Strategic Snapshot

IBM eServer zSeries:
A Cost-Effective Resource for Enterprise Application Deployment and Integration

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INTRODUCTION

Enterprise applications, while offering potentially the highest leverage of any IT resource, often remain under-utilized due to enterprises' historic propensity for creating discrete vertical application solutions. To date, interconnecting systems to bridge these islands of computing has been a daunting, if not impractical undertaking. Compounding this is the over-provisioning inherent in discrete solutions, where each system must be designed to meet occasional peak loads, leaving it severely underutilized the rest of the time. The result has been ever-increasing numbers of systems deployed tactically to meet users' critical needs, but without strategic consideration of the long-term IT overhead created and ultimately borne by the enterprise.

To maximize the value derived from Enterprise Applications, organizations need a more efficient platform on which to integrate and deploy business-critical solutions. Further driving this need are the lean economic times that affect IT funding and the ongoing mergers and consolidations of corporations on a global scale, which typically bring together disparate and overlapping computing solutions without regard to their functional capabilities. Traditional integration solutions are slow, expensive, and focused on past technologies with inherent high overheads. Clearly, an alternative to this IT par for the course is essential for enterprises seeking competitive advantage.

IBM's eServer zSeries products provide a unique platform to integrate, deploy, and host Enterprise Applications. IBM eServer zSeries' leadership in areas including Linux development, server consolidation, and autonomic self-healing and self-managing technologies make it a compelling alternative to the ever-burgeoning racks of disparate, underutilized, and difficult-to-manage IT resources. Additionally, IBM's On Demand initiative proffers enterprise IT environments that combine in-house systems with additional capacity on demand into a model that responds flexibly and quickly to dynamic business requirements. IBM's eServer zSeries provides an integrated, yet logically discrete, computing environment by which enterprises can maximize the leverage and value of their existing applications while deploying state of the art technologies to capitalize on the promises of tomorrow.

In this paper, we will examine the challenges of managing Enterprise Applications, effective resource utilization, and how the IBM eServer zSeries is uniquely positioned to address these business needs. In addition, we will review two case studies where IBM's eServer zSeries solutions play critical roles in satisfying enterprise customers' demanding Enterprise Application requirements.

IBM eServer zSeries

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What Is the Future for Enterprise Applications?

Ever since the first computer landed in the business world some forty-odd years ago, there have been many competing visions of what enterprise computing would be and ultimately would mean to the businesses. Some saw it strictly as a financial services solution; others viewed it as a research and development tool, albeit an expensive one. For most, the computer was ultimately regarded as a tool that could help automate business processes. It is from this vantage point that the Enterprise Application was born.

Over the years, the perception of what constitutes an Enterprise Application has changed, often directly in response to the evolving power and capabilities of computing technologies. As a result, there are numerous applications developed both in-house and by high-end software vendors that are executing in contemporary enterprises. Unfortunately, while these applications offer potentially the highest leverage of any IT resource, they often go under-utilized given enterprises' historic propensity to create discrete vertical application solutions. For example, an accounting system does not necessarily share information with the payroll, inventory control, manufacturing, or other enterprise applications. Interconnecting these systems has been a daunting, if not impractical undertaking. In fact, much of the promise of renewed vigor and business advantages in delivering enterprise applications via Web Services and other middleware seeks to overcome this lack of intra-application communication and information sharing.

One other side effect of these discrete computing deployments is that they represent copious quantities of systems hardware and software that must be managed and maintained in good working order. Thus, continued scaling out of computing solutions only increases the cost of operation. But the most strategically important issue is that as enterprises increasingly achieve a common view of the customer through effective integration of internal applications and Web Services, the logical next step is to extend this integration outside the enterprise to partners and customers. This external endeavor will be geometrically more complex, demand ever-higher levels of scalability, integrity, and security, and create even higher pressures on IT infrastructures in order to cope with huge transaction volumes based upon LOB processes. Clearly, there is a need to provide a new approach and platform to support Enterprise Applications in order to maximize their leverage and value.

