Disclaimer

- This document represents the author's views and opinions.
  It does not necessarily represent IBM's position or strategies

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Agenda

- Cloud Computing Introduction
  - On its Way to Become a Standard ... NIST and DMTF
  - An Evolution from Known Technologies It's More than Virtualization
  - Delivery Models – Private -> Public Clouds
- IBM System z Cloud Option's/Solution's
  - A World Wide Federated Cloud project on IBM System z
  - Boeblingen Tivoli Service Automation Manager setup and example
  - Solution Edition for Cloud Computing and Data Cloud
- Summary & Discussion
Today’s Challenges

- **85% idle**
  In distributed computing environments, up to 85% of computing capacity sits idle.

- **70¢ per $1**
  70% on average is spent on maintaining current IT infrastructures versus adding new capabilities.

- **1.5x**
  Explosion of information driving 54% growth in storage shipments every year.

- **$40 billion**
  Consumer product and retail industries lose about $40 billion annually, or 3.5 percent of their sales, due to supply chain inefficiencies.

- **33%**
  33% of consumers notified of a security breach will terminate their relationship with the company they perceive as responsible.

It’s time to start thinking **Differently** about infrastructure.
Defining Cloud Computing ...

Cloud computing is a **new consumption and delivery model** inspired by consumer Internet services. Cloud computing exhibits the following 5 key characteristics:

- On-demand self-service
- Ubiquitous network access
- Location independent resource pooling
- Rapid elasticity
- Pay per use

Multiple Types of Cloud Exist
- Private, Public & Hybrid

A User Experience
This is a Natural Progression

Virtualization is not “Cloud” any more than a house is only its foundation.

Cloud Computing: The next step in the evolution of IT

   - Optimized for sharing, industrial strength, systems management, ...
   - Managed by central IT organization
   - Back office applications involving transactions, shared databases, ...
   - Mainframes, supercomputers, minicomputers, ...

2. Client/Server: 1985 –
   - Optimized for low costs, simplicity, flexibility, ...
   - Distributed management across multiple departments and organizations
   - Large numbers of PC-based applications
   - PC-based clients and servers, Unix, Linux, ...

   - New consumption and delivery model
   - Optimized for massive scalability, delivery of services, ...
   - Centralized model, hybrid service acquisition models
   - Supports huge numbers of mobile devices and sensors
   - Internet technology-based architecture

Just like introducing the Client/Server model impacted almost everything we did in IT (operation IT, developing applications, …), Cloud computing has severe impact on the IT industry
### IBM Premise: Cloud Computing Must Have

<table>
<thead>
<tr>
<th>Common Attribute</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible pricing</td>
<td>Utility pricing, variable payments, pay-by-consumption and subscription</td>
</tr>
<tr>
<td></td>
<td>models make pricing of IT services more flexible</td>
</tr>
<tr>
<td>Elastic scaling</td>
<td>Resources scale up and down by large factors as the demand changes</td>
</tr>
<tr>
<td>Rapid provisioning</td>
<td>IT and network capacity and capabilities are – ideally automatically – rapidly provisioned using Internet standards without transferring ownership of resources</td>
</tr>
<tr>
<td>Advanced virtualization</td>
<td>IT resources from servers to storage, network and applications are pooled and virtualized to provide an implementation independent, efficient infrastructure</td>
</tr>
<tr>
<td>Standardized offerings</td>
<td>Uniform offerings readily available from a services catalog on a metered basis</td>
</tr>
</tbody>
</table>

### Cloud computing allows companies to rethink IT and reinvent the way they do business

**Rethink IT**
- Rapidly deliver services
- Integrate services across cloud environments
- Increase efficiency

**Reinvent Business**
- Faster time to market for new services
- Increased focus on differentiated processes
- Meet changing customer expectations, direct access to technology

**Economics of Computing are Changing**
The Harsh Reality of Cloud Computing

Lines of business are leveraging public clouds today
“Submarine Projects” are currently underway in your business

IT has been here before
Remember when those pesky Windows based Web Servers did this?

