



Highlights

- The industry's fastest and most scalable and flexible enterprise server.
 - A control hub for the enterprise with end-to-end management capabilities and policy-based framework for heterogeneous workloads.
 - Integrated system with the ability to optimize technology deployment according to individual workload requirements across a highly integrated mainframe, POWER7™ and/or System x® computing environment.
 - Virtualization leadership can enable affordable, virtually limitless capacity for massive consolidation and infrastructure simplification.
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IBM zEnterprise System

Today, IT departments and data centers face two conflicting pressures. First, the challenge of trying to manage the rising cost of IT services and second, the challenge of changing and evolving IT to meet the business needs. Businesses today rely on IT to innovate, gain competitive advantage, and change the business. As IT managers and CIOs deal with these challenges, they choose System z® for advantages—running mission critical workloads, availability, security, and data management. However, they have also made choices of using distributed servers for other workload needs. As a result, many customers have a heterogeneous environment, and thus each business process starts to span multiple platforms. Each of those platforms are managed as silos...having multiple and disparate copies of the same data, different business priorities for application availability, separate security and regulatory processes, even separate organizations and budgets. However at the end of the day, all must be brought back together as one business process, with a single view of data, that needs to be available and secure, and managed under one IT budget.

It is clear that IT technology needs to be taken to a new level, one where smarter systems and smarter software work together to address the needs of a smarter business.



IBM® zEnterprise System (zEnterprise) takes that bold new step. For the first time it will be possible to deploy a truly integrated hardware platform that is able to span and intelligently manage workloads across mainframe and distributed technologies. zEnterprise is an integrated environment that can effectively consolidate islands of computing, reducing complexity, improving security, and bringing applications closer to the data they need. With zEnterprise you can deliver the gold standard of enterprise computing and extend mainframe-like governance and qualities of service to special purpose workload optimizers and select IBM POWER7 and IBM System x blades. Bringing these heterogeneous environments together is the new IBM zEnterprise Unified Resource Manager. It provides energy monitoring and management, goal-oriented policy management, increased security, virtual networks, and data management, consolidated in a single interface that can be tied to business requirements.

The IBM zEnterprise 196 (z196) platform is designed with performance and capacity for growth and large-scale consolidation, improved security, resiliency and availability while helping you to lower both risk and cost. As environmental concerns raise the focus on energy consumption, z196 offers new efficiencies enabling dramatic reduction of energy usage and floor space when consolidating workloads from distributed servers. For organizations looking to build green data centers, optional water cooling and high-voltage dc power allow a bold step into the future of cooler computing without changing the footprint. The z196 will deliver unique specialty engines to help deliver greater efficiencies and expand the use of the mainframe for a broader set of applications, while helping to lower the total cost of ownership.



Extending out by bringing applications closer to their data

The needs of the business are requiring speed of deployment for new applications and many customers are battling growing infrastructure complexity with many tiers and nodes of independent resources spread over the corporate network. Businesses are quickly realizing that system management information does not typically offer an end-to-end view. Automation policies are limited to tier and node boundaries. Each “island” of resources speaks a different language with a different protocol. Redundancy is pervasive as they all create copies of data. Security is a concern and management of all these heterogeneous silos consumes the majority of IT budget.

And while other vendors are focused on homogeneous virtualization to address expanding environments, IBM is turning up the heat and its leadership by focusing on embracing heterogeneous architectures that take part in the execution of the end-to-end transactions. Imagine having tighter integration between the database and the applications that need access to System z data but run on a distributed platform. Imagine a new IT infrastructure that is a mix of heterogeneous processors with the ability to have many virtualized servers that can be managed as one. Welcome to a new dimension in computing—zEnterprise System.

