



Smarter Planet: Using cloud computing to deliver innovation and efficiency

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PCTY2011 

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

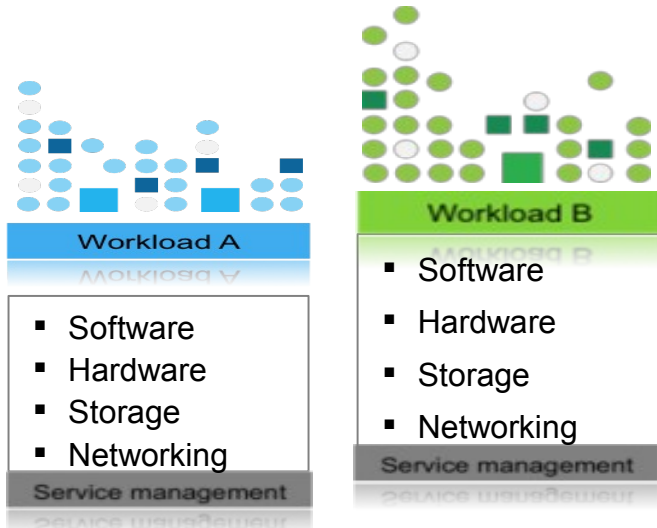


Breakthrough agility

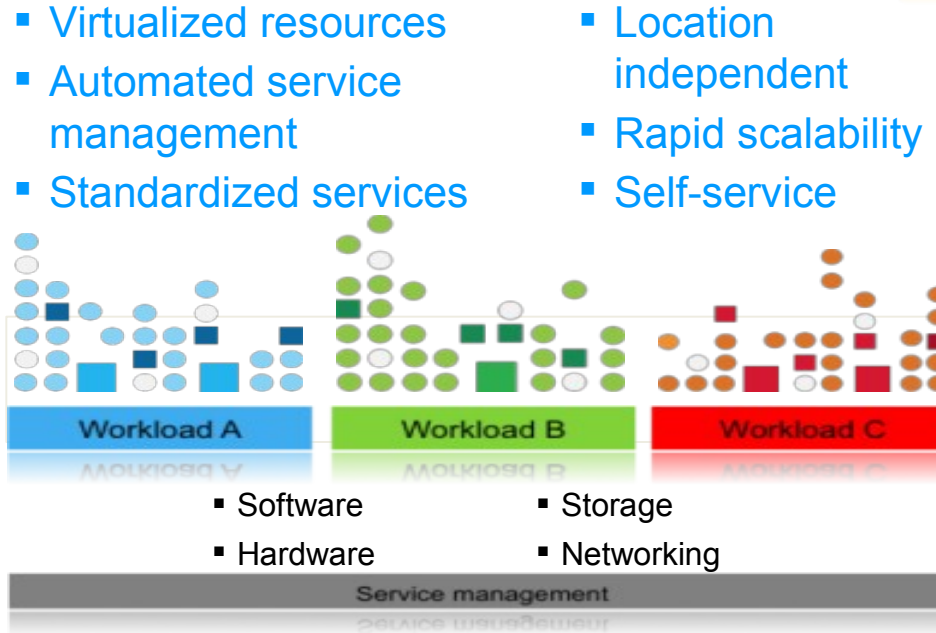
Increase ability to quickly deliver new services to capitalize on opportunities while containing costs and managing risk

What is different about cloud computing?