Users views IT as a commodity.
Users think Cloud can do Everything.
Who needs traditional IT?
Lines of business are focusing on short term cost.

Enterprises desire the benefits of cloud – but are not willing to compromise on their requirements

<table>
<thead>
<tr>
<th>Availability and performance tuned to workloads</th>
<th>Technology platform choices built on standards</th>
<th>Flexible payment and billing options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varying degrees of Security and Isolation</td>
<td>From self service to fully managed environments</td>
<td></td>
</tr>
</tbody>
</table>

44% are concerned with the lack of or limited ability for customization of public clouds
50% concerned about the loss of control over IT activities/ business processes
56% believe that service level agreements are not detailed enough
Large enterprises can significantly reduce costs for some workloads compared with traditional IT.
Definition – National Institute of Standards and Technology

OVF = Open Virtual Format

http://www.dmtf.org/
Distributed Management Task Force (DMTF) –

Cloud Computing – Standardization: DMTF, SNIA, OGF, OMG, ...

Cloud is not a Hype anymore

- DMTF – Distributed Management Task Force
  - Open Virtual Format (OVF)

- SNIA - Storage Networking Industry Association
  - Cloud Data Management Interface (CDMI)

- OGF – Open Grid Forum
  - Open Cloud Computing Interface (OCCI)

- OMG
  - Unified Modeling Language (UML)

Webinar May 2010 at
http://www.brighttalk.com/webcast/20535
Security – Grand Challenge for the Adoption of Cloud Computing

Security Is Limited By The Weakest Link
Concerns about data security and privacy are the primary barriers to public cloud adoption

What, if anything, do you perceive as actual or potential barriers to acquiring public cloud services?

- Security/privacy of company data: 69%
- Service quality/performance: 54%
- Doubts about true cost savings: 53%
- Insufficient responsiveness over network: 52%
- Difficulty integrating with in-house IT: 47%

Percent rating the factor as a significant barrier (4 or 5)
Respondents could select multiple items

Source: IBM Market Insights, Cloud Computing Research, July 2009. n=1,090

Specific Customer Concerns Related to Security

- Protection of intellectual property and data: 30%
- Ability to enforce regulatory or contractual obligations: 21%
- Unauthorized use of data: 15%
- Confidentiality of data: 12%
- Availability of data: 9%
- Integrity of data: 8%
- Ability to test or audit a provider’s environment: 6%
- Other: 3%

Source: Deloitte Enterprise@Risk: Privacy and Data Protection Survey

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Cloud Data Integrity is Critical

October 11, 2009: Microsoft Cloud Loses T-Mobile customer data

October 2nd, 2007: Amazon EC2 Outage Wipes Out Data

Piecing together islands of data from multiple locations involves synchronization and is not simply a data restore.

Cloud Security 101: Simple Example

TODAY
- We Have Control
  - It’s located at X.
  - It’s stored in server’s Y, Z.
  - We have backups in place.
  - Our admins control access.
  - Our uptime is sufficient.
  - The auditors are happy.
  - Our security team is engaged.

TOMORROW
- Who Has Control?
  - Where is it located?
  - Where is it stored?
  - Who backs it up?
  - Who has access?
  - How resilient is it?
  - How do auditors observe?
  - How does our security team engage?

What is Cloud Security?
Confidentiality, integrity, availability of business-critical IT assets
Stored or processed on a cloud computing platform
Cloud Security: Foundational Control Categories

1. Identity and Access Management
   Strong focus on authentication of users and management of user identity.

2. Discover, Categorize, Protect Data & Information Assets
   Strong focus on protection of data at rest or in transit.

3. Information Systems Acquisition, Development, and Maintenance
   Management of Application and Virtual Machine deployment.