How did IBM do it? The z196 can attach the new IBM zEnterprise BladeCenter® Extension (zBX). The zBX infrastructure works with the z196 to support this new multiplatform environment. Installed in the zBX will be special purpose workload optimizers like the new IBM Smart Analytics Optimizer for DB2® for z/OS® V1.1, and select general purpose POWER7 blades with a statement of direction to add System x blades.¹ Now you can run an application that spans z/OS, Linux® on System z, AIX® on POWER®, or Linux on System x but have it under a single management umbrella. System z offers investment protection, reduction in complexity, improved resiliency, and lower cost of ownership. Managing everything is the Unified Resource Manager. It can help to deliver end-to-end virtualization and management and the ability to optimize resource deployment according to individual workload requirements.

Transforming the way assets are managed and deployed

zEnterprise System is the only platform that allows the definition of z/VM® guests and blades as virtual servers within a tightly integrated and centrally managed enterprise

computing environment. Virtualization means fewer resources are required to meet peak demands. Having multiple platforms integrated together brings new collaboration of technical resources together. Packaged hardware can reduce the complexity of ordering and installing a system. But the real value is in the integrated, advanced management of all the virtual servers using the Unified Resource Manager.

With the Unified Resource Manager, you are able to apply some of the fundamental strengths of the System z environment to a multiplatform infrastructure—think of it as governance taken to the next step. When new resources are installed, the Unified Resource Manager will be able to run discovery and identify them, add them to the inventory, and turn them on or off. It can also perform a physical configuration of the resource and establish a plan for disaster recovery (backup or restore). And from a serviceability standpoint the resources, z/VM guests and blades will be able to monitor themselves and log errors that happen—with time stamps to keep data and transaction integrity. A notification of issues can be sent to operations and a “call home” is placed to the IBM System Service Representative to come out and take a repair action.

Every IT installation wants to make the best use of its resources and maintain the highest possible throughput to help achieve the best possible system responsiveness and ultimately meet Service Level Agreements. Unified Resource Manager manages your resources to user specified business service level objectives. It can define a group of virtual servers that support an application. By being able to monitor and manage the group, dynamic adjustments can be made to ensure that all applications are provided sufficient resources.

Two dedicated private networks are set up between the z196 and the blade resources. One is for handling management functions and the other handles the data. The dedicated data network allows for the creation and provisioning of virtual networks. Virtual servers can be associated with the virtual network—which can eliminate some network expense that could be incurred when attaching a blade to System z without the Unified Resource Manager. And having control of the access to System z data and network isolation enhances security.

Scale to meet your needs

The z196 will enable growth and optimize service delivery under conditions of change by taking scalability to new dimensions. The all new 96 core design delivers massive scale for consolidation, secure data serving and transaction processing. z196 is expected to deliver 40 percent more capacity compared to an IBM System z10® Enterprise Class (z10™ EC) of equal Nway and up to 60 percent more total capacity on a fully configured server than the z10 EC Model E64, for average LSPR workloads running z/OS 1.11.

Our new 5.2 GHz microprocessor chip has a high-frequency design that leverages IBM leadership technology with more cache than other chips and a new execution sequence that delivers world-class per-thread performance. There are 100 new instructions that will help to deliver CPU-centric performance. For CPU intensive workloads additional gains of up to 30 percent can be achieved via compiler improvements. Like the z10 processor chip, there are data compression and cryptographic processors right on the chip and IBM delivers leadership technology for chip cooling and power distribution.

The z196 has a machine type of 2817, with five models offering between 1 to 80 configurable cores. The server supports up to 3 TB of real memory, 1 TB per LPAR, which is double the maximum memory available on the z10 EC. A significant reliability enhancement to the z196 is Redundant Array of Independent Memory (RAIM)—similar to what is known in the Disk industry as RAID. The z196 will be the first high-end server in the industry to offer RAIM. The increased available capacity and memory on the server can help to benefit throughput on workloads such as DB2, WebSphere® and Linux. With the z10 EC, beyond the customer purchased memory, there was an additional 16 GB of memory for the Hardware System Area (HSA) and the z196 is delivering that again. The HSA holds the I/O configuration data for the server.

