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Establishing Cloud Environments on zEnterprise: A Strategic Direction

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IBM

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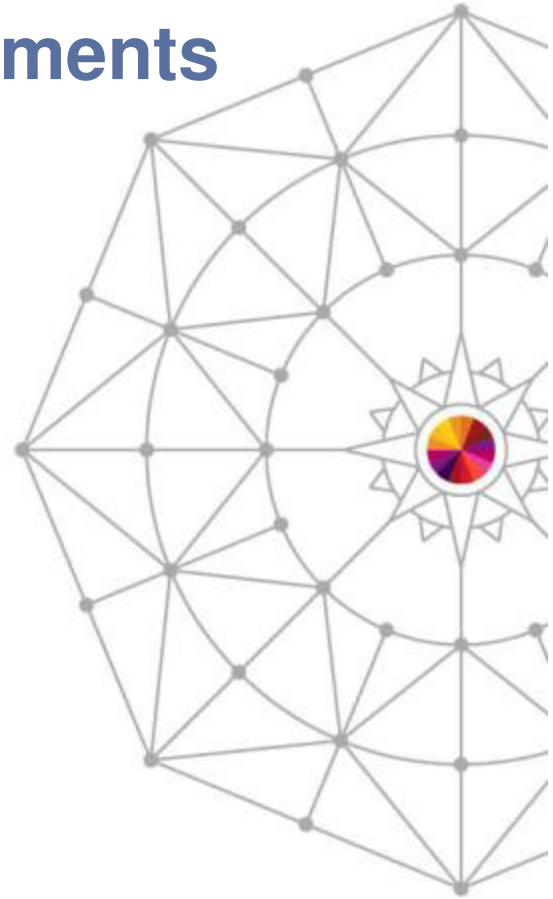
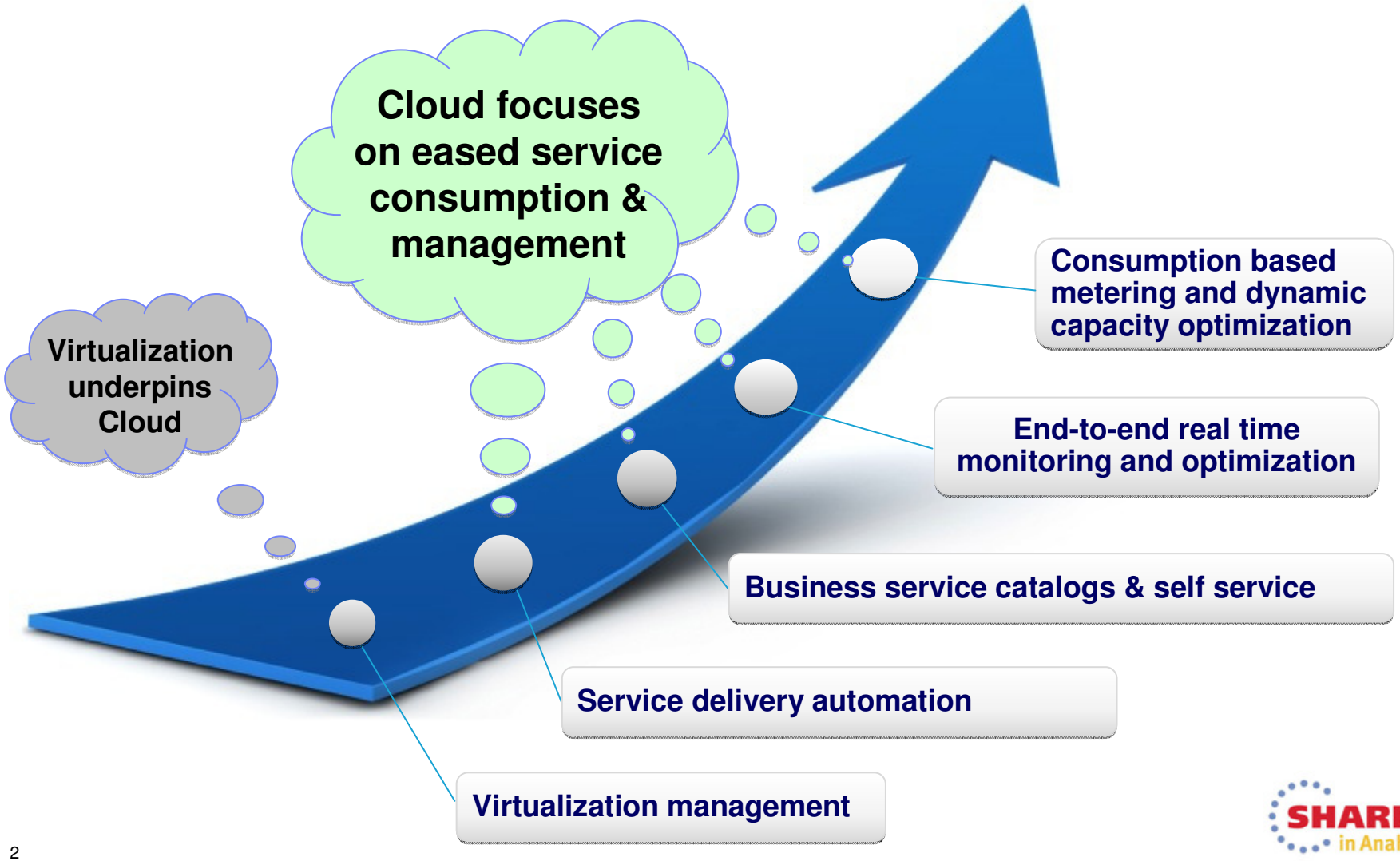


SHARE in Anaheim

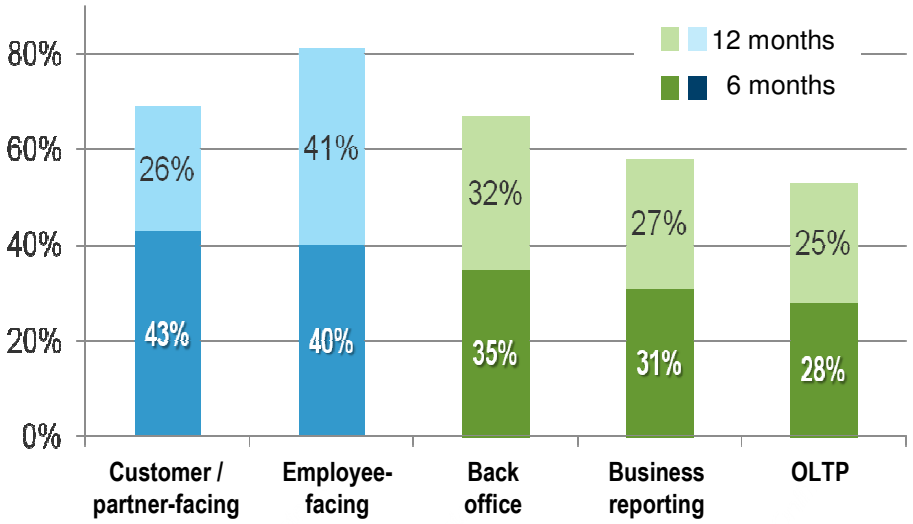
Organizations are now moving beyond virtualization to higher value stages of Cloud Computing



3 of 5 top cloud scenarios are traditional enterprise workloads

What types of applications do you plan to host on cloud platforms?

