IBM Power System E850

The most agile 4-socket system in the marketplace, optimized for performance, reliability and expansion

Highlights

- Designed for data and analytics, delivers secure, reliable performance in a compact, 4-socket system

- Can flexibly scale to rapidly respond to changing business needs

- Can reduce IT costs through application consolidation, higher availability and virtualization to yield over 70 percent utilization

Businesses today are demanding faster insights that analyze more data in new ways. They need to implement applications in days versus months, and they need to achieve all these goals while reducing IT costs. This is creating new demands on IT infrastructures, requiring new levels of performance and the flexibility to respond to new business opportunities, all at an affordable price.

The IBM® Power® System E850 server offers a unique blend of enterprise-class capabilities in a space-efficient, 4-socket system with excellent price performance. With up to 48 IBM POWER8™ processor cores, advanced IBM PowerVM® virtualization that can yield over 70 percent system utilization and Capacity on Demand (CoD), no other 4-socket system in the industry delivers this combination of performance, efficiency and business agility. These capabilities make the Power E850 server an ideal platform for medium-size businesses and as a departmental server or data center building block for large enterprises.

Designed for the demands of big data and analytics

Businesses are amassing a wealth of data and IBM Power Systems™, built with innovation to support today's data demands, can store it, secure it and, most important, extract actionable insight from it. Power Systems are designed for big data. From operational business intelligence and data warehouses to predictive analytics and cognitive IBM 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. The open, data-centric design of Power Systems 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.

The Power E850 server delivers exceptional throughput, using POWER8 processors up to 3.7 GHz that support simultaneous multi-threading of up to eight threads per core (SMT8). Each Dual Chip Module has on-chip memory controllers and may utilize up to128 GB off-chip eDRAM L4 cache to deliver 192 GB/sec of memory bandwidth per socket. I/O bandwidth is also dramatically increased by way of PCIe Gen3 I/O controllers, directly integrated into the processors to further reduce latency. The Power E850 server offers over 70 percent more system performance than an IBM POWER7+™ Power 750 server, enabling increased throughput and data center efficiency.

Industrial-strength PowerVM virtualization

PowerVM is the family of technologies, capabilities and offerings that deliver industry-leading virtualization on IBM POWER® processor-based systems. In addition to inherent virtual machines (Logical Partitions) provided by firmware, PowerVM provides advanced virtualization technologies to help optimize efficiency, increase throughput and lower costs. And PowerVM has no documented vulnerabilities, so it can enhance system security, as well.

PowerVM includes IBM Micro-Partitioning® and Virtual I/O Server (VIOS) capabilities, which enable businesses to share resources and increase system utilization, while helping to ensure applications continue to get the resources they need. Also included are support for Multiple Shared Processor Pools and Shared Dedicated Capacity, which enable automatic, non-disruptive balancing of processing power between VMs.

Active Memory Sharing, another component of PowerVM, can intelligently flow memory from one VM to another, enabling further resource utilization and flexibility. And, Live Partition Mobility (LPM) enables a VM to be moved from one server to another with virtually no impact to the applications running inside the partition. All of these PowerVM innovations work together to help optimize system utilization and energy savings, improve application availability, balance critical resources and respond to ever-changing business demands.

Clients have the flexibility to run IBM AIX® or Linux operating systems concurrently on a Power E850 server. AIX, IBM's industrial-strength Unix operating system, has delivered exceptional reliability, availability and security for business-critical applications. IBM is firmly committed to Linux, and PowerVM has enabled both Big Endian and Little Endian guests, paving the way for a broader portfolio of Linux applications to be deployed on POWER8 systems. And, with the Power Integrated Facility for Linux (*Power IFL*), now available on the Power E850, clients can deploy Linux applications onto more-scalable, reliable Power servers with unprecedented economic efficiency.

Optimized for the rigorous demands of enterprise computing

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.

A totally integrated approach to the design, development and testing of each and every Power Enterprise system ensures the resiliency required for today's enterprise IT infrastructure. The Power E850 server includes many hot-plug, hot-swappable, redundant components, as well as additional, unique reliability, availability and serviceability (RAS) features that help avoid unplanned downtime and loss of data. The POWER8 processor and memory subsystem uses the First Failure Data Capture mechanism for fault detection and isolation, and incorporates advanced technology and design techniques for soft-error avoidance. All POWER8 servers use industry-leading Chipkill memory on custom dual in-line memory modules (CDIMMs) that offer additional DRAM sparing and dynamic de-allocation of memory DIMMs for predictive errors. Thermal monitoring is integrated directly onto the POWER8 processor, with triple redundant ambient temperature sensors.

The new 4U design of the Power E850 server provides enhanced serviceability and phase redundant, sparing power regulators for processors, memory and I/O. Light Path diagnostics provide an obvious and intuitive means to identify failing components. Hardware failures that may have taken hours to locate and diagnose on other systems can be detected in minutes by system engineers and administrators, avoiding or significantly reducing costly downtime. And *Active Memory Mirroring for Hypervisor*, designed to prevent a system outage in the event of an uncorrectable error in memory being used by the system hypervisor, is now offered as an option on Power E850 system configurations.

