



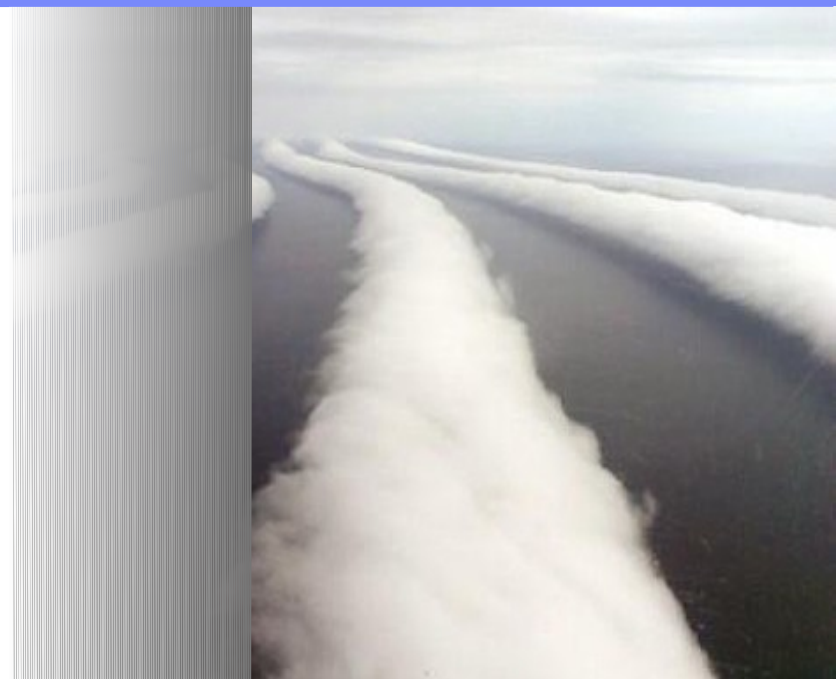
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An Introduction to Shared Middleware in Cloud Environments

WebSphere User Group
Edinburgh
28th September 2010

Chris Sharp
STSM, Master Inventor
IBM Hursley

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Agenda

- Cloud Computing Level Set
- Value of Application-aware Cloud Computing
- Required Capabilities
- Getting Started Today

There is a greater need for IT to help address business challenges...Cloud Computing has evolved to help with this



Doing more with less

Reduce capital expenditures and operational expenses



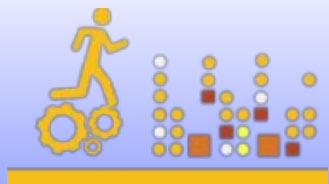
Reducing risk

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

So what is Cloud Computing?

