How To Provision and Manage Cloud Workloads with Improved Tivoli Capability

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March 12, 2012
Session Number: 10386
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• Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.
Cloud success on System z requires reliable Service Management capabilities

Key Takeaways

- Business Service and Service Level Management are key components of cloud

- To optimize cloud environment it requires:
  - Automated Provisioning leading to DevOps Integration
  - Enhanced Virtual Image Lifecycle Management
  - Policy-based Audit, Secure Isolation
  - SLA level Monitoring/Reporting

- System Z and zEnterprise is designed around these capabilities:
  - Integration of heterogeneous virtualized infrastructure
  - Workload Aware Monitoring/Performance Management
  - Availability Management linking application to platform
  - Enhanced accounting/chargeback/capacity planning
  - Secure isolation at OS, middleware and data layers
IBM Integrated Service Management delivers visibility, control and automation™ across the end-to-end business infrastructure and the integrated service chain.
Service Management is the alignment of *IT and Operation Assets* with desired *Business Outcomes*.

Deliver repeatable business outcomes across all assets, aligned with the business needs of the customer/end-user.

Establish disciplined management through the use of common metrics, repeatable processes, and task automation.

Create a complete, comprehensive, inventory of all assets, their relationships, status and operational metrics.
Cloud implementations can deliver smarter, more flexible infrastructure

Cloud computing is a service delivery model that enables the automation of shared computing resources.

Private cloud: IT capabilities are provided “as a service” over an intranet, within the enterprise and behind the firewall.

Hybrid: Internal, on-premise and external service delivery methods are integrated.

Public cloud: IT activities and functions are provided “as a service” over the Internet.

System z provides an excellent platform for Hybrid and private cloud

60% of CIOs plan to use cloud up from 33% two years ago

…the majority being hybrid clouds
Best Practices on System z cloud focus on simplification, standardization and security

- Enterprise IT can perform as Internal Service Provider for Private/Hybrid Cloud environment
- Need to communicate requirements across LOBs
  - Service Patterns/Templates
    - Provide application topology plus metadata for infrastructure resource requirements and constraints
    - Create Service Model with views of discovered resources, augmented with configuration information
- Defined SLAs
  - Performance, Availability metrics
  - Internal accounting, external reporting and chargeback
- Security Policies
  - data/application isolation, audit and compliance
- Enable additional automation and standardization based on business requirements for timely and sustainable processes
Cloud provides more than just automatic provisioning

**User experience and a business model**

- Emerging style of IT delivery in which applications, data, and IT resources are:
  - Rapidly provisioned and configured dynamically
  - Standardized offerings visible via catalog
  - Flexible pricing model supporting virtualization

An infrastructure management and services delivery methodology to manage large numbers of highly virtualized resources delivered with elastic scaling

"It's a mainframe model where things run together but in isolation. …You need reliability, security, auditing, privacy, data integrity, automation and full isolation..."*

- Steve Mills, SWG, in CNET interview when asked about Cloud Computing
Cloud provides both opportunity and risks

<table>
<thead>
<tr>
<th>Value</th>
<th>Concerns/Challenges</th>
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<tbody>
<tr>
<td>• Elastic scalability</td>
<td>• Compliance/Audit</td>
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<tr>
<td>• Rapid provisioning</td>
<td>• Software licenses</td>
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<td>• Advanced virtualization</td>
<td>• Availability</td>
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<td>• Image management</td>
<td>• Data Protection/Integrity</td>
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<td>• Multi-tenancy &amp; Isolation</td>
<td>• Analytics/capacity planning</td>
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<td>• Flexible pricing</td>
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<td>• A better user experience</td>
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IBM Service Management helps organizations leverage current environment to ease moving to Cloud

- Leverage current best practices service management principles
- Tailor combinations of **hardware, software, best practices and consulting**
- Create best business value in each unique industry.

