IBM System z Technology Summit

Getting started with private clouds on System z

Presenter -

Date -

Cloud computing is about enabling the end user to help themselves

A user experience and a business model

- Rapidly provisioned
- Ease of access

An infrastructure management and services delivery method

- Virtualized resources
- Managed as a shareable, scalable cloud model
- Delivering services with elastic scaling

Similar to Banking ATMs and Retail Point of Sale, Cloud is Driven by:

- Self-Service (consumer behavior)
- Economies of scale
- Technology advancement

Banking

IT

Retail

Cloud for business top characteristics

- ✓**Real time added capacity**

- ✓**Accelerate time to value for implementing Cloud based Infrastructure as a Service**

- ✓**Manage your existing Server and Virtualization sprawl**

- ✓**Control software licenses and cost**

- ✓**Optimize energy consumption**

Does your cloud have these capabilities?

Let us help you lead - with zEnterprise and Cloud!

Customers are building multiple virtualization technology stacks

zEnterprise can run multiple virtualization stacks from one place

Integrated Service Management - for Service Lifecycle Management of Cloud workloads on IBM zEnterprise

Deploy Service
- Request Driven Provisioning
- Management Agents and Best Practices
- Application / Service On Boarding
- Self-service interface

Subscribe to Service
- Request a service
- "Sign" Contract

Offer Service
- Register Services and Resources
- Add to Service Catalog

Manage Operation of Service
- Visualize all aggregated information about situations and affected services
- Control operations and changes
- Event handling
- Automate activities to execute changes
- Include charge-back

Service Creation
- Scope of Service
- SLAs
- Topologies, Best Practices Management Templates
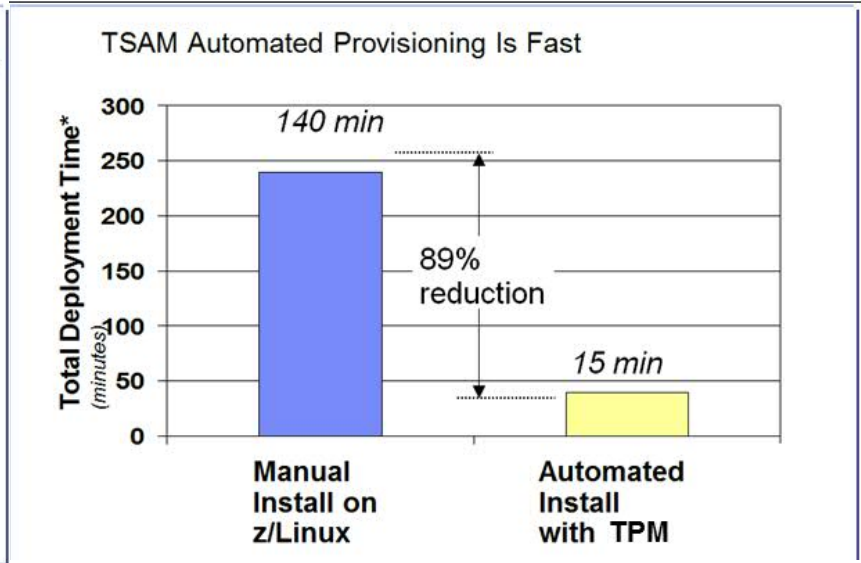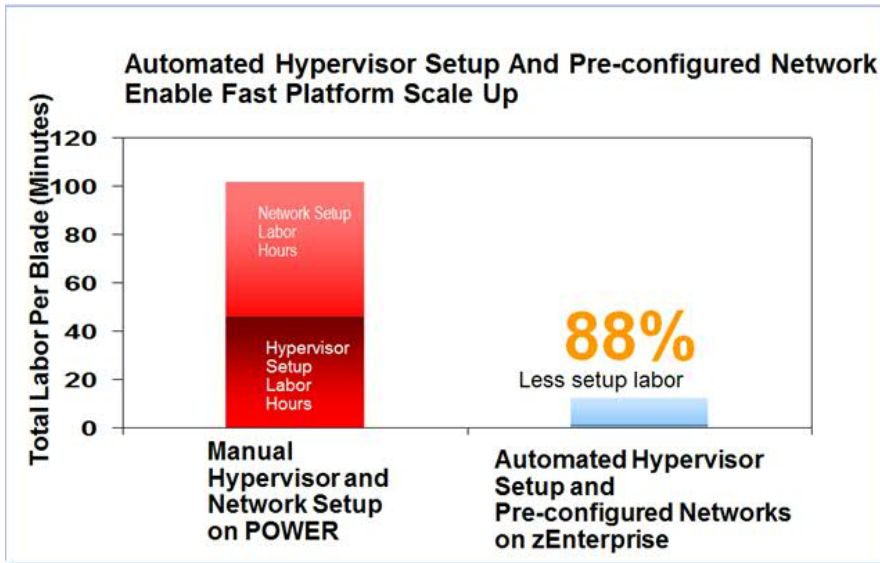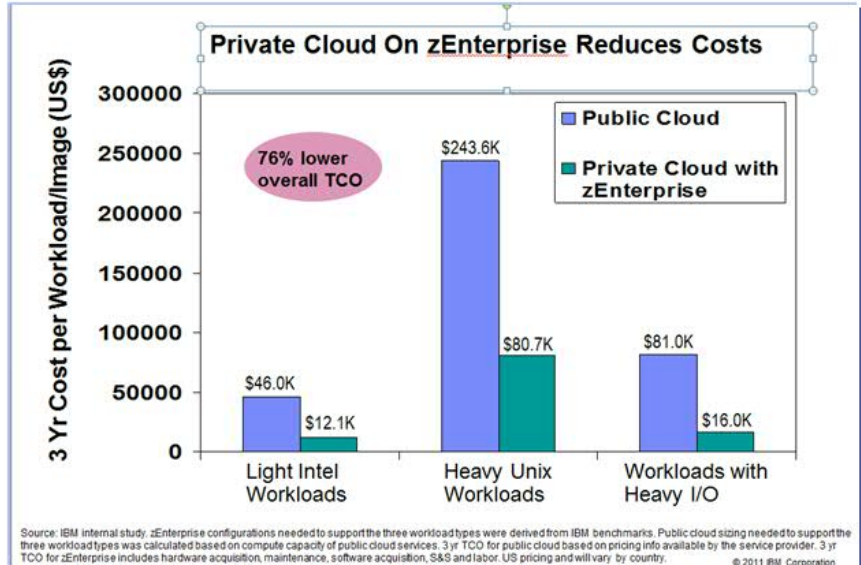
Terminate Service
- Controlled Clean-up

