Managing cloud deployments on IBM System z

Unlock the potential of the cloud with IBM Integrated Service Management solutions

Highlights

- Leverage the strengths of IBM® System z® servers to maximize cloud ROI
- Improve agility with more flexible delivery models
- Automate services to reduce human error
- Manage services and the supporting infrastructure to improve service availability

It's a cycle. The smarter and faster technology becomes, the greater the demands it places on IT. And to keep business moving forward, technology must not be allowed to stagnate. It must be managed beyond initial deployment to accommodate more than maintenance. Technology must be managed to support business-changing results and innovations.

When IT operations are being asked to do more with less, continued change and advancement pose a dilemma. How can you keep up on a smarter planet where technology is more instrumented, interconnected and intelligent? How can you reduce costs, improve service and manage risks?

Many organizations are looking to cloud computing to meet these challenges. They want a platform that supports:

- 100 percent virtualization
- Shared storage
- Dynamic resource provisioning
- Highest levels of security
- Multitier applications
- High scalability
- Robust service management tools
- 99.9999 percent availability

The question is, why not build your cloud infrastructure on a platform that already has all these characteristics? Organizations deploying IBM System z servers have a clear answer: use System z, which already delivers these characteristics and more.

IBM System z servers provide an ideal platform for cloud environments, with their capabilities for extreme virtualization and large-scale consolidation. System z servers offer the high availability that defines cloud environments, scalability to respond to the increasing and changing demands of the cloud's reach, and the highest security certification available.

Tying it all together is IBM Integrated Service Management, an industry-leading portfolio that delivers the full range of visibility, control and automation necessary to support your entire cloud environment. Best-in-class tools and processes deliver the capabilities necessary to simplify and streamline management of your IT systems and cloud infrastructure.

A holistic approach for managing service delivery

The traditional IT approach to supporting business workloads and initiatives pulls together resources and deploys them one at a time, on a project-by-project basis. But resources are dedicated to specific workloads. They cannot be leveraged for workload support in other areas.

One of the major advantages of cloud computing, by contrast, is its ability to span and share workloads. By doing so, it can support business more effectively than ever before, with operational efficiencies and advantages that can improve business processes, enhance customer satisfaction, generate new revenue streams, distinguish the company from its competition and help increase market share.

Like any innovative strategy, however, effective cloud deployments don't happen on their own. They require responsive management capabilities that can adapt to changing business and technology requirements in a rapid and scalable manner.

To help cloud environments become a reality—and remain the most useful reality they can be—IBM Integrated Service Management delivers a portfolio of solutions that provide a holistic approach to visibility, control and automation across infrastructures and the service chain. Here's how:

- **Visibility:** Achieving the best results from a complex service infrastructure requires knowing how it's performing. IBM Integrated Service Management provides the visibility you need to see and manage your services and measure delivery against key performance indicators. Visibility supports highly virtualized environments with insight into change and configuration and capabilities for their management—helping you avoid problems before they occur and optimize your delivery of services.
- **Control:** Reducing IT risk and maximizing return on deployed assets require a high degree of control. IBM Integrated Service Management supports processes based on best practices for enterprise asset management, change management and security management to minimize service problems for increased return on investment (ROI).
- **Automation:** By automating operational processes, IBM integrated Service Management can free valuable resources from performing reactive and maintenance-intensive tasks, enabling you to shift them to areas that support business growth. The improved performance, reliability and efficiency made possible by automation can help make competitive gains a reality. And because commonplace tasks are always performed the same way, services are rendered not only more quickly, but more effectively.

With these three values at its core, IBM Integrated Service Management provides greater flexibility and agility than is possible with traditional IT service management solutions. As the complexity of your applications environment grows—whether cloud or not—so does the need for more mature systems management capabilities.

IBM zEnterprise delivers a heterogeneous cloud solution that can integrate and unify IBM System z, Power Systems and System x resources as one complete system to build solutions optimized for the right platform instead of forcing everything onto only one platform.