High-speed connectivity and high bandwidth out to the data and the network are critical in achieving sufficient levels of transaction throughput and enabling resources inside and outside the server to maximize application requirements. The z196 uses a host bus interface with a link data rate of 6 GB using the industry-standard InfiniBand protocol to help satisfy coupling, cryptography, I/O and LAN requirements; for ICF and server-to-server connectivity, for the Crypto Express3 with secure coprocessors and SSL transactions, for I/O connectivity using ESCON®, FICON® or FCP, for LAN connectivity using the OSA-Express3 Gigabit, 10 Gigabit and 1000 BASE-T Ethernet features. The High Performance FICON for System z (zHPF) has been enhanced and combined with FICON Express8 bring new levels of performance when accessing data on zHPF enabled storage devices such as the IBM System Storage® DS8700.

Virtualization for today—and for the future

The z/VM hypervisor offers a base for organizations that want to exploit IBM virtualization technology on one of the industry's best-of-breed server environments—the System z platform. Test and development servers can run side by side on the same hardware as production, helping to improve resource utilization and offer significant operational advantages. With the z196 design for increased capacity and the number of available processor cores per server, and reduced energy usage and floor space, it is a perfect fit for large-scale consolidation. The z196 virtualization capabilities can support up to 50 distributed servers on a single core, up to thousands on a single system.

The new heterogeneous zEnterprise technology is centered around creating a virtual server environment for deploying applications that have affinity to data hosted on the z196 but runs on AIX or Linux on System x. The virtual servers can be created and associated with a pool of resources that are then grouped with System z virtual servers to define a workload for which coherent management and performance policies can be defined and enforced. This will allow better end-to-end application integration with System z transaction processing, messaging and data serving capabilities.

A new world of application support

System z is optimized to provide best-of-breed support for mission-critical data and mixed workloads. Data processing requires exceptional single-thread performance, so System z is engineered with a strong threading model and robust cache in support of the processing of data—as opposed to a

throughput computing design targeting more generic applications. This strategy allows System z to deliver exceptional data management capabilities while also accommodating mixed applications that have close affinity to this data.

There will always be situations where end-to-end application logic is best served by a set of closely federated heterogeneous resources that includes System z and other processor types. For example, there are particular industry processes where a distributed topology is the de facto standard. Even when most processing is performed on System z, some critical software element might not be available and must be deployed on a distributed server. Now on zEnterprise, a blade, installed in the zBX, can be used to host applications and enable application integration with System z transaction processing, messaging and data serving capabilities. And IBM Smart Analytics Optimizer on the zBX can offer data-in-memory support to deliver significant performance and/or lower cost per transaction for queries redirected to the solution.

Business applications that have the best attributes for taking advantage of the optimizers, general purpose blades and associated management technologies can be found in every industry but are seen most often in the areas of banking, insurance, retail and government. They typically have workload types such as Business Intelligence/Data Warehousing, ERP/CRM, Infrastructure/Web Serving. Applications such as Business Analytics, SAP and Multitier Web Applications will be excellent candidates for zEnterprise.

Specialty engines offer more choice

The z196 will offer specialty engines to organizations that expand the use of the mainframe for a broader set of applications, while helping to lower the cost of ownership. The IBM System z specialty engines can run independently or complement each other.

The System z Integrated Information Processor (zIIP) is designed to support and run data and transaction processing and network workloads and to make the consolidation of these workloads on to System z more cost effective.

