

IBM @server zSeries
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A New World of Enterprise e-business

The zSeries at the Heart of Next Generation e-business



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Overview

A short time ago, the Internet was primarily about surfing the Web and visiting cool sites.

Then people began to realize the Internet could transform the business landscape. The race was on to develop new and hybrid business models in order to compete in the dot.com or “click and mortar” arena.

Unfortunately, as many companies found out during the last two e-tailing seasons, simply having an Internet-based business plan is not enough. Companies are discovering that customers take e-business applications just as seriously as they take traditional business applications. They demand the same level of performance and availability, and many e-businesses are finding their infrastructure isn't ready to meet the demands of serious e-business.

The question facing businesses today, therefore, is what's going to happen to their infrastructure and their business model when those 35 million online customers become 350 million – or 3 billion? Looking ahead, what will happen when they begin accessing the Internet from wireless smart phones and PDAs, over high-speed cable modem or digital subscriber line connections?

This paper will explore some of the implications to both business and business computing of the continuing evolution of e-business and how the new IBM® @server zSeries™ can be leveraged to manage the high performance data and transaction requirements of next generation e-business.

The Next Generation of e-business

Follow the business news and it's easy to be convinced that the e-business revolution isn't complete; the fact is, the revolution has hardly started.

As reported in The New York Times, a recent survey by Price Waterhouse Coopers and The Conference Board stated that large enterprises were moving into e-business at a much slower pace than previously expected. Nearly 75 percent of the large enterprises surveyed were not yet processing transactions online. For 80 percent of the companies, e-business was generating less than five percent of revenue.¹

¹Big Companies Go Slowly In Devising Net Strategy," The New York Times, March 27, 2000

Highlights

Every business today must begin to ask some strategic questions with this continuing evolution in mind: how do we evolve our infrastructure; what are the right architectures and interfaces to build on; what products and services do I need?

According to analysts at the International Data Corp., as of June 2000 there were fewer than 300 million Web users worldwide.²

But the vast untapped potential on each side of the digital marketplace is only the beginning. Also driving change is the next generation Internet, which provides very high bandwidth at very low cost. The result will not only be vast numbers of new users, but users who will be logging on with an array of new devices. For example, IDC estimates that mobile commerce will grow from fewer than 1,000 users in 1999 to 29 million users in 2004, creating a \$21-billion channel.³

What that means is over the next few years we will see a marketplace that is defined by explosion and convergence: an explosion of new devices, new users, new media and transactions; a convergence of standards to bring it all together.

As a result, every business today must begin to ask some strategic questions with this continuing evolution in mind: how do we evolve our infrastructure; what are the right architectures and interfaces to build on; what products and services do I need?

The answers to these questions will define the infrastructure for the next generation of e-business.

The Next Generation Infrastructure

What will the infrastructure for serious e-business look like?

The answer is that the next generation infrastructure will be as diverse as the organizations that build it. Each company will customize its infrastructure based on its strategy and growth plans and will depend on the continuing development of open Internet standards to ensure interoperability with trading partners and customers alike.

There are, however, three key characteristics of a serious e-business infrastructure: it must provide disciplined systems management; it must be flexible enough to absorb the new technologies that are coming at us at a blinding rate; and it needs to be able to provide the optimized performance to handle the demands of different e-business workloads.

²"IDC Internet Commerce Market Model Version 6.3," IDC, June 2000

³"Despite Challenges, mCommerce Will Generate a Tidal Wave of Activity," IDC, July 31, 2000

What's required is the freedom to run any application on the server that offers the right combination of cost, performance and growth capabilities for the job.

These characteristics, in turn, define three key requirements for the servers that will form the foundation of that infrastructure. To support serious e-business, servers must provide: new ways to manage end-to-end growth, risk and costs; choice in selecting, building and deploying applications; and extreme performance matched with scalability, reliability and security.

New ways to manage: In the changing e-business environment, no one can afford for IT staffing to grow at the same rate as the IT infrastructure. New ways must be found to control software licensing costs as well. Simpler, more effective management can play a crucial role in the critical transition of IT from a cost center to a profit center in the new world of e-business.

Choice in applications: As the next generation of e-business unfolds, value will often be determined by the ability to deliver new services customized to meet changing customer needs faster than the competition. Today, however, there is often a conflict between those responsible for ensuring quality of service and those charged with rapidly deploying new business applications. What's required is the freedom to run any application on the server that offers the right combination of cost, performance and growth capabilities for the job – as well as the ability to integrate critical data wherever it resides on the network.

