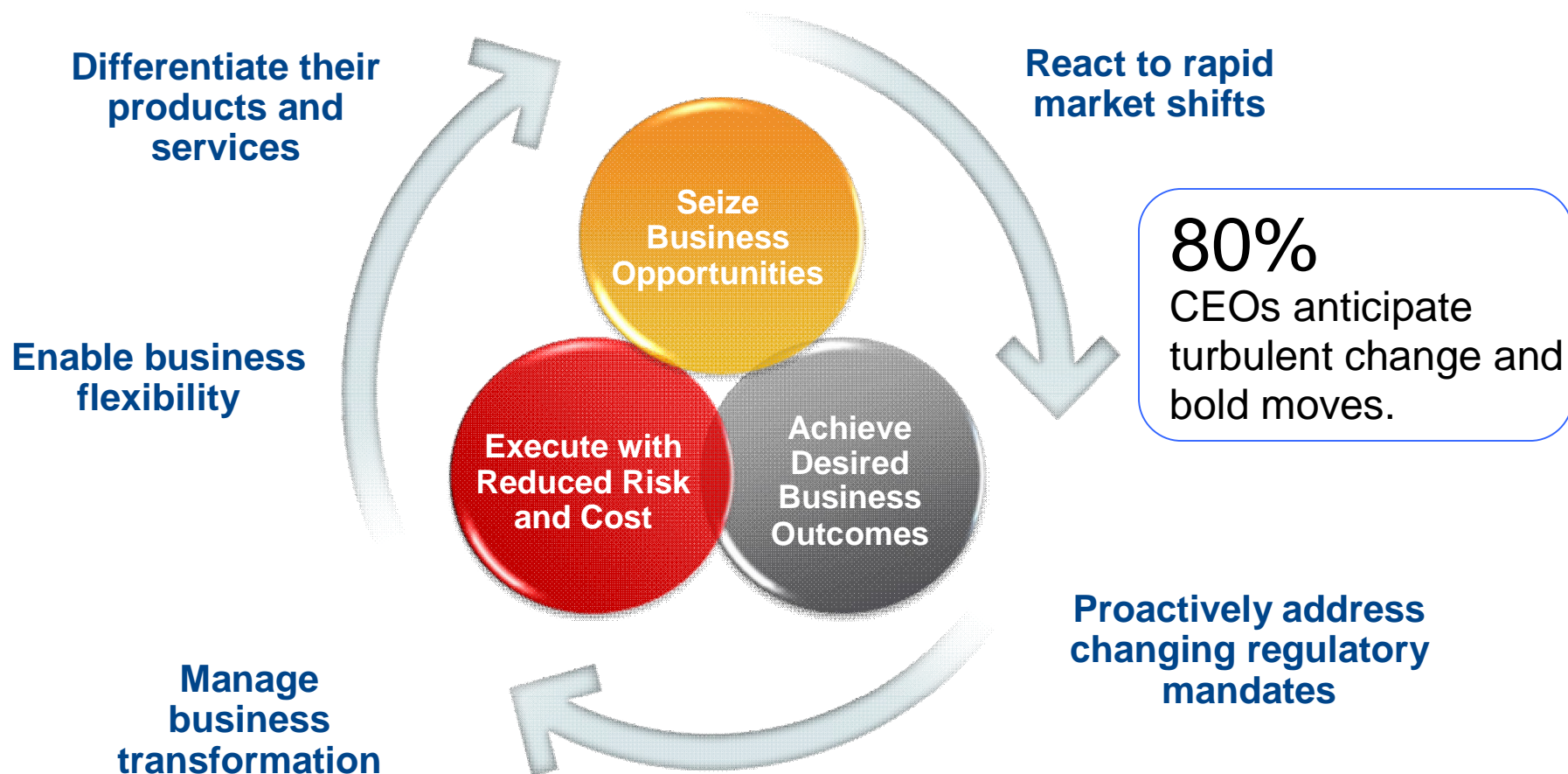IBM

# Moving your workloads to cloud using Integrated Service Management

# Today's businesses face unparalleled rate of change along with requirement for increased business agility

**Differentiate their products and services**

**React to rapid market shifts**

**Seize Business Opportunities**

**Execute with Reduced Risk and Cost**

**Achieve Desired Business Outcomes**

**Enable business flexibility**

## 80%
CEOs anticipate turbulent change and bold moves.

**Manage business transformation**

**Proactively address changing regulatory mandates**

* Source: IBM CEO Study

# Cloud computing helps business and IT address rate of change while driving innovation

## Cloud allows business to:

### Improve security and compliance control posture

Embrace new business opportunities while maintaining control and mitigating risk.

### Improve speed and dexterity

Speed the delivery of new offerings and services by creating new models of self-service and deployment.

### Deliver IT without boundaries

Implement new systems and management processes that simplify access to information in order to deliver better business outcomes.

### Create new business value

Empower internal and external communities to define and create new offerings and services.

# Why deploy clouds on larger, scale-up servers like System z?

## Higher Utilization

- Up to 100% CPU utilization
- "Shared everything" architecture
- Host thousands of mixed workloads

## More Efficient Data Center

- Less power and cooling
- Less floor space
- Fewer parts to manage

## Increased Productivity

- Efficient, rapid provisioning
- Superior workload management
- Fewer parts to manage

## Greater Reliability, Availability

- Built-in hardware redundancy
- Decades of RAS innovation
- Capacity and Backup on Demand

# System z has had Cloud Computing capability supplying business flexibility for years

## System z supplies all components necessary to deliver cloud today
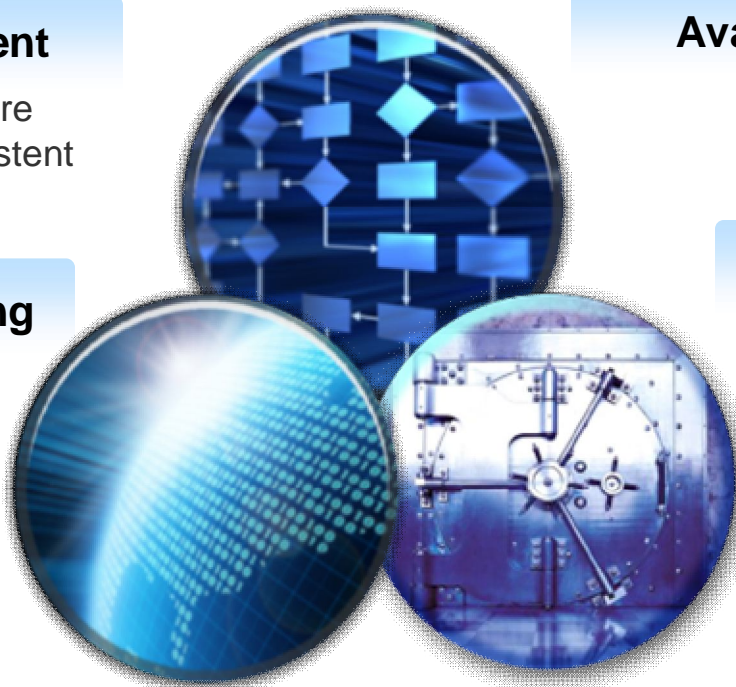
### Workload Management

Manage cloud infrastructure capacity requirements consistent with business policies

### Transaction Processing

Support integration of cloud with mission critical OLTP applications

### Scalability

Scale vertically with zOS and LPAR and horizontally with zLinux and zVM coupled with Workload Manager

### Availability and Provisioning

Automation for deploying Virtual Machines and recovery applications including DR
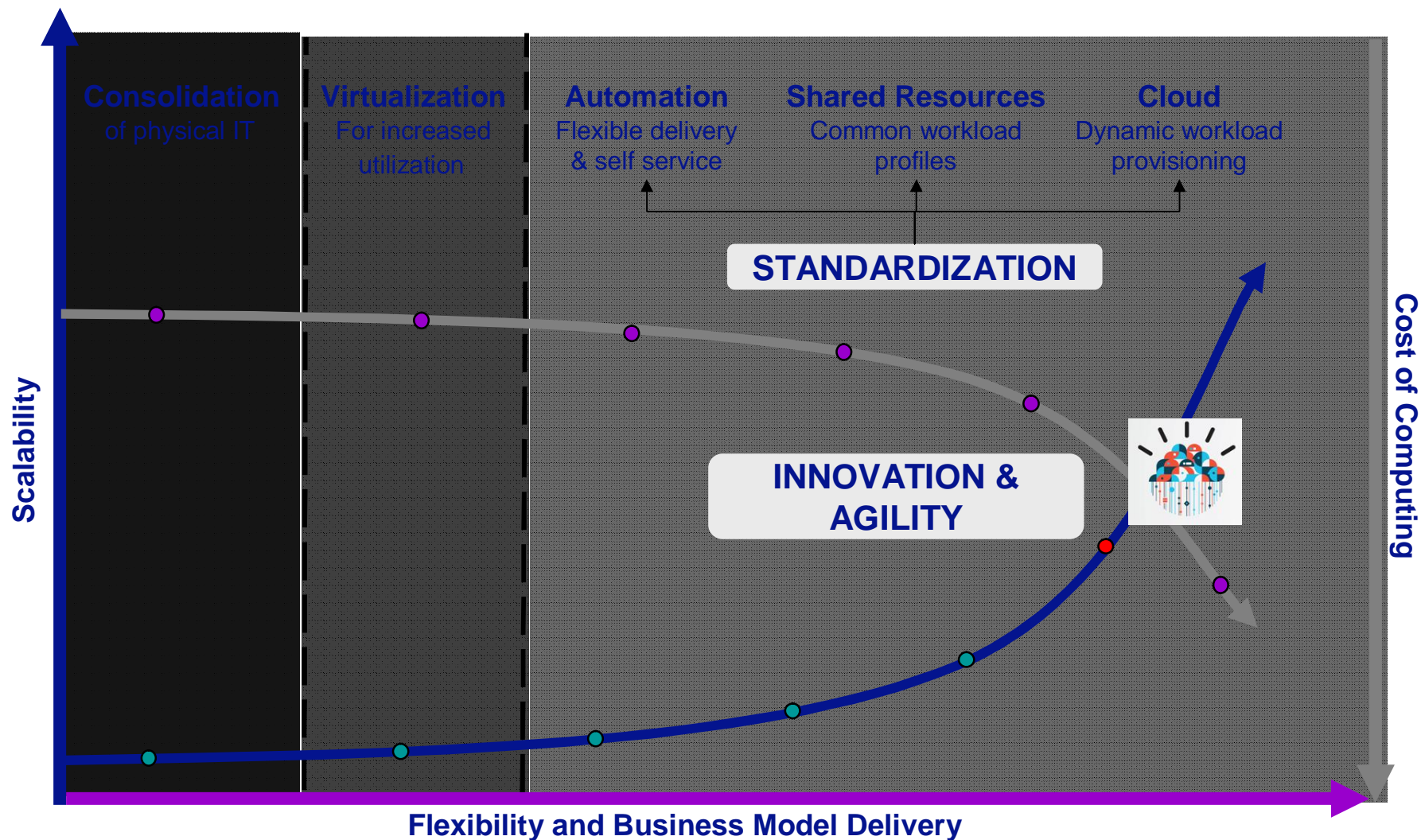
### Security and Compliance

System Z Security provides fine grained controls with hardware encryption and isolation

### Auditing and Metrics

Workload based accounting and metering to support capacity planning and chargeback to LOB

# Obtaining the full benefits of cloud
## Movement to standardized infrastructure is driving greater automation and optimization

**Cost of Computing**

**Scalability**

**Consolidation** of physical IT

**Virtualization** For increased utilization

**Automation** Flexible delivery & self service

**Shared Resources** Common workload profiles

**Cloud** Dynamic workload provisioning

**STANDARDIZATION**

**INNOVATION & AGILITY**

**Flexibility and Business Model Delivery**

Rethink IT. Reinvent Business. Cloud Computing

# Cloud computing services from IBM are delivering measurable results and addressing IT infrastructure challenges

| Value delivered | From traditional | To cloud |
|---|---|---|
| Change management | Months | Days or hours |
| Test provisioning | Weeks | 20 minutes |
| Install database | 1 day | 12 minutes |
| Install of operating system | 1 day | 30–60 minutes |
| Provisioning environment | | 51% cost savings |

**Improve IT delivery speed and agility** • **Deliver IT without boundaries** • **Create new business value**

Rethink IT. Reinvent Business. Cloud Computing

# However, Cloud is not without its challenges…

*After all, IT has been trying to automate service delivery from the start...*

…design a secure & resilient cloud infrastructure?

…ensure effective release across DevOps?

**How do you…**

…design cloud-ready applications?

…enable self-service in the cloud?

…ensure cloud service quality is maintained?

*Bottom Line:*
- Virtualization good starting point but not sufficient
- Requires intelligent platform and QOS that z provides

**Cloud Requires**

✓ Full **service lifecycle management**, not just provisioning of resources

✓ Seamless collaboration & workflow **across Service Design and Service Operations**.

✓ Interoperability of infrastructure, tools & delivery models as **automated system**.

# Integrated Service Management delivers the value of Cloud on z

- Maximize utilization from automating and deploying workloads in a cloud

- Achieve greater efficiency with standardized, simplified resource allocation and monitoring

- Increase availability based on analytics for improved customer satisfaction

- Operate workloads securely across Enterprise Businesses

- Improve ROI with tracking and billing based on workload usage

**VISIBILITY**　　　　**CONTROL**　　　　**AUTOMATION**

## Business Services & Assets

Cloud Computing　　　　Workload Optimization　　　　Federated Information
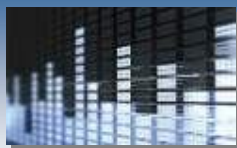
*Discovery*　　　*Monitoring*　　　*Security*　　　*Provisioning*　　　*Accounting*

# IBM's Cloud Service Delivery Platform gives organizations the Visibility. Control. Automation.™ needed for cloud…

**VISIBILITY**

**CONTROL**

**AUTOMATION**

*Visibility: Track cloud service levels & performance, and predict cloud problems before clients are impacted.*

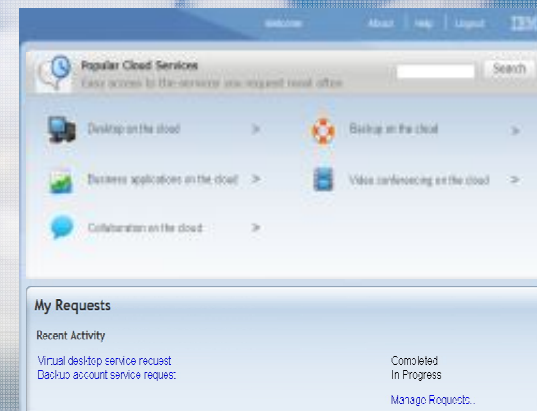*Control: Manage compliance and costs through effective cloud policy enforcement and service reporting.*
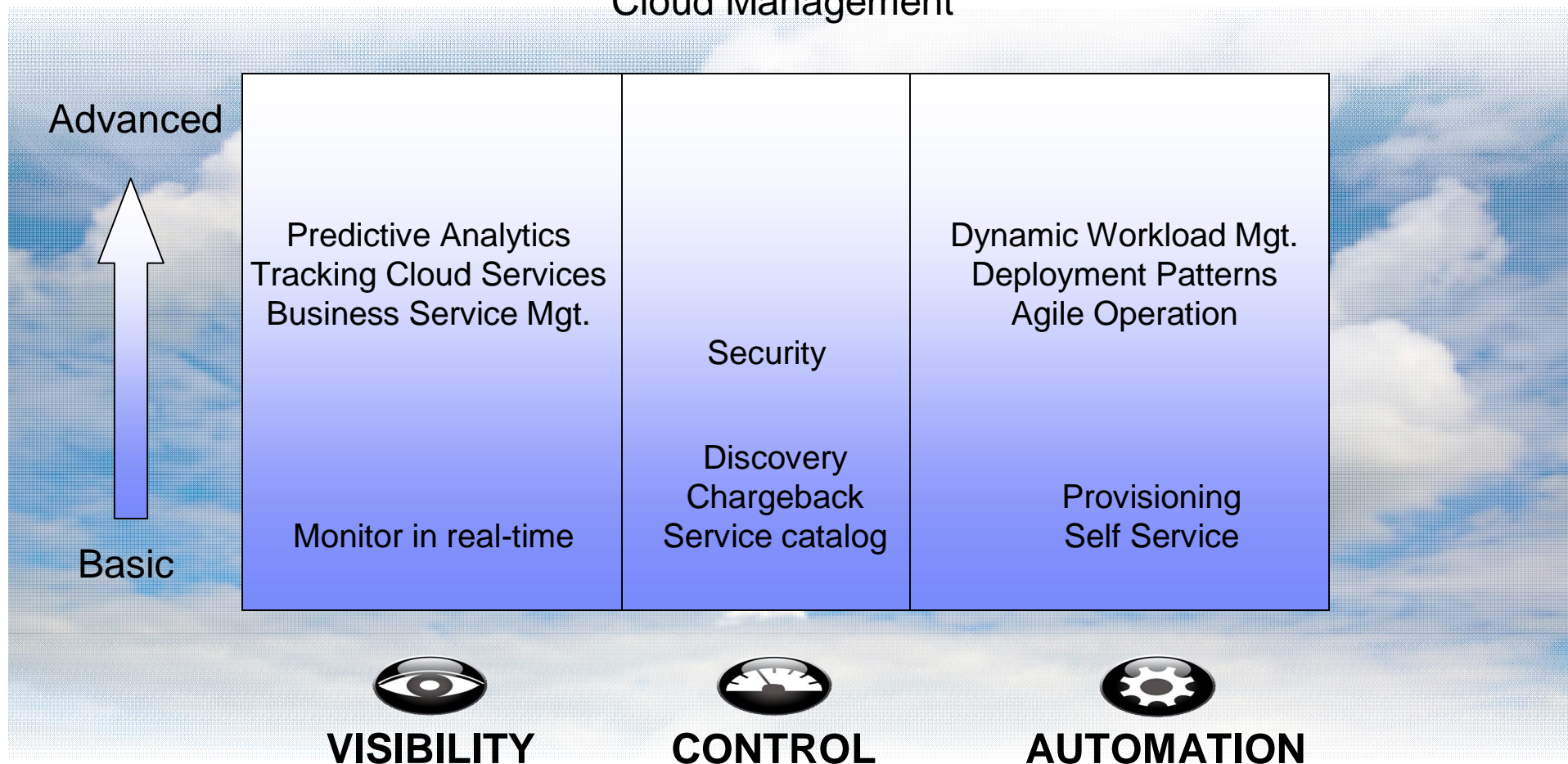
*Automation: Enable user self service while improving productivity and time to market for cloud services.*

# Driving cloud ROI using advanced cloud management capabilities

## Cloud Management

Advanced

Basic

| VISIBILITY | CONTROL | AUTOMATION |
|---|---|---|
| Predictive Analytics Tracking Cloud Services Business Service Mgt. | Security | Dynamic Workload Mgt. Deployment Patterns Agile Operation |
| Monitor in real-time | Discovery Chargeback Service catalog | Provisioning Self Service |

**VISIBILITY**     **CONTROL**     **AUTOMATION**

# Visibility to cloud servers through real-time monitoring
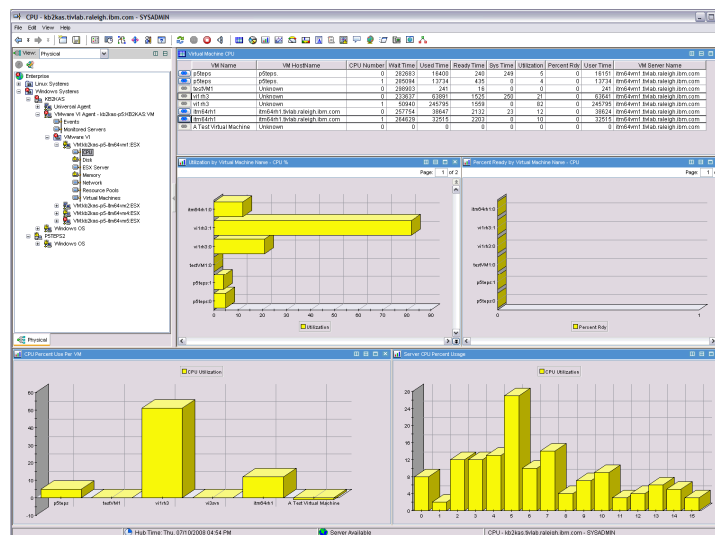
- Collect key performance and availability metrics.
  - Application, VM, virtual network, virtual storage I/O and other metrics
- Receive real-time proactive & predictive alerts
  - Side-by-side and historical data to identify problems quickly
- Warehouse data and report on current and future trends
  - Identify resource bottlenecks, plan for future capacity needs, and optimize resource performance

# Visibility at the business level leveraging detailed views

**VISIBILITY**
**Advanced**

## Business Service Management
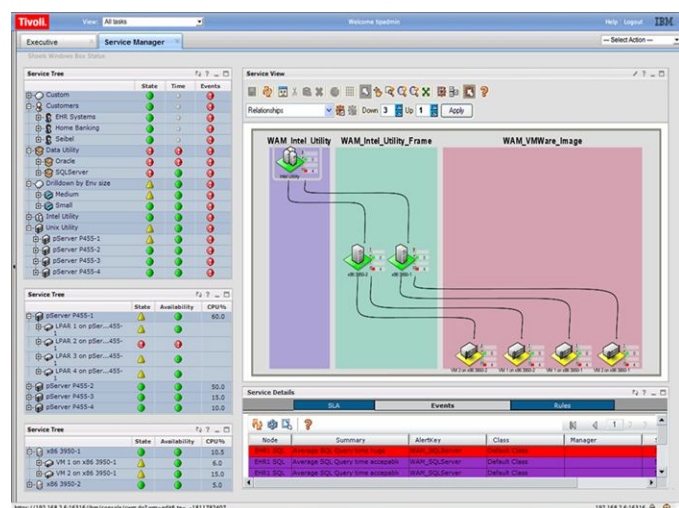


## Detailed transaction view
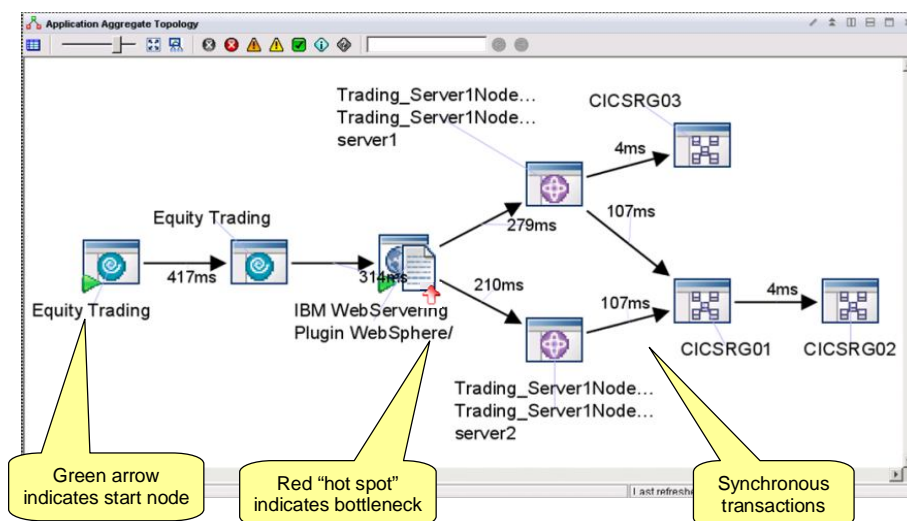


- Visualize physical & logical partitions and physical & virtual machines
- See service-impacting root cause events for prioritized response

- Agentless tracking for public and hybrid clouds, zLinux agent for clouds on z
- Ability to monitor and alert on SOA SLA policies defined in WebSphere
- Integrated response time and tracking

# Visibility through analytics to enable capacity planning and optimization of cloud & virtual environments

## Capabilities Include

- What-If Analysis for Workload Placement

- Performance Trends and Resource Forecasts

- Workload Right Sizing and Balancing

## Allowing you to

- Perform virtual machine right sizing - adjust the allocated computing resources to levels needed for the virtual machine by understanding real usage of computing resources over time

- Determine how many more customers or virtual machines can be serviced with existing resources

- Predict physical and virtual resource capacity bottlenecks
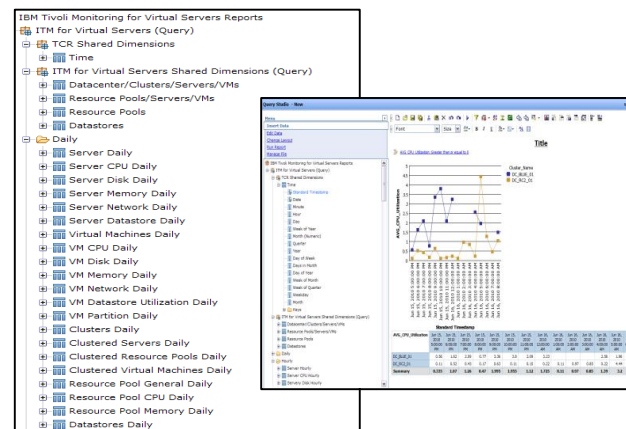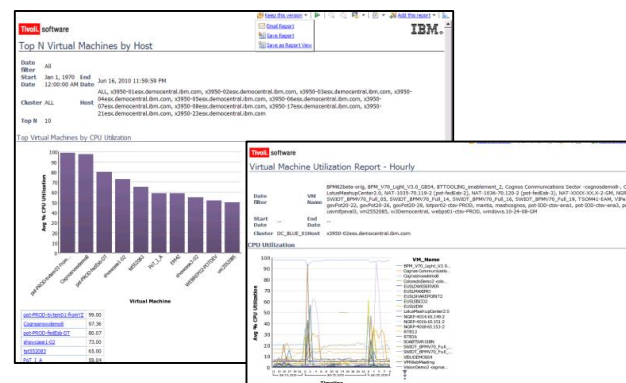
# Control the cloud environment and services

## Discover
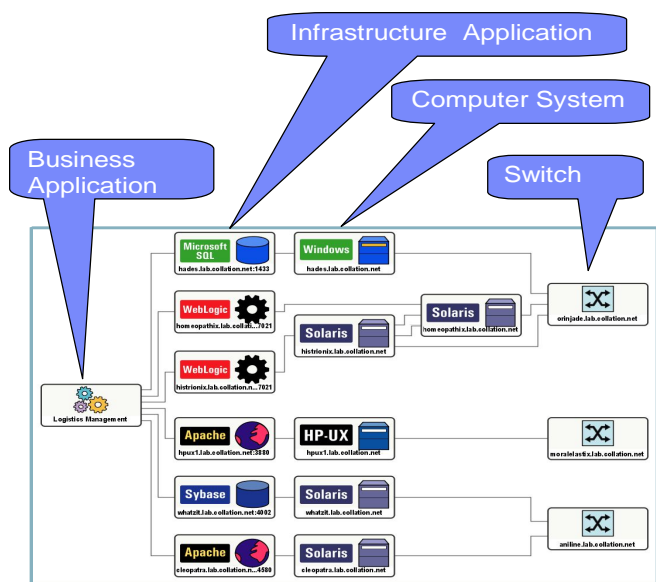


- Understand what you have
- Discovery application relationships/dependencies
- Determine if it is compliant

## Service Catalog
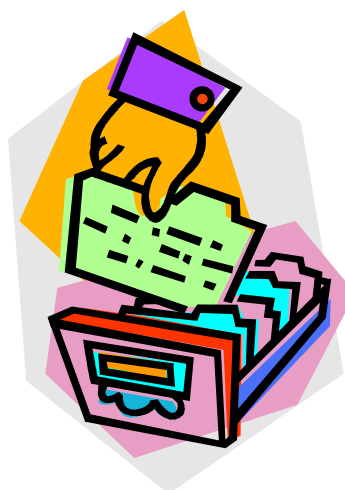


- Single repository for all cloud services
- Insure delivery of standard services to avoid virtual server sprawl

## Chargeback



- Control supply by charging for services
- Determine service rates based on service costs and real usage
- Provide service usage and enable billing

# Control cloud security

- Deploy a security strategy that smoothly integrates into the fabric of the cloud

- Consider… one size does not fit all, different cloud workloads have different risk profiles

| Access and Identity | Data and Information | Release Management | Security Event Information Management | Physical Security | Threat and Vulnerability Management |
|---|---|---|---|---|---|
| Need to leverage a combination of extensive internal policies | Apply data protection to information when possible | Implement strong polices for management of virtual images and software within it's environment | Provide the functions for security event and information management | Need to apply security to data centers such as CCTV, 24/7 physical security biometrics, etc. | Leverage managed services and tolling for best of breed solutions |

16

# Control in cloud will require security to address reliability and compliance

**CONTROL**
**Advanced**

- Enforce security policy compliance and reduce security vulnerabilities
- Centrally manage and protect access to applications, business services, infrastructure, and data across server, storage and network
- Leverage the mainframe as your Enterprise Security Hub for cross-platform security

**Tivoli zSecure suite**
- Cost-effective security administration, security policy enforcement, automated auditing and compliance to detect threats and reduce risk

**Tivoli Key Lifecycle Manager**
- Protect data encrypted on server and storage
- Supports all latest system Z centric storage
- Supports all system Z hardware crypto

**IBM Security zSecure suite**

Security audit and compliance

Administration management

Tivoli zSecure Manager for RACF z/VM

Security zSecure Audit*

Security zSecure Admin

RACF z/VM

z/OS

Security zSecure Alert**

Security zSecure Visual

Security zSecure Command Verifier

Security zSecure CICS Toolkit
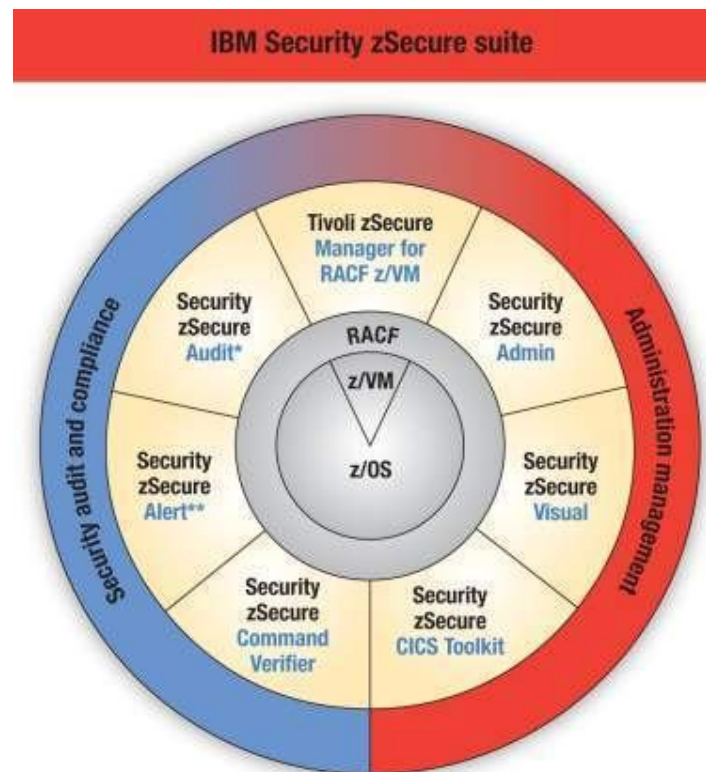
*Also available for ACF2™ and Top Secret®
**Also available for ACF2

# Automation of service provisioning and enable self service

## Self Serve Portal



Create Project with z/VM Linux Servers

Provision one or more z/VM Linux virtual servers containing a software image.

**General**

* Project Name
VanillaSLES_Class01

* Team to Grant Access
POKSEC

Project Description

* Start Date
10/28/2010

* End Date
Until this date
11/10/2010

**Requested Image**

Resource Group Used to Reserve Resources
Poughkeepsie System z pc

Monitoring Agent to be Installed

* Image to be Deployed

| Select | Name | Hypervisor | CPUs | Memory | Storage |
|--------|------|------------|------|--------|---------|
| ○ | SLES10 | zVM | 2 | 0.5 GB | 7 GB |
| ◉ | VanillaSLES | zVM | 1 | 0.5 GB | 7 GB |

**Resources**

To adjust the settings of the requested resources, press the setting button. After making the necessary adjustment, press the setting button to save the configuration.

**Servers**
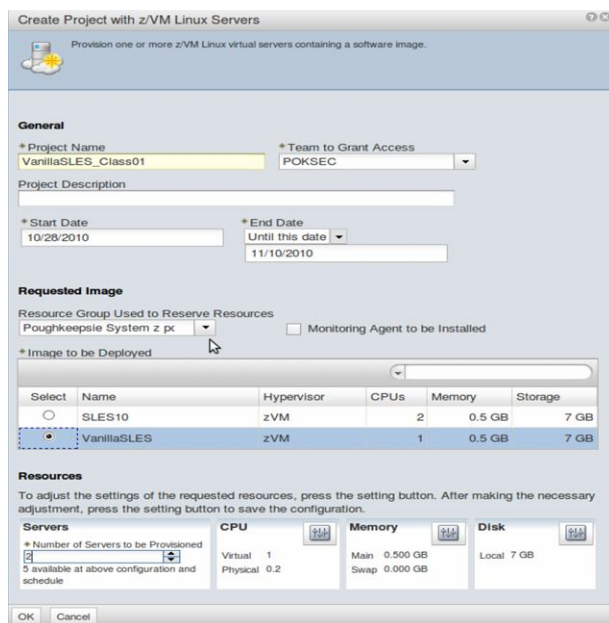* Number of Servers to be Provisioned
5 available at above configuration and schedule

**CPU**
Virtual   1
Physical  0.2

**Memory**
Main  0.500 GB
Swap  0.000 GB

**Disk**
Local 7 GB

OK    Cancel

- Self serve web portal allows users to request services from a service catalog
- Automate approval workflows and provide visibility to status
- When service no longer needed de-provision resources and return to pool

## Automated Provisioning



**Visibility**
- Monitoring data

**Virtual Servers**

Apps Apps Apps   Apps Apps Apps
Middleware Middleware Middleware   Middleware Middleware Middleware
Linux Windows Windows   Linux Windows Windows
Hypervisor 1   Hypervisor 2
CPU 1 CPU 2 CPU 3 CPU 4   CPU 1 CPU 2 CPU 3 CPU 4

**Control & Automation**
- Provision/ move virtual resources

**Virtual Networks**

SAN   Virtual Storage   SAN

- Coordinate and manage virtual resource provisioning from a centralized manager
- Increased HW utilization and decreased energy consumption

# Automation for cloud based dynamic workload management

## Scenarios

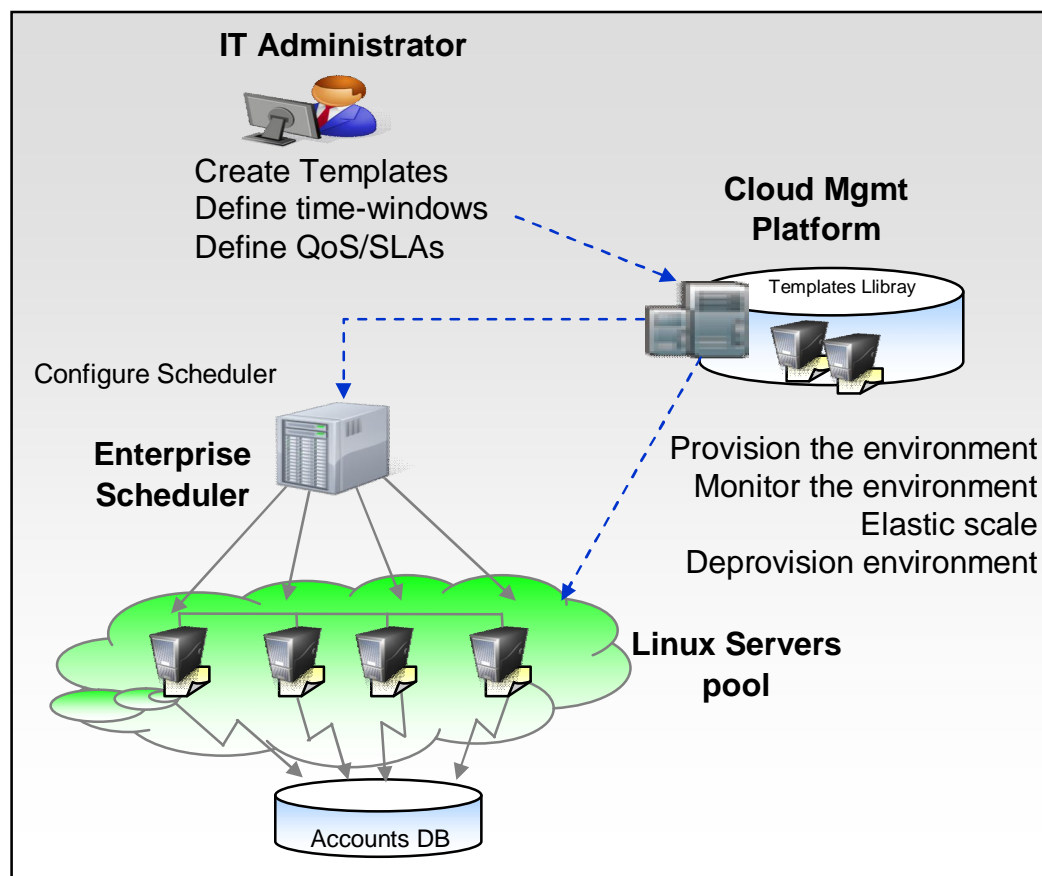▪Every month-end a Bank needs to create a set of Reports. Reporting application runs on a Linux servers pool that should be created on month-end and released after its usage

▪Reports for private-banking accounts must be delivered by 8:00 AM; in case of potential delays, customer wants the environment to be automatically boosted to meet this SLA

## Business benefits

▪ Reduce investments and effort, through simple provisioning and release of workload automation resources

▪ Simplify the lifecycle management of a "batch-ready" execution environment

▪ Reduce energy costs



**IT Administrator**

Create Templates
Define time-windows
Define QoS/SLAs

**Cloud Mgmt Platform**

Templates Llibray

Configure Scheduler

**Enterprise Scheduler**

Provision the environment
Monitor the environment
Elastic scale
Deprovision environment

**Linux Servers pool**

Accounts DB

# IBM zEnterprise for IT Optimization, Consolidation, Cloud Computing
## The "graduate" level capabilities in Cloud computing

- Consolidate even more with zEnterprise IFLs: up to 60% faster at 33% lower price

- Increase energy savings as you scale, up to 75% [1]

- Spend up to 70% less on acquisition costs [2] and boost staff productivity by up to 70% [3] compared to virtualized x86 alternatives

- Incorporate IBM POWER® and System x technologies for unparalleled levels of workload optimization

- Manage and govern the integrated environment to deliver superior business results at a lower cost

High Speed Private Network

| Business Apps | Data Serving | Linux Virtual Servers | Linux Virtual Servers | | Virtual Servers | Virtual Servers | Virtual Servers |

z/OS   z/OS   z/VM   z/VM          Hypervisor  Hypervisor  Hypervisor

**Shared Everything Infrastructure**
(CPU, Memory, Network, Adapters, Crypto, Devices)

**zEnterprise-Managed Infrastructure**
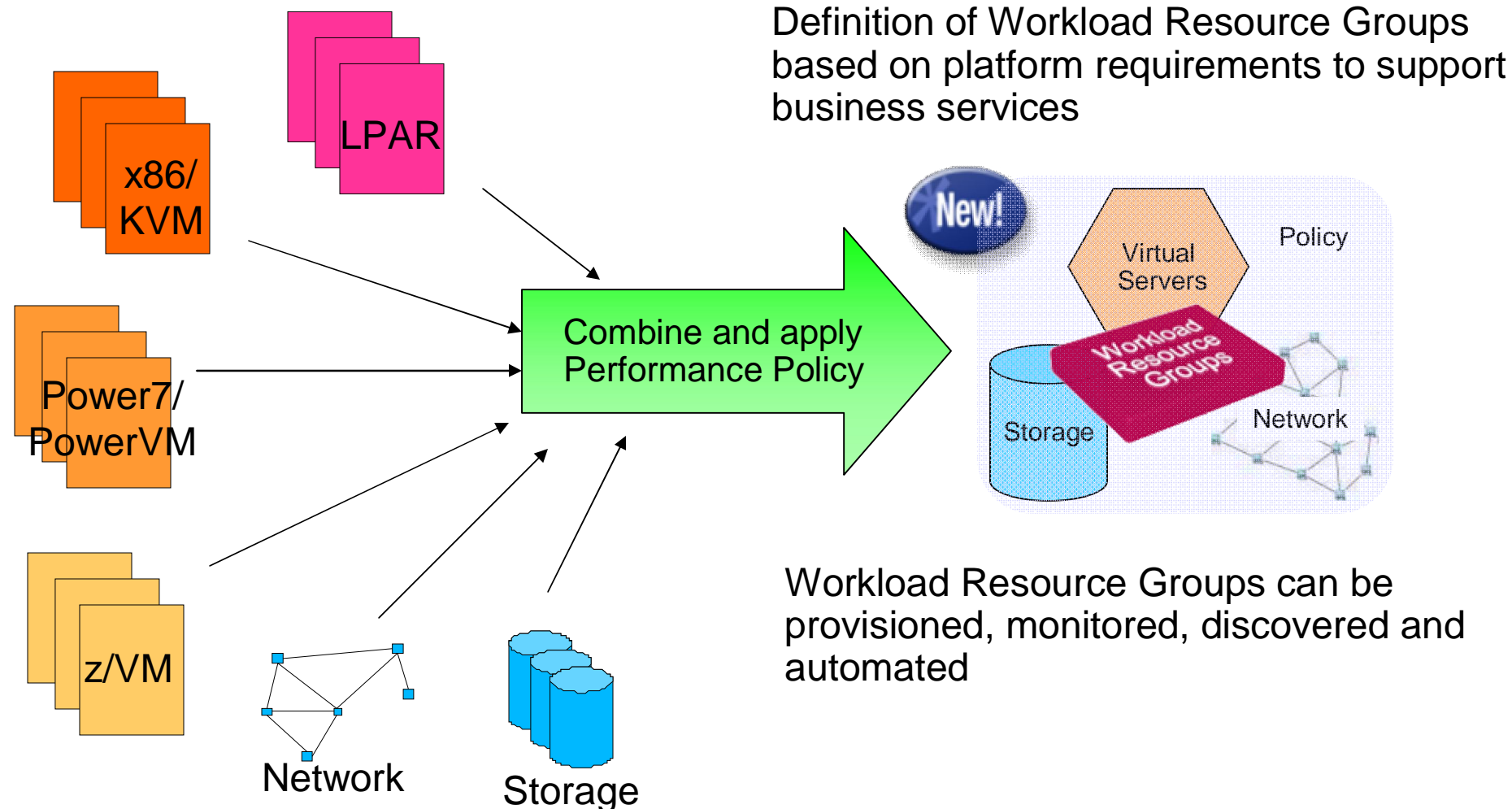(Hardware, Hypervisors, Virtual Servers)
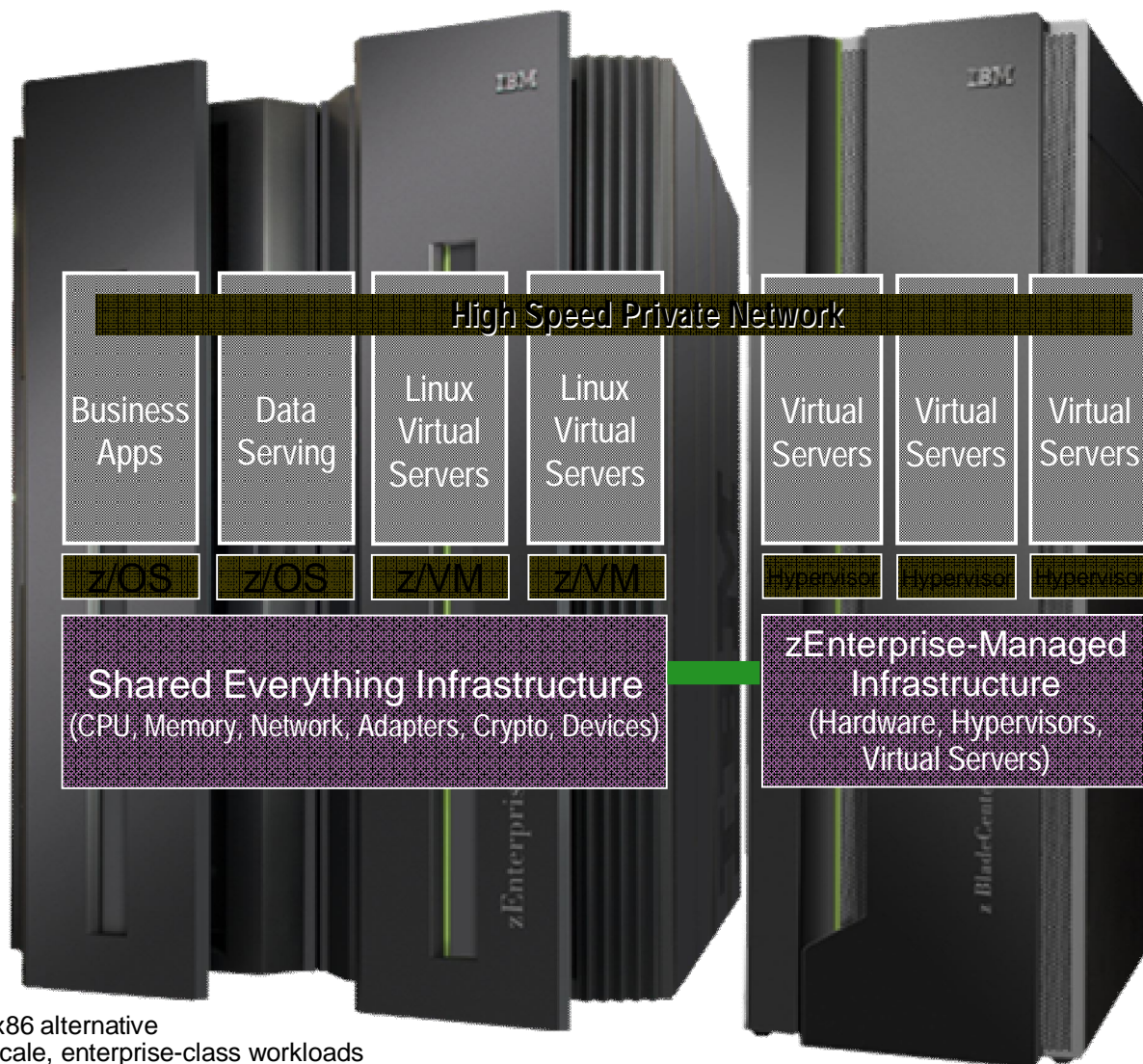
(1) Based on zEnterprise comparison to virtualized x86 alternative
(2) Based on three-year acquisition costs for large-scale, enterprise-class workloads
20 (3) Based on life-cycle management testing of large-scale virtual server environment conducted by IBM

# Workload Resource Groups moves management to the business level versus resources and components

x86/ KVM

LPAR

Power7/ PowerVM

z/VM

Network

Storage

Combine and apply Performance Policy

Definition of Workload Resource Groups based on platform requirements to support business services

New!

Virtual Servers

Policy

Workload Resource Groups

Storage

Network

Workload Resource Groups can be provisioned, monitored, discovered and automated

# Provision the Cloud across heterogeneous resource groups



Provision

**Service Automation Management**

*Establish workload context across Virtualized infrastructure!*

**Unified Resource Manager APIs**

[1] *All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.*
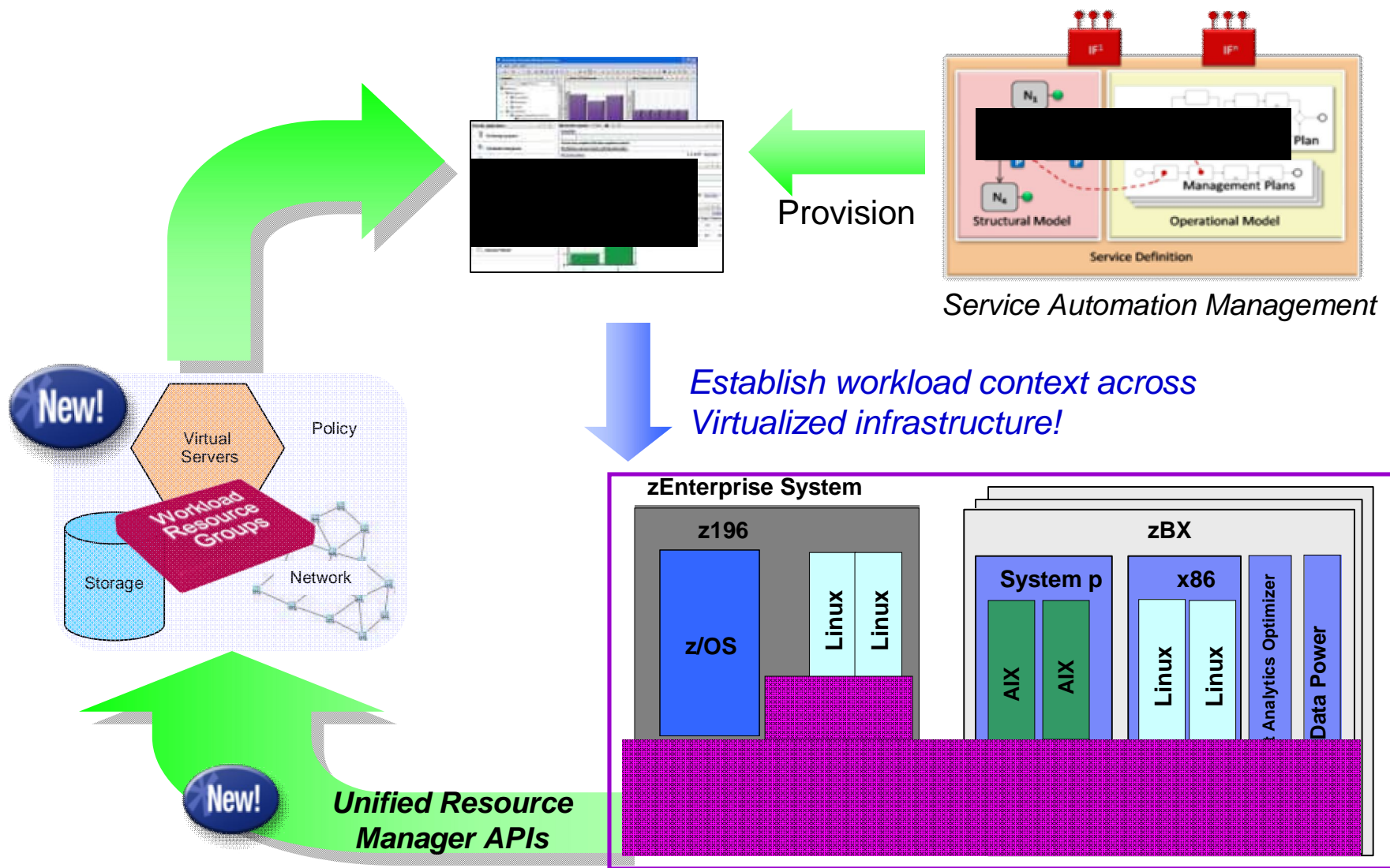
# Track and manage Workload Resource Groups across zEnterprise

Events

*Workload Dashboard*



New!

Virtual Servers

Policy

Workload Resource Groups

Storage

Network

*Add existing operating system, middleware, and application insights*

**zEnterprise System**

| z196 | | | zBX | | | | |
|------|---|---|-----|---|---|---|---|
| z/OS | Linux | Linux | **System p** | | **x86** | | |
| | | | AIX | AIX | Linux | Linux | Analytics Optimizer / Data Power |

New!

***Unified Resource Manager APIs***

*[1] All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.*

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# Leverage automation to ensure availability of Workload Resource Groups and Business Services



Policy

*Automate Operations*

*Integrated Workload availability for normal operations and disaster recovery!*

[1] *All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.*

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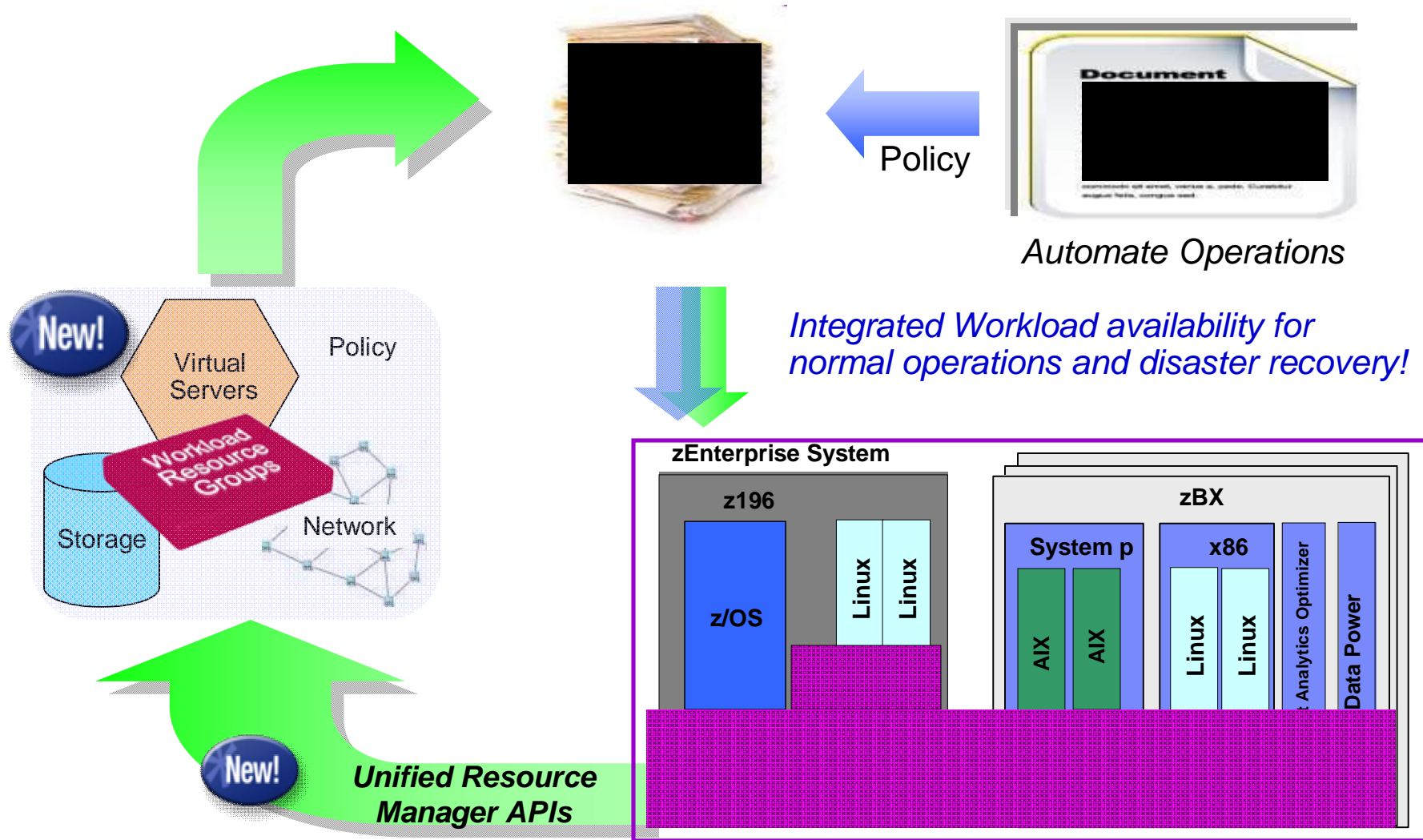
# Emerging successful cloud adoption patterns for both beginning and progressing cloud initiatives:

**Cloud Enabled Data Center**

*Cut expense, manage complexity and drive standardization*

Integrated service management, automation, provisioning, and self service

**Cloud Platform Services**

*Accelerate time to market*

Integrated stack of middleware optimized for automated deployment and management of heterogeneous workloads that dynamically adjusts

**Cloud Service Provider**

*Innovate business models*

Advanced, reliable, highly secure and scalable platform for creating, managing, and monetizing cloud services

**Business and IT as a Service**

*Immediate Access, Immediate Value*

Capabilities provided to consumers for using a provider's applications running on a cloud infrastructure

## Design, Deploy, Consume

Rethink IT. Reinvent Business. Cloud Computing
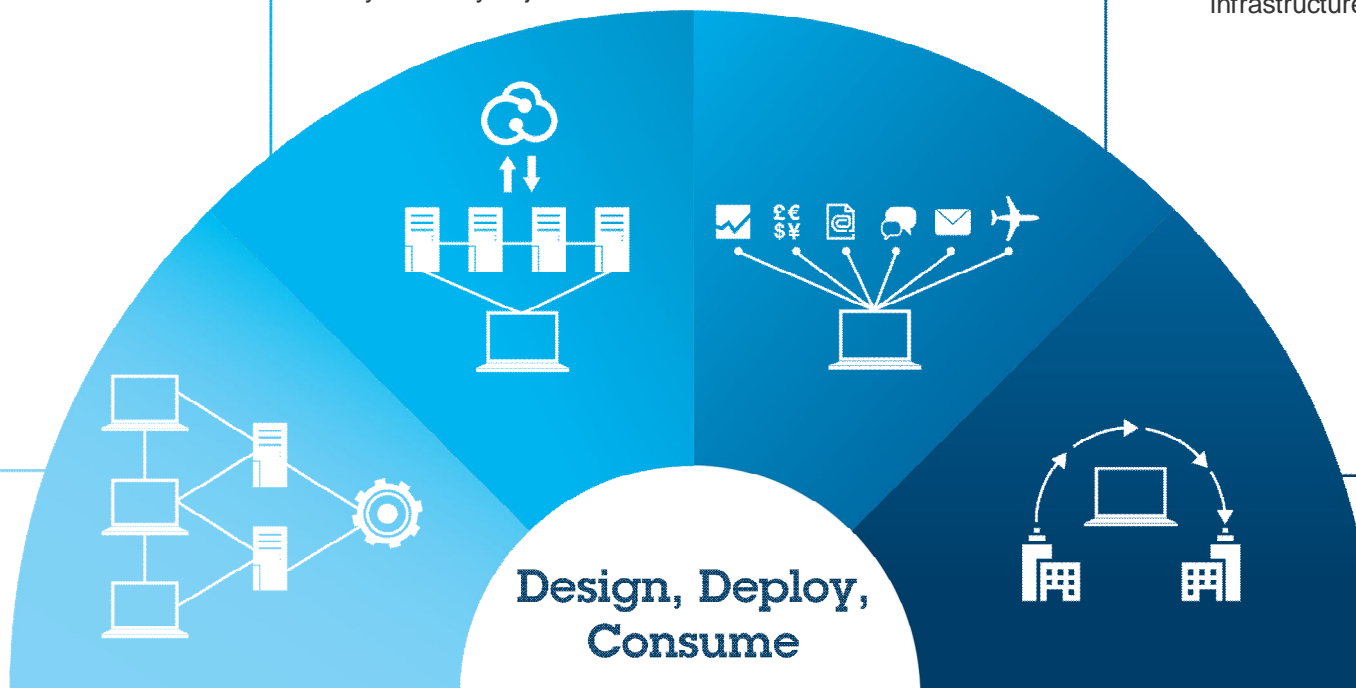
# Universita di Bari

## Innovative Cloud Solutions

### Wine Market

Support for 60 wineries to determine demand and get best market price

### Fish Market

Electronic fish auction for fishermen while on boats

### MoniCA

Logistics solution tracks and collects data real time

**Solution Edition for Cloud Computing**

Linux

z/VM

Solve community challenges

# BENEFITS to Clients

*Cloud computing allows multiple organizations to tap into heavy-duty computing power at minimal cost.*

*It lowers the barrier for local businesses to benefit from this technology.*

UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

Universita di Bari, established in 1924, is developing cloud-based solutions for a consortium of companies and universities from five regions of southern Italy.

Press release: http://www-03.ibm.com/press/us/en/pressrelease/32051.wss

# IBM can help you assess where you are today, and keep up with where industry is going

- *Join IBM Academic Initiative to enhance staff productivity:*
  - *Training on Integrated Service Management and System z*

- *Receive ISM for zEnterprise information updates on a regular basis:*
  - *IBM Software Newsletter*

- *Leverage Integrated Service Management information:*
  - Managing cloud deployments on IBM System z
  - *Integrated Service Management for System z*
  - *Service Management Strategy & Design*

- *Get started with Cloud design services*
  - *Strategy and design services for a cloud infrastructure*

- *Take advantage our of FREE self-assessment tool:*
  - *Integrated Service Management Self-Assessment*
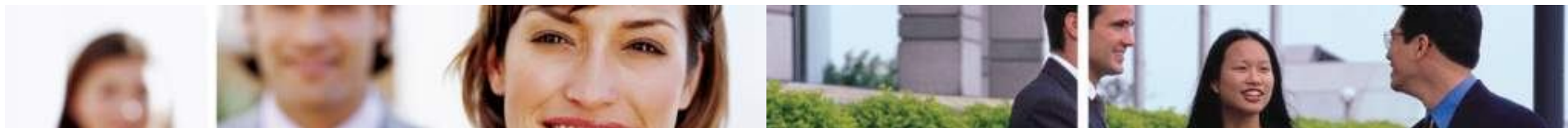
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