# Cloud Computing with IBM System z

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Thursday, August 15th, 2013

Session 13489

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# Agenda

- **Trends in the IT Industry and why cloud matters**

- **Cloud Computing Introduction**
  - On it's Way to Become a Standard ... NIST and DMTF
  - An Evolution from Known Technologies It's More than Virtualization

- **IBM System z Cloud Option's/Solution's**
  - A World Wide Federated Cloud project on IBM System z
  - Solution Edition for Cloud Computing and Data Cloud
  - SAP Cloud solution
  - CICS Cloud Solution
  - Mobile Solution for System z

- **Summary & Discussion**

# Will cloud solve all my problems ?
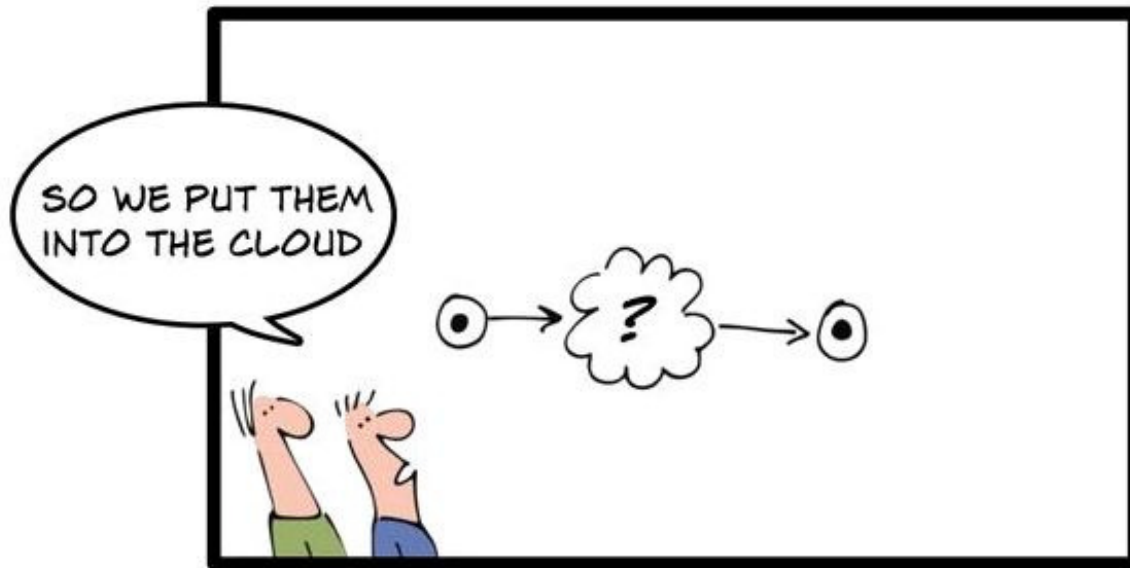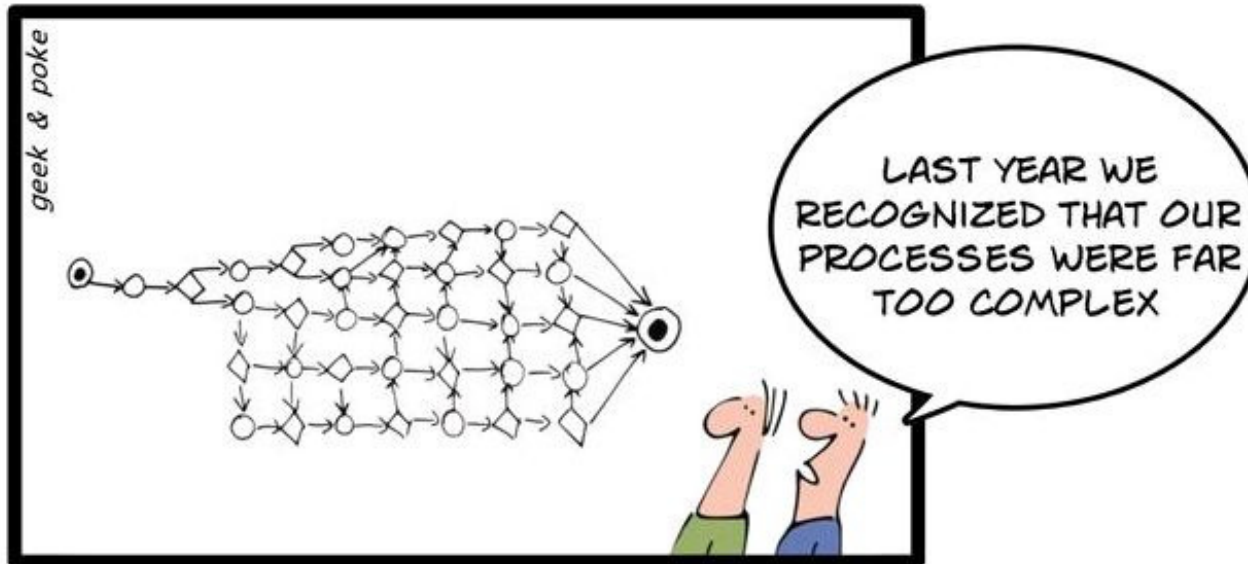
# 2012 Industry Hot Topics

**Soft Budgets**

Despite constrained growth in general IT spend, SW remains a key area of spend as a vehicle to improve ROI and do "more with less" in the data center

**Business efficiency/flexibility**

Focus on agile IT, increasing operational efficiency, reducing complexity, solutions that enable business priorities

**Mobile Device Management**

Requires many of the same service management capabilities found in the data center: configuration management, security mgmt., asset mgmt., monitoring/logging, scalability
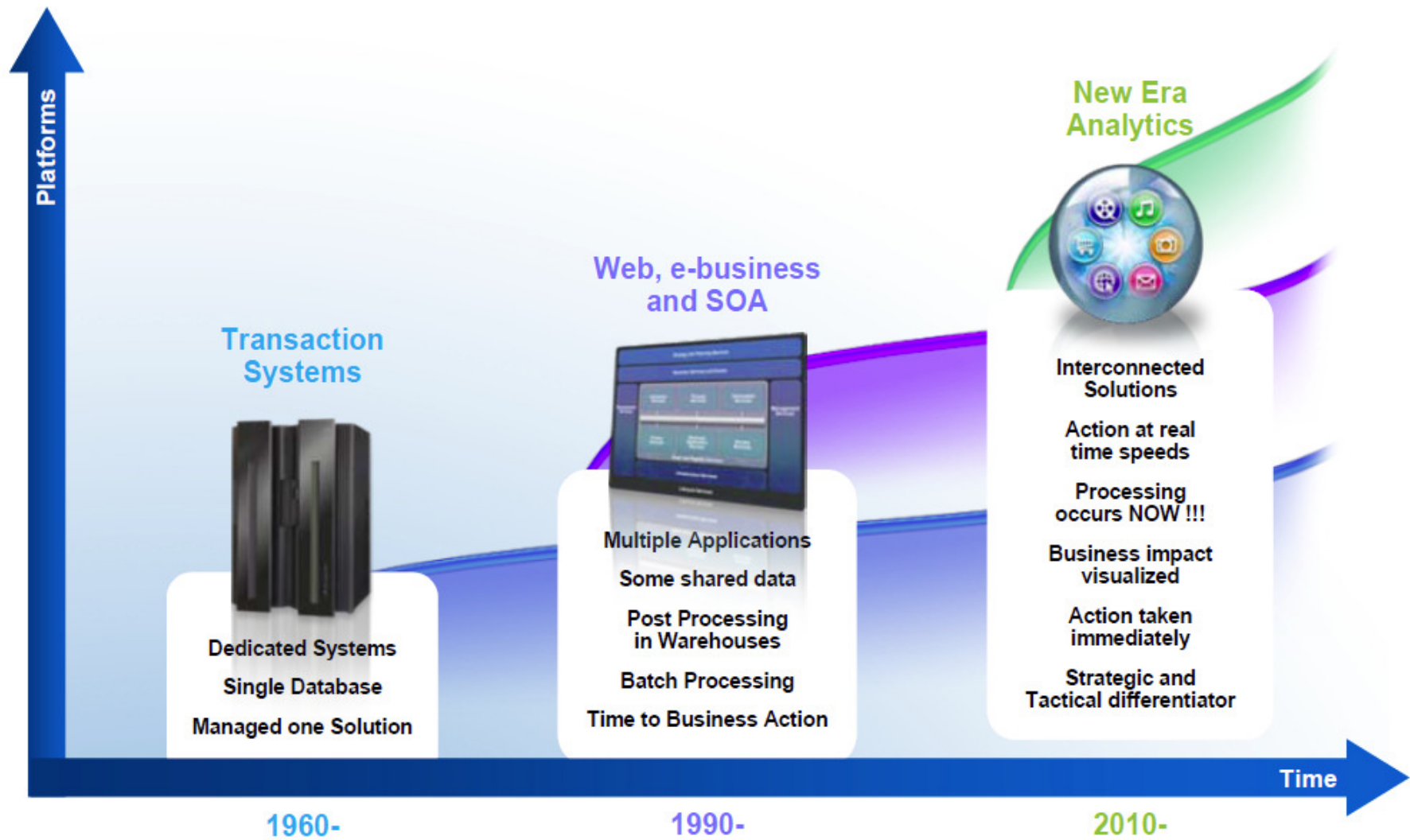
**Virtualization**

Tops in CIO spending priorities; growing opportunity in virtualization management tools

**Cloud**

Enterprises looking to build private clouds often lack core service management capabilities essential to successful cloud implementation

Complete your sessions evaluation online at SHARE.org/BostonEval

# Mobility, big data, analytics, social collaboration and cloud are creating a new wave of business opportunities and IT challenges

**Platforms**

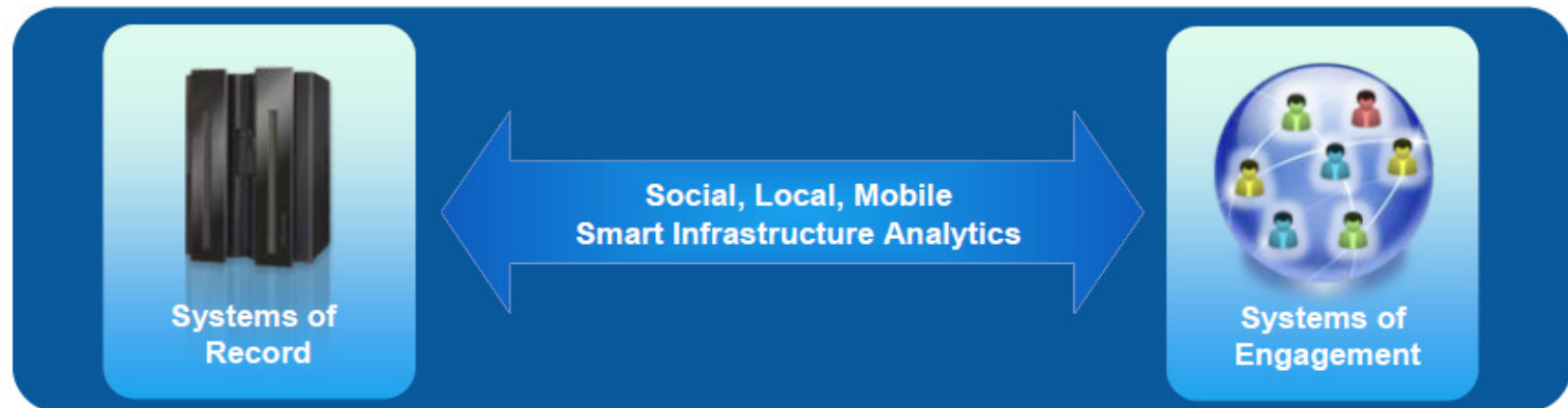**Time**

## Transaction Systems

**Dedicated Systems**

**Single Database**

**Managed one Solution**

1960-

## Web, e-business and SOA

**Multiple Applications**

**Some shared data**

**Post Processing in Warehouses**

**Batch Processing**

**Time to Business Action**

1990-

## New Era Analytics

**Interconnected Solutions**

**Action at real time speeds**

**Processing occurs NOW !!!**

**Business impact visualized**

**Action taken immediately**

**Strategic and Tactical differentiator**

2010-

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# The new challenges for IT

| From | To |
|---|---|
| Millions of PC's / Terminals | Billions of Mobile Devices |
| Structured Data | Unstructured Data |
| Monolytic applications Static and predictable | Dynamic Services Unpredictable |
| Stable Workload | Unpredictable Workload |
| Static Infrastructure | Cloud unpredictable infrastructure |
| Proprietary standards | Open innovation |
|  |  |

# Systems of engagement integrate existing operational systems with rapid delivery of new client-facing apps



Systems of Record ← Social, Local, Mobile Smart Infrastructure Analytics → Systems of Engagement

