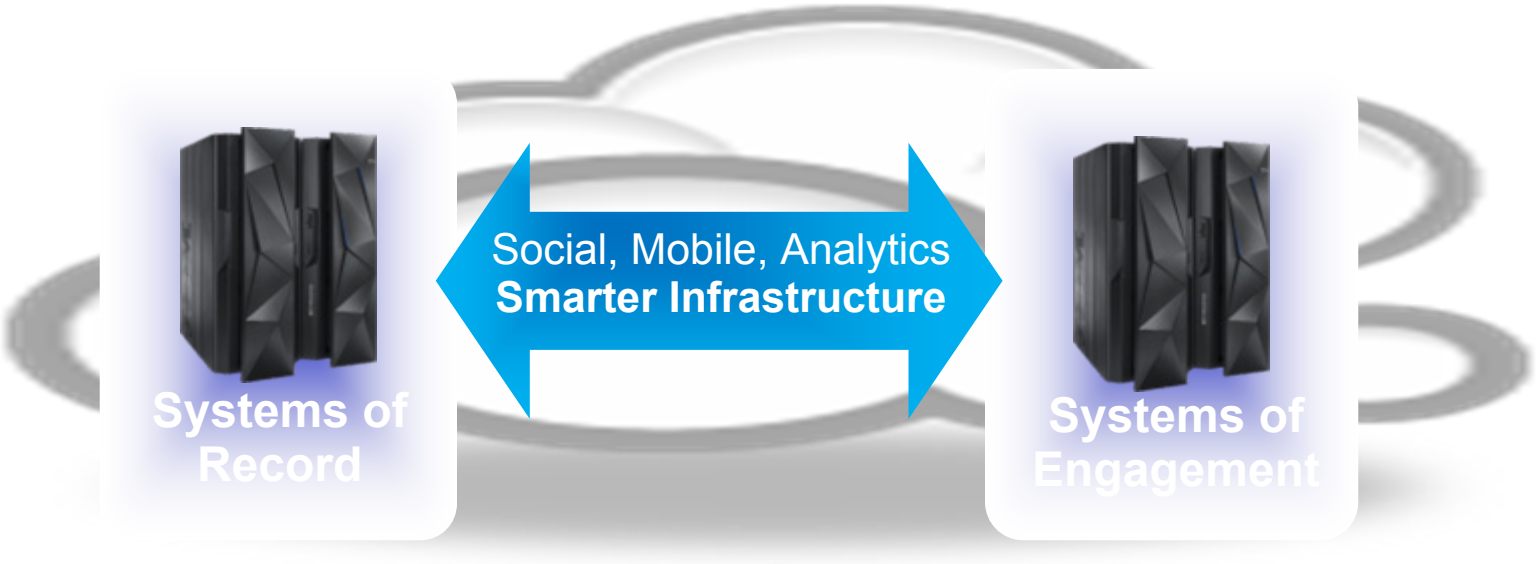
Moving to cloud?

System z provides key capabilities for optimizing workloads on Private/Hybrid Cloud

#mainframe

Rapid growth of next generation technologies supported seamlessly on zEnterprise

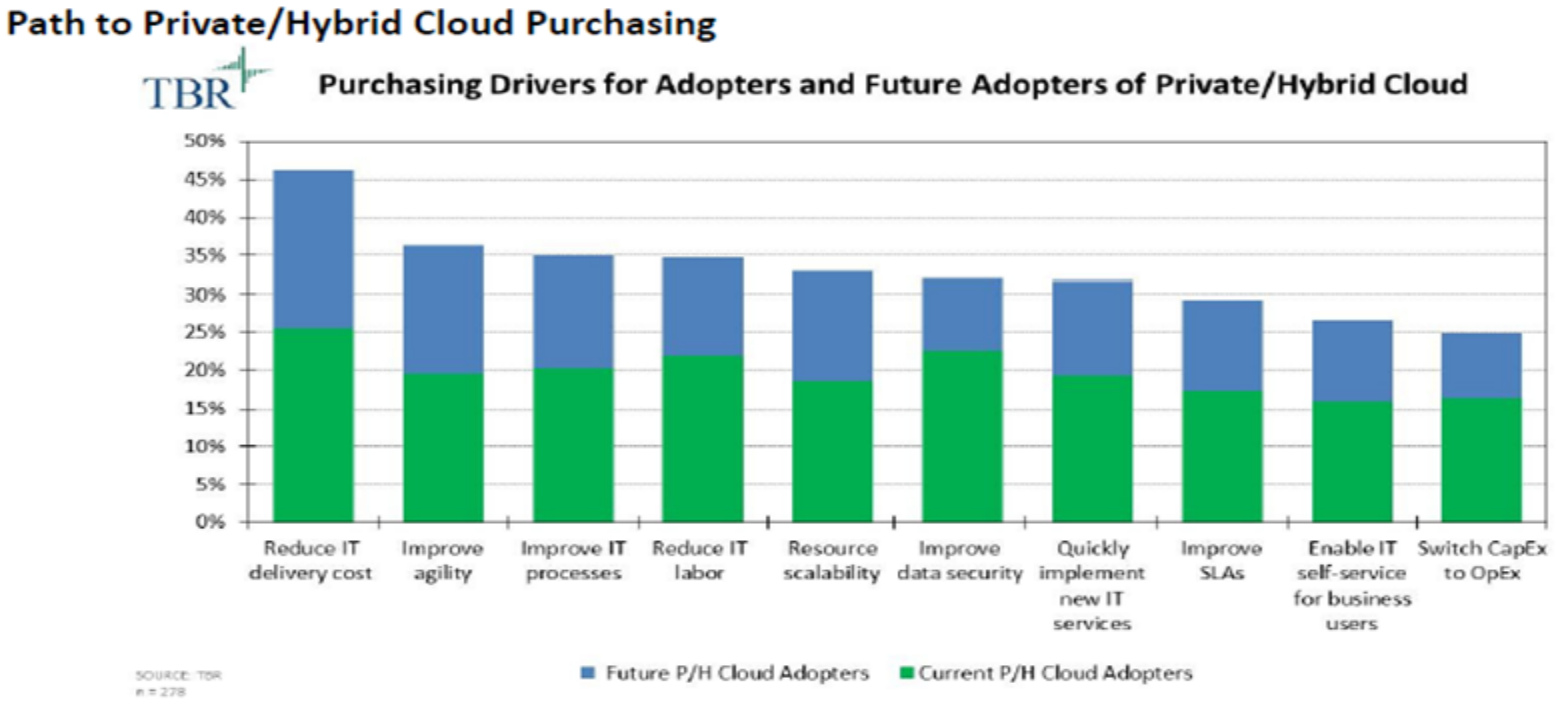
System z scaling model and security to manage and optimize both



- Business Transactions
- Quality of Service
- Command & Control
- Facts and data “source of truth”
- z/OS

- Mobile and Social
- Dynamic
- Interactions and Collaboration
- Insight, trends, analytics
- Linux on System z