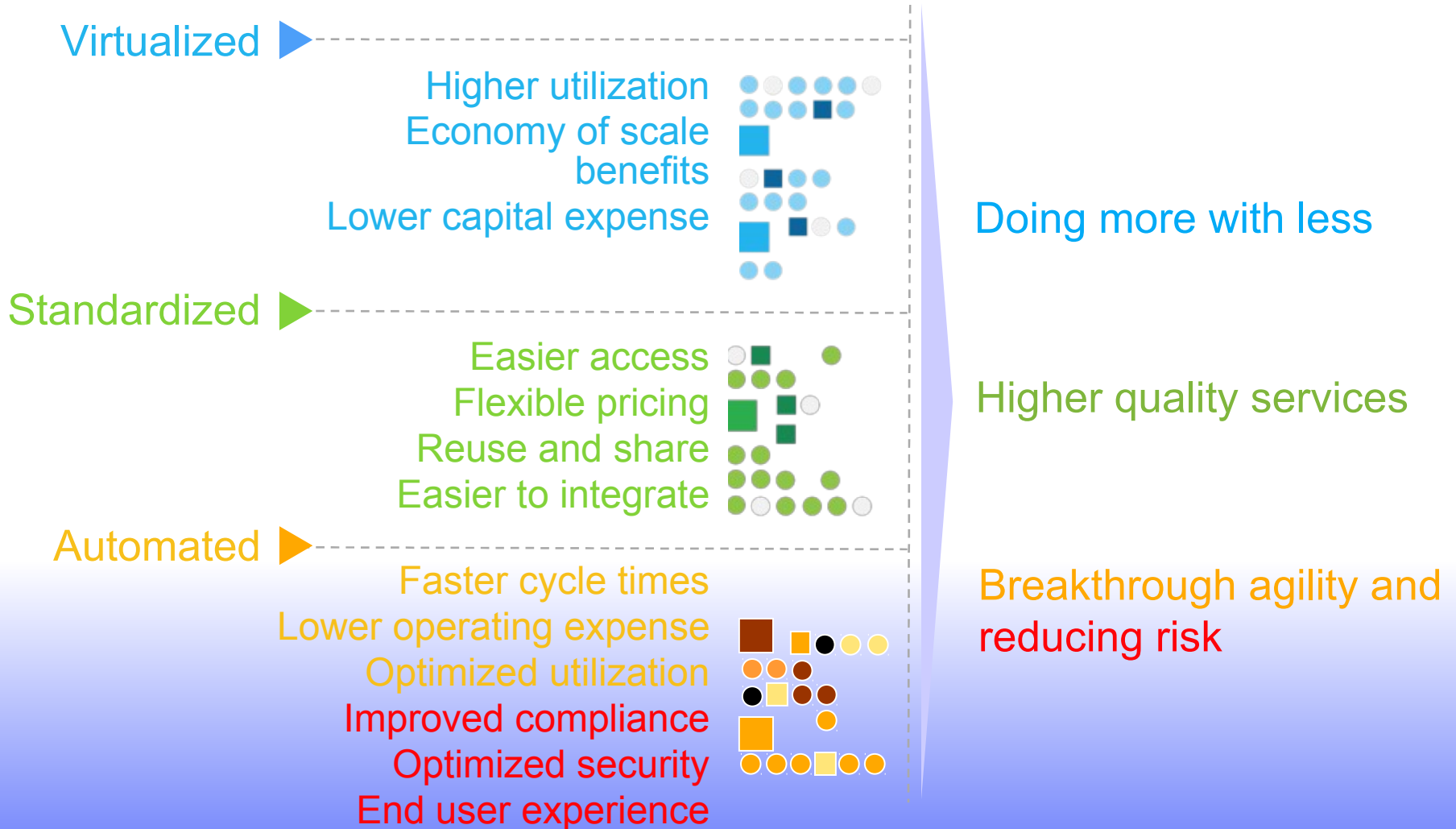
... a style of computing in which dynamically **scalable** and often **virtualized** resources are provided **as a service** over the Internet. Users need not have knowledge of, expertise in, or control over the technology infrastructure “in the cloud” that supports them.

Wikipedia

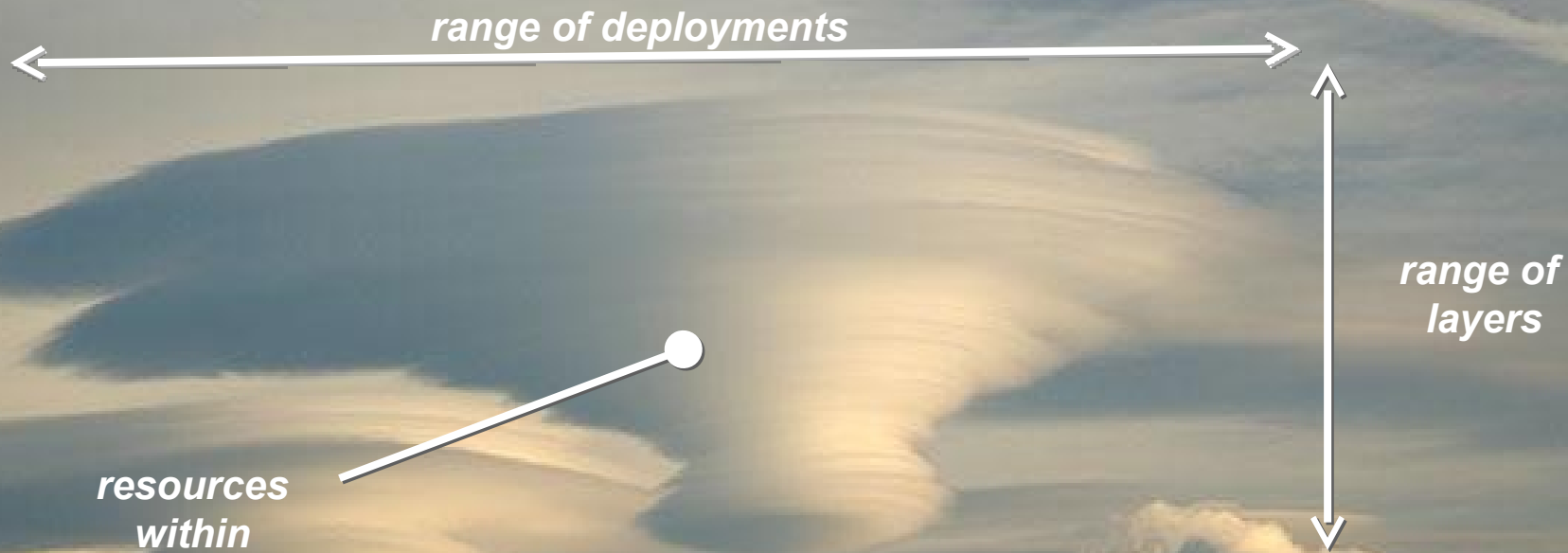
- “The Cloud” is the infrastructure that a “service” runs on
 - ▶ A collection of *resources* pooled together, and **virtualized**
 - ▶ **Standardized** service running on *virtual resources* in that pool
 - ▶ As demand increases, the service is *rapidly provisioned* through **automation**, on more *virtual resources* from the pool – *elastic scaling*