**Manage workloads and maintain security**
CRM — HR — Legacy DB — ERP

**Rapid innovation in the cloud**
SOCKET IO — SmartOS — redis — node — mongoDB — RabbitMQ — NGINX — fr — Intuit GoPayment — LinkedIn — Twitter — g+

**User experience and mobile management**

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# Emergence of next generation architectures in Smarter Infrastructure will include System z

Social, Mobile, Analytics
**Smarter Infrastructure**

**Systems of Record**

**Systems of Engagement**
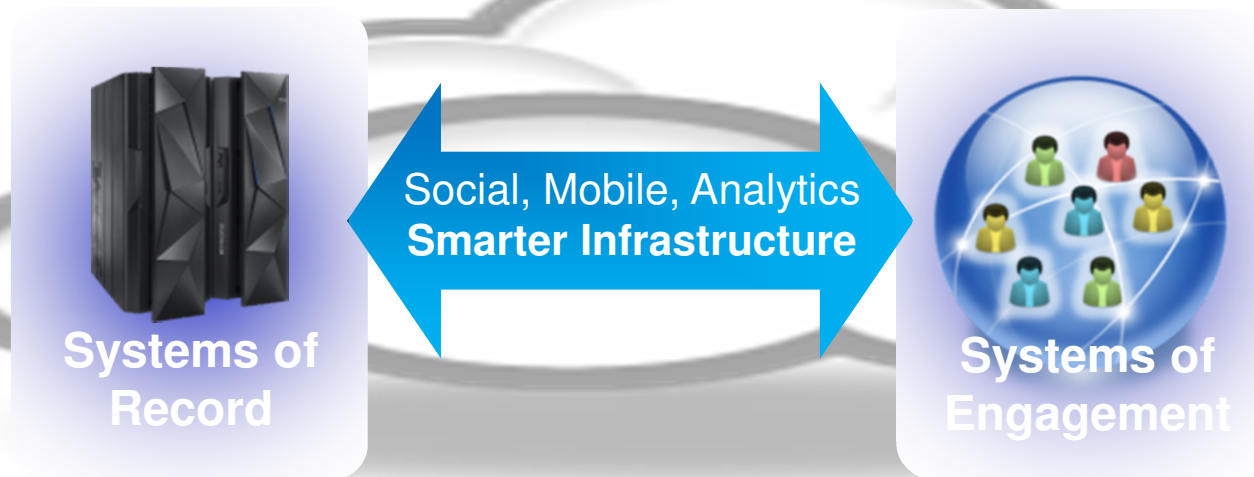
- Transactions
- Command & Control
- Authored content focused on text and graphic docs
- Facts and data mastered in single "source of truth"

- Interactions
- Collaboration
- Community based content primarily with video / audio
- Insight, trends, analytics thru open forums

Both 'Systems of Record' and 'Systems of Engagement' included in cloud

# Today's data centers are struggling to stay efficient and profitable while keeping up with needs of business

- Over 60% of Data Center Costs are spent on management labor, followed by costs associated with equipment

- Increasing government and industry regulations focused on security risks and data access

- With growth of virtualization, IT admins now being called to manage both physical and virtual servers with hundreds or thousands of VMs and Network / Storage devices

- 1 hour of downtime costs an organization at least $42K, for large enterprises 12 hours of downtime could cost $10M

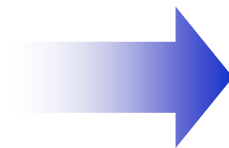- With over 2.7B ZB of digital content, how will this data be analyzed, stored, and protected?
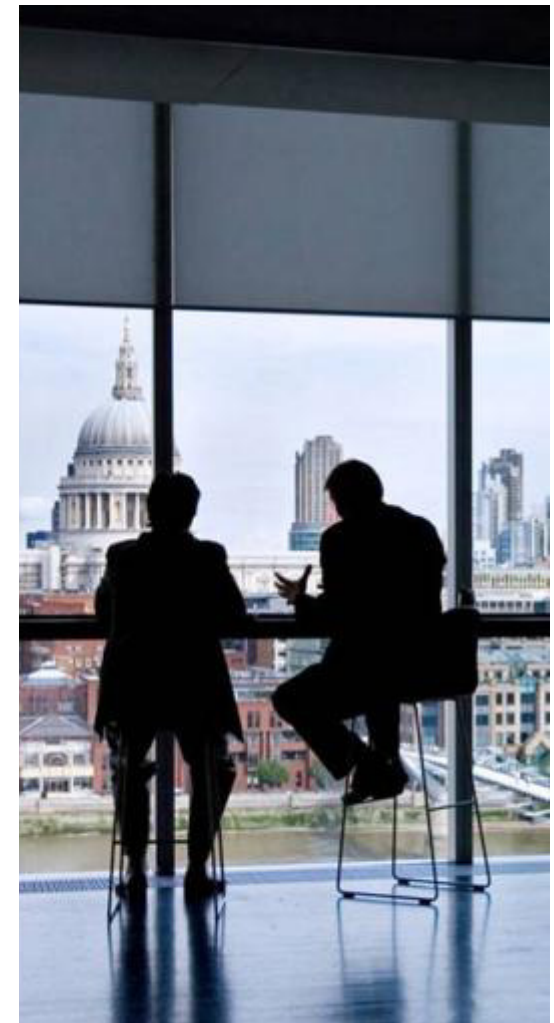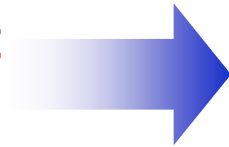
# Strategies to Improve Value and Reduce Costs

*Optimize the Overall IT Environment*

**Consolidate Hardware Infrastructure**

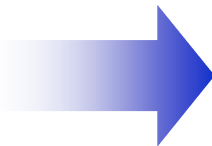

**Consolidate Redundant Software and Data**



- SOA
- Compress
- Deduplicate
- Integrate
- Archive

**Improve Service Delivery**

**Integrated Service Management**

Visibility   Control   Automation

Cloud Computing

# One Size Does Not Fit All

# 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
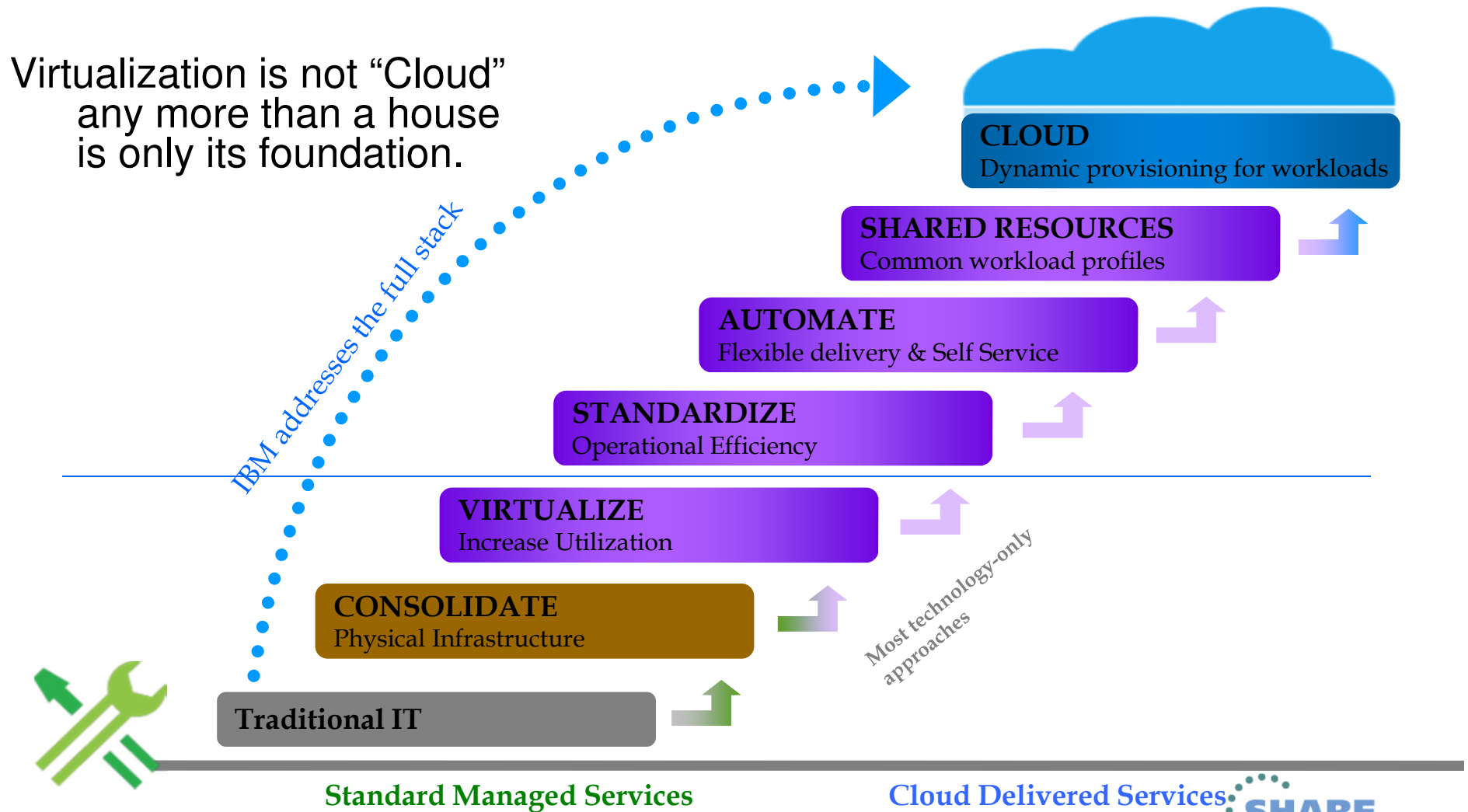
- Private, Public & Hybrid

http://csrc.nist.gov/groups/SNS/cloud-computing/

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# This is a Natural Progression

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

**IBM addresses the full stack**

**CLOUD**
Dynamic provisioning for workloads

**SHARED RESOURCES**
Common workload profiles

**AUTOMATE**
Flexible delivery & Self Service

**STANDARDIZE**
Operational Efficiency

**VIRTUALIZE**
Increase Utilization

**CONSOLIDATE**
Physical Infrastructure

*Most technology-only approaches*

**Traditional IT**

**Standard Managed Services**

**Cloud Delivered Services**

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# Virtualization is evolving from being a way to reduce costs to being a change agent that enables new and more flexible infrastructures

**Cloud Computing**
- Elastic scaling
- Shared resources
- Delivered as-a-service
- Private, Hybrid, and Public

**Flexible Infrastructure**
- Pools of heterogeneous resources
- Policy-based management automation

**Availability**
- Move running workloads
- Improve maintenance window
- Support old application environments

**Test & Server Consolidation**
- Better hardware utilization
- Lower power consumption

2007 7%

Not Virtualized
93%

2007->2011 % Workloads Virtualized

2011

39%

61%
Virtualized

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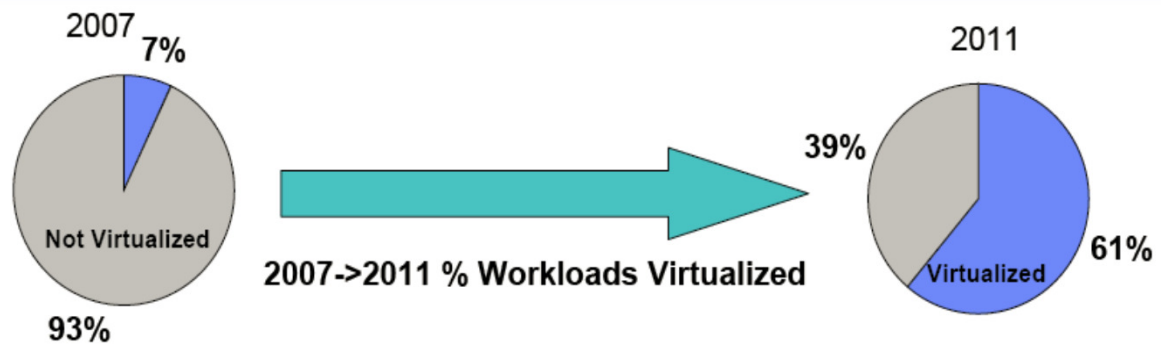
# Industry Standardization - DMTF, SNIA, OSGi, OMG,... to Set Industry Cloud Standards

- **DMTF – Distributed Management Task Force**
  - Open Virtual Format (OVF) ← Infrastructure Virtual **Server**