The Shared Server Approach

In order to cost-effectively address future enterprise computing and business needs, it is imperative that a new approach be found to the existing high-maintenance and high-cost approaches deployed to date. One such approach is the notion of shared servers, i.e., the deployment of virtual server environments that mimic the current distributed architecture of client/server and Web-based applications within a single physical server. Fewer systems maintenance personnel would be required to maintain a given set of applications, and freed IT resources and personnel could be better allocated to focus on value-added activities such as developing and deploying new applications. Through the shared server approach, enterprises can drive toward a common view of the customer, while providing the high-volume message rates implicit in an organization-wide customer relationship solution.

Deploying shared servers allows enterprises to make available additional resources at significantly lower administrative overhead, due in large part to the sharing of CPUs, storage, management software, etcetera. These shared resources can be dynamically prioritized and allocated to meet the business needs of the enterprise, thus increasing the overall resource capacity for all applications compared with traditional IT solutions. As a result, there is less aggregate spare or idle capacity within the enterprise. Furthermore, as peak demands occur, the usability of spare capacity is higher given its concentration in a single IT resource.

Overall, this shared server approach leads to improved IT efficiency and decreased IT operational costs.

At first glance, some might react negatively to shared servers under the mistaken notion that applications and data are being freely shared throughout the system; however, this is not the case. Application security is of paramount concern to any enterprise and must be achieved to ensure the isolation, integrity, and credibility of Enterprise Applications. Through the logical partitioning of resources, only the hardware is shared, not the application or data, as each application is executing in its own logically isolated and secure environment. This discrete integrity of applications and data is especially prudent in environments where there is a high degree of IT integration with external partners and customers.

IBM's On Demand

IBM's On Demand initiative portrays any one employee, customer, application, or business process having access to any/all necessary assets, information, and resources within or outside of the enterprise based upon a series of LOB rules. While not exclusively limited to shared server deployments, On Demand's benefits apply to companies of every size, not just the traditional mainframe enabled enterprise. IBM will lead the On Demand evolution by bringing to market Business transformation, operating environments and infrastructures, and utility services for enterprises of all sizes.

On Demand combines in-house infrastructures with capacity on demand services and hosting offerings to provide a fundamentally new computing model where enterprise application deployment and integration can dynamically match enterprises' business needs. This flexibility in addressing business needs as they arise enhances the inherent IT efficiency gains and cost savings realized through shared server computer solutions. Consequently, flexibility in meeting both business needs and the commensurate IT resources is provided while simultaneously reigning in the cost of delivering said resources.

IBM's eServer zSeries: Enabling the Future of Enterprise Applications

In an era of budgetary constraints and economic malaise, the mantra of the profitable enterprise will be decreasing costs while increasing service and efficiency. For that reason, the value proposition of shared servers cannot be dismissed and IBM's eServer zSeries typifies the benefits of the shared server approach.

The mainframe has always had a special place in enterprise computing infrastructures. Historically this meant glass house computing environments, but this is hardly the eServer zSeries of today. The computational capabilities of the eServer zSeries provide the high volume implicit in enterprise-wide customer relationship solutions. Simply stated, as enterprises are more successful and grow their customer bases, the number of customer interactions should also soar. As enterprises deploy Web services, and integrate existing applications and information repositories in the quest of creating a common view of the customer, the demand for computing power will grow geometrically.

Through its Logical Partitions (LPAR) and other virtualization abilities, eServer zSeries allows enterprises to deploy additional resources with a significantly lower administrative overhead, due in large part to the sharing of CPUs, storage, management software, etcetera. As a result, average utilization factors of as high as 70%, with peak loads often exceeding 90% are not uncommon in eServer zSeries installations.[i] This compares favorably with the typical 15% average utilization of RISC-based UNIX servers, and even more favorably with the approximately 5% average utilization of Intel-based server solutions. From a purely business perspective, maximizing resource utilization creates competitive advantage. From a techno-logical perspective, reducing complexity, and hence the opportunity for operator error, is always a welcome achievement.