4. Secure Infrastructure Against Threats and Vulnerabilities
   Management of Vulnerabilities and their associated mitigations with strong focus on network and endpoint protection.

5. Problem & Information Security Incident Management
   Management and responding to expected and unexpected events.

6. Physical and Personnel Security
   Protection for physical assets and locations including networks and data centers. Employee security.

7. Security Governance, Risk Management & Compliance
   Security governance including maintaining security policy and audit and compliance measures.

8. Cloud Governance
   Cloud specific security governance including directory synchronization and geo locational support.

Categories of Cloud Computing Risks

Control
Many companies and governments are uncomfortable with the idea of their information located on systems they do not control.
Providers must offer a high degree of security transparency to help put customers at ease.

Reliability
High availability will be a key concern. IT departments will worry about a loss of service should outages occur.

Compliance
Complying with SOX, HIPAA and other regulations may prohibit the use of clouds for some applications.
Comprehensive auditing capabilities are essential.

Data
Migrating workloads to a shared network and compute infrastructure increases the potential for unauthorized exposure.

Authentication and access technologies become increasingly important.

Mission critical applications may not run in the cloud without strong availability guarantees.

Security Management
Even the simplest of tasks may be behind layers of abstraction or performed by someone else.
Providers must supply easy controls to manage security settings for application and runtime environments.
When thinking about “Cloud”, think about workloads

- Workload characteristics will drive the rate and degree of standardization of IT and business services.

- Complex transaction and information management processes, for example, will likely present challenges and risks of migration to standardized services. Other workloads will move faster, presenting rapid return-on-investment and productivity gains.

- For most enterprises, the best opportunities will be clear.
One-size does not fit-all: Different cloud workloads have different risk profiles

Today's clouds are primarily here:
- Lower risk workloads
- One-size-fits-all approach to data protection
- No significant assurance
- Price is key

Tomorrow's high value / high risk workloads need:
- Quality of protection adapted to risk
- Direct visibility and control
- Significant level of assurance

Need for Security Assurance

Low

Low-risk

Analysis & simulation with public data

Mid-risk

Training, testing with non-sensitive data

High-risk

High

Mission-critical workloads, personal information

One Size Does Not Fit All
Today there are three primary delivery models that companies are implementing for cloud ...

**Private Cloud**
- IT functions are provided “as a service,” over an intranet, within the enterprise and behind the firewall
- Key features include:
  - Scalability
  - Automatic/rapid provisioning
  - Widespread virtualization
  - Chargeback ability

**Hybrid Cloud**
- Internal and external service delivery methods are integrated, with activities/functions allocated to based on security requirements, criticality, architecture and other established policies.

**Public Cloud**
- IT activities/functions are provided “as a service,” over the Internet
- Key features:
  - Scalability
  - Automatic/rapid provisioning
  - Standardized offerings
  - Consumption-based pricing
  - Multi-tenancy


---

Enterprises Have Achieved Significant Benefits through Cloud Computing

Most of the financial benefits are due to standardization and service management automation

<table>
<thead>
<tr>
<th>Capability</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server/Storage Utilization</td>
<td>10-20%</td>
<td>70-90%</td>
</tr>
<tr>
<td>Self service</td>
<td>None</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Test Provisioning Change Management</td>
<td>Weeks</td>
<td>Minutes</td>
</tr>
<tr>
<td>Release Management</td>
<td>Months</td>
<td>Days/Hours</td>
</tr>
<tr>
<td>Metering/Billing</td>
<td>Weeks</td>
<td>Minutes</td>
</tr>
<tr>
<td>Standardization</td>
<td>Complex</td>
<td>Granular</td>
</tr>
<tr>
<td>Payback period for new services</td>
<td>Years</td>
<td>Self-Service</td>
</tr>
</tbody>
</table>

Cloud accelerates business value across a wide variety of domains.
Developing the Cloud strategy and implementation plan is key

- Define cloud in your own terms, what it means for you, and look to capitalize on the value that it brings:
  - Cost Reductions
  - Service improvements
- Look at how technology has changed and understand if this can be leveraged for business advantage
- Revisit your enterprise architecture to understand how new IT trends in cloud computing can best support the business architecture and strategy
- Analyse workloads to identify those that can deliver most benefit from a cloud delivery model:
  - High volatility
  - Low security exposure
- Define the blend between public and private cloud that delivers the greatest benefit for your organization
- Initiate pilot initiatives
- Adapt applications to run as virtualised images

Does Cloud Computing solve (all) problems?