IBM Tivoli Provisioning Manager
Supports z/VM and Linux

Cloud for Real IT, designed to fit your business the way you run your business

Automated Hypervisor Setup And Pre-configured Network Enable Fast Platform Scale Up

Total Labor Per Blade (Minutes)

Network Setup Labor Hours

Hypervisor Setup Labor Hours

88% Less setup labor

Manual Hypervisor and Network Setup on POWER

Automated Hypervisor Setup and Pre-configured Networks on zEnterprise

TSAM Automated Provisioning Is Fast

Total Deployment Time* (minutes)

140 min

89% reduction

15 min

Manual Install on z/Linux

Automated Install with TPM

- Using tools such as TPM and TSAM running on System z resources allows you to manage outward to the rest of your virtualization technologies managing them from a centralized, robust secure and trusted environment so that you can grow and secure your IT assets.

- zEnterprise cloud solutions are the only cloud offerings in the industry designed to run in a mix architected environment, and to manage a mixed environment.

Private Cloud On zEnterprise Reduces Costs

3 Yr Cost per Workload/Image (US$)

- Public Cloud
- Private Cloud with zEnterprise

76% lower overall TCO

$243.6K

$46.0K $12.1K

$80.7K

$81.0K $16.0K

Light Intel Workloads

Heavy Unix Workloads

Workloads with Heavy I/O

Source: IBM internal study. zEnterprise configurations needed to support the three workload types were derived from IBM benchmarks. Public cloud sizing needed to support the three workload types was calculated based on compute capacity of public cloud services. 3 yr TCO for public cloud based on pricing info available by the service provider. 3 yr TCO for zEnterprise includes hardware acquisition, maintenance, software acquisition, S&S and labor. US pricing and will vary by country. © 2011 IBM Corporation

IBM zEnterprise Provides a New Dimension in Cloud Computing

The world's fastest and most scalable system:
IBM zEnterprise 196 (z196)
IBM zEnterprise 114 (z114)

Unified management for a smarter system:
IBM zEnterprise Unified Resource Manager (zManager)

Scale out to a trillion instructions per second:
IBM zEnterprise BladeCenter Extension (zBX)

Broad Network Access
Very large number of end user access from multiple sources including mobile devices

Rapid Elasticity
A new dimension of Scale. Most efficient platform for Large-scale Linux consolidation

Resource Pooling
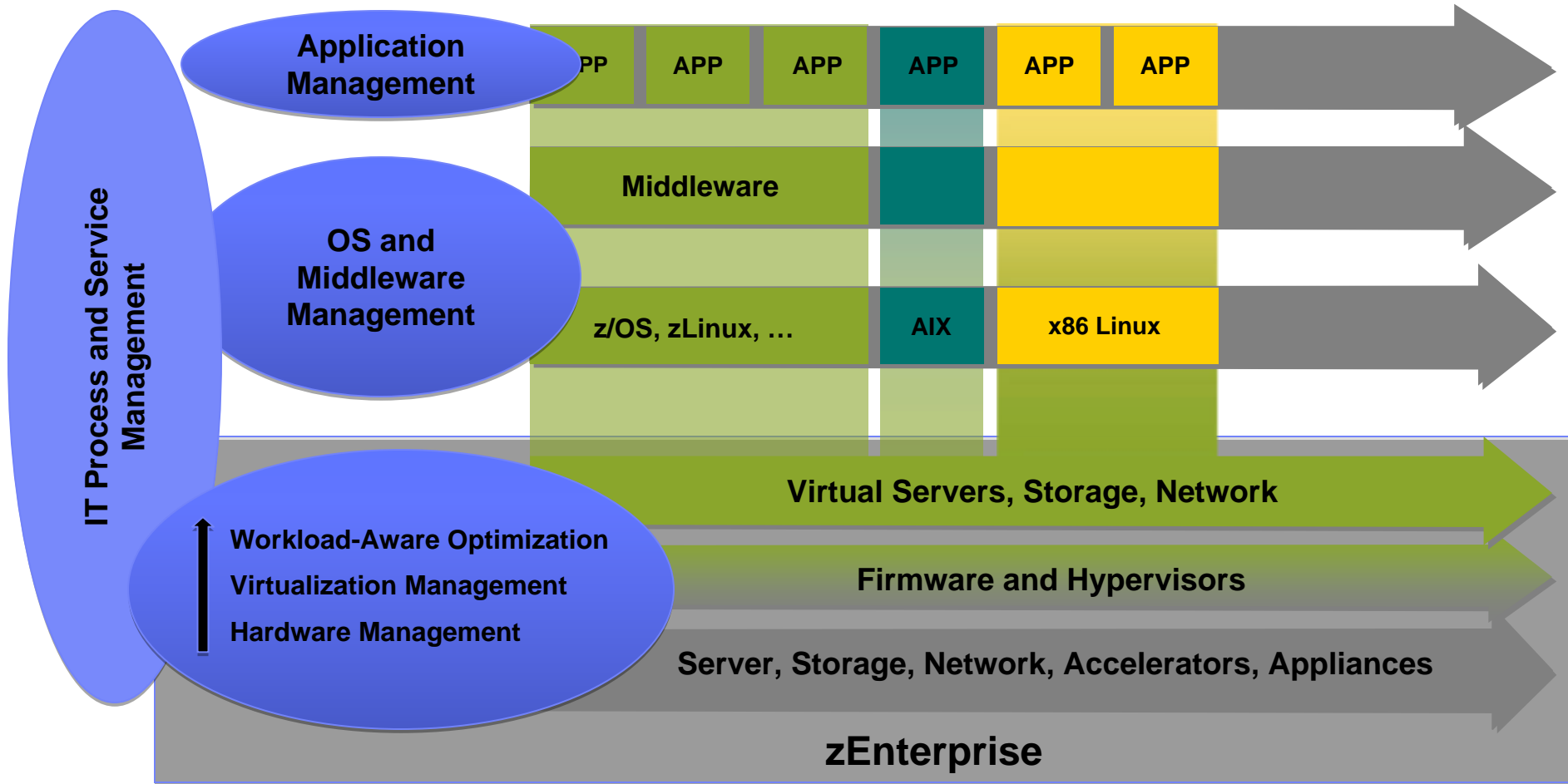1000s of virtualized systems across a heterogeneous resource pool