Applying IBM Integrated Service Management to the cloud

The IBM System z platform is an ideal foundation for the efficient and flexible environment that supports cloud computing. Consider, for example, the platform's ability to run thousands of mixed workloads with priority settings that align application usage with business goals, its ability to attain 100 percent utilization of CPU resources for extended periods of time without sacrificing service level agreements, and its "shared everything" architecture that can provide the highest levels of service quality with the lowest requirements for energy, cooling and floor space.

The IBM zEnterprise™ platform further creates a unified and robust infrastructure for cloud computing that addresses the complexity and inefficiency of multiarchitecture data centers with the ability to integrate and unify cross-platform resources as one complete system.

The move to a cloud based environment is further enhanced by IBM Integrated Service Management which can make your IT environment cloud-ready. There are three key steps to becoming cloud-ready:

- Preparing for cloud computing
- Automating service provisioning and enabling self service
- Managing services to maintain service levels

Preparing for cloud computing

The first step in becoming cloud-ready is the basic setup of the cloud management environment. With cloud computing you need to understand what assets will be part of the cloud and how they will fit into the larger IT environment.

Next, you need to consider how you will deliver a standard set of services to your customers. One of the biggest concerns with cloud deployments is what is known as "server sprawl," in which potentially thousands of unique images are propagated throughout the environment. Because a cloud is capable of delivering virtual images very quickly, it is critical to define a standard set of images that includes a standard set of operating systems, middleware and applications that you want to support—instead of hundreds of deployed images, each containing a unique software stack. Establishing a catalog of standard services based on easily accessible standard images is key to avoiding server sprawl.

Finally, you need to ensure that your security, backup and network infrastructures are capable of handling the cloud.

To accomplish these setup steps, you'll need the following key capabilities:

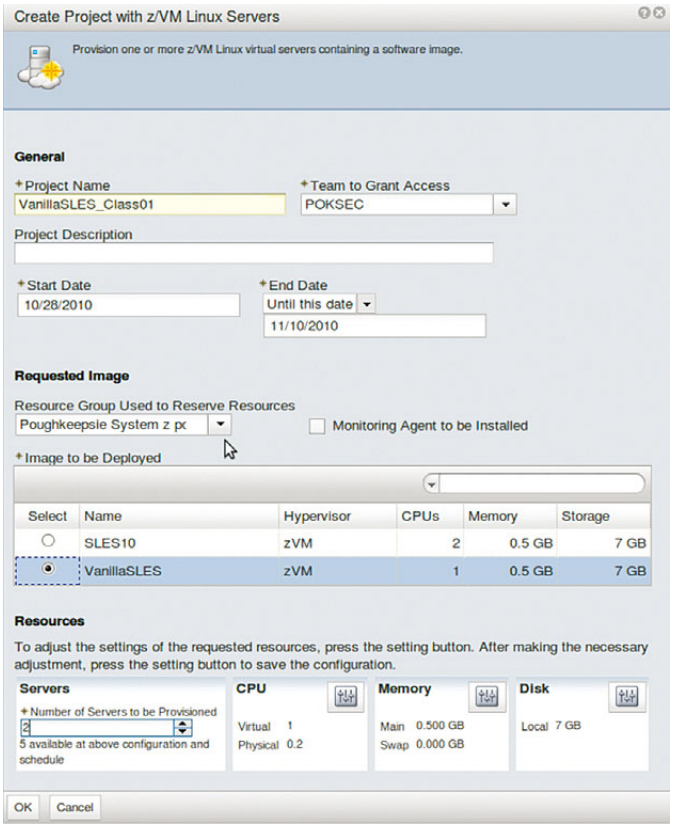
- **Discovery:** IBM Integrated Service Management lets you see the logical and physical dependencies among applications, servers and devices, so you can compare the configurations of the discovered applications to a designated golden master of configurations that meet compliance standards. The result? You can catch rogue changes and use the information as input to any required remediation process.
- **Service catalog:** Once you know what you have and how it works, you can create a service catalog. This will serve as a single repository of standard images for all your cloud-based services, and will allow end users to use IT services without being an expert in IT. With a catalog in place, your business can benefit from faster delivery of business services.
- **Chargeback:** If your organization charges for cloud-based services—either internally or externally—you'll need to set up procedures for billing. With this step, you can forecast and control supply by charging for services based on predetermined rates and real consumption.
- **Security:** In this final stage of set up, you take steps to enforce security policy compliance and reduce security vulnerabilities. You can take advantage of the security capabilities inherent in System z to centrally manage and protect access to applications, business services, infrastructure and data. You can facilitate cross-platform security by leveraging the mainframe as an enterprise security hub.

