

# Cloud Computing: Customer Project Experiences & How to implement Cloud services



# Cloud-onomics...

## CLOUD COMPUTING



...leverages virtualization, standardization and automation to free up operational budget for new investment



...allowing you to optimize new investments for direct business benefits

## What questions to ask to determine if Cloud is a good fit?

### Key Pain Points

- Lost business opportunity because IT too slow to react. Lack of agility.
- Long deployment timelines for new systems (weeks/months+).
- Many people involved in the process, high cost & complexity.
- Many steps are manual and prone to error.
- Huge up front investment for new infrastructure when I want to start small.
- Server Sprawl
- Low Utilization
- Compliance, auditing, and security patching costly.
- Don't know what compute resources are used or how much they cost?

### Key Questions to ask?

- How quickly can you react to deliver a new IT service?
- How many steps are in the provisioning process?
- What is the ratio of system admins to servers?
- Have you experienced outages due to human error ?
- How are systems sized and scaled quickly (peak usage, CUOD)?
- How many images per user?
- Am I sized for min, mean, or peak ?
- How many different configurations used?
- What level of metering and method of charging used? How do we manage license compliance ?

# Emerging Patterns

## Self Service Provisioning

Compelling entry-point into Cloud Computing, particularly for Development /Test environments,

## Cloud Service Delivery Platform

Very active with CSP's, Telco's. High Competition

## Analytics

Heavy interest in Health & Pharma, emerging in FSS

## Application / Platform Service

Advanced enterprises looking for the “big bang” of Cloud, with focus on increasing & optimizing existing infrastructure utilization



# Typical Cloud Management Platform Middleware Stack

## Workloads

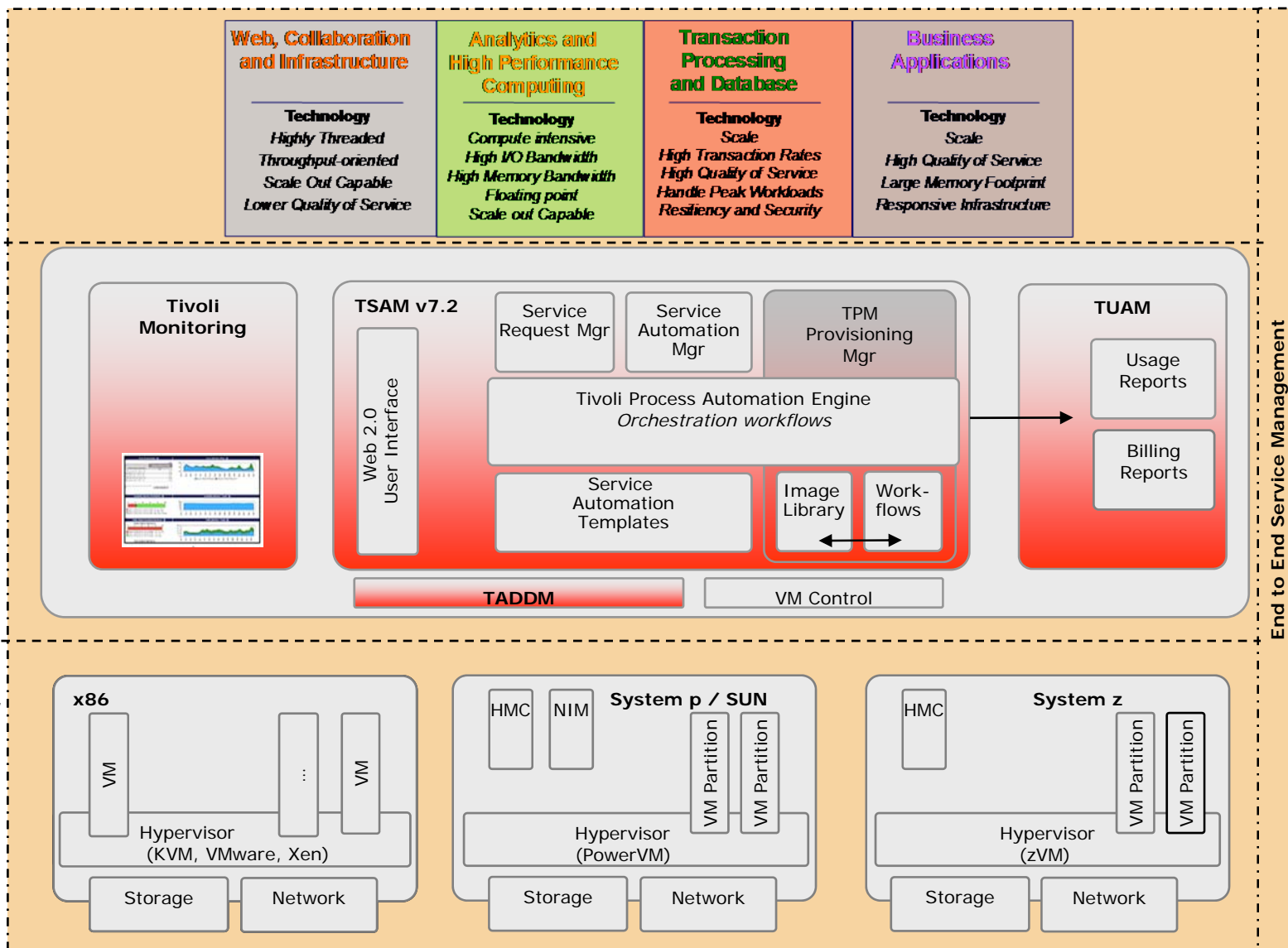
- Service measurement
- Service reporting
- Usage accounting
- Auditing and controls

## Tivoli Service Automation Layer

- Automate process of instantiating and managing a distributed IT environment.