- **SNIA - Storage Networking Industry Association**
  - Cloud Data Management Interface (CDMI) ← Infrastructure **Storage**
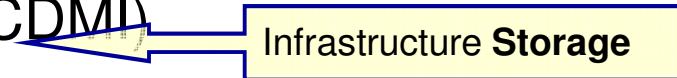
- **OSGi – Open Services Gateway initiative**
  - OSGi framework ← Cloud **Management**
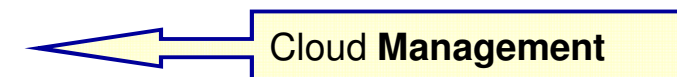
- **OMG**
  - Unified Modeling Language (UML) ← **Application**
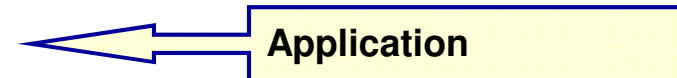
# Cloud Computing – Deployment, Service, Characteristics

**4 Deployment Models**

- Private cloud
- Community cloud
- Public cloud
- Hybrid cloud

**3 Service Models**

- Software as a Service (SaaS)
- Platform as a Service (PaaS)
- Infrastructure as a Service (IaaS)

**5 Characteristics**

- Rapid elasticity
- Broad network access
- Resource pooling
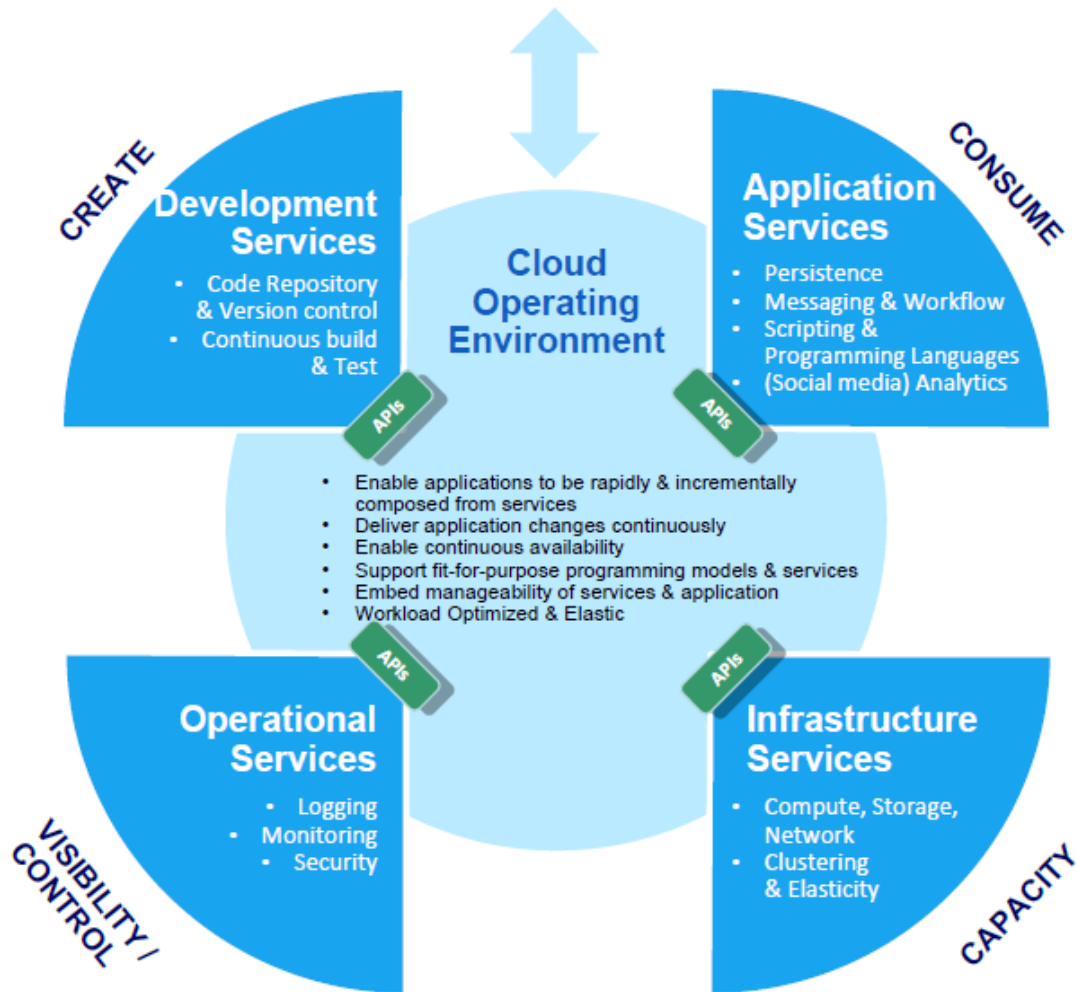- Measured service
- On-demand self-service

http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf

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# Cloud Operating Environment

**APPLICATIONS / WORKLOADS**
(define user experience, services & programming models; composition model; operational model; differentiation)

CREATE

**Development Services**
- Code Repository & Version control
- Continuous build & Test

CONSUME

**Application Services**
- Persistence
- Messaging & Workflow
- Scripting & Programming Languages
- (Social media) Analytics

**Cloud Operating Environment**

APIs

APIs

- Enable applications to be rapidly & incrementally composed from services
- Deliver application changes continuously
- Enable continuous availability
- Support fit-for-purpose programming models & services
- Embed manageability of services & application
- Workload Optimized & Elastic

APIs

APIs

**Operational Services**
- Logging
- Monitoring
- Security

VISIBILITY / CONTROL

**Infrastructure Services**
- Compute, Storage, Network
- Clustering & Elasticity

CAPACITY

Services will be matured over time with standard interfaces

# 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

**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

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

**Service Creation**
- Scope of Service
- SLAs
- Topologies, Best Practices Management Templates

**Terminate Service**
- Controlled Clean-up

## Defining Cloud Services
### Cloud Server Model
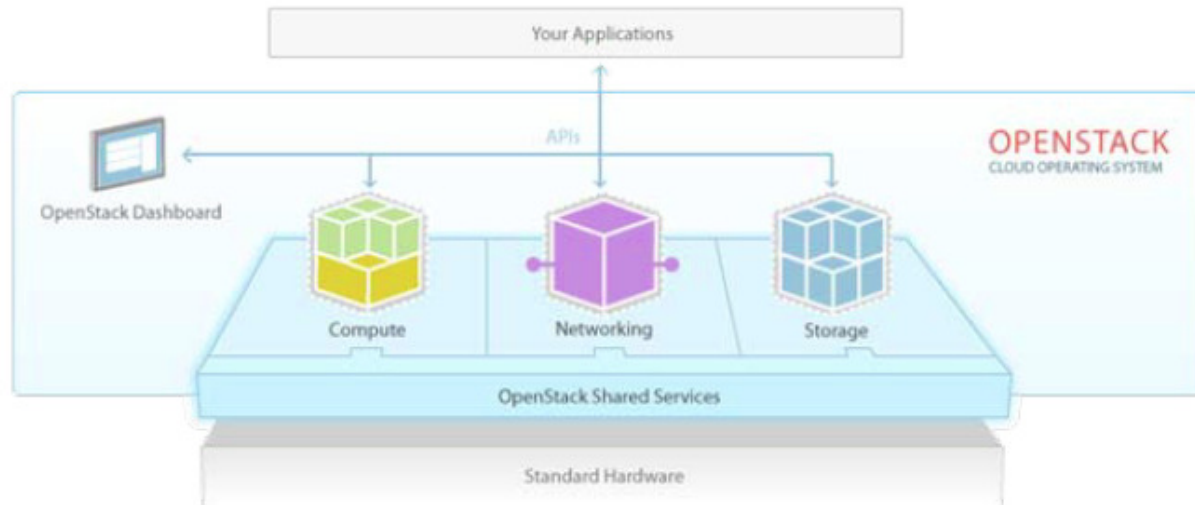
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# OpenStack



**OpenStack** is a global collaboration of developers and cloud computing technologists that seek to produce a *ubiquitous Infrastructure as a Service (IaaS) open source cloud computing platform* for public and private clouds. OpenStack was founded by Rackspace Hosting and NASA jointly in July 2010. 190+ companies and over 5,500 members.

http://openstack.org/

**Platinum Members**

AT&T
Canonical
HP
IBM
Nebula
Rackspace
RedHat
SUSE

Your Applications

APIs

OpenStack Dashboard

Compute

Networking

Storage

OpenStack Shared Services

Standard Hardware

OPENSTACK
CLOUD OPERATING SYSTEM

**Gold Members**

Cisco
Cloudscaling
Dell
Dreamhost
ITRI/CCAT
Mirantis
Piston
Yahoo

Code available under Apache 2.0 license. Design tenets – scale & elasticity, share nothing & distribute everything

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# What is OpenStack?

**OpenStack** is a global collaboration of developers and cloud computing technologists that seek to produce a **ubiquitous Infrastructure as a Service (IaaS) open source cloud computing platform** for public and private clouds. OpenStack was founded by Rackspace Hosting and NASA jointly in July 2010. 160 companies and close to 3,000 developers.

http://openstack.org/
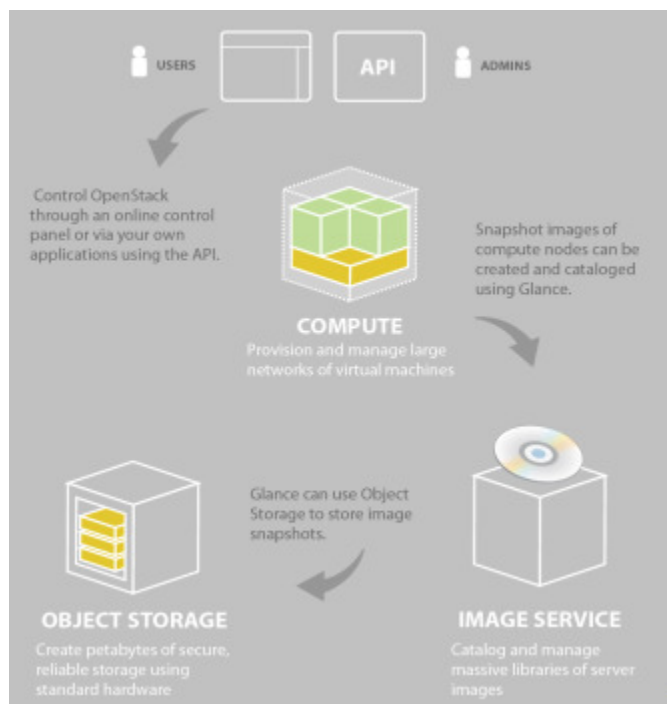
- **OpenStack Compute (core)**
  Provision and manage large networks of virtual machines

- **OpenStack Object Store (core)**
  Create petabytes of secure, reliable storage using standard hardware

- **OpenStack Image Service (core)**
  Catalog and manage massive libraries of server images

- **OpenStack Identity (core)**
  Unified authentication across all OpenStack projects and integrates with existing authentication systems.

- **OpenStack Dashboard (core)**
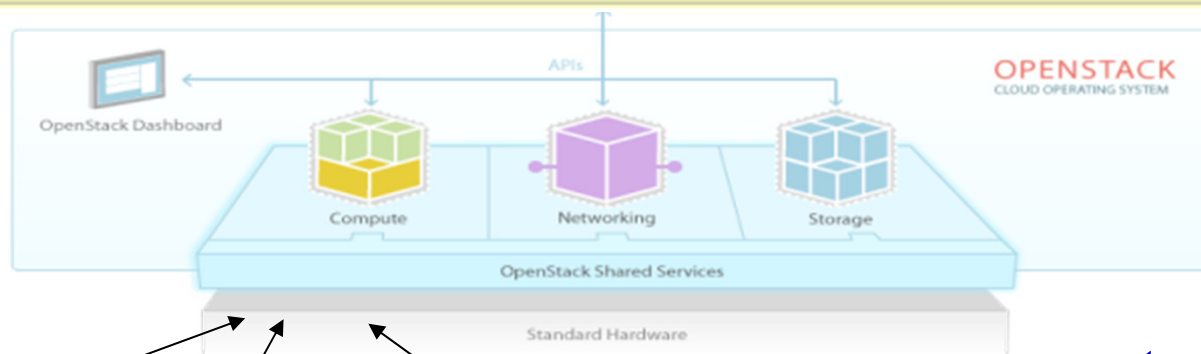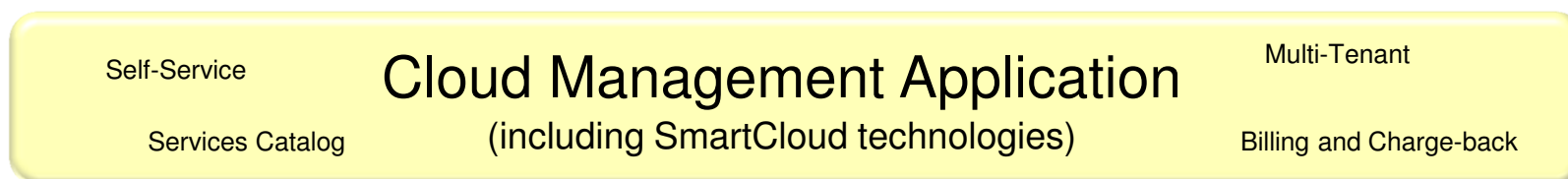  Enables administrators and users to access & provision cloud-based resources through a self-service portal.

