Building a Service Provider Cloud with IBM & Capgemini

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The Premier Service Management Event

Optimizing the World's Infrastructure

February 27–March 2 Las Vegas, Nevada

Session Objectives

- **Abstract**
  - This session will describe the experiences and lessons learned from the implementation of a multi-tenancy IaaS Cloud for Capgemini in the UK and US, using IBM's Cloud management platform. This is a joint presentation from the Capgemini and IBM teams responsible for the deployment of the solution.

- **Key Points**
  1. Why Capgemini chose IBM to partner with on this important Cloud initiative.
  2. Key challenges of implementing a multi-tenant IaaS in a leading Global IT Services Provider.
  3. Project and technical lessons learned of deploying a multi-tenant Cloud platform, using Tivoli based solutions (TSAM/ISDM).

Agenda

- The New Business model for Cloud computing
  - Capgemini's drivers for Cloud computing.
  - An outsourcer and global integrator, not a Cloud Service Provider
  - Capgemini value proposition
- Why Capgemini chose IBM as the IaaS technology partner?
  - Why partner with a competitor?
- What did we jointly build?
  - Important use cases & capabilities
  - Solution overview
  - Cloud Management Platform
- What were the key challenges to overcome?
- What were the key lessons learned during the project?
- Summary

The New Business Model

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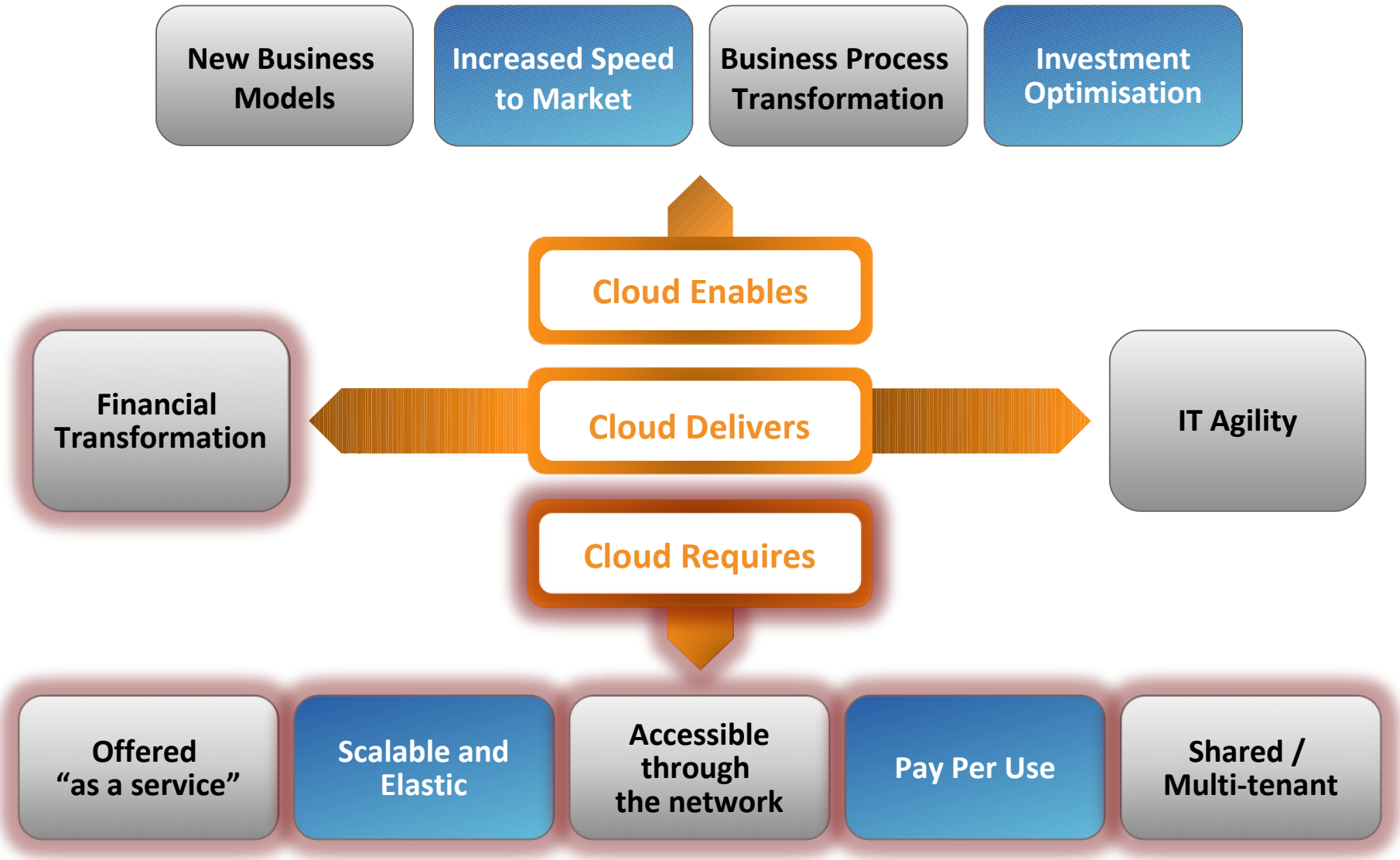
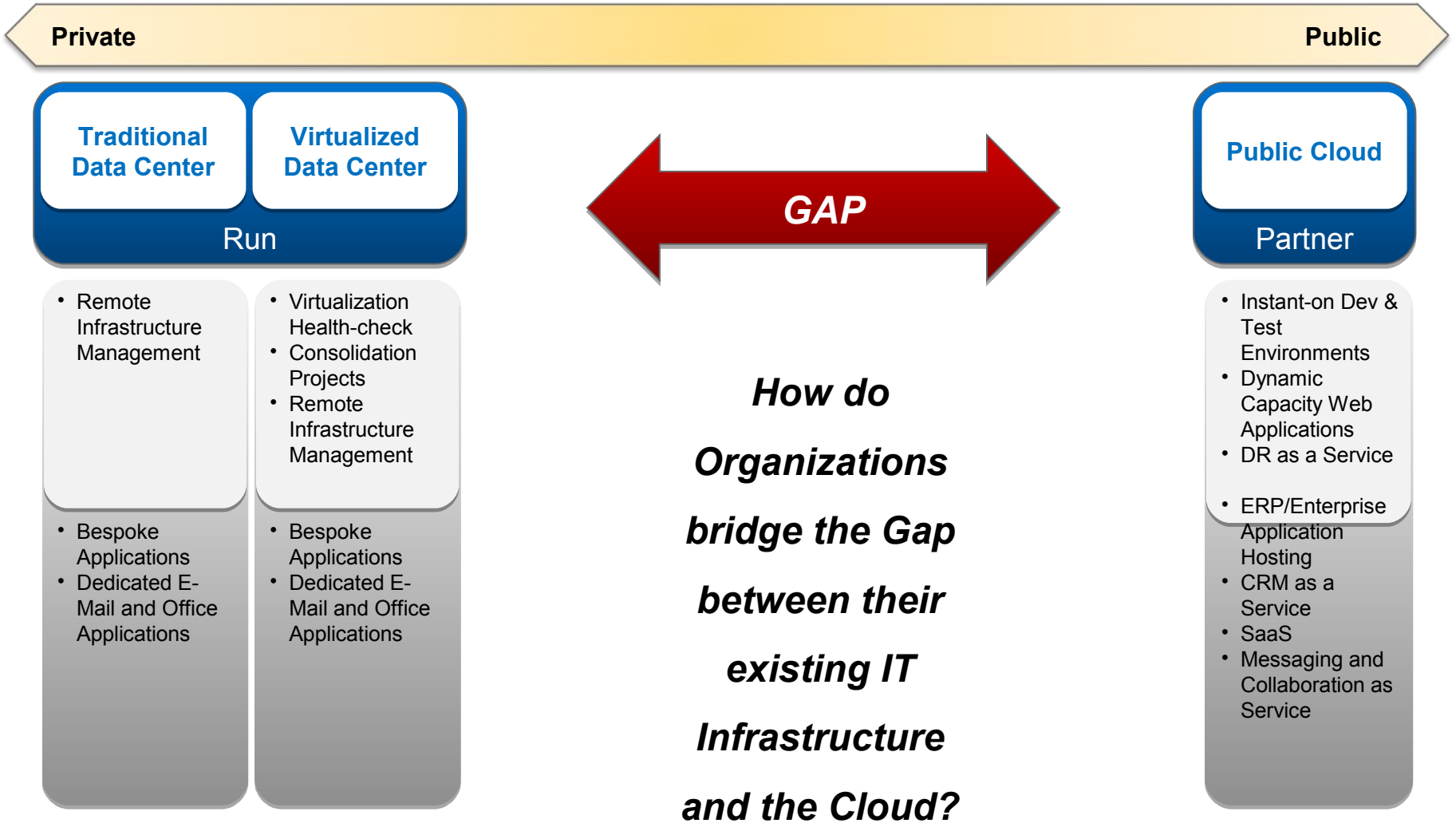
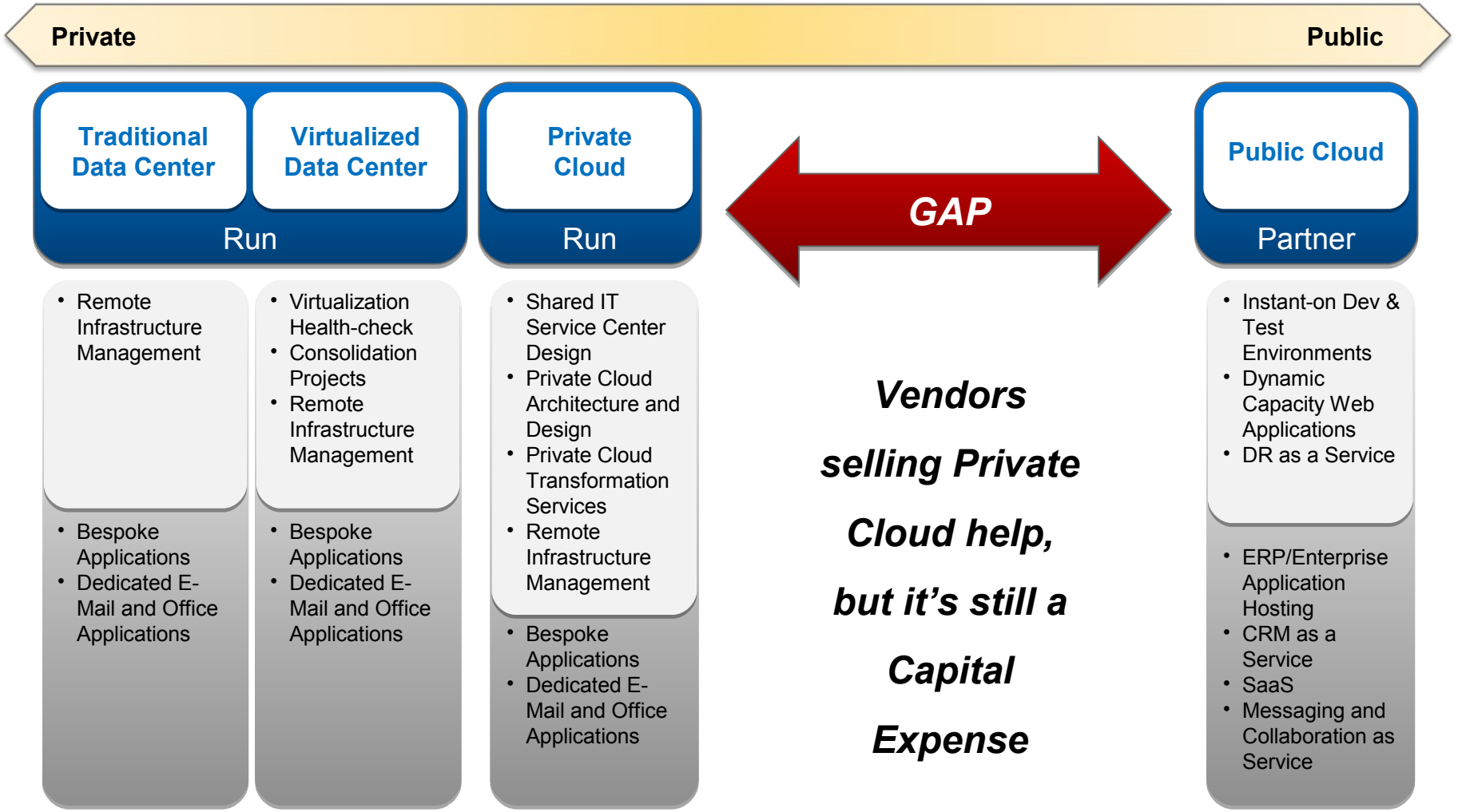
What is the Cloud?



