Hybrid Clouds: Bridging Private & Public Cloud Infrastructures

March 18, 2015

Today's Presenters

SNIA™
Cloud Storage Initiative

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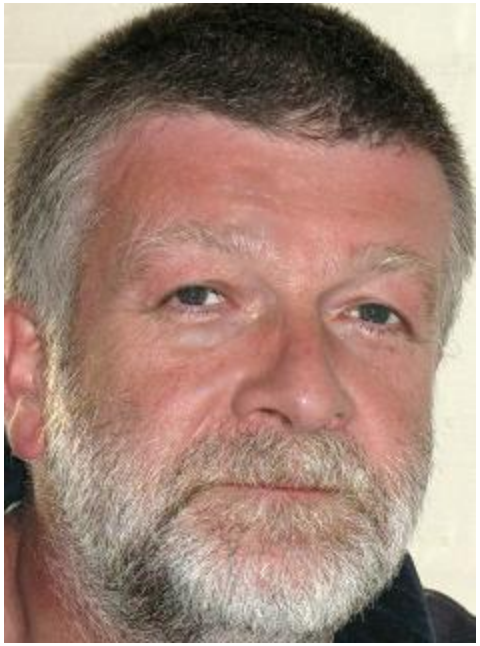

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Agenda

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- Learning Objectives
  - Understand the place of storage in cloud architectures
  - Learn about specific storage requirements for cloud
  - Identify the issues in using storage in a cloud architecture

The Theoretical ITU Model

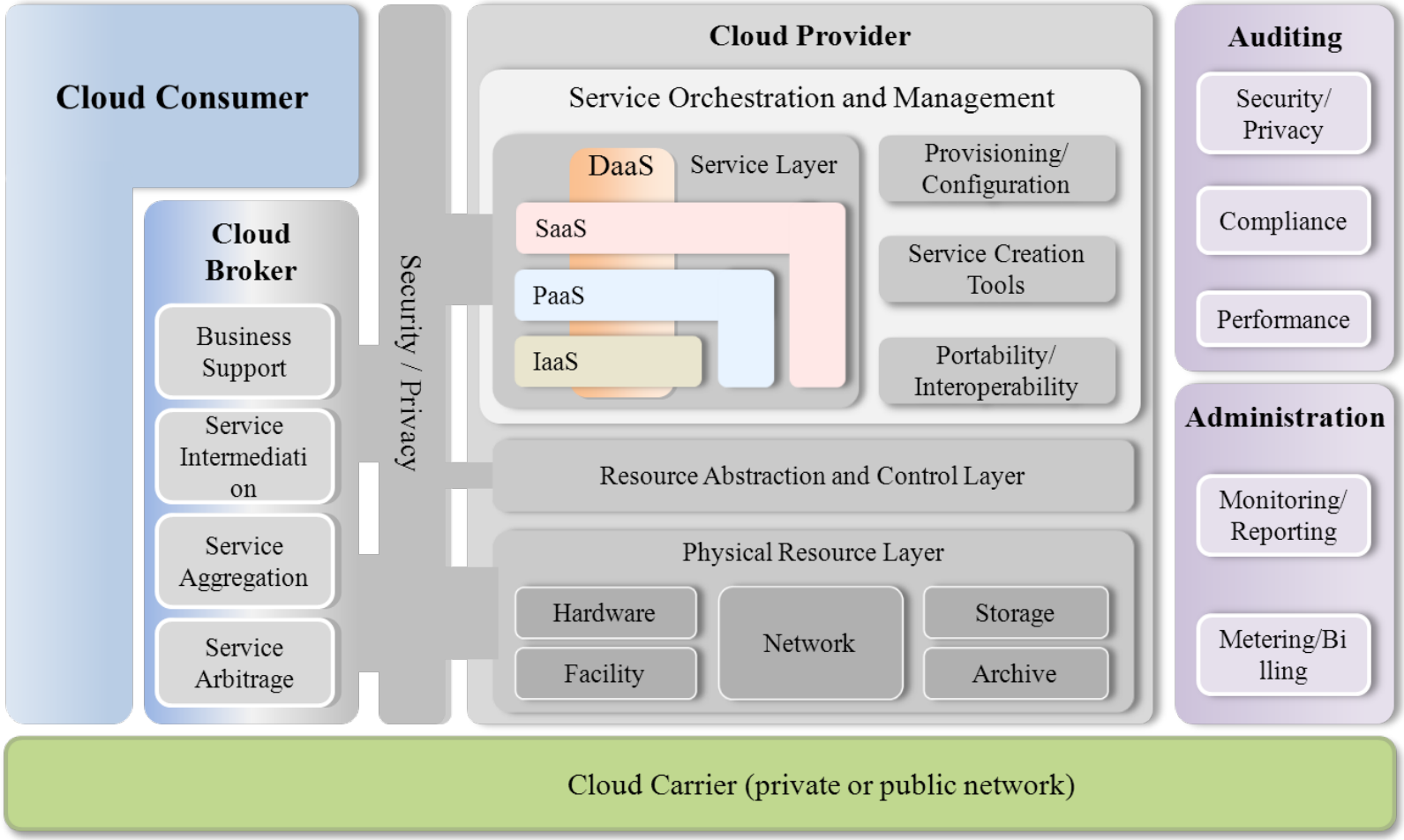

diagram provided by ITU-T (N326)