Without cloud computing



With cloud computing



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

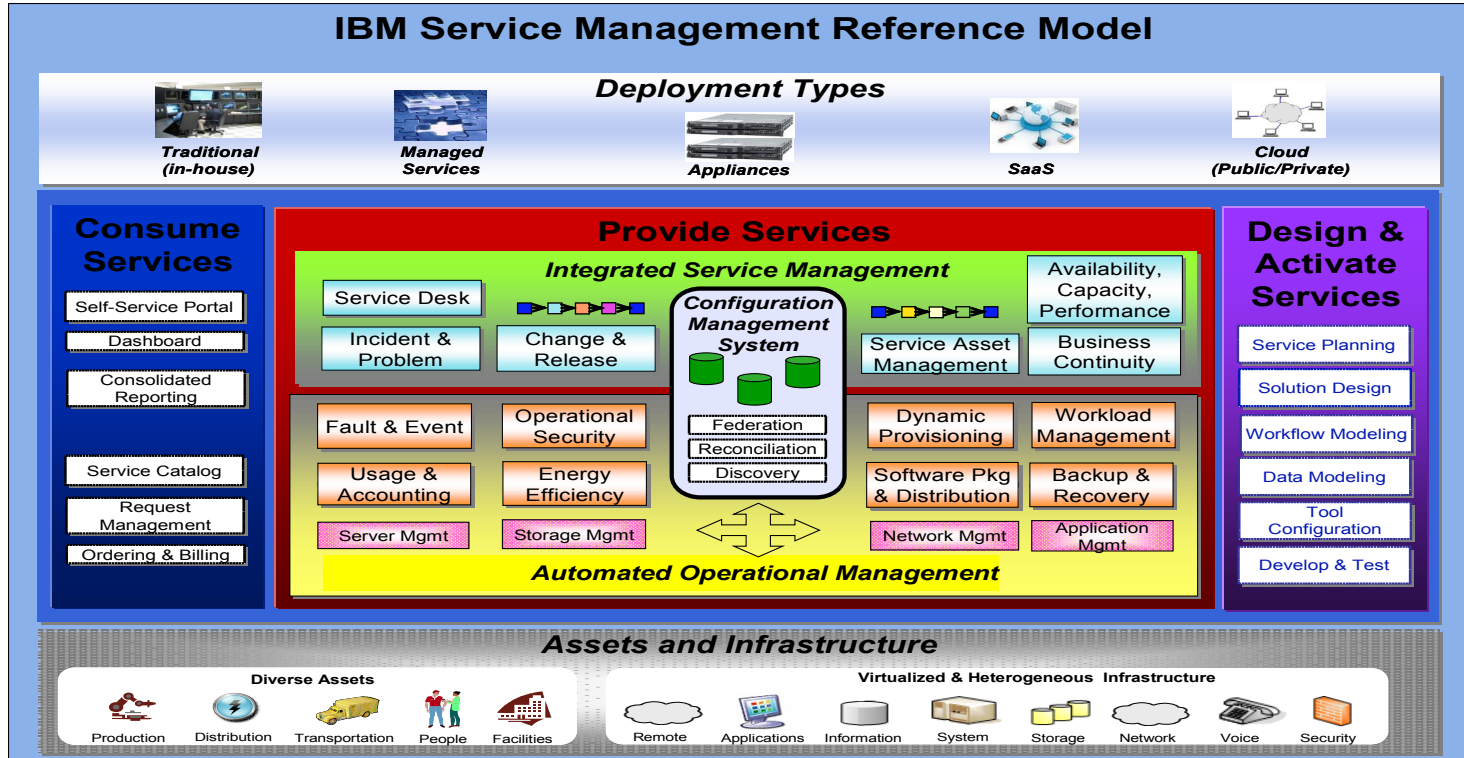


Integrated Service Management Addresses New Challenges with Virtualization Management & Cloud Computing

