Smarter Planet: Using cloud computing to deliver innovation and efficiency

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Pulse Comes to You

Optimising the World's Infrastructure

There is a greater need for IT to help address business challenges

Doing more with less

Reduce capital expenditures and operational expenses

Reducing risk

Ensure the right levels of security and resiliency across all business data and processes

Higher quality services

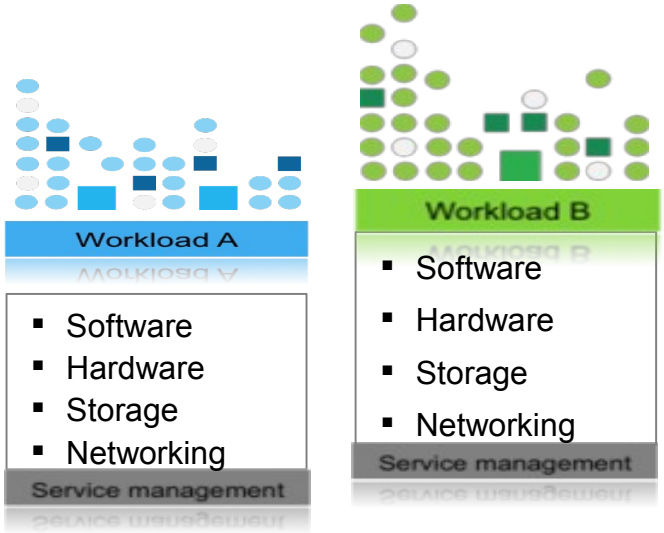
Improve quality of services and deliver new services that help the business grow and reduce costs

Breakthrough agility

Increase ability to quickly deliver new services to capitalize on opportunities while containing costs and managing risk

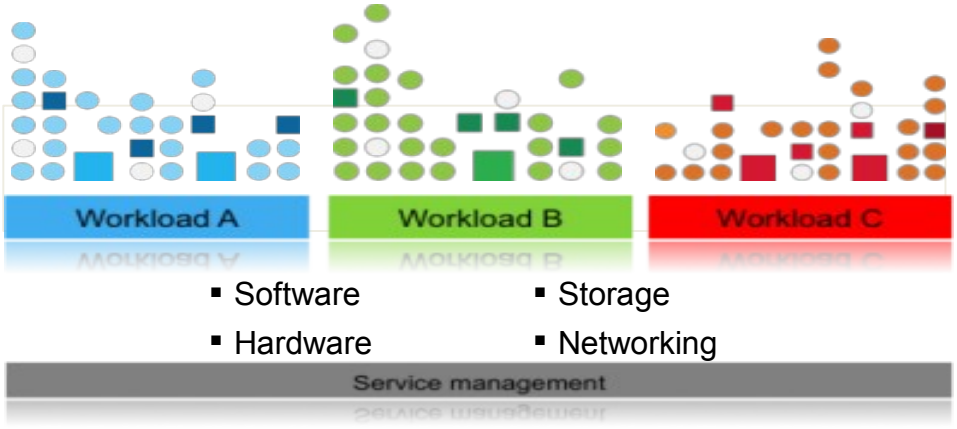
What is different about cloud computing?

Without cloud computing



With cloud computing

- Virtualized resources
- Automated service management
- Standardized services
- Location independent
- Rapid scalability
- Self-service



What clients are telling us: Universal interest cross geo and industry

Cost takeout and ***Faster Time to Value***		• ***Cited by 77% and 72% respectively as top reasons for interest in cloud.***
Security and Control are top concerns		***69% say security is the top inhibitor to their use of public clouds***
Workloads and patterns are emerging		• ***Almost all workloads require connection to other IT services*** • ***Collaboration and analytics meta-patterns are occurring***
Industries with the ***greatest cost pressures lead adoption***		• ***Over 50% of clients in Retail, Manufacturing, Utilities, Government have cloud projects budgeted or in process***

Open Cloud Standards Leadership

Drive an Open Conversation	**Promote reuse of existing standards** Lead Open Cloud Manifesto with almost 400 companies Lead Open Cloud Use Case Project with 1500 world wide participants, including Chinese translation
Discourage Proprietary Lock-in	**Allow alternatives at the Virtualization layer** Drive a common VM API interfaces for management and image definitions Build open source adapters to existing hypervisor implementations
Build a Strong Cloud Ecosystem	**Drive Application Portability that establishes an ecosystem for the development community** Partner with industry leaders to define common APIs and an image format for IaaS, management, storage and beyond. Build open source adapters to existing implementations.
Focus on Enterprise Issues	**Ensure Cloud Focus on Security and Management** DMTF Audit & Compliance WG, OASIS Identity Management WG Future Management Orchestration standardization in OASIS
Engage Industry Standards	**Drive adoption of IBM Architecture by Industry Standards Groups** World Wide partnership especially US, China, Japan and EU. Initial focus in Financial Services, Retail, Telco, Government, & Education. Lead SLA Discussions based on Enterprise requirements & trust in IBM