eServer zSeries solutions offer the flexibility to scale up as well as logically scale out in order to meet the ever-increasing needs of customers all within an integrated environment. Through its multi-operating system partitioning ability the eServer zSeries allows enterprises to logically scale out, i.e., add discrete computing environments, should their IT departments deem this the approach to fit their needs. eServer zSeries can provide virtual instantiations of multiple computing environments while physically hosting all of these within a single computing resource. Computing memory, operating systems, storage, and other resources can appear to be dynamically allocated to an application but without the traditional expenditures associated with acquiring and managing additional hardware resources.

eServer zSeries' LPARs address application security and integrity issues by providing complete isolation for applications, which execute only within their known logical environment and cannot access data outside of their computing context. As result, eServer zSeries systems have earned Common Criteria EAL5 certification for the security of its LPARs. From the application's perspective, they have their own physical realm, even though it is within the shared server context. The scaling and partitioning capabilities of eServer zSeries offers users the potential for massive database consolidation while maintaining high performance computing and high-speed data transfer levels.

In aggregate, eServer zSeries' capabilities represent the essence of Sense and Respond Computing, i.e., responding to business demands in an integrated, resilient, virtualized, and open IT environment. Its ability to sense and respond to shifts in dynamic workloads provides a unique computational intelligence and agility. The eServer zSeries' dynamic resource allocation provides support for hundreds of simultaneously executing applications, with each existing in the context of its own virtual computing system. In addition, efficient resource management leads to improved asset and cost management for virtually any business environment. The eServer zSeries can scale to meet the needs of internal application deployment and integration as well as the potentially daunting demands of external application integration and deployment. Years of enterprise customer experience shows that eServer zSeries environments are proven secure, highly available and quickly accessible and recoverable; a critical consideration in creating an On Demand computing infrastructure.

Case Studies: Maximizing the value of Enterprise Applications on eServer zSeries

While it is easy to tout the possibilities of a given hardware platform, are there any real examples of where these unique capabilities have been deployed? In the following section, we will illustrate two instances where enterprises have taken advantage of eServer zSeries' compelling proposition as a powerful Enterprise Application platform.

Looking to the Skies: eServer zSeries Brings Application Consolidation and Integration to a European Aerospace Vendor

The advent of the Euro was a watershed for European industry, which required significant change to IT infrastructures. A strategically focused European aerospace and defense company took this opportunity to deploy a new integrated IT solution to support its Enterprise Application suite in order to accelerate processes, improve data consistency, and provide integration between systems, while simultaneously replacing legacy application solutions. Given this firm's global focus with overseas sales accounting for more than 60% of its revenues, it needed a solution that would provide a future growth path, either by scaling up or by scaling out as the enterprise saw fit.

This enterprise gradually replaced its legacy applications that supported project systems, materials managements, accounting, sales and distribution, asset accounting, and controlling

with an integrated Enterprise Application suite. A fundamental benefit of integrating formerly disparate data sources is that data is more accurate, reliable, and readily available without the many man-hours spent sourcing and cleaning data as in the previous solution. Such integration provides real-time monitoring of raw materials, finished goods, pending orders, and production, as well as other financial and process control benefits; this is the basis of a Sense and Response computing solution — an On Demand manufacturing-focused enterprise.

To achieve its data integration, the enterprise incrementally retired its legacy applications while maintaining WAN connectivity to operating legacy systems. To facilitate message traffic, components of WebSphere MQ were deployed to deliver secure and reliable communication between legacy systems and the new application suite so that data integrity was maintained throughout the migration phase. In addition, WebSphere MQ resolved data conversion issues and the serial process of operations. So while the complete redeployment to eServer zSeries took place over time, a united view of the customer and operations was achieved earlier in the project's timeline.

By taking advantage of eServer zSeries' flexibility, the database and application servers were each placed in a z/OS logical partition to run, and the two-tier environment resides within a single physical server solution. The operational efficiency of this single system approach is in sharp contrast to the legacy distributed environment that it replaced. As the enterprise's current user load increases with company growth, eServer zSeries' virtual partitioning provides the enterprise with a growth path that does not require the installation of new systems with the corresponding increase in management and maintenance overhead. In addition, eServer zSeries' high availability and performance provides an operational safety net, should unforeseen difficulties be encountered.