The Compute Continuum



The Compute Continuum



The Compute Continuum

Private ⟶ **Public**

Run

Traditional Data Center

- Remote Infrastructure Management
- Bespoke Applications
- Dedicated E-Mail and Office Applications

Virtualized Data Center

- Virtualization Health-check
- Consolidation Projects
- Remote Infrastructure Management
- Bespoke Applications
- Dedicated E-Mail and Office Applications

Run

Private Cloud

- Shared IT Service Center Design
- Private Cloud Architecture and Design
- Private Cloud Transformation Services
- Remote Infrastructure Management
- Bespoke Applications
- Dedicated E-Mail and Office Applications

Host

Dedicated External Private Cloud

- Dedicated Private Cloud IaaS
- Hybrid Cloud Burst Capacity
- DR as a Service
- Desktop as a Service
- ERP/Enterprise Application Hosting
- SaaS
- Messaging and Collaboration as Service

Multi-tenant External Private Cloud

- Private Cloud Dev & Test
- Hybrid Cloud Burst Capacity
- DR as a Service
- Desktop as a Service
- Performance Testing
- ERP/Enterprise Application Hosting
- SaaS
- Messaging and Collaboration as Service

Partner

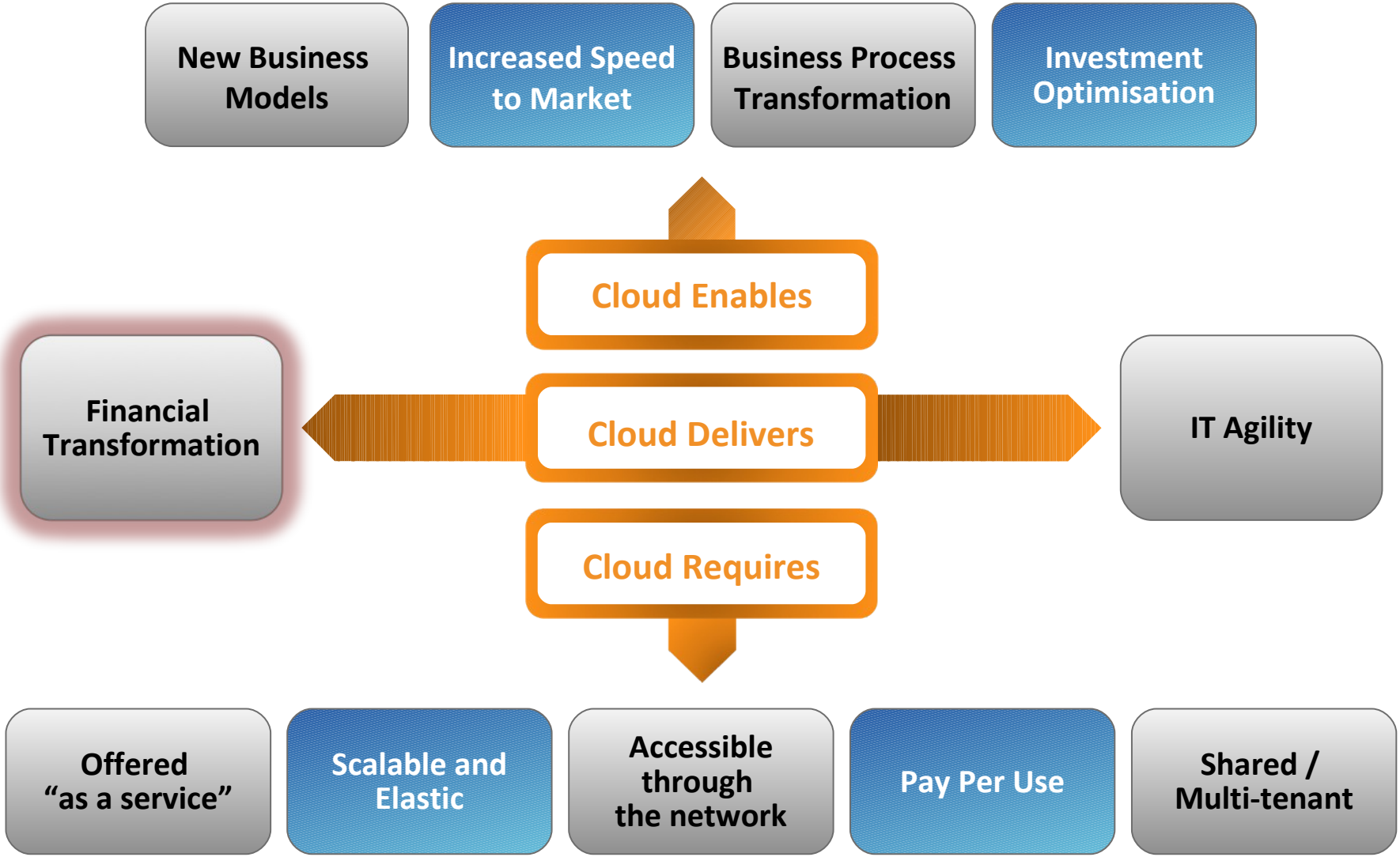
Public Cloud

- Instant-on Dev & Test Environments
- Dynamic Capacity Web Applications
- DR as a Service
- ERP/Enterprise Application Hosting
- CRM as a Service
- SaaS
- Messaging and Collaboration as Service

Common Foundation Services

Cloud Strategy & Business Case; Readiness Assessment; Architecture & Design Services; Implementation & Transition; Security Engineering; Service management

What is the Cloud?

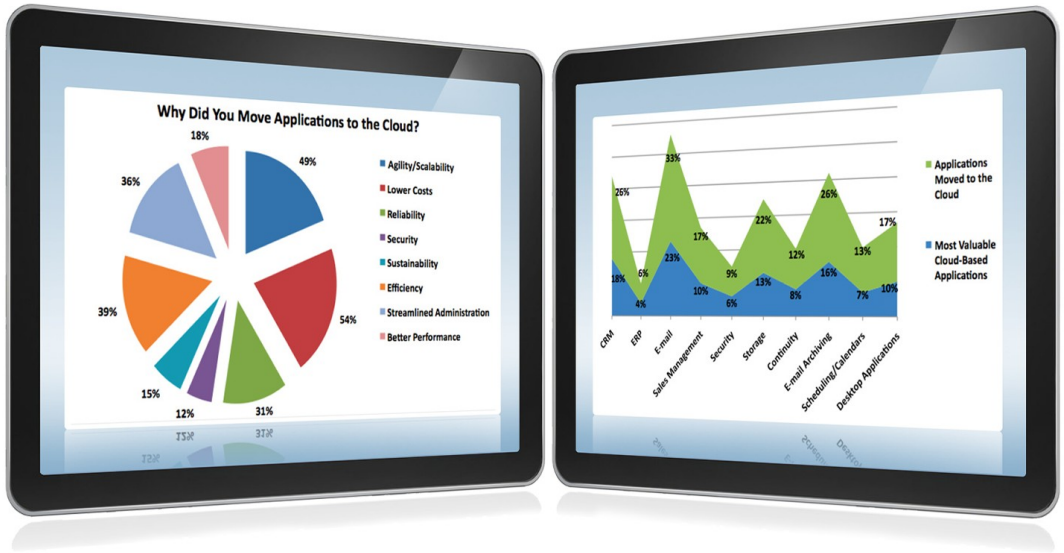


What's the impact for Service Providers?

- Changing Business Model
  - From Cost-Plus to Cost-Volume-Price (CVP)
  - The Hotel Occupancy Model
  - Capacity
  - Competitive Rates

- Value Add
  - Outsourcing. Systems Integration, Applications
  - Portfolio of services
  - Service Levels

- Market-Driven
  - Reduced Cost
  - Flexibility



Why Capgemini chose IBM as the IaaS technology partner?

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Our Evaluation Process

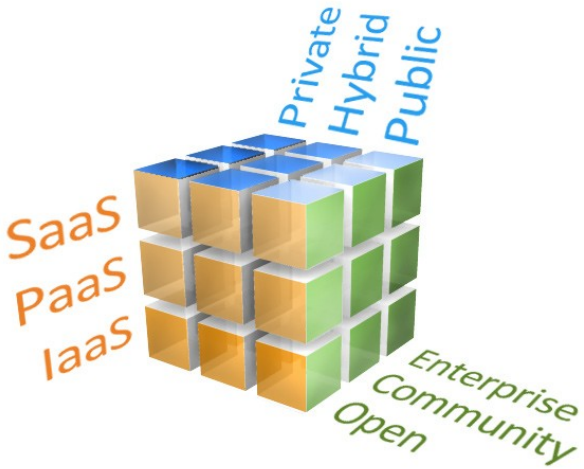
- Build vs. Buy
  - “Private Cloud” versus “Service Provider”
  - The Cloud Market is nascent and dynamic
  - Balancing “Leading Edge” against Reliability
- Scale
  - Start small, but think Big
  - From 10s of thousands to 100s of thousands
  - Respect the various Global Regulatory Environments
- Total Cost of Ownership
  - Capital, One-time and Operating Expenses
  - Technology AND Process AND People

Why IBM

- Leverage IBM's Cloud deployment experience
- Broad portfolio of technology capability
- Roadmap to extend cloud service provider capability
- Competitors working together!

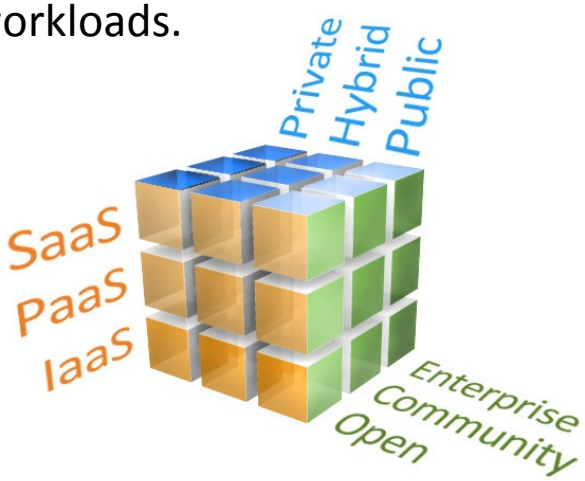
IaaS Functional Requirements

- Fully automated delivery of IaaS into Private Cloud.
- Secure self-service portal for access to service catalog.
- **Resource pools with different quality of service.**
- Multi-Customer shared infrastructure.
- **Network separation between customer environments.**
- Simple branding of portal.
- Resource reservation.
- Role based access & approval.
- Automated de-provisioning of workloads.
- **Metering of cpu, memory, storage & images.**
- Different pricing schemes per customer.



IaaS Non-Functional Requirements

- Resilient global infrastructure deployment.
- **Single CMP managing multiple CRPs.**
- Regional resource pools.
- Highly available CMP and CRP design.
- **Modular design, quick to scale out.**
- Secure multi-tenancy of VMs.
- Multiple network domains per customer.
- Local image libraries.
- Quickly extensible in service catalog richness.
- Secure portal access.
- Integrated monitoring.
- **No hypervisor lock-in.**
- Ability to on-board existing Capgemini customer workloads.



What did we jointly build?

