IBM Power System E850C

The most agile 4-socket system in the marketplace, ideal for private cloud deployment

Highlights

- Secure, reliable performance in a compact, 4-socket system

- Built-in PowerVM® virtualization

- Capacity on Demand for processor and memory

- OpenStack based private cloud management

- Cloud-based system inventory and performance monitoring

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. Cloud computing is quickly becoming both the delivery and consumption model for IT services, creating new demands on IT infrastructures and requiring new levels of performance and flexibility to respond to new business opportunities.

The IBM® Power® E850C system offers a unique blend of enterprise-class capabilities in a reliable, space-efficient 4-socket 4U form factor that delivers exceptional performance at an affordable price. With two to four IBM POWER8® processors at 3.65 GHz, 3.95 GHz or 4.22 GHz, up to 4 TB of DDR4 memory, built-in PowerVM virtualization and Capacity on Demand (CoD), no other 4-socket system in the industry delivers this combination of per-core performance, efficiency and business agility. The Power E850C is an ideal platform for medium-size businesses and as a departmental server or data center building block for large enterprise private cloud deployment.

The open, data-centric design of Power Systems™ combines computing power, memory bandwidth and broad data pathways to process and move data through applications in ways that are easier to consume and manage. The Power E850C server optimizes throughput, using POWER8 processors 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. In fact, a 48-core Power E850C server with 3.65 GHz POWER8 processors can deliver over 40% more system throughput than a 48-core Power 770 with 4.22 GHz POWER7+ processors, and offers clients an attractive option to move to the latest POWER8 technology while realizing operational savings and increasing data center efficiency.

Built-in, PowerVM virtualization

PowerVM is the family of technologies, capabilities and offerings that deliver industry-leading virtualization on IBM POWER® processor-based systems, and every Power E850C includes PowerVM Enterprise Edition license entitlement for its active cores.

Deeply integrated into the Power E850C system, PowerVM virtualization and provides a comprehensive set function designed to fully exploit the POWER8 architecture to enable workload consolidation, providing secure workload isolation and system resource optimization. PowerVM includes IBM Micro-Partitioning® and Virtual I/O Server (VIOS) capabilities to enable businesses to optimize efficiency, dynamically sharing resources to 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. Live Partition Mobility enables the movement of a running AIX or Linux Logical Partition from one physical server to another with no downtime, and PowerVP Virtualization Performance monitor provides real-time monitoring of a virtualized system showing the mapping of VMs to physical hardware.

All of these PowerVM innovations work together to help optimize critical resources, improve application availability, and respond to ever-changing business demands.

Designed for the rigorous demands of enterprise computing

IBM 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. Each Power E850C 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.

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 E850C 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 4U design of the Power E850C 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 offered as an option on Power E850C system configurations. For enhanced server availability by way of clustering, the Power E850C 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.

Flexible and Cloud optimized

In addition to its high-performance POWER8 processors and exceptional reliability, a robust range of Capacity on Demand (CoD) innovation has being extended to the Power E850C 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.

Clients have the flexibility to run IBM AIX® or Linux operating systems concurrently on each Power E850C 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.

The new Power Enterprise Systems for the Cloud are optimized for cloud delivery of the largest and most demanding workloads. Each Power E850C, E870C and E880C system features integrated software and services designed to help clients to accelerate the transformation of their IT infrastructure for cloud, including OpenStack based private cloud management, open source cloud automation and configuration tooling for AIX®, cloud-based HMC Apps as a Service, and secure hybrid cloud integration tools and services.

Cloud PowerVC Manager provides OpenStack-based cloud management to accelerate and simplify cloud deployment by providing fast and automated VM deployments, prebuilt image templates, and self-service capabilities, all with an intuitive and user-friendly interface. PowerVC management upwardly integrates into a variety of third-party hybrid cloud orchestration products, including IBM Cloud Orchestrator, VMware vRealize, and others. Clients can simply manage both their private cloud VMs and their public cloud VMs from a single, integrated management tool.

Power System E850C at a glance	
System Configurations	Model 8408-44E
Processor and Memory	
Processor cores	48 at 3.65 GHz POWER8 40 at 3.95 GHz POWER8 32 at 4.22 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 128 GB to 4 TB
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 E850C at a glance

Standard features

Flexible Service Processor	1
IBM POWER Hypervisor™	LPAR, Dynamic LPAR; Virtual LAN (Memory to memory inter-partition communication)
PowerVM Enterprise Edition	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
Cloud Management and Deployment features	IBM Cloud PowerVC Manager HMC Apps as a Service IBM API Connect and WebSphere Connect Open source cloud automation and configuration tooling for AIX Power to Cloud Rewards – 5,000 points IBM Cloud Starter Pack[†]
Operating systems	AIX and Linux[‡]
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 E850C, please contact your IBM representative or IBM Business Partner, or visit the following website: http://www-03.ibm.com/systems/power/hardware/E850C/index.html.

Additionally, IBM Global Financing provides numerous payment options to help you acquire the technology you need to grow your business. We provide full lifecycle management of IT products and services, from acquisition to disposition. For more information, visit: **ibm.com**/financing

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¹ HMC Apps as a Service performance and inventory applications are initially scheduled to be offered in a technology preview in 2016 and to be followed by a full general availability offering with more applications in 2017.

² For more information on Power to Cloud Rewards Program services Contact your IBM representative, IBM Business Partner, or ibmsls@us.ibm.com for full program details.