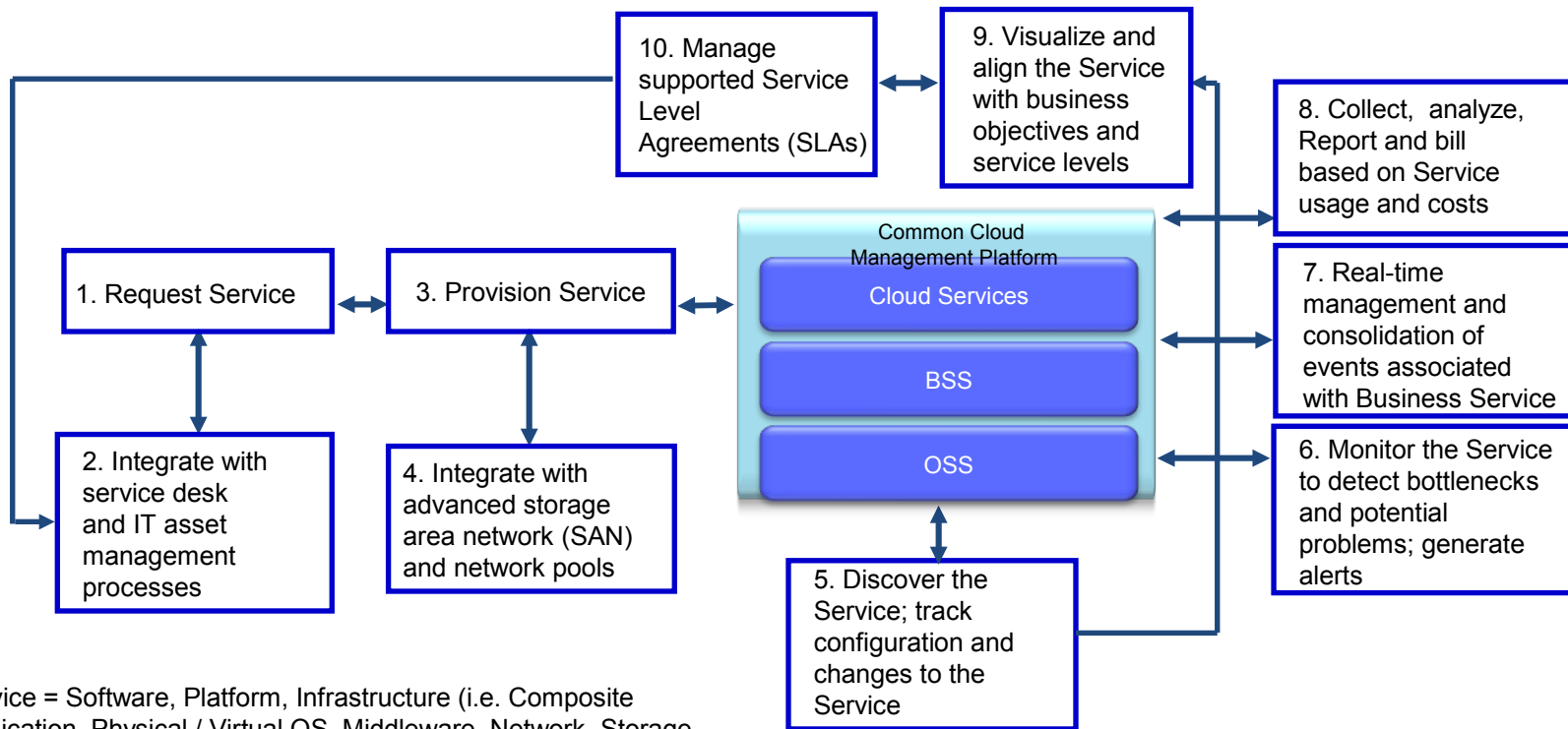


<i>Visibility</i>	<i>Control</i>	<i>Automation</i>
<p>Improve service quality and customer focus</p> <ul style="list-style-type: none">• How are my services performing?• What is the utilization of my environment? How do I ensure adequate capacity?	<p>Improve service through process discipline</p> <ul style="list-style-type: none">• How do I secure my shared infrastructure & protect my data?• How do I manage Image Sprawl?	<p>Accelerate tasks and create process efficiencies</p> <ul style="list-style-type: none">• 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

Highly secure multi-tenancy & isolation

API-driven self-service portal

Support heterogeneous infrastructures

Integrated monitoring & metering

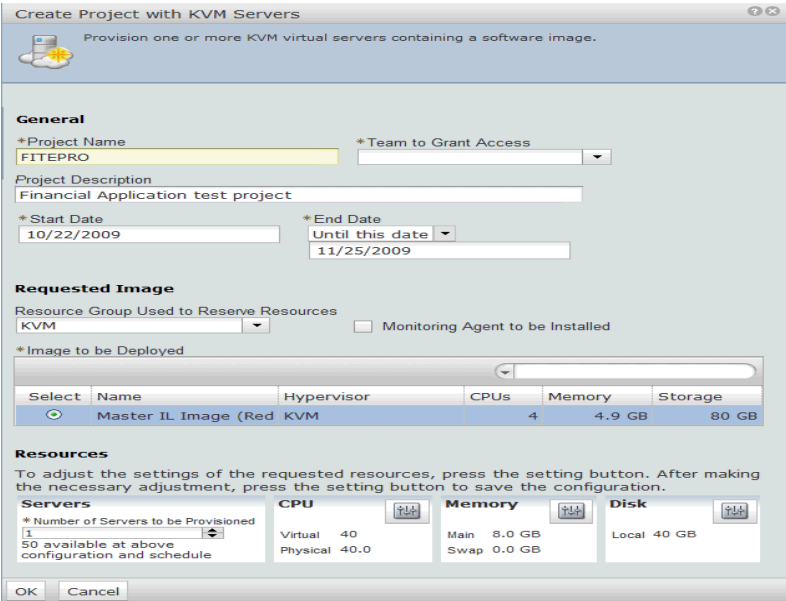
High availability and integrated backup

- 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



Create Project with KVM Servers
Provision one or more KVM virtual servers containing a software image.