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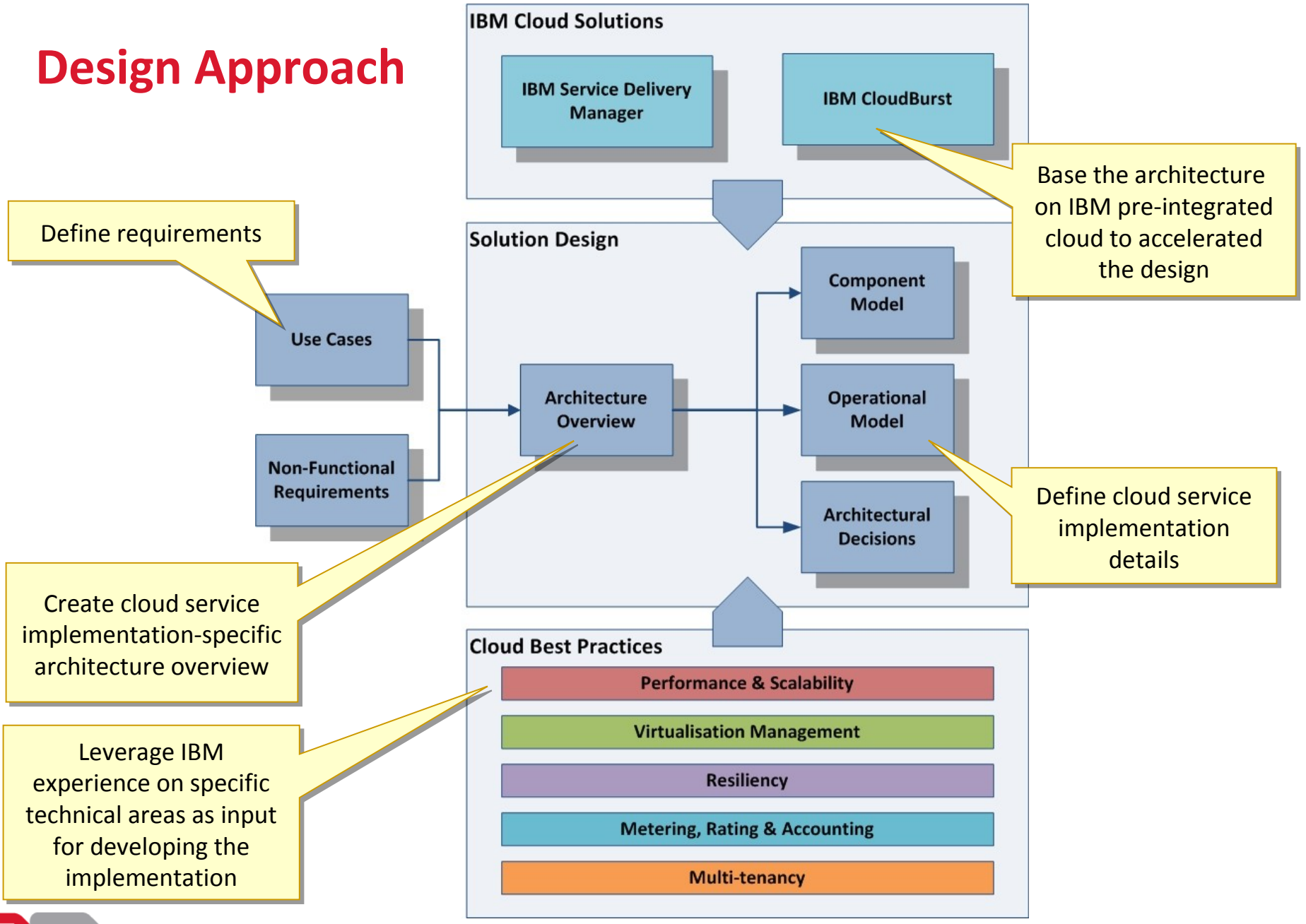
Design Approach