- *Cloud* is the natural evolution of *Grid* and *Utility*
 - ▶ with a more user and business focused perspective of service delivery

Cloud computing is an Evolution that helps deliver IT and business benefits



Anatomy of a Cloud



Anatomy of a Cloud



Mount Rainier, Washington, behind lenticular clouds
Photograph by Arco Images/Alamy

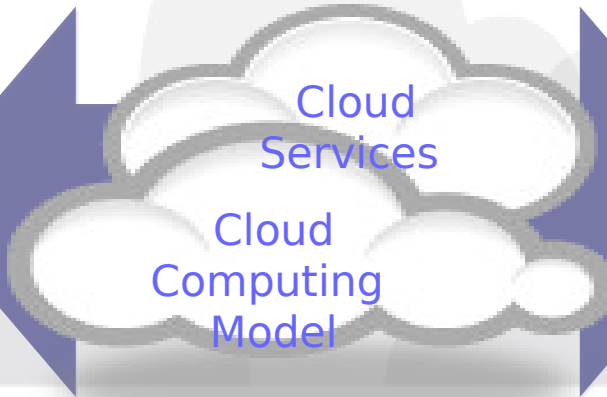
Cloud Computing Delivery Models

Flexible Deployment Models

Private ...

Privately owned and managed.
 Access limited to client and its partner network.
 Drives efficiency, standardization and best practices while retaining greater customization and control

Standardization, capital preservation, flexibility and time to deploy



Public ...

Service provider owned and managed.
 Access by subscription.
 Delivers select set of standardized business process, application and/or infrastructure services on a flexible price per use basis.

Customization, efficiency, availability, resiliency, security and privacy

Hybrid ...

Access to client, partner network, and third party resources

ORGANIZATION

CULTURE

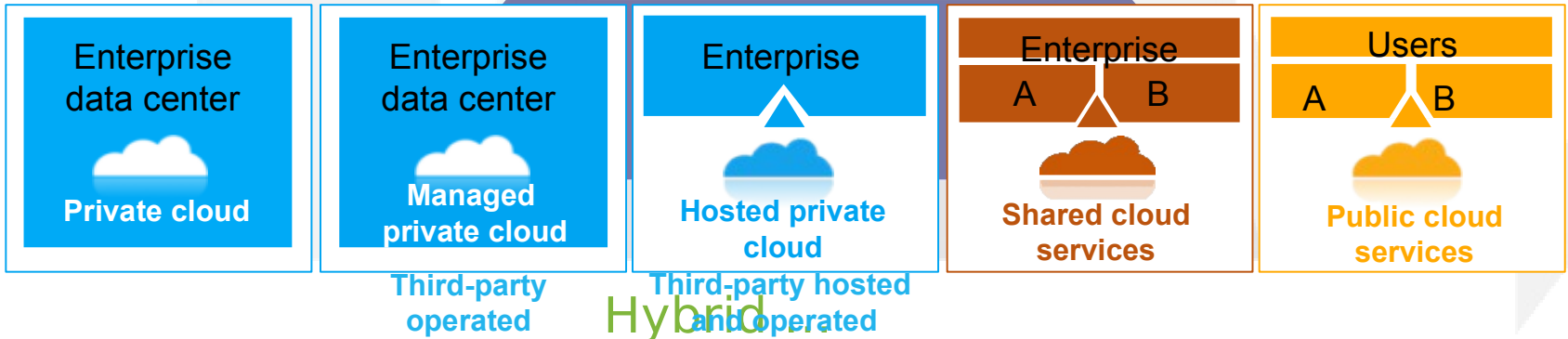
GOVERNANCE

Cloud Computing Delivery Models

Flexible Deployment Models

Private ...