Code available under Apache 2.0 license

# OpenStack Strategy

**OpenStack** is a global collaboration of developers and cloud computing technologists that seek to produce a **ubiquitous Infrastructure as a Service (IaaS) open source cloud computing platform** for public and private clouds. OpenStack was founded by Rackspace Hosting and NASA jointly in July 2010. 160 companies and close to 3,000 developers.

http://openstack.org/

Self-Service

## Cloud Management Application
### (including SmartCloud technologies)

Multi-Tenant

Services Catalog

Billing and Charge-back



OPENSTACK
CLOUD OPERATING SYSTEM

OpenStack Dashboard

APIs

Compute    Networking    Storage

OpenStack Shared Services

Standard Hardware

**Compute (Nova)**
**Storage (Cinder)**
**Network (Quantum)**
Provision and manage virtual resources

**Direct Hypervisor Integration**
System z support (z/VM followed by zManager) being added to OpenStack, in the same manner as other hypervisors

z/VM    zManager

kvm   Xen   Hyper-V   Power VM   FSM   VMware
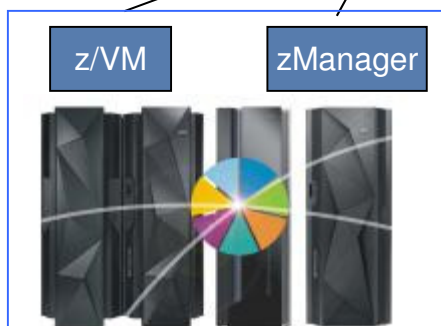
# OK – Now How Do I Set-up a Cloud Infrastructure Following All These Standards

- Make use of existing Cloud Reference Architectures (CCRA)
  - Sample: NIST Cloud Computing Reference Architecture
- Sample: IBM Cloud Computing Reference Architecture
  - Sample: HP & I

ITIL and cloud series: NIST and IBM Cloud Reference Architecture, what and how to

October 21, 2011 1:46 pm by   Claudio Valant

*"We know what cloud computing is and we have ITIL that guides us for service management. Do we really need any additional model or framework?"*

Yes we do! Indeed we need an architecture that helps us in planning, designing, and building a real cloud computing environment with all the capability and information systems to efficiently run it.

compare  IBM CCRA with the **NIST CCRA**².

**IBM Cloud Computing Reference Architecture**¹(CCRA) has already been effectively introduced in a **blog** from Vasfi Gucer. In this blog, I would like to dig a little more and compare IBM CCRA with the **NIST CCRA**².

NIST CCRA is an excellent w*hat,* and the IBM CCRA (the complete one) is a very useful h*ow to - they are complementary*

http://thoughtsoncloud.com/index.php/2011/10/itil-and-cloud-series-nist-and-ibm-cloud-reference-architecture-what-and-how-to/

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# IBM Cloud Computing Reference Architecture (CCRA)

- IBM CCRA represents the aggregate IBM experience from:
  - cloud projects with IBM clients
  - IBM implementation of private/hybrid/public cloud offerings as well as services.

- The architectural overview document might serve as guide to the fundamental cloud building blocks (see graphic)
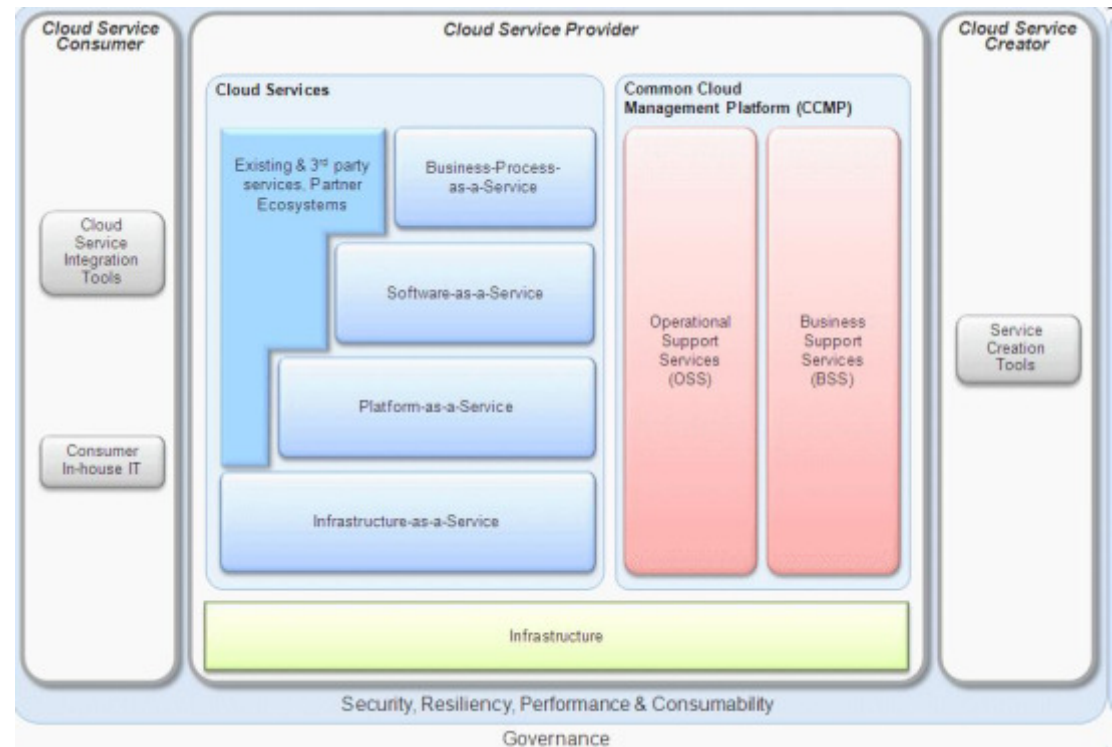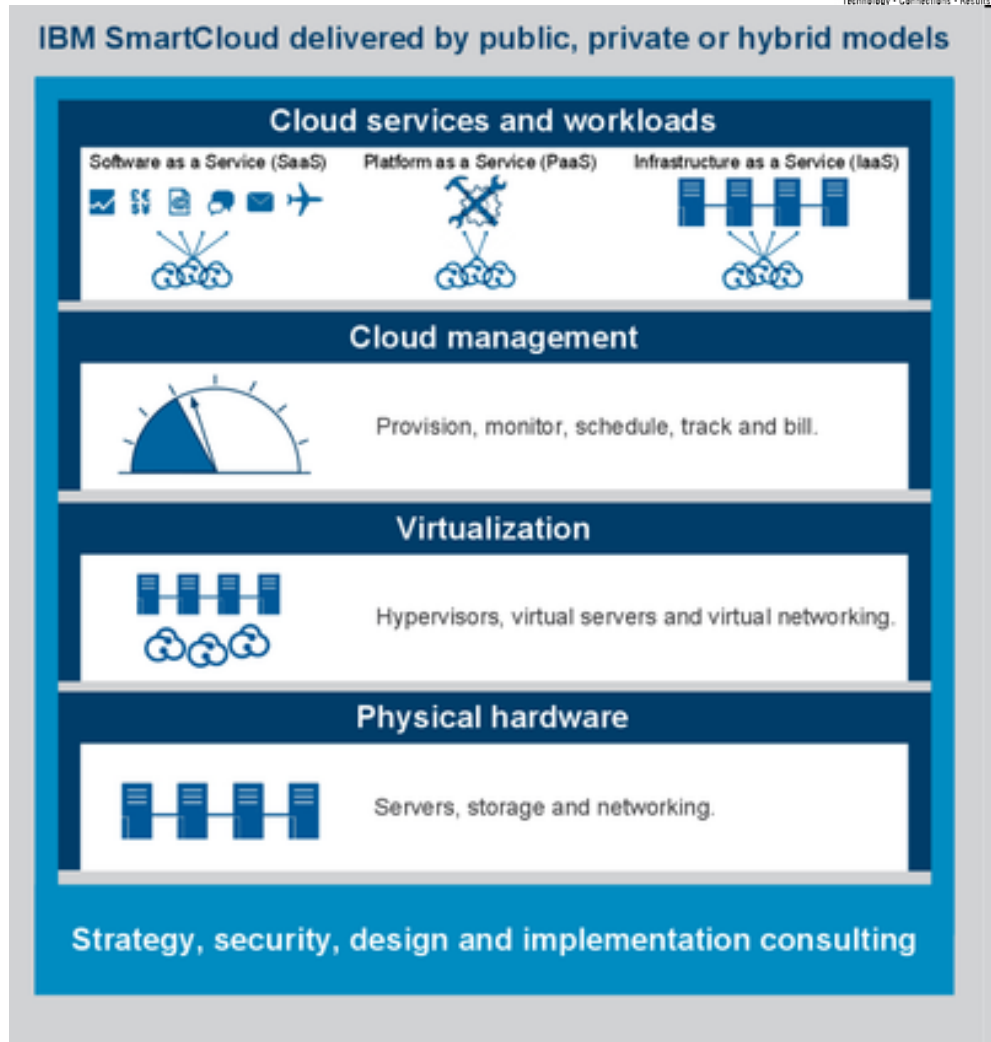
**IBM SmartCloud**

- Branded ecosystem of cloud computing products and solutions from IBM.

- Includes IaaS, PaaS, SaaS offered through public, private and hybrid cloud delivery models

- 3 umbrellas:
  - SmartCloud Foundation
  - SmartCloud Services
  - SmartCloud Solutions

- SmartCloud Foundation consists of the infrastructure, hardware, provisioning, management, integration and security that serve as the underpinnings of a private or hybrid cloud

- ... – see **http://en.wikipedia.org/wiki/IBM_cloud_computing**

**IBM SmartCloud delivered by public, private or hybrid models**

**Cloud services and workloads**

Software as a Service (SaaS)   Platform as a Service (PaaS)   Infrastructure as a Service (IaaS)

**Cloud management**

Provision, monitor, schedule, track and bill.

**Virtualization**

Hypervisors, virtual servers and virtual networking.

**Physical hardware**

Servers, storage and networking.

**Strategy, security, design and implementation consulting**

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# Security –
# Grand Challenge for the Adoption of
# Cloud Computing

**Security Is Limited By The Weakest Link**

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# Cloud customers call out security & reliability strengths as highest priorities

**Survey Question: How important is it for your cloud platform to have the following reliability characteristics?**
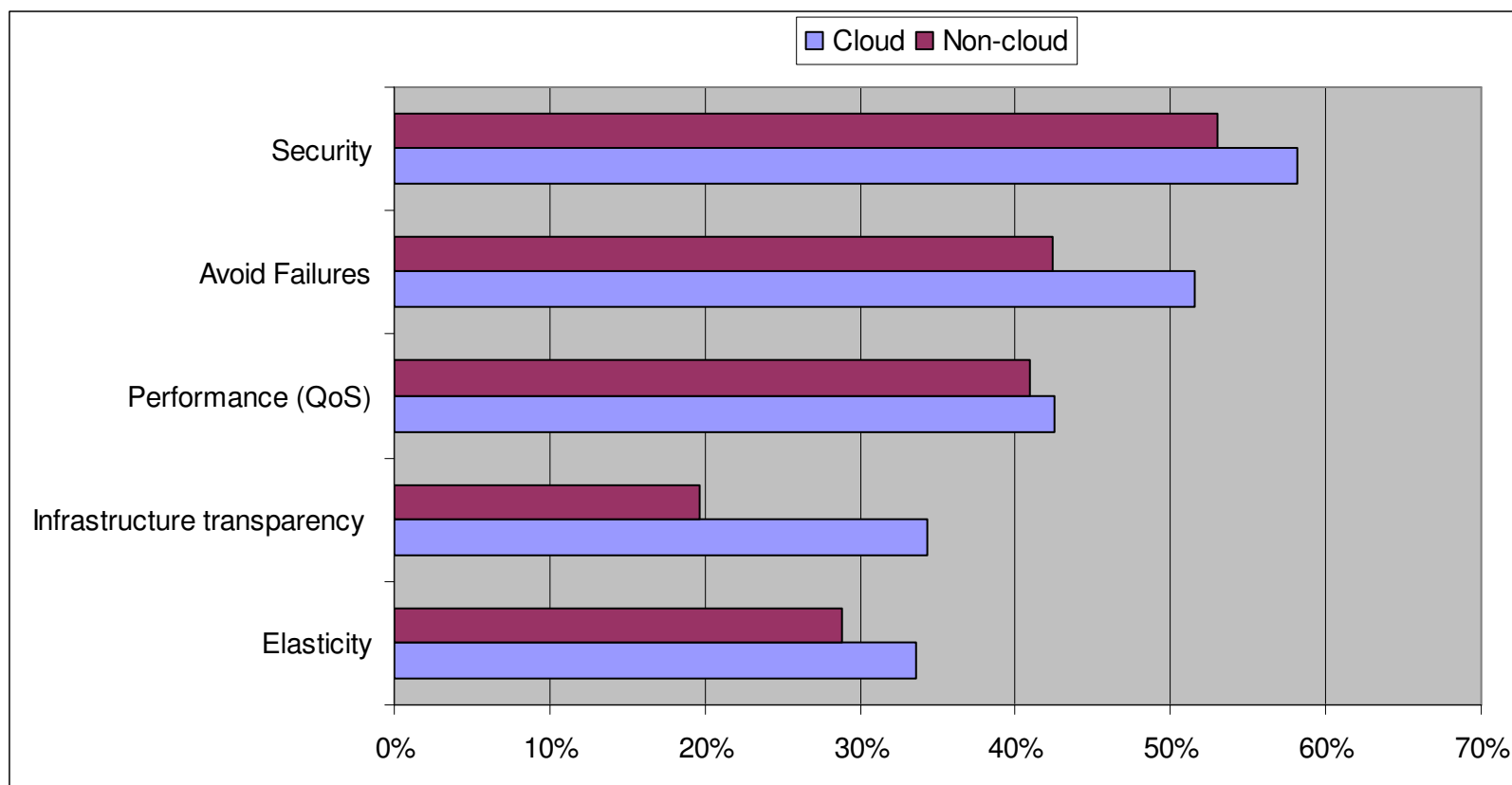
# Cloud Security 101: Simple Example