What are we hearing: top cloud adoption drivers

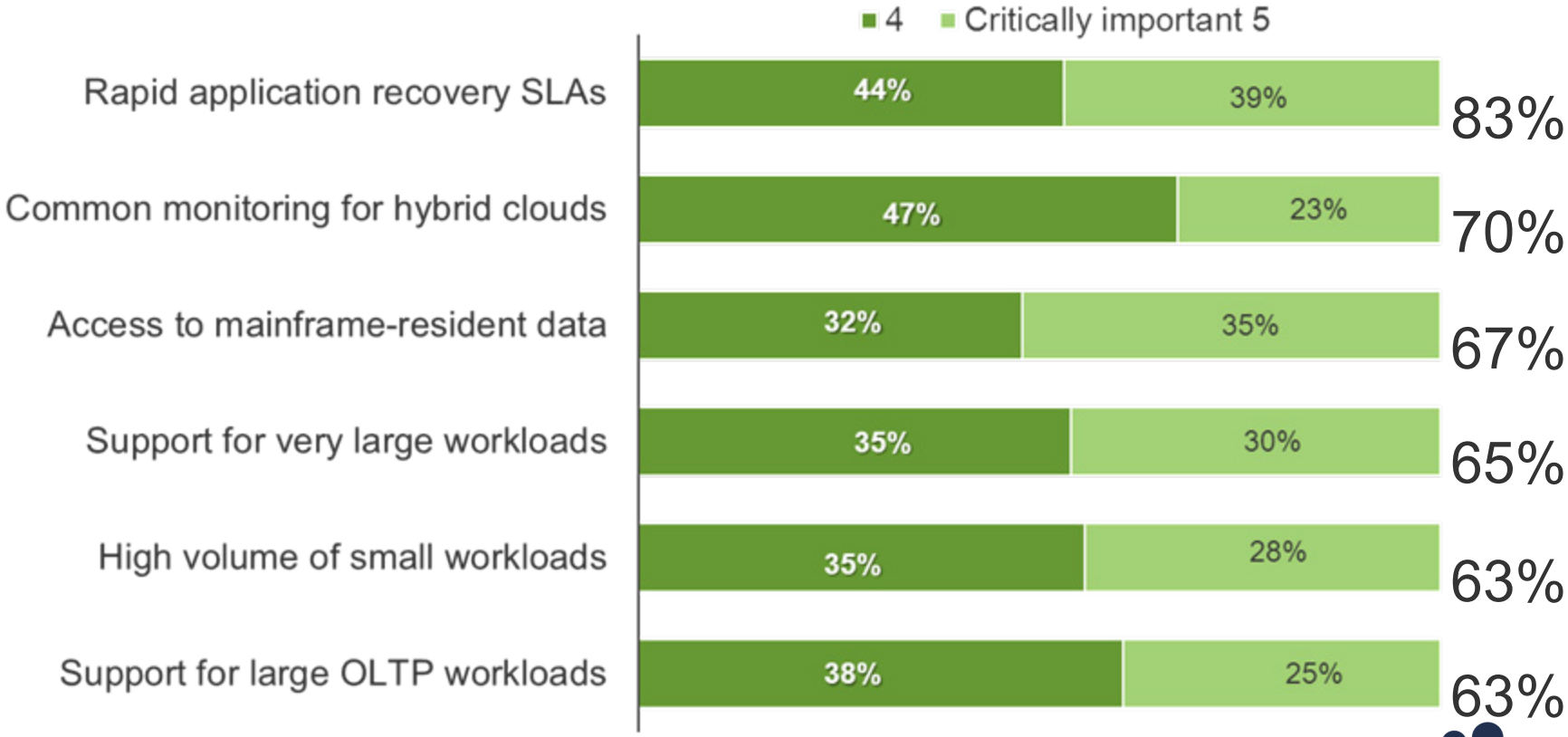


- **Reduce IT Delivery Cost**
- **Improve Agility**
- **Improve IT processes**

Source: TBR Private/Hybrid Workload Adoption Report, 2012

Forrester shows importance of mainframe infrastructure services in support of cloud workloads

How important is it for your cloud platform to have the following *workload* characteristics? (Top 6 factors)



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

Exploiting Cloud on System z provides significant business value day one and increased value over time