**Successful transformation to Cloud computing requires a Secure, Consistent and Integrated Service Management platform as the foundation with visibility to virtualized infrastructure and controls to manage change and meet SLAs**
System z ideal platform for private cloud focused on provisioning LOB, Development and Test

Create maximum Business flexibility while maintaining System z required integrity and performance

LOB Workloads
- Identify Application components
- Create Workflow to provision
- Define Security and SLAs
- Assign LPAR or Virt Machine
- Isolation with ability to share production resources

Development and Test
- Create Standardized Image
- Dynamically allocate resources
- zVM supports 1000’s VMs on single processor with very rapid provisioning
- Most efficient use of energy and software licenses
- Reclaim resources when done
**Built-in Virtualization and Metering/Usage Accounting will be key for assessing value of cloud**

- Understand virtual and physical resource usage
- Dashboards which aggregate views across hypervisors and enable drill-down

- Generate billing to clients for services delivered based on service usage data
- Provide visibility into the cost of services in order to determine the rate structure
- Understand costs, track, allocate and invoice by department, user and many additional criteria
- Deliver detailed information and reports about the intricate use of shared resources

*Increases utilization for lower capital expense and provides data for planning, budgeting, billing and accurate chargeback for services*
Designing Service using virtual images (Model Driven)

Build and validate virtual images

Catalog & Index images across many repositories. Manage replication of images

Composite Service deployment using images

Deployment in conjunction with Storage & Network

Deployment of Base OS images

Change Management of images (Versioning & place of origin)

Update and patch images

Image Security

Image Lifecycle Management allows for faster innovation of business services

Images can be customer built, vendor built or ISV built
zEnterprise Service Management provides business flexibility at each cloud level

- Intelligent Platform Management meets Service Management
  - Insights from collection of virtualized resources in context of the workloads/services
  - Coordination of actions across server, storage and network
  - Application of E2E policy objectives to the affected resources
  - Correlation/federation of information with analytics relative to impact on business

- zOS+Middleware+ISM = Platform-as-a-Service
  - Additional insights at application/middleware level including SLAs and accounting/chargeback
  - Optimized workload deployment in “fit-for-purpose” model across different architectures

- zEnterprise = Infrastructure-as-a-Service
  - Virtualized images deployed across heterogeneous architectures
  - Ability to connect logical with physical/virtual topology and monitor/report utilization at workload (collection of virtual servers – Unified Resource Manager) level
Successful Clouds on zEnterprise grow over time

**STEP 1**

*Lower Cost*

- Consolidate and Virtualize

- Exploit the extreme virtualization capabilities of System z and z/VM
- Use basic z/VM features and functions to manage virtual Linux servers

**STEP 2**

*Simplify*

- Automate and Manage Better

- Use advanced z/VM features and functions for automated operations and service delivery
- Add Tivoli technologies for greater levels of service management

**STEP 3**

*Integrate and Optimize*

- Cross-architecture Workload Optimization

- zEnterprise as multi-architecture cloud solution
- Use a cloud deployment model to host multi-tier solutions across System z, POWER and System x resources
- Use Unified Resource Manager and Tivoli support for optimal workload management

**Cloud Offerings and Products**

- Enterprise Linux Server
- Solution Edition for Enterprise Linux
- System z Solution Edition for Cloud Computing
- zEnterprise System and Unified Resource Manager
- Tivoli Integrated Service Management
Tivoli can create and manage Workload Resource Groups enabled by zEnterprise APIs

Definition of Workload Resource Groups based on platform requirements to support business services

Workload Resource Groups can be provisioned, monitored, discovered and automated
Tivoli monitoring and discovery can track and manage Workload Resource Groups across zEnterprise.

Add existing operating system, middleware, and application insights.

Unified Resource Manager APIs
Tivoli System Automation can ensure availability of Workload Resource Groups and Business Services.
Take advantage of **Dashboards** to allow for sense and isolation of problems.

- **Virtualization Dashboard**
- **Navigate Drill-Down**
- **Launch in Context**
- **Business Services**

**Detailed Workspaces**

**Managed Resources**

- Network
- Virtual Service Monitor
- Storage Mgmt
- Discovery

**Monitoring & Discovery**

- KVM
- Power7
- z/VM
- LPAR

**Standalone Systems**

- Network
- VMware
- KVM
- PowerVM
- Storage
Monitoring cloud on zEnterprise with Workload Dashboard simplifies meeting SLAs

- Workload Scorecard lists Ensemble Workloads and key metrics.
- Diagram of Nodes and Virtual Servers comprising the selected Workload.
- The Performance Index for worst performing Service Class and highest impact Service Class graphed over time.
- CPU Utilization for the Virtual Server in selected Workload.
IBM zEnterprise Cloud Starter Edition provides first step in moving to a private/hybrid cloud

