Taking aim at today's IT infrastructure challenges with virtualized computing

For years, conducting business on the Web has meant a mounting investment in server and related capacity resources. With Web performance critical to visitor retention and customer loyalty, there was little choice but to overbuild the server environment to accommodate peak usage and maintain superior availability levels. For many companies following this path, the resulting information technology (IT) infrastructure has grown very costly and complex. Worse yet, it is largely underutilized, and in a financially strained economy, the rising acquisition and management costs associated with an underutilized infrastructure can be a real source of frustration.

In the current business climate, with intense pressure to reduce IT costs, the emphasis has shifted from infrastructure expansion to consolidation. Company leaders are determined to lower not only the number of servers and other hardware resources that make up their IT infrastructure, but the management complexity as well.

Achieving this goal will require a highly scalable, flexible infrastructure that enables companies to respond dynamically and cost-effectively to everyday resource demands, however uneven or unpredictable they may be. For companies en route to becoming on demand businesses, the answer lies in virtualization—replacing dedicated physical resources with virtual ones to allow for consolidation and optimal scalability.

Virtualizing the server environment

IBM virtual server services is one of the ways we are helping clients lower their infrastructure costs through virtualization. Virtual server services pools a client’s server capacity resources (including CPU processing power, main memory and hard disk storage) to help simplify resource provisioning and management. Virtual servers share the application workload, minimizing the possibility of a capacity shortage. When a surge occurs, additional processing capacity is dispensed automatically to meet the rise in demand.

IBM Managed Hosting - server services

virtual iSeries

Achieving infrastructure flexibility and scalable capacity on demand with virtual servers for OS/400-based applications

Highlights

- Helps reduce IT infrastructure cost and complexity
- Merges IBM @server® capability with the dynamic scalability and usage-driven flexibility of virtual technology
- Helps relieve pressing IT concerns, allowing renewed focus on strategic business matters
- Helps simplify IT management through standardization, automation and integration
- Provides usage-based pricing flexibility
- Includes access to a wide range of services from the IBM Managed Hosting portfolio
- Leverages partitioning and IBM security technologies to isolate and protect client environments
- Combines IBM virtualization and hosting expertise with end-to-end infrastructure solutions for a virtual world

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IBM virtual iSeries™ enables clients running IBM OS/400®-based applications to capitalize on these resource benefits. Built using powerful IBM server technology, virtual iSeries uses the same high-performance POWER4™ processors and dynamic workload management features as dedicated iSeries servers, but with even greater resource optimization and cost efficiency. With a single virtual server doing the job of multiple physical servers, you can consolidate existing hardware resources and simplify resource management.

Logical partitioning technologies, which segment the physical server into multiple virtual servers, allow the virtual servers to efficiently share hardware resources and host multiple operating system instances. One iSeries can be divided into as many as 32 separate logical partitions with server resources distributed dynamically among them. That means you can run multiple applications on a single physical server and reverse the one-to-one, application-to-server mindset that has resulted in an overabundance of servers today. With fewer servers to deploy, you can lower your operating expenses and, more important, your total cost of ownership.

Applying the cost benefits to your own IT environment
Implementing virtual iSeries technology can help you achieve your most critical IT objectives:

- **Dynamic resource allocation**, with burstable CPU capacity to accommodate fluctuations in demand
- **Rapid provisioning of additional resources** beyond the base capacity commitment, with fulfillment of CPU, memory and disk capacity requirements as needed
- **Optimal server utilization**, enabling a single machine to handle increased workloads and multiple applications, with limited or no degradation to performance and availability
- **Better return on investment** with fewer expenditures earmarked for the infrastructure and related management
- **Improved cost control and predictability** with usage-based pricing to better align monthly spending with actual resource consumption
- **Accelerated time-to-market for new applications**, by leveraging available partitions of the virtual server and helping you avoid the delays and cost of purchasing additional server hardware.
Implementing management efficiencies enterprisewide for the greatest benefit

Every device added to an IT infrastructure to accommodate a new application or greater throughput increases its complexity. This ad hoc approach to server acquisition has resulted in a heterogeneous mix of hardware and operating systems that is often difficult to manage with a single set of tools. Emerging technologies have also increased the complexity of the infrastructure, putting enormous pressure on existing IT personnel and forcing company executives to hire additional skill sets or risk technological obsolescence.

IBM virtual iSeries technology helps lessen the IT management struggle and its costs. You can consolidate testing and production workloads on the same device, in separate partitions. You not only reduce the need for additional dedicated testing servers, you can build and test new applications on the same system on which they will be deployed, simplifying the migration from testing to production.

Virtual iSeries can also facilitate resource consolidation and integration across multiple business units. This makes it easier to implement a standardized management toolset across the enterprise. Multiple business units can share capacity resources with less waste and greater efficiency. With resources pooled, individual workloads can be handled by common hardware. Plus, iSeries enables you to assign each partitioned application exactly the resources needed, without shutting down the partition.

Finally, virtual iSeries facilitates automation. Instead of the manual effort and time typically required to handle functions like resource provisioning, automation enables them to be handled more simply, with fewer personnel and at lower cost.

Mapping the service to your business needs

Virtual iSeries (OS/400 v5 r2 Standard Edition) servers are deployed and managed by IBM at an IBM delivery center. Applications running in the virtual server environment are accessible over the Internet via frame relay, virtual private network (VPN) connection or other connection.

While virtual iSeries lessens the need for in-house server management, your system administrators still retain visibility into the operating environment and its performance via IBM e-business Hosting™ Connection, our comprehensive Web portal service.