Service Delivery Business Challenges

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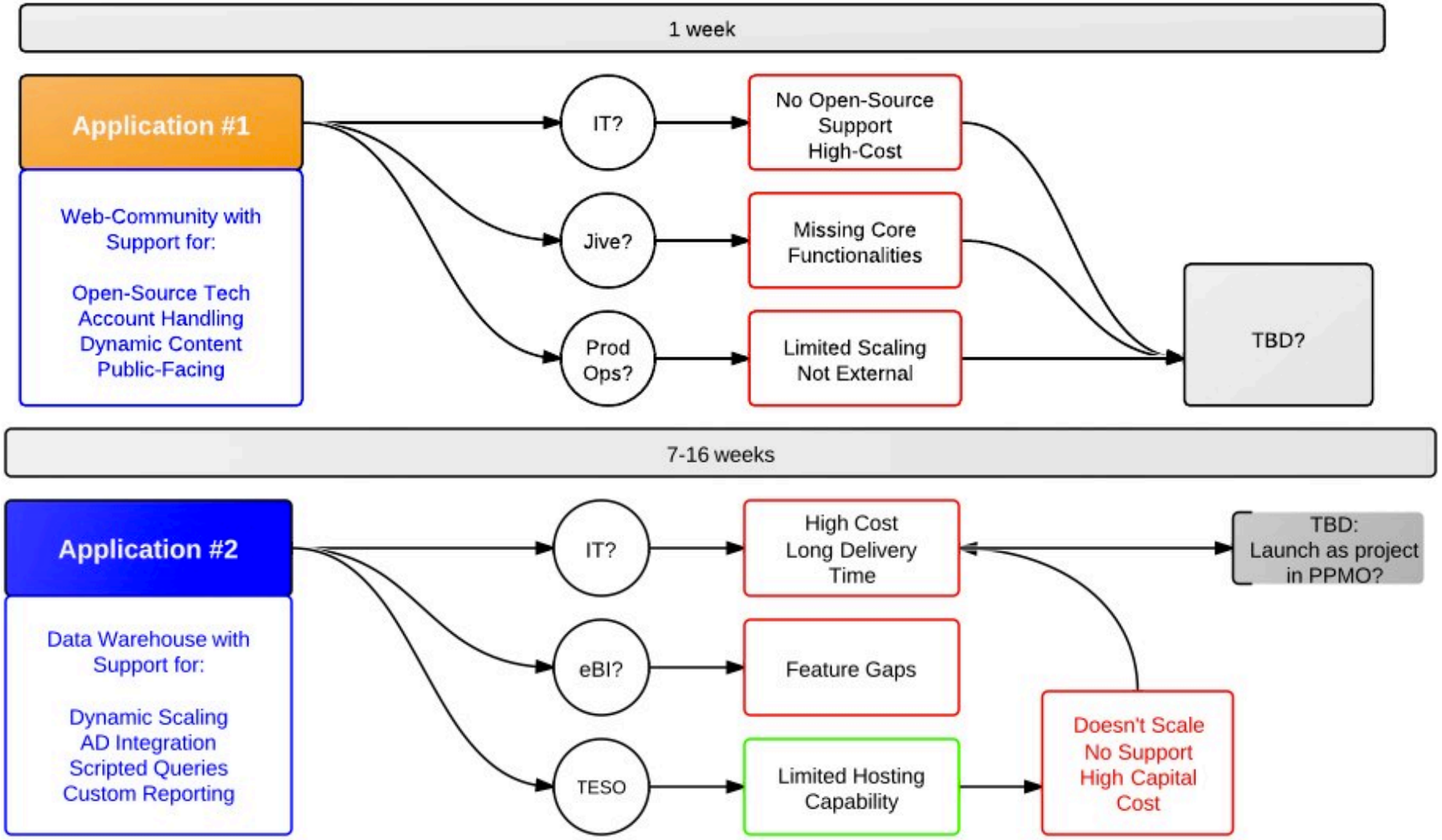
- The need for speed and innovation by business users creates a demand that is difficult to meet with the current IT model
  - Operating model can be constrained by IT's need for consistency and standards
  - One-size-fits-all model which typically doesn't "fit all sizes"
  - Prioritized against enterprise IT projects
- Technology has become more available
  - Commercial public cloud is available with the swipe of a credit card and equally easy to use

- End-users are finding other ways to procure resources and cloud becomes an enabler.
- These solutions have the potential to increase risk and cost to the business
  - Spawns applications with no integration to IT support or security, and typically with no business continuity
  - HW, SW, and resources are invested by the business in order to manage their needs; no economy of scale

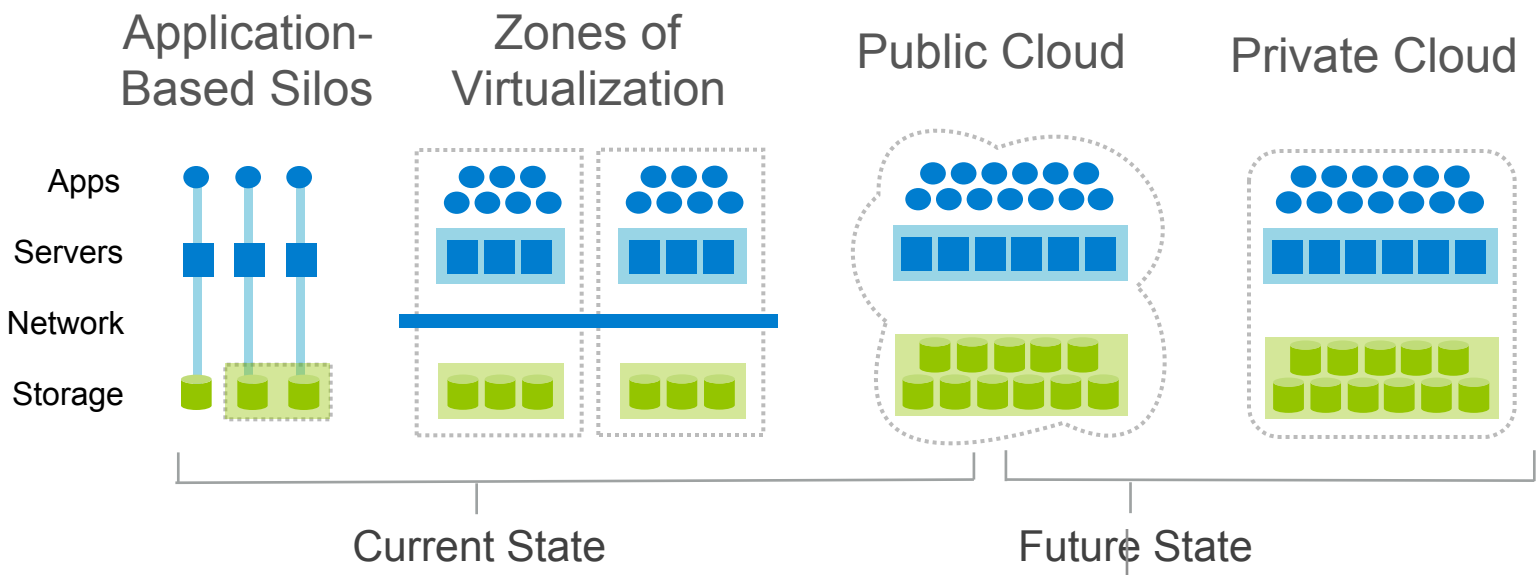
Specific Business Scenarios



Approach

- Started fast with Cloud Service Provider which provided VPC (virtual private cloud)
  - Provided needed velocity to capability at lowest cost
  - Iterative approach to defining capabilities and mapping to business needs of the end-user
  - Demonstrate the simplicity and agility of a resource on-demand model
  - Prove application / workload compatibility
  - Illustrate how cloud fits as a component in the IT service management framework
- Iterate to refine service offering
- Continue business apps migration
- Drive toward private / hybrid cloud

Approach (cont.)



Reduced Time to Capability
Capacity Management
Standard Image Library
Increased Security Posture
Business Scalability
Data Protection and Management
Resource Monitoring and Reporting
Lowered Capital Requirements

The Planning Process & Challenges

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- Legal Considerations
- Culture
- Operations
- Governance
- Processes
- Security & Data Privacy
- Contracts & SLAs
- Best Practices

Legal Considerations

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- Why and when you need a lawyer
- Transborder Data Flow
  - May generate legal obligations (sometimes conflicting) in multiple jurisdictions
  - “The Right To Be Forgotten”; many jurisdictions have such laws
  - Exporting data may be illegal
    - EU Data Protection Directive; does NOT permit transferring personal information to countries that do not provide EU protection levels; the USA is one such country
- Expectation of "Reasonable Security"
  - Security breaches leading to potential liability
  - Only as strong as weakest link

Legal Considerations (cont.)