Measured Service
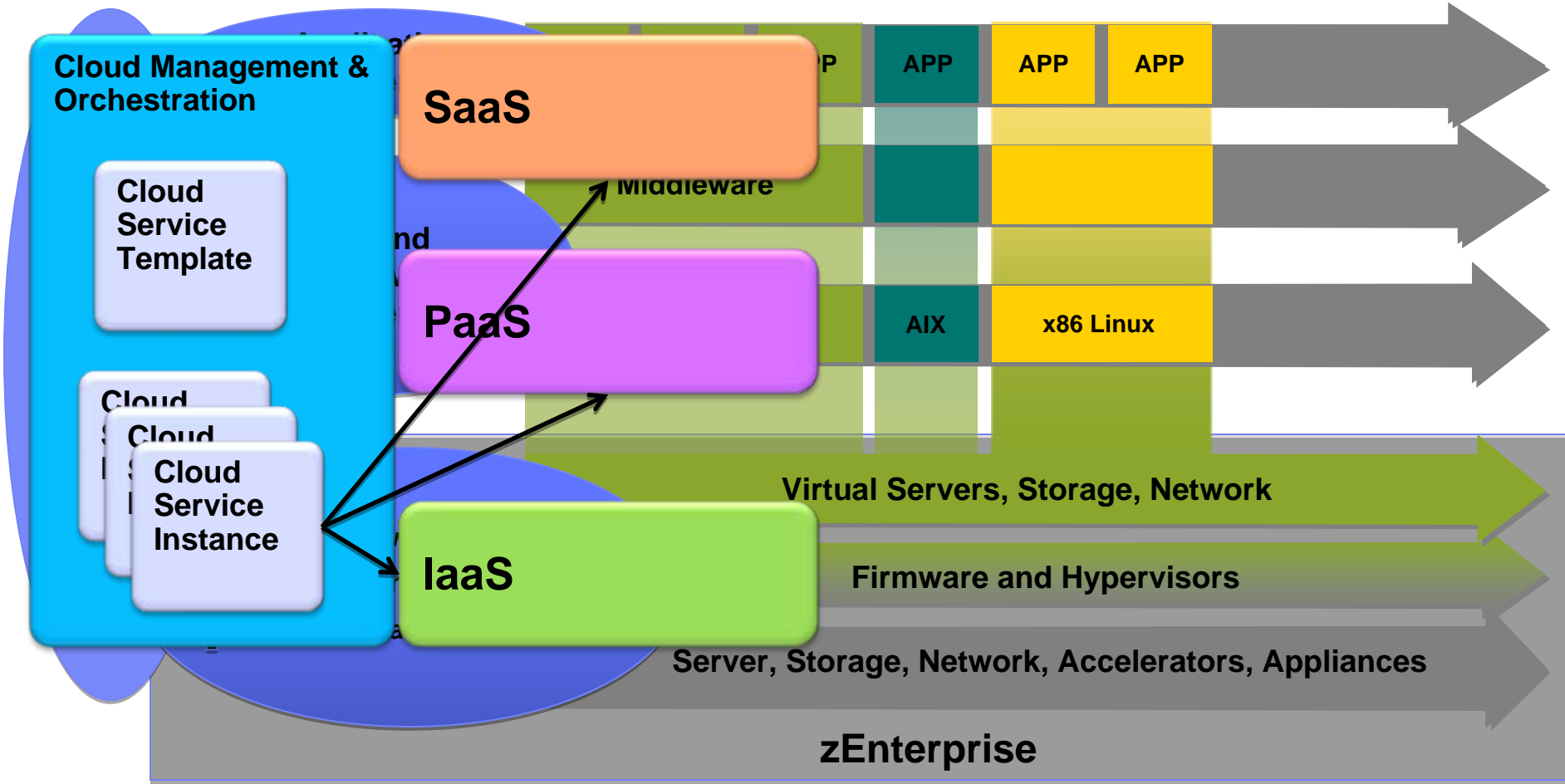Meter, monitor, and track workloads for chargebacks and capacity expectations

