A mainframe sized and priced to suit your on demand business needs

IBM @server® zSeries 890

Highlights

- ***IBM @server® zSeries® functionality at a lower entry capacity level than previously available on IBM z/Architecture™ hardware and with new granular growth options***
- ***Optionally configured zSeries Application Assist Processor (zAAP), delivering a cost-effective and specialized Java™ execution environment for improved price/performance benefits***
- ***Specialty engines for flexible deployment of Linux® workloads and internal Parallel Sysplex® coupling facilities help to better align IBM @server zSeries 890 (z890) advanced technology with your IT infrastructure requirements***
- ***Flexibility to run multiple applications and operating systems on a single server***

A mainframe for the midsized enterprise

The wave of change that IBM first called "on demand" continues to gain momentum. Customers ask more of your company every day, demanding that your technology infrastructure be responsive, flexible and resilient. To help meet the challenges of constant change, your company must do more than simply integrate its processes—it must literally be able to provide products and services to customers on demand. Achieving success in this environment requires an entirely new approach. In short, it's never been so important for your business—and your IT infrastructure—to be flexible.

But what does it really mean to be flexible? It means building an IT infrastructure that can change as fast as the market demands. It means maintaining the ability to grow along with your business at your own pace, increasing and decreasing capacity as needed and paying for only what you use. It means running multiple applications and multiple operating systems at the same time *on the same server*. It means maintaining flexible growth and upgrade

z890—Single model with multiple features for a range of capacity settings

Uni-processor variants	2 processor variants	3 processor variants	4 processor variants
110	210	310	410
120	220	320	420
130	230	330	430
140	240	340	440
150	250	350	450
160	260	360	460
170—Full Uni	270—Full 2P	370—Full 3P	470—Full 4P

Single machine: 2086 and a single model: A04

options. If your company can truly achieve this flexibility, it can compete—and win—in today's marketplace.

From an IT perspective, flexibility has sometimes seemed like a luxury afforded only to larger companies. While small and medium-sized businesses struggled to do more with less, bigger companies were able to simplify their infrastructures through high-end enterprise servers like the IBM @server zSeries 990 (z990). Now, IBM brings the advanced mainframe technology of the z990 to your IT world with the IBM @server zSeries 890 (z890), designed and sized specifically for the midsized enterprise. The z890 is a mainframe with advanced on demand capabilities at a size and cost that fits your business.

How can the z890 help you control costs? This new line of high-performance midrange servers provides many of the capabilities available in larger enterprise-class servers at a lower entry point, along with extremely granular growth options that allow you to buy the capacity that best fits your needs. The z890 is capable of running Linux and mainframe operating systems at the same time, and it provides the flexibility to easily manage changing business needs while maintaining mainframe levels of availability and security.

With the z890, you can start at the capacity setting you need to meet your IT infrastructure requirements, then easily add additional capacity to meet your changing needs as you grow. The four processors on the z890 have seven engine levels, giving you a total of 28 capacity settings overall. The smallest z890—with capacity setting 110—has most of the same features as the other 27 capacity settings, however, it has smaller I/O configuration/expansion capabilities.

To help you reduce the complexity and costs of your IT infrastructure, you can use the advanced virtualization technology of the z890 to run several operating systems at the same time. Competitively priced Integrated Facility for Linux (IFL) engines help you run Linux applications more cost-effectively, and specialized assist processing with zSeries Application Assist Processors (zAAPs) deliver a newly designed environment for running Java technology-based applications on z/OS® V1.6 and

subsequent releases on the mainframe. Most importantly, the z890 gives your business many of the same availability, scalability and security features of the z990—IBM's cornerstone On Demand Business server. The z890 can provide the power and flexibility that seemed out of reach in a size that's right for your IT world.

Granular growth options

When it comes to growth, the z890 offers extreme granularity. The range of capacities for the z890 has increased from the processor on its predecessor, the IBM @server zSeries 800 (z800)—options for low capacity are now lower and those for high capacity are now higher. What does that mean to your business? It means you can start at the capacity level you need to simplify your IT infrastructure, then add additional capacity to meet your changing needs as you grow.

Built on z990 technology

Built on the powerhouse function of the z990, the z890 offers many of the features and functions of the z990 at a considerably lower capacity entry point. That's not so bad, considering the z990 is IBM's most sophisticated mainframe, with world-class scalability, virtualization, automation, security and reliability.