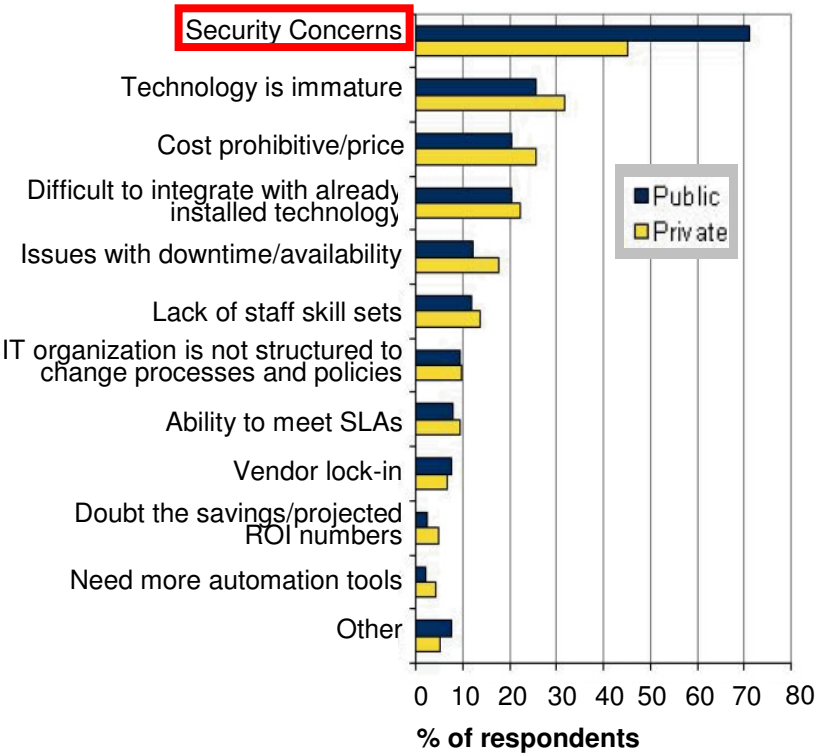
(Base: 200 North American and European hardware and infrastructure decision-makers)



Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, October, 2012

Top Challenges in Moving to a Public or Private Cloud

Q: What do you see as the top 2 challenges in moving to a public/private cloud?



Source: IDC's "Data Center and Cloud Computing Survey", January 2010

zEnterprise Differentiation for Deploying Clouds on System z

90%+ utilization
Increased Productivity

- Advanced workload management that provisions resources on the fly for 90%+ utilization and maximizes ROI
- Significant software license savings due to zEnterprise power/scale
- 79% less TCA vs. leading public cloud alternatives

100,000 virtual servers
Higher Utilization

- Maintain service levels with up to 100% CPU utilization
- "Shared everything" architecture
- Manage up to 100,000 diverse virtual servers
- Unmatched scalability with 24X more scale than x86

80% less energy
More Efficient Data Center

- Up to 80% less energy than existing distributed servers
- Less floor space
- Fewer parts to manage

Greater Reliability, Availability

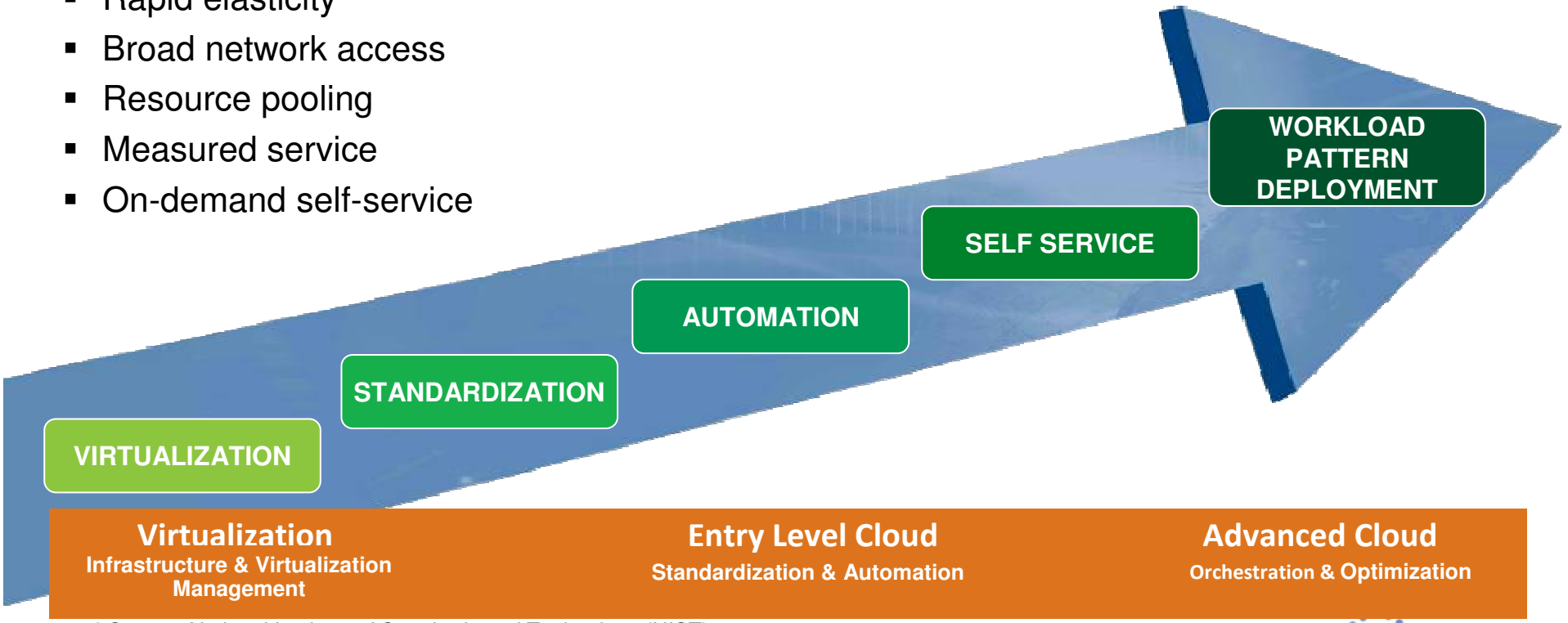
- Built-in hardware redundancy
- Decades of RAS innovation
- Real time capacity on demand to manage growth and handle workload spikes
- Highest security rating for any commercially available server

Cloud Computing - Based on Virtualization and Standardization

We need to understand that Cloud computing is a journey beginning with virtualization and consolidation of environments and ending with workload pattern-based deployment of IT services.

Cloud Computing – Characteristics*:

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



* Source: National Institute of Standards and Technology (NIST)

System z Cloud Blueprint

Orchestrate

Advanced Cloud
Orchestration & Optimization

Finally, some customers will want to evolve and optimize their cloud environment to orchestrate application deployment based on reusable workload patterns in order deliver dynamic cloud services.

Automate

Entry Level Cloud
Standardization & Automation

- Customers begin to standardize their environments for faster delivery of services.
- Automation is employed to provision and deprovision virtual guest environments using a shared pool of resources.
- Some customers may choose to allow end-user self service provisioning/deprovisioning.

Integrate

Virtualization
Infrastructure & Virtualization Management

This is where System z drives differentiation!

- Infrastructure Scalability: Consolidate more workloads per core; elastic scaling using Capacity On Demand
- Virtualization Management: More virtual servers in a single footprint
- Security: Highest security rating for tenant isolation
- Reliability & Availability: Unparalleled in the industry

Why do these customers choose Cloud on System z?

- **Scalability** – Cloud on System z customers need to scale quickly and efficiently both up and down with complete confidence and zero loss of availability
  - 800 Bank branches
  - 1200 ATM's
  - 35% YoY growth
- **Availability** – a guaranteed capability there when you need it to bolster a reputation for the highest service quality
  - A SaaS Cloud
  - 69,000 users
  - 100% YoY growth
- **Multi-Tenancy** – delivering core server incubation services for local businesses
  - An IaaS Cloud
  - 60+ tenants
- **Performance** – consolidation of a distributed x86 Linux domain onto a single IBM Cloud on System z with Linux
  - 60% compute performance improvement
  - 25% employee efficiency
- **Security** – unmatchable world class system security with ensured isolation and protection of each virtual server environment
  - Improved business continuity posture
  - Enhanced security

zEnterprise drives delivery of real bottom line savings

<$1 Per day per Linux virtual

90% Space reduction

80% Less energy

70% Labor savings

55% Less TCO

Cut electricity costs by 60 percent and floor-space requirements by 50 percent

BALDOR

Reduced datacenter footprint by 30%, heat output by 33%, carbon footprint by 39%, and expects a 20% ROI

bnz

Labor savings of 30%, infrastructure savings of 50% (Facilities: Electric, real estate, network, heating/ cooling, Software license)

IBM Blue Insight

Reduce TCO by up to 80 percent, compared to a traditional distributed x86 environment

Atos Origin

Enabled transaction growth of 600% in mobile, 200% in Internet and 60% in-branch

SICOOB

Delivering new services to empower the general public to create new citizen-centric applications.