On Demand Self-Service
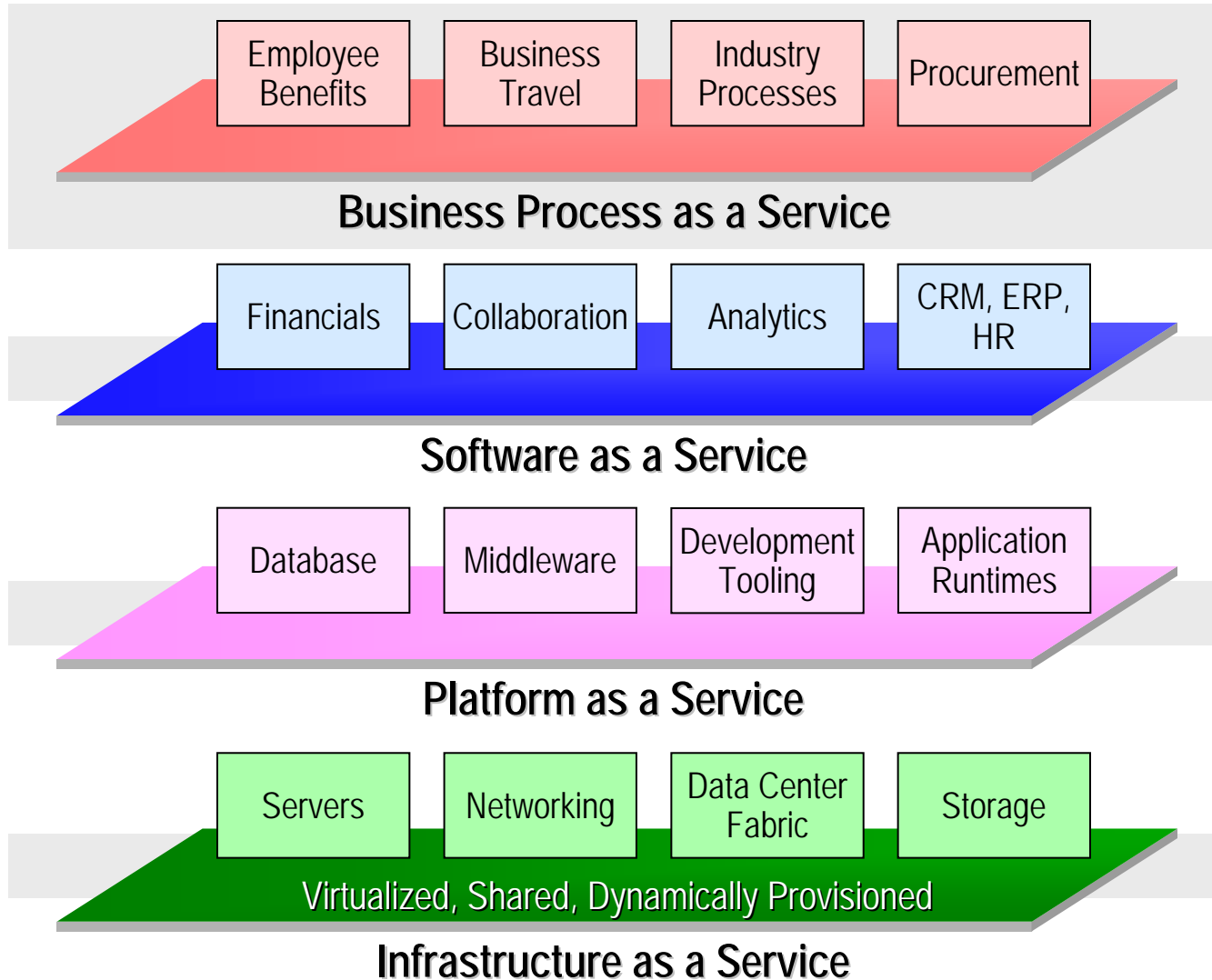Automate provisioning and service requests reducing provisioning cycles from weeks to minutes

zEnterprise
Heterogeneous Virtual Infrastructure Management

IT Process and Service Management

Application Management

OS and Middleware Management

Workload-Aware Optimization
Virtualization Management
Hardware Management

APP	APP	APP	APP	APP	APP

Middleware

z/OS, zLinux, …	AIX	x86 Linux

Virtual Servers, Storage, Network

Firmware and Hypervisors

Server, Storage, Network, Accelerators, Appliances

zEnterprise

zEnterprise
Heterogeneous Virtual Infrastructure Management

Cloud Management & Orchestration

- Cloud Service Template
- Cloud Service Instance

SaaS

PaaS

IaaS

APP | APP | APP | APP

Middleware

AIX | x86 Linux

Virtual Servers, Storage, Network

Firmware and Hypervisors

Server, Storage, Network, Accelerators, Appliances

zEnterprise

Cloud Service Models

| Employee Benefits | Business Travel | Industry Processes | Procurement |

Business Process as a Service

| Financials | Collaboration | Analytics | CRM, ERP, HR |

Software as a Service

| Database | Middleware | Development Tooling | Application Runtimes |

Platform as a Service

| Servers | Networking | Data Center Fabric | Storage |

Virtualized, Shared, Dynamically Provisioned

Infrastructure as a Service

Infrastructure as a Service

Definition

- Provisioning the data center infrastructure of server, operating system, disk storage and network resources in a virtualized shared dynamic environment.

Client Business Model

- Motivated CTO or IT Director who wants to drive efficiency for his staff who build environment for their end-users

Customer References / Examples

- Blue Cross Blue Shield of Minnesota
- Universita di Bari

Solution / Offering Examples

IBM System z Solution Edition for Cloud Computing

http://www-03.ibm.com/systems/z/solutions/editions/cloud/

Business Process as a Service

Software as a Service

Platform as a Service

Infrastructure as a Service
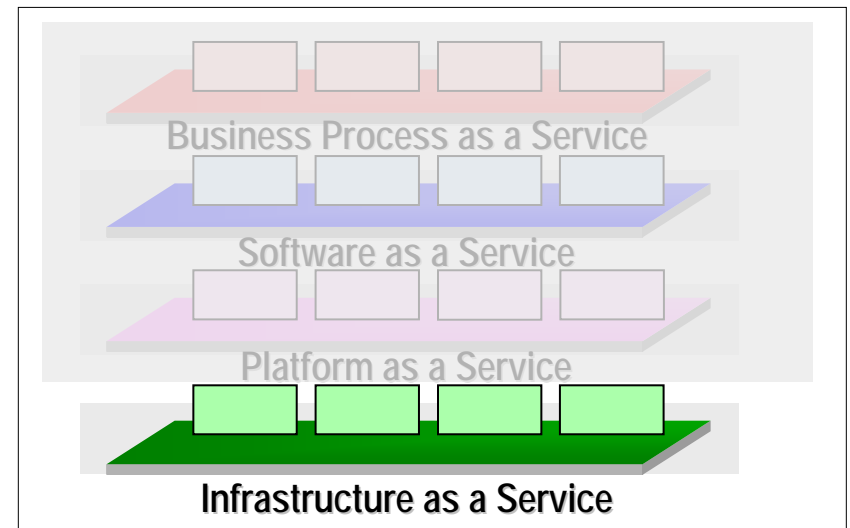
Blue Cross Blue Shield of Minnesota

Advantages of virtualization

- The lead time for server provisioning has been reduced by more than 99 percent. When the business requires a new test or development environment, <u>the IT team can deploy a new Linux virtual server within 20 minutes.</u>

Realizing the cost savings

- BCBSM expects the new infrastructure to deliver cost savings over and above the predicted TCO savings in the initial cost-benefit analysis.