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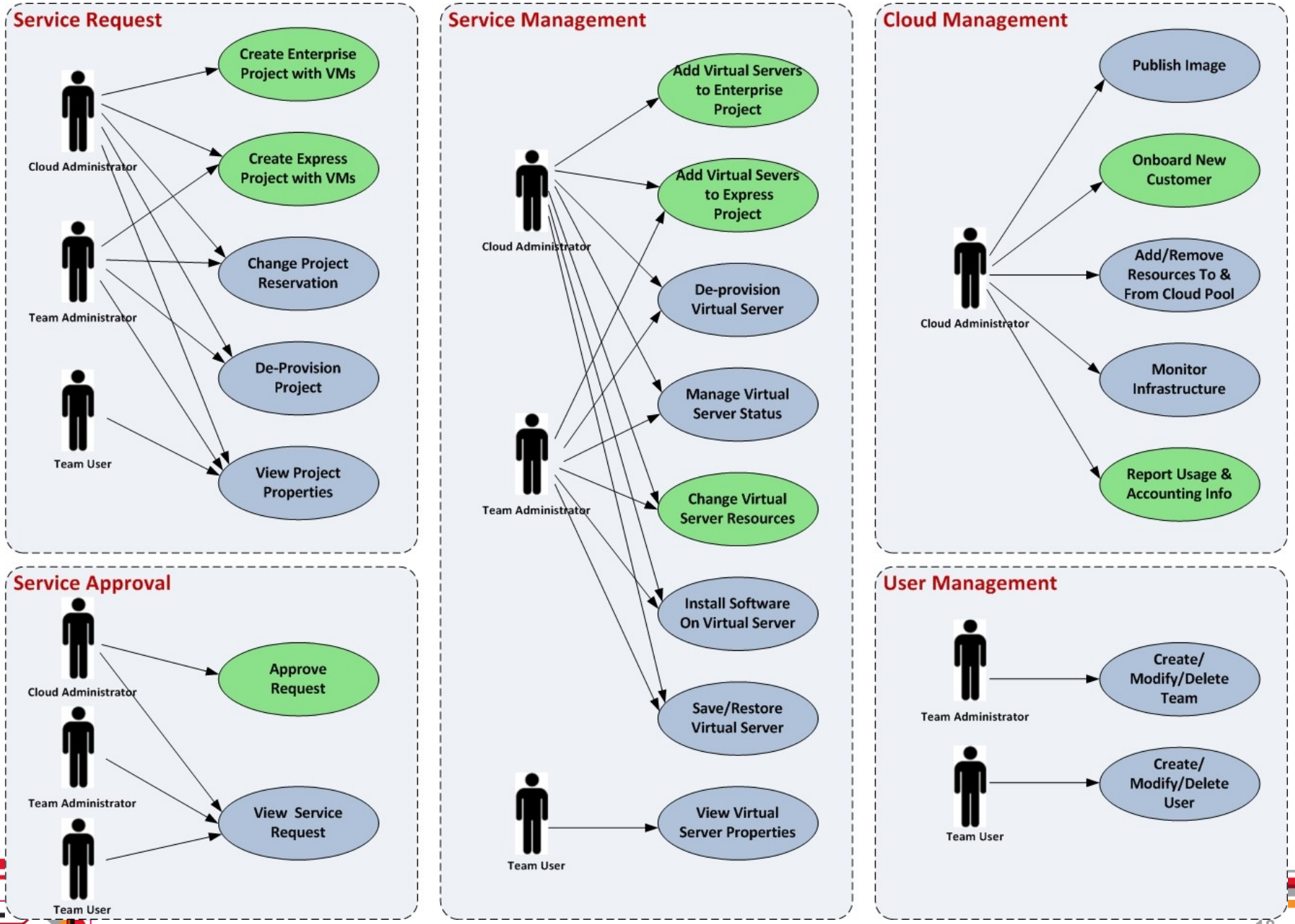
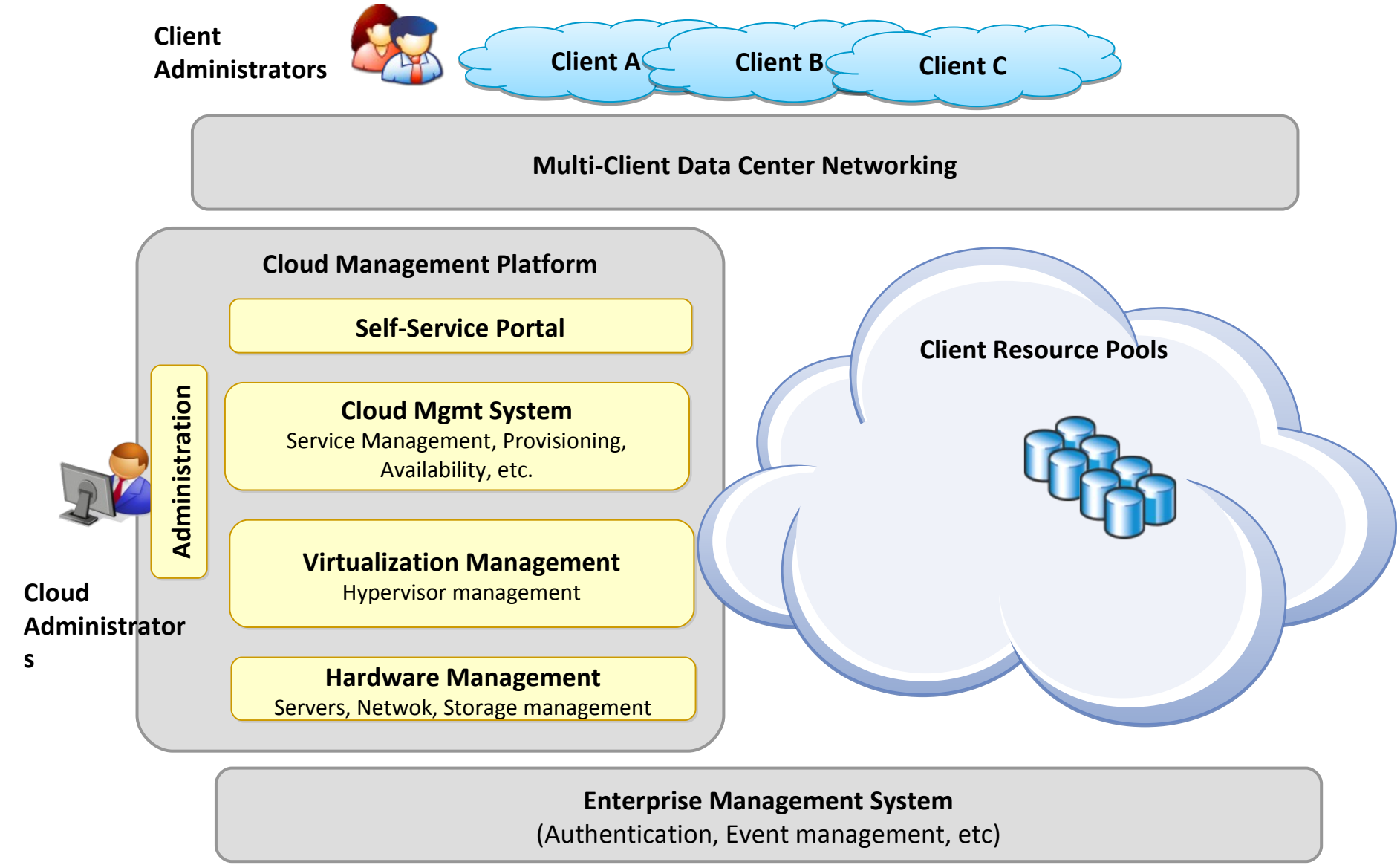
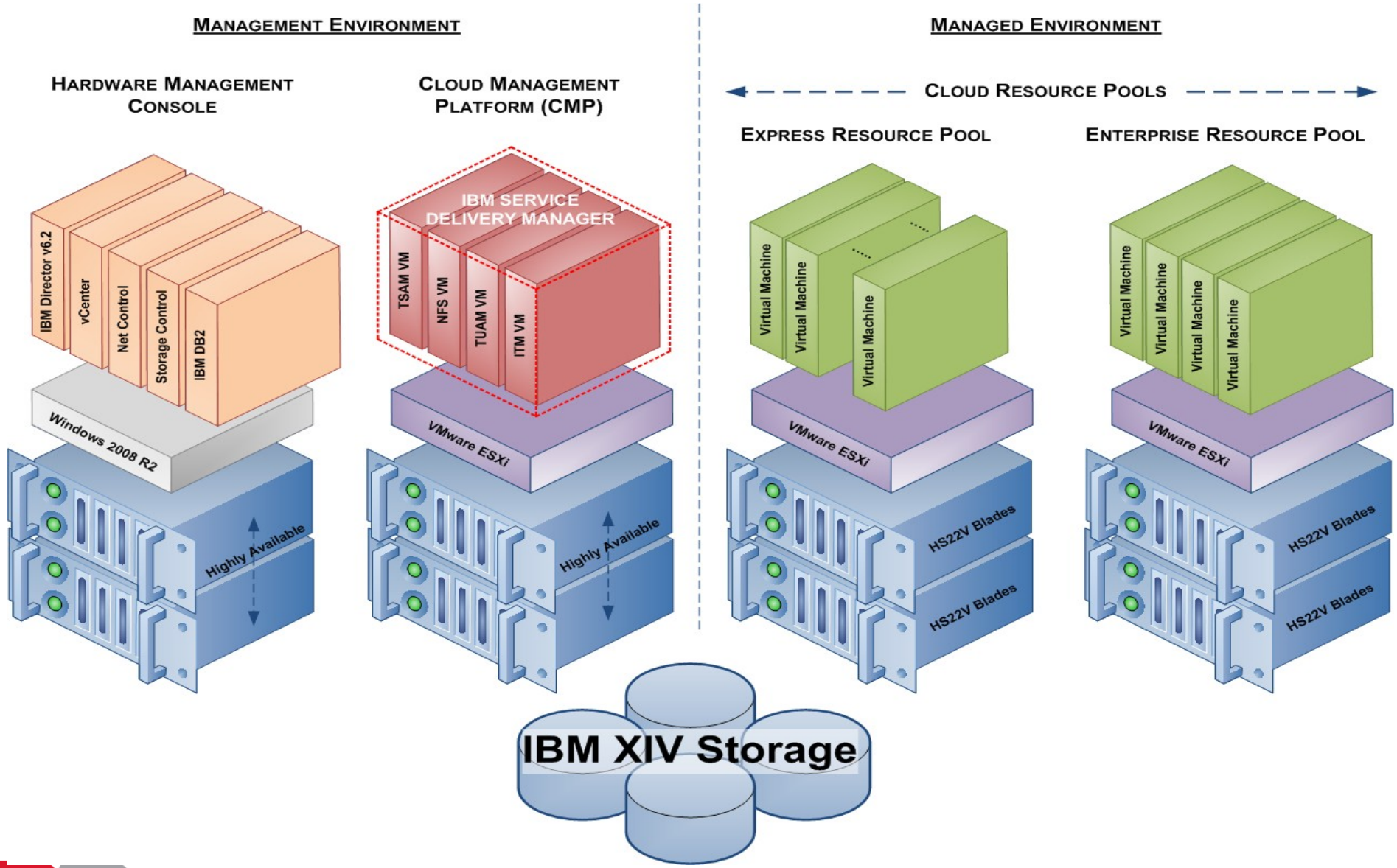
Key Use Cases



Solution Overview



Cloud Management Platform & Resource Pools



IBM Tivoli Service Automation Manager