CITY AND COUNTY OF HONOLULU · STATE OF HAWAII

Credit Union Systems for Brazil (Sicoob) avoids $1.5M in annual costs with IBM mainframe cloud consolidation

Business Challenge:

- Goal of being primary provider of financial services to members
- Needed flexible, secure and scalable IT infrastructure to support reliable 24/7 service and mobile access.

Solution:

- Private System z cloud running 300 production environments
- Replacing distributed, Intel processor-based servers with Linux on z virtual servers

Business Results:

- Avoid $1.5m per year in energy costs, while growing 600%

"We grew by nearly 600 percent; Internet banking grew by 200 percent; for mobile solutions, growth was 600 percent. It would not have been possible to support this growth without IBM System z."

Nationwide Insurance cuts costs with smart workload consolidation of Cloud on System z

Business Challenge:

- 3,000 distributed servers inefficient and costly. 80-90% capacity unused, software licenses on every server
- Need to standardize development in Fit-for-Purpose model
  - Take advantage of best platform that met characteristics
- Monitoring/capacity management spans x, z and p based on SLA

Solution description:

Consolidated distributed servers to Linux virtual servers running WAS, DB2, and z/VM on System z creating a multi-platform private cloud optimized for all its different workloads

Customer Value:

- Application Development
- 80 percent reduction in power, cooling and floor space requirements

"The creation of a private cloud built around the z196 servers supports our business transformation goals by enabling the rapid, seamless deployment of new computing resources to meet emerging requirements," Jim Tussing, CTO for Operations, Nationwide

Virtualization and Cloud Portfolio for Linux on System z

Virtualization	Entry Level Cloud	Advanced Cloud
Infrastructure & Virtualization Management	Standardization & Automation	Orchestration & Optimization

zEnterprise: zEC12, zBC12

- Massively scalable
- Characterized by great economics / efficiencies
- Highly secure / available

z/VM 6.3

- Support more virtual servers than any other platform in a single footprint
- Integrated OpenStack support

Linux on System z

- Distributions available from RedHat and SUSE

IBM Wave for z/VM

- A graphical interface tool that simplifies the management and administration of z/VM and Linux environments

Differentiation

xCAT

- Shipped with z/VM 6.3
- Allows customers to set up a rudimentary cloud environment, without acquiring any additional product
- Based on open source code
- Focused on a different layer and not designed for upward integration to SmartCloud suite

SmartCloud Entry *

- A simple, entry level cloud management stack
- Based on OpenStack
- First tier in the SmartCloud suite of cloud management products

Standardization

Cloud Ready for Linux on System z

- Image-based cloud service delivery with integrated provisioning, monitoring, service catalog & service desk, storage management, and HA

SmartCloud Provisioning

- Builds on functionality of SmartCloud Entry and adds middleware pattern support for workload deployment

SmartCloud Orchestrator *

- Builds on functionality of SmartCloud Provisioning and adds runbook automation

Service Lifecycle Management

* *System z support currently in development*

z/VM 6.3 – Virtualization with Efficiency at Scale

Improved economies of scale with z/VM Support for 1TB of Real Memory

- **Better performance for large virtual machines**
  - 4x increase in memory scalability while continuing to maintain greater than 90% resource utilization, unmatched in the industry for a multiple diverse workload environment
- **Additional vertical scalability to reduce logical partition (LPAR) sprawl**
  - Considerably more virtual machines may be consolidated into a single LPAR depending on workload characteristics
- **Reduced administrative expense**
  - Savings for management of smaller number of large capacity z/VM host servers

Improved Price Performance with z/VM HiperDispatch

- **Higher and more efficient utilization of CPU resources[1]**
  - Efficient dispatching of CPUs

OpenStack Enablement for Cloud

- **Enables integration for Software Defined Environment**

Simplified migration to z/VM 6.3 with upgrade in place

- **Reduces the impact of an upgrade on active workloads and eliminates the need for separate install volumes**

Support from Tivoli products on day one

- **OMEGAMON XE on z/VM and Linux V4.3**
- **Operations Manager for z/VM V1.5**
- **Backup and Restore Manager for z/VM V1.2**

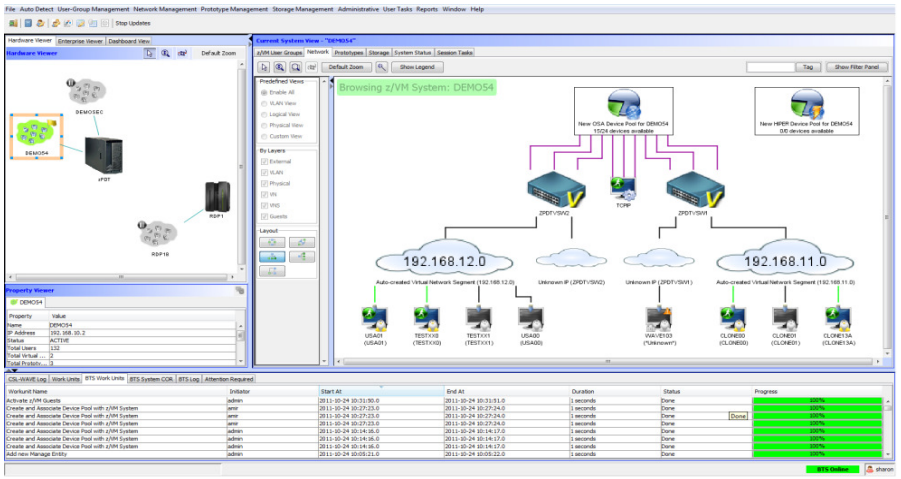
Learn More:
www.vm.ibm.com/zvm630

[1] **The performance boost expected with z/VM HiperDispatch depends on workload characteristics. Memory-intensive workloads running on large numbers of logical processors (16 to 32) are most likely to achieve the highest performance gains.**

IBM Wave for z/VM – High Level Overview

IBM Wave for z/VM (formerly CSL-WAVE) provides the graphical interface that simplifies and helps to automate the management of z/VM and Linux on System z virtual servers.

- **Monitors and manages virtual servers and resources** from a single graphical interface
- **Simplifies and Automates** tasks
- **Provisions virtual resources** (Guests, Network, Storage)
- **Supports advanced z/VM capabilities** such as Single System Image and Live Guest Relocation
- **Allows delegation of administrative capabilities** to the appropriate teams



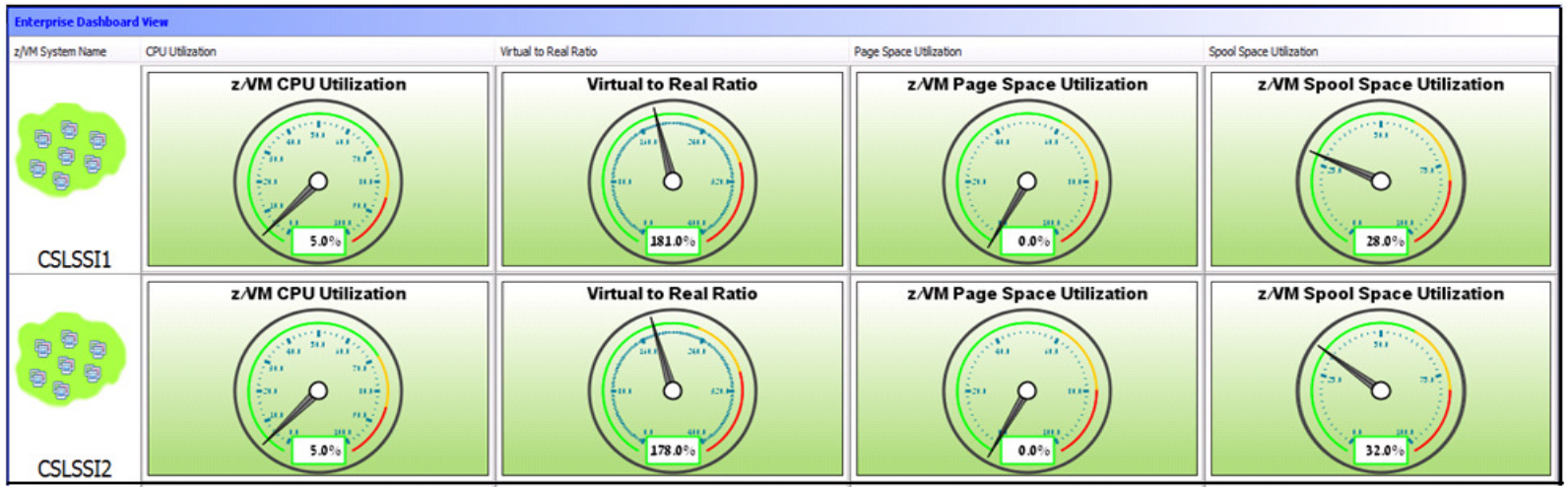
A simple, intuitive graphical tool providing management, provisioning, and automation for a z/VM environment, supporting Linux virtual servers.