"*Even without factoring in the maintenance and support costs—which would be considerable for a large estate of physical servers—we found that running a virtualized Linux environment on System z would be somewhere between 30 and 50 percent less expensive than a distributed architecture.*"

— Ted Mansk, Director of Infrastructure Engineering and Databases at BCBSM

Solution components:

- System z10 Enterprise Class (z10 EC)

- System z9 Enterprise Class (z9 EC)

- z/OS, DB2 for z/OS, Linux, z/VM

- Linux, z/OS and OS/390, z/VM

Using IT architecture to transform a local economy
University of Bari

Business challenge:

The Università di Bari needed a system to help local businesses (Wine market, fish market, logistics firm) decrease time-to-market, reduce transportation costs, reduce the amount of wasted products and improve overall product quality.

Solution:

The Università di Bari worked with IBM to architect a complete IT transformation, deploying a cloud-based solution that leverages System z, IBM software, storage and Global Technology Services.

Benefits:

- Decreased time-to-market

- Minimized transportation costs

- Quick and accurately assessment of demand

- Increased profits and minimized waste

Solution components:

- IBM System z9 BC

- IBM System z IFL

- WebSphere Integration Developer

- WebSphere Process Server

- Web Services Gateway

- WebSphere Business Modeler

- DB2 for z/OS

- Tivoli Service Automation Manager

Platform as a Service

Definition

- Provides the infrastructure on which software developers can build new applications or extend existing applications without requiring the need to purchase new server infrastructure.

Client Business Model

- Customers that want to provide standardized platforms or environments for their end-user community.

Customer References / Examples

- Nationwide
- Haddon Hill

Solution / Offering Examples

- IBM Workload Deployer
    - WebSphere Application Server provisioning

Business Process as a Service

Software as a Service

Platform as a Service

Infrastructure as a Service
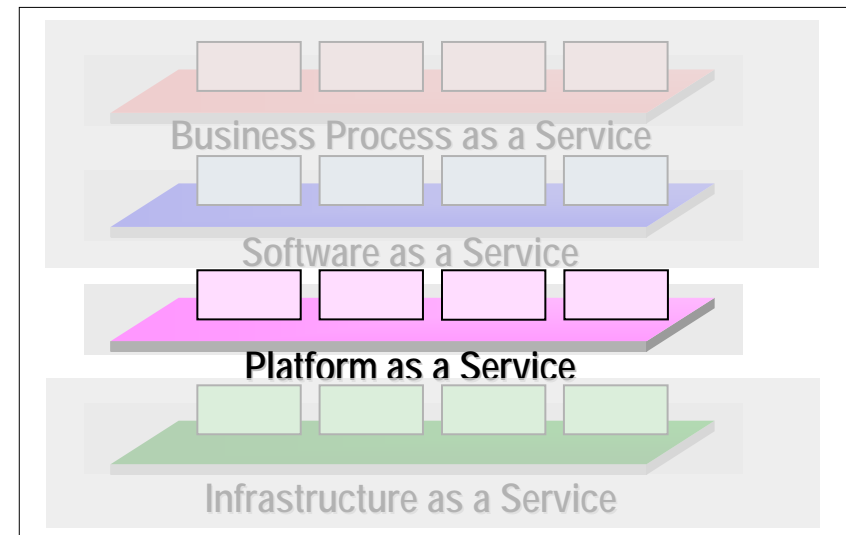
Nationwide Delivers Cloud Services with Linux on System z

Nationwide is running hundreds of virtual Linux servers on two IBM System z10 Enterprise Class machines. The company offers a broad set of tested-and-certified Linux images as part of their catalogue of services:

- WebSphere Application Server
- WebSphere Portal Server
- Apache Server
- DB2 LUW Server

Virtual server images are deployed in minutes after a request is submitted using pre-approved templates and a "shared root" file structure made possible by running Linux on z/VM.

Services are monitored and managed with complete back up capabilities to run in either of their two Class 4 Data Centers. Services are terminated and resources are reclaimed when user contracts expire.

Nationwide®
On Your Side℠

Software as a Service

Definition

- Software distribution model in which applications are hosted by a service provider and made available to their customers over a network

Client Business Model

- Customer who has a specialized application which needs to be provided to a large number of users with rapid elasticity, therefore requiring automation and the ability to dynamically grow and teardown environment.
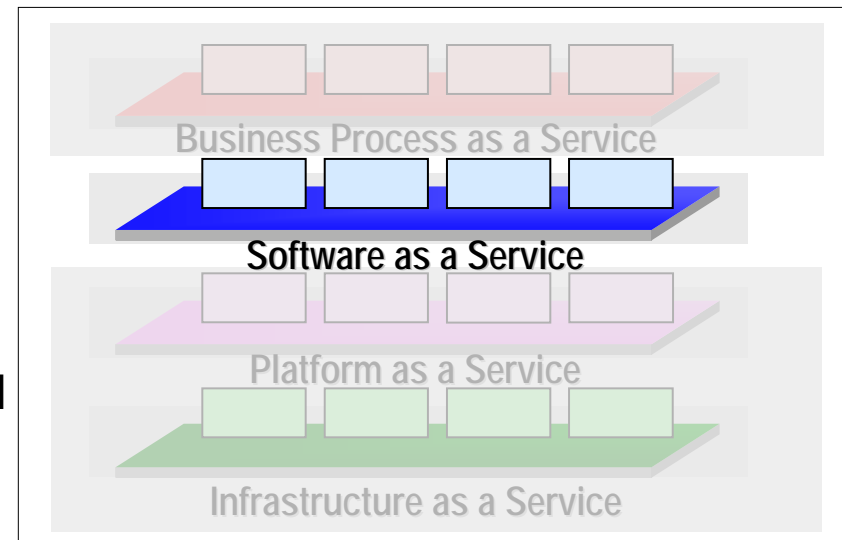
Customer References / Examples

- Transzap
- PSP

Solution / Offering Examples

IBM Blue Insight – IBM Smart Analytics cloud

http://www-03.ibm.com/systems/z/solutions/cloud/smart.html

Business Process as a Service

Software as a Service

Platform as a Service

Infrastructure as a Service

Transzap Boosts Software-as-a-Service Uptime with IBM System z

Transzap, Inc.