The inherent reliability, availability and serviceability (RAS) features of POWER8 systems help to increase system availability and enable more work to be processed with less operational disruption. For enhanced server availability by way of clustering, the Power E850 server supports IBM PowerHA® SystemMirror.

Security and compliance are intrinsic to today's business processes, development and daily operations and should be factored into the initial design of any IT or critical infrastructure solution, not bolted on after the fact. The Power system architecture has security designed into each layer of the stack from the hardware to the firmware and through the system software. *IBM PowerSC™* software enables automation of compliance standards, including real-time alerts for compliance violations and reporting for compliance measurement and audit. Additional PowerSC functionality includes compliance monitoring for network segregation, system trust status and system patch policy compliance.

Cloud capacity for non-disruptive growth

The Power E850 server supports significant processor, memory and I/O scale and expansion, enabling clients to initially tailor their system to their unique requirements, then grow by adding additional resources over time with minimal or no disruption to the base system.

In addition to its high-performance POWER8 processors, a robust range of Capacity on Demand (CoD) innovation is being extended to the Power E850 server. These CoD features provide businesses tremendous flexibility to respond to changing business requirements and increase responsiveness. Clients can install processors and/or memory and activate them on a 30-day trial with Trial CoD, a day-to-day basis with Elastic CoD, only as long as required, or permanently by way of Capacity Upgrade on Demand (CUoD). Additionally, Utility CoD enables clients to install processors and have them automatically activated as needed on a minute-to-minute basis.

Power System E850 at a glance

System Configurations	Model 8408-E8E
Processor and Memory	
Processor cores	48 at 3.02 GHz POWER8 40 at 3.35 GHz POWER8 32 at 3.72 GHz POWER8
Sockets	2 - 4
Level 2 (L2) cache per core	512 KB
Level 3 (L3) cache per core	8 MB eDRAM shared L3
Level 4 (L4) cache	Up to 128 MB eDRAM L4 (off-chip) per socket
Enterprise Memory	Up to 32 CDIMMs, 1600 MHz DDR3 128 GB to 2 TB, increasing to 4 TB in the future*
Processor-to-Memory bandwidth	192 GBps per socket
Storage and IO	
Integrated PCIe adapter slots	Up to 11 hot-swap PCIe Gen3 slots x16: 4 - 8 (2 per socket) x8: 3 (one defaults to 2 x 10 Gb LAN)
Integrated SAS Controllers	Two in storage backplane, supporting standard RAID 0,5,6,10, 5T2, 6T2 and 10T2 • Dual SAS Controller Backplane, with 7.2 GB write cache • Dual SAS Controller Backplane, without write cache • Split Disk Backplane (two single SAS controllers), without write cache
Integrated SAS bays for solid-state drives (SSD) or hard-disk drives	8 hot-swap SFF SAS drive bays (2.5") + 4 SSD bays (1.8")
Expansion features (optional – operating system dependencies)	
DVD bay	One
Max PCIe Gen3 I/O Drawers (12 PCIe Gen3 slots each)	4
Max DASD/SSD I/O Drawers (24 SFF bays each)	64 EXP24S I/O drawers

---

Power System E850 at a glance

Standard features

Flexible Service Processor	1
IBM POWER Hypervisor™	LPAR, Dynamic LPAR; Virtual LAN (Memory to memory inter-partition communication)
PowerVM Standard Edition (optional)	20 Micro-Partitions per processor; Multiple Shared Processor Pools; Shared Dedicated Capacity; Virtual I/O Server
PowerVM Enterprise Edition (optional)	20 Micro-Partitions per processor; Multiple Shared Processor Pools; Virtual I/O Server; Shared Dedicated Capacity; Live Partition Mobility (LPM) and Active Memory Sharing† (AMS)
RAS features	Processor Instruction Retry Alternate Processor Recovery Selective dynamic firmware updates Chipkill memory Memory DRAM sparing Dynamic L3 cache column repair Dynamic Processor de-allocation Phase redundant, integrated sparing voltage regulator modules for processors, memory and I/O Second generation service processor Hot swappable Time-of-Day battery Redundant, hot swappable power supplies Redundant fans for SAS controllers and drive bays Redundant, hot swappable fans for processor, memory and PCIe slots Hot-swappable SAS bays Hot-swappable PCIe slots Dynamic de-allocation of logical partitions and PCIe bus slots Extended error handling on PCIe slots Active Memory Mirroring for Hypervisor (optional)
Capacity on Demand features (optional)	Processor and/or Memory Capacity Upgrade on Demand (CUoD) Elastic Processor and/or Memory Capacity on Demand (CoD) Trial Processor and/or Memory CoD Utility CoD
Operating systems	AIX and Linux for Power‡
High availability	Power HA Editions
Power requirements	Operating voltage: 200 to 240 V AC
System dimensions	Four EIA (4U) space in a 19-inch rack Width: 449 mm (17.6 in.) Depth: 776 mm (30.6 in.) Height: 175 mm (6.9 in.)

Why IBM?

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 portfolio of Power Systems and software.

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

For more information

To learn more about the Power System E850, please contact your IBM representative or IBM Business Partner, or visit the following website: http://www-03.ibm.com/systems/power/hardware/e850/index.html. Additionally, IBM Global Financing can help you acquire an IT solution in the most cost-effective and strategic way possible. For information, visit: **ibm.com**/financing