IBM Wave for z/VM Foundational Capabilities

- **Inventory Management**
  - Discovers z/VM resources and the relationships among them across multiple LPARs, SSI clusters, and CECs
  - Identifies resource and relationship changes and accommodates them in the resource model and its visual representation
- **Visualization**
  - Rich interface with graphical and tabular displays with layered drill down
- **Monitoring, Systems Management, and Administration**
  - Allows the state of resources to be observed and manipulated in an intuitive manner
- **Automation**
  - Simplifies the process of performing a function across multiple virtual machines and z/VM systems
- **Team Empowerment**
  - Enables different constituencies (operations, systems programming, application development, project management, end users) to exercise their authority to manage appropriate aspects of the z/VM environment

Comparing Performance Monitoring with IBM Wave for z/VM and Omegamon XE on z/VM and Linux

- IBM Wave for z/VM provides real-time monitoring of virtual server resources from a single graphical interface



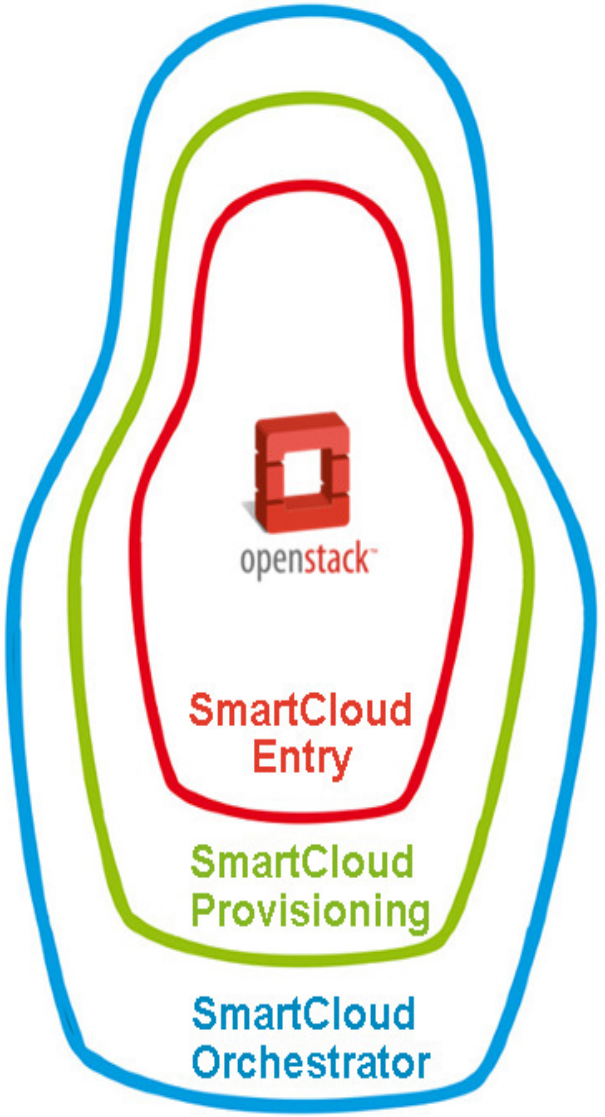
- With Omegamon XE on z/VM and Linux, you have not only real-time monitoring of z/VM, but you also have:
  - Monitoring of individual Linux guest environments
  - Ability to set service level thresholds and generate events when exceeded
  - Historical view of monitoring data
- Both Omegamon XE on z/VM and Linux and IBM Wave for z/VM can coexist in customer environments
- Both gather the data from the Performance Toolkit for z/VM

Cloud Ready for Linux on System z

- Cloud Ready for System z is an image-based deployment for cloud service delivery and management on the System z platform leveraging multiple Tivoli products
- Cloud Ready is a solution with integrated services available today and provides:
  - Automated provisioning (via TPM workflows)
  - Service Catalog
  - Monitoring, Backup/Recovery, HA, accounting/chargeback, storage management
- **Product List:**
  1. Tivoli Provisioning Manager / Tivoli Service Automation Manager
  2. Omegamon XE on z/VM and Linux
  3. Tivoli System Automation for MultiPlatforms
  4. SmartCloud Control Desk
  5. Tivoli Storage Manager
- **Includes services to have your cloud service management solution up and running**
- Clients that invest in Cloud Ready will be able to migrate to SmartCloud Orchestrator when available

SmartCloud Suite of Cloud Management Software

- **SmartCloud Entry**
  - A simple, entry level cloud management stack that can be used as a turn-key solution that cost-effectively delivers basic cloud capabilities across all supported IBM platforms.
  - Based on OpenStack – IBM's strategic code base for all cloud management software and services.
- **SmartCloud Provisioning**
  - Builds on functionality of SmartCloud Entry and adds workload pattern support for application deployment.
  - Same pattern technology support as found in IBM Workload Deployer and PureApp Server
- **SmartCloud Orchestrator**
  - Builds on functionality of SmartCloud Provisioning and adds runbook automation using WebSphere Business Process Manager (BPM) technology (aka Lombardi)
  - Support will be provided to allow SmartCloud Orchestrator runbook workflows to invoke legacy TPM workflows for migration and backward compatibility



Cloud Management Suite for System z provides critical workload provisioning to z

Hosted Beta Available
https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?source=swerptiv-p3084-4

Easily move cloud services to System z with standardized, open orchestration

- Provision workloads to z Linux from SmartCloud Orchestration running on x and p

Fully automate deployment and lifecycle management of cloud services across workloads

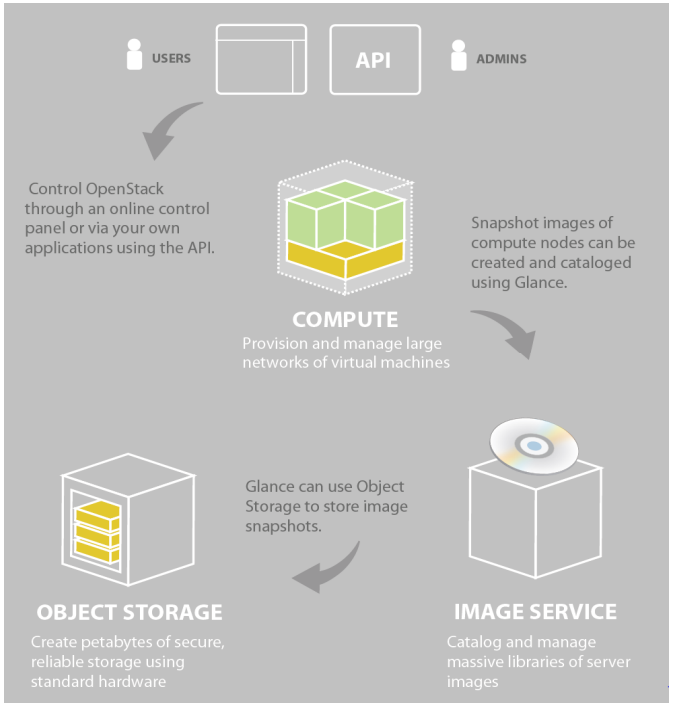
Simplify cloud operations and increase productivity with OMEGAMON monitoring of services

Increase availability of cloud data with easy to implement backup/recovery

What is OpenStack?