**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.
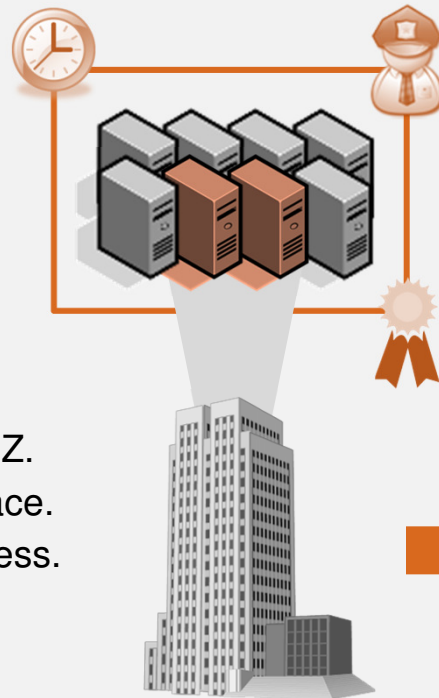
**Who Has Control?**

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

# 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.**

## Data

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

**Authentication and access technologies become increasingly important.**

## Reliability

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

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

## Compliance

Complying with SOX, HIPAA and other regulations may prohibit the use of clouds for some applications.

**Comprehensive auditing capabilities are essential.**

## 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.**
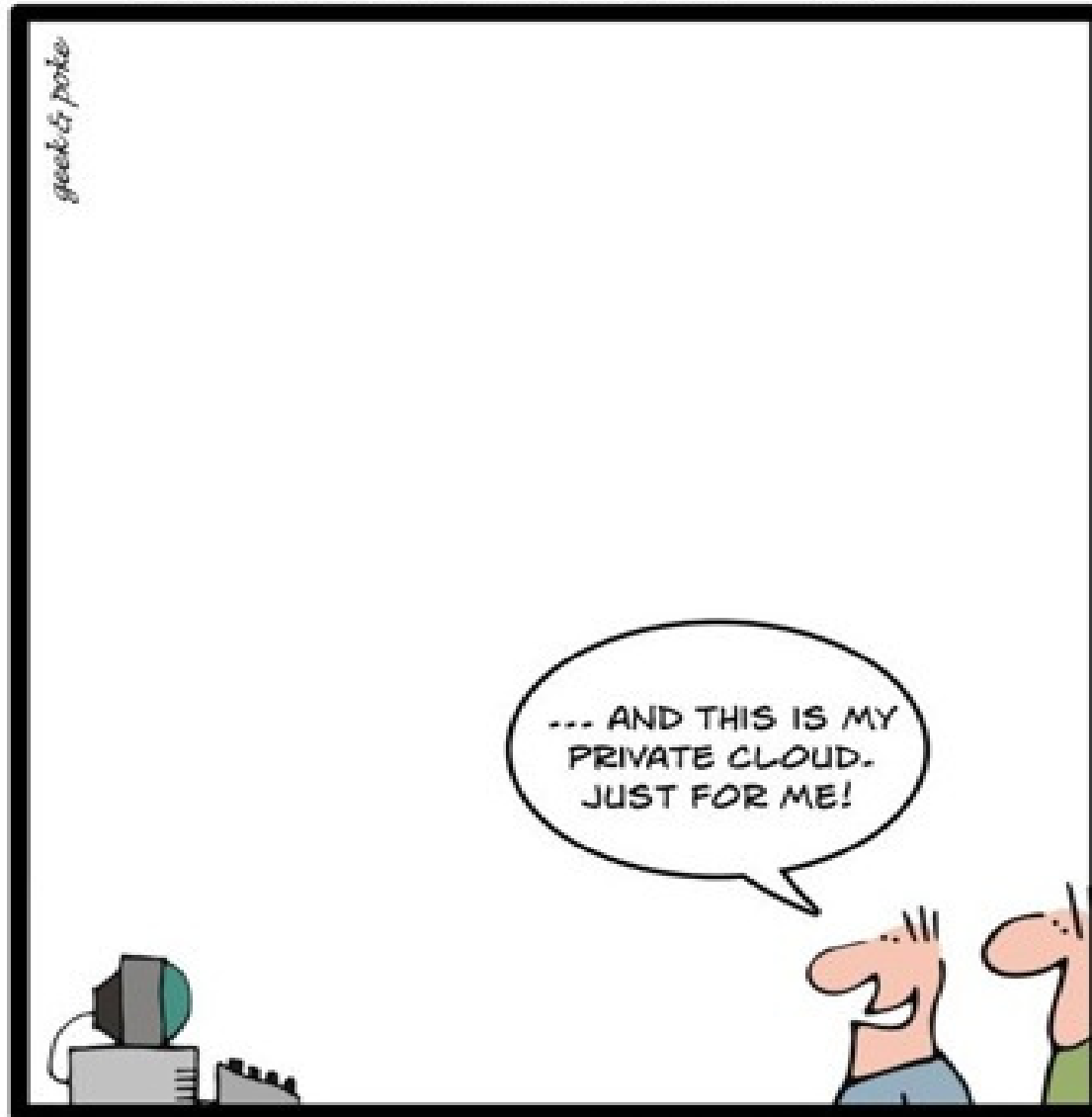
# System z Cloud Blueprint

| **Integrate** | **Automate** | **Orchestrate** |
|---|---|---|
| *"Take out cost"* <br> *Consolidate and Virtualize* | *"Simplify"* <br> *Automate and Manage Better* | *"Orchestrate"* <br> *Service Lifecycle Management* |
| *Differentiation* | *Standardization* | *Service Management* |

- Rapid deployment of Linux virtual servers for less than $1 a day
- Industry leading "gold standard" security for tenant isolation
- Elastic scaling achieved by dynamically adjustable capacity at sustained performance
- Multisystem virtualization simplifies management by clustering shared resources

- Automated provisioning and de-provisioning
- Pool standardized virtualized building blocks
- Plug-and-play capacity across hardware generations
- Capture and catalog virtual images in the data center
- Automated methods for faster delivery of services with higher levels of control

- Integrated virtualization management with IT service delivery processes
- Self-service provisioning
- Automated service lifecycle management including dynamic instantiation of cloud services
- Pay for use
- Optimize IT resources to reinvent business processes

**Client Cloud Journey:  virtualization/consolidation → simplify/standardize → orchestrate**

# System z Cloud Ecosystem

**Integrate** → **Automate** → **Orchestrate**

**IBM Products & Offerings**

*Integrate:*
- zEnterprise: zEC12, z196, zBC12, z114
- z/VM 6.2
- Linux on System z
- z/VM 6.3

*Automate:*
- Tivoli Provisioning Manager
- CloudReady for Linux on System z
- SmartCloud Entry
- SmartCloud Provisioning

*Orchestrate:*
- Tivoli Service Automation Manager
- SmartCloud Orchestrator

**ISV Solutions**

**CSL Wave**
- Provided by **CSL International**
- Hypervisor Manager
- Cross marketing agreement to market and promote product

**zPRO**
- Provided by **Velocity Software**
- Add-on feature to Velocity's zVPS product that provides performance management
- Provides golden image creation, cloning, and operational controls

**APPLogic**
- Provided by **Computer Associates**
- Part of the 3Tera acquisition
- GA in 2H2012

**MOAB**
- Provided by **Adaptive Computing**
- Provides a policy based cloud management based on xCAT

**Open Source Options**

**xCAT**
- E**x**treme **C**loud **A**dministration **T**ool
- Now supported on z/VM through services offering (GTS)

**OpenStack**
- Being enabled for z/VM for delivery in 1H2013
- Being used as a code base for SCE / SCP / SCO and possibly MDM

# Getting Started with System z Cloud Solutions

- **IBM zEnterprise Starter Edition for Cloud**
  - Tivoli Provisioning Manager
  - *Learn More:* http://public.dhe.**ibm.com**/common/ssi/ecm/en/zsd03028usen/ZSD03028USEN.PDF

- **IBM System z Solution Edition for Cloud Computing**
  - Tivoli Service Automation Manager
  - *Learn More:* http://www.**ibm.com**/systems/z/solutions/editions/cloud/index.html

- **Cloud Ready for System z**
  - Image-based deployment for cloud service delivery and management
    - SmartCloud Control Desk, Tivoli Provisioning Manager, IBM Tivoli Monitoring, System Automation for Multi-Platforms, Tivoli Storage Manager
  - *Learn more:* http://public.dhe.ibm.com/software/tivoli/brochures/Install_Config_cloud_readyLinux_sysz_flyer073112.pdf

- **CICS V5.1 with Cloud Enablement**
  - Moving towards a cloud oriented service delivery platform
  - *Learn More:* http://www.ibm.com/podcasts/software/websphere/middleware/index.rss

- **xCat (Extreme Cloud Administration Toolkit)**
  - Open source solution for creating customized cloud deployments on System z
  - *Learn More:* http://www-03.**ibm.com**/systems/software/xcat/index.html

- ***CSL WAVE***
  - *ISV solution providing complete provisioning and management solution for z/VM environment*
  - *Learn more:* http://www.csl-int.com/

# xCAT Architecture on System z

- **Stands for Extreme Cloud Administration Toolkit**
- **Tool to manage, provision, and monitor physical and virtual machines on IBM**
- **Easy to use**
- **Open sourced in 2007 and licensed as EPL (Eclipse Public License)**
- **Used by NASA, University of Toronto, IBM, Adaptive Computing, Los Alamos Laboratory, and more!**

**xCAT MN**: Central management server running on normal Linux

**zHCP**: Runs on privileged VM and manages other VMs via SMAPI and CP
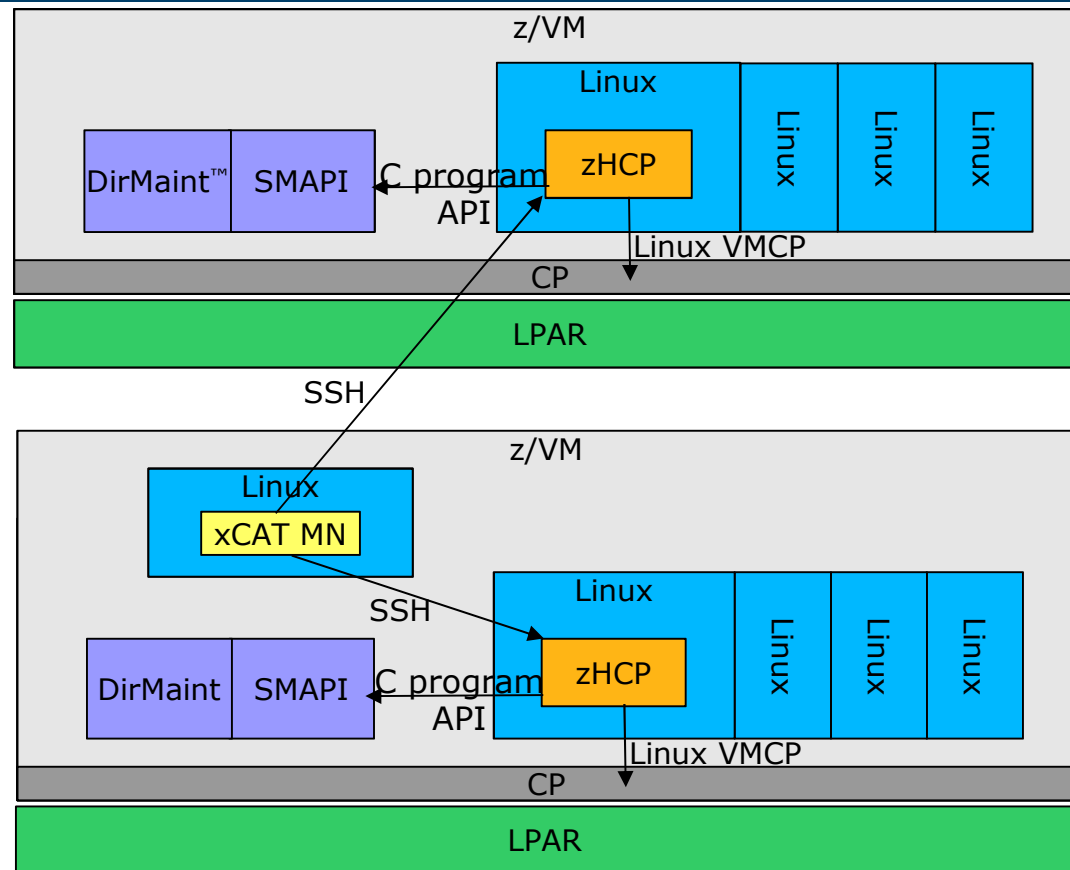
## Based on Tivoli Provisioning Manager