Customers can move across roadmap as business requirements grow

Toda

Infrastructure Teams

1 Virtualization Optimization

Image Management

Dev & Operations Teams

2 Workload Optimized Cloud

Workload Optimized Patterns

DevOps

CIO / IT Executive

3 Cloud Enabled Data Center

Self Service Provisioning

Usage Metering and Chargeback

Tomorro

CMSuite/LOB

4 Enterprise Cloud

Fit for Purpose Workloads

Disaster Recovery

Enterprise Security

Common Cloud platform built on an open standards reference model

Cloud Standards Customer Council

ISO International Organization for Standardization

W3C

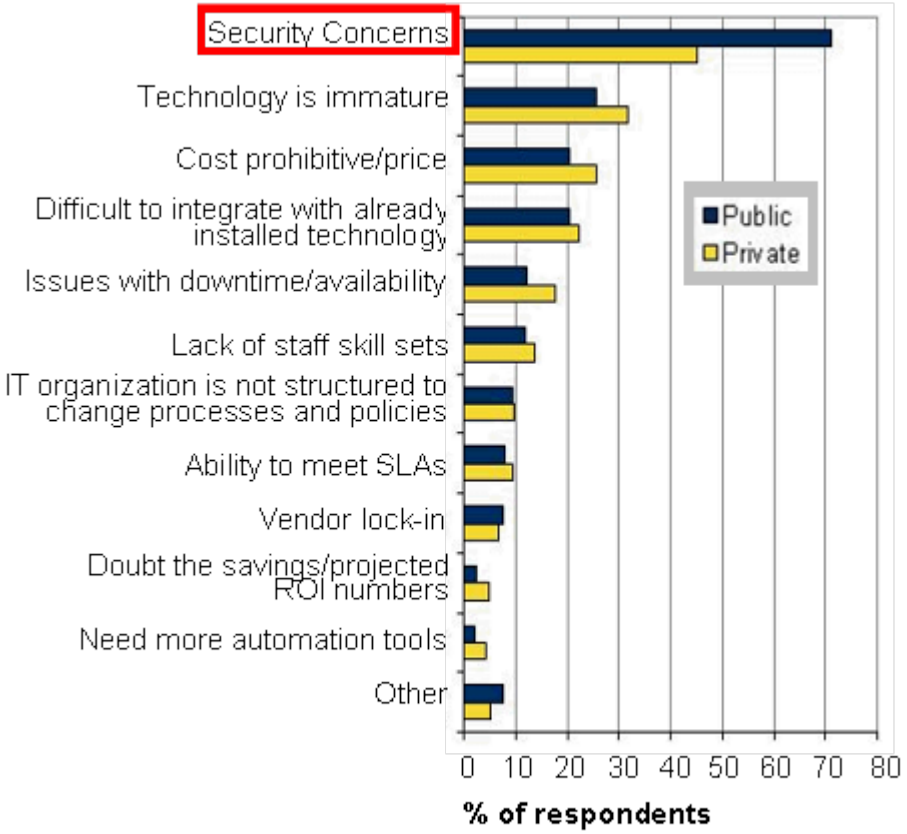
openstack CLOUD SOFTWARE

OASIS Advancing open standards for the information society

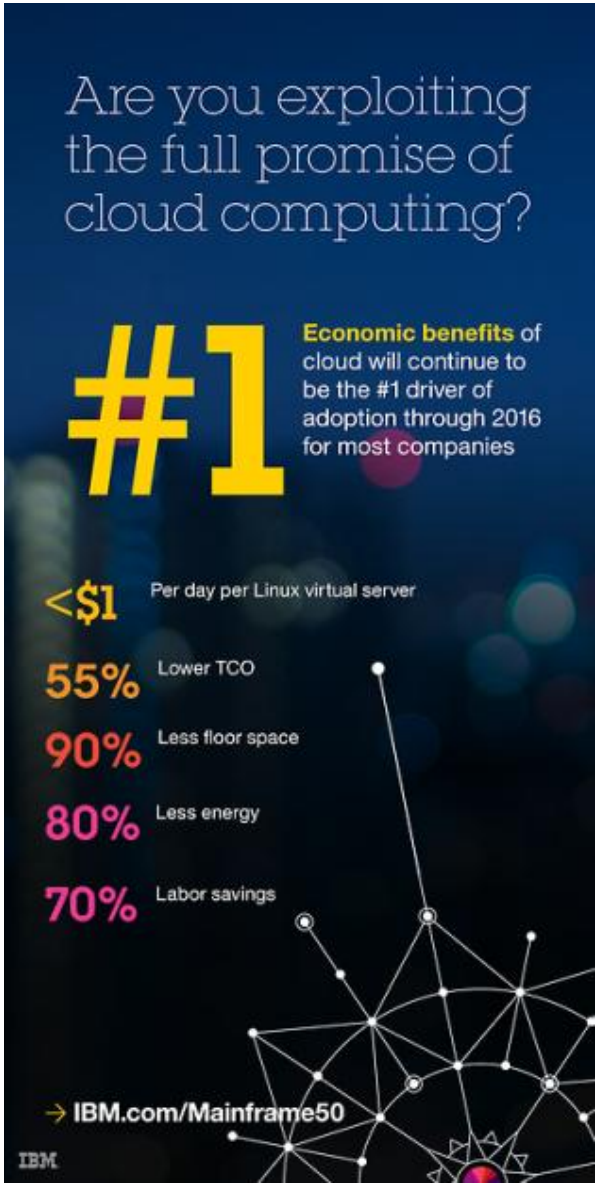
IBM Business Partner

In addition to strategic goals, there are challenges for moving to public and private cloud

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



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



But customers seeing value of deploying Cloud on zEnterprise

Increased Productivity
90%+ utilization

- Advanced workload management provisions resources on the fly for 90%+ utilization
- License savings due to zEnterprise power/scale
- 79% less TCA vs. leading public cloud alternatives

Higher Utilization
100,000 virtual servers

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

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

SICOOB

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."

IBM offers hybrid/private cloud across platforms with open "fit for purpose" approach

z Enterprise secure cloud for data	Power Systems for compute intensive applications	System x reduced cost & data→ insight	Pure Systems for workload optimized design
			
zEnterprise EC12	*Power 770, Power 780, Power 795*	*System x eX5, x3640*	*Pure Systems*

Flexibility to choose platform that meets business requirements

- Management tools are **consistent** and **interoperable** across platforms
- Open standards approach avoids vendor lock-in
- ***Now supported for deploying into SoftLayer***

Benefits:

- Reduced administration costs and increased staff productivity
- Lower total cost of ownership including software licensing savings
- Decreased risk with improved automation and workload consolidation

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

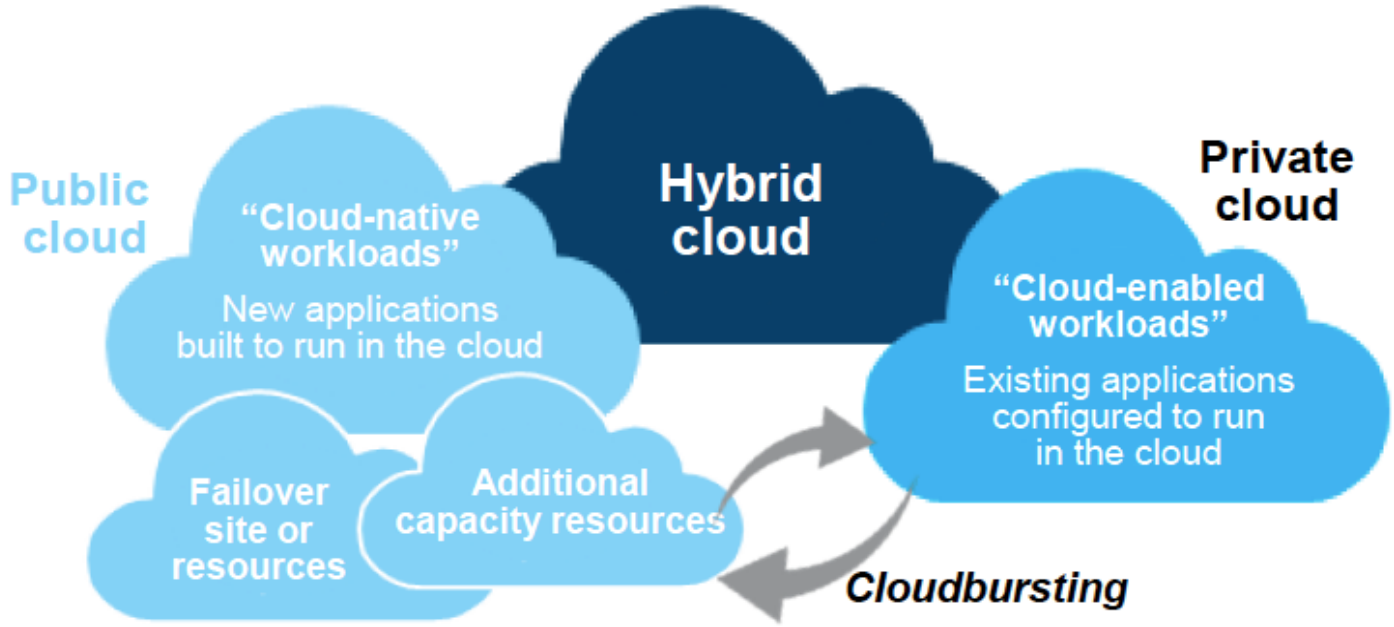
Solution description:
Consolidated distributed servers to Linux virtual servers running WAS, DB2, and z/VM on System z creating a multi-platform private cloud optimized for all its different workloads

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

Hybrid clouds enable companies to effectively leverage cloud capabilities for both new and legacy workloads