LAST YEAR WE RECOGNIZED THAT OUR PROCESSES WERE FAR TOO COMPLEX

SO WE PUT THEM INTO THE CLOUD

LET THE CLOUDS MAKE YOUR LIFE EASIER
An Architectural Model for Cloud Computing


Publicly available RA whitepaper on ibm.com:
Cloud Life Cycle Management - Delivery & Consumption of IT Resources as Cloud Service

- Service Start
- Service Offering
- Service Design
- Definition of Cloud Services
- SLA Adherence
- Service Operation
- User
- Administrator
- Service Catalog
- Offerings
- Consumption
- Termination
- IT Operator
- Process Platform
- Middleware
- Virtualized and Physical Resources

Based on IT Service Management ITIL Best Practices
12 steps towards creating a cloud service

1. Specify cloud service description
   - Define cloud service, SLA, etc.
   - Identify business needs

2. Implement runtime functionality
   - Select appropriate technology
   - Configure environment

3. Define unit of delivery & charging
   - Determine pricing model
   - Establish billing policies

4. Implement self-service delivery & management functionality
   - Provide user interface
   - Enable automated operations

5. Implement monitoring metrics & event correlation rules
   - Set up alerting systems
   - Monitor performance

6. Implement incident, problem and asset mgmt processes
   - Establish procedures
   - Manage incident resolution

7. Implement resiliency SLA
   - Ensure availability
   - Implement redundancy

8. Implement backup approach
   - Define backup strategies
   - Ensure data integrity

9. Implement security functions
   - Protect data
   - Implement access controls

10. Implement cloud service specific billing metrics
    - Define usage metrics
    - Establish chargeback approach

11. Implement rates for charging cloud service consumption
    - Establish pricing tiers
    - Implement cost segregation

12. Register cloud service to service catalog
    - Publish service information
    - Provide access controls

---

Market View - Clients Approach Cloud as a Journey

Most are in the early stages of adoption

Virtualization
Infrastructure, Virtualization, Consolidation & Management

Entry Level Cloud
Standardization, Automation & Orchestration

Advanced
Cloud Optimization

Most Important Characteristics of Private Cloud

- Virtualization
- Dynamic resource scalability
- Highly Standardized Infrastructure
- Share infrastructure resources

Blue = % adopting

38 - 44%
Shared resources

21 - 25%
Automated Provisioning

40 - 50%
Storage Virtualization

38 - 44%
Standardized Infrastructure

Source: 2010 STG Private Cloud Study, December 2010, Base Size Total = 747
IBM Offerings – Virtualization, Entry and Advanced in Support of the Client’ Cloud Journey