OASIS

DMTF

simple cloud

Apache

ISO International Organization for Standardization

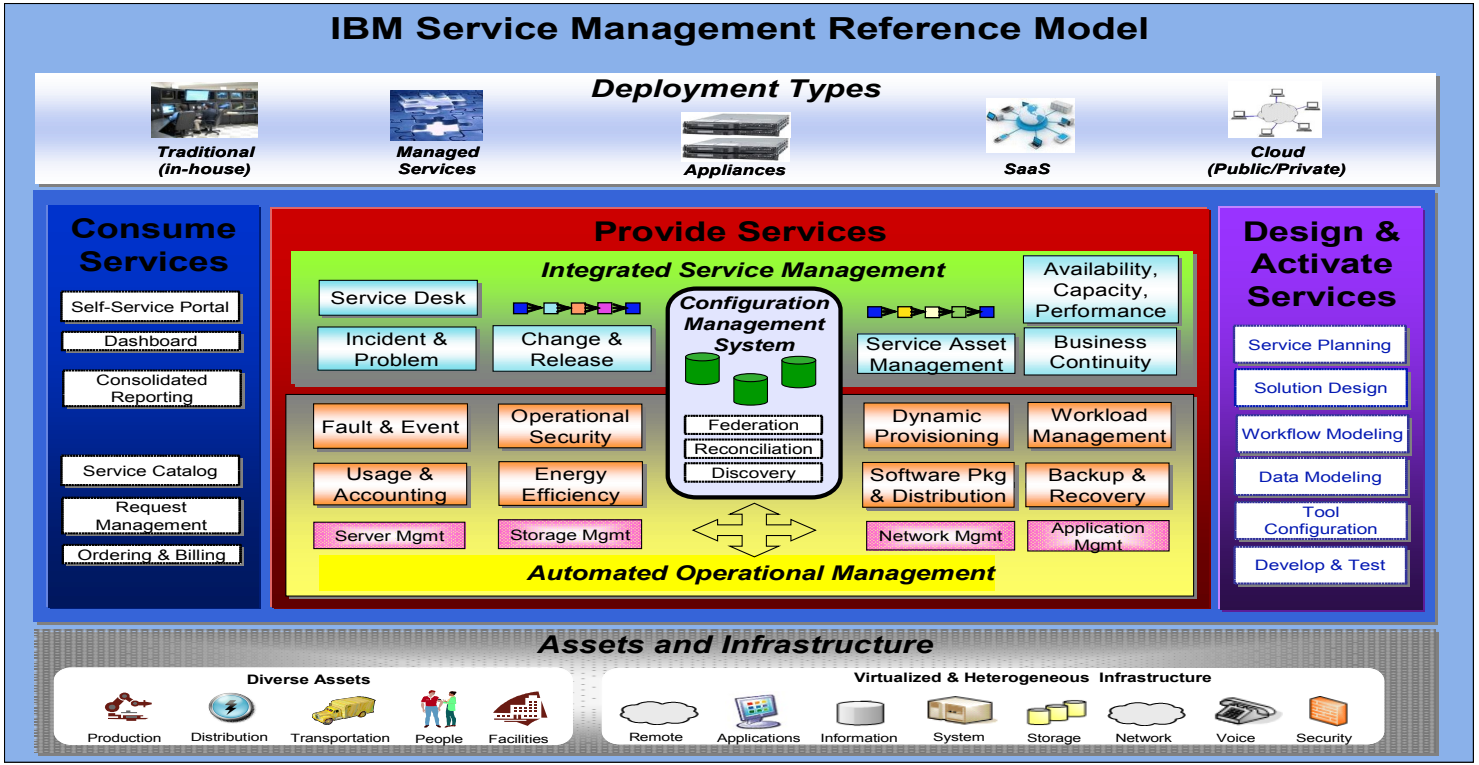
Hotel Technology next generation

ARTS Association for Retail Technology Standards

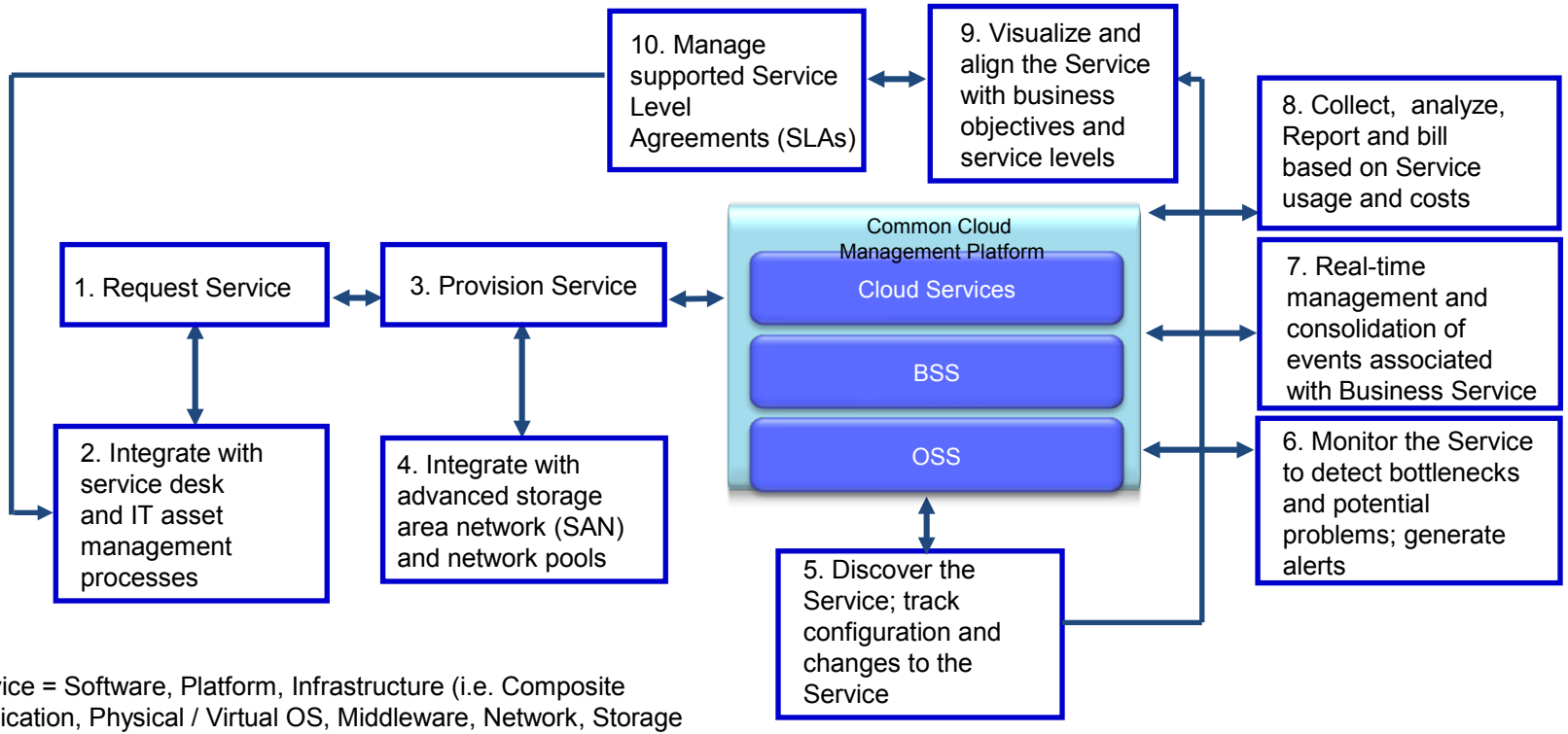
Integrated Service Management Addresses New Challenges with Virtualization Management & Cloud Computing