Automate requesting, deployment, monitoring and management of cloud computing services

Overview

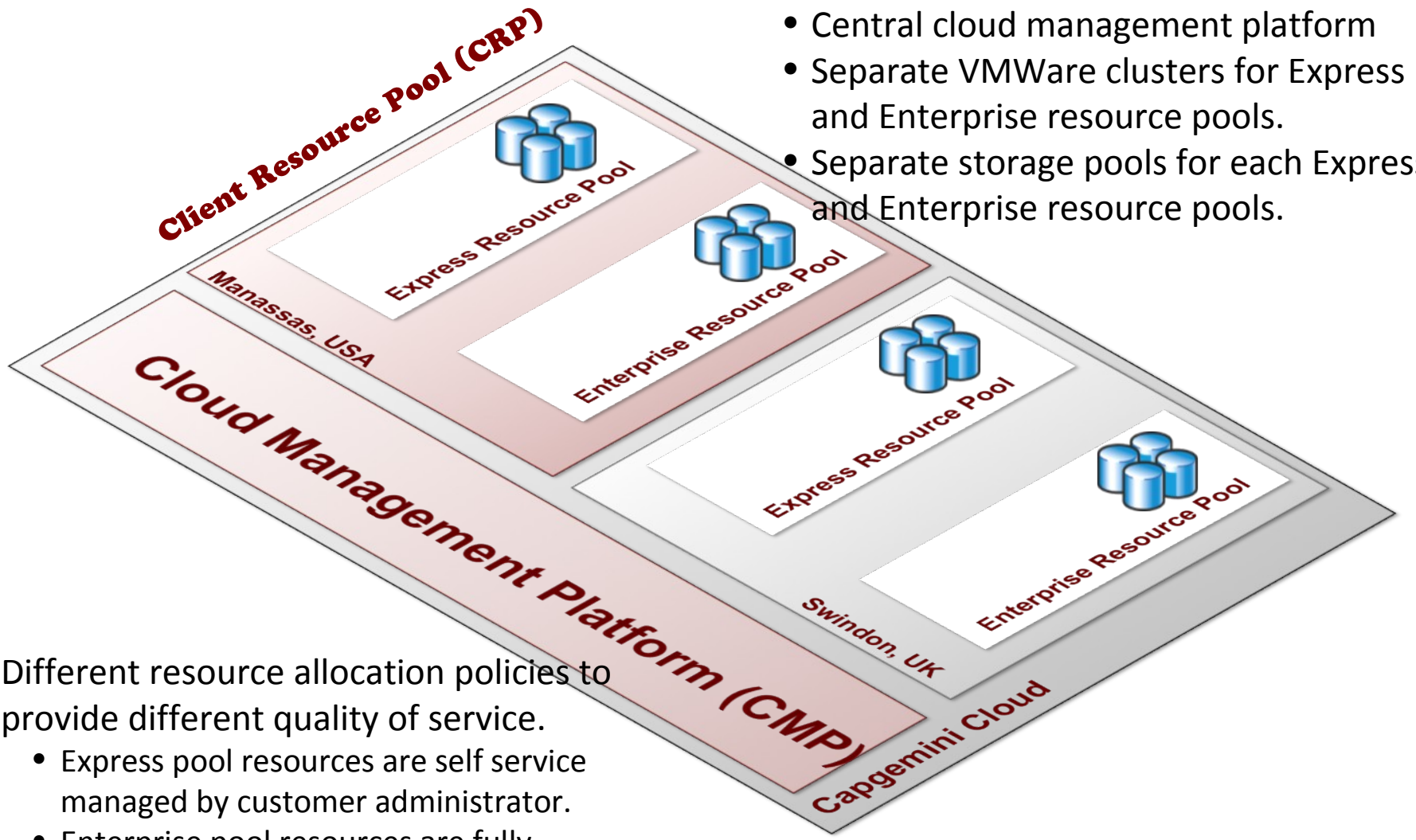
Enables users to request automated deployment, monitoring and management of cloud computing services. Also provides traceable approvals and processes and integrates with process governance.