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- Electronic evidence & e-discovery
  - What constitutes evidence?
  - Multiple copies, digital signing, data fragmentation
  - Retrieval of data often complicated
- Existing non-Cloud contracts insufficient
  - License agreement vs service agreement
  - Ownership vs use of content
- Mobile Devices
  - The law applies where you are, and where your data is stored
- Get Legal Involved
  - Early and often; laws change

Key Challenges in Selecting/ Using Cloud

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- Culture
  - Some groups are wary of clouds & those services that they cannot physically interact with
  - Utility model (pay-as-you-go) takes time to be fully accepted by business users
  - Shifting the mindset of the user: chargeback doesn't always mitigate over-provisioning
- Operations
  - Managing the service-provider!
  - How to integrate off-premise services (and do so where the current model is in silos)
  - Cloud education is essential – to understand the value of cloud to business users, and how it can help make more efficient

Key Challenges in Selecting/ Using Cloud

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- Governance
  - Governance is key in shaping the speed of adoption and success
  - Companies must understand what they should put in the cloud and why
  - Risk management is crucial - from vendor sourcing, to legal policy, to developing strong application patterns around cloud usage
- Processes
  - Clarity of processes for Cloud operations, governance and SLA
  - Driving cloud brokerage into the service management framework
  - Normalizing and federating data

Key Challenges in Selecting/ Using Cloud

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- Security & Data Privacy
  - Enterprise CSP - offers a more secure environment than most IT datacenters
  - Data privacy- threat of data holds & other legal matters can be potential risks
  - Self-service can open the door without proper controls
- Contract & SLAs
  - A strong contract helps mitigate risks and the key in cloud provider selection
  - A well-structured SLA is essential to manage expectations and deliverables
  - Exit strategy; how to cleanly terminate or move

Key Challenges in Selecting/ Using Cloud

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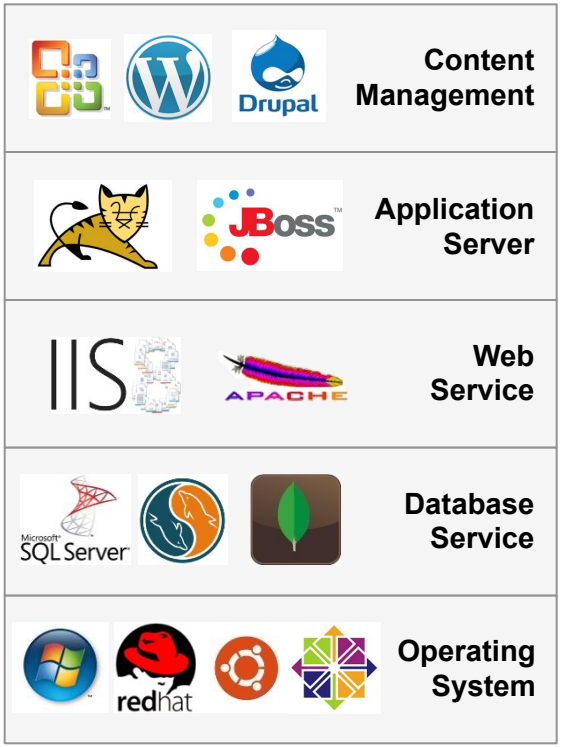
- Best Practices
  - CSP selection process & risk management
  - Modernization of applications - as they are the true consumer
  - Pay-as-you-go, chargeback consumption model

Capabilities

- xCloud provides a method for end-users to provision and manage IT systems
- Service catalog of more than just simple infrastructure instances
- Many common web and database platforms are fully supported; from deployment through steady-state
- Core Services (SSO, LDAP, AD, DNS, etc) are available via blueprint catalog

xCloud Supported Platform Stack



What does xCloud do?

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Load Balancing

Monitoring

Reporting

Scheduling

Instance Management

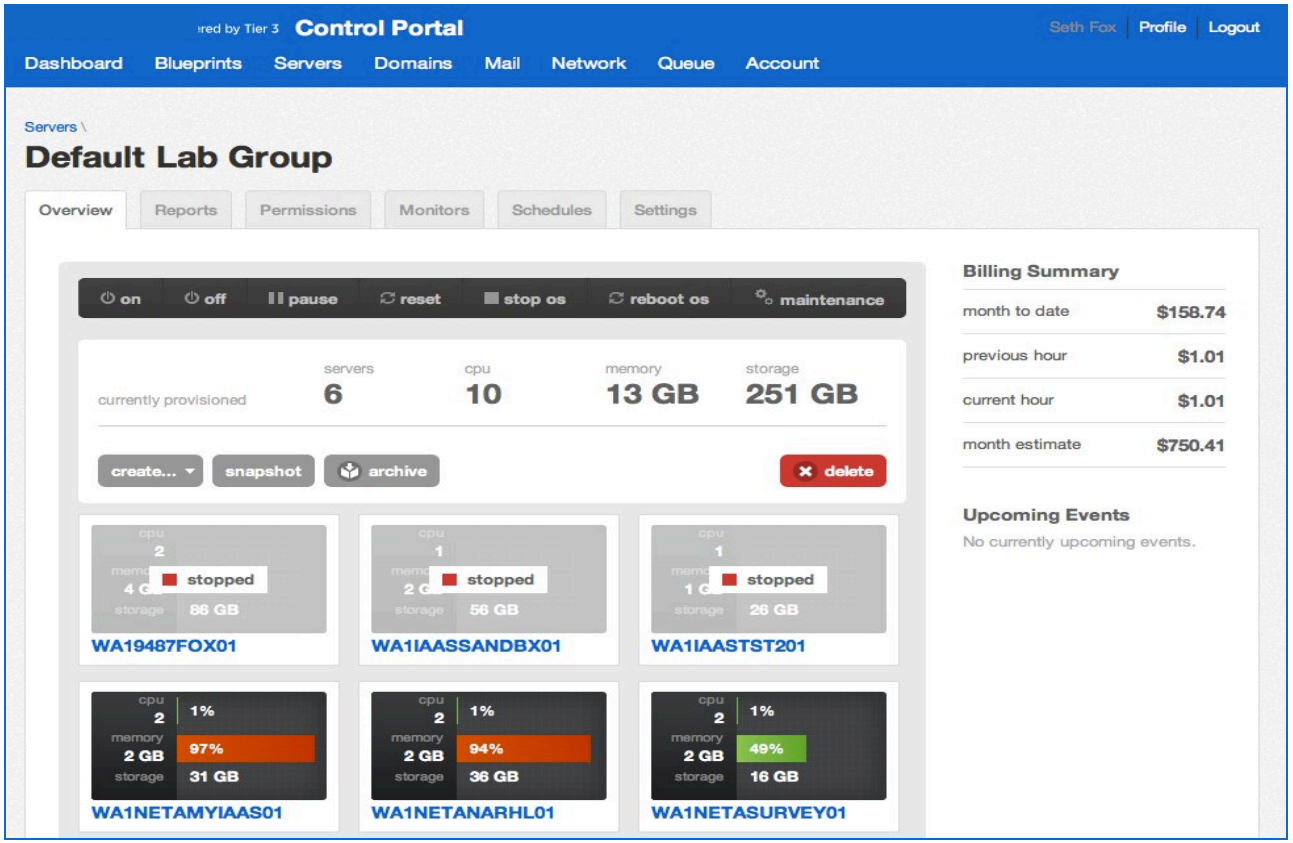
Billing

Continuity

Blueprints

Core Service Support

API



Value of xCloud

Business Agility

- Removes IT as a bottleneck
- Increased platform and application confidence

Improved Security

- Lowered risk of app compromise or data loss
- Reduced application downtime

Measurable Benefits:

Value Opportunity	Quantitative Benefits	Qualitative Benefits
Improved Time to Capability	Up to 3000% decrease in time to deliver over traditional IT	• Acceleration of feature/function • Ability to repurpose resources
Enhanced Reliability	99.9+% availability	• Less application downtime / Fewer P1/2's • Improved application performance
Capacity Management	30% better capacity utilization	• More efficient use of resources • Fewer performance issues
Expense Avoidance	$3.5M estimated annual savings in HW, SW, and support	• Reduced up-front costs with no long-term commit • Visibility into actual consumption

What can xCloud be used for?