General

*Project Name: FITEPRO *Team to Grant Access: [Dropdown]
Project Description: Financial Application test project
*Start Date: 10/22/2009 *End Date: 11/25/2009

Requested Image

Resource Group Used to Reserve Resources: KVM Monitoring Agent to be Installed

*Image to be Deployed

Select	Name	Hypervisor	CPUs	Memory	Storage
<input checked="" type="radio"/>	Master IL Image (Red	KVM	4	4.9 GB	80 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: 50 (50 available at above configuration and schedule)

CPU Virtual 40 Physical 40.0

Memory Main 8.0 GB Swap 0.0 GB

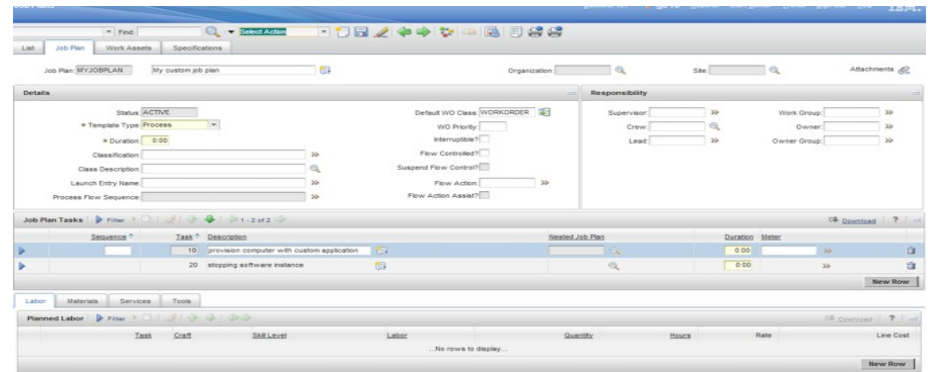
Disk Local 40 GB

OK Cancel

...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

Create Server Image

This task allows you to save an image of a server in order to restore the server to a previous state. Any previously saved image will be destroyed.

CTJZH2341W: Selected server already has an image. The new image will replace the existing one.

* Name of Virtual Server Image
MyFinancialSystem Image 7

Description of Virtual Server Image
This is the image of the Financial Test System with Fixpack 4711

* Project Name
PRJ003

Project Details		Operational
Project Name	PRJ003	
Project Description	Project 003	
Project Type	RDP	
Start Date	10/19/2009	
End Date	Indefinite	
Team Access	MYCLTM02	
Requested Server(s)	1	
Active Server(s)	1	

* Select a server to save an image

Select	Server Name	Hypervisor	Status	Memory	CPU	Disk
<input checked="" type="radio"/>	BackendlessTestSe	VMware	CREATED		5 GB	4 35 GB

OK Cancel

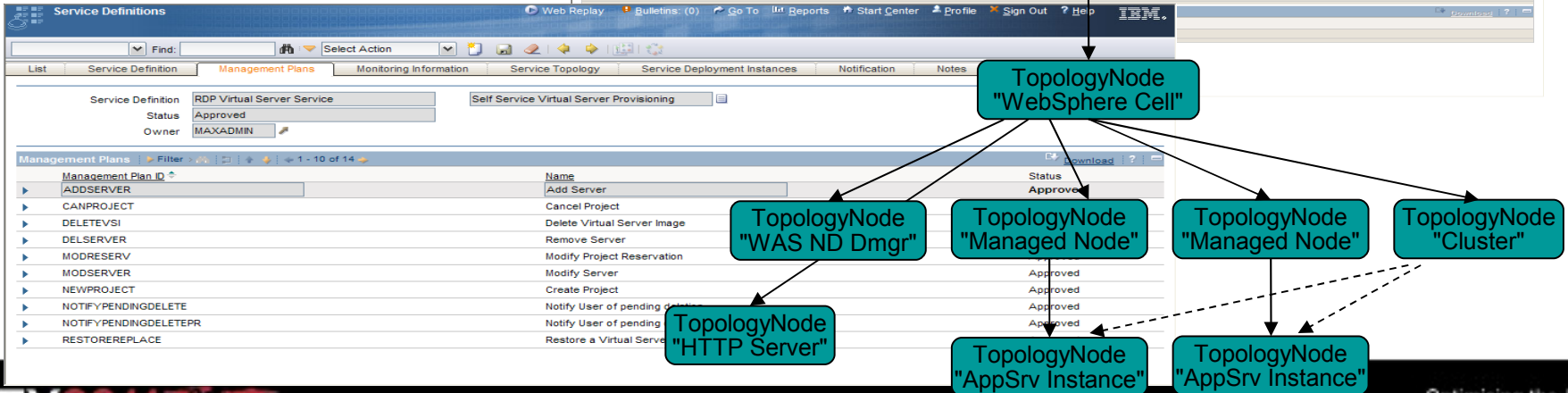
...Speeds delivery of services via easy-to-use provisioning