The IBM @server zSeries Application Assist Processor (zAAP), available on the z890 and z990 servers, is an attractively priced specialized processing unit that provides an economical z/OS Java execution environment for customers who desire the traditional qualities of service and the integration advantages of the zSeries platform. zAAPs are designed to assist and operate asynchronously with the central processors to execute Java programming under control of the IBM Java Virtual Machine (JVM). This can help reduce the demands and capacity requirements on central processors which may then be available for reallocation to other zSeries workloads.

The amount of central processor savings may vary based on the amount of Java applications executed by zAAPs, and thereby may contribute to lowering the overall cost of computing for z/OS Java technology-based applications. Best of all, IBM JVM processing cycles can be executed on the configured zAAPs with no anticipated modifications to the Java application(s).

Continuing enhancements to the Open Systems Adapters provide improved throughput, enhanced virtualization with up to 4 times the supported TCP/IP connections, Large Send TCP Segmentation offload, concurrent LIC updates, a 10 Gigabit Ethernet feature, and the capability to perform like a Layer 2 type device providing the capability of being protocol or Layer 3 independent.

FICON® Express2 features can provide improved throughput, support for up to four FICON Channels, support for up to 2 Gigabit per second high speed attachment of traditional disk and tape storage, connectivity to SCSI based open storage via Linux on zSeries and availability enhancements with FICON Purge Path Extended. Additionally, with FICON Express and FICON Express2, FCP LUN Access Control, when available, is designed to enhance security and resource sharing on SCSI storage controllers and devices.

Another feature for both the z890 and the z990 is the OSA-Integrated Console Controller (OSA-ICC), which offers system console (IPL) and operations support for multiple logical partitions (LPARs). The OSA-ICC enables local and remote user console session capability, as well as encrypted remote

connection for configuration changes. Use of the OSA-ICC can positively impact the ongoing costs of running your system by eliminating the requirement for an external controller for console support.

The zSeries is the enterprise-class on demand server optimized for integration, transactions and data of the next generation on demand business world. In implementing the z/Architecture features with new technology solutions, zSeries models are designed to help facilitate the IT business transformation and reduce the stress of business-to-business and business-to-customer growth pressure. The zSeries represents an advanced generation of servers that feature enhanced performance, support for zSeries Parallel Sysplex® clustering, and improved hardware management controls and innovative functions to address on demand processing. The z890 may be configured with an Internal Coupling Facility processor that can be integrated with other central processors or configured standalone to allow the z890 to run as a Coupling Facility.

The zSeries is designed to deliver a high level of application availability in response to today's on demand environment. It offers technology for high reliability and is endowed with self-healing, self-managing features so your system can fine-tune itself in key areas to help provide optimized performance. Fault avoidance and tolerance design features can help minimize business disruptions and permit concurrent maintenance and repairs.

The IBM **@server** Capacity Upgrade on Demand* provides for the addition of one or more Central Processors (CPs), Internal Coupling Facilities (ICFs), Integrated Facility for Linux (IFLs), and/or zSeries Application Assist Processors (zAAPs) to increase your server resources when you need them.

IBM **@server** On/Off Capacity on Demand* on the z890 is designed to provide even greater flexibility by allowing you to turn on temporary capacity resources at busy times of the year and then turn them back off when they're no longer needed. This can give you exceptional control over costs while you address your dynamic capacity needs. The z890 processors can provide reserved emergency backup CPU capacity through their Capacity BackUp* feature. This feature gives extra capacity to your operation in emergency situations where you have lost capacity in another part of your establishment and need to recover capacity on a designated z890 system.

* Contact an IBM Representative for additional terms and conditions that may apply.

Pay for what you use

The z890 and the z/OS or z/OS.e operating systems can be a powerful combination in helping to reduce computing costs by leveraging the sub-capacity benefits of Entry Workload License Charges (EWLC). Subcapacity EWLC aligns IBM monthly license charge software charges with the utilization of an LPAR or LPARs where a software product executes. Exclusive to the z890 is the EWLC Tiered Price Structure, which IBM is introducing in order to provide greater granularity and price/performance for all flat-charge IBM software products that run on the z890.

IBM Global Financing, a leading provider of IT financing services, offers solutions that can make acquiring your z890 fast, easy and affordable. The financing charges for all your hardware, software and services can be included in a single monthly payment to help simplify your administration. By spreading your total cost of acquisition over the term of the financing, you turn large upfront expenses into regular monthly payments.