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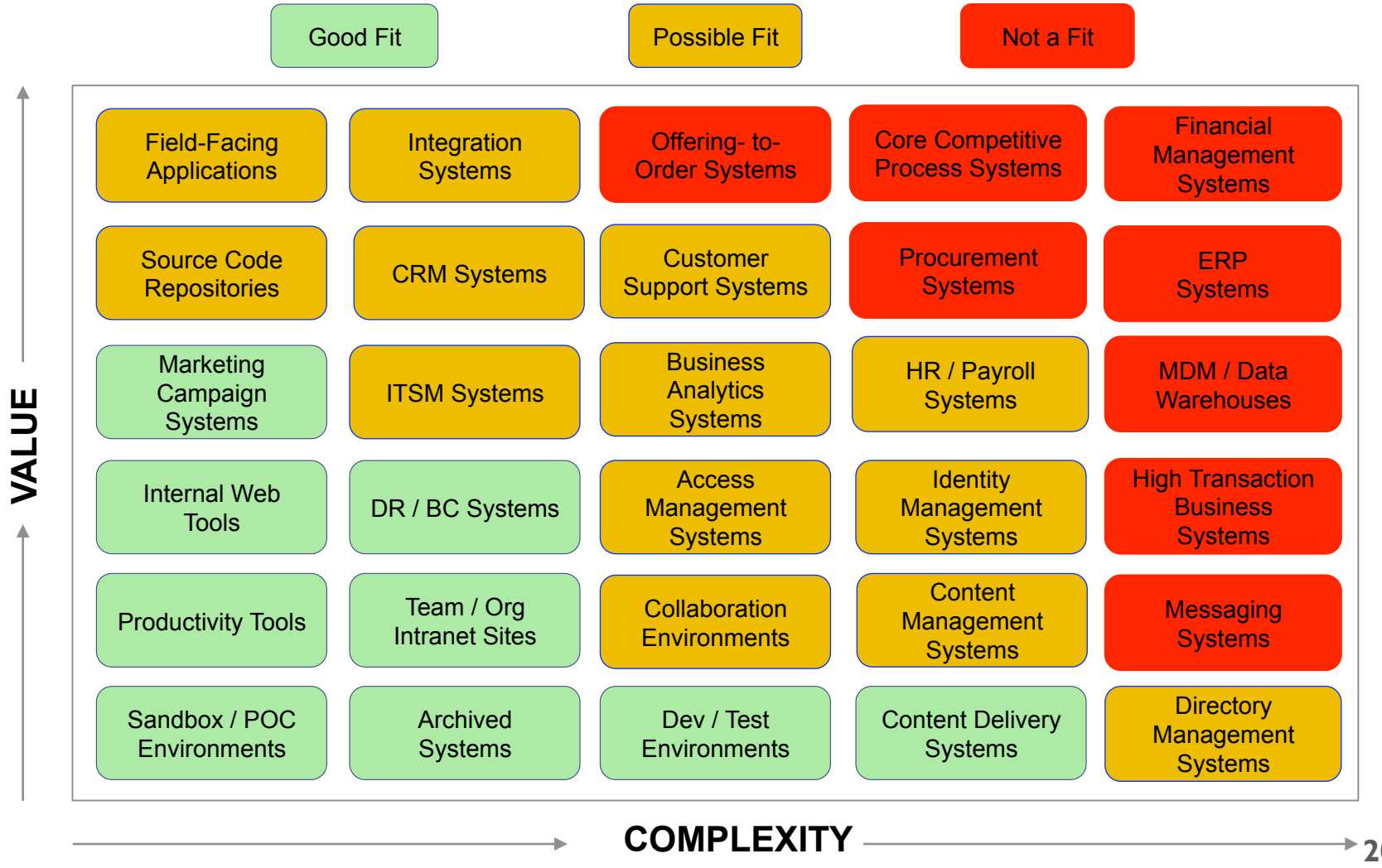