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

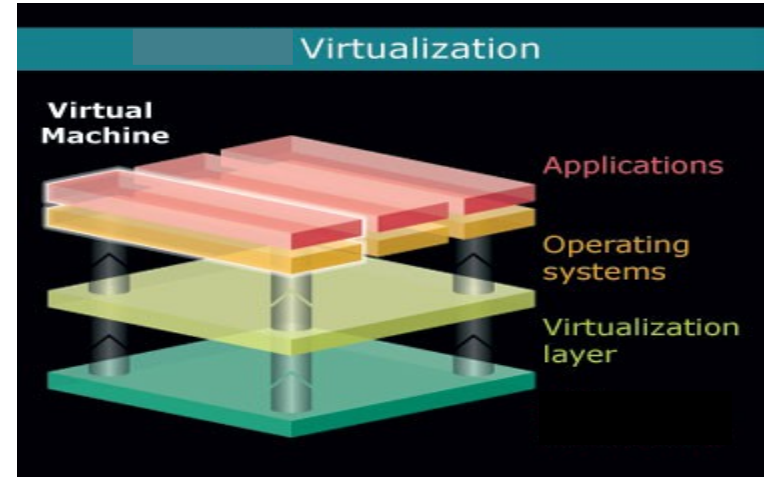
The screenshot displays the 'Service Topology' configuration page in the Service Definitions application. It shows a hierarchy of nodes for an 'RDP Virtual Server Topology'. The 'Software Stack' node is expanded, showing details for 'Virtual Server \$(VirtualServerNum)'. Below this, a table lists specifications for the topology.

Asset Attribute ID	Description	Data Type	Alphanumeric Value	Numeric Value	Encrypted Value
PMZHB_SOURCE_TOKEN	Source Token				
PMRDPLCSWS_SWSTACKID	Software ID				
PMRDPLCSWS_IMAGEID	Image to be Deployed				
PMRDPLCSWS_MONITORING	Monitoring Agent to be Installed				
PMRDPLCSWS_SWIDS	Software Identifiers				



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

Usage and Accounting Manager

Invoice
Invoice Number 1
Date Range: 12/1/2009 to 12/11/2009

The Big Time Company
 Corporate Headquarters
 3013 Douglas Blvd.
 Roseville, CA 95661
 United States of America

Account Bertrand

	Units	Rate	Charge
TSAM - Server hours	51.00	0.05000000	2.55
TSAM - CPU hours	105.00	0.10000000	10.50
TSAM - Memory (hrs) for VMWare	8.58	0.01000000	0.09
TSAM - Memory (hrs) for system p Lpar	98.30	0.05000000	4.92
TSAM - Capacity for Cloud Services			18.06
Total for: Account Bertrand			18.06

Usage and Accounting Manager

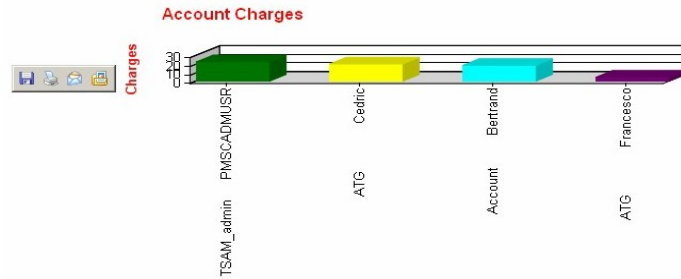
Logout Reports Spreadsheets Favorites Help Home