Highlights

- Lowers the cost of service delivery through automation and reduced skill requirements
- Deploys IT services faster to meet the increased need for development, test, preproduction and production systems
- Delivers a higher degree of standardization and automation for deployment and management of cloud services while reserving skilled IT staff members' time for other high-value tasks
- Offers an integrated management capability that addresses the lifecycle changes of a cloud service
- Provides traceable processes and approval routings to serve as audit trails, and integrates with process governance

Client Resource Pools

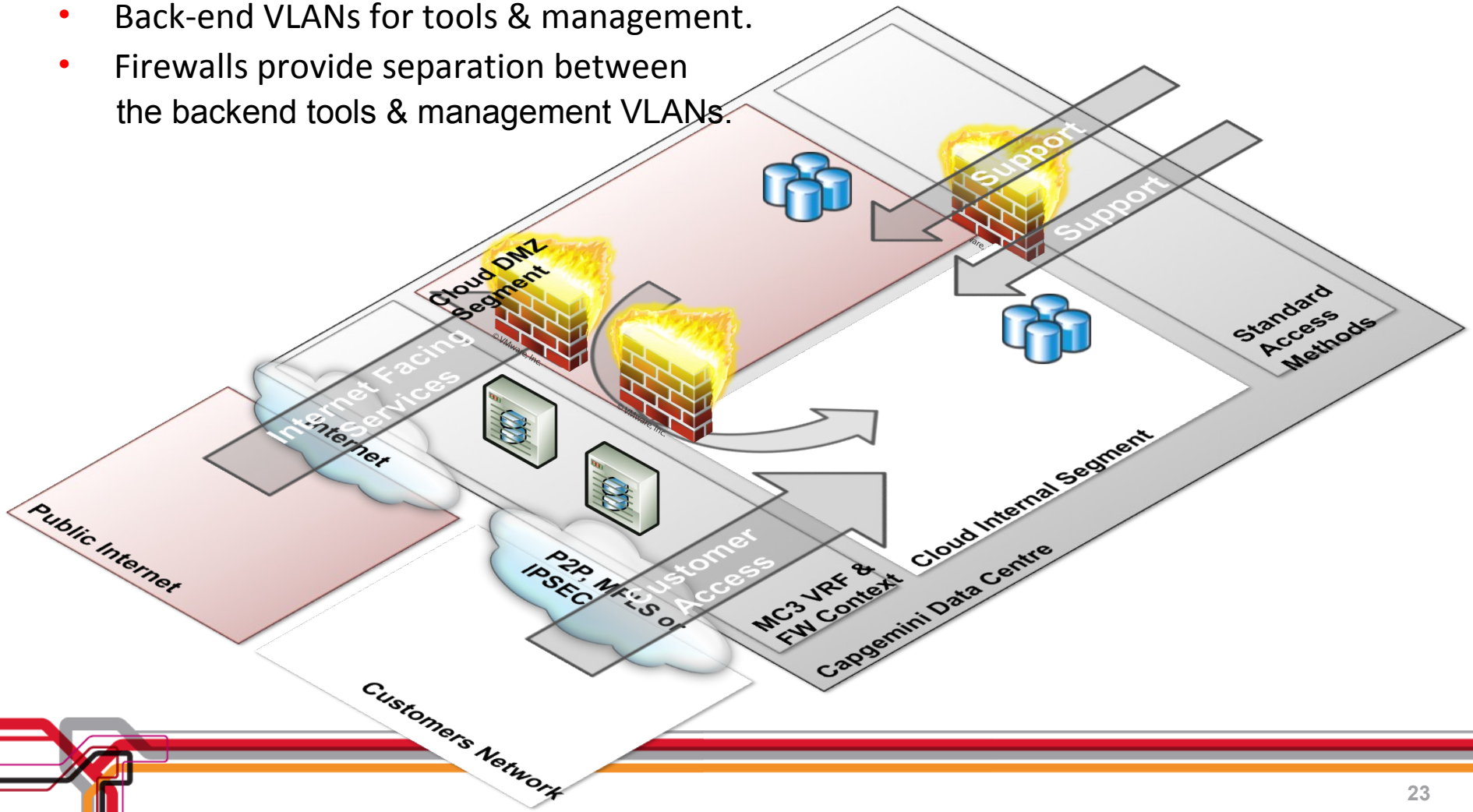
- Regionally deployed, initially in US & UK.
- Central cloud management platform
- Separate VMWare clusters for Express and Enterprise resource pools.
- Separate storage pools for each Express and Enterprise resource pools.



- Different resource allocation policies to provide different quality of service.
  - Express pool resources are self service managed by customer administrator.
  - Enterprise pool resources are fully managed by Capgemini administrators.

Network Infrastructure

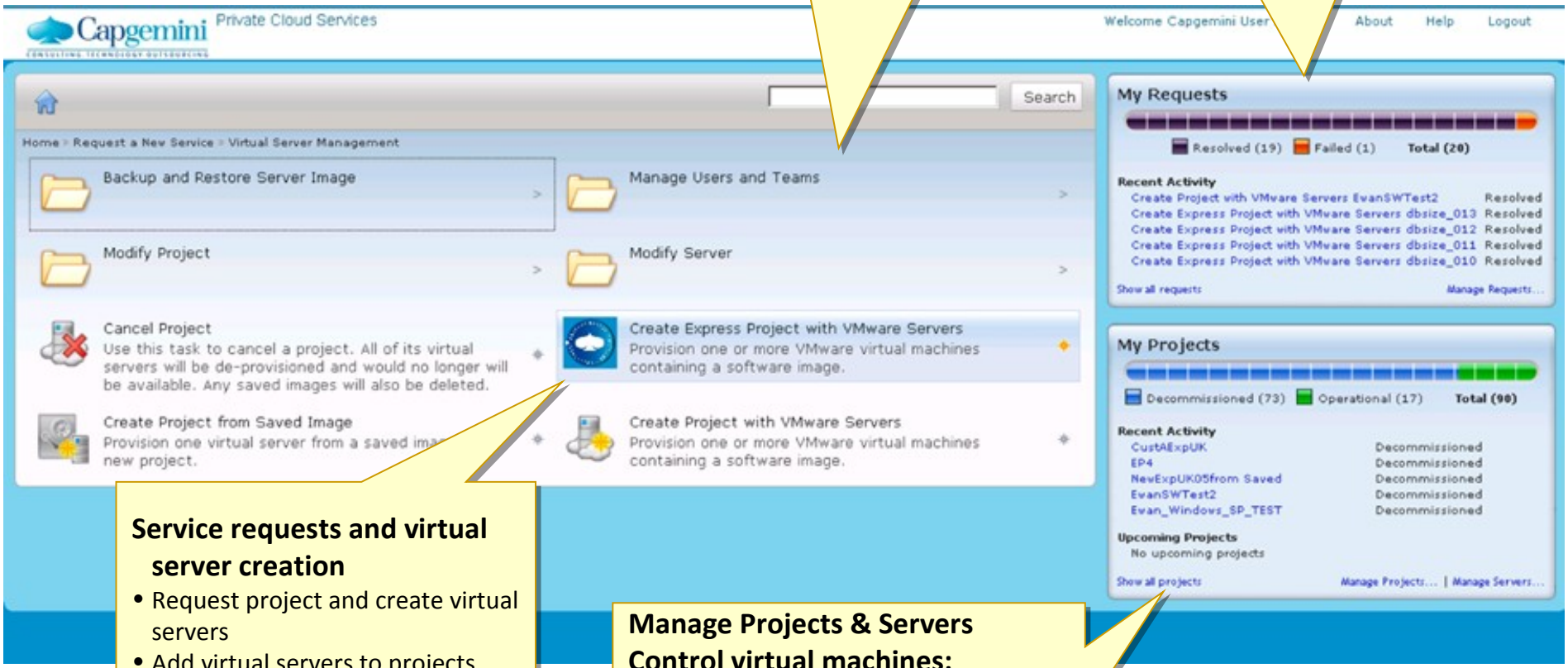
- Customers allocated VRF, customer VLANs within VRF
- VMs are assigned to a Customer assigned VLANs
- Management VLANs for CMP, automation, remote access
- Back-end VLANs for tools & management.
- Firewalls provide separation between the backend tools & management VLANs.