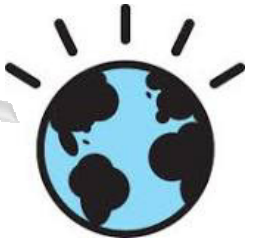
OpenStack is a global collaboration of developers and cloud computing technologists that seek to produce a ***ubiquitous Infrastructure as a Service (IaaS) open source cloud computing platform*** for public and private clouds. OpenStack was founded by Rackspace Hosting and NASA jointly in July 2010.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

Open source and open ecosystems are important factor in growing markets and fostering technology innovation



September 2012: IBM orchestrates the launch of The OpenStack Foundation boasting $10 million in funding and 5,600 members changing the dynamics of the Cloud ecosystem

150+ interconnected OSS Projects

In the era of a Smarter Planet, IBM will continue to leverage open source ecosystems ….

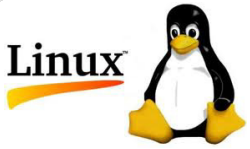
30-50 OSS Projects

In the era of e-business…

IBM leverages the **nascent open source** software movement…

…and **becomes** the **market leader** in SOA implementations and the world's largest software company

20-30 independent OSS Projects



November 2001 – IBM rallies 150 influential vendors and the development community around a new tools environment with a $40 Million software donation disrupting the leadership of the software development ecosystem

September 1999: IBM capitalizes on an untapped market trend and begins participating in the community development of Linux with a $60M annual investment

June 1998 – IBM enters into an engineering agreement with The Apache Group for development of the open-source Apache HTTP server software eventually becoming the leader of the new Application Server market

System z Cloud Ecosystem Overview for *Linux on System z*

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

IBM Products & Offerings

- **zEnterprise: zEC12, zBC12**
- **Linux on System z**
- **z/VM 6.3**

xCAT
- Extreme Cloud Administration Tool
- Now shipped in z/VM 6.3

- **Cloud Ready for Linux on System z**
- **Smart Cloud Entry ***
- **Cloud Management Suite for System z (powered by SmartCloud Orchestrator) ***

**** System z support currently in development***

IBM Wave
- Hypervisor Manager
- Graphical management of z/VM environment
- To be sold with ELS, ECS

ISV Solutions

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

CA AppLogic
- Provided by **CA Technologies**
- Provisioning and full lifecycle management for both distributed and z/VM environments

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

Open Source Options

OpenStack
- Being enabled for z/VM first and eventually zManager
- Being used as a code base for SCE / SCP / SCO

Introducing CA AppLogic® for System z: a turnkey application platform

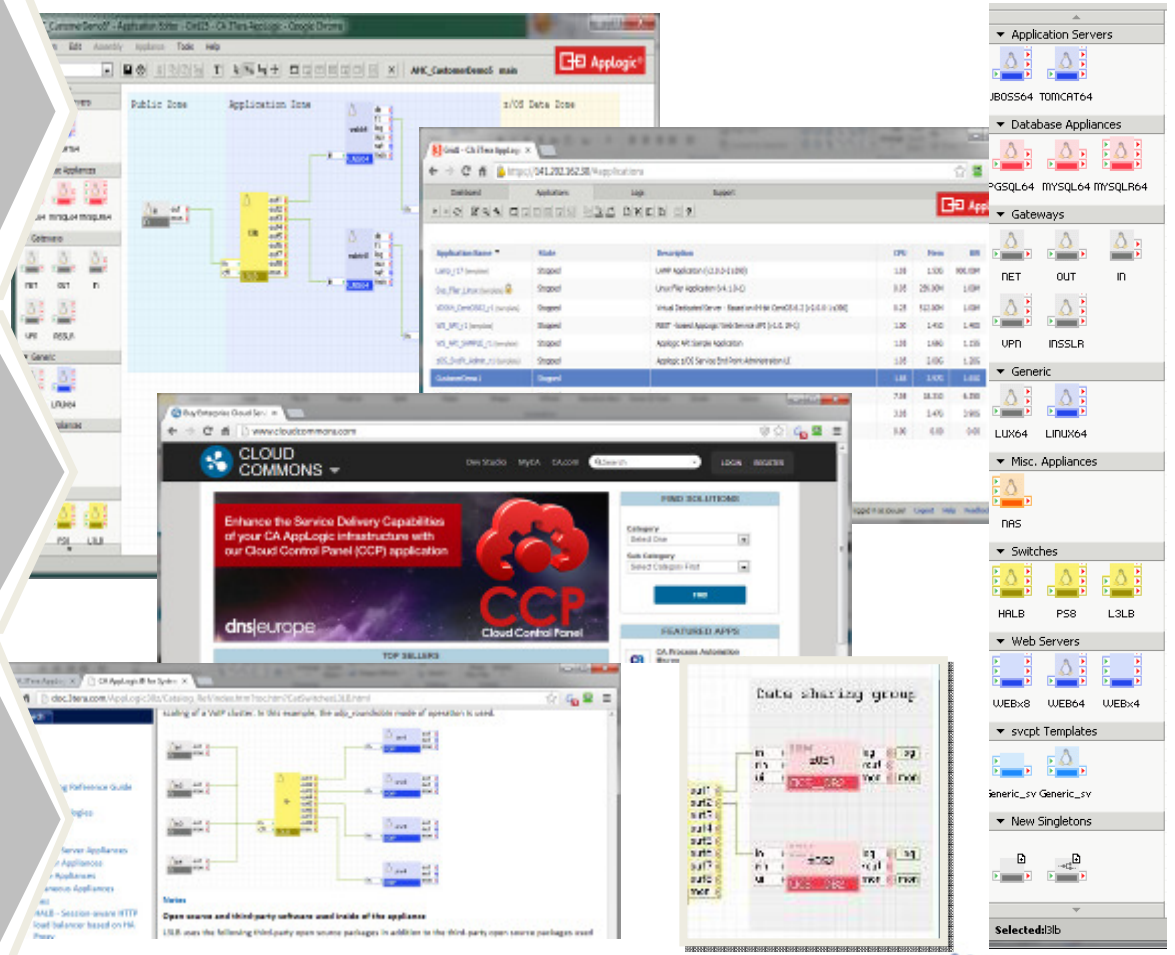
Virtualize Linux on System z application and its **ENTIRE infrastructure**

Firewalls, Load balancers, Web servers, App servers, Storage

Create, test, provision, deploy and manage it all as a single unit called a ***Virtualized Business Service***

Simplify Deployment

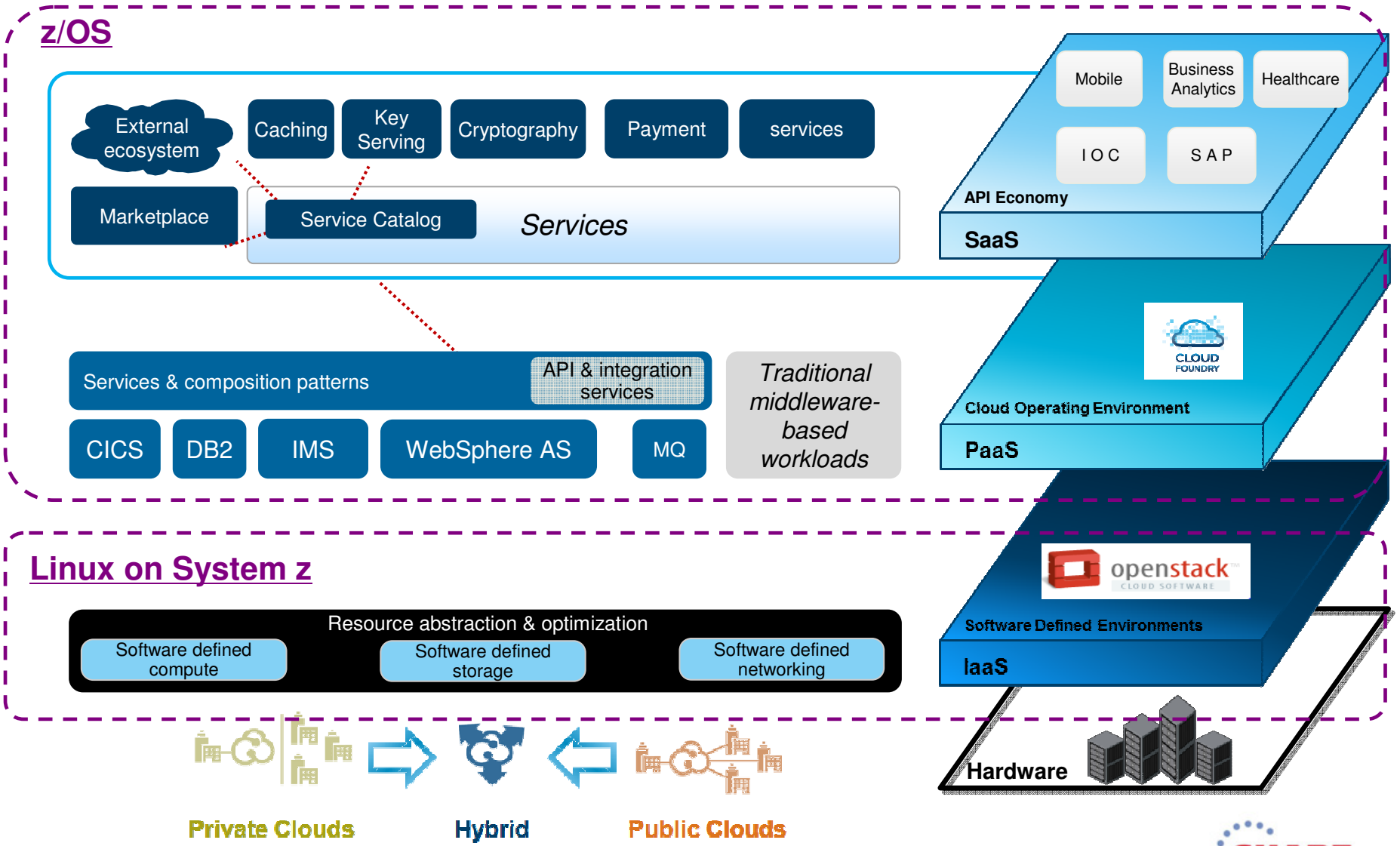
Automatically scale, easily migrate and instantly replicate entire Virtualized Business Service