Reports

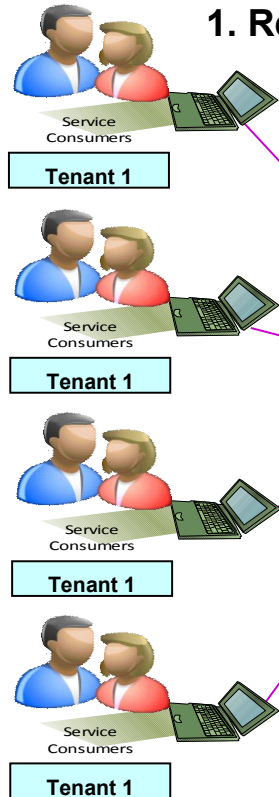
- ▢ Invoices
 - ▢ Invoice by Account Level
 - ▢ Invoice by Account Level - Graph
 - ▢ Alternate Invoice
 - ▢ Run Total Invoice with Shifts
 - ▢ Run Total Invoice
 - ▢ Run Total Percent
 - ▢ Run Total Rate Group Percent
 - ▢ Account Total Invoice
 - ▢ Invoice with Shifts
 - ▢ Invoice with Shifts - Graph
 - ▢ Application Cost
- ▢ Account Reports
 - ▢ Account Summary YTD
 - ▢ Account Summary Daily
 - ▢ Account Summary Daily 2
 - ▢ Summary Crosstab - Charges
 - ▢ Summary Crosstab 2 - Charges
 - ▢ Summary Crosstab - Usage
 - ▢ Summary Crosstab 2 - Usage
 - ▢ Daily Crosstab - Charges
 - ▢ Daily Crosstab - Usage
 - ▢ Weekly Crosstab - Charges

Usage and Accounting Manager

Top 10 Bar Graph
 Lowest Possible Account - Highest Possible Account
 Date Range: 12/1/2009 to 12/11/2009

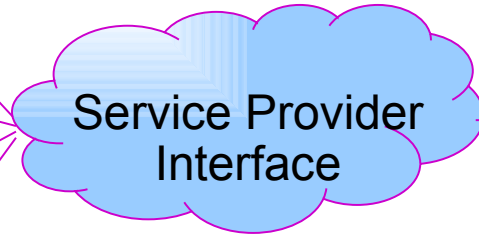


Requirement #7: Multi-tenancy; Assuring 'Service' and Tenant Isolation



1. Request Service

2. Provision service end-to-end

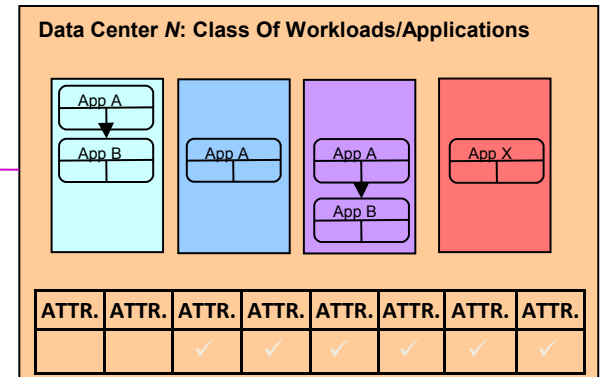
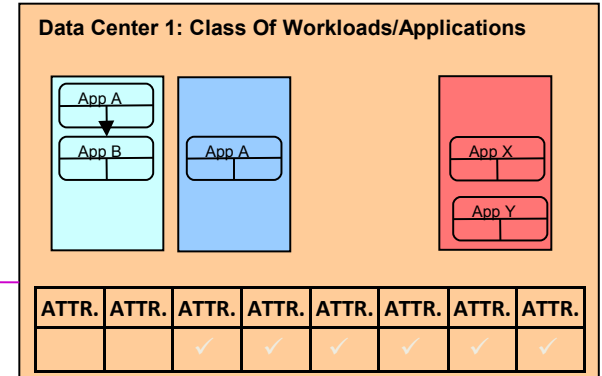


Rapid Application On-Boarding

Virtualization blurs the physical boundaries between systems that are used to separate workloads

Mobility of systems and flexible deployment and re-deployment of systems

Introduces technological and operational risks, changing and intensifying old risk



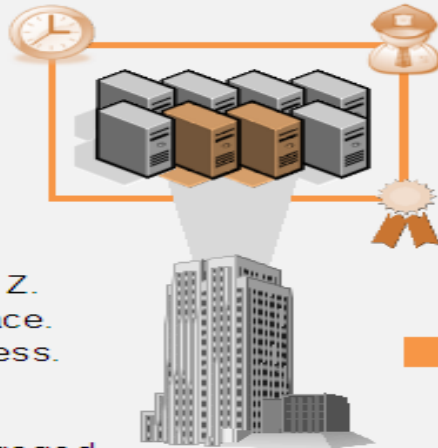
3. Assure Tenant Isolation



Requirement #8: Security and Privacy

Today's Datacenter

Tomorrow's Public Cloud



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?