Self-Service Portal

Manage users teams and assign authorization roles
- Create, modify teams
- Create, modify users
- Assign roles

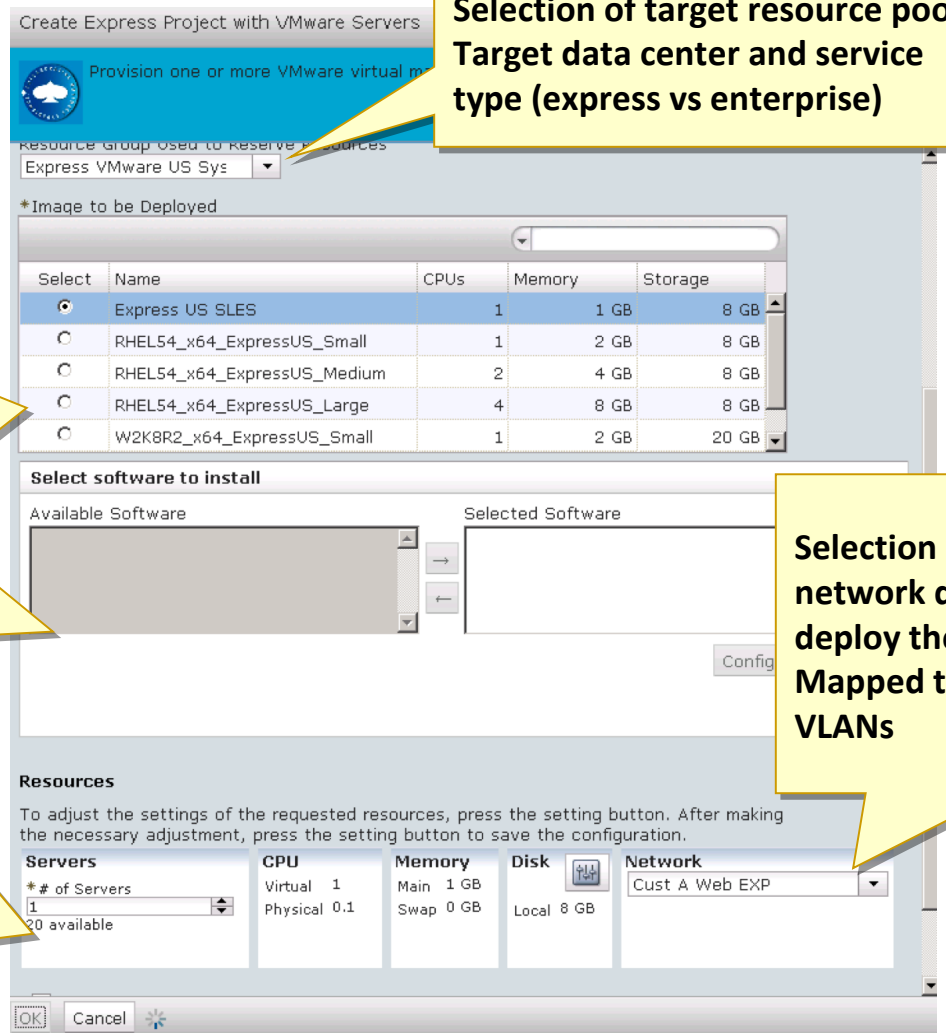
Manage service requests
- View Service Request
- Manage service request approvals



Service requests and virtual server creation
- Request project and create virtual servers
- Add virtual servers to projects

Manage Projects & Servers
Control virtual machines:
- Start, Stop, Restart and Save/Restore servers
- Modify virtual server resource allocation
- Request decommission of virtual servers and projects

Self Service Portal: Request Project and Server Creation



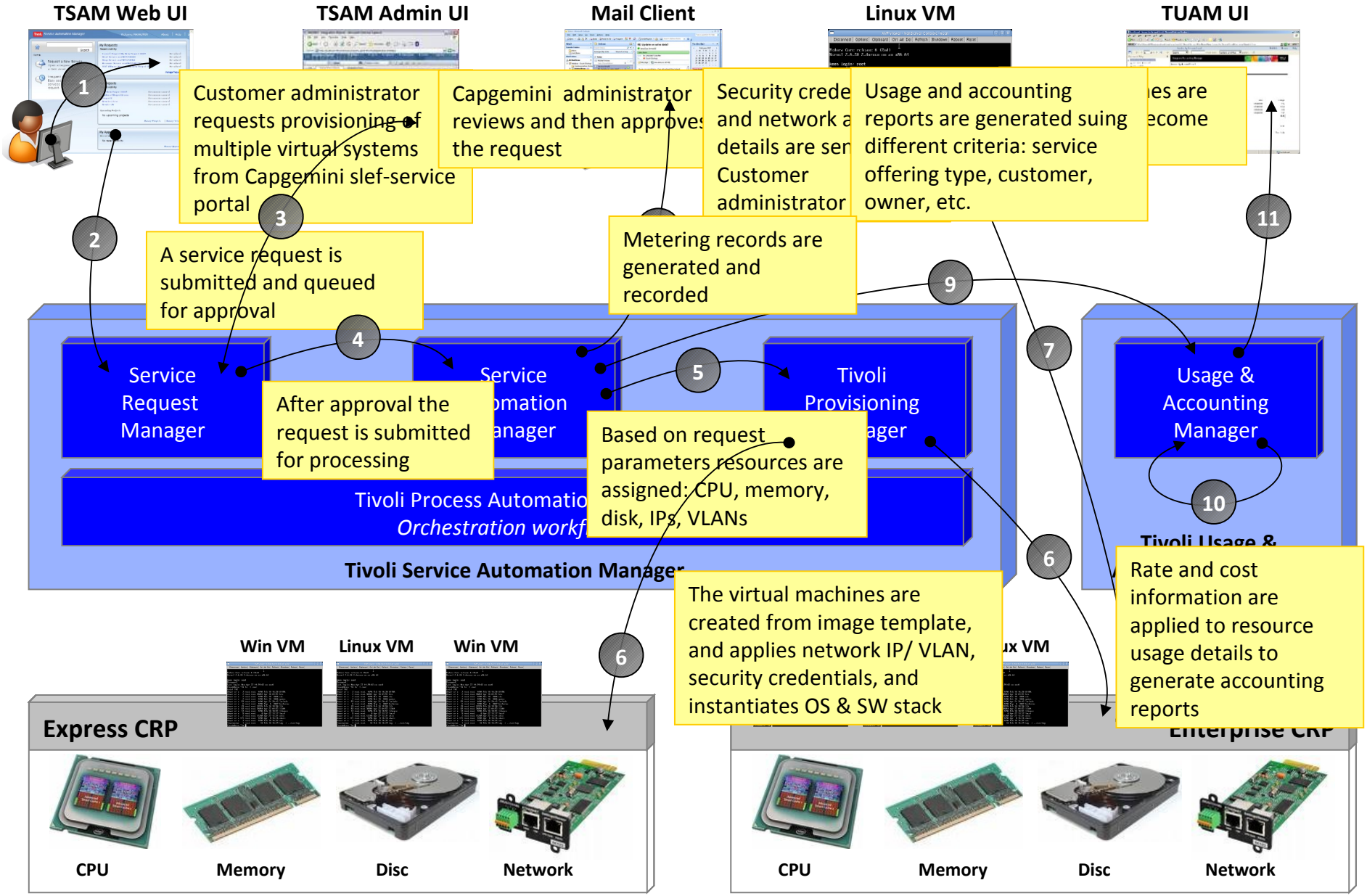
Selection of target resource pool Target data center and service type (express vs enterprise)