Cloud Decision Framework

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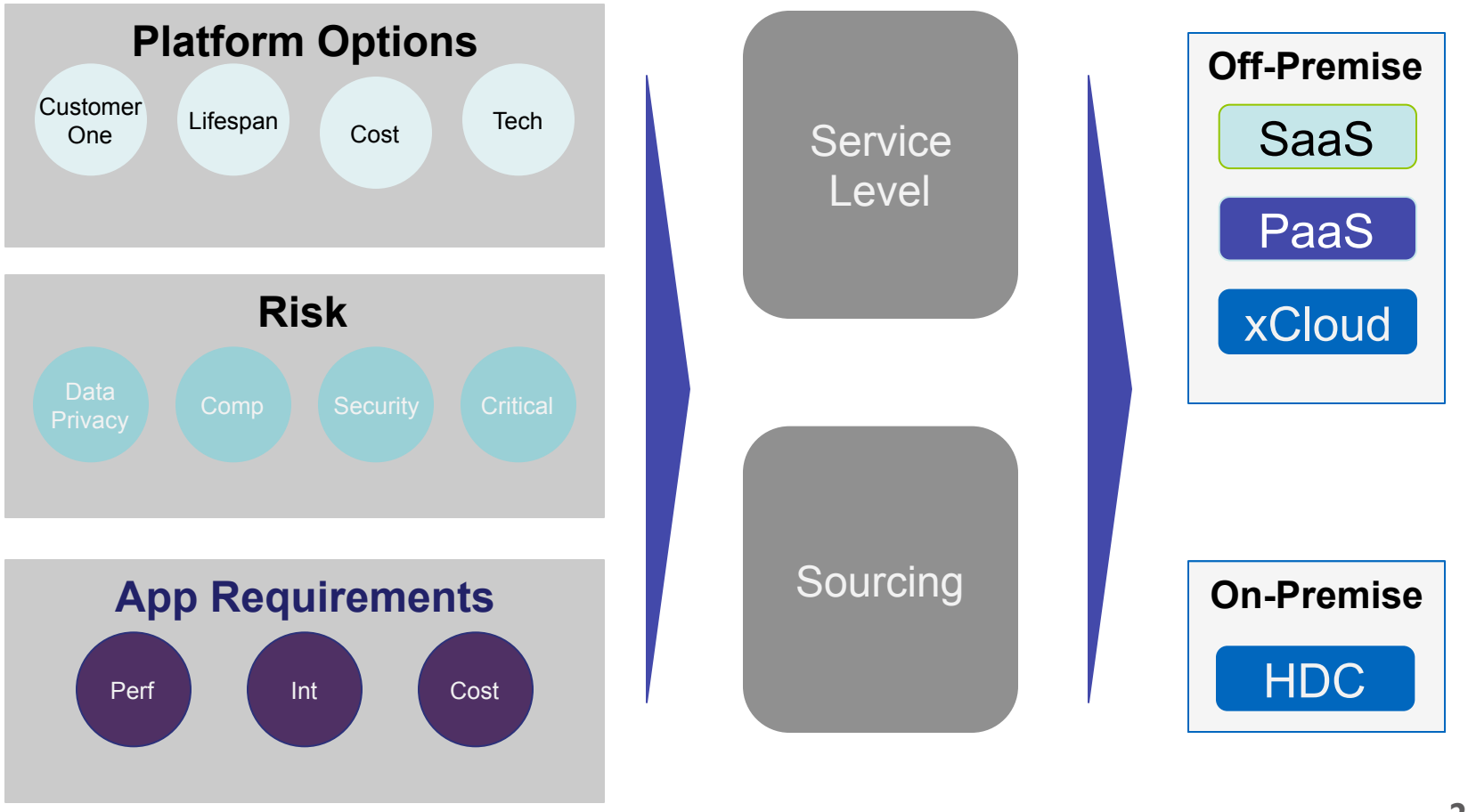
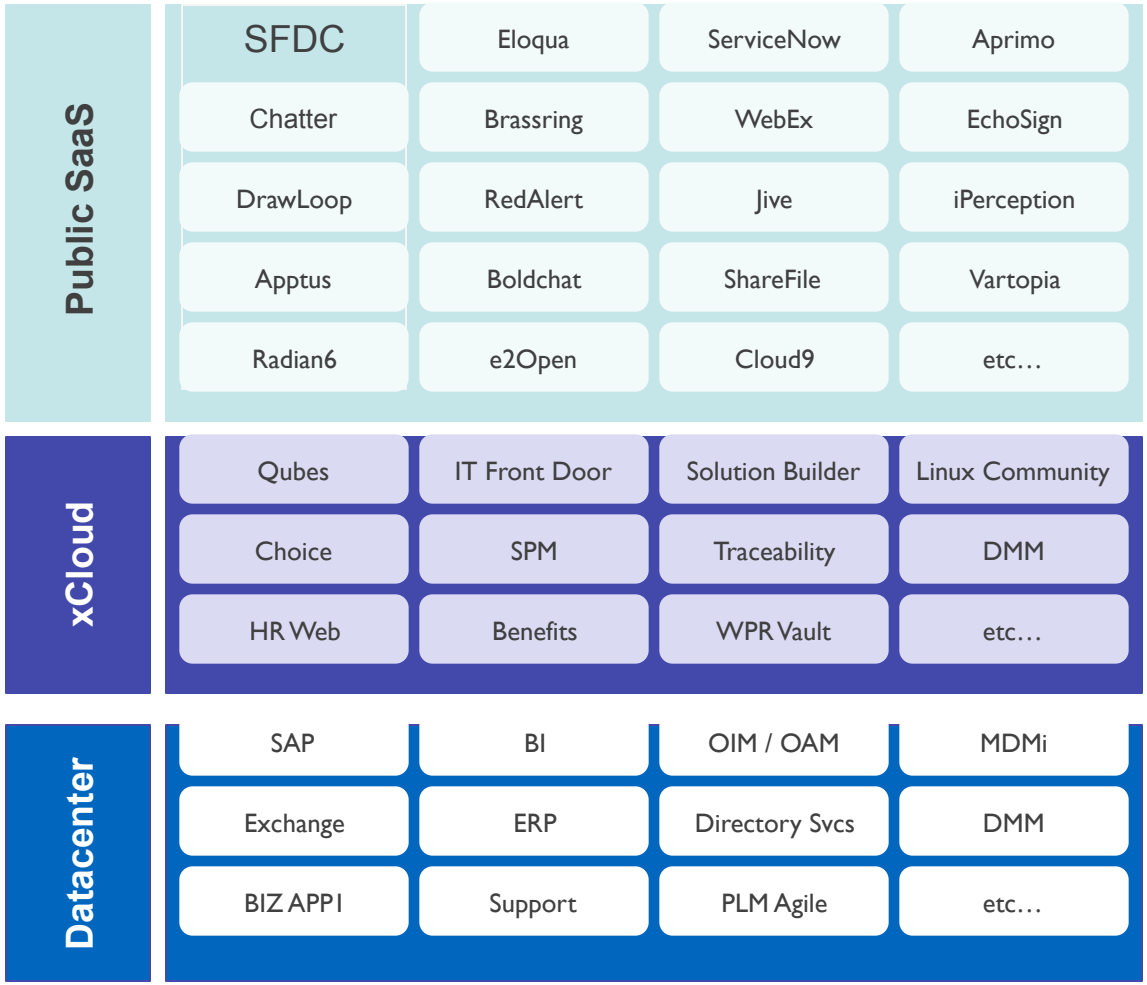
Decision Framework for Business and IT to know which lever to pull to solve the right business problems and drive cost optimization