## Virtualized Infrastructure Layer

- Virtualized resources
- Virtualized aggregation
- Physical infrastructure



## Self Service Provisioning

### Business Challenge

- Increased and excessive IT and labor costs
- Inability to respond to peak demand
- Compliance and audit exposure
- Elongated Time to Market

### Solution

- Self-service request & subscription model for end users.
- Self-service provisioning of virtualized network, storage, and server resources across z, Unix, and x86 platforms..
- Self-service delivery of pre-configured application / middleware stacks.
- Integrated Service Management of Provisioning Environment.

### IBM Components

- Tivoli Service Automation Manager, Tivoli Service Request Manager, Tivoli Change & Configuration Management Database Tivoli Release Process Manager
- Cloudburst

### Client Value

- Improved time to market
  - Decreased time to deployment of new capability by 85%
  - Increased service delivery capacity by 20%
- Improved Compliance and Audit posture
  - Significant reduction in human error
- Reduced costs
  - Standardization enables “zero touch” simplified processes”
  - Automated provisioning process reduces labor time from 100-500 hours to <1
  - Improved server utilization yields

# JPMC Self Service Provisioning Project

*Low-cost, low-touch self-enablement server provisioning system that leverages automation around JPMC's virtualized server and storage infrastructure*

## Primary Focus Areas

## Supporting Capability

## Key Metrics

Improve Efficiency

### Self-service portal with automated provisioning

*Move from traditional high touch provisioning model to a self-service, full-lifecycle, reservation model with automated provisioning*

time to market  
consistency  
flexibility  
server/admin ratio

Improve Quality

### Management of the full lifecycle of a server

*Systems can be reserved, provisioned and de-provisioned based on schedule and capacity*

systems utilization  
systems capacity

### Image management

*Temporarily restore servers for further testing*

time to market  
flexibility  
systems capacity

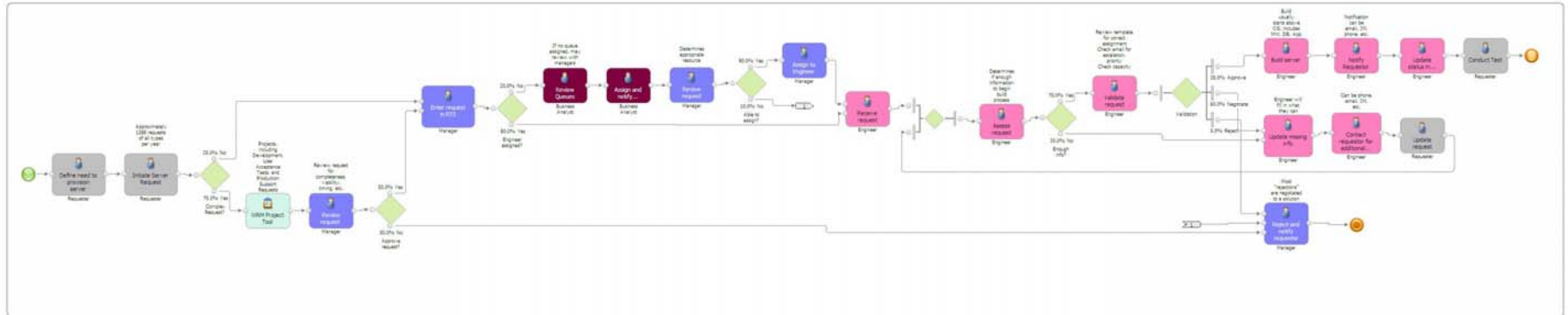
### Policy management and governance

*Consistency of server provisioning and configuration. Flexibility and control over request/approval workflows, resource assignment, utilization and capacity, and cost allocation*

consistency  
visibility and control  
systems capacity

- AIX LPARs on IBM p5/6
- Linux and Windows images on x86

The as-is Request and Approval process is primarily manual, with extensive back-and-forth, oversight, and administrative involvement throughout

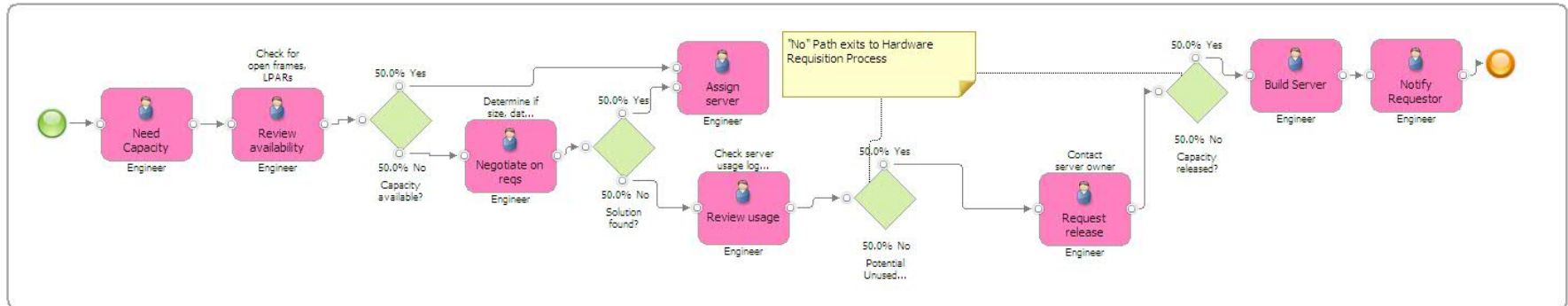


## Key Findings:

- The request process is primarily manual, supported by queue-driven work request system
- Approvals are required at key steps in the process, along with admin support
- Multiple iterative clarifications are required, using manual methods outside of the request system
- Actual provisioning depends on manual analysis of availability, time to build, and notification