People and identity



Application and process

Data and information

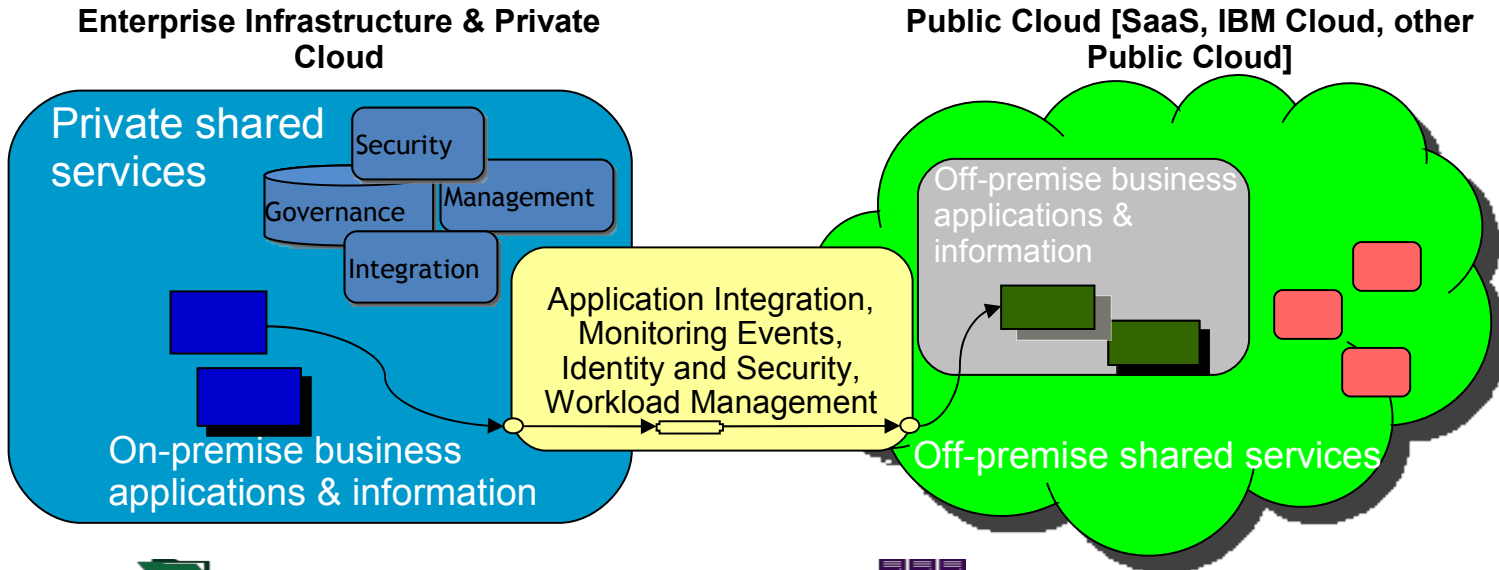


Physical infrastructure



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

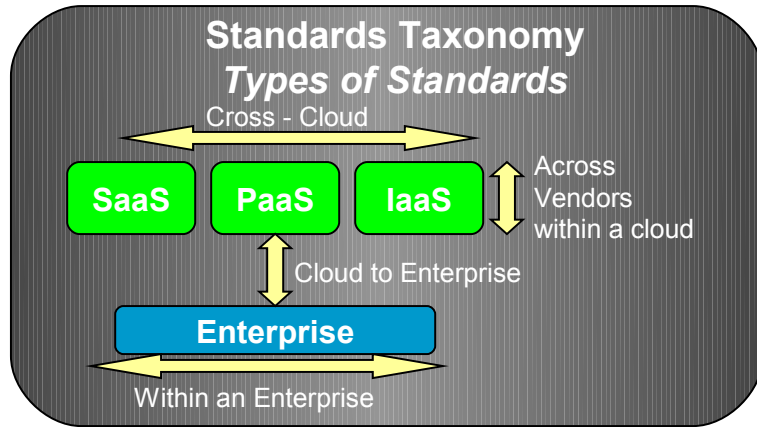


Provisioning
Automate provisioning of resources



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



SLMISLA



Network



Storage



Security

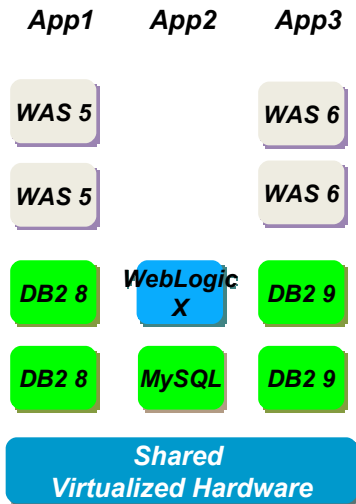


Industry Verticals

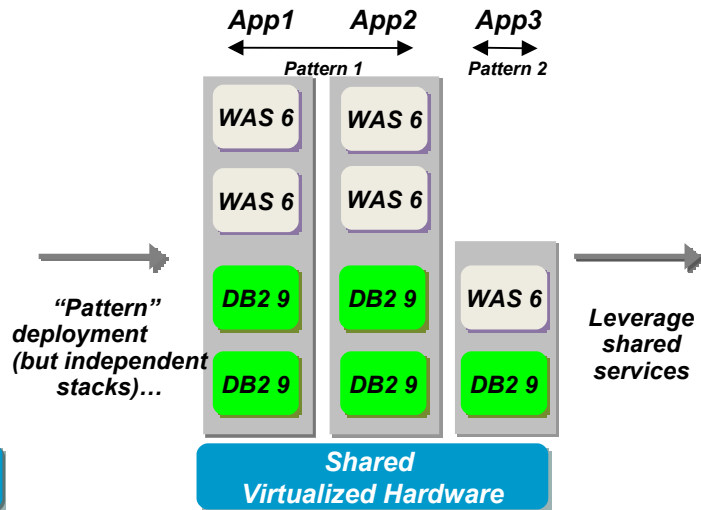


Requirement #11: Migration and Quality of Service Management

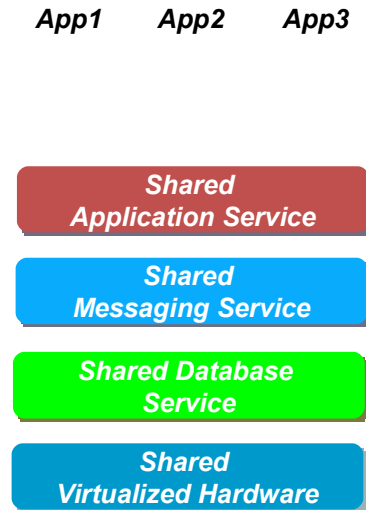
Virtualized Traditional