Business challenge:

Transzap offers its customers a comprehensive suite of financial software tools. As a small business with tens of billions of dollars in client transactions flowing through their systems each year, Transzap needed an economical, reliable platform to provide clients with high availability, while enabling the capacity to accommodate growth within their software-as-a-service business model.

Solution:

Transzap decided to consolidate on an IBM System z platform to provide the stability and scalability needed to accommodate triple digit volume growth, enabling them to focus on the business of software innovation. Transzap migrated to System z and virtualized its critical applications on Linux on System z, a platform that supports Transzap's dynamic Java and Oracle environments.

Benefits:

- Helps Transzap serve more than 69,000 users across 6,800 companies

- Provides higher levels of uptime for their customers

- Offers peace of mind through 24x7 world-class hardware support

"We intend to deliver a 99.9% application uptime guarantee to our customer base, thanks to the availability characteristics of System z."

— *Peter Flanagan, CEO, Transzap, Inc.*

Solution components:

- IBM System z
- Linux on System z
- IBM z/VM

TRANSZAP

Smart Analytics Cloud in the IBM Corporation

> *Our commitment to informed decision making led us to consider private cloud delivery of Cognos via System z, which is the enabling foundation that makes possible **more than $20M savings over 5 years**.*
>
> – IBM CIO Office

Business Results:

- Consolidating 20+ multi-product, departmental BI deployments to Cognos 8 BI on System z

- Deploying private cloud self service to support 200,000+ users across global workforce

- 56% cost savings per user (grows with volume)
  - $7,775,767 – Infrastructure cost savings realized with z10 technology
  - $2,558,525 – Business Intelligence Competency Center (BICC) cost savings

> *"What IBM has done is come up with a perfect application for a private cloud."*
>
> *– John Webster, CNET, Nov. 18, 2009*

Business Process as a Service

Definition

- Providing fundamental Business Process services to customers looking to outsource that functionality, such as accounting, payroll, tax filling, invoicing, etc…
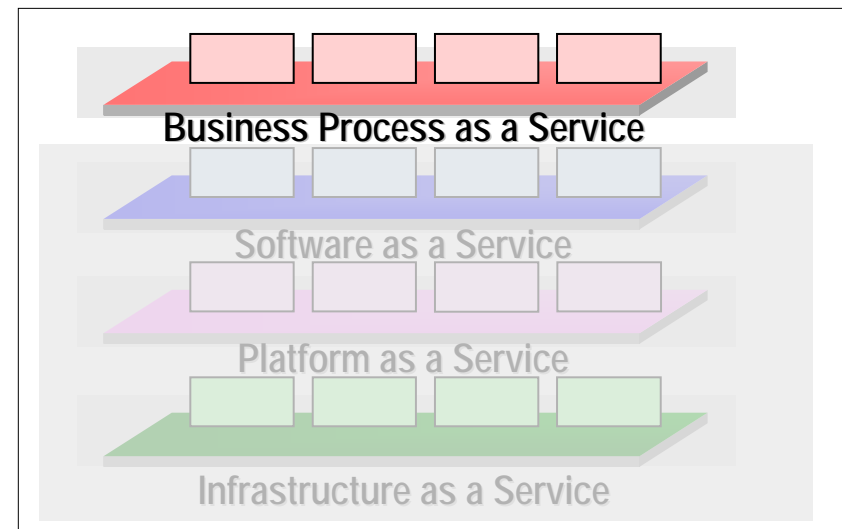
Client Business Model

- Niche client, who has their own written application and now wants to provide it as a business service to other businesses in an efficient and elastic environment.
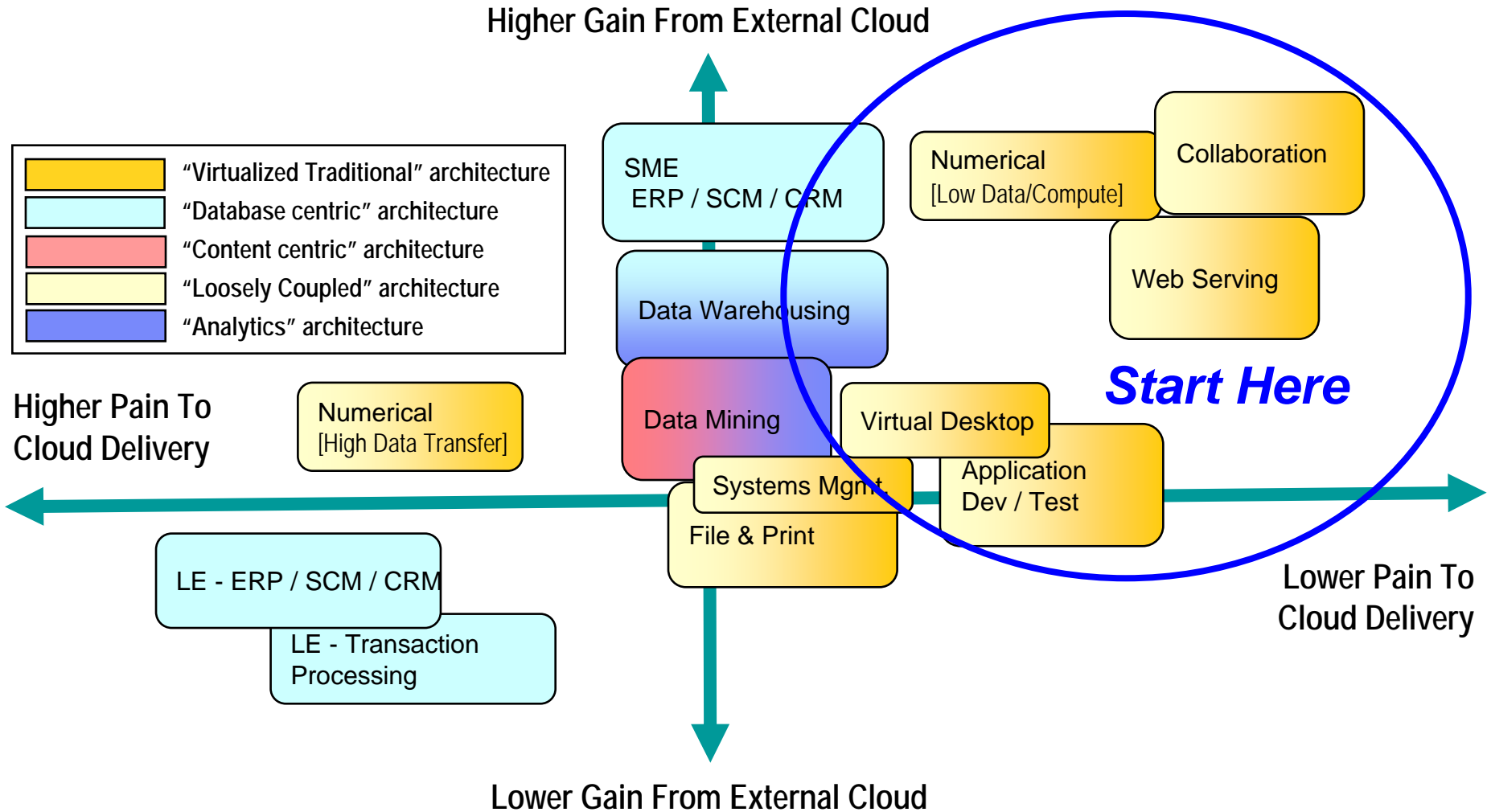
Customer References / Examples