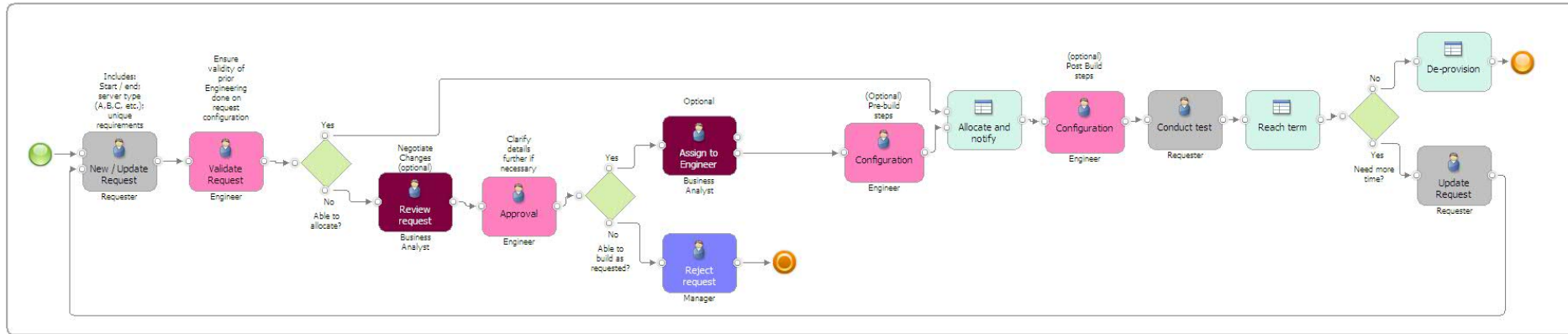
## The current de-provisioning process is informal, driven by demand for servers, and entirely manual



### Key Findings:

- The de-provisioning process is informal, driven by requests for new servers- no automatic de-provisioning
- Engineers look for low usage rates, and manually contact and negotiate with server users to free them up
- Average elapsed time from initial allocation to de-provisioning is 2 years
- Process can add significant time to obtaining server capacity for a request if negotiation needed for release of server

## The to-be process combines the request and provisioning with the de-provisioning, and significantly automates them



### Key Attributes:

- Immediate, zero-touch provisioning for basic requests
- Automatic de-provisioning based on established date
- Workflow driven approvals and notifications
- Image Restore promotes the release of servers when test procedures are complete and the reduction of reservation time
- Automated requirements validation, with predefined standard images and guided configuration of resources
- Greatly simplified, faster process

## Cloud Service Delivery

### Business Challenge

- Grow customer base for existing services
- Improve time-to-market of new service offerings.
- Reduce on-boarding time for new customers.
- Quickly respond to changes in market demand.
- Provide flexible billing models for service offerings.
- Deliver services with shared infrastructure and cost effective security model.

### Solution

- Self-service request & subscription model. Deployment of new service requests based on current resource allocation and utilization.
- Usage metering of services and supporting resources warehoused to enable variable billing models.
- Comprehensive security framework
- Service bus model for mediation requests and provider implementation..

### IBM Components

- Tivoli Service Automation Manager
- Tivoli Usage & Accounting Manager
- Tivoli Identity Manager & Tivoli Access Manager
- Tivoli Security Policy Manager
- Websphere Application Server
- DB2 Universal Database

### Client Value

- Improved time to market of services
- Enables creation of new revenue markets and streams
- Upsell existing clients on more offerings
- Improved Client Satisfaction with Services
- Reduction of client partner onboarding
- Enabled aggressive Service Level Agreements

## SK Telecom company profile

- SK Telecom (NYSE: SKM, KSE: 017670) is Korea's leading telecommunications provider with more than 24 million subscribers, which accounts for more than 50% of the total market.
- The company established in 1984, reached KRW 11.67 trillion in revenue in 2008.
- SK Telecom was the first to launch and commercialize CDMA, CDMA 2001x, CDMA EV-DO and HSDPA networks, and it currently provides cellular, wireless internet, mobile media, global roaming service and more.
- IT infrastructure is based on 3 big Data Centers with about 1,000 servers on distributed platform, network, storage, applications.

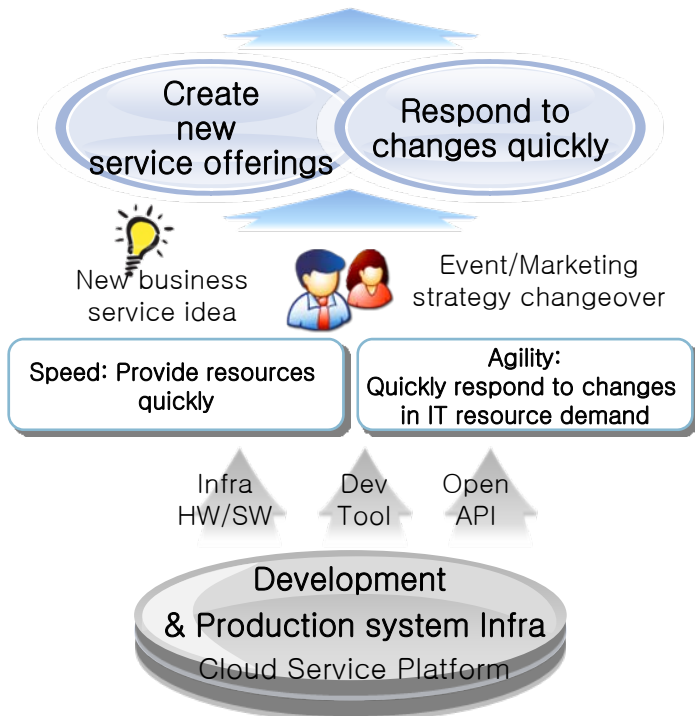


- Award-winning 'Best Tele-communication Company of Asia' (2006, 2007) by Telecom Asia & IDC
- <http://www.sktelecom.com>

Cloud Computing platform needs to be deployed that enables mobile content providers and business partners with a mobile service idea to develop, test and commercialize new services quickly and easily.