Automates processes & tasks across servers, applications, networks and storage, e.g.:

- Automates and manages virtual guests across multiple z/VM instances in a consistent, error-free manner
- Service catalogue to request IaaS cloud services, e.g. new z/VM Linux instance

**Server Provisioning**

- Middleware
- Operating System
- Hardware Layer

**Storage Provisioning**

- Virtualization
- Storage Devices
- Fabric

**Network Provisioning**

- Virtualization
- Routers / Switches
- Protocols

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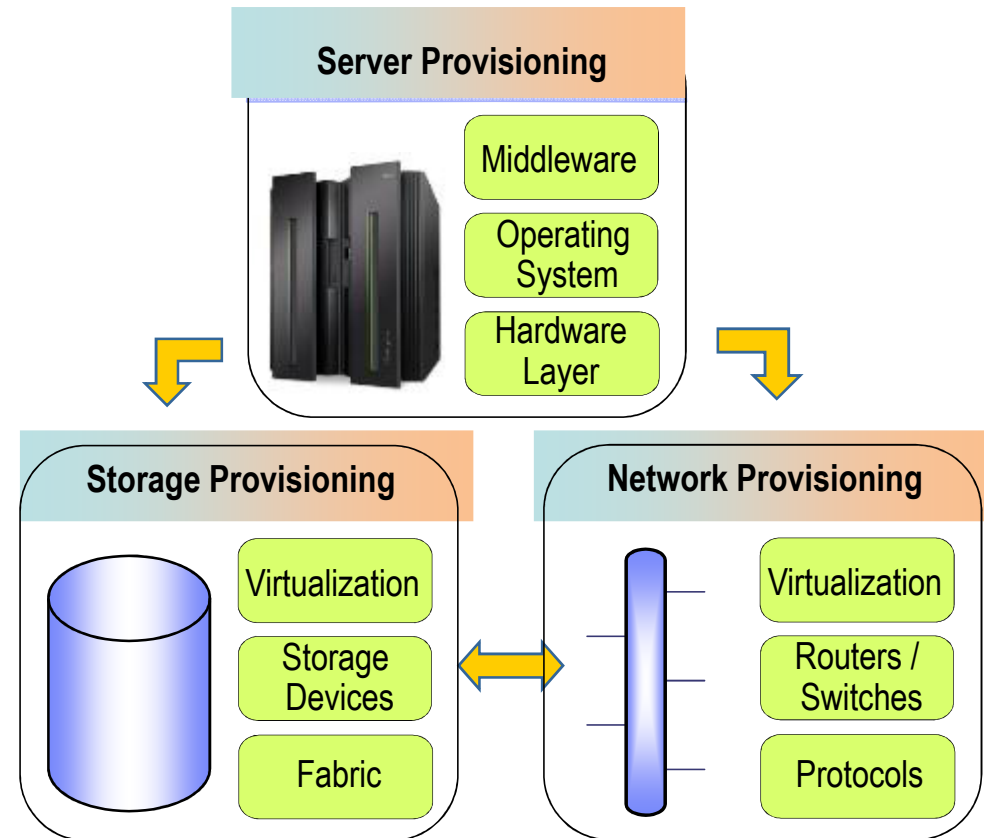
# IBM zEnterprise Starter Edition for Cloud

**Cloud Technology**

**Tivoli Provisioning Manager Version 7.2.0.2**
**License PID:** 5608-TPM

- RVU License and SW S&S12 Months -       D0I32LL
- RVU Annual SW S&S Annual Renewal -       E0BI5LL

**Monitoring**
(optional)

**Tivoli OMEGAMON® XE on z/VM and Linux Version 4.2**

**License PID:** 5698-A36
**S&S PID:**       5608-S73

**Implementation**

**Install using z/VM workflows for TPM**
                                              **or engage**
**IBM STG Lab Services**

- IBM Services to implement cloud using workflows

*Tivoli Provisioning Manager (TPM 7.2.1) with z/VM workflows*

*Optional Monitoring (OMEGAMON XE)*

*Enterprise Linux Server (ELS) or Solution Edition for Enterprise Linux (SEEL) (z/VM 6.2 Toleration)*

*zEnterprise 196 or 114 or spare IFLs*

## *Easy to get started!*

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

# Use Cloud Ready to get up and running quickly, and supports moving to SmartCloud as needs grow

**Cloud Ready for Linux on System z**

**SmartCloud Foundation**

**Automation with Cloud**
System Automation for Multiplatform

**Cloud Backup/Recovery**
Tivoli Storage Manager

**Cloud Monitoring**
ITM (OMEGAMON for z/VM & Linux)

**Service Lifecycle Management**
SC Control Desk (Svc Catalog)

**Automated Provisioning**
Tivoli Provisioning Manager

**Automation with Cloud**
System Automation for Multiplatform

**Cloud Backup/Recovery**
Virtual Storage Center

**Cloud Monitoring**
SmartCloud Monitoring

**Service Lifecycle Management**
SC Control Desk (Svc Catalog/Desk)

**Automated Provisioning**
SC Provisioning/Orchestration

# IBM System z Solution Edition for Cloud Computing

**Visibility**   **Control**   **Automation**

**Cloud Technology**

**Tivoli Service Automation Manager Version 7.2.2 License PID:**
- RVU License and SW S&S12 Months -
- RVU Annual SW S&S Annual Renewal -

**Monitoring** (optional)

## Tivoli OMEGAMON XE on z/VM and Linux Version 4.2

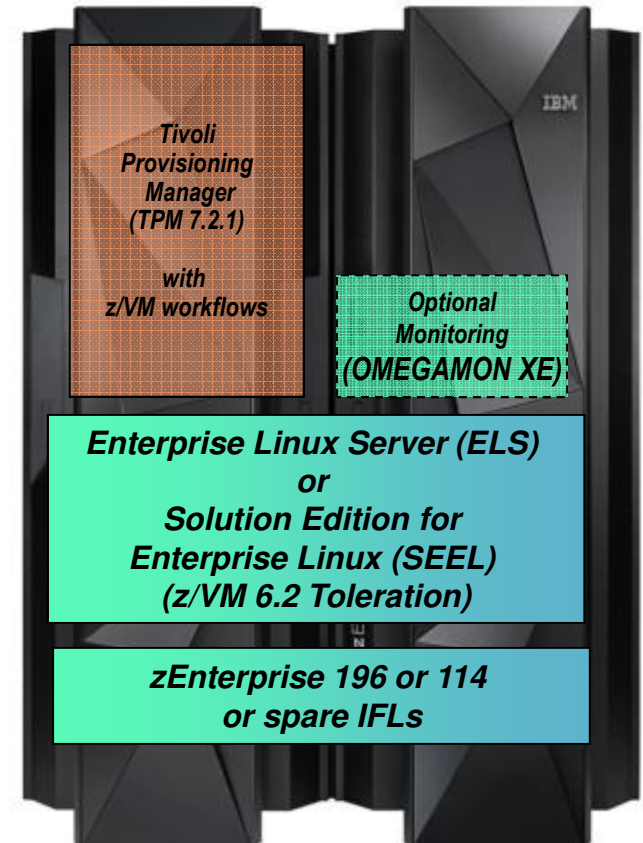**License PID:** 5698-A36
**S&S PID:**      5608-S73

**Implementation**

**IBM Lab Services - STG & SWG**
- Install configuration:
  - Hardware system (LPAR creation, security
  - Base z/VM & Linux distro
  - Tivoli Components
- Develop test scenario for service automation & management via TSAM
- Optional:  Planning Workshop for Cloud Environment
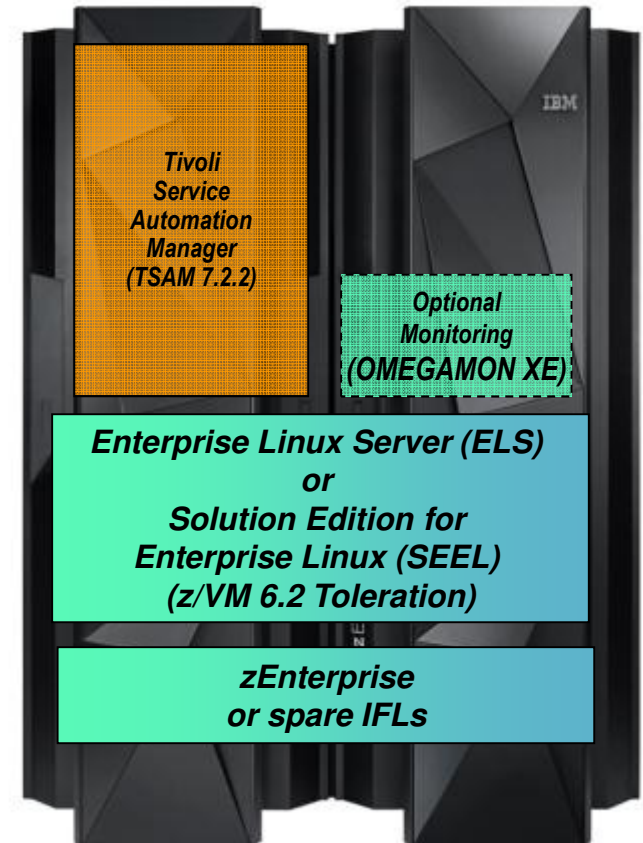
*Tivoli Service Automation Manager (TSAM 7.2.2)*

*Optional Monitoring (OMEGAMON XE)*

*Enterprise Linux Server (ELS) or Solution Edition for Enterprise Linux (SEEL) (z/VM 6.2 Toleration)*

*zEnterprise or spare IFLs*

***Learn More**: http://www.**ibm.com**/systems/z/solutions/editions/cloud/index.html*

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# Private Cloud Management - Tivoli Service Automation
## Manager - Growth Path Based on TPM

**Business Support Systems (BSS)**
- Customer Management
- Product Management
- Partner Management
- Subscription Management
- Metering
- Billing
- Rating and Charging
- Financial Management
- Analytics and Reporting

**Operational Support Systems (OSS)**
- Service Automation
- Package On-boarding
- Service Quality Management
- Package Management
- Service Operations Management
- VM Management
- Resource Management

*IBM CC RA Based*

**End Users**

Web2.0

**Service Designers, Service Operators, Administrators**

Admin GUI

Tivoli Service Request Manager → Tivoli Service Automation Manager → Tivoli Provisioning Manager