Moab Cloud Suite provides intelligent cloud management and optimization

- **Self-service request catalog** for efficient and fast VMs/multi-VMs reduces delivery time and issues
- **Auto provision optimal VM service resources** reduces provisioning costs 60-70 percent
- **Optimize workload placement** to ensure VM service performance SLAs are met
- **Chargeback or report on resource usage,** requested use or actual, to enable better usage decisions
- **Self-service VM lifecycle management** to improve utilization and reduce management costs and time
- **VM decommissioning** for high utilization and reduce resource waste

System z Cloud Architecture



Cloud Computing on z/OS

With z/OS, we need to think about cloud just a bit differently…..

- Today in cloud environments on distributed servers, or even with Linux on System z, customers would provision a virtual machine with an instance of an operating system to run a single workload.
  - To deploy another workload would mean another virtual machine with another instance of the operating system.
- However, in the context of z/OS, this methodology goes against everything we have come to know and expect about z/OS.
  - On z/OS, you have the ability to run multiple disparate workloads with different service levels for those hosted workloads with isolation or multitenancy.
- Hence our **approach for cloud on z/OS** is not focusing on the provisioning of operating system instances, but rather **the ability to provision multiple workloads in a single z/OS instance.**

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*

100+ requirements satisfied!

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

… 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

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

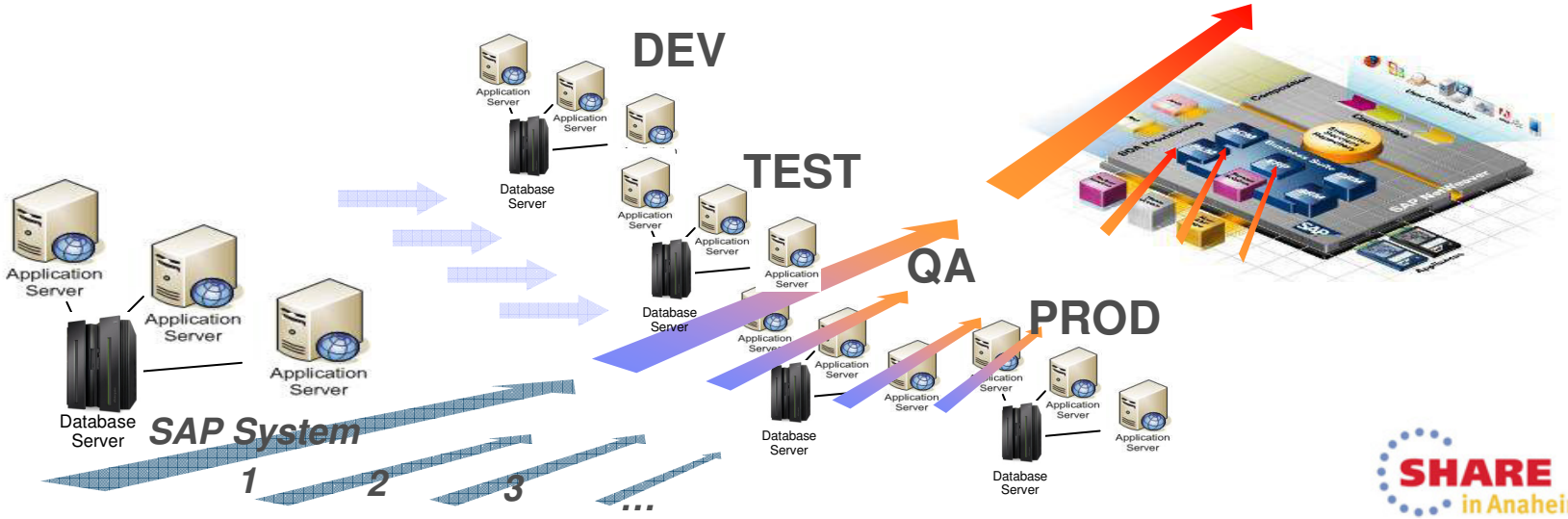
IBM Entry Cloud Configuration for SAP Solutions on zEnterprise

Customer Challenges:

- Explosive growth in the number of SAP systems
- Dependence on labor intensive processes
- SAP operational budgets are draining valuable resources
- Need for improved productivity of teams to implement and manage

Solution:

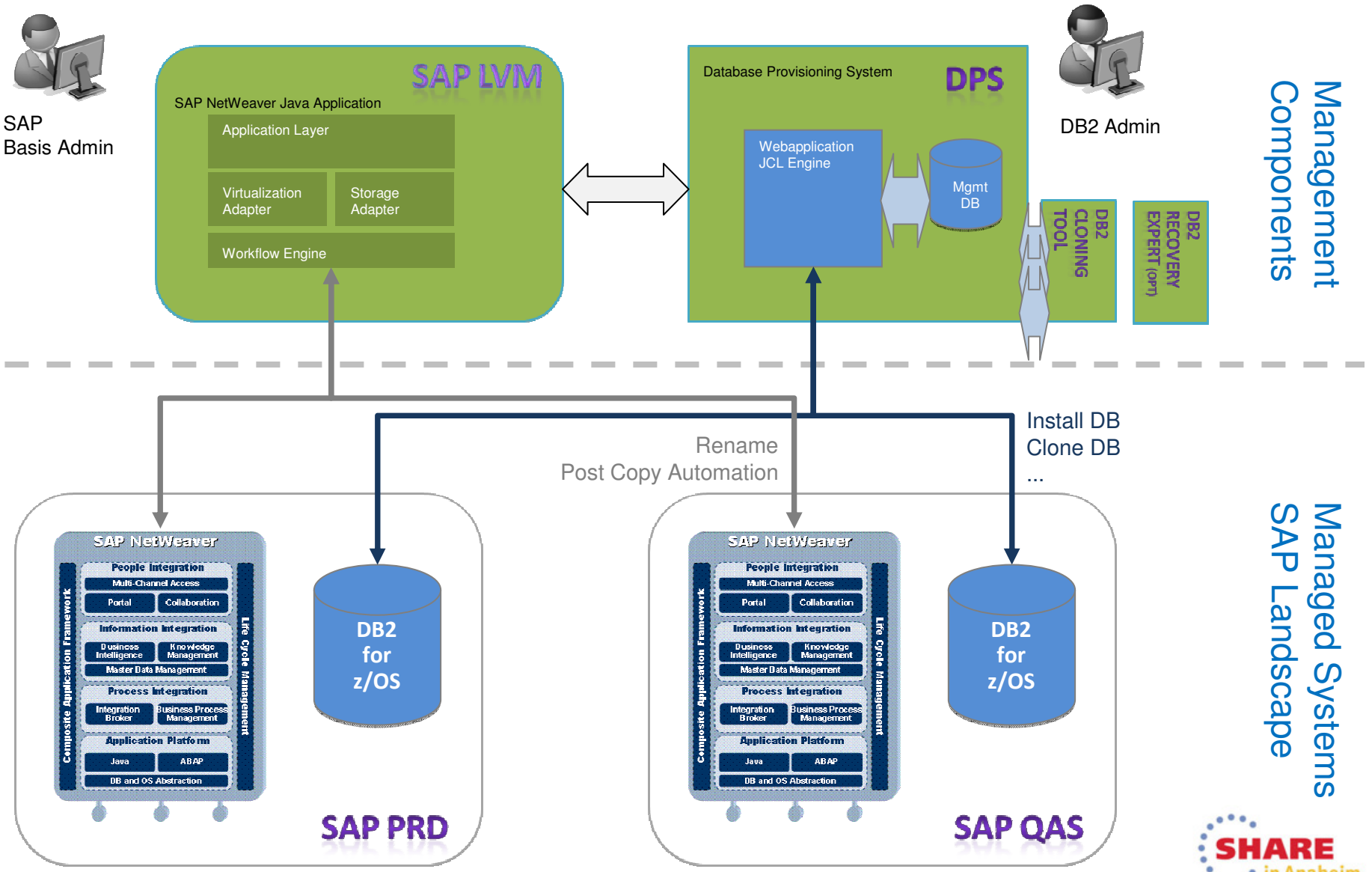
A cloud enablement offering, that combines technology and services to automate, standardize, and speed up day-to-day operations of SAP on System z environment resulting in reduced operational costs and faster time to value.