## Business Needs

“Strengthen the Competitiveness of the SKT Internet Service & Create new business opportunities for Platform service”



## Project Objective

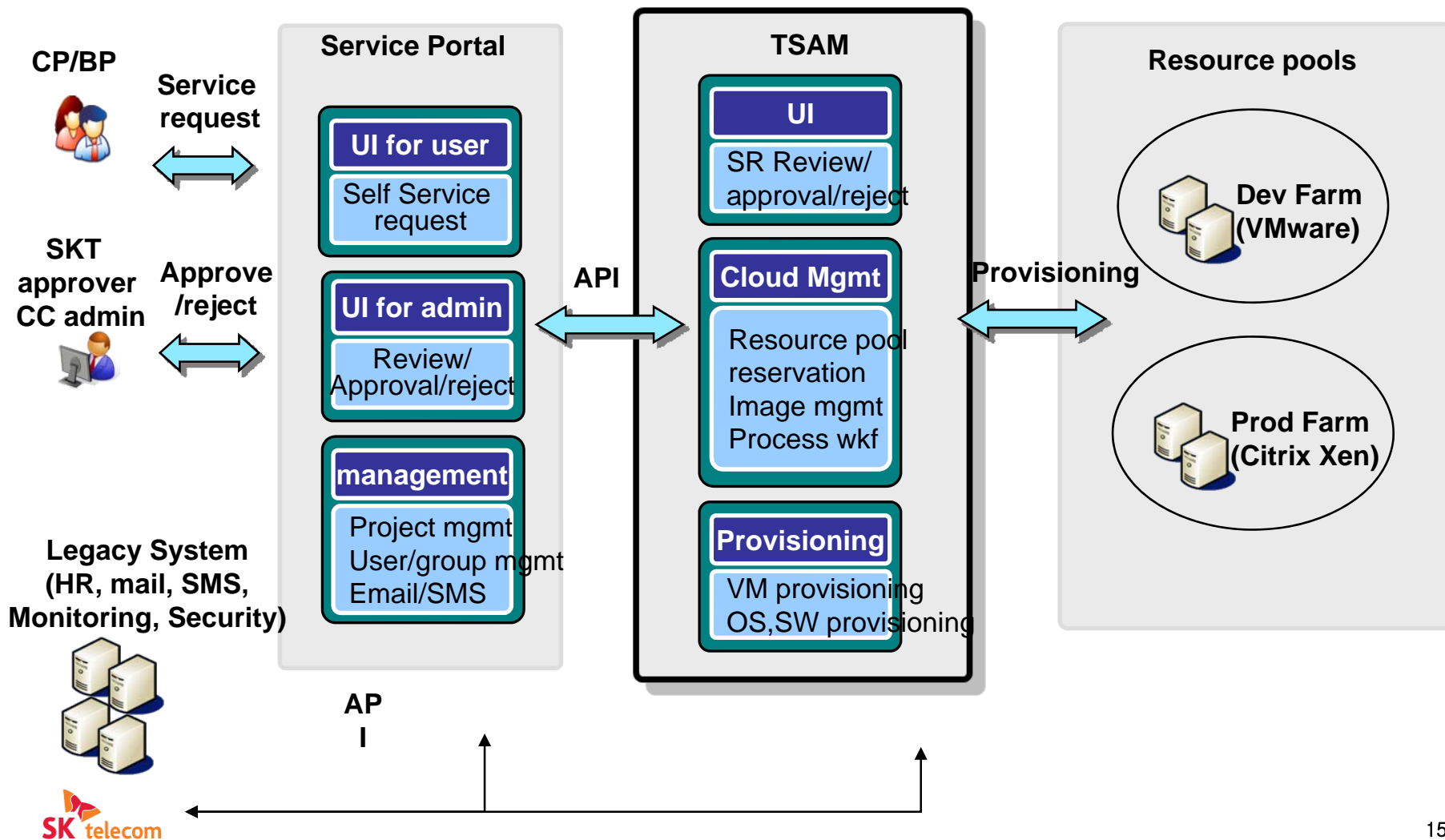
– Provide Better and flexible service to users (CP/BP), enabling self-service request and delivering services more rapidly  
To leverage CP/BP who has a new business service ideas  
– Reduce cost for operations & management and for new investment

- Improve time to market – react to deliver a new IT service quickly, decrease time to deploy systems for new service offerings
- Lower development cost – increase resource utilization and reduce labor costs
- Find new revenue/profit streams thru embrace a new business service ideas of CP/BP quickly.

## 7 Main Use Cases

1. Request VM which is Linux or Windows.
2. Request multi- VMs which can be heterogeneous platform. Some of them are Linux (RHEL, Oracle Linux) and some of them are Windows (2003, 2008).
3. Request VM including several S/Ws. Users get the list of selectable S/Ws and select several S/Ws to be provisioned on VM.
4. Request multi-VMs which can be heterogeneous platform. Users select several S/Ws to be provisioned on each VM.
5. Request a service based on template which is composed with VMs like 3-tier J2EE architecture.
6. Request to install S/Ws additionally on VMs that user requested and got previously.
7. Request to change the capacities of provisioned VMs that are CPU, Memory and Storage.