- ADP

Solution / Offering Examples
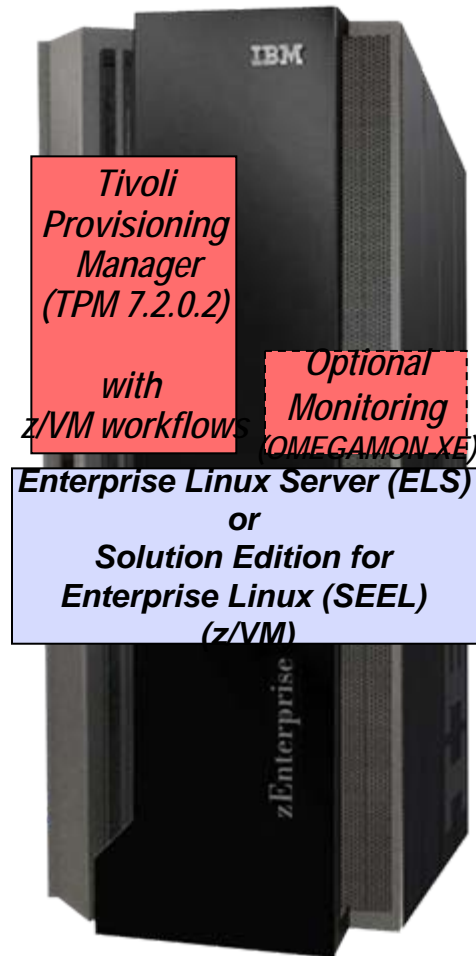
- Customer dependent – custom deployments

Business Process as a Service

Software as a Service

Platform as a Service

Infrastructure as a Service

Clients Will Adopt Cloud Computing Based on Workload Affinity

Higher Gain From External Cloud

Legend:
- "Virtualized Traditional" architecture
- "Database centric" architecture
- "Content centric" architecture
- "Loosely Coupled" architecture
- "Analytics" architecture

Higher Pain To Cloud Delivery

- SME ERP / SCM / CRM
- Data Warehousing
- Data Mining
- Numerical [High Data Transfer]
- Numerical [Low Data/Compute]
- Collaboration
- Web Serving
- Virtual Desktop
- Application Dev / Test
- Systems Mgmt.
- File & Print
- LE - ERP / SCM / CRM
- LE - Transaction Processing

Start Here

Lower Pain To Cloud Delivery

Lower Gain From External Cloud

IBM® zEnterprise™ Starter Edition for Cloud

Establishing Infrastructure as a Service (IaaS) delivery model

Tivoli Provisioning Manager (TPM 7.2.0.2)

with z/VM workflows

Optional Monitoring (OMEGAMON XE)

Enterprise Linux Server (ELS) or Solution Edition for Enterprise Linux (SEEL) (z/VM)

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 (Optional)

- zVM workflows simplify installation

- STG Lab Services can provide rapid provisioning with newly created z/VM workflows (Optional)

A Deeper View of IBM® zEnterprise™ Cloud Starter Edition

Cloud Technology

Tivoli Provisioning Manager Version 7.2.0.2
License PID: 5608-TPM

- RVU License and SW S&S12 Months - `DOI32LL`
- RVU Annual SW S&S Annual Renewal - `EOBI5LL`

Monitoring (optional)

Tivoli OMEGAMON XE on z/VM and Linux Version 4.2
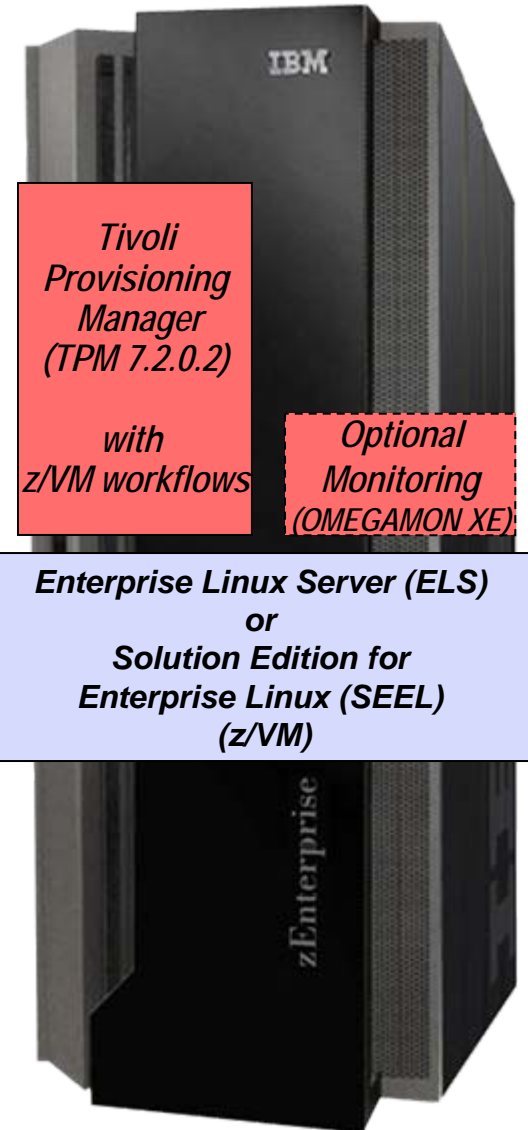
License PID: 5698-A36
S&S PID: 5608-S73

Implementation

z/VM workflows integrated into TPM

or

Mainframe Cloud Implementation Services

- IBM Services to implement cloud using workflows

Easy to get started!