Entry Cloud Solution for SAP

- Automated lifecycle management operations
  - Provisioning
    - Installation of DB2 Subsytems
    - Installation of DB2 Data Sharing Groups
  - Backup / Restore / Clone
    - Offline Backup / Restore (logical dump)
    - Clone based on Offline Backup
    - Backup System (System Level Backup)
    - Clone based on SLB
  - Patch Management
  - Release Migration
  - Extensibility (custom parameters, custom workflows)
- Expose services to external management systems via REST Interface

Entry Cloud Solution for SAP



Database Provisioning System - Observed Efficiences

Process		Before (w/o DPS)	After (w/ DPS)
DB Admin	Install DB2	1 day	12 min
	Maintain DB2 libraries	½ day	8 min
	Clone DB2	2-3 days	20 – 180 min
Unix Admin	Install Operating System	1 day	30 – 60 min
SAP Basis	Prepare Upgrade / Provide SAP System	2-3 days	~ 40 – 200 min

Deploying the IBM entry cloud configuration for SAP solutions on zEnterprise enables Endress+Hauser InfoServe to automate routine IT tasks

Endress+Hauser
People for Process Automation

Endress+Hauser InfoServe is the IT competence center of Endress+Hauser (E+H), a leading supplier of industrial measurement and automation equipment. With the SAP application landscape they support business processes of the complete group worldwide.

The need:
E+H were looking for an efficient solution to reduce costs for SAP lifecycle operations like the SAP System Refresh. With their highly skilled IT staff they also wanted to focus on the qualify of service for the SAP operations rather than spending lots of money and time when managing complex technologies.

The solution:
E+H started to implement parts of the IBM Entry Cloud Configuration for SAP Solutions on zEnterprise. IBM's entry cloud configuration and SAP's NetWeaver Landscape Virtualization Manager provide all the means to automate the entire system refresh scenario.

The benefits:
- In phase 1 E+H implemented the Database Provisioning System (DPS) which covers
  labor intensive database operations, like cloning
- Significantly faster refreshing of SAP databases: going down from 8 hours to 2 hours
- Effort have been significantly reduced through automation
- Relieved strain on IT staff as well as reduced risk of errors from manual operations

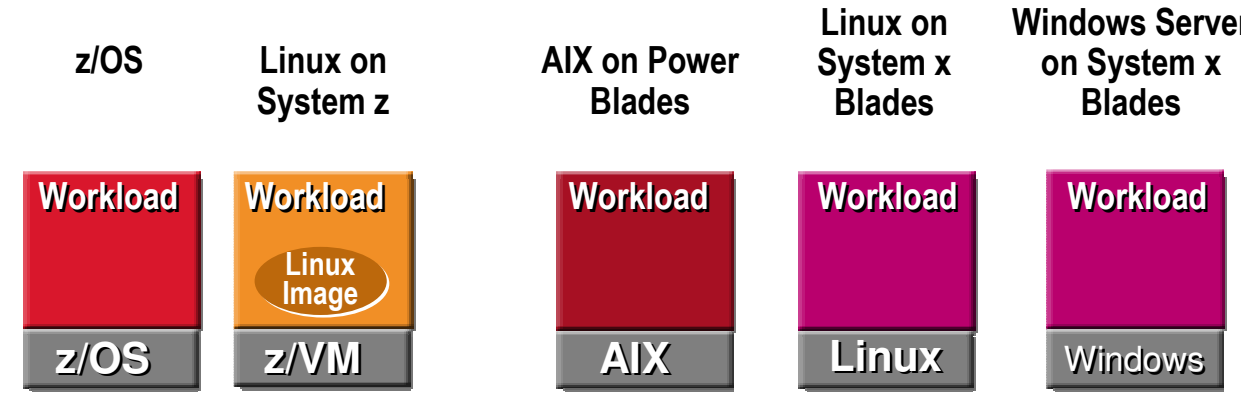
"We run our SAP Landscape on zEnterprise because we need very high availability and the transaction performance. But at the same time we are seeing increased demand for SAP System copies to support critical new projects. And we are seeing this across our whole SAP landscape. Deploying the IBM Entry Cloud Configuration for SAP Solutions on zEnterprise enables us to automate routine IT tasks. This not only helps us to reduce the strain on our IT staff, but it also helps reduce the risk of errors from manual operations. Cloud service automation allow us to focus on the SAP service qualities we need for our business, rather than the complexities and costs of managing the underlying technologies."

— Hansjörg Klaiber - Department Manager Computer Center, Endress+Hauser InfoServe GmbH+Co.KG

Solution components
- IBM Entry Cloud Configuration for SAP Solutions on zEnterprise
- IBM zEnterprise System

SHARE in Anaheim

IBM zEnterprise System: A Heterogeneous Platform for Cloud



zEnterprise

zEnterprise BladeCenter Extension (zBX)