Standardized Images and Patterned Deployment



Shared Middleware Platform Services (increased reuse)



Reduced Costs and Increased Flexibility

**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

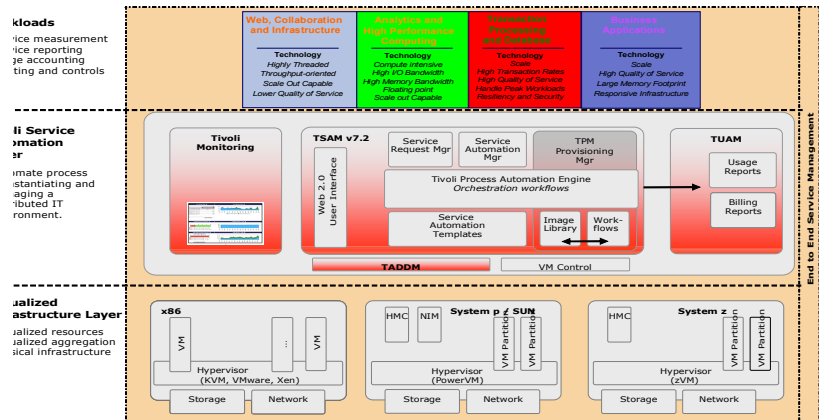
- ING is a large world-wide operating financial institution offering clients banking, insurance and asset-management services (HQ in Amsterdam, Netherlands), ~110,000 employees
- ING needs to drive down IT costs dramatically and intensively improve their time to deliver new IT environments to the business
 - *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



NORTHROP GRUMMAN