Visibility	*Control*	*Automation*
Improve service quality and customer focus	**Improve service through process discipline**	**Accelerate tasks and create process efficiencies**
• How are my services performing? • What is the utilization of my environment? How do I ensure adequate capacity?	• How do I secure my shared infrastructure & protect my data? • How do I manage Image Sprawl?	• How do I rapidly provision services ? • How do I reduce cost of service delivery?

…supported by a Service Management Reference Architecture

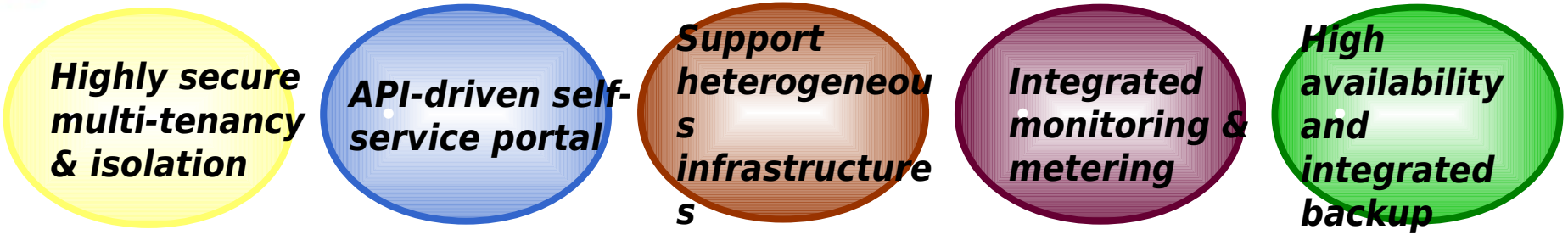


Why is Service Management Important? Cloud Use Case



Service = Software, Platform, Infrastructure (i.e. Composite Application, Physical / Virtual OS, Middleware, Network, Storage

Customer Criteria for Success as a Cloud Service Provider

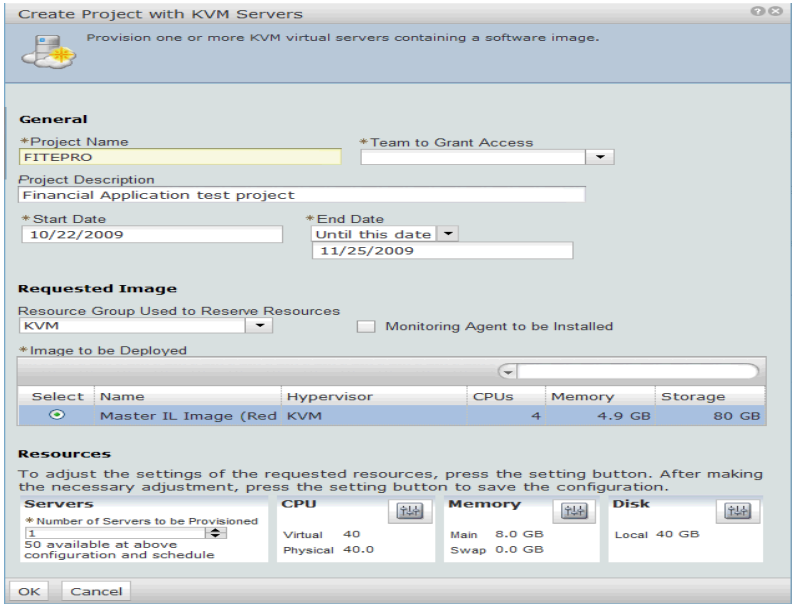


- Requirement #1: Self-Service Portal
- Requirement #2: Service Catalog
- Requirement #3: Automated Provisioning
- Requirement #4: Complex Topology Creation & Deployment
- Requirement #5: Platform/Virtualization Management
- Requirement #6: Usage Metering & Accounting
- Requirement #7: Multi-tenancy: Assuring ‘Service’ and Tenant Isolation
- Requirement #8: Security and Privacy
- Requirement #9: Connect, manage and secure hybrid clouds
- Requirement #10: Open Standards
- Requirement #11: Migration and Quality of Service Management
- Requirement #12: Deployment Options with Heterogeneous Support

Scalability and reliability to enable customers to meet today and tomorrow’s needs

Requirement #1: Self-Service Portal

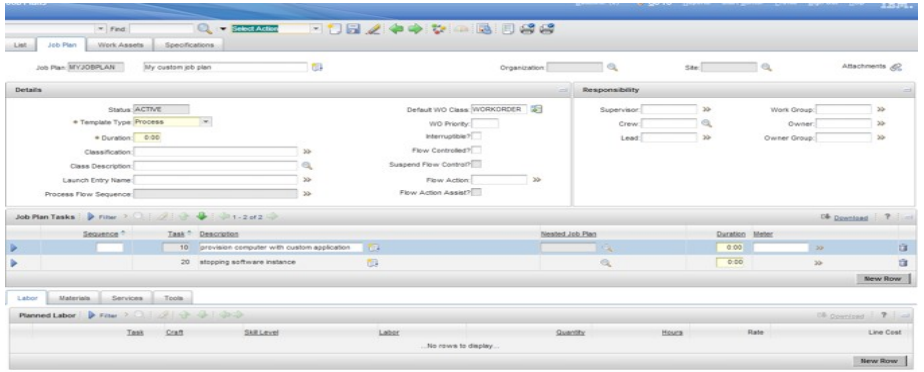
- Users can request the services they need, when they need them, for the time they need them
- Easily manages automated approval policies and fully extendable to complex workflows if needed
- Eliminates manual processes for requesting resources
- Based on a RESTful Web2.0 API for ease of integration with existing Portals
- Easily customizable for branding, logos & corporate colour schemes