**Tivoli Process Automation Engine**

**Integrated Systems**

**Management Technology**

IBM Tivoli Monitoring

Tivoli Usage and Accounting Manager

# Tivoli Service Automation Manager - NIST Cloud Characteristics

**On-demand self-service**

**End Users**

**Broad network access**

Web2.0

**MEA / REST APIs**

Service Designers, Service Operators, Administrators

Admin GUI

Tivoli Service Request Manager

Tivoli Service Automation Manager Routines

Tivoli Provisioning Manager

**Resource pooling**

Service Run-Time

**Tivoli Process Automation Engine**

**Measured service**

**Integrated Systems Management Technology**

IBM Tivoli Monitoring

Tivoli Usage and Accounting Manager

**Rapid elasticity – z/VM, VMWare, Kvm, Xen, p-Hypervisor,…**

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# Tivoli Service Automation Manager – Set-up example on System z
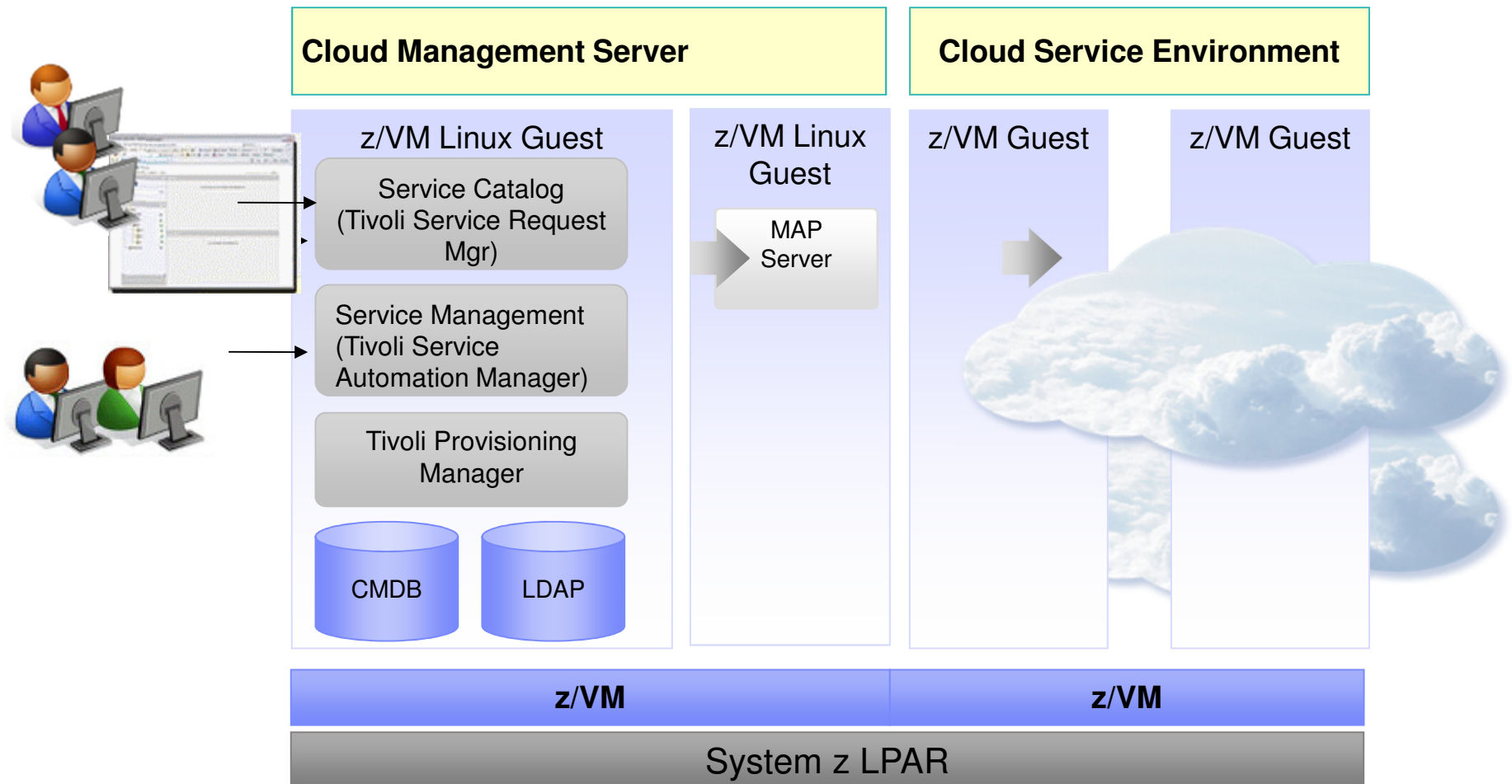


Cloud Management Server

Cloud Service Environment

z/VM Linux Guest

Service Catalog
(Tivoli Service Request Mgr)

Service Management
(Tivoli Service Automation Manager)

Tivoli Provisioning Manager

CMDB

LDAP

z/VM Linux Guest

MAP Server

z/VM Guest

z/VM Guest

z/VM

z/VM

System z LPAR

## IBM Entry Cloud Configuration for SAP Solutions on zEnterprise

- A privat cloud enablement offering that combines technology and services to automate, standardize, and speed up day-to-day operations for SAP Solutions
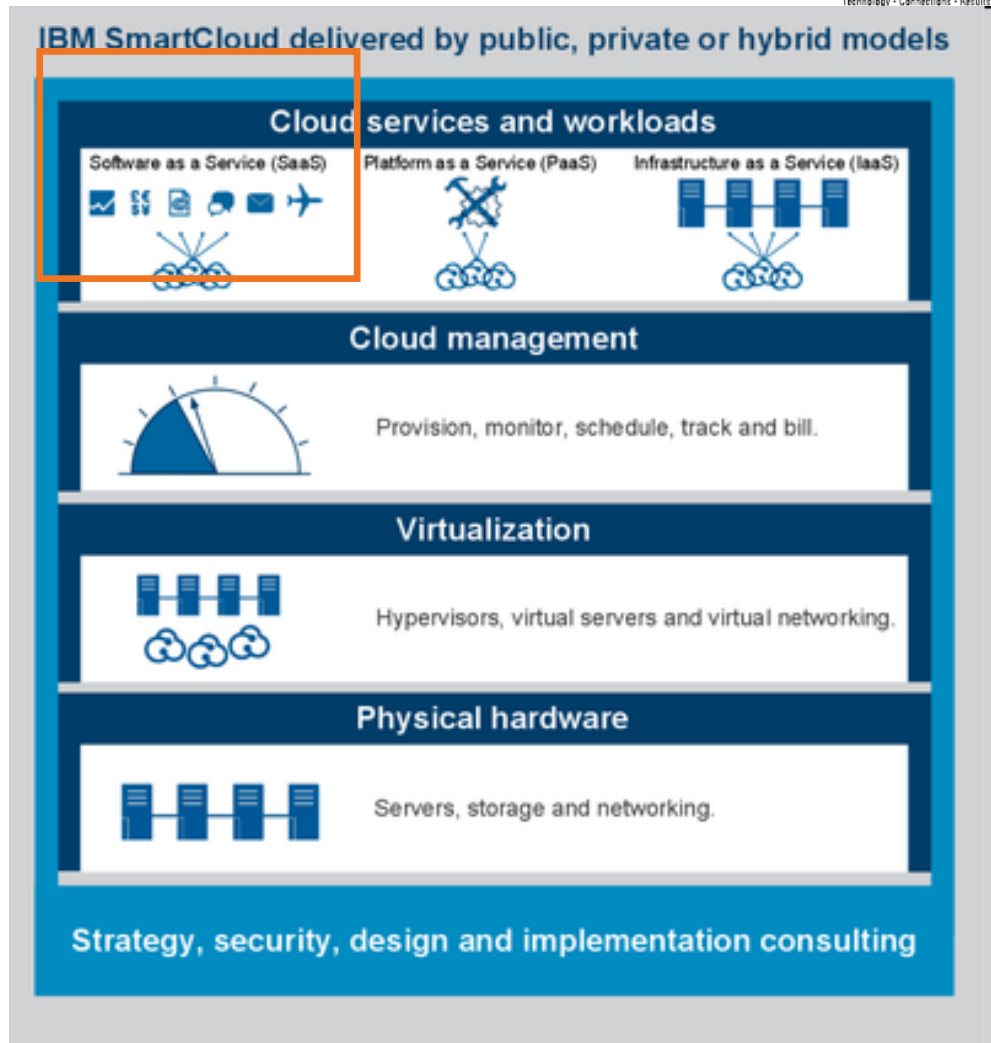
# Introducing: IBM Entry Cloud Configuration for SAP Solutions on zEnterprise

**A cloud enablement offering that combines technology and services to automate, standardize, and speed up day-to-day operations for SAP Solutions**

Solution Summary:

- **SAP Landscape Virturalization Manager (LVM ) provides SAP Basis Admin tasks automation for SAP on System z - System Refresh / Copy / Clone**
- **IBM Entry Cloud Configuration SAP Solutions on zEnterprise  provides components needed by SAP LVM for SAP database provisioning and cloning**

**Offering Components:**

- Database provisioning System (DPS) for DB2 on z/OS automation (refresh only in R1)

- IBM Lab Services to deliver and implement the DPS code along with other services

- Optional -  IBM DB2 Recovery Expert for z/OS

- Database Provisioning System (DPS) can be used as a Standalone Automation Solution for DB2 on z/OS

Note: IBM Entry Cloud Configuration for SAP on zEnterprise **is** offered initially as a pilot **with plans to be** followed by a formal offering. Availability dates and attributes may still vary.

# IBM Service Automation Cloud for SAP on zEnterprise - Operational Efficiency

Cloud Services:

- SAP System Copy – Create a customized SAP system based on existing system
- SAP System Refresh – Copy DB content from PRD to Non-PRD including post processing
- SAP System Provisioning – Create a fresh SAP system based on existing image
- Additional Dialog instance– Adding additional application server instances, e.g. for monthly closing
- SAP System Clone – Create an identical copy of an existing SAP system

| Value Delivered: | From traditional | To cloud |
|---|---|---|
| Install DB2 | 1 day | 12 mins |
| Maintain database libraries | ½ day | 8 mins |
| Clone database | 2-3 days | 20-180 mins |
| Install operating system | 1 day | 30-60 mins |
| Prepare upgrade/provide SAP system | 2-3 days | ~40-200 mins |
| Add additional application server | 1 day | 10 mins |

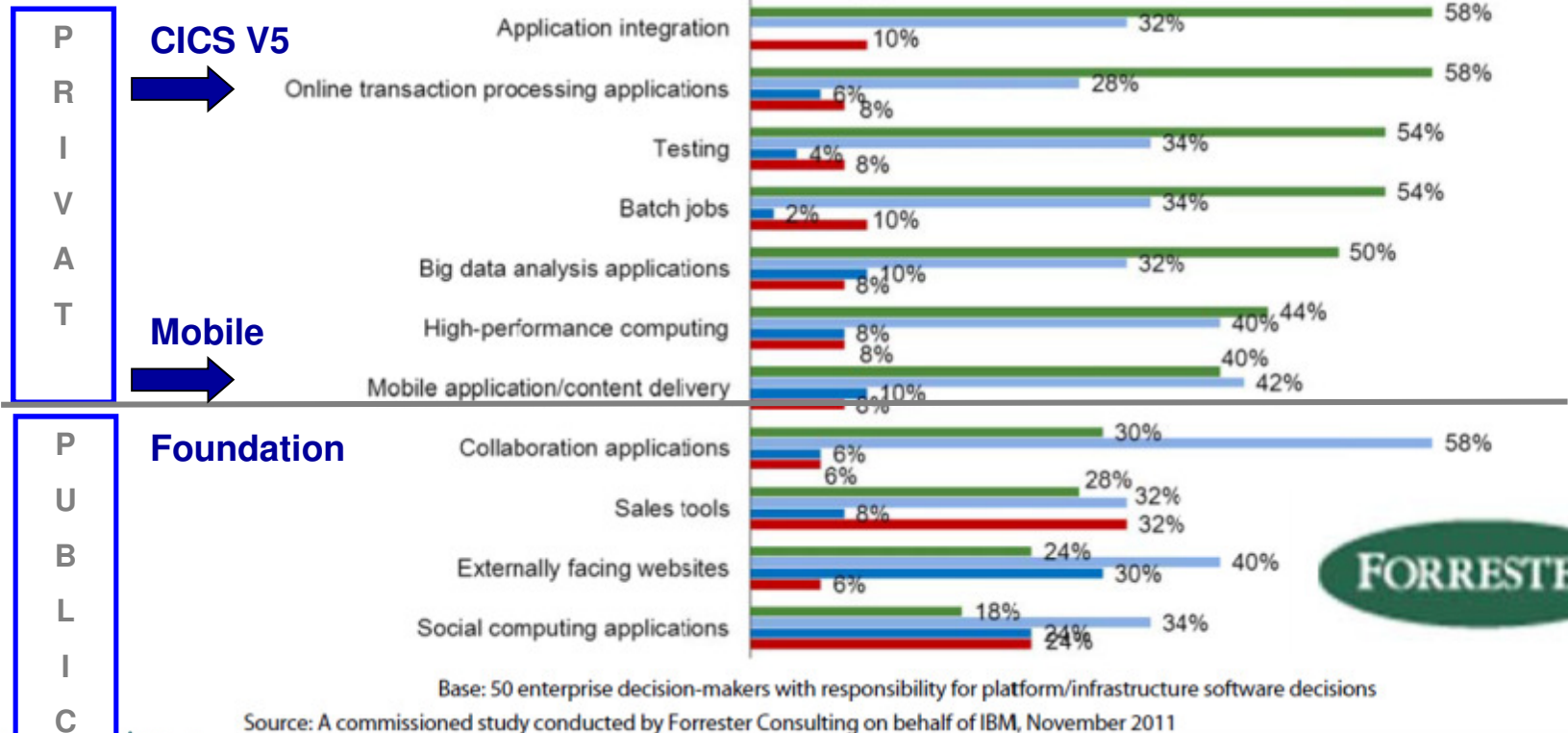# … and There is More to come to hit Market Need
## - System z goes Mobil
## - System z CICS TS V1 goes Cloud

**Private PaaS By Far Preferred By Respondents**

"If your organization could consume, as a managed service, a complete platform to develop, deploy, manage, and integrate applications, including development tools, administration and management tools, and runtime engine(s), which type of hosted scenario, if any, do you feel would be best suited to the following applications/jobs?"