Service Delivery Current State



Strong adoption of SaaS

Mature enterprise operations

xCloud : Virtual Private Cloud

IT acts as Provider and Broker

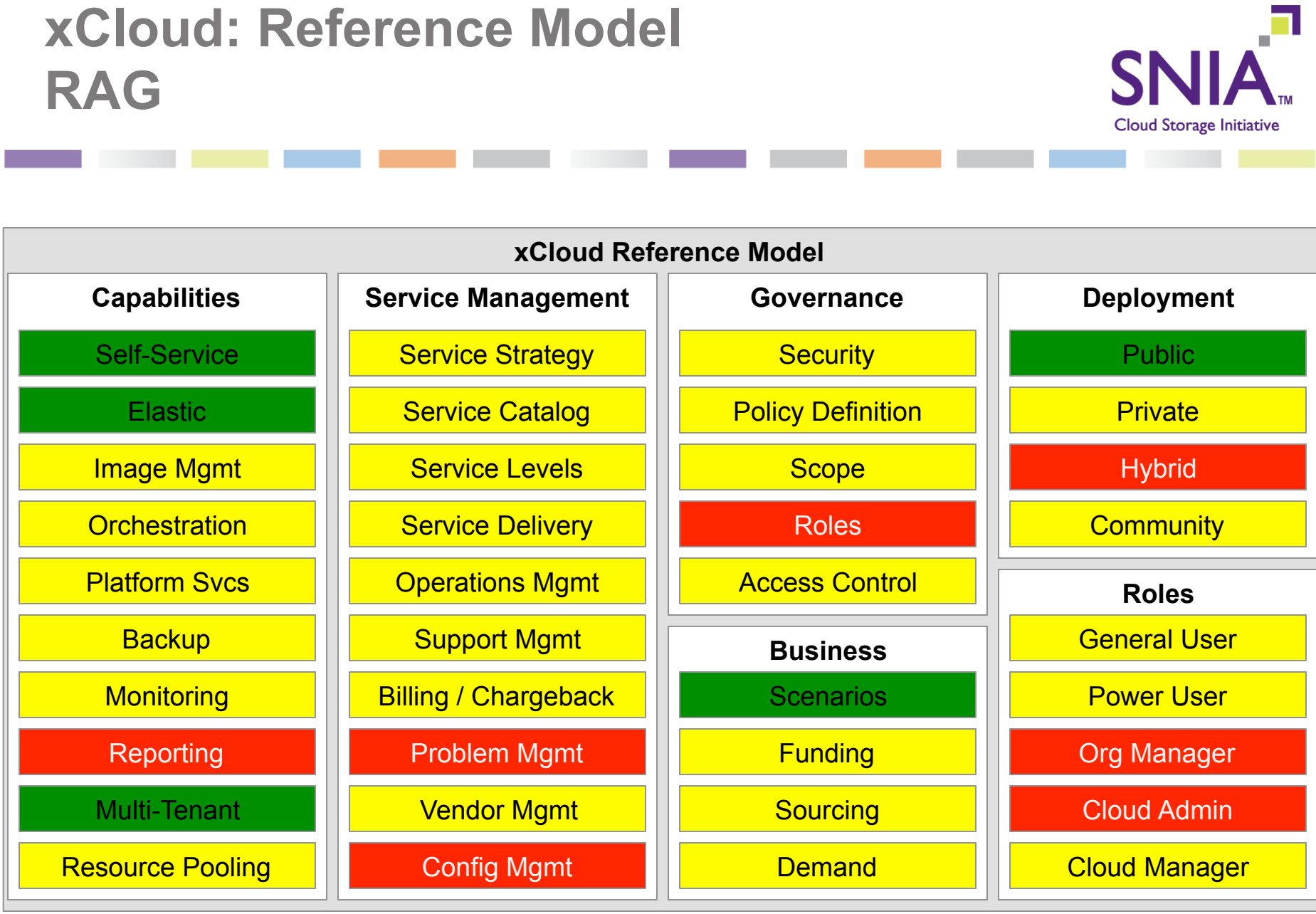
Operate in silos

Immature cloud technology

Lack of holistic governance

Basic concept of chargeback

xCloud: Reference Model RAG

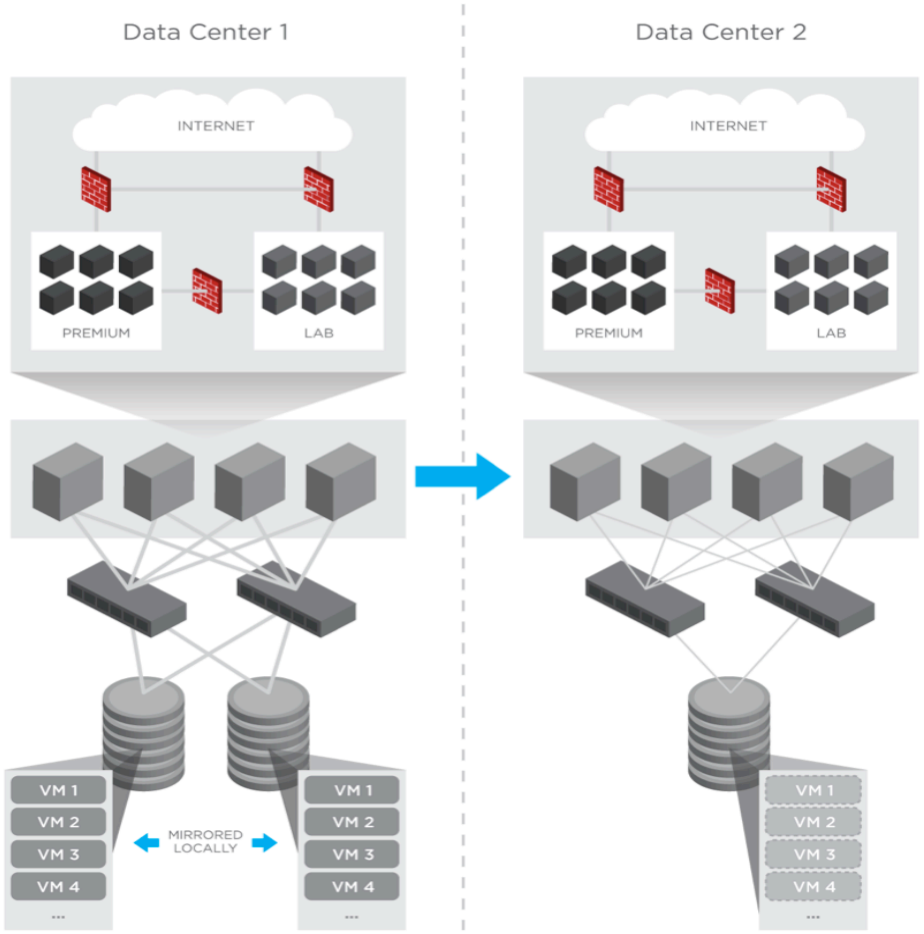


Technology

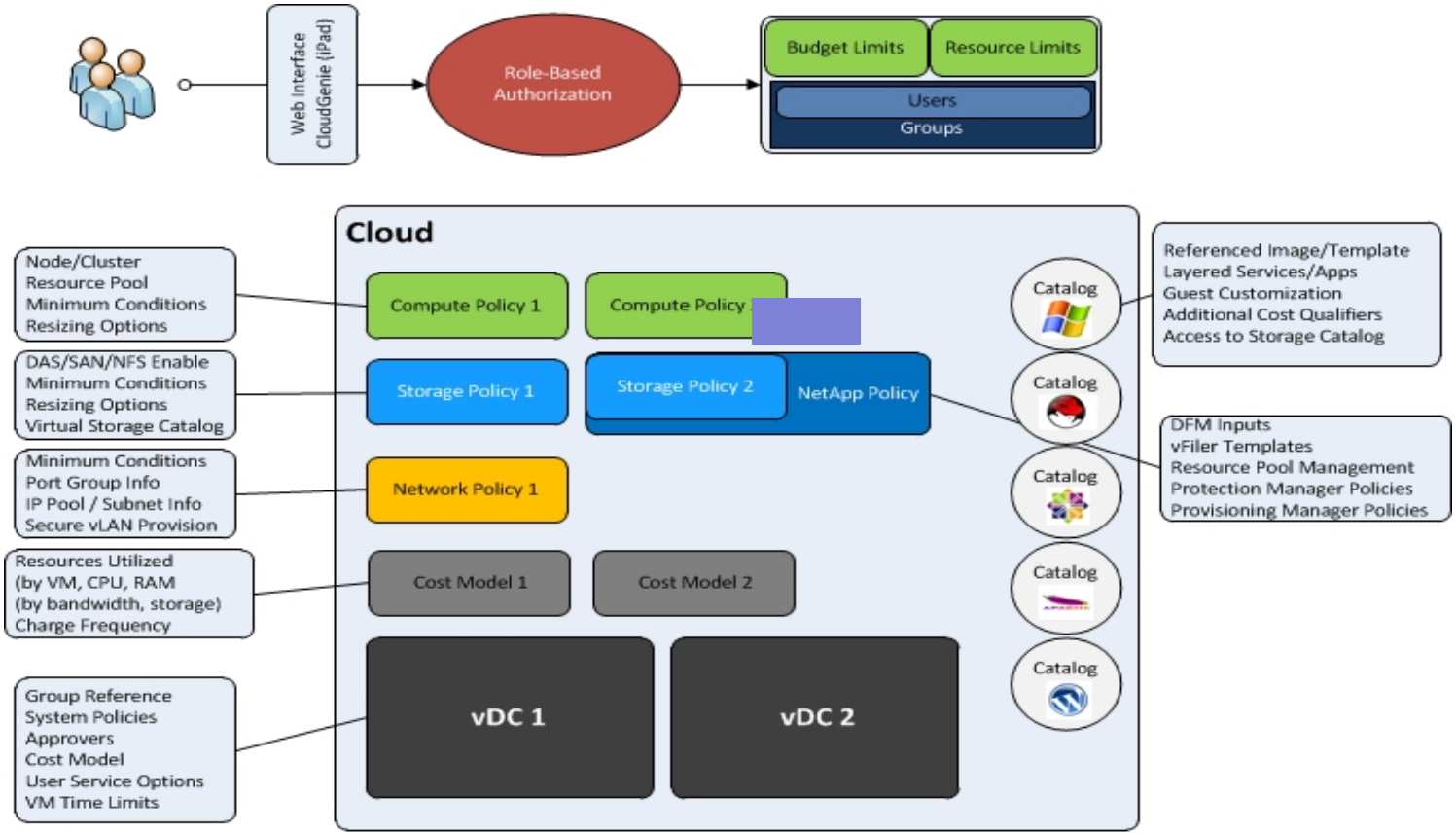
- Secure private network
- Monthly security auditing
- DDOS protection
- Intrusion protection