Selection from image catalog the OS type and size

Option to select additional software packages to be deployed and configured

Selection of number of virtual system to instantiate and customization of disk size

Selection of the target customer network domain where to deploy the virtual systems Mapped to customer specific VLANs


TSAM Web UI
TSAM Admin UI
Mail Client
Linux VM
TUAM UI
1
Customer administrator requests provisioning of multiple virtual systems from Capgemini slef-service portal
3
Capgemini administrator reviews and then approves the request
Security crede and network a details are ser Customer administrator
Usage and accounting reports are generated suing different criteria: service offering type, customer, owner, etc.
es are ecome
2
A service request is submitted and queued for approval
Metering records are generated and recorded
9
11
4
Service Request Manager
Service omation anager
5
Tivoli Provisioning ager
7
Usage & Accounting Manager
After approval the request is submitted for processing
Based on request parameters resources are assigned: CPU, memory, disk, IPs, VLANs
10
Tivoli Process Automatio
Orchestration workf
Tivoli Usage &
Tivoli Service Automation Manager
6
6
The virtual machines are created from image template, and applies network IP/ VLAN, security credentials, and instantiates OS & SW stack
Rate and cost information are applied to resource usage details to generate accounting reports
Win VM
Linux VM
Win VM
ux VM
Express CRP
Enterprise CRP
CPU
Memory
Disc
Network
CPU
Memory
Disc
Network

What were the key challenges to overcome?

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Key Challenges

- Secure **Multi-tenancy**
  - Integration with the existing network & management infrastructure.
  - Seamless integration with customer network.
  - Implementing flexible automation for network multi-tenancy.
  - Mapping customers/resource pools/zones to VLANs.
  - Self service portal to provide full separation of authorization and responsibilities between different customer administrators and service provider administrators.

- Implementing on a **Global Scale**
  - Single Global CMP, highly available, with regional failover.
  - Multiple regional Client Resource Pools.
  - Leverage Capgemini's network.
  - Deployed in highly secure, access controlled data centres.

Key Challenges

- Delivery of **different type of service offerings**
  - Self service vs. fully managed service offerings.
  - Resource pools with different qualities of service with different availability, monitoring, support policies.
  - Expanded roles & responsibilities for customer & team separation.
  - Enable delegation of responsibility to service provider administrators for fully managed service offerings.

- Metering of **service usage**
  - Allocation based metering using oob TSAM / TUAM capabilities.
  - Extending the allocation metering for IaaS storage & image storage.
  - Provide full flexibility for supporting different pricing schemas.

What were the key lessons learned during the project?

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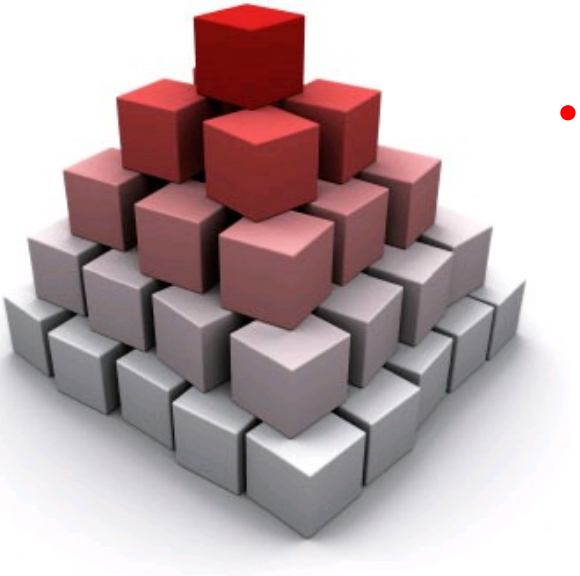
Key Lessons Learned

- **Cloud computing** doesn't change everything
  - Evolutionary in implementation, revolutionary in technology!
  - Normal IT project methodologies apply (mostly).
  - Leverage processes & skills you already have.
  - Don't throw everything out, because a small part is new!
  - Ironically, everything that holds up "traditional" projects will hold up your first Cloud project.

- **New aspects** of Cloud do need to be carefully planned.
  - (Cloud) Service definition, quality of service, evolution of the service, service catalog, and service life cycle need to be well defined and designed.
  - Clarity in use-cases, service catalog and non-functional requirements fundamental to success.

Key Lessons Learned

- **Networks** are the **enabler** as well as the **inhibitor** !
  - Access to the Cloud services requires secure front-end user access and back-end Cloud management for a viable Cloud solution.
  - Most enterprise networks are designed for separation & security, and actively prevent back-end access to network zones across business-units, countries and regions.
  - Early verification of network viability for Cloud services delivery is vital, especially when Cloud span beyond the data centre.



- Building a **modular & scalable** architecture
  - Growth and scale becomes the key architectural principle.
  - Modular – not locking into a single hypervisor
  - Architecture designed to be horizontally and vertically scalable.

Key Lessons Learned

- Build to the **lowest common denominator**
  - Simplification will accelerate deployment and adoption.
  - Grow the service offering complexity with experience and demand.
  - Don’t try to solve too many problems at once.

- **Plan early** on how to **operate** your Cloud
  - Build a multi-discipline team embedded in a single group, to compliment the traditional delivery processes. (Hypervisor, storage, compute, service management skills)
  - New Cloud processes will be required in addition to traditional service management processes.
  - These should focus upon the service life cycle from creation, instantiation, operation and termination.

Smarter Computing enables integrated, automated, and secured Service Delivery

Efficient and innovative IT for improved economics

Integrated

Improved Integrated Service Management deployed across IT and business infrastructures:

- **End to end service management stack for IaaS / PaaS delivery.**
- **Faster time to value with pre-integrated solutions, eg. ISDM.**

Automated

Automated service delivery and processes across the full lifecycle of requests and incidents:

- **Self-service request driven delivery of services in minutes.**

Secured

Increased visibility across complex environments and effective control to meet security and compliance objectives:

- **Multi-tenant isolation of workloads**

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Thank you and Questions?

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Hands-on Labs

Hands-on labs provide an excellent opportunity to gain first-hand technical experience with Tivoli products and solutions.

Room 119,
Conference Center, Level 1

Hands-on Lab Schedule

Sun.	10:30 a.m. – 5:00 p.m.
Mon.	10:30 a.m. – 6:00 p.m.
Tue.	10:30 a.m. – 6:00 p.m.
Wed.	8:00 a.m. – 6:00 p.m.
Thur.	8:30 a.m. – 3:00 p.m.

Technical Product Certification

Technical product certification lays the groundwork to help you become a world-class resource to your clients, colleagues, and company.

Rooms 301 and 302,
Conference Center, Level 3

Certification Schedule

Mon.	10:30 a.m. – 6:00 p.m.
Tues.	10:30 a.m. – 6:00 p.m.
Wed.	8:00 a.m. – 6:00 p.m.

Post -Conference Education

Two-Day Tivoli Workshops

Rooms 101-110,
Conference Center, Level 1

Thur.	8:00 a.m. – 5:00 p.m.
Fri.	8:00 a.m. – 5:00 p.m.

One-Day Asset Management Workshops

Rooms 121-123,
Conference Center, Level 1

Thur.	8:30 a.m. – 3:30 p.m.

Solution Expo

IBM and Partner exhibits, theater presentations,
Meet the Experts,
Client Hospitality Lounge,
User Group Networking, Business Partner Cafe and Client Reference Lounge

Expo Hours

Sun.	6:30 p.m. – 9:00 p.m.
Mon.	12:00 p.m. – 7:00 p.m.
Tue.	12:00 p.m. – 6:00 p.m.
Wed.	12:00 p.m. – 4:00 p.m.

Receptions will be held Sunday and Monday nights.

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