Automate service provisioning and enable self service

The second set of steps in managing the cloud computing environment is to automate service provisioning and enable self service. These two functions go hand-in-hand when it comes to working more efficiently and reliably, and they enable some of the key cost savings that drive cloud ROI.

During this phase, the organization will achieve the following outcomes:

- **Centralized management:** Once established, automated service provisioning lets you coordinate and manage virtual resource provisioning from a centralized manager.
- **Optimized performance:** Automation helps increase hardware utilization while decreasing energy consumption and the risk of system outages. For the long reach of cloud environments, System z offers industry-leading availability for global operations, with reduced downtime to support business continuity and increase ROI. System z also provides industry-leading scalability, enabling you to take utilization and energy savings to an even higher level.
- **Enhanced agility:** Organizations can achieve new levels of efficiency with automated approval workflows and always-available visibility into system status. Capabilities for adding a self-serve web portal can improve business agility by enabling users to easily request services from the service catalog.
- **Reduced cost:** Automation enables the organization to shrink both their administrative costs and their energy footprint, as services and resources that are no longer needed can be automatically deprovisioned and returned to the pool. Automation can also reduce the amount of labor required to perform provisioning tasks and increase the quality of provisioned services. Reducing provisioning time from weeks to hours or minutes can drive significant cost savings.



A self-service portal is the centerpiece of automated service delivery.

Manage the services to maintain service levels

The final steps in realizing the benefits of cloud computing involve managing services in a way that maintains high service levels. Visibility is key—without the proper insight into virtualized environments and services, even the best efforts can become lost and the root causes of service problems can be overlooked. Within an IBM Integrated Service Management solution on System z, you can take the big picture view—visualizing physical and logical partitions, and physical and virtual machines—or you can drill down for a detailed transaction view to see events that merit prioritized response.

Steps toward complete and effective management of cloud-based services include:

- **Service performance management:** Cloud computing can result in the delivery of complex services that may use everything from SOA to CICS transactions on system z and distributed systems. The ability to analyze these transactions and service flows is critical to isolating problems and resolving problems before customers are affected. IBM provides the capabilities to quickly analyze and isolate problems in cloud services and link to tools for root cause analysis.
- **zLinux performance:** Information about your Linux instances running as z/VM guests and the Linux workloads reveal how they are performing and affecting z/VM and each other. You can view and monitor workloads for virtual machines, groups, response times and LPAR reporting and view reports on z/VM and Linux usage of resources such as CPU utilization, storage, mini-disks and TCP/IP, all of which are key to understanding cloud performance.
- **Predictive analytics:** Viewing collected and stored performance data helps you gain insight into future problems, giving you the opportunity to improve service before rather than after a mishap. By employing utilization trending information for a given resource, you can also take proactive action to mitigate a future outage. This information is available as capacity trending reports and alerts that can be fed into the operations center.

Predictive analytics provides visibility into potential problems before they have a chance to impact services.