## Components (Client Environment, Management Environment)



## Analytics

### Business Challenge

- Unable to efficiently deliver the right information where, when and how it's needed
- Inability to realize multi-business variable analysis
- Increased and excessive costs

### Solution

- Self service approach to dispensing BI services
- Integrated single point of control for departmental business processes, corporate security and compliance standards

### IBM Components

- Tivoli Service Automation Manager
- IBM Cognos Business Intelligence
- IBM Infosphere Warehouse Cubing
- IBM Infosphere Warehouse Text Analytics & Data Mining
- IBM Infosphere Warehouse Advanced Workload Management
- IBM Infosphere Streams
- IBM Infosphere Warehouse

### Client Value

- Reduced cost Costs
  - Reduced capital and operating expenses needed to support enterprise wide BI services.
- Improved Productivity
  - More effective usage of skilled BI resources to support a common enterprise BI approach
  - Self service approach reduces the time, resources and costs for delivering BI services to new divisions, departments and users



# United States Air Force

## Mission Oriented Cloud Architecture

### Business Background

- The United States Air Force (USAF) provides aerial, space and cyber warfare for the United States Armed Forces. The USAF consists of 10 major commands, 100 military bases, and 700,000 personnel worldwide

### Business Benefit

- IBM will provide research, design and demonstration of a secure cloud computing infrastructure for the USAF.
- IBM is helping the USAF understand how to manage, monitor, and secure the information flowing through the USAF, Department of Defense and other intelligence agency networks.
- IBM will demonstrate an unprecedented level of security, network resiliency to the USAF networks.
- The resulting architecture will provide the USAF with an advanced level of "Situational Awareness" by implementing sensors, monitors, detection devices, security policy management, compliance management, and advanced analytic stream processing.
- The new cloud architecture will reduce the time it takes to respond to cyber threats by leveraging automated mission prioritized workload and capacity management systems.

### Solution Overview

- Demonstration of a security focused cloud computing architecture that can manage, monitor and secure the information flowing through the Air Force network.
- Advanced analytic processing from InfoSphere Streams coupled via sensors, monitors, and other detection devices
- Automated mission prioritized capacity management
- Real-time situational awareness of the cloud environment
- Policy based security compliance reporting and enforcement
- IBM hardware – System x , BladeCenter, DataPower, ISS Proventia
- IBM software – Tivoli, Rational, WebSphere and InfoSphere

## Platform / Application Services

### Business Challenge

- Limited business agility
- Inability to migrate workloads to more cost effective and efficient environments
- Inability to respond to variations and spikes in demand
- Time to market of business growth initiatives

### Solution

- Integrated modeling environment
- Rules-based automated event-based sizing of IT resources
- User interface with support for administrators
- Process-driven workflows
- Spill-over for peak capacity periods.

### IBM Components

- Tivoli Service Automation Manager
- IBM Tivoli Monitoring
- IBM Tivoli Composite Application Manager
- IBM Tivoli Netcool Omnibus
- Tivoli Business Service Manager
- IBM Tivoli Monitoring for Energy Management

### Client Value

- Improved agility
- Improved Productivity
  - Decrease time to resource acquisition.
  - Reduce manual hand-offs in deployment processes.
  - Simplified processes for requesting execution of new workloads
- Reduced Costs

## Lessons learned summary (1)

- Cloud Computing does achieve cost savings – really.
  - Cost savings justify the investment
- It's a transformative process
  - Drive from executive level
  - Focus on people and process rather than technology
  - Requires new roles and changes methods
- All usual laws for introducing new technology apply
  - Start with a pilot
  - Sound project foundations need to in place
  - Be driven by the requirements, not the solution
  - Use incremental and phased approach to balance risk, build consensus and demonstrate early savings