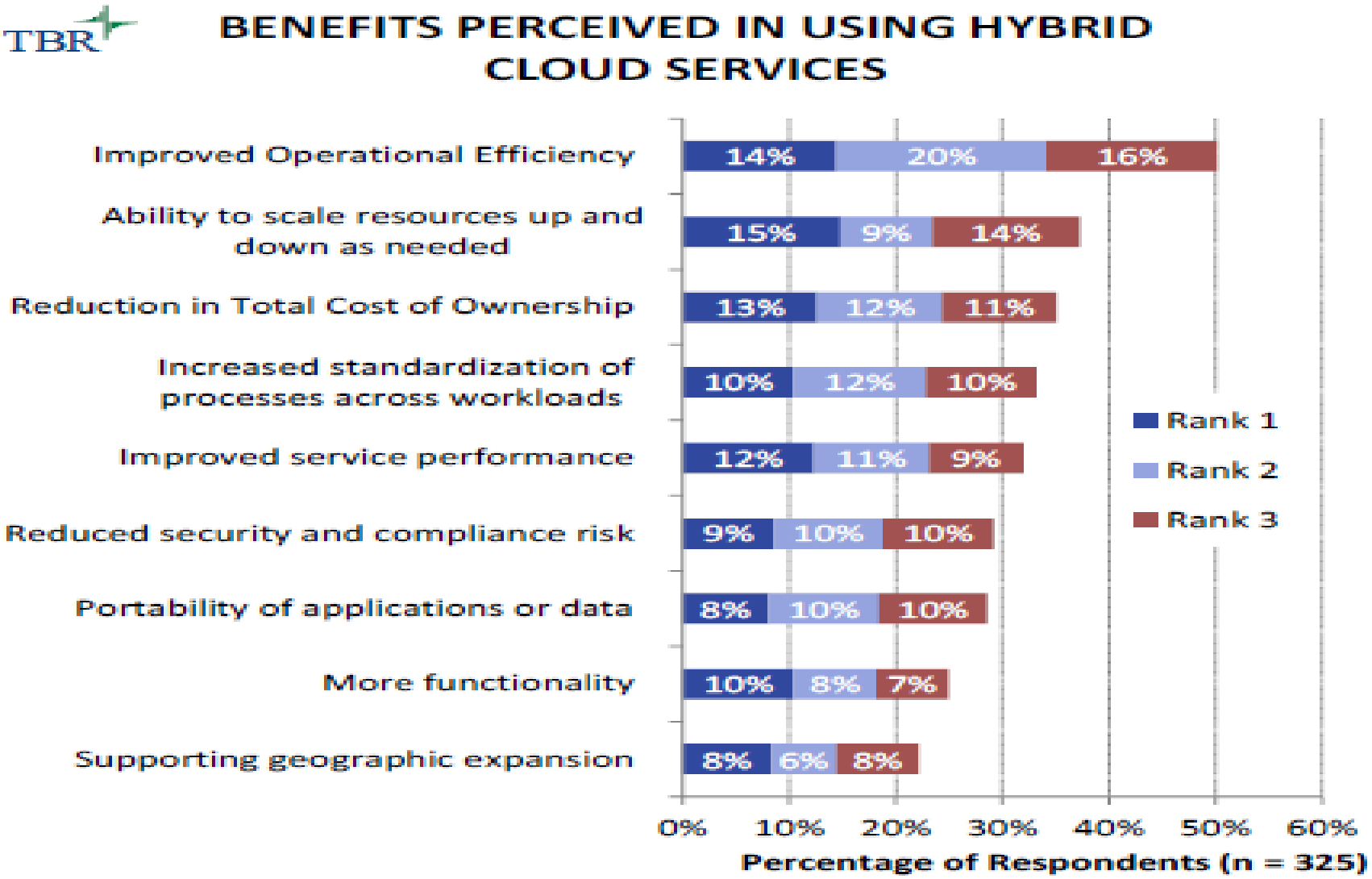


Retain control of the IT environment and protect proprietary systems and data

Address rapidly escalating **scalability and processing demands** required by analytics and innovation

Maintain regulatory compliance and desired service levels

Benefits of a Hybrid Cloud



SOURCE: TBR

Complete solution for cloud workloads on System z includes number of key components to simplify usage and operations

Cloud Management

Self Service Catalog

Pre-defined menu of Services

SmartCloud Orchestrator

Cloud Automation | **Open,** scalable platform

Cloud Marketplace

Pattern sharing/re-use, from engine | Rich set of ready to use **patterns**

Add on:

- **Cost management**
- **High Availability**
- **Security**
- **Application Performance Management**

Infrastructure Management

IBM Wave

Simple, intuitive, graphical **z/VM management tool**

OM XE for z/VM and Linux

Monitor z/VM and Linux guests

Ops Mgmt/Backup & Archive

Key set of **z/VM tooling**

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

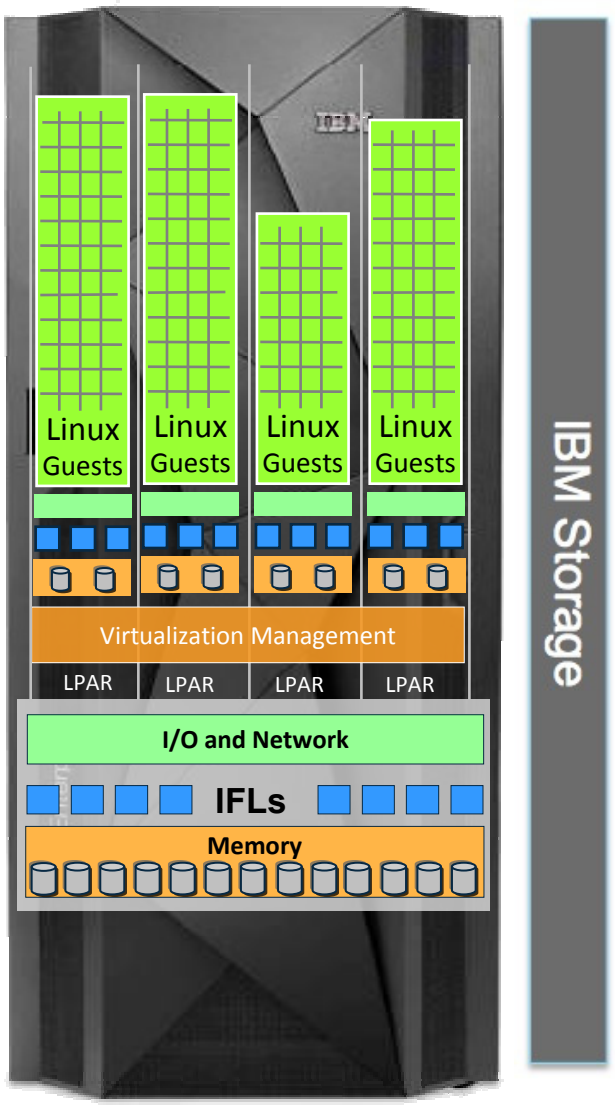
- Easily move cloud services to System z with standardized, open orchestration
  - Provision workloads to z Linux from Orchestration running on x
- Fully automate deployment and lifecycle management of cloud services across workloads
- Simplify cloud operations and increase productivity with OMEGAMON monitoring of services
- Increase availability of cloud data with easy to implement storage backup/recovery
- Runs on z/VM V6.3 with Linux on z

The thing I like about the product is its simplicity and flexibility. Frequently simplicity comes with a cost—narrow constructs necessary in order to be repeated easily. But here, it's the architecture that provides the simplicity and the 'drop-in' functionality via patterns provides the flexibility. IBM Business Partner

Introduction to IBM Enterprise Cloud System

Converged Infrastructure-as-a-Service solution, providing a highly available, secure, cloud platform based on System z technology

- **Pre-configured and integrated system**
  - Includes Processor, Disk, Hypervisor, Cloud Management Software and Services
  - Pre-installed cloud management software that leverages open source such OpenStack and Linux to deliver orchestration, provisioning and monitoring
  - Integration performed at IBM's Customized Solution Center and onsite by STG Lab-Based Services
- **Flexible configurations**
  - No fixed sizes - flexibility on hardware configurations allow customers to choose the right amount of resources for their workload
  - Sample configurations will be provided to Sales Team as guidance and comparison



Manage all components of Data Center Lifecycle with Cloud based on open standards fit for purpose approach