This flexibility can help you to overcome current budget restrictions, better manage your expenses, and eliminate hardware disposal issues.

An open, flexible server

The z890 offers the flexibility to manage numerous operating systems on a single server, including z/OS, Z/VM®, VSE/ESA™, TPF and Linux for zSeries and Linux for S/390®.

While zSeries servers support a number of different operating systems, their most advanced features are optimized for z/OS. z/OS is the foundation for the future of zSeries. It is designed and developed to quickly respond to the demanding quality of service requirements for the on demand business environment. z/OS easily allows you to physically scale-up to the amount of server capacity you need. It is designed to deliver high qualities of service for enterprise transactions and data, and extends these qualities to new applications using some of the latest software technologies. It provides a security-rich, scalable, high-performance base on which to deploy Internet and Java applications, providing a comprehensive and diverse application execution environment.

z/OS.e, unique to the z890 and the z800, is a specially priced product offering with a select subset of z/OS functionality designed to make the deployment of new applications on these servers attractively priced. z/OS.e provides the same z890 functionality that is provided with z/OS, and is comparable to z/OS in service, management, reporting and reliability. Best of all, no new skills or service procedures are required for z/OS customers who wish to exploit z/OS.e.

z/VM, strategic to Linux and new workloads on zSeries, uses established virtualization technology as a foundation to offer Virtual Machine (VM) capabilities on a mainframe. It allows you to virtualize processor, communications, storage I/O and networking resources to help minimize the planning, purchasing and installation of new hardware to support additional workloads. An ideal environment for consolidating servers and simplifying the infrastructure, z/VM enables you to run hundreds of Linux images simultaneously on a single server—helping to reduce both cost and complexity—while benefiting from the reliability and availability of the z890.

The z890 provides important improvements to the QDIO architecture to help improve performance and may help minimize the overhead of running Linux and other virtual server guests running under z/VM V4 or later. The Linux open standards-based platform supports rapid application portability which can be adapted to suit changing business needs. zSeries enables massive scalability within a single server. Linux and z/VM can take advantage of the zSeries capacity by allowing you to run many virtual blade servers simultaneously, so you can scale-out virtually for high utilization while helping to lower the cost of ownership.

New zSeries Grid Computing support leverages Linux for zSeries and z/VM to provide on demand Grid node capacity to help meet changing needs. Linux for zSeries supports the 64-bit architecture and can utilize the 16 HiperSockets™ available on the z890.

Linux also benefits from the zSeries support of Fibre Channel Protocol (FCP) channels, switches and FCP/SCSI devices with full fabric connectivity. The

z890 allows you to IPL operating systems that support SCSI-attached disks attached via the zSeries FCP channel. zSeries FCP LUN Access Control, an exclusive on z990 and z890, when available is designed to allow the host to control access to SCSI storage controllers and their devices in Linux and Linux hosted by z/VM environments including z/VM system-owned SCSI disks. This expanded attachability means you have more choices for new storage solutions, or may have the ability to use existing storage devices to leverage your current investments and help lower the cost of ownership for your Linux Implementation.

Many VSE customers have faced a challenge to leverage their existing VSE investments without being limited by them. They can reap the benefits of combining VSE and Linux, using Linux to consolidate existing distributed servers onto one zSeries server—in other words, to "think inside the box."

Safety and security

In the on demand era, security is more critical than ever. An IT infrastructure can now be a tangible manifestation of a brand image. It is the way a company can help maintain the privacy of confidential information and the security of the system itself. The Crypto Express2 feature combines the functions of PCICA and PCIXCC in a single feature with two coprocessors. This is designed to provide an equivalent level of SSL acceleration and may provide improved secure-key and system throughput on the z890 system.

The Crypto Express2 feature, designed for FIPS 140-2 Level 4, supports highly secure applications requiring hardware acceleration for SSL and TLS protocol transactions, as well as the security functions—PKE, PKD, TDES, DUKPT and EMV2000—which were announced in April 2004.

zSeries cryptography is further advanced with the introduction of the Cryptographic Assist Architecture implemented on z890 general purpose processors (CPs) and competitively priced Integrated Facility for Linux (IFL) Processors. With the available scalability and data rates, the z890 processor offers a set of symmetric cryptographic functions, synchronously executed, which can provide the performance of the encrypt/decrypt function of Secure Sockets Layer (SSL), Virtual Private Network (VPN) and data storing applications which do not require FIPS 140-2 Level 4 security.