Public ...

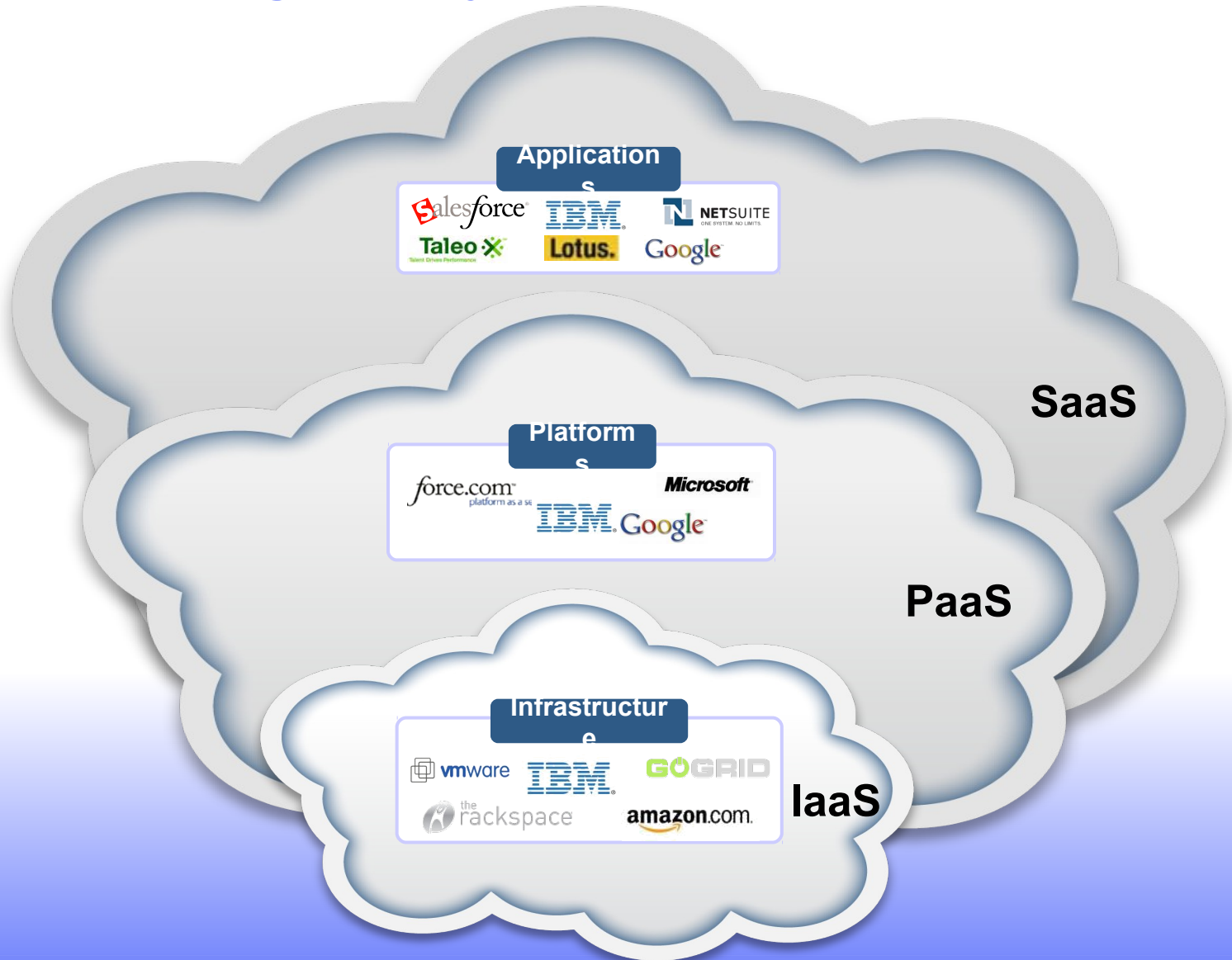


ORGANIZATION