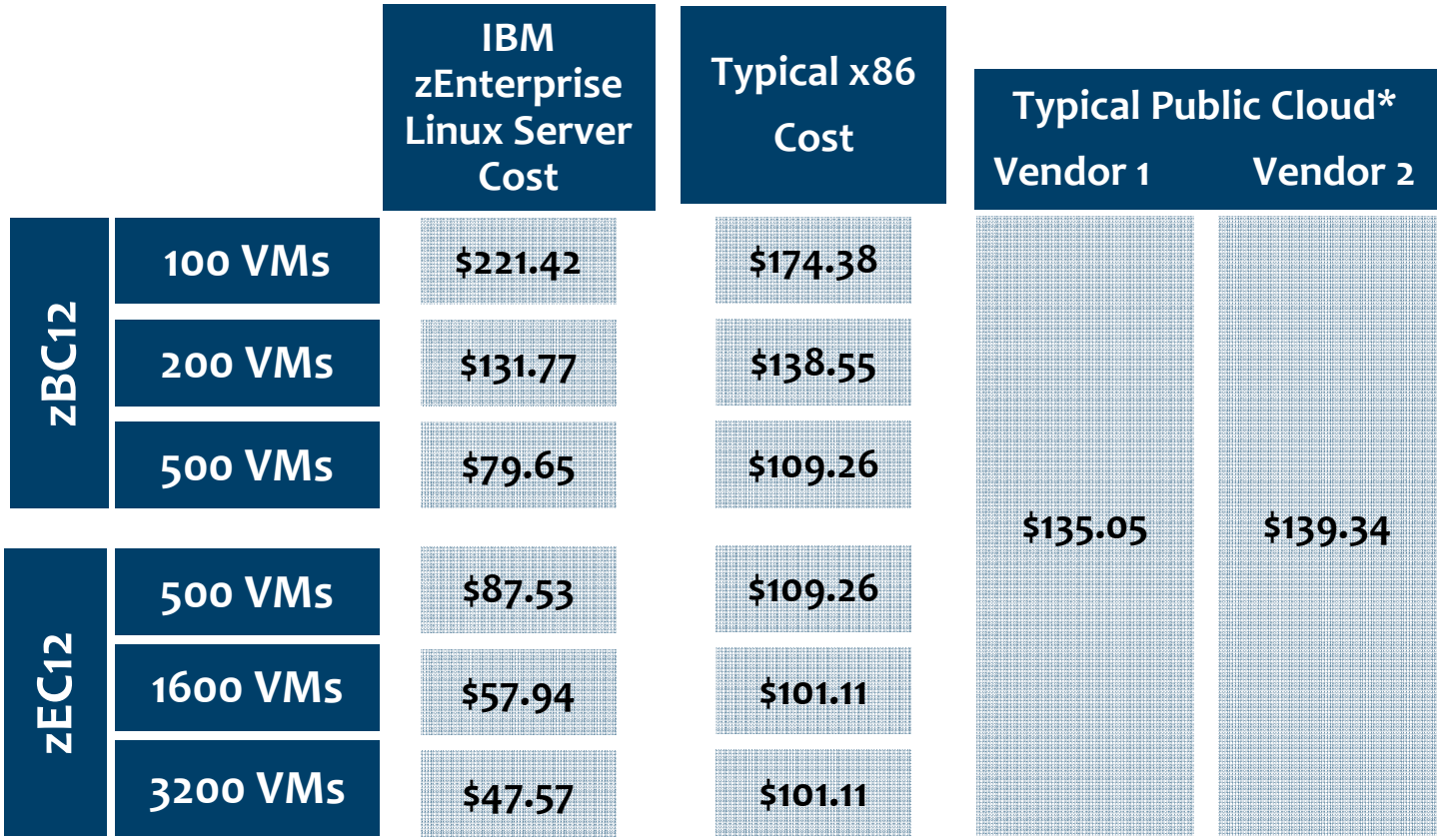
79% lower overall TCO*

Fit-for-Purpose Strategy

Assign workloads to the environment that best satisfies requirements

Achieves overall lowest cost per workload

zEnterprise can deliver the same services in a more efficient way than distributed platforms



Source: IBM Analysis. Includes HW, SW licensing, service & support, energy usage, floor space, and IT personnel costs

* Published WWW pricing 05-28-2012

Consolidate and Deploy Software to the "Best Fit" Technology

- Extreme consolidation of servers and networking
- Run up to hundreds of distributed server workloads on a single server
- Fewer components and reduced complexity
- Excellent price performance from a software licensing perspective
- Industry-best virtual I/O bandwidth and reliability
- Superior levels of virtual server provisioning, monitoring and workload management
- System z qualities of dynamic resource management and capacity-on-demand

Recommended Workloads for Cloud on System z*

- **Data services**: Cognos, SPSS, DB2, InfoSphere, Informix®, Oracle Database, Builders WebFOCUS, …
- **Business applications**: WebSphere Application Server, WebSphere Process Server, WebSphere Commerce, …
- **Development & test**: e.g. of WebSphere/Java applications – Rational Asset Manager, Build Forge®, ClearCase®, Quality Manager
- **Email & collaboration**: Lotus Domino®, Lotus Collaboration (Sametime, Connections, Quickr™, Forms) WebSphere Portal, …
- **Enterprise Content Management**: FileNet® Content Manager, Content Manager, Content Manager On Demand
- **Business Process Management**: Business Process Manager, WebSphere Business Monitor, FileNet Business Process Manager, WebSphere Operational Decision Management, …
- **Infrastructure services**: WebSphere MQSeries®, WebSphere Message Broker, WebSphere Enterprise Service Bus, DB2 Connect™, FTP, NFS, DNS, Firewall, Proxy, …

* *Source: IBM Market Intelligence 1Q2013*

System z Participates in the OpenStack Strategy

Self-Service

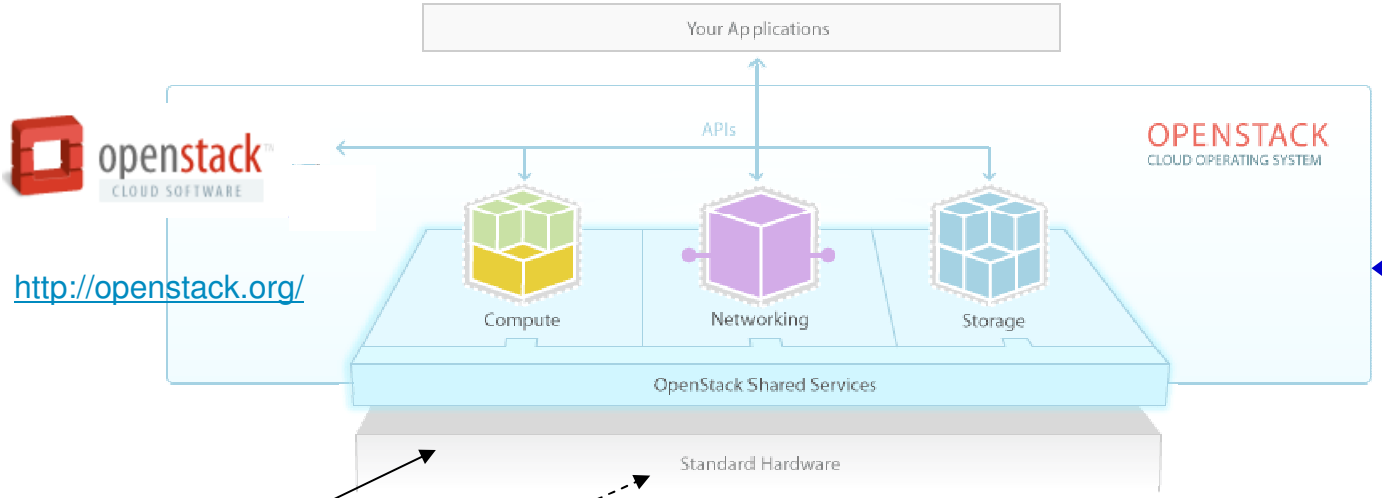
Services Catalog

Cloud Management Application

(including SmartCloud technologies)

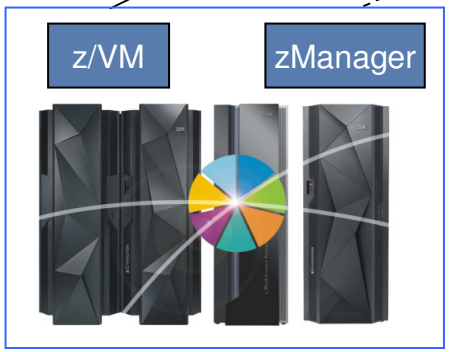
Multi-Tenant

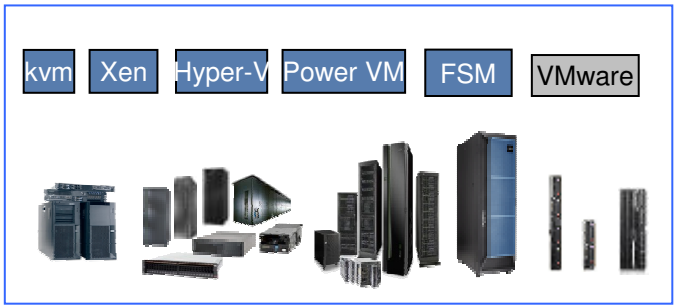
Billing and Charge-back



http://openstack.org/

Compute (Nova)
Storage (Cinder)
Network (Quantum)
Provision and manage virtual resources such as servers, networking, and storage.





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

Why You Should Implement a Private Cloud on IBM zEnterprise

- The IBM SmartCloud open cross-platform architecture includes zEnterprise within a fit-for-purpose framework
- zEnterprise optimizes critical business workloads for private clouds
- IBM zEnterprise is a platform for open heterogeneous enterprise private clouds
- zEnterprise provides the lowest TCO coupled with industry leading Quality of Service and security

Thank You!