World-class servers

The IBM brand is about uncompromising flexibility in selecting, building and deploying the applications your business needs. Toward that end, IBM offers one of the industry's broadest range of platforms and operating systems. IBM is committed to industry-standard, cross-platform technologies—such as Java support, XML, HTML, SOAP and UDDI—that are at the heart of a flexible on demand business infrastructure.

Support for these standards in our key middleware—including DB2 Universal Database™, WebSphere® Application Server and MQSeries®—means you won't be locked into a single platform as your business grows. As a result, you have more flexibility to deploy applications in a cost-effective way.

Smoothing the path

The systems management functions and features of the z890 provide incredibly robust control and automation as well as exceptional serviceability and availability. For example, Intelligent Resource Director (IRD) extends the classic strengths of I/O priority queuing by prioritizing requests across the

channels of the z890 to move to the workloads which require additional connectivity via Dynamic Channel Path Management. It can dynamically balance CP resources across LPARs according to business goals.

z/OS can provide an approach for installing and configuring products: a managed system infrastructure. This approach, when employed, goes a step beyond Web-based wizards by furnishing a step-by-step installation guide and automated system updates. For example, Managed Systems Infrastructure for Setup can establish a Parallel Sysplex cluster quickly and easily by transparently creating the policies, parmlib specifications and initialization parameters necessary to configure a basic Parallel Sysplex environment.

The new frontier

What does the on demand era mean for your medium-sized enterprise? It means being able to sense and respond to change. It means managing risk while lowering costs. It means greater control and transparency with less complicated management. And it means maintaining a flexible IT infrastructure.

With its combination of flexible design and advanced mainframe technology, the IBM @server zSeries 890 can help your company simplify its infrastructure and remain flexible. It can offer your business extremely granular growth options, along with the power and flexibility that comes with technology that can be configured for general purpose workload processing (CPs), Linux workloads (IFL), Parallel Sysplex internal coupling facilities (ICF), as well as specialty assist processing for I/O (SAPs) and Java technology-based applications (zAAPs). All of this comes with the world-class mainframe qualities of service (e.g., high availability, scalability and security) found on the z990—IBM's cornerstone on demand business server. The z890 is designed to provide a growth-focused mainframe with advanced on demand capabilities at a size and cost that fits your business.

IBM @server zSeries 890 enterprise server at a glance*

Hardware models	A04					
Maximum coupling links	ISC-3	IC	ICB-2	ICB-3	ICB-4	Max # links
	48	32	N/A	16	8	64
Channels						
Minimum	0/0/0/0 (ESCON®/FICON Express/OSA-Express/HiperSockets)					
Minimum	0/0/0 (FICON Express2/OSA-Express2[1] - GbE/OSA-Express2[1] - 10 GbE)					
Maximum	420/40/40/16 (ESCON/FICON Express/OSA-Express/HiperSockets) * 110 Capacity Setting = 240/32/24/16					
Maximum	80/40/20 (FICON Express2/OSA-Express2 - GbE/OSA-Express2 - 10 GbE) * 110 Capacity Setting = 64/24/12					
Increments	4/2/2/1 (ESCON/FICON Express/OSA-Express/HiperSockets)					
Increments	4/2/1 (FICON Express2/OSA-Express2 - GbE/OSA-Express2 - 10 GbE)					
Cryptographic	PCIX Crypto Coprocessor—optional up to 4 features (4 coprocessors) PCI Crypto Accelerator—optional up to 2 features (4 accelerators) Crypto Express2—optional up to 8 feature (16 coprocessors)					
LPARS	30 max // *110 capacity setting 15 max					
Processor memory						
Minimum	8GB					
Maximum	32GB					
Upgradeability	Upgradeable within z890 Upgradeable to z990 from select z890 configurations					

Physical configuration	**Min**	**Max**
Weight (unpacked) kg	674	785
Weight (unpacked) lbs	1482	1730
Floor space square meters	1.24	1.24
Floor space square feet	13.33	13.33
Floor space with service clearance square meters	3.03	3.03
Floor space with service clearance square feet	32.61	32.61
Input power kVA	1.5	4.7
Heat output kBTU/hr	5.12	16.05
Air flow CFM	640	640
Air flow m*3/min	17.64	17.64
Height cm	194.1	194.1
Height inches	76.4	76.4

IBM @server zSeries 890 enterprise server at a glance*

General	Conforms to EIA guidelines for frame
Software	
z/OS LPAR mode:	z/OS 1.2 and subsequent releases
z/OS.e LPAR mode:	z/OS.e 1.3 and subsequent releases
Linux on zSeries LPAR mode:	Red Hat, SUSE LINUX, Turbolinux
VSE LPAR mode:	VSE/ESA™ 2.6 and subsequent releases
TPF LPAR mode:	TPF 4.1 (ESA mode only)
Linux on S/390 LPAR mode:	Red Hat, SUSE LINUX, Turbolinux
z/VM LPAR mode:	z/VM V3.1, z/VM V4.3 and subsequent releases, z/VM 5.1

* The smallest z890—with capacity setting 110—has most of the same features as the other 27 capacity settings; however it has smaller I/O configuration/expansion capabilities.

IBM @server zSeries 890 enterprise server features and benefits

z/Architecture	• zSeries Application Assist Processor (zAAP) • Intelligent Resource Director • Capacity Upgrade on Demand**	• Integrated Facility for Linux • Capacity Backup Upgrade** • On/Off Capacity on Demand**	• HiperSockets • Customer Initiated Upgrades** • QDIO
Cluster systems	• Parallel Sysplex clustering technology • Sysplex Distributor • Shared ICFs and CPs • Geographically Dispersed Parallel Sysplex™**	• Dynamic CF Dispatching • Internal Coupling Facility (ICF) • Dynamic ICF Expansion • Internal Coupling Channel • Transparent ICF Sparing	• z/VM Virtual Parallel Sysplex (when z/VM has been licensed) • InterSystem Coupling-3 Links • Integrated Cluster Bus • System-Managed CF Structure Duplexing
Availability	• Transparent CP Sparing • System Assist Processor (SAP) • Enhanced Application Preservation • Dynamic memory sparing • Reassignment & Sparing • CICS® subspace group facility (when CICS has been licensed) • Partial memory restart • CICS subsystem storage protect (when CICS has been licensed)	• Dynamic Channel Path Management • Remote operations support • Dual Support Elements • N+1 power supply technology • Hybrid cooling • Concurrent power and thermal maintenance • Concurrent channel, OSA-E and Coupling Link maintenance	• Concurrent Hardware Management Console and Support Element • Concurrent Licensed Internal Code (LIC) maintenance for CP, SAP, SE, PR/SM™, LPAR, Hardware Management Console, OSA-Express2 • FICON Purge Path Extended • Dynamic I/O Reconfiguration
Management	• (SE) maintenance • Power/Thermal	• Cancel I/O Requests • Internal Battery Feature	• ESCON sparing
PR/SM™	• Up to 30 LPARs each (up to 15 LPARS each with capacity setting 110) with 64-bit central memory addressability	• Enhanced Dynamic Reconfiguration management	
Performance	• IEEE binary floating point support for advanced Lotus® Domino™ and Java performance • Up to 32 GB memory • Hipersorting	• Hiperbatch™ • Compare-and-move extended • Long Displacement Facility • Hardware-assisted data compression	• Performed Locked Operations for enhanced IP performance • DB2® sort assist (when DB2 has been licensed)
I/O connectivity	• ESCON half duplex data transfer • Multiple Image Facility (MIF) • ESCON CTC native and basic mode • FICON full duplex data transfer	• FICON CTC • Full fabric FCP support • FCP support for SCSI devices	• FCP LUN Access Control • Logical Channel SubSystems

IBM @server zSeries 890 enterprise server features and benefits

Networking	• OSA-Express (1000BASE-T Ethernet, Token-Ring, Fast Ethernet)	• OSA-Express2 (Gigabit Ethernet, 10 Gigabit Ethernet) • OSA-Express and OSA-Express2 Layer 2 support	• OSA-ICC Integrated Console Controller • HiperSockets
Security	• Open Architecture Distributed Transaction Element • SSL Acceleration for Linux and z/OS (when Linux or z/OS have been licensed)	• Tamper-proof Cryptographic Support • Designed for LPAR isolation - Common Criteria EAL certification • Designed for FIPS 140-2 Level 4 certification	• AES Encryption support • CP assist for Cryptographic Functions • TKE Smart Card Reader support

** Certain features require execution of additional terms and conditions.

For more information

For more information about the IBM @server zSeries 890, contact your IBM marketing representative or IBM Business Partner or visit the following IBM Web site:

ibm.com/eserver/zseries

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