- Consolidate even more with zEnterprise IFLs: up to 60% faster at 33% lower price
- Increase energy savings as you scale, up to 75% (1)
- Spend up to 70% less on acquisition costs (2) and boost staff productivity by up to 70% (3) compared to virtualized x86 alternatives
- Incorporate IBM POWER® and System x technologies for unparalleled levels of workload optimization
- Manage with Smart Cloud to deliver superior business results at a lower cost

(1) Based on zEnterprise comparison to virtualized x86 alternative
(2) Based on three-year acquisition costs for large-scale, enterprise-class workloads
(3) Based on life-cycle management testing of large-scale virtual server environment conducted by IBM
Cloud success on System z requires reliable Service Management capabilities

Key Takeaways

• Business Service and Service Level Management are key components of cloud

• To optimize cloud environment it requires:
  • Automated Provisioning leading to DevOps Integration
  • Workload aware monitoring and capacity management
  • Automated compliance and reporting
  • SLA level Management for Performance and Availability

• System Z and zEnterprise is designed around these capabilities:
  • Single view of virtualized server/network/storage
  • Workload context aligned with business priorities
  • Automated HA and DR at workload level
  • Workload level accounting and analytics
  • Secure isolation across infrastructure
zEnterprise Cloud Starter Edition provides several key Tivoli components

Solution focused on establishing Infrastructure as a Service (IaaS) delivery model

Built on top of Enterprise Linux Server or Solution Edition for Enterprise Linux

- Allows customers to create a Cloud IaaS environment
- Integrates into customer’s self-service UI
- Resource monitoring provided by OMEGAMON XE for z/VM and Linux
- STG Lab Based Services provide rapid provisioning with newly created z/VM workflows
Tivoli zEnterprise Monitoring and Discovery

**Beta Program**

- **Beta Process**
  - Education provided via web conferences.
  - Pre-GA product code available for download or use in IBM hosted Cloud environment.
  - Product documentation drafts available for download.
  - Support web site with Discussion Forum.

- **Steps to Register**
  - Nomination form for background information.
  - Online license which covers Confidentiality and Beta code license.

- **Customer Benefits**
  - Early exposure to planned product functions.
  - Development assistance during your initial testing period.
  - Ability to influence the product through your direct interaction with the Development team.

- **Time Commitment**
  - No specific minimum time commitment – we realize customers have other work to perform.
  - Attend web conferences if possible and download and install code when able to.
  - Beta planned schedule: Is currently taking place
  - Status will be collected occasionally informally via e-mail.
  - Two written feedback surveys will be requested – quality survey and final feedback survey.

- **Contact Info**
  - Beta Coordinator: Mathias Manohar (mmathias@in.ibm.com)
  - Development Release Manager: Rohit Badlaney ribadlan@us.ibm.com
Stay Connected - Service Management Connect

- New online technical community for Integrated Service Management practitioners
- Built on IBM developerWorks
- Using Rational jazz.net as the model
- Bridges the gap between clients, partners and development teams
- Promotes a more transparent development model

http://www.ibm.com/developerworks/servicemanagement
Getting Started – Service Management Connect

- Create a developerWorks profile:

- Join the Service Management Connect groups:
  http://www.ibm.com/developerworks/servicemanagement

- Contribute to the discussion
  - Create blog entries
  - Contribute your best practices on wikis
  - Ask questions in the product forums
Related sessions - Performance Monitoring on System z

10386: How To Provision and Manage Cloud Workloads with Improved Tivoli Capability (Monday, March 12, 2012 – 11:00am)

10384: Managing Your zEnterprise Platform with New Tivoli Monitoring Support (Monday, March 12, 2012 - 4:30pm)

11093: What's New with System z Monitoring? - Lunch & Learn (Tuesday, March 13, 2012 - 12:15pm)

10383: Introducing e3270UI Problem Solving Capability with OMEGAMON XE on z/OS 5.1.0 (Tuesday, March 13, 2012 - 4:30pm)

11083: Understand the Power of the IBM Mainframe Storage Management Portfolio to Save Time and Money (Wednesday, March 14, 2012 - 1:30pm)

10385: Solving CICSplex Performance Problems Using the New Enhanced 3270 User Interface in OMEGAMON XE for CICS on z/OS 5.1.0 (Wednesday, March 14, 2012 - 4:30pm)

10972: Getting your hands around z/OS Storage management, top 10 common problems and how to address them (Thursday, March 15, 2012 - 4:30pm)

Visit the SHARE Technology Exchange Expo for a Demo (IBM Tivoli Service Management booth)
Thank You