- **Workload management:** Supporting the development of new services and providing consistent delivery of quality user experiences in the cloud requires robust workload scheduling and management. As new resources are provisioned in the cloud, the workload management function drives the execution of workloads and applications to take advantage of these new resources. The function also monitors workload and application performance to ensure service levels are being met. Workload management capabilities on System z can help organizations manage and capitalize on the power of cloud computing. These capabilities include:
  - Calendar-based and event-based definition and monitoring of batch and near real-time workflows.
  - Centralized management and control of chains of composite, heterogeneous workloads for improved operation efficiency and reduced risk of errors. The value proposition is even more compelling in a zEnterprise environment, where a closely federated set of resources and central management for mixed workloads support cohesion of heterogeneous resources and enhance the ability to respond to demanding business changes.
  - Unchanged management of workloads in modern environments where customers move workloads around for better efficiency, for less risk and relief in modernization projects.
  - Service-driven delivery of workload schedules and plans for increased business and IT flexibility through automatic prioritization of critical business workloads or through automatic provisioning (and deprovisioning) of additional cloud-based resources according to desired service levels.
  - Extensive workload modeling and forecasting facilities that provide impact analysis of changes to plans and workloads while reducing trial-and-error production changes.
  - Automatic start, stop and move of applications, relieving operators from manual command entry while reducing errors.
  - Policy-based automation, which reduces automation implementation and coding time as well as support efforts.

Take the next step to better cloud management

With IBM System z, you already have a powerful system capable of advanced workload capacity. Once you make the move toward cloud computing on System z, IBM can help you assess where you are today and offer the right roadmap for success. IBM offers a self-assessment tool that can help you better understand how your IT infrastructure can more effectively and efficiently deliver IT services.

This self-assessment tool examines specific service management capabilities, levels of automation, and governance processes, which can help your organization by:

- Evaluating IT processes and their importance to your service management efficiency and effectiveness.
- Providing insights into process priorities for improvements based on your specific situation.
- Sharing approaches and solutions on how an integrated services approach to cloud computing can benefit your organization.

The self-assessment is a key step in realizing the benefits of an integrated, services-oriented approach to cloud computing, including more effective and efficient delivery of IT services, quantifiable process performance, greater ROI from existing investments and increased IT flexibility and productivity.

Additional System z offerings go deeper into the cloud

Helping you get your business into the cloud faster and more easily than ever, the IBM System z Solution Edition Series delivers a packaged solution that brings together key components of hardware, software and maintenance at a single, affordable bottom-line price. Each Solution Edition is tailored to meet key business needs and designed to deliver maximum value from your current IT infrastructure. Like the System z on which it is built, the Solution Edition Series is an ideal solution for addressing key workloads without compromising quality of service.

Going a step further, the Solution Edition for Cloud Computing delivers an aggressively priced integrated solution designed especially for organizations making the transition to cloud computing. Including System z hardware, IBM Tivoli® software and IBM services, the solution delivers a cloud computing foundation of standardization, automation and virtualization of services. It creates private cloud service automation and management capabilities on System z that can be used to accelerate the business value of workloads.

To facilitate your cloud environment as it grows, IBM Integrated Service Management integrates with IBM WebSphere® software and IBM Rational® development tools to speed the delivery of cloud-ready environments, align IT capabilities with business processes, and advance business goals.

The System z platform and IBM Integrated Service Management also provide tight integration with the IBM Tivoli family of monitoring and management software for a single view of operations, including common visualization, navigation, security and reporting capabilities.

For more information

To learn more about applying IBM Integrated Service Management in a cloud computing environment on System z, contact your IBM representative or IBM Business Partner, or visit: **ibm.com**/software/tivoli/solutions/zsmc

About Tivoli software from IBM

Tivoli software from IBM helps organizations efficiently and effectively manage IT resources, tasks and processes to meet ever-shifting business requirements and deliver flexible and responsive IT service management, while helping to reduce costs. The Tivoli portfolio spans software for security, compliance, storage, performance, availability, configuration, operations and IT lifecycle management, and is backed by world-class IBM services, support and research.

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