## Lessons learned summary (2)

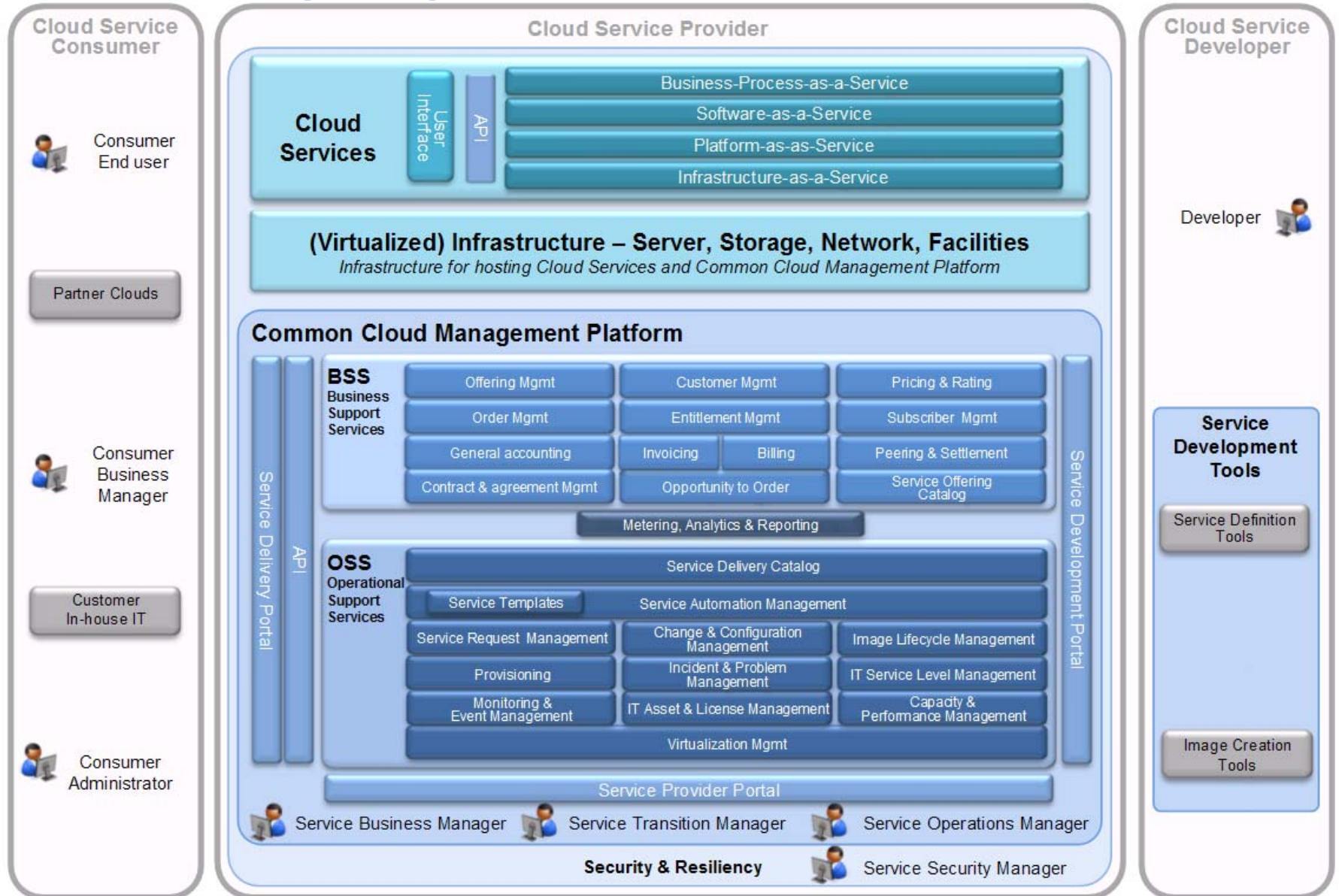
- Cloud has its sceptics – stakeholder management is critical
- Automate & optimize across technology, processes and organizations
  - Optimize deployment process to maximise greatest benefits of automation move non-critical path steps out entirely
  - Design Service Catalog carefully to minimise the number of variations and achieve standardization
- Cloud Computing is maturing very rapidly – significant business benefits can already be achieved today

## Considerations for Building Cloud services

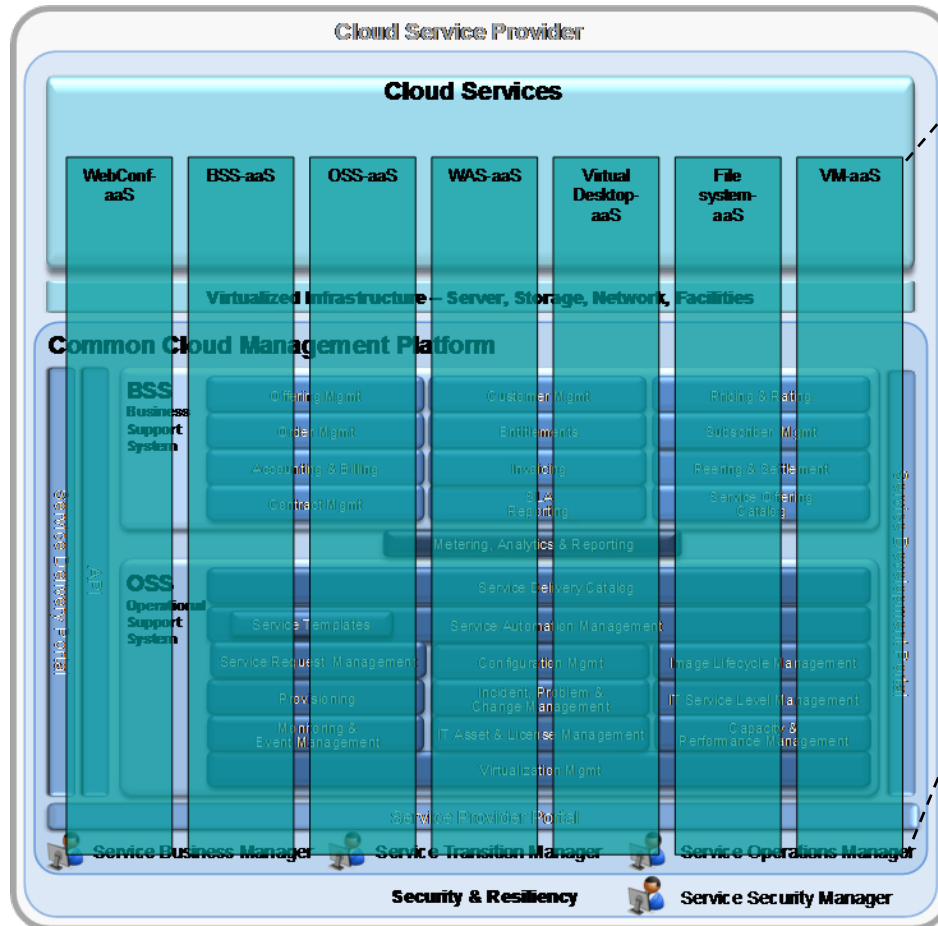
## Motivation

- Whenever a new cloud service gets built (across I/P/S/BPaaS), a specific set of functionality is commonly required.
- This section provides a basic guideline for the basic approach & considerations for building a new cloud service.