…Improves customer satisfaction by accelerating service delivery

Requirement #2: Service Catalog

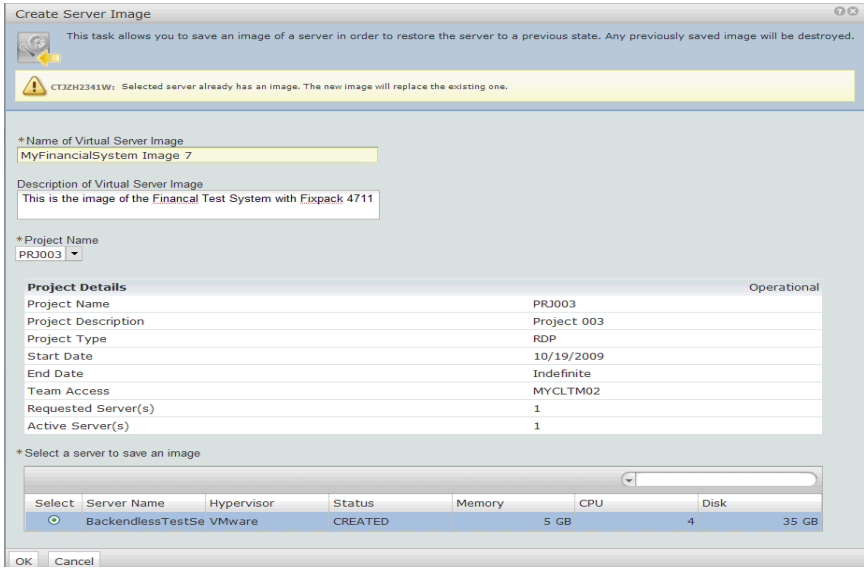
- Single repository for all cloud services
- Allows end users to use IT services without being an expert in IT
- Supports faster delivery of business services
- Wizard-like importing of new service templates into the catalog
- Client-specific image segmentation
- Centralized or delegated image management



…Improves consistency of services

Requirement #3: Automated Provisioning

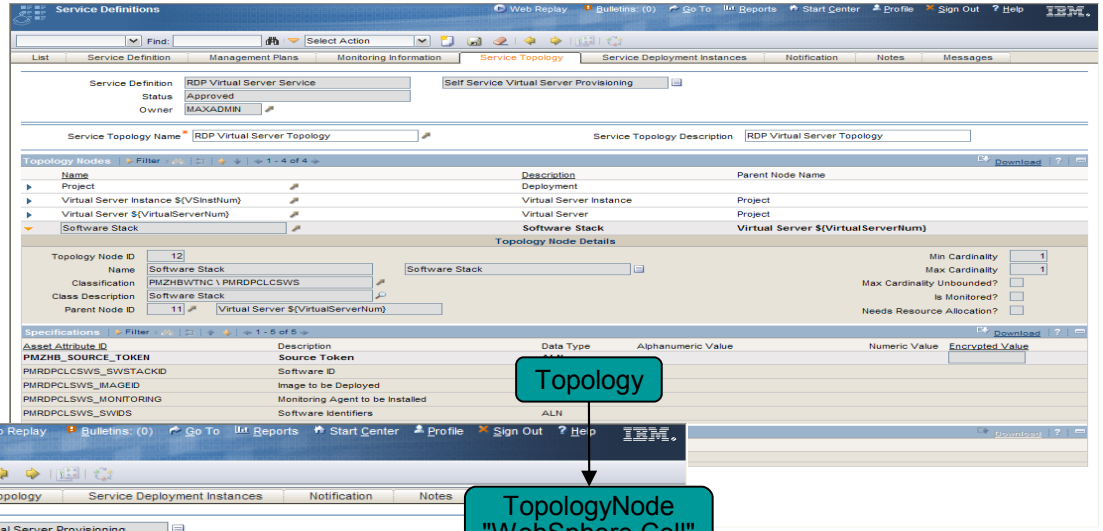
- Resources can be provisioned in minutes versus weeks
- Resources are provisioned consistently every time
- Resources are quickly returned to pool when no longer needed instead of sitting idle
- Easily customizable by role