Tivoli Provisioning Manager (TPM 7.2.0.2) with z/VM workflows

Optional Monitoring (OMEGAMON XE)

Enterprise Linux Server (ELS)
or
Solution Edition for Enterprise Linux (SEEL)
(z/VM)

Learn More: ***http://www-03.ibm.com/systems/z/solutions/cloud/***

IBM System z Solution Edition for Cloud Computing

	Creates…	That delivers …
Solution Edition for Cloud Computing	An infrastructure solution for cloud computing built on Tivoli & System z	The framework to migrate workloads for rapid adoption of cloud computing benefits

The solution components…

IBM Software

IBM Services

Tivoli. software

Visibility **Control** **Automation**

IBM Hardware

Centralize, Virtualize, Simplify

- Phase 1: Create cloud computing use cases within the enterprise

- Phase 2: Implement the service automation and management tooling to support cloud workloads

- Phase 3: Educate the client on cloud computing for on-going success and provide a sample workload

Learn more at: http://www.ibm.com/systems/z/solutions/editions/cloud/index.html

IBM Smart Analytics Cloud for System z

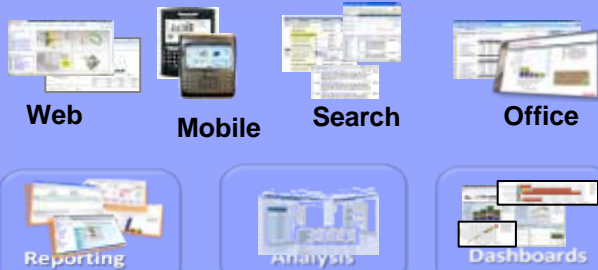|	Creates…	That delivers …
Smart Analytics Cloud	A private cloud within the enterprise	A solution for delivering business intelligence to the entire organization

The solution components…

IBM Software

Cognos 8 BI
A broad range of BI capabilities

Web **Mobile** **Search** **Office**

Reporting Analysis Dashboards

Open, enterprise-class BI platform

IBM Hardware

IBM System z
Centralize, Virtualize, Simplify the BI infrastructure

IBM Services

- Phase 1: Create awareness of, a strategy for, and a governance foundation for BI across the organization

- Phase 2: Preparation for the Smart Analytics Cloud

- Phase 3: Install the base cloud, integrate into the corporate enterprise, and test the cloud use cases

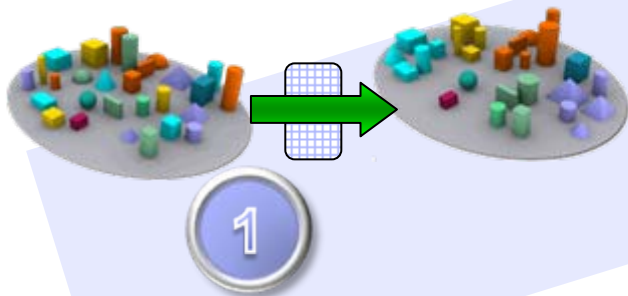- Phase 4: Educate the enterprise for on-going success with the Smart Analytics Cloud

Learn more at: http://www.ibm.com/systems/z/solutions/cloud/smart.html

A Step-by-Step Approach for Growing Cloud on zEnterprise
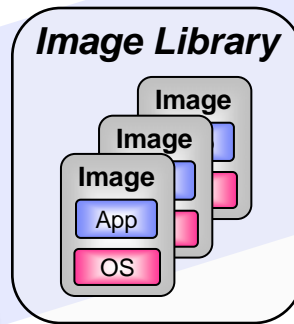
Take Out Cost (Foundation)

STEP 1
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
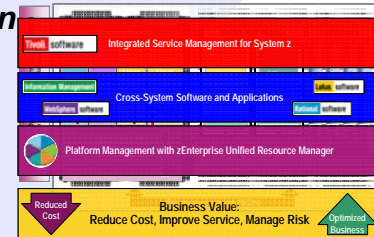
Simplify (Entry)

STEP 2
Automate and Manage Better

Image Library

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

Integrate and Optimize (Advanced)

STEP 3
Cross-architecture Workload Optimization

- zEnterprise is the industry's only multi-architecture cloud solution
- Use a cloud deployment model to host multi-tier solutions across System z, POWER and System x resources
- Use the Unified Resource Manager and Tivoli ISM for optimal workload placement

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- Enterprise Linux Server (z196, z114)
- Solution Edition for Enterprise Linux

- zEnterprise Starter Edition for Cloud (TPM)
- xCAT as an open source option

- System z Solution Edition for Cloud Computing (TSAM)
- SAP-as-a-Service
- Unified Resource Manager (zManager)

Key Takeaways …

- **IBM Cloud Computing on System z is transforming businesses**
  Better qualities of service, advanced workload optimization, and efficient resource consolidation

- **zEnterprise is an Infrastructure as a Service platform for workload-optimized, heterogeneous computing**
  The Unified Resource Manager is zEnterprise platform management strategy for Infrastructure as a Service facilitating secure cloud services and providing the building blocks for Integrated Service Management

- **zEnterprise is the industry's only heterogeneous cloud platform**
  Centralized platform management and optimization across multiple architectures with the ability to also manage other virtualization solutions for a complete cloud portfolio

QUESTIONS ?