- Switches, blades & VMs

- Three copies of data across two data centers kept at all times
- Clustering and HA
- 5 /14 day backups



Topology


Web Interface
CloudGenie (iPad)
Role-Based
Authorization
Budget Limits
Resource Limits
Users
Groups
Cloud
Node/Cluster
Resource Pool
Minimum Conditions
Resizing Options
DAS/SAN/NFS Enable
Minimum Conditions
Resizing Options
Virtual Storage Catalog
Minimum Conditions
Port Group Info
IP Pool / Subnet Info
Secure vLAN Provision
Resources Utilized
(by VM, CPU, RAM
(by bandwidth, storage)
Charge Frequency
Group Reference
System Policies
Approvers
Cost Model
User Service Options
VM Time Limits
Compute Policy 1
Compute Policy
Storage Policy 1
Storage Policy 2
NetApp Policy
Network Policy 1
Cost Model 1
Cost Model 2
vDC 1
vDC 2
Catalog
Catalog
Catalog
Catalog
Catalog
Referenced Image/Template
Layered Services/Apps
Guest Customization
Additional Cost Qualifiers
Access to Storage Catalog
DFM Inputs
vFiler Templates
Resource Pool Management
Protection Manager Policies
Provisioning Manager Policies
Additional Clouds
Other Cloupia Clouds

xCloud Reference Architecture

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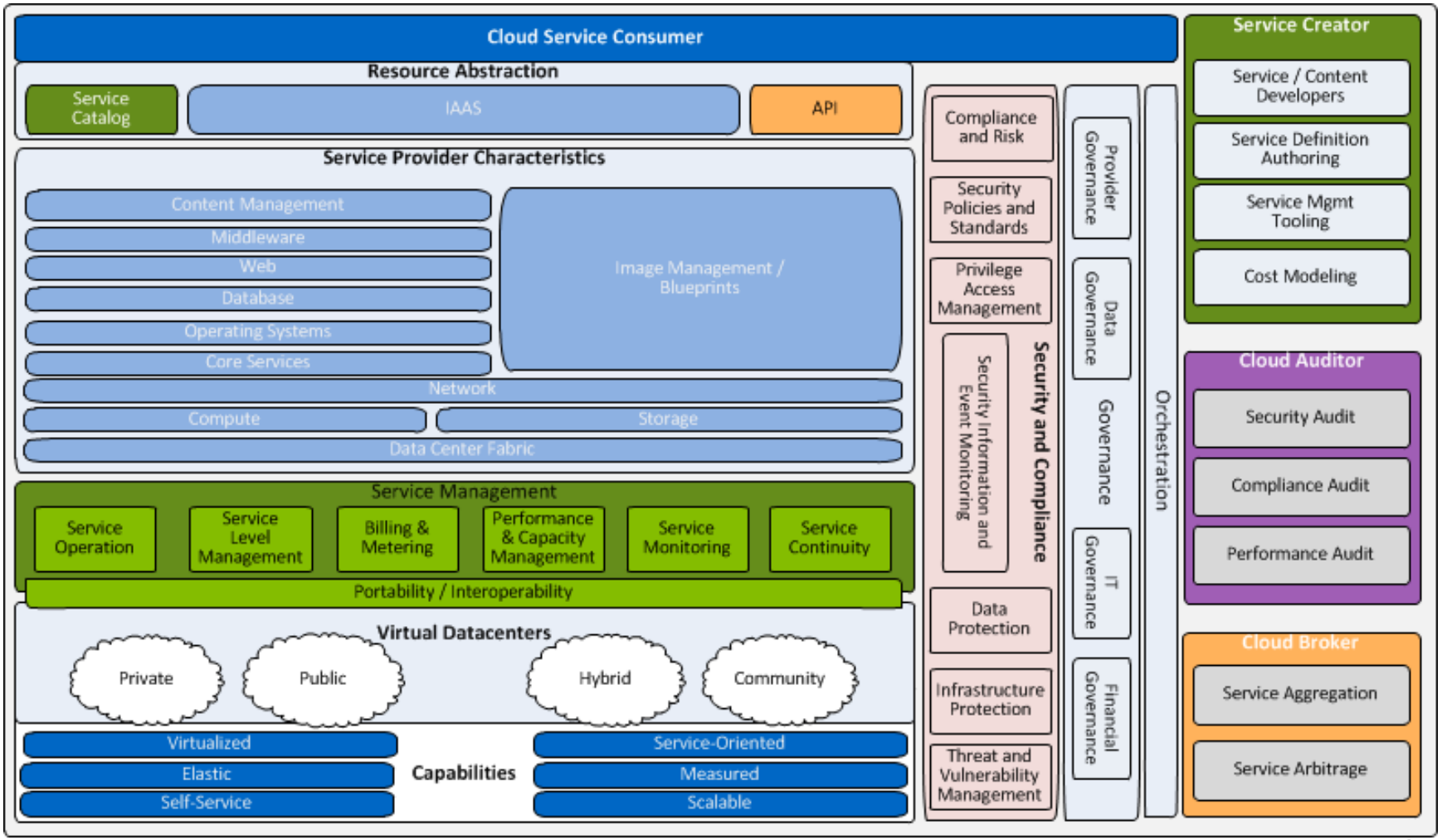