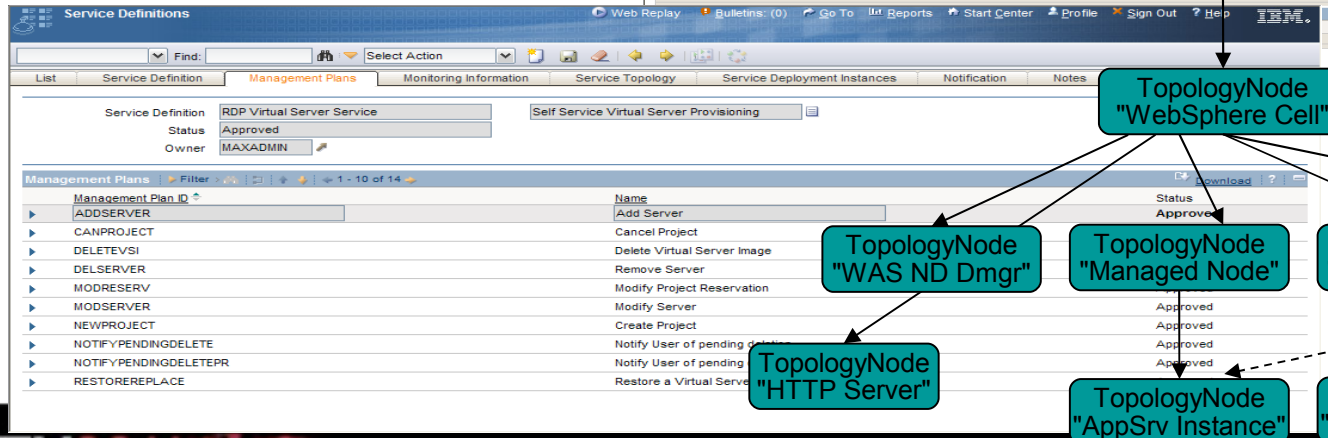


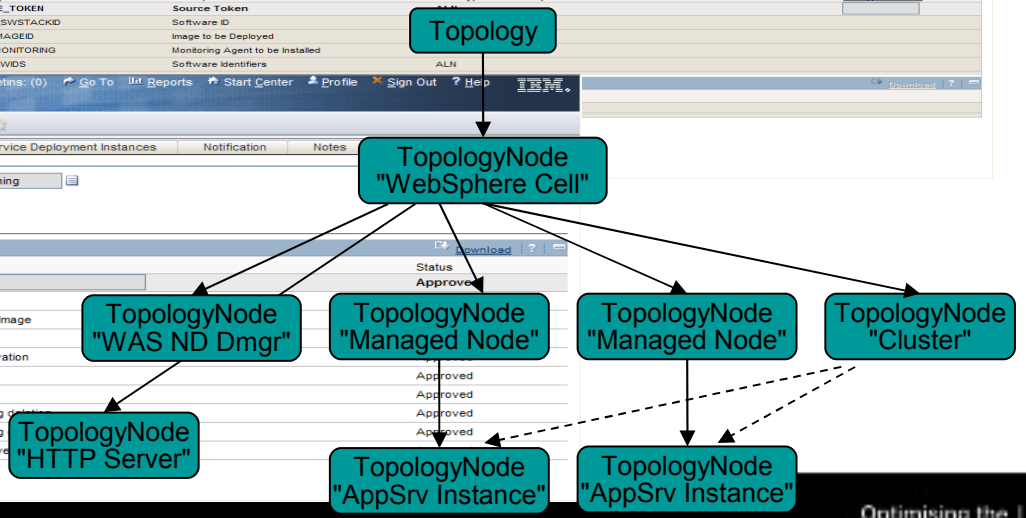
…Speeds delivery of services via easy-to-use provisioning

Requirement #4: Complex Topology Creation & Deployment

- Full template data model definition
- Process Model Definition with Define Build– and Management plans
- Fully automated deployment through *build plan* and topology definition

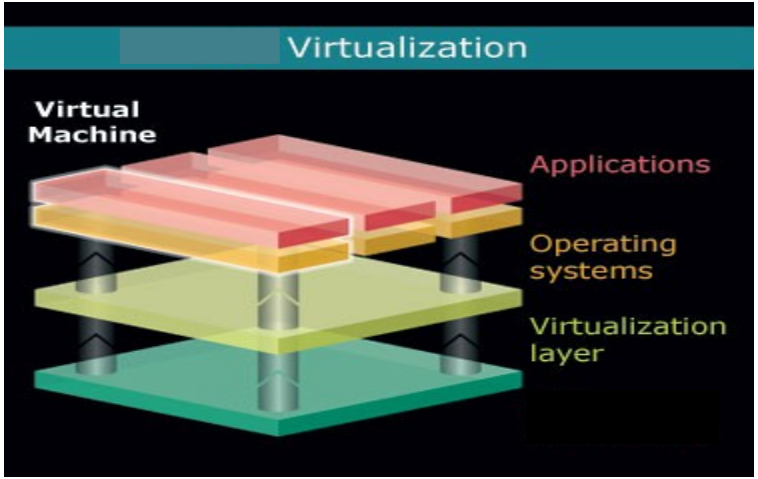






Requirement #5: Platform/Virtualization Management

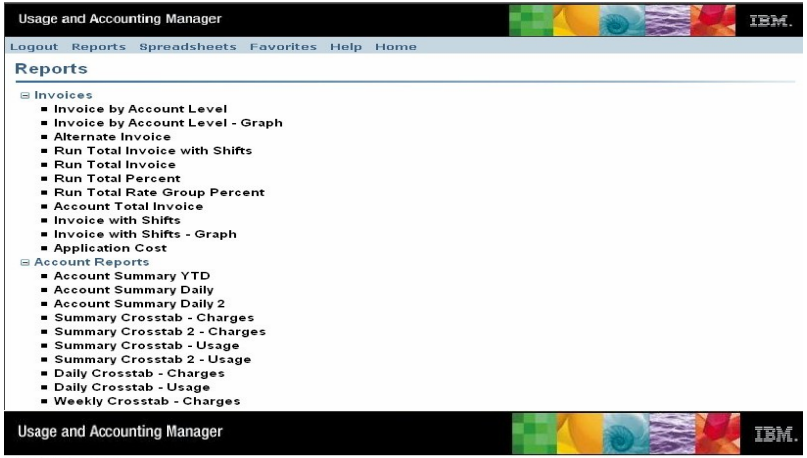
- Understand virtual and physical resource usage
- Dynamically manage virtual workloads to optimize resource usage
- Automatically migrate virtual machines across systems to maintain service levels
- Management of VLANs to support multi-tenancy

