1, 7.2	6.1.1, 7.1, 7.2	6.1.1, 7.1, 7.2	7.2 TR1 7.1 TR9	7.2 TR1 7.1 TR9
AIX level & group	6.1, 7.1	6.1, 7.1	6.1, 7.1	6.1, 7.1	6.1, 7.1	6.1, 7.1	6.1, 7.1
Linux support	SLES 11 SP2 RHEL 6.4	SLES 11 SP2 RHEL 6.4	SLES 10 SP3 SLES 11 RHEL 5.5, 6.0	SLES 10 SP3 SLES 11 RHEL 5.5, 6.0	SLES 10 SP3 SLES 11 SP1 RHEL 5.5, 6.0	SLES 11 SP3 or later RHEL 6.5 or later	SLES 11 SP3 or later RHEL 6.5 or later
Machine type - model	8408-E8D	9109-RMD	9117-MMD	9179-MHD	9119-FHB	9119-MME	9119-MHE

IBM Power Systems scale-out offerings

	Power S812L	Power S822L	Power S824L	Power S814	Power S822	Power S824
System package	2U, 19-inches rack	2U, 19-inches rack	4U, 19-inches rack	4U, 19-inches rack or tower	2U, 19-inches rack	4U, 19-inches rack
POWER8 Processor Options GHz - # of cores	3.42 GHz - 10 3.02 GHz - 12	3.42 GHz - 20 3.02 GHz - 24	3.42 GHz - 20 3.02 GHz - 24	3.02 GHz - 4 3.02 GHz - 6 3.72 GHz - 8	3.89 GHz - 6,12 3.42 GHz - 10,20	3.89 GHz - 6, 12 4.15 GHz - 8, 16 3.52 GHz - 24
IBM i level	N/A	N/A	N/A	7.1, 7.2	N/A	7.1, 7.2
AIX level	N/A	N/A	N/A	6.1, 7.1		
Linux support	SLES RHEL Ubuntu		Ubuntu	SLES RHEL		
Machine type - model	8247-21L	8247-22L	8247-42L	8286-41A	8284-22A	8286-42A

For more information

Contact your IBM representative or IBM Business Partner or visit: **ibm.com**/power

To learn more about the IBM Power Systems, please contact your IBM marketing representative or IBM Business Partner, or visit the following website: **ibm.com**/power

Additionally, IBM Global Financing can help you acquire the IT solutions that your business needs in the most cost-effective and strategic way possible. We'll partner with credit-qualified clients to customize an IT financing solution to suit your business goals, enable effective cash management, and improve your total cost of ownership. IBM Global Financing is your smartest choice to fund critical IT investments and propel your business forward. For more information, visit: **ibm.com**/financing

[1] IDC Quarterly Server Tracker Q210 release, August 2010

[2] IBM's Power Systems recorded approximately 13 minutes per server/per year of unplanned downtime (99.997 percent uptime) according to the ITIC 2013 Global Server
Hardware and Server OS Reliability Survey (itic-corp.com) with Oracle x86 servers recording the highest percentage of server outages among the 14 platforms surveyed

[3] More information on the binary compatibility of AIX can be found at
ibm.com/systems/power/software/aix/compatibility/guarantee/index.html

[4] On POWER7+ servers IBM i 6.1 uses virtualized I/O through an IBM i 7.1 partition or VIOS. Native I/O support requires #EB34 feature. POWER7+ 750 does not have #EB34