Compare With the Theoretical ITU Model

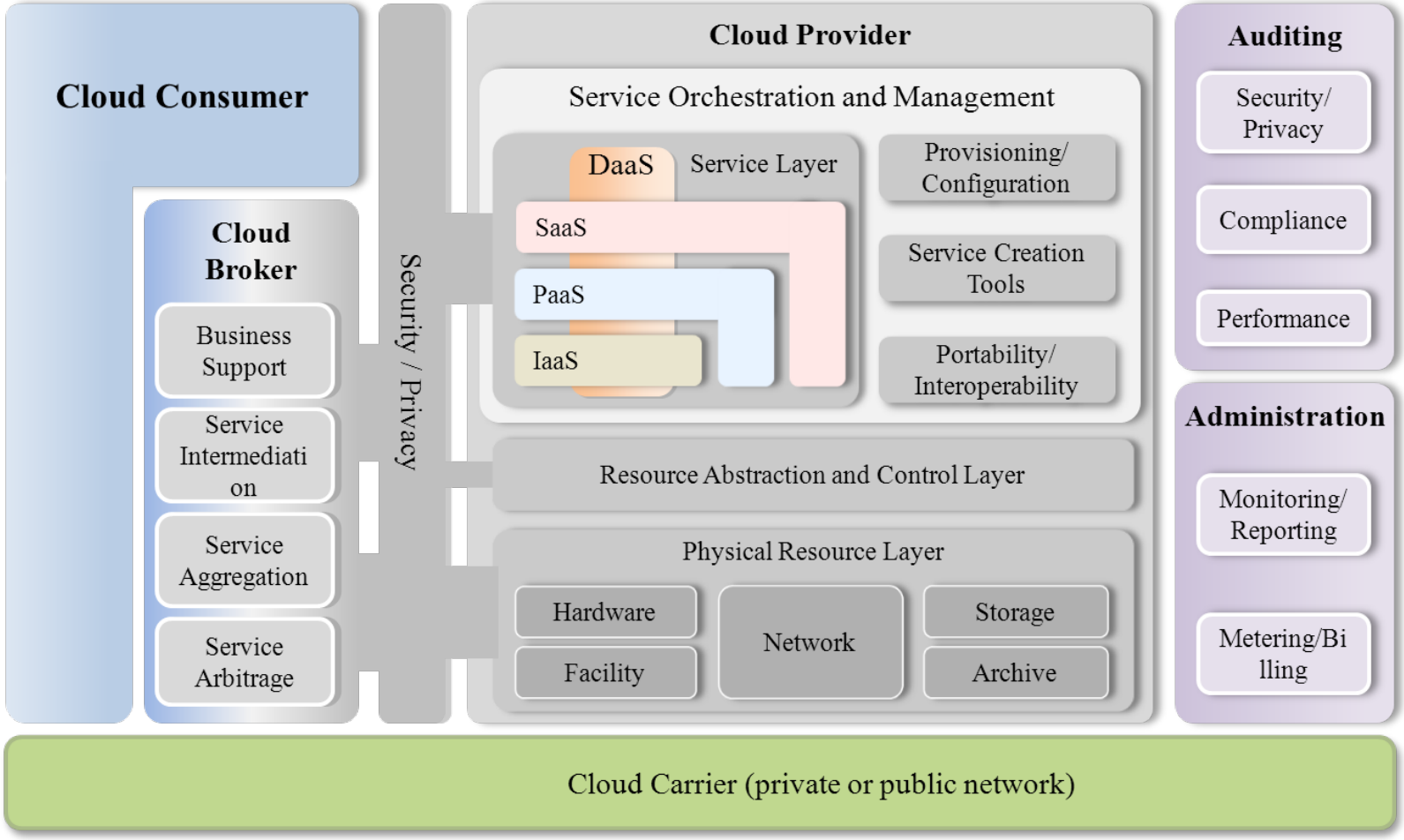
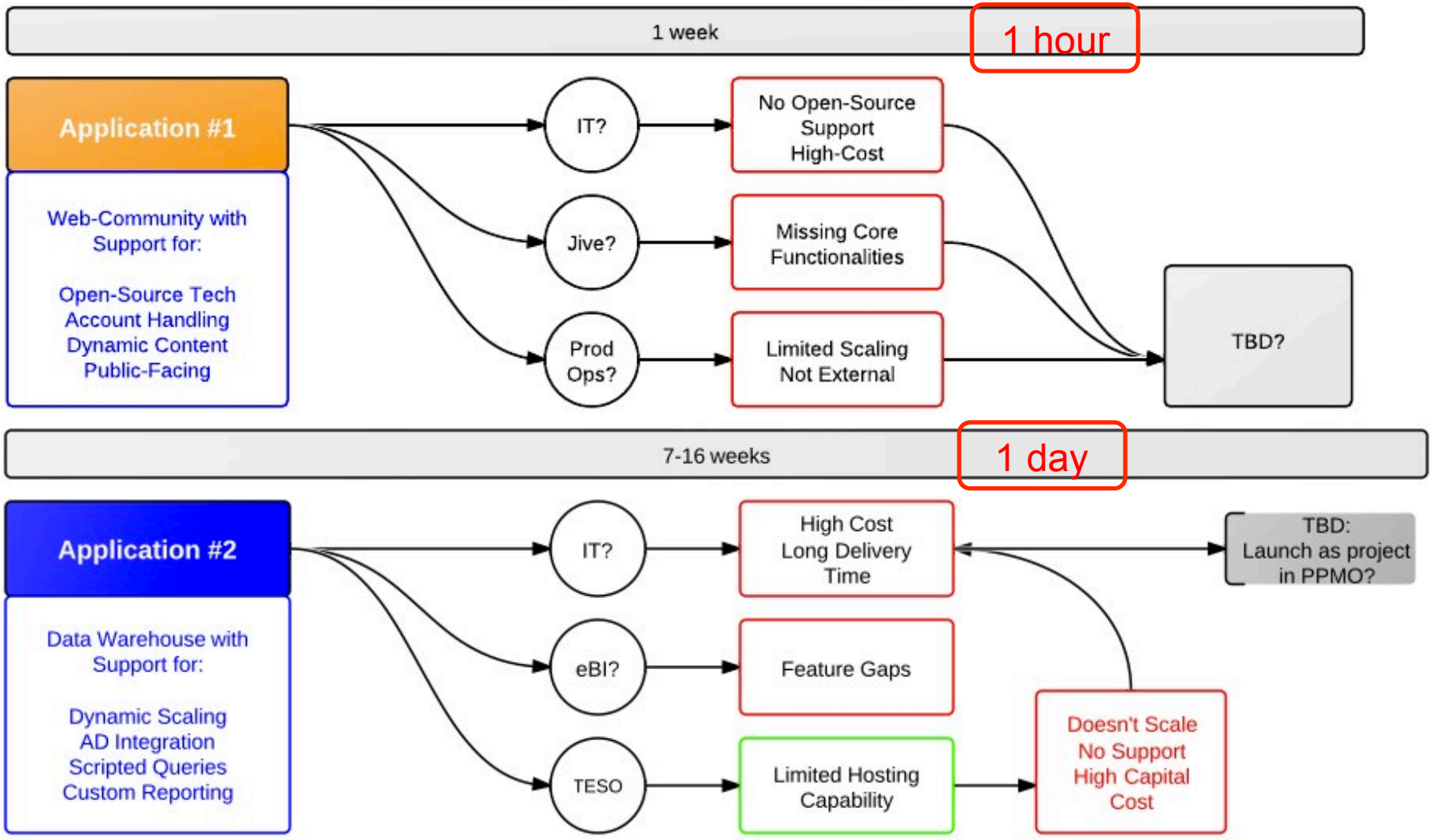


diagram provided by ITU-T (N326)

Before & After



Final thoughts

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- There are significant differences in how cloud services are delivered to the various categories of users. The integration of these services with traditional IT operations will remain an important success factor but also a challenge for IT managers.
- The Cloud industry is still in its infancy. We can expect many more developments for IaaS, PaaS and SaaS solutions across business segments and verticals. It will become increasingly important to understand how such services can be combined in a secure and cost-efficient fashion.
- Mobile & virtualised use of data well suited to cloud. Embracing it now will prevent data proliferation on unsuitable services.

After This Webcast

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- This webcast and a copy of the slides will be posted to the SNIA-CSI website and available on-demand
  - http://www.snia.org/forum/csi/knowledge/webcasts
- A full Q&A from this webcast, including answers to questions we couldn't get to today, will be posted to the SNIA Cloud blog
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- Google Groups:
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Conclusion

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Questions

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Thank You