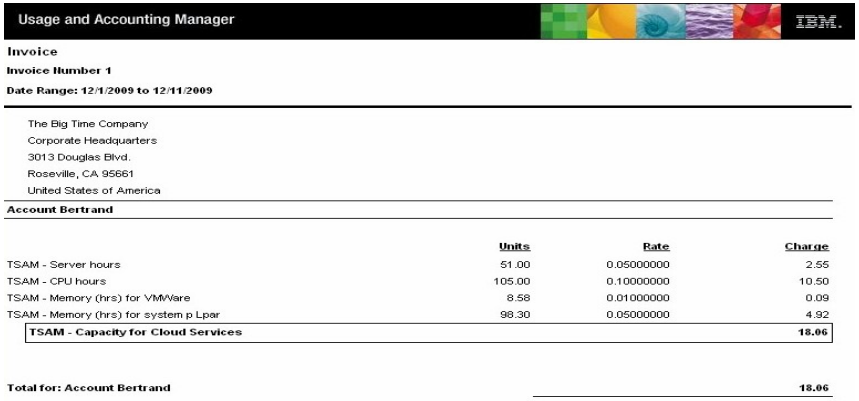


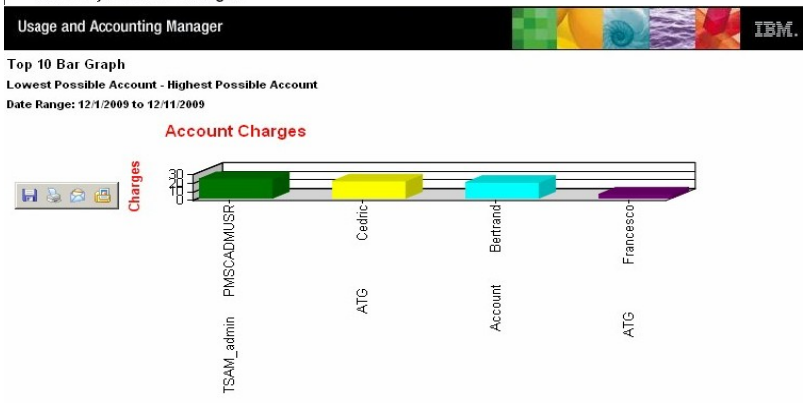
…Increases utilization for lower capital expense with improved application availability

Requirement #6: Usage Metering & Accounting

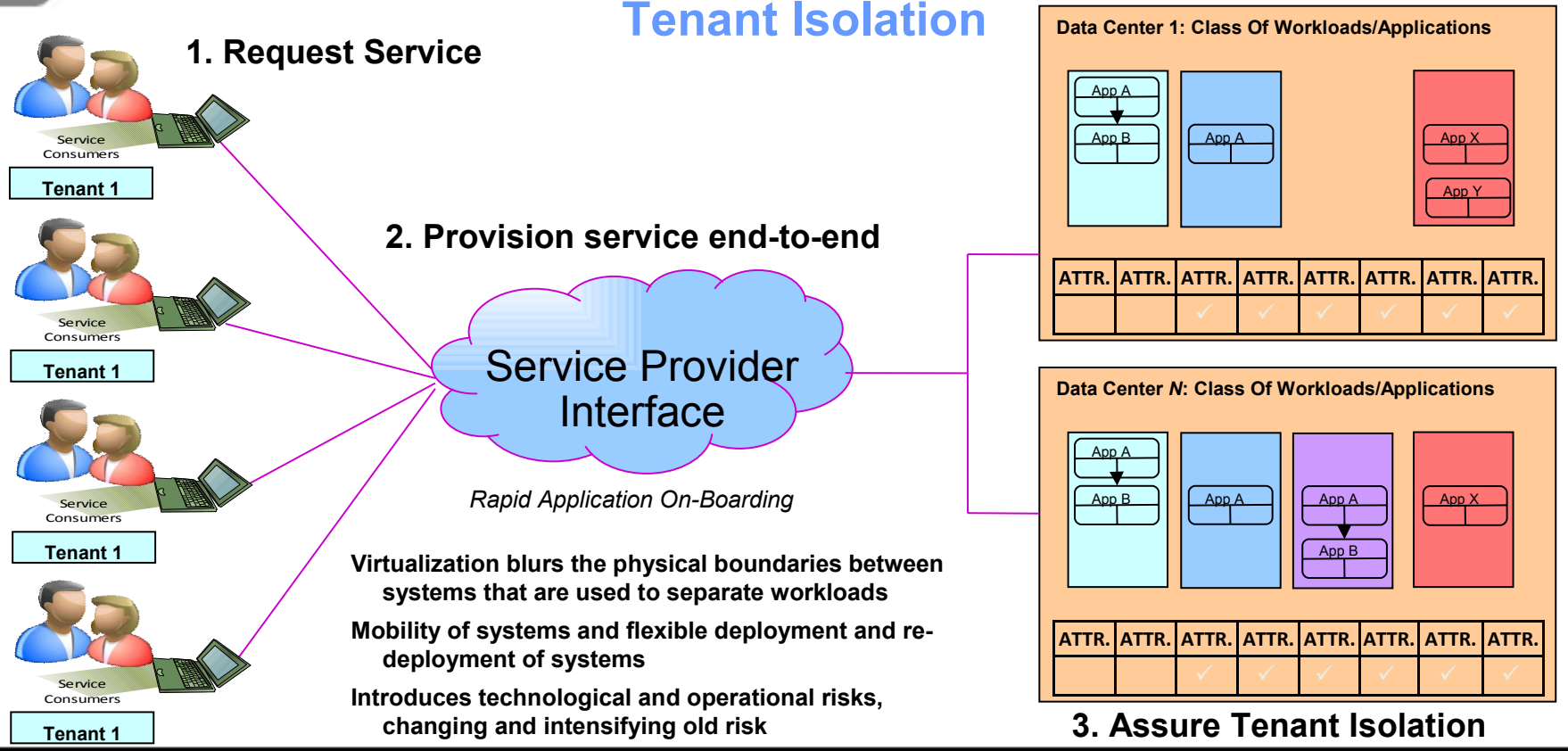
- Understand costs, track, allocate and invoice by department, user and many additional criteria
- Collect, analyze and bill based on usage and costs of shared assets
- Deliver detailed information and reports about the intricate use of shared resources







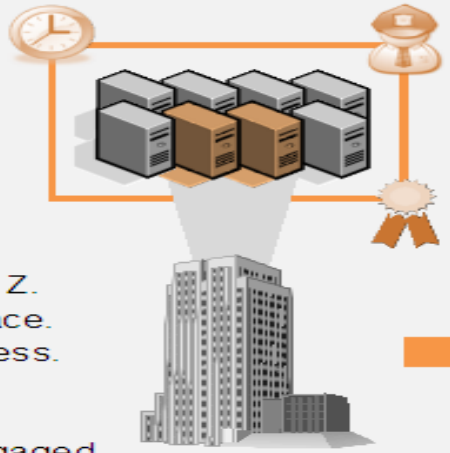
Requirement #7: Multi-tenancy; Assuring 'Service' and Tenant Isolation



Requirement #8: Security and Privacy

Today's Datacenter

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.