Extreme performance: Experience has demonstrated that e-business is based on three types of tasks: the traditional data/transaction processing jobs, such as “back-office” tasks; the newer generation of “front-office” and Web-serving applications; and a variety of network management jobs. Each of these tasks calls for varying levels of performance, and each demands a server optimized for the job. In other words, one size does not fit all in an e-business infrastructure.

But delivering information in a way that doesn't keep customers waiting requires much more than fast servers. It will involve a whole new level of connectivity supporting an unprecedented level of integration across the virtual enterprise so that customer-critical information is available whenever and wherever needed.

To meet these conditions, IBM has introduced a new brand of servers – the IBM @server. Among them is the IBM @server zSeries, powered by the new z/Architecture™ built on z/OS™. The first e-business enterprise server, the zSeries is designed and optimized for the high-performance data and transaction serving requirements demanded by next generation e-business.

A major aspect of simplified management is the ability of a server to grow without disrupting business.

The zSeries includes an array of technological advances, resulting in the flexibility to handle dynamic workloads while empowering customers with the freedom to select and implement e-business applications. A balanced design and advanced workload management provide a higher level of responsiveness, and the zSeries features a completely rethought approach to managing – and paying for – the resources necessitated in a growing e-business environment.

What's New

New tools for managing e-business: A major aspect of simplified management is the ability of a server to grow without disrupting business. This is enabled in the zSeries by Capacity Upgrade on Demand. zSeries servers have the capability to add server capacity and virtual servers nondisruptively, as well as to install FICON™, ESCON®, OSA-Express ATM, Fast Ethernet, Gigabit Ethernet and PCICCs, and activate additional memory without bringing the system down.

zSeries, z/OS and Linux® can be a powerful combination in helping you greatly reduce the cost of computing by simplifying the way you pay for the software you need. Workload Based Pricing is based on the capacity you define for the workload, not the capacity installed in the server. It also provides common pricing for many cross-platform products.

The zSeries is backed by a number of new and innovative offerings from IBM:

- *Capacity Advantage: To manage unpredictable growth with minimal risk.*
- *Availability Advantage: End-to-end design to maximize availability of your entire system.*
- *Technical Support Advantage: On-line collaborative customer care supporting you when and how you need it.*
- *Solution Assurance Advantage: The largest, most experienced system and solution testing capability in the industry.*
- *Financing Advantage: With the flexibility to buy or lease as you need and only pay for what you need.*

IBM believes that Linux will help drive the long-term growth of e-business by providing an open application platform that will drive the growth of emerging Internet applications.

Application flexibility: IBM offers a complete portfolio of e-business tools for zSeries that help supply the application interoperability imperative for next generation e-business. These tools, built on the structure of the IBM Application Framework for e-business, provide rich capabilities to support simple to sophisticated applications, and they support a rapid application development environment based on cross-platform standards including Java[®], HTML and Linux.

When combined with the advanced technology of zSeries, these tools – such as the WebSphere[®] Internet software platform – create the flexibility to quickly and reliably integrate existing transactions and data with new Web applications.

For example, instead of running multiple Linux servers to host new or legacy Web applications, an organization can run multiple Linux images on a zSeries server alongside multiple z/OS images. These mixed workloads, as required, can have dedicated or shared access to system resources as necessary, but remain separate and secure in individual partitions. As a result, a WebSphere Application Server running under Linux, for example, could have direct, high-bandwidth access to CICS[®] and IMS[™] applications and data stored in DB2[®] without any fear of a security breach or any effect on the rest of the z/OS system. This can result in significantly lower systems management costs and quicker deployment compared to front-ending the zSeries with hundreds of distributed mid-tier servers.

Additionally, zSeries has embraced and fully supports Linux. IBM believes that Linux will help drive the long-term growth of e-business by providing an open application platform that will drive the growth of emerging Internet applications. This Linux-based application development environment will make it possible for the community to converge toward common development tools that will ensure interoperability of software across diverse software platforms.

Support for Linux is based on two unique features: zSeries Virtual Image Facility[™] for Linux and the zSeries Integrated Facility for Linux.

The Virtual Image Facility is an easy-to-use high-performance supervisor that operates within a logical partition in native zSeries mode and furnishes you with the capability to create a significant number of Linux images. This feature creates these images quickly and easily, allows you to share resources and supplies an internal network that can be used for high-speed communications among Linux images.

The zSeries is well positioned as the deployment platform for e-business data and transaction workloads.

The Integrated Facility is a hardware feature that allows you to use zSeries processor capability for Linux. This optional feature enables purchasing additional processing capacity exclusively for Linux workloads with no effect on zSeries model designation and no additional IBM zSeries operating system or middleware charges.

Innovative technology = leading server performance: The zSeries is well positioned as the deployment platform for e-business data and transaction workloads. It offers the traditional enterprise computing strengths – scalability, high availability, low total cost of ownership and robust security – necessary for a company seeking to create the kind of flexible computing infrastructure required for enterprise-wide e-business solutions.