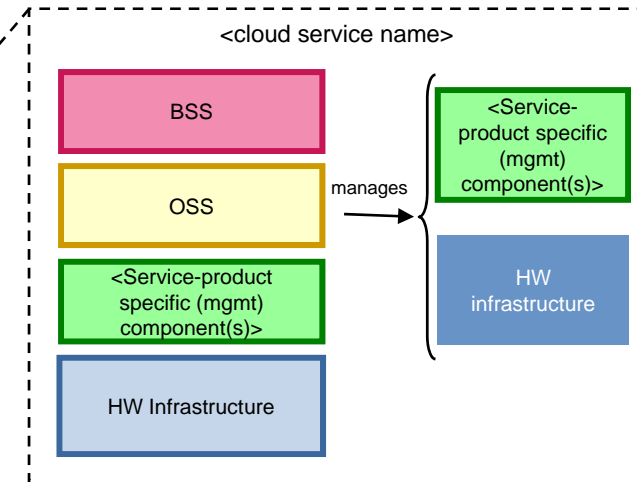
## Cloud Computing Management Platform – Architectural Details



# \* Cloud services using OSS & BSS functionality



Service products used in diagram only for illustration purpose, not normative

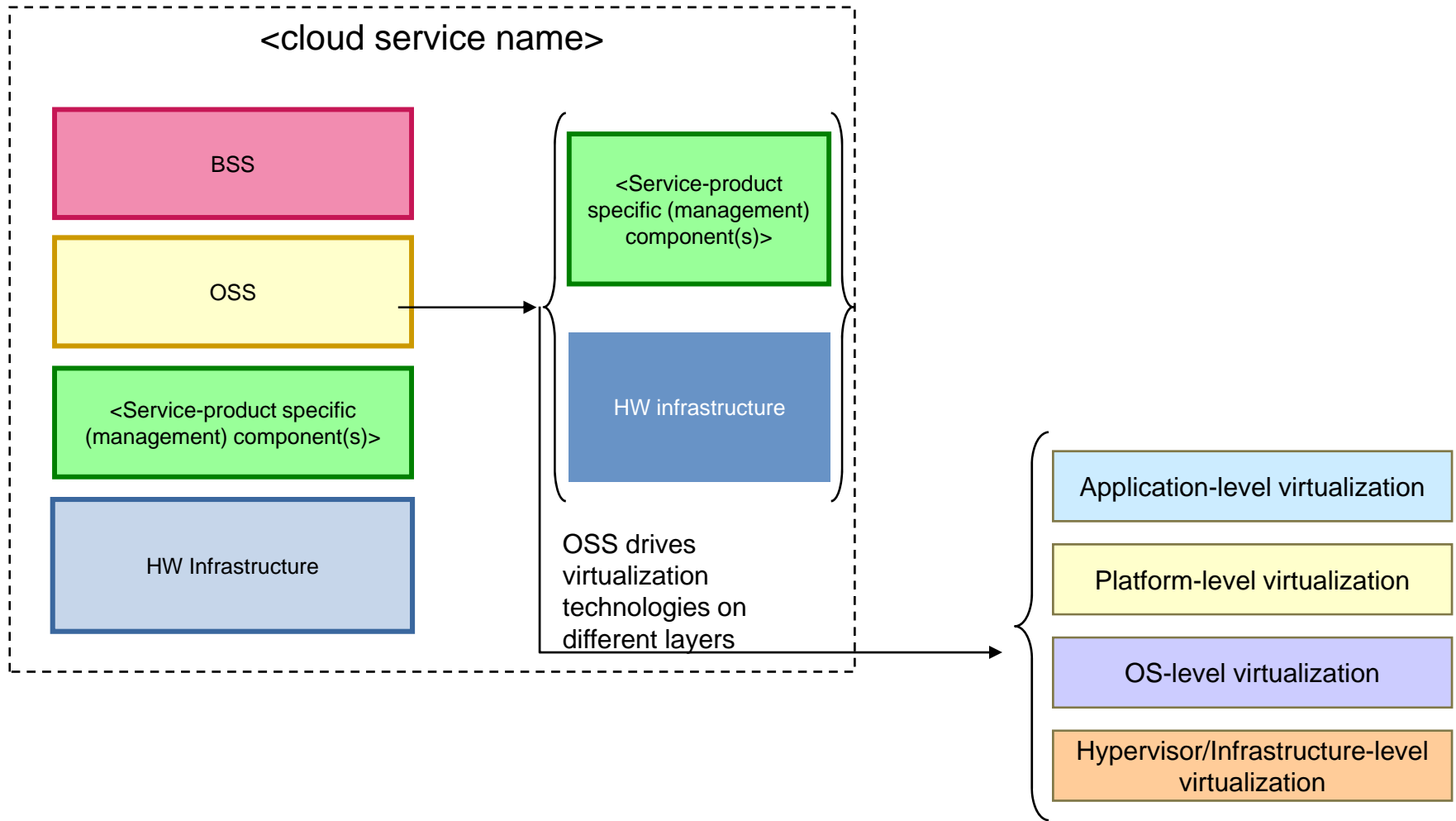


Each cloud service uses BSS and OSS functionality (besides service-product specific components), much of these functionalities is common across service products