Tomorrow's Public Cloud

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?

People and identity

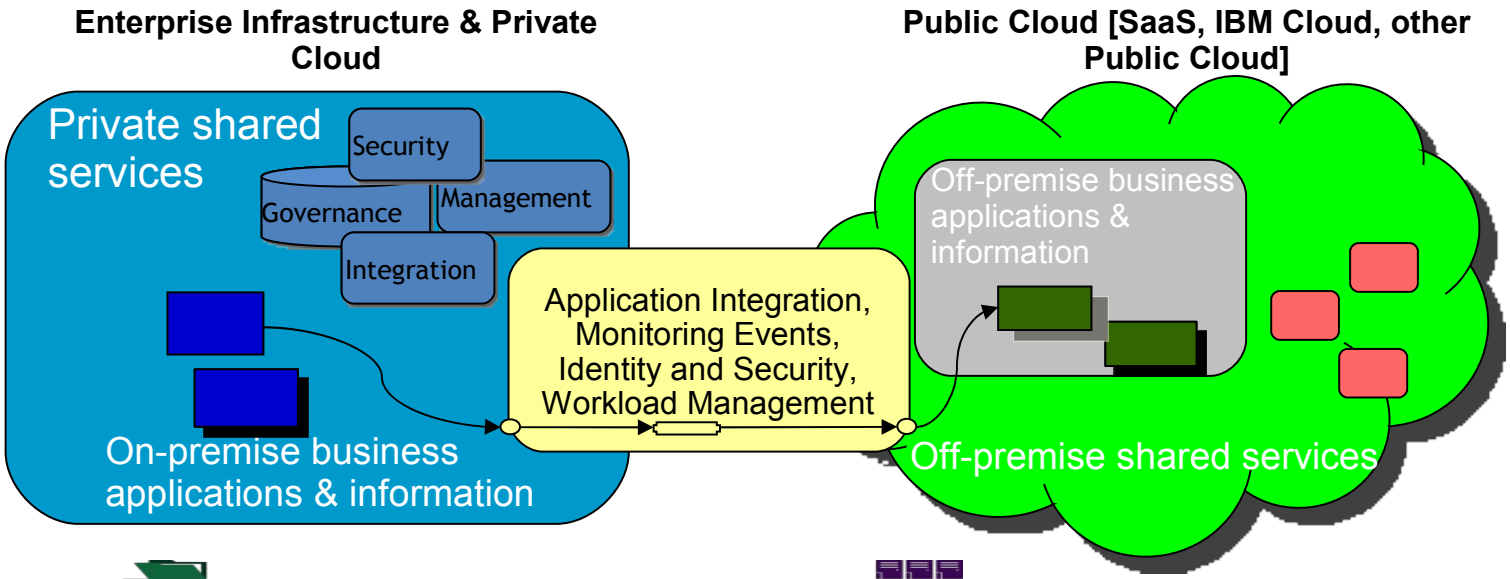
Application and process

Physical infrastructure

Data and information

Network, server and end point

Requirement #9: Connect, manage and secure hybrid clouds



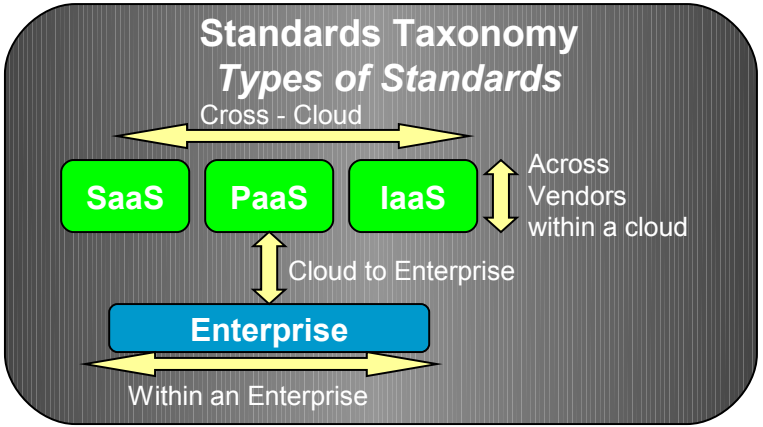
Workflow
Manage the process for approval of usage

Monitoring
Provide visibility of performance of virtual machines

Provisioning
Automate provisioning of resources

Metering and rating
Track usage of resources

Requirement #10: Open Standards



Source: Cloud Computing Use Case Group
www.cloudusecases.org

Standards address inhibitors to cloud adoption including security, vendor lock-in and portability.