Service Orchestration

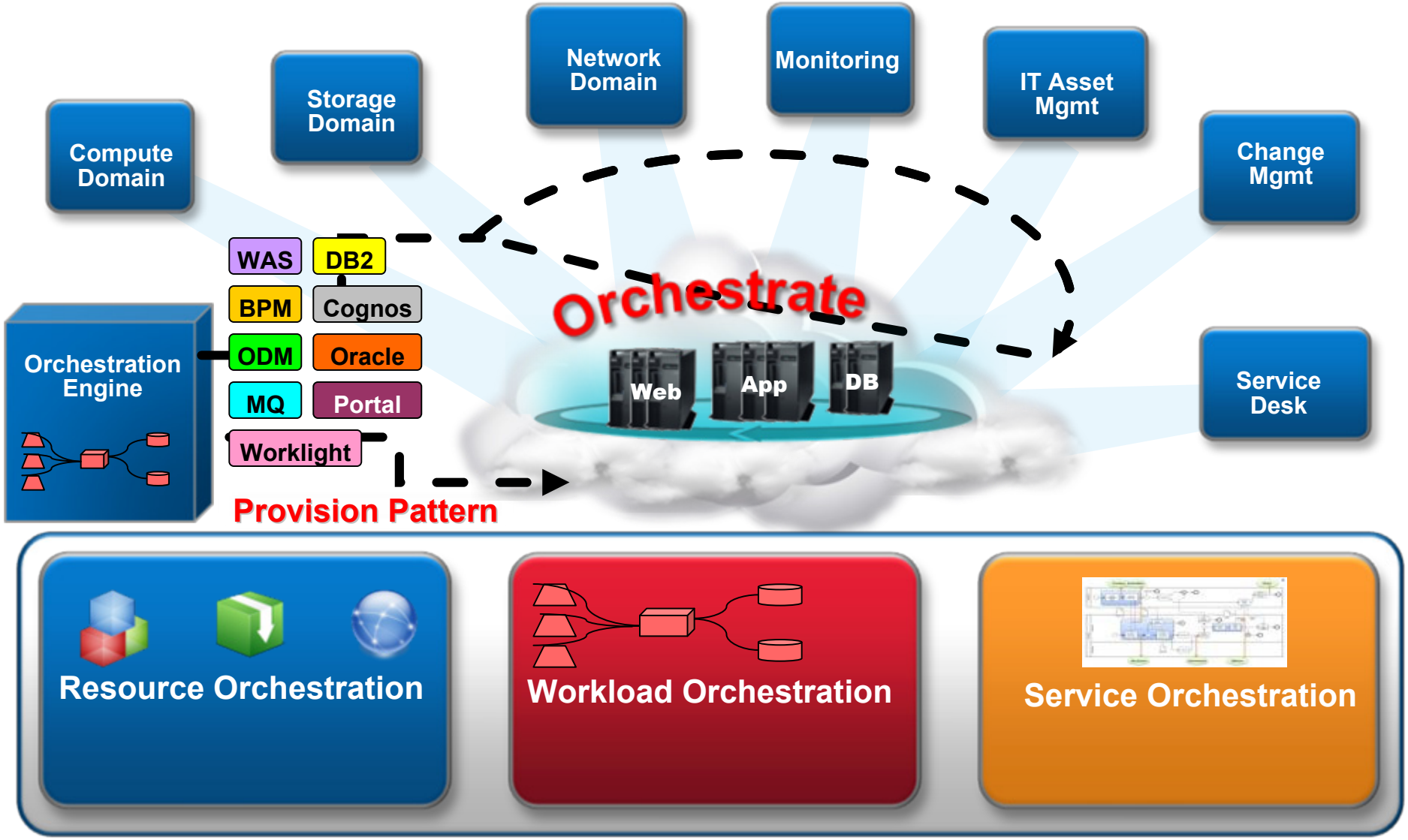
OASIS
The Organization for the Advancement of Structured Information Standards

Resource Management
Onboard, provision, manage CPU, Storage and Network

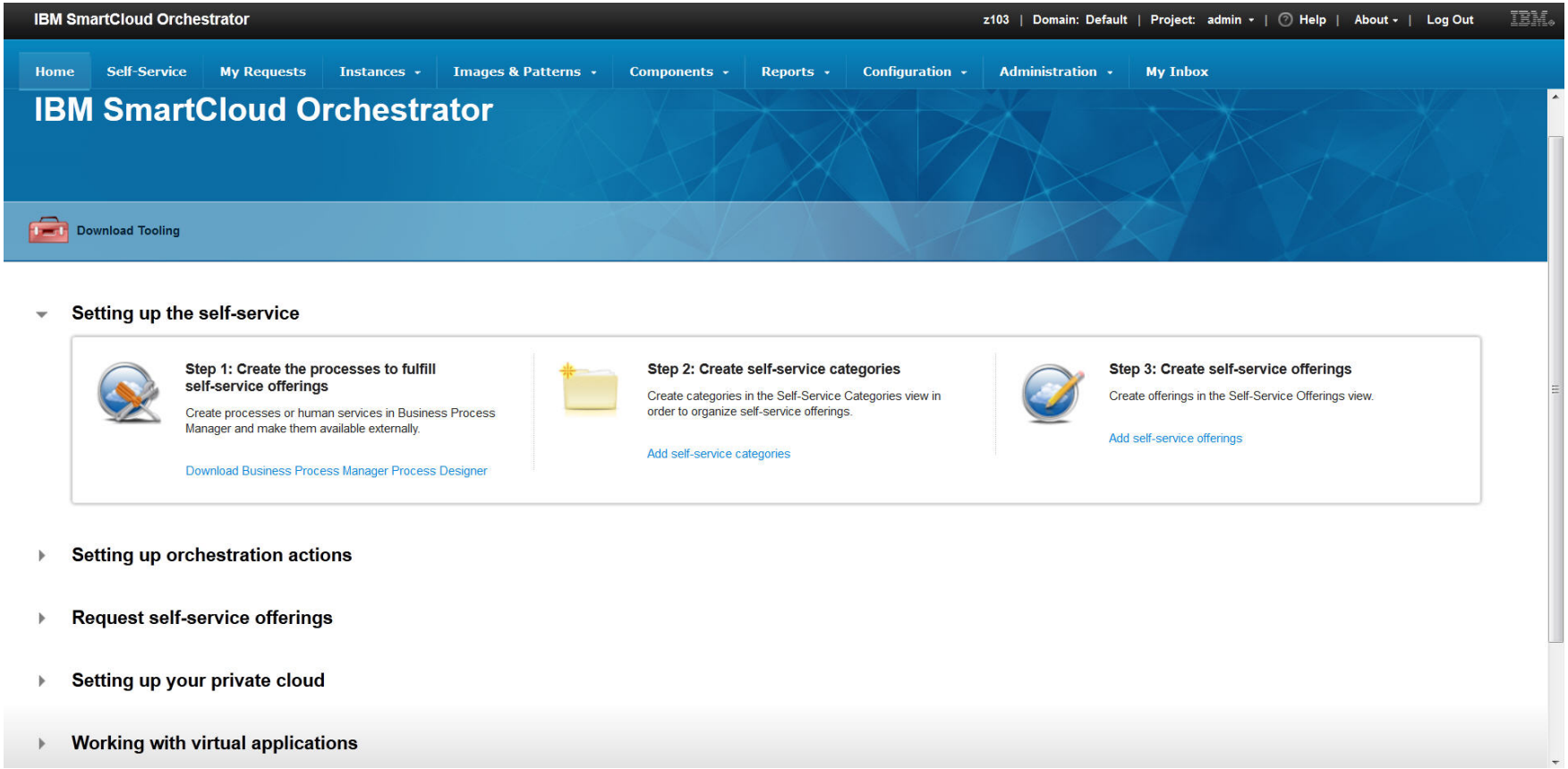
Workload Management
Workload aware placement, optimization and operation

Service Management
Manage the lifecycle of business applications

Orchestrator for End-to-End Workload Management



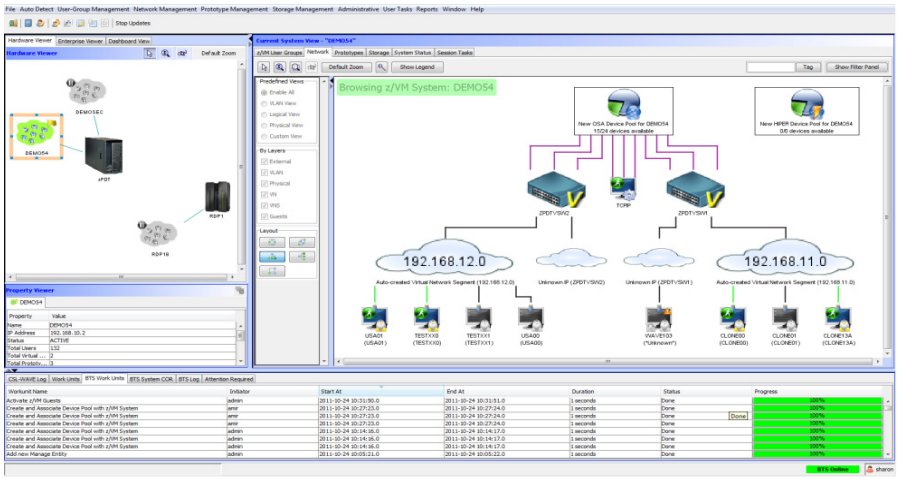
IBM SmartCloud Orchestrator



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.

Enhanced visibility and management with OMEGAMON XE for z/VM and Linux saving time and money

Cloud Monitoring

Increased Performance & Availability

- zVM Live Guest Relocation & Single System Image

Cloud Health Visibility and Optimization

- Performance and Availability metrics/analytics

Extensible Cloud Environment

- Business Expansion based on capacity planning
  - Grow without adding hardware

Client Success

- Cloud service provider **consolidates 59 development & test labs into 6**.
- Increased utilization by **increasing VM density by 58%**

Cloud on System z workload backup/recovery with Tivoli Storage Manager Extended Edition

Cloud Backup/Recovery

Performance: High-performance, scalable backups and restores that minimize network traffic .

Disaster recovery: Performs automated, scheduled asynchronous replication of backup data and metadata

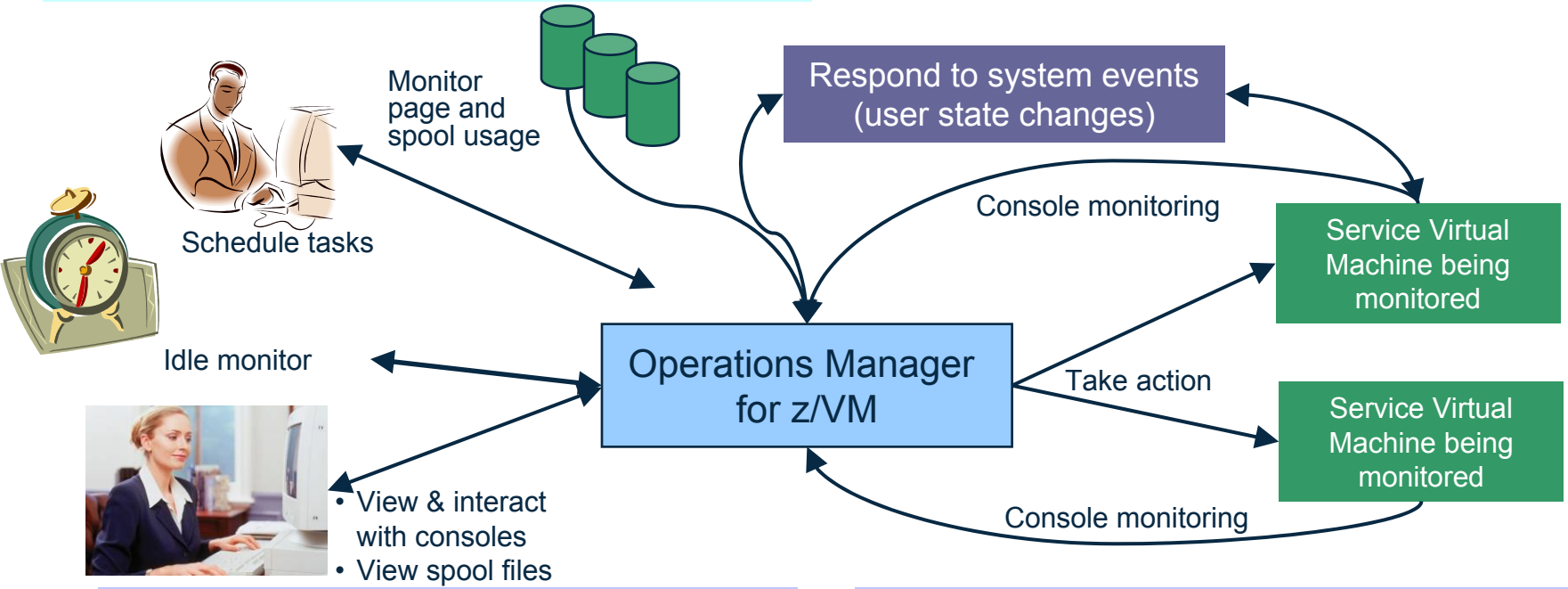
Flexibility: Data protection and disaster recovery for more than 500 different disk, tape and virtual tape storage

Scalability and reliability Management of up to four billion data objects on single server architecture built on IBM DB2®

Operations Manager for z/VM

Increase productivity
- Authorized users to view and interact with monitored virtual machines without logging onto them
- Multiple users view/interact with a virtual machine simultaneously

Improve system availability
- Monitor virtual machines and processes
- Take automated actions based on console messages
- Reduce problems due to operator error



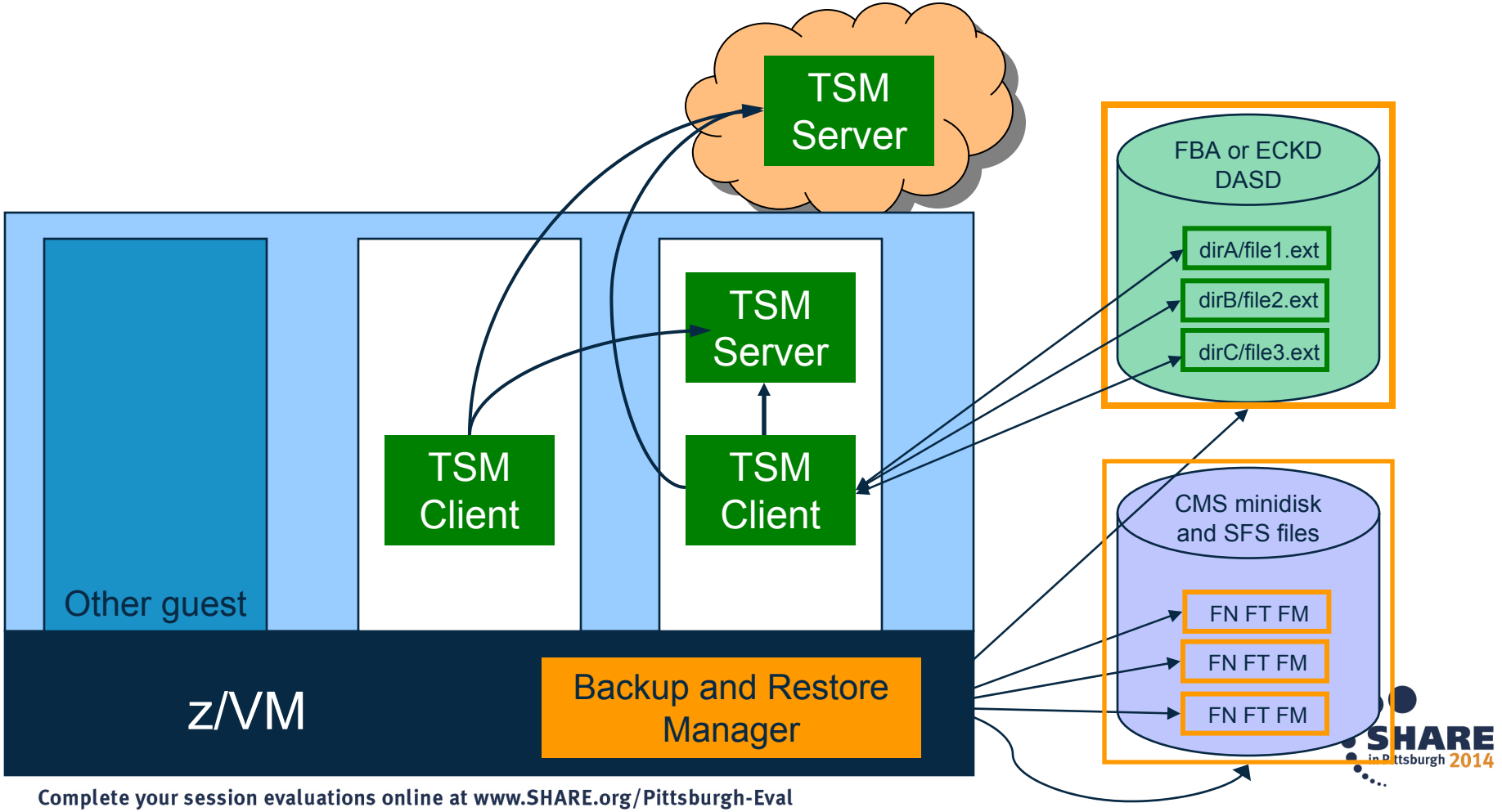
Automation
- Routine activities done more effectively with minimal operations staff
- Schedule tasks to occur on a regular basis

Integration
- Fulfill take action requests from performance monitoring products (e.g. OMEGAMON XE on z/VM and Linux)
- Send alerts to email, central event management systems (e.g. Netcool\OMNIbus), etc.

Backup and Restore Manager and Linux Guests

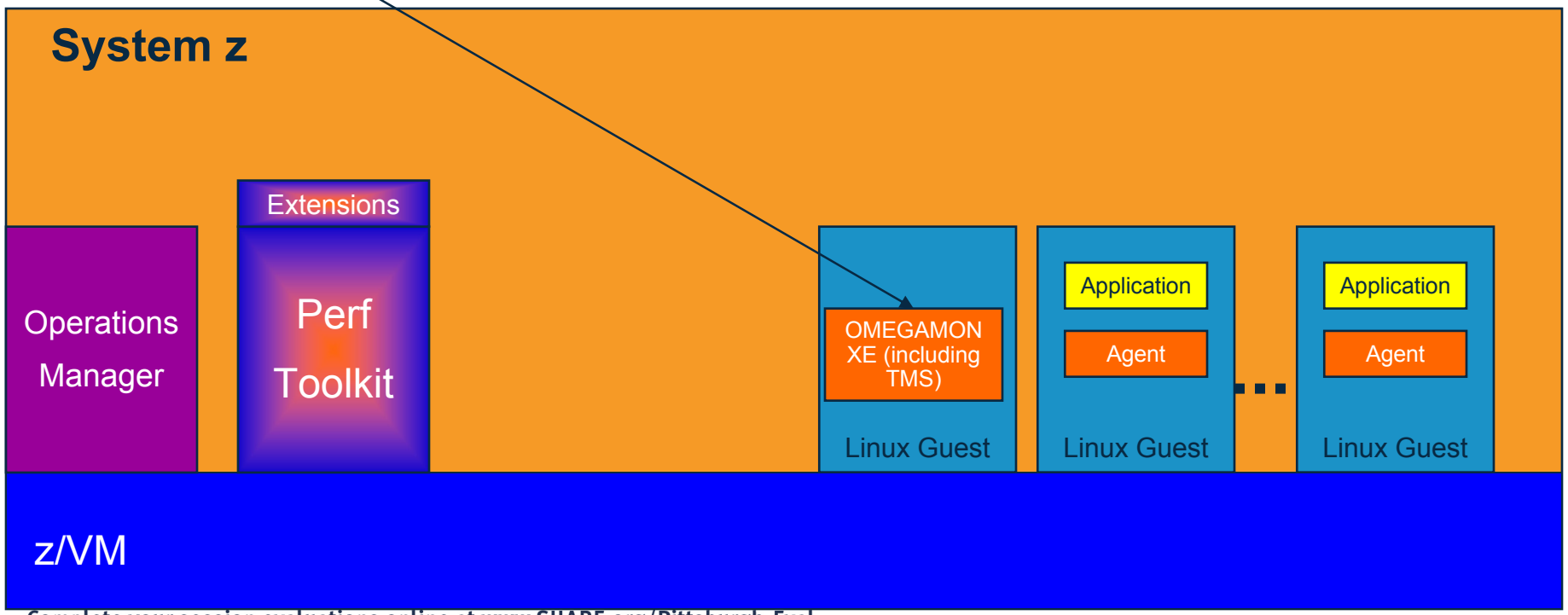
Using Backup and Restore Manager with Tivoli Storage Manager

Choose the solution that meets your needs – or combine for file recovery and DR



Operations Manager for z/VM & OMEGAMON XE on z/VM and Linux

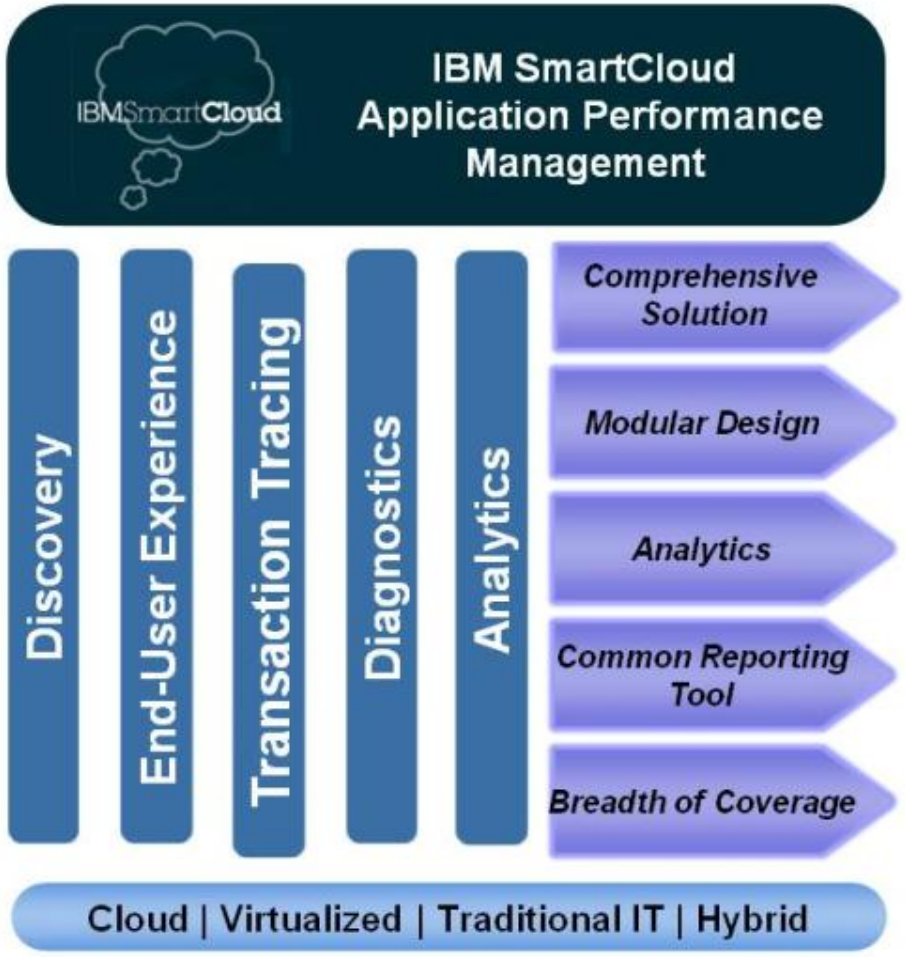
- OMEGAMON XE on z/VM and Linux
  - Performance monitoring for z/VM and Linux guests
  - Part of Tivoli Management Services (TMS) infrastructure
- Operations Manager for z/VM
  - Monitor consoles of z/VM service machines and guest user IDs
  - Take actions based on console messages
    - Respond to “take action” requests from OMEGAMON
  - Schedule routine tasks



Intelligently manage Cloud infrastructures across heterogeneous platforms

SmartCloud APM

- Comprehensive application/workload solution
- Modular design to get started quickly and add capabilities as needed.
- Analytics to improve capacity utilization and optimize performance
- Common reporting tool, based on Cognos, makes reporting simple and easy to customize
- Single trusted source of information for accurate and fast problem diagnostics



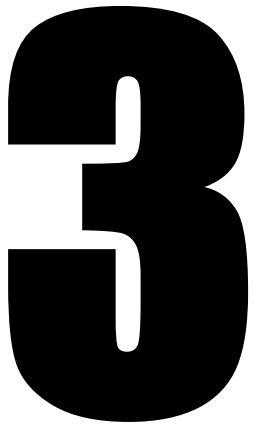
Track, allocate and report resource usage accurately including chargeback

Cloud Cost Management

Assess shared computing resource usage

- Insights into relationships between virtualized and physical IT assets
- Usage metering coverage to help determine costs based on allocation and utilization.
- End user visibility into cost implications of services requesting .
- Mechanism for chargeback with accurate metering and cost rating tool
- Integrates secure cloud usage reporting with the cloud provisioning and management so users can manage infrastructure costs

Cloud Management for System z support continues to evolve with new capability for cloud, analytics and mobile



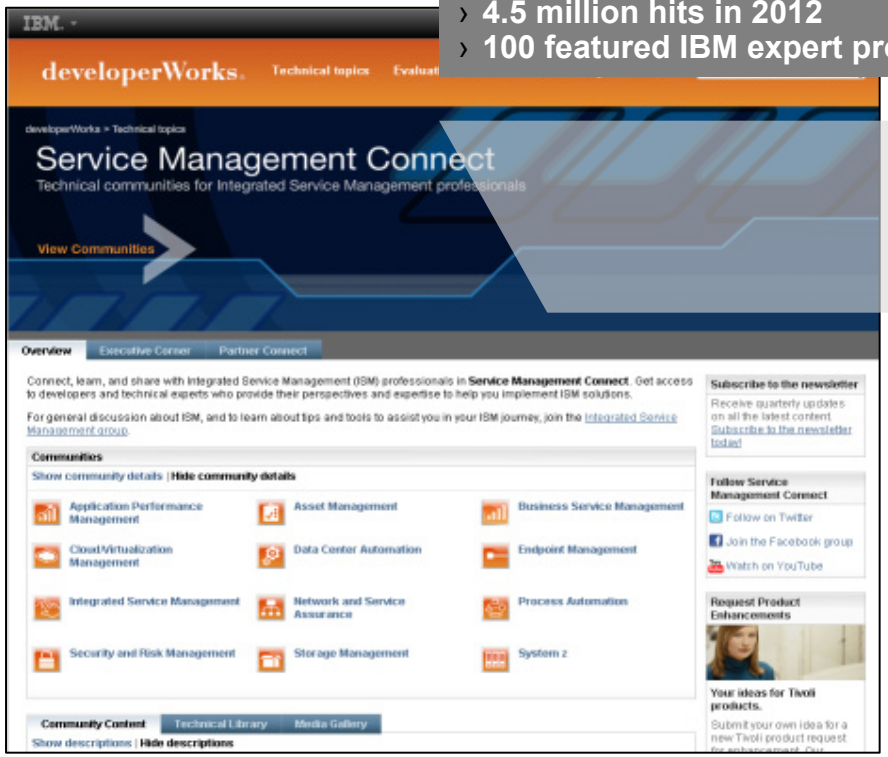
- zEnterprise supports both Systems of Record and Systems of Engagement, including Cloud on System z
- IBM System z cloud support based on open standards with fit for purpose capability across all architectures
- Integrate system Z with modern cloud and mobile interfaces with consistent APIs with E2E management

Service Management Connect

Connecting future of service management

- Transparent development
- Product roadmaps
- Code downloads and demos
- Access to the System z experts
  - Forums
  - Blogs
  - Wikis
- Best practices
- Submit requirements

› 250+ System z blog entries from the IBM experts
› 4.5 million hits in 2012
› 100 featured IBM expert profiles



IBM System z Service Management critical for moving to Mobile, Big Data and Cloud

IBM continues to improve z/OS environment to support new technologies

- IBM SmartCloud Analytics – Log Analysis z/OS Insight Packs 1.1.0.1
- IBM Service Management Suite for z/OS V1.2
- IBM Tivoli OMEGAMON Performance Management Suite for z/OS V5.3.0
- IBM Tivoli OMEGAMON XE on z/OS 5.3.0, IBM Tivoli OMEGAMON Dashboard Edition on z/OS 5.3.0, IBM Tivoli OMEGAMON XE for Messaging for z/OS 7.3.0, IBM Tivoli OMEGAMON XE for CICS on z/OS 5.3.0, IBM Tivoli OMEGAMON XE for Storage on z/OS 5.3.0
- IBM Tivoli System Automation for z/OS V3.5
- IBM Automation Control for z/OS V1.1.1
- IBM Tivoli NetView for z/OS V6.2.1
- IBM Tivoli NetView Monitoring for GDPS V6.2.1
- IBM Tivoli Workload Scheduler for z/OS V9.2

Learn More: http://www-01.ibm.com/software/os/systemz/itsm/

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