<table>
<thead>
<tr>
<th>Virtualization</th>
<th>Entry</th>
<th>Advanced</th>
<th>Cloud Optimization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure, Virtualization, Consolidation &amp; Management</td>
<td>Standardization, Automation &amp; Orchestration</td>
<td>Cloud Service Provider Platform</td>
<td>Cloud Service Provider Platform</td>
</tr>
<tr>
<td>IBM Servers &amp; Storage with Virtualization</td>
<td>IBM Service Agility Accelerator for Cloud (Power &amp; System z)</td>
<td></td>
<td>IBM Service Delivery Manager</td>
</tr>
<tr>
<td>• Servers: zEnterprise, Power, System x, BladeCenter</td>
<td>• Core Image Management</td>
<td></td>
<td>• Highly scalable provisioning</td>
</tr>
<tr>
<td>• Storage: SONAS, XIV, Storwize V7000</td>
<td>IBM Starter Kit for Cloud</td>
<td></td>
<td>• Hybrid cloud management</td>
</tr>
<tr>
<td>• Virtualization Technology: zVM, PowerVM, VMware, SAN Volume Controller</td>
<td>• Cloud Mgmt w/VMControl to deploy a private cloud</td>
<td></td>
<td>IBM Service Delivery Manager</td>
</tr>
<tr>
<td>IBM Platform Management &amp; Monitoring</td>
<td>IBM Starter Kit for Cloud Editions</td>
<td></td>
<td>• Chargeback and accounting</td>
</tr>
<tr>
<td>• IBM Systems Director, VMControl, Unified Resource Manager</td>
<td></td>
<td></td>
<td>• Request driven provisioning</td>
</tr>
<tr>
<td>• IBM Tivoli Monitoring</td>
<td>IBM Starter System for Cloud</td>
<td></td>
<td>• High Availability</td>
</tr>
<tr>
<td>• IBM network optimization</td>
<td>(System x, Q1 2012, Power Q2 2012)</td>
<td></td>
<td>• Hybrid cloud management</td>
</tr>
<tr>
<td>IBM BladeCenter Foundation for Cloud **</td>
<td>IBM CloudBurst</td>
<td></td>
<td>**IBM BladeCenter Foundation for Cloud - chassis-level integration in August, rack-level integration in Q4</td>
</tr>
</tbody>
</table>

Integrated Systems

IBM Starter Kit for Cloud Edition for Cloud Computing

IBM Starter Kit for Cloud

• Cloud & Platform Mgmt, Self Service UI, Image Consolidation & Conversion, Automated Provisioning, Cloud Admin
• Automated provisioning
• Self service catalog and interface
• Hybrid cloud management

Cloud on System z and zEnterprise Offerings – Perspective

<table>
<thead>
<tr>
<th>Services</th>
<th>Services</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronze</td>
<td>Silver</td>
<td>Gold</td>
</tr>
<tr>
<td>ELS (z/VM)</td>
<td>ELS (z/VM)</td>
<td>ELS (z/VM)</td>
</tr>
<tr>
<td>Provisioning via DirMaint</td>
<td>Enhanced Provisioning</td>
<td>Monitoring via DirMaint</td>
</tr>
<tr>
<td>zManager</td>
<td>Solution Edition for Cloud Computing (TF/GASM)</td>
<td>Tivoli Integrated Service Management</td>
</tr>
<tr>
<td>with z/VM Workflow</td>
<td>IBM with z/VM Workflow</td>
<td>IBM with z/VM Workflow</td>
</tr>
</tbody>
</table>

* IBM BladeCenter Foundation for Cloud - chassis-level integration in August, rack-level integration in Q4

** IBM CloudBurst IBM System z Solution Edition for Cloud Computing
What is IBM Systems Director VMControl?
VMControl encompasses virtual server lifecycle management, image management and resource pool management as an extension to IBM Systems Director.

VMControl features:
- Discover virtual resources
- Display inventory and topology
- Monitor virtual resource health
- Relocate virtual resources
- Create and manage virtual servers
- Deploy and manage workloads
- Provision and manage virtual images
- Manage virtual resource pools

Using VMControl as an extension of IBM Systems Director it is possible to combine management of physical and virtual resources in one management tool.
IBM zEnterprise Starter Edition for Cloud - Details

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

zVM Virtual Infrastructure Automation Package

Monitoring
Tivoli Provisioning Manager (TPM 7.2.0.2) with zVM Automation Package

Enterprise Linux Server Solution Edition for
Enterprise Linux

Supported:
- z/VM 5.4 or 6.1
- Linux SLES V10, V11
- Linux RHEL V4, V5

TPM 7.2.0.2

Set-up on Linux on System z

Benchmark for TPM on zLin.