The flexibility built into the virtual iSeries helps you implement the service according to your business needs. Virtual iSeries servers can be implemented alongside your dedicated servers. So going virtual doesn't mean you have to replace your entire dedicated infrastructure. Plus, you can retain your dedicated infrastructure at its current location. The open-standards-based virtual iSeries servers facilitate interoperability with legacy systems and IT environments no matter where they reside.

But virtual iSeries flexibility does not end with the initial implementation. Each month, IBM will work with you to size your virtual resource capacity according to projected needs. You continually adjust your baseline resource commitment to accommodate shifts in the workload. This enables you to optimize your monthly resource costs and reduces the need for bursting. It also helps ensure that ample resource capacity is available to your applications whenever it's needed.
Establishing a baseline and monitoring monthly utilization

Your monthly resource commitment not only determines the baseline processor capacity available to your applications, it also determines your base usage charges. To help you set an initial baseline, IBM monitors your actual usage for 60 days. We provide usage reports and sizing tool estimates to help you come up with an appropriate number of CPU hours for each virtual server.

Once this baseline is established, you are charged for the actual CPU hours you consume monthly, within a 50 percent band. If you use 25 percent fewer hours than your baseline commitment, your monthly charge will be 25 percent less than the baseline usage charge you have established for the month. If you use 25 percent more hours, your monthly charge will be 25 percent higher. It’s simple—you pay for the resources you use.

IBM gathers utilization metrics to help you forecast processing requirements for the upcoming month. Baselines can be adjusted up or down each month, giving you the flexibility to allocate adequate processing resources for monthly promotions or seasonal fluctuations in demand. The virtual iSeries pricing flexibility also enables you to keep monthly payments predictable and under control.

Although charges for disk and memory capacity are not based on usage, monthly planning is still important. Charges are based on the amount of resources allocated each month, and additional disk space and memory can be purchased as needed.

Leveraging integrated IBM management and support services

IBM provides a common toolset for managing and supporting our clients’ virtual and dedicated server environments. Standard Managed Hosting services provided with the virtual iSeries solution include:

- Installation of the physical server and the operating system for server virtualization, and configuration of multiple virtual server instances
- Capacity planning, including a monthly review of client-specific usage data and upcoming plans
• Device (IP ping) and URL availability monitoring, network bandwidth monitoring and server utilization monitoring
• Proactive management of the physical and virtual servers, including alert monitoring, problem determination and fault correction
• Access to client support services, plus billing, performance and utilization reports via a single Web portal
• Service level agreements for availability
• Call center support
• Routine operational services, including system reboots and device status notifications, plus tape backup and restoration.

You can augment the standard services with security, performance, storage and other services from the IBM Managed Hosting services portfolio. Custom hardware, software and application solutions can also be provided, as well as disaster recovery, database support and application performance management.

Relying on virtual iSeries to isolate and protect your work environment
Each client’s virtual environment is logically partitioned and physically isolated from that of other IBM clients. Key iSeries Hypervisor and virtual LAN (VLAN) technologies help guard against unauthorized cross-partition access, denial of service attacks and resource insufficiencies among partitions.

Hypervisor oversees partition control and mediation for iSeries servers, isolating partitions from one another at the processor, memory and I/O device level. This is designed to prevent a program running in one partition from affecting another. It is also designed to prevent high processor utilization or an outage in one partition from impacting the performance of another. Likewise, programs running outside the Hypervisor cannot accidentally or maliciously execute an instruction that could affect a Hypervisor-controlled partition.

Virtual LAN offers distinct, high-speed Ethernet connections between partitions to allow for dynamic processor allocation across partitions while restricting traffic as needed. Security-rich communication paths can be easily established or prevented between partitions. Because these paths cannot be detected by other partitions, they preclude one partition from eavesdropping on the data moving between other partitions.

Virtual iSeries servers are also protected by IBM managed security services, including vulnerability scanning, which audits the iSeries monthly to pinpoint weaknesses that are in violation of predefined security controls; security policy verification, which automatically checks compliance and evaluates suspicious policy changes monthly; and Internet-facing managed firewall services. All of these services are designed to provide protection proactively—before a breach occurs. If a security fault is detected by these services, IBM will respond and take any corrective action needed.
Leading the virtualization movement

Virtual iSeries is part of a family of virtual service offerings from IBM. Other virtual server offerings include virtual pSeries® (for AIX®-based applications), virtual xSeries® (for Microsoft® Windows®-based applications) and Linux virtual services (for Linux-based applications running on IBM zSeries® mainframes). Together, these solutions offer clients the industry’s first multiplatform, virtual server solution for e-business.

IBM virtual networking services redefine the way front-end infrastructure capacity is delivered. They provide a highly scalable, usage-based virtual alternative when dedicated services become too costly or difficult to manage. Services include IBM managed firewall, managed load balancing and Internet bandwidth.

Today, IBM makes it possible to virtualize the IT infrastructure from end to end, allowing you to achieve the greatest cost savings and return on your existing IT investment. Choosing these solutions can help you retain your competitive advantage. Choosing IBM can provide the virtual technology expertise you need and the multiplatform flexibility your IT environment demands.

Virtualization is a critical step in the move to on demand. As you make your move, let IBM help you implement virtual iSeries and the dynamic e-business infrastructure to speed the journey.

For more information

To learn more about virtual iSeries, contact your IBM sales representative or ask your IBM Business Partner about IBM e-business Hosting, and visit:

ibm.com/e-business/hosting

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