Workloads eligible for the zIIP (with z/OS V1.7 or a later) include remote connectivity to DB2 to help support these workloads: Business Intelligence (BI), Enterprise Relationship Management (ERP), Customer Relationship Management (CRM) and Extensible Markup Language (XML) applications. z/OS V1.11, together with DB2 for z/OS Version 8 or DB2 9 DB2 utilities, now offers additional capabilities for exploiting zIIPs. DB2 utilities sorting fixed-length records using IBM's memory object sorting technique can have a portion of the workload redirected to a zIIP when one is available. In addition to supporting remote connectivity to DB2 (via DRDA® over TCP/IP) the zIIP also supports DB2 long-running parallel queries—a workload integral to Business Intelligence and Data Warehousing solutions. A solution from IBM Global Business Services (GBS), IBM Scalable Architecture for Financial Reporting (SAFR), a highly efficient and scalable business intelligence reporting solution, can be enabled for the zIIP. The zIIP (with z/OS V1.8 and above) also supports IPsec processing, making the zIIP an IPsec encryption engine helpful in creating highly secure connections in an enterprise. In addition, zIIP (with z/OS V1.10 and above) supports select z/OS Global Mirror (formerly called Extended Remote Copy, XRC) disk copy service functions. z/OS V1.10 introduced zIIP Assisted HiperSockets™ for large messages.

The System z Application Assist Processor (zAAP) is designed to support new application technologies such as Java™ and XML and helps make running these new application technologies on z/OS more cost effective. Workloads eligible for the zAAP (with z/OS V1.8) include all Java processed via the IBM Solution Developers Kit (SDK) and XML processed locally via z/OS XML System Services. z/OS v1.11 is enhanced with a new capability that can enable zAAP eligible workloads to run on zIIPs. This capability can allow you to run zIIP and zAAP eligible workloads together on just one specialty engine—the zIIP.

The z196 also features the Integrated Facility for Linux (IFL) to support Linux and open standards creating a great opportunity for large-scale consolidation. Linux brings a wealth of available applications that can be run in a real or virtual environment within z196. An example is the z/VSE™ strategy, which supports integration between the IFL, z/VSE and Linux on System z to help customers integrate timely production of z/VSE data into new Linux applications, such as data warehouse environments built upon a DB2 data server (all of which are supported as a guest on z/VM 5.4 with z/VM mode partitions).

Improve your agility to respond to change

Along with having multiple technologies to manage, IT departments must be agile so they can respond rapidly to change. It may be necessary to coordinate changes in people, processes and technology. The z196 can help.

The server will continue to build on the System z capacity on-demand offerings that simplify making modifications. Permanent Capacity Upgrade can be initiated by the customer using Resource Link via CIU (Customer Initiated

Upgrade). Temporary capacity is available with IBM On/Off Capacity on Demand (On/Off CoD) when satisfying short-term spikes in capacity or for testing new applications when needed. Capacity Back-up (CBU) can help provide reserved emergency capacity for multiple processor configurations. And Capacity for Planned Events (CPE), a variation on CBU is available when there is unallocated capacity available in a server, CPE will allow up to the maximum capacity available to be used for planned events such as planned maintenance in a data center. A three-day CPE contract can be purchased at a fixed price based on the amount of capacity you need to turn on.

Enhancements to our on-demand capability offer simplification for your staff. The z196 eases management of your On/Off CoD records by eliminating the need to manually replenish the expiration data on your On/Off CoD records. Resource Link will now monitor the On/Off CoD records and generate a replenishment record for each installed record. And back by popular demand is the Administrative Test for On/Off CoD providing an option to do training and API testing without activating any capacity. Another new simplification offering is available for purchasing unassigned capacity. Unassigned capacity is purchased general purpose cores or IFL capacity that for business reasons is not turned on. Prior to the z196, you needed to work with the sales team to purchase unassigned capacity. CIU has been updated to allow you to order additional unassigned engines.

Helping to manage energy usage

Power and cooling discussions continue to be part of any IT budget planning. As energy prices have risen and utilities have restricted the amount of power usage, it is important to

review the role of the server in balancing IT spending. A zEnterprise System can help take better control of energy usage in the data center. Unified Resource Manager will monitor and provide trend reporting of energy efficiency for the entire heterogeneous infrastructure. New static power savings mode allows for turning off engines that are not being used. New query max potential power will help when doing total data center energy use management.