64 Bit Benchmark Results

The benchmark results will be broken down into the following result sets:

- CPU scaling for DB2.
- CPU scaling for TPM.
- Network utilization.
- Transaction and page response times.

http://public.dhe.ibm.com/software/dw/linux390/perl/TPM-5.1.1.1-64-Bit-z10-Benchmark-Results-v2.4.pdf

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IBM zEnterprise Starter Edition for Cloud – Growth Option Towards Tivoli Service Automation Manager (TSAM)

IBM Service Delivery Manager

TPM technology

IBM Tivoli Monitoring

Tivoli Usage and Accounting Manager

End Users

REST APIs

Web2.0 GUI

Admin GUI

Catalog

Service Request

Service Context

Service Automation

Automation

Provisioning

Infrastructure as a Service

Smart Cloud Provisioning

Solution Edition for System z Cloud Computing - Components

Bill of Materials

- eyeOS*, wordpress
- Tivoli Service Automation Manager incl. TPM, TSRM
- IBM Tivoli Monitoring: Omegamon XE
- z/VM®
- Linux
  - IBM System z10™ or IFLs
  - Memory
  - Storage

IBM Services

- Planning workshop for cloud environment
- Install/configure
  - HW system (LPAR creation, security)
  - Base z/VM & Linux
  - Tivoli components
- Develop test scenario for service automation and management via Tivoli Service Automation Manager
- Direct to eyeOS image

Sample workload

Cloud Management SW

OS and VM

HW

* procured by customer

STANDARDIZATION

SELF-SERVE PORTAL

VIRTUALIZATION

AUTOMATION

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Tivoli Service Automation Manager - Cloud Life Cycle Management

- Interaction with end user
- Access to Service Catalog
- Collect parameters for service requests
- Prepare service request from given input parameters
- Approval and notifications on business level
- Perform reservation of resources
- Topology definition
- Orchestration by management plans
- Management plan definition
- Management plan execution
- Situation governance incl. error handling by admin
- Work assignments on admin level (‘inbox’)
- Management plan fulfillment by executing TPM workflows
- ... or native scripts
- ... or Java based actions
- ... or manual tasks

IBM Service Delivery Manager

- Web 2.0 GUI
- REST APIs

Tivoli Service Automation Manager

- Catalog
- Service Request
- Service Context
- Automation Provisioning

Smart Cloud Provisioning

- IBM Tivoli Monitoring
- Tivoli Usage and Accounting Manager

Typical Cloud Management Platform Middleware Stack

- Workloads
  - Service measurement
  - Usage accounting
  - Auditing and controls

- Tivoli Service Automation Layer
  - Automate process of instantiating and managing a distributed IT environment.

- Virtualized Infrastructure Layer
  - Virtualized resources
  - Virtualized aggregation
  - Physical infrastructure

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Tivoli Service Automation Manager – Implementation under z/VM – Boeblingen Demo System Set-up

Cloud Management Server

- z/VM Linux Guest
  - Service Catalog
    - (Tivoli Service Request Mgr)
  - Service Management
    - (Tivoli Service Automation Manager)
  - Tivoli Provisioning Manager
- CMDB
- LDAP

Cloud Service Environment

- z/VM Guest
  - MAPSERVE
  - VSMSERVE
  - DIRMANT

System z LPAR

IBM System z Cloud Computing Solutions

System z Solution Edition for Cloud Computing

… a cloud computing foundation solution that can be customized by the client for a wide range of cloud workloads.

Enterprise Linux Server and Solution Edition for Enterprise Linux

… a system offering that provides a basic level of cloud infrastructure support well suited for deploying a development / test cloud.

IBM Smart Analytics Cloud for System z

… a cloud computing solution for the delivery of business intelligence and analytics optimized for the large enterprise client.