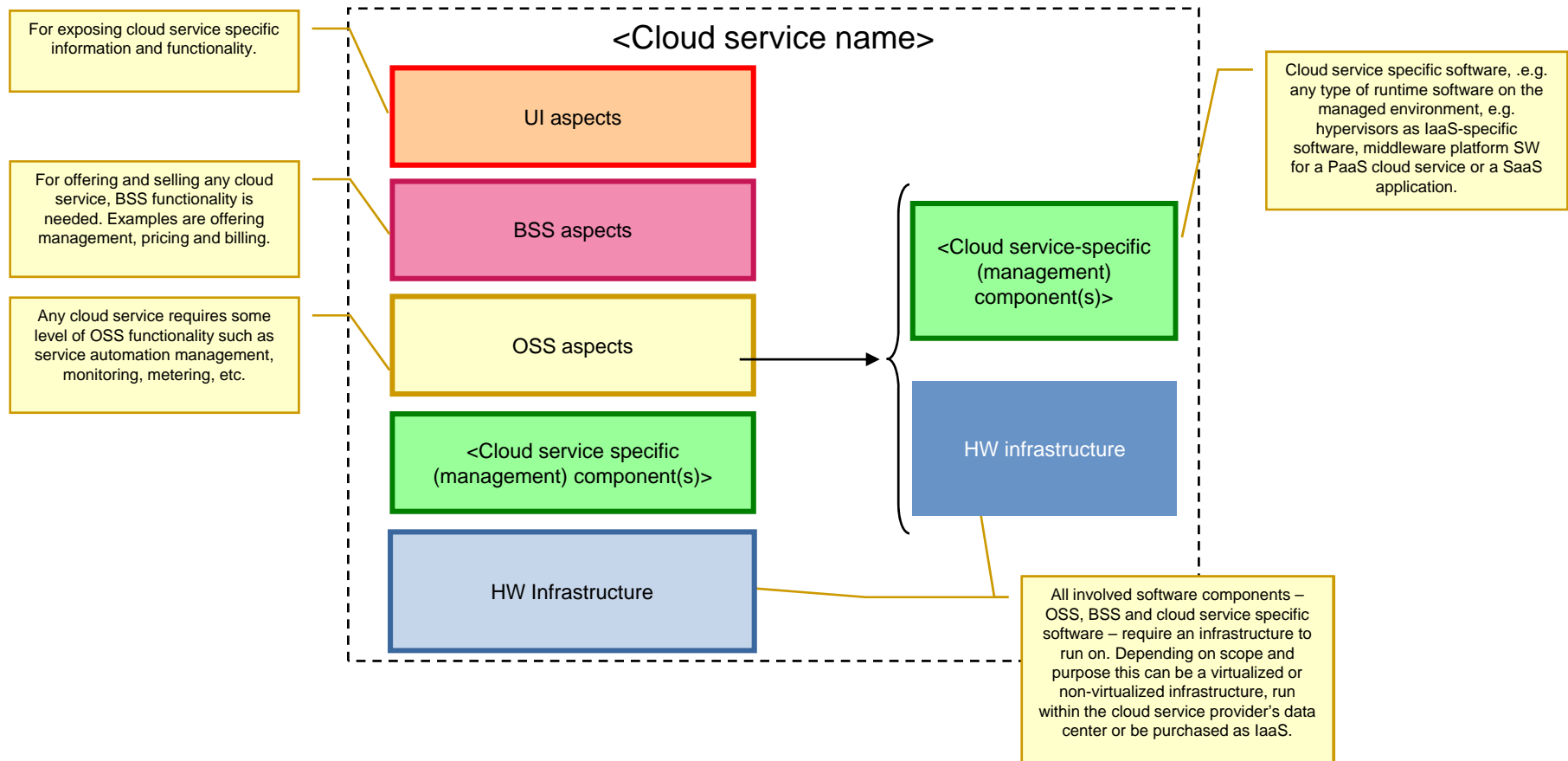
→ Sharing makes a lot of sense from a economies-of-scale / cost-sharing and increased time-to-market perspective



## The complete spectrum of virtualization is covered by OSS functionality



## Cloud Service – Basic structure



- Diagram shows aspects to be considered for every cloud service.
- Two basic implementation choices
  1. Build up a BSS, OSS, UI & Hardware infrastructure for each cloud service in a dedicated fashion
  2. Build up a base management platform providing all basic functionality, which can be enriched with cloud service-specific artifacts

## Areas of consideration for implementing cloud services

Aspect to be considered	Affected CCMP component
What do I want to expose as a cloud service / what is my “unit of delivery & mgmt” and which (self-service) execution functionality?	OSS / Service Automation
What is the scope of management (mgmt up to hypervisor, OS, MW, App) and the associated management processes?	All BSS/OSS components, focus on Service Automation
Which underlying provisioning functionality do I need for my cloud service?	OSS / Provisioning
Which assets do I need to maintain (servers, storage, SW licenses, etc.)?	OSS / Asset Management
Which configuration items are relevant for my cloud service?	OSS / Configuration Management
Which resources / metrics have to be monitored?	OSS / Monitoring
Which metrics have to be collected historically?	Metering
Which consumer model should be applied (single person, complex org, etc.)	BSS / Customer Management
Which rates should be applied to the metered information?	BSS / Rating
Which golden master images do I need?	OSS / Image Lifecycle Mgmt
Which reports do I need internally & which reports should be exposed to my customers?	Reporting
Which cloud service-specific UI panels do I want to expose to service consumers?	UI / Service Delivery Portal
Which cloud service-specific runtime functionality do I need?	Web conferencing software, analytics application, etc.



**Thank you!**

**For more information, please visit:**  
[ibm.com/cloud](http://ibm.com/cloud)

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