Banking on Integration: Eastern US Bank Enhances Competitive Position with eServer zSeries

An Eastern USA regional bank subsidiary decided to enhance its competitive position by integrating its channels through extensive business process reengineering, backed up by new enterprise applications and IT architecture. This subsidiary, part of a $60+ billion full-service financial services company, serves more three million personal account customers. The bank had multiple, discrete customer channels: branches, the call center, and the Web site operated independently, each with its own applications, some developed internally and others commercially purchased. The IT strategy was to integrate these disparate information resources onto a common platform with a unified view of the customer.

Since the bank had legacy data on a mainframe, it wanted its Enterprise Applications database to reside on the same platform. As a result, it felt that DB2 for z/OS was the appropriate choice. The database solution was an important consideration for the firm as it has approximately 4,000 users to support, with more than 2,700 accessing the system across multiple channels at any given time. The bank took a three-staged approach to its IT rollout, starting with sales referrals, opportunity management, and campaign management; followed by new accounts and account selection; and culminating with loan approval, closing, and fulfillment. These Enterprise Applications are at the core of a banking operation and key components of a Sense and Response solution.

The new solution was based on a three-tier solution consisting of a presentation layer, application server layer, and a database layer. The presentation and application layers were integrated through a series of XML-based interfaces, with the applications operating in a high-availability AIX environment on pSeries hardware. The application layer leveraged WebSphere MQ middleware and an Enterprise Application integration framework to integrate with the database layer deployed on DB2 residing on an eServer zSeries mainframe.

Through this three-tier approach, it is possible to incrementally port functions from the legacy environment without disrupting legacy operations.

As a result, the bank employees can, on demand, access all customer information in a consistent fashion, achieving a unified view of the customer. While the current 600+ GB of data may seem daunting, the solution provides an easy method for the bank to capture even more information and offers new ways to leverage the value of this information in ways that were previously simply not possible. Combined with potential future customer growth, the data requirements of this enterprise will undoubtedly scale over time, something that eServer zSeries is well positioned to support. The value of this new information paradigm speaks for itself as the bank has experienced growth in small business accounts, customer retention, and overall customer satisfaction since deploying the new IT solution.

What Does It All Mean?

Today it is common for enterprises to have numerous applications developed in-house as well as those purchased from high-end software providers. Unfortunately, while these applications offer potentially the highest leverage of any IT resource, they often go under utilized, as many were discretely deployed as vertically integrated solutions. Effectively interconnecting these applications has been a daunting, if not impractical undertaking. Yet there is also great latent potential in unlocking new value from Enterprise Applications as noted by the growing interest among enterprises seeking new business advantages by redeploying Enterprises Applications as Web Services.

The notion of shared servers, i.e., the deployment of virtual server environments, which mimic the current distributed architecture of existing client/server and Web-based applications, provides a new cost-effective solution for consolidating existing Enterprise Applications as well as providing an integrated and manageable future growth path. Through application and information consolidation, enterprises can drive toward a common view of the customer, while knowing that their IT infrastructures can manage the high-volume message rates implicit in organization-wide customer relationship solutions. In addition, enterprises can deploy additional resources with significantly lower administrative overhead while maintaining higher overall utilization levels compared with traditional UNIX- or Intel-based solutions.

When enterprises begin reaching the full potential of their Enterprise Applications, they will increasingly focus on external relationships as customers and partners are integrated into business processes. Externally focused deployments are geometrically more complex than behind-the-firewall implementations, and will create even higher pressures on IT infrastructures.

IBM's eServer zSeries provides a uniquely beneficial platform for customers looking for in-house application integration solution and for those seeking an external hosting platform. The scalability and partitioning capabilities of eServer zSeries offers users the potential for massive database consolidation while maintaining high performance computing, high-speed data transfer and higher overall utilization levels than other solutions. eServer zSeries can scale up or scale out, whichever is the best approach to meet the customer's needs, all within a single integrated environment. eServer zSeries embodies Sense and Response, and On Demand computing, proactively responding to the dynamic changes in enterprise business computing needs.

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[i] IBM Scorpion Whitepaper: *Simplifying the Corporate IT Infrastructure*