IBM WebSphere CloudBurst Appliance for z/VM

… an appliance that creates and dispenses multi-server patterns of virtualized IBM middleware products.
Multi-System Cloud Management on IBM zEnterprise

IBM Tivoli Service Management

- Enables optimal workload placement in a multi-system cloud infrastructure: spend less and deliver higher qualities of service
- Allows clients to manage all the hypervisors in a zEnterprise system with consistency
- Extends same management capabilities to Power and System x servers elsewhere in the enterprise

IBM Systems Director VMControl

Future

IBM Power

IBM System x

Mobile Banking Services within a Cloud

Note: All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

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Implementation Options on Linux on System z - Cloud Computing and zEnterprise

- Executive overview
- Challenges of cloud computing
- Prevalent issues with cloud environments
- Solving cloud computing challenges
- zEnterprise: The value of cloud in a box
- zEnterprise end to end integrated architecture
- System z environment and distributed systems
- zEnterprise hardware
- Hypervisor overview
- Integrated Software Stack
- How others started the journey
- Summary


Implementation on Linux on System z

- Provisioning Linux on IBM System z with Tivoli Service Automation Manager
- Overview
- Introduction to Tivoli Service Automation Manager
- Preparing for Linux provisioning on System z with Tivoli Service Automation Manager
- Verification of provisioning setup environment

Summary

- Enterprises need to consider cloud deployments as part of their IT roadmaps
- Enterprise adoption is driven by workload considerations and will happen across a spectrum of deployment options
- Governance and architecture are critical for success – introducing cloud computing is transformational
- There will be many clouds and many enterprise deployments will be hybrid
- IBM is investing in enabling deployment choices and offering services ‘on the IBM cloud’
- We would like to stay engaged with you as you develop your cloud strategy

Questions?
Cloud Computing is real -- It’s not just another hype
There’s real technology available today to build clouds

For more information, please visit:
ibm.com/cloud

Or contact me at:
amrehn@de.ibm.com

Additional Resources

- IBM Tivoli Service Automation Manager:
- Solution Edition for Cloud Computing:
- Provisioning Linux on System z Redpaper:
- IBM WebSphere Cloudburst Appliance (WAC):
  - http://www.youtube.com/websphereclouds#p/search/3/yya-gvCMiwQ
- Linux Distributions Supported by each System z Platform:
  - http://www-03.ibm.com/systems/z/os/linux/support_testedplatforms.html
- IBM Software available for Linux on System z:
- Destination z
  - http://www-03.ibm.com/systems/z/destinationz/
Mainframes for SW As a Service

Leading SaaS provider of ePayable, digital data, and spend analysis solutions
- 44,000+ users
- 4,200 companies
- $80 B in transaction detail, processed

Traditional Lintel shop
- Challenge to scale, manage, secure
- Complex configurations
- Linear costs for growth

New z9 Business Class shop
- 100% YTY growth-plan to production
- Flexible capacity on demand
- Centrally managed & secured
- Manageable cost of incremental growth

“The IBM z9 provides the stability and scalability needed to accommodate Transzap’s triple digit volume growth in a SaaS environment.”
- Peter Flanagan, President

System z Data Cloud allows customers to bring BI services with less cost and higher qualities of availability and security.

What is a Data Cloud?
- Centralize BI for optimization using Cognos on z/Linux
- Take Data from anywhere: structured, unstructured, applications, mainframe, or distributed
- Deliver consumer driven services to a broad set of users / lines of business
- Automate delivery of services

Why z for data clouds?
- Save costs with operational efficiencies of z and virtualization
- Deliver qualities of service: availability, security, recoverability
- Allow for elastic growth in tenants and data
- Prevent unforeseen operations costs that occurs with a patchwork IT investment pattern

Leverage the data centric strengths of z: allows for multi-tenant data support, Sysplex enablement and massive consolidation at the application layer