- On-premises, hosted, or self-managed
- Externally hosted, private environment
- Externally hosted, public environment
- Not suited to any hosted scenario

**P R I V A T**

**CICS V5**

**Mobile**

**P U B L I C**

**Foundation**

| Application | Values |
|---|---|
| Intranets (internal only) | 2%, 8%, 26%, 64% |
| Application integration | 10%, 32%, 58% |
| Online transaction processing applications | 6%, 8%, 28%, 58% |
| Testing | 4%, 8%, 34%, 54% |
| Batch jobs | 2%, 10%, 34%, 54% |
| Big data analysis applications | 8%, 10%, 32%, 50% |
| High-performance computing | 8%, 8%, 40%, 44% |
| Mobile application/content delivery | 8%, 10%, 40%, 42% |
| Collaboration applications | 6%, 6%, 30%, 58% |
| Sales tools | 8%, 28%, 32%, 32% |
| Externally facing websites | 6%, 24%, 30%, 40% |
| Social computing applications | 18%, 24%, 24%, 34% |

Base: 50 enterprise decision-makers with responsibility for platform/infrastructure software decisions
Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, November 2011

**FORRESTER**

# The new CICS Transaction Server V5.1 delivers…

## Operational Efficiency

- *Greater capacity* - achieve cost savings through consolidation
- *Managed operations* - *reduce cost and risk through automation*
- *Increased availability* - reduce the need for planned downtime
- *Deeper insight* - *Improve decision making and audit readiness*

## Service Agility

- *First-class applications* - create agile services from existing assets
- *First-class platforms* - create agile service delivery platforms
- *Modern interfaces* - build rich web experiences for critical applications
- *Foundational enhancements* - extend core capabilities

*100+ requirements satisfied!*

### … with Cloud Enablement

consistent with the IBM Cloud Computing strategy
positions customers for the next transformational era in technology
moves towards a cloud oriented service delivery platform

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# OSGi – Modularization of Applications

The **OSGi framework** ("Open Services Gateway initiative") implements a complete and dynamic component model above a JVM:

- **Bundles** - are normal jar components with extra manifest headers
- **Services** - connects bundles in a dynamic way
- **Services Registry** - API for management services e.g Service Registration
- **Life-Cycle** - API for life cycle management for install, start, stop, update, and uninstall bundles
- **Modules** - defines encapsulation and declaration of dependencies
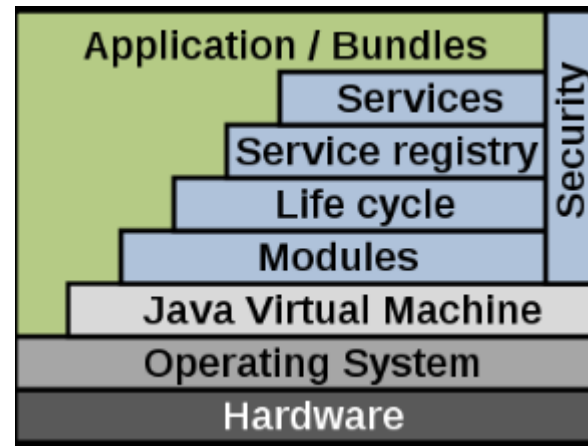


A **bundle** is a group of Java classes and additional resources equipped with a detailed manifest MANIFEST.MF file on all its contents, as well as additional services needed to give the included group of Java classes more sophisticated behaviors
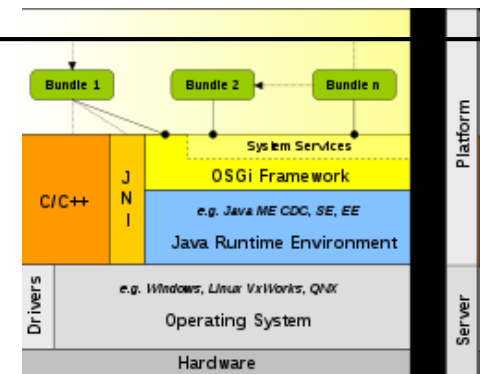
# CICS TS V5.1 with cloud enablement

*Moving towards a cloud oriented service delivery platform*

### 3 simple steps to cloud enablement…

1. Define your platform encapsulating your existing regions
2. Define your applications, entry points, and dependencies from existing assets
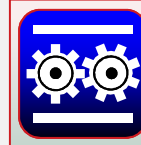3. Deploy your applications onto your platform

### With cloud enablement you can…

- Bring the flexibility of cloud deployment to your existing CICS assets
- Easily measure resource usage of your CICS business applications
- Dynamically control your CICS applications and infrastructure at runtime

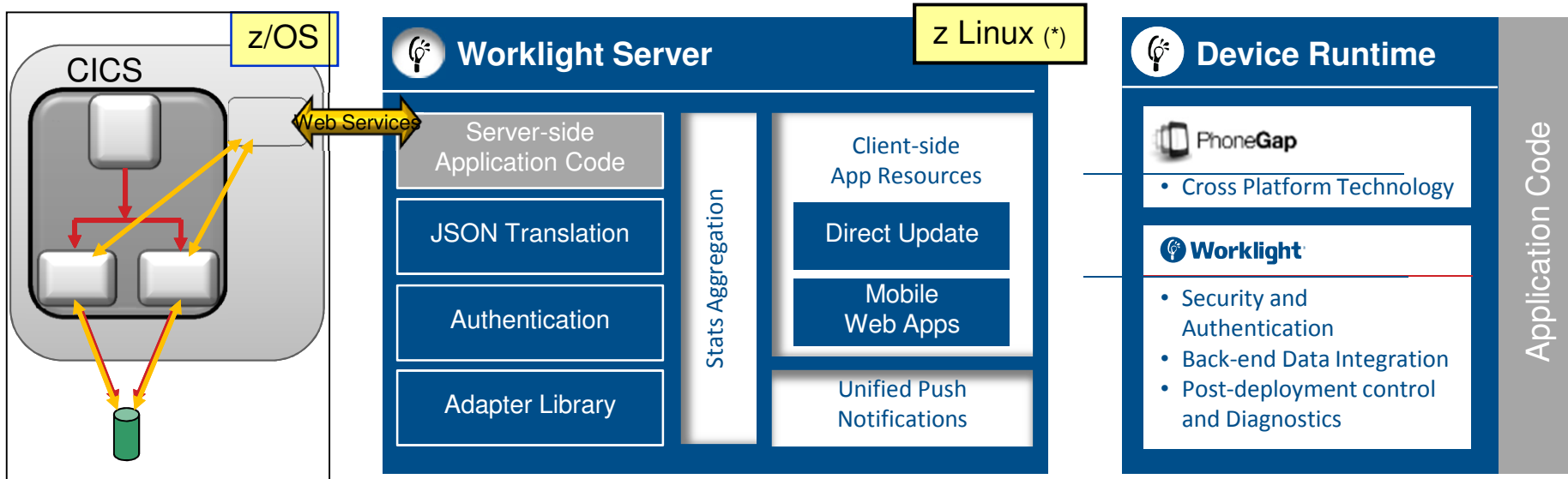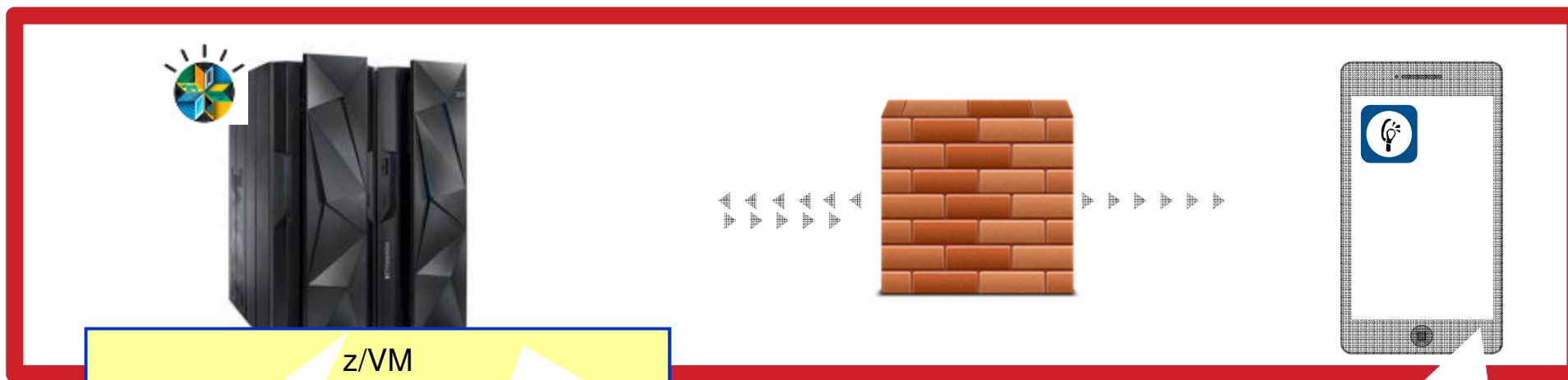**Application**

*Create agile services from existing assets*

**Platform**

*Create agile service delivery platforms*

**Policy**

*Control critical resource thresholds with policies*

# Worklight Server on Linux on System z – Support of Mobile Devices

z/VM

**z/OS**

CICS

Web Services

**z Linux (*)**

## Worklight Server

Server-side
Application Code

JSON Translation

Authentication

Adapter Library

Stats Aggregation

Client-side
App Resources

Direct Update

Mobile
Web Apps

Unified Push
Notifications

## Device Runtime

**PhoneGap**

• Cross Platform Technology

**Worklight**

• Security and
Authentication
• Back-end Data Integration
• Post-deployment control
and Diagnostics

Application Code

(*) – no documented platform requirement nor any restriction

# Client Examples

| | |
|---|---|
| **BlueCross BlueShield MN** — For the health of all. | "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." <br> - Ted Mansk, Director of Infrastructure Engineering and Databases at BCBSM |
| **Nationwide** On Your Side℠ | Nationwide delivers Cloud Services with Linux on System z and is running hundreds of virtual Linux servers on two IBM System z10 Enterprise Class machines. <br><br> 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** |
| **HHG \| Haddon Hill Group** | Haddon Hill is using IBM Workload Deployer to increase efficiencies through simplified tax filing processes. <br><br> ▪ Projected 7-figure savings for enterprise WebSphere implementations <br><br> ▪ **13 - 15x faster time to market (3 - 4 days versus 40 - 60 days)** |
| **TRANSZAP** | Transzap boosts Software-as-a-Service uptime with IBM System z <br><br> "We intend to deliver a **99.9% application uptime guarantee** to our customer base, thanks to the availability characteristics of - Peter Flanagan, CEO, Transzap, Inc System z." |
| **IBM** | Consolidating 20+ multi-product, departmental BI deployments to Cognos 8 BI on System z <br> Deploying **private cloud self service to support 200,000+ users** across global workforce <br> 56% cost savings per user (grows with volume) |

# What Workloads are Good targets for Cloud on zEnterprise?



- **Database applications**

- **Transaction-processing systems**

- **ERP workloads**

- **Highly regulated services**

- **Agile Operations (Such as multi-architecture cloud management)**

- **Help Desk**

- **Test/Development ( Java™, WAS, Portal, Process Server, Web Hosting)**

- **Cross Architecture solutions ( Business Intelligence, Fraud, Analytics )**

# Advantages of Deploying Clouds on System z

| **Increased Productivity** | **Higher Utilization** | **More Efficient Data Center** | **Greater Reliability, Availability** |
|---|---|---|---|



- Advanced workload management that provisions resources on the fly for 90%+ utilization and maximizes ROI

- U.S. Bank reduced provisioning time from 45 days to 20 minutes

- 79% less TCA vs. leading public cloud

- Up to 100% CPU utilization

- "Shared everything" architecture

- Manage up to 100,000 virtual servers

- Up to 80% less energy than existing distributed servers

- Less floor space

- Fewer parts to manage

- Built-in hardware redundancy

- Decades of RAS innovation

- Capacity and Backup on Demand

- Ultimate security

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# 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

**Cloud implementations that include System z maximize Enterprise flexibility and increase cost savings**

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# Questions?

Complete your sessions evaluation online at SHARE.org/BostonEval

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