There is value in reducing wattage and power across the entire data center and zEnterprise offers solutions that can help. The z196 will have a water cooled option that doesn't increase the system footprint and offers energy savings without compromising performance. There is an option for high-voltage dc, which can eliminate the need for a Universal Power Supply (UPS) inverter and Power Distribution Unit (PDU). Top exit I/O cabling can improve flexibility in the data center by helping to increase air flow in a raised-floor environment. And the zBX has an optional rear door heat exchanger to reduce energy consumption.

New system. New possibilities. New value.

The zEnterprise System is a revolutionary new mainframe—a truly integrated hardware platform that is able to span and intelligently manage workloads across mainframe and distributed technologies. The multiplatform system with the zEnterprise Unified Resource Manager brings integration of governance to manage risk across the infrastructure, integration that will help to accelerate insight for the business, integration of processes to increase business agility, and integration of people to enable new business innovation.

IBM zEnterprise System (2817) at a glance

Processor Core Types: CP/IFL/ICF/zAAP²/zIIP²/zBX

Model	Minimum	Maximum
M15	1/1/1/0/0/0	15/15/15/7/7/4
M32	1/1/1/0/0/0	32/32/16/16/16/4
M49	1/1/1/0/0/0	49/49/16/24/24/4
M66	1/1/1/0/0/0	66/66/16/33/33/4
M80	1/1/1/0/0/0	80/80/16/40/40/4

Coupling Links

Maximum # external coupling links	80
ISC-3 maximum ³	48
IC maximum	32
InfiniBand maximum	32
CHPID maximum	128

Channels

Minimum: 0/0/0/0/0	ESCON/FICON Express8/FICON Express4/OSA-Express3/OSA-Express2
Maximum: 240/336/336/96:48/48	ESCON/FICON Express8/FICON Express4/OSA-Express3/OSA-Express2
HiperSockets	Up to 32 high-speed "virtual" Local Area Networks

Cryptographic⁴

Crypto Express3	Optional up to 8 features (16 PCIe adapters), minimum order is 2 features
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IBM zEnterprise System (2817) at a glance

Processor Memory

Model	Minimum	Maximum
M15	32 GB	752 ⁶ GB
M32	32 GB	1520 GB
M49	32 GB	2288 GB
M66	32 GB	3056 GB
M80	32 GB	3056 GB

zEnterprise BladeCenter Extension (zBX) Model 002

IBM Smart Analytics Optimizer	5 solution sizes: 7, 14, 28, 42, 56	
POWER7 blades	Minimum: 0	Maximum: 112 ⁶
Upgradeability	Upgradeable within the z196 family Upgrading to the M80 from other z196 models will require a planned outage Upgradeable from IBM System z10 Enterprise Class and IBM System z9® Enterprise Class The zBX Model 002 is upgradeable from the zBX Model 001.	
Physical Configuration	See announcement letter 110-170 for detailed physical configuration for z196—air cooled and water cooled. See announcement letter 110-177 for detailed physical configuration for zBX.	

Supported Operating Systems

z/OS	z/OS V1.9 and subsequent releases
z/VM:	z/VM 5.4 and subsequent releases
Linux on System z:	Red Hat RHEL 5 and subsequent releases, Novell SUSE SLES 10 and subsequent releases, Linux as z/VM guest
z/VSE	z/VSE V4.2 and subsequent releases
z/TPF	z/TPF 1.1
AIX® (on blade)	AIX 5.3 and subsequent releases and PowerVM™ Enterprise Edition

For more information

To learn more about zEnterprise, please contact your IBM marketing representative or IBM Business Partner, or visit: ibm.com/systems/zenterprise



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¹ All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.

² If ordering a zAAP or a zIIP, one or more general purpose processor (CP) per the specialty engine is required. One CP can satisfy the requirement for either or both of the specialty engines.

³ ISC-3 Peer mode only

⁴ Initial order of Crypto Express3 requires two features, maximum of eight features

⁵ Excludes the standard fixed size of 16 GB HSA

⁶ IBM Smart Analytic Optimizer and blades can be mixed in the same zBX— but not in the same BladeCenter Chassis—and can not exceed 112 total blades



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