The zSeries offers 26 air-cooled models, from one-way to 16-way, employing from three to twenty processors. Each zSeries can operate independently or as part of a Parallel Sysplex® cluster of servers with as many as 640 processors⁴. In addition to supporting z/OS, it can host hundreds of Linux images running open source applications using the zSeries Virtual Image Facility for Linux.

The zSeries is based on the entirely new z/Architecture, which can eliminate bottlenecks associated with the lack of addressable memory. This is achieved through its virtually unlimited addressing capability providing plenty of “head-room” for unpredictable workloads and growing enterprise applications.

The servers also automatically direct resources to priority work through Intelligent Resource Director (IRD). The zSeries IRD combines the strengths of three key zSeries technologies: Workload Manager, Logical Partitioning and Parallel Sysplex clustering technology.

This powerful combination of technology gives this system the ability to intelligently manage numerous operating system images executing on a single server, as a single compute resource, with dynamic workload management as well as physical resource balancing across logical partitions. In other words, the system can dynamically allocate processors, channel paths, and channel-and-controller work across multiple virtual servers to ensure that the unpredictable needs of e-business workloads can be intelligently managed according to business priorities.

⁴ 32 systems in Parallel Sysplex providing 512 customer workload processors and 128 system support processors.

To support end-to-end responsiveness, the zSeries delivers a greater level of integration by expanding on the balanced system approach of the classic S/390 architecture.

The IBM @server zSeries delivers the highest level of application availability required in today's global networked environment. Even in a single footprint, zSeries servers are designed to avoid or recover from failures to minimize business disruptions.

High availability is realized through very high component reliability and design features that assist in fault avoidance and tolerance as well as providing concurrent maintenance and repair.

IBM leads the industry in bringing greater security to e-business with its high-availability CMOS Cryptographic Coprocessors. This feature has earned Federal Information Processing Standard (FIPS) 140 -1 level 4, the highest certification for commercial security ever awarded by the U.S. Government. These coprocessors are designed as single-chip modules that are individually serviceable, minimizing downtime in the event of a crypto chip failure.

zSeries servers can also support up to 16 optional PCI Cryptographic Coprocessors (PCICC). These two coprocessor types enable applications to invoke industry-standard cryptographic capabilities – such as CDMF, ZKA, DES, Triple DES or RSA – for e-transaction security. They also provide the industry-leading capability to support more than 2,000 SSL transactions/second.

To support end-to-end responsiveness, the zSeries delivers a greater level of integration by expanding on the balanced system approach of the classic S/390® architecture.

The I/O subsystem has been implemented to complement the number of processors and size of memory. High-speed interconnects, known as HiperSockets™, let TCP/IP traffic travel between partitions at memory speed, rather than network speed. An ultra-high performing Gigabit Ethernet feature is the first in the industry capable of achieving line speed: one gigabit per second. The result is ultrahigh-speed communications within the server and between servers, thereby allowing greater integration between traditional and Web applications to maximize e-business effectiveness.

zSeries and z/OS extend Workload Manager functionality to allow real-time prioritization of storage requests through the IBM Enterprise Storage Server™ and real-time prioritization of network traffic through Cisco routers. The Parallel Sysplex Distributor builds on Virtual Internet Protocol Addressing (VIPA) to offer

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transparent failover from device, interface or network failures. As a result, the zSeries can deliver intelligent and automatic self-management from the edge of your network to the heart of your data.

The systems management function and features of z/OS provide more robust control and automation, and better serviceability and availability. For example, Channel Subsystem Priority Queuing enhances the classic strengths of I/O priority queuing by prioritizing requests across zSeries channels. Another example is Dynamic Channel Path Management, which allows I/O channels to move automatically to those workloads that require additional connectivity. These are two of the capabilities available with Intelligent Resource Director.

The integration of the Tivoli® Management Agent into the z/OS base provides enhanced management capabilities by making z/OS Tivoli-ready. In addition, z/OS can act as a server/gateway in Tivoli enterprise-based management of the whole IT environment.

Summary

The Internet has forever altered the business arena, creating a world where the customer is in command and the only constant is change. To succeed in this new world of e-business requires an infrastructure that gives you maximum performance, real-time responsiveness, application flexibility and simplified management. At the heart of that infrastructure is the new IBM @server zSeries, the first e-business Enterprise Server, designed for the high-performance data and transaction requirements of next generation e-business.

For More Information

For more information, contact your IBM representative, Business Partner, or visit: ibm.com/eserver/zseries



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Software Communications
Route 100
Somers, NY 10589
U.S.A.

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