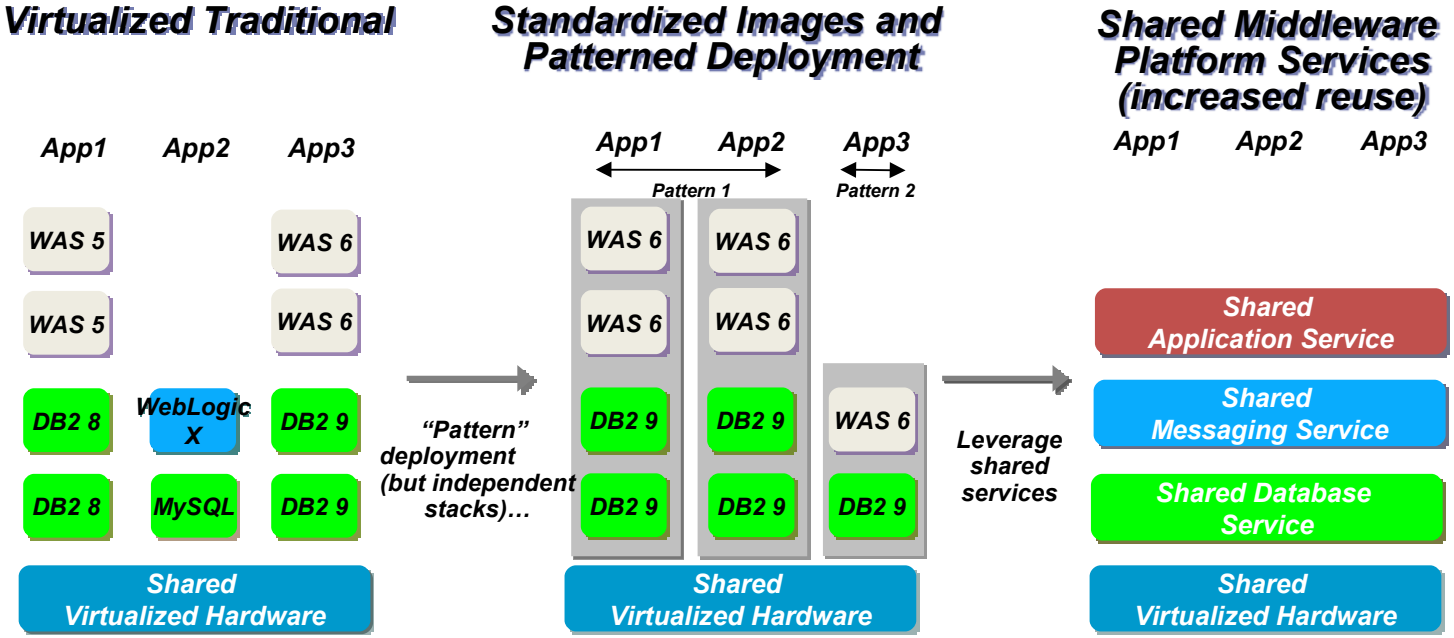
Recognize that cloud standards are emerging throughout the market, within IT and other industries.

Standards should be open, have long term stewardship, have code to back them, and be widely adopted.

Management Virtualization API SLM\SLA

Network Storage Security Industry Verticals

Requirement #11: Migration and Quality of Service Management



Shared, virtualized hardware results in Capex savings; shared middleware services results in Opex savings

Requirement #12: Deployment Options with Heterogeneous Support

Three approaches to give our customers consumability options and multiple entry points for a common cloud computing platform

A la Carte Service Mgmt

- Customizable
- Individual software offerings, fully customizable to the environment
- Could begin with TSAM, or could require other SM capabilities for cloud, such as security or storage mgmt.
- Designed for customized datacenter automation. Currently utilized by external customers, service providers, and internal customers such as IBM public clouds.

IBM Service Delivery Mgr

- Flexible HW Configurations w/Fast Time to Value
- Integrated software-only service management offering for cloud computing.
- Same basic SW function as CloudBurst
- Delivered as a set of virtual machines for simplified deployment and faster time to value
- Allows flexibility of the HW platform, with a pre-determined set of service management tasks and workflows

IBM CloudBurst

- Fixed Configurations, Faster Time to Value
- Pre-Integrated HW/SW/Services release in a pre-determined configurations
- Includes HW for System x, or PowerSystems, STG SW and Tivoli Service Management Software, GTS quickstart services
- Self-contained management designed for cloud computing pilots or fixed size environments
- Designed for quick deployment of limited cloud use cases

Customizable ⟵ ⟶ **Rapid Time to Value**

Business Background

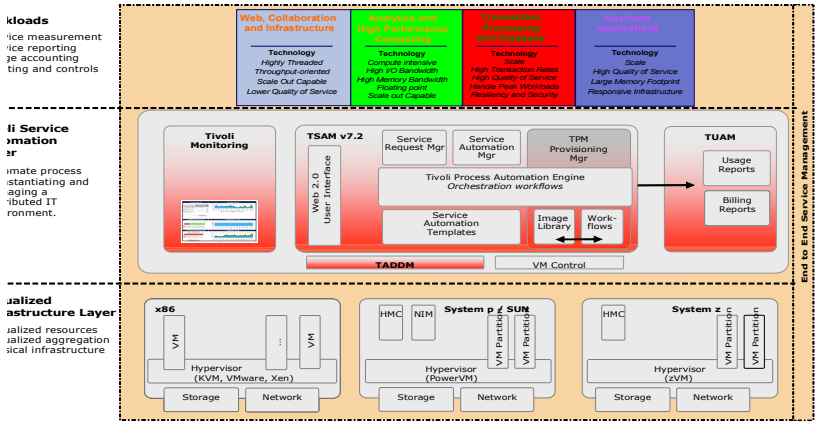
- ING is a large world-wide operating financial institution offering clients banking, insurance and asset-management services (HQ in Amsterdam, Netherlands), ~110,000 employees
- ING needs to drive down IT costs dramatically and intensively improve their time to deliver new IT environments to the business
  - ➢ *ING is in the process of transforming towards a "new world" IT landscape (besides their legacy "old world" IT), in which they can benefit from the advantage of a private cloud concept*

Solution Overview

- Automated delivery of standardized "stacks" (OS up to app, single VM) and "solutions" (distributed environment, multiple stacks), for development, test, acceptance and production purposes
- Tivoli Service Automation Manager-based private cloud implementation, management across System p and x86 (VMware vSphere), additional platforms will be added
- Restructuring of existing IT delivery / mgmt processes & IT landscape to enable large efficiency gain. New processes implemented in TSAM mgmt plans
- Integrates with ING-internal mgmt systems where needed and appropriate (e.g. ING Corporate Directory Server & Identity Mgmt System, agents to integrate with backup & monitoring get deployed & configured automatically)

Cloud Business Benefit

- Large efficiency improvement in time and cost to deliver new IT environments
- Massively improved predictability (regarding time to deliver new environments and future availability of required IT capacity, enabled by reservation)
- Visibility into where resources are allocated to
- Improved customer experience (i.e. quality of service) through standardisation and increased agility.
- Transparent cross-charging ability for provided IT services



Client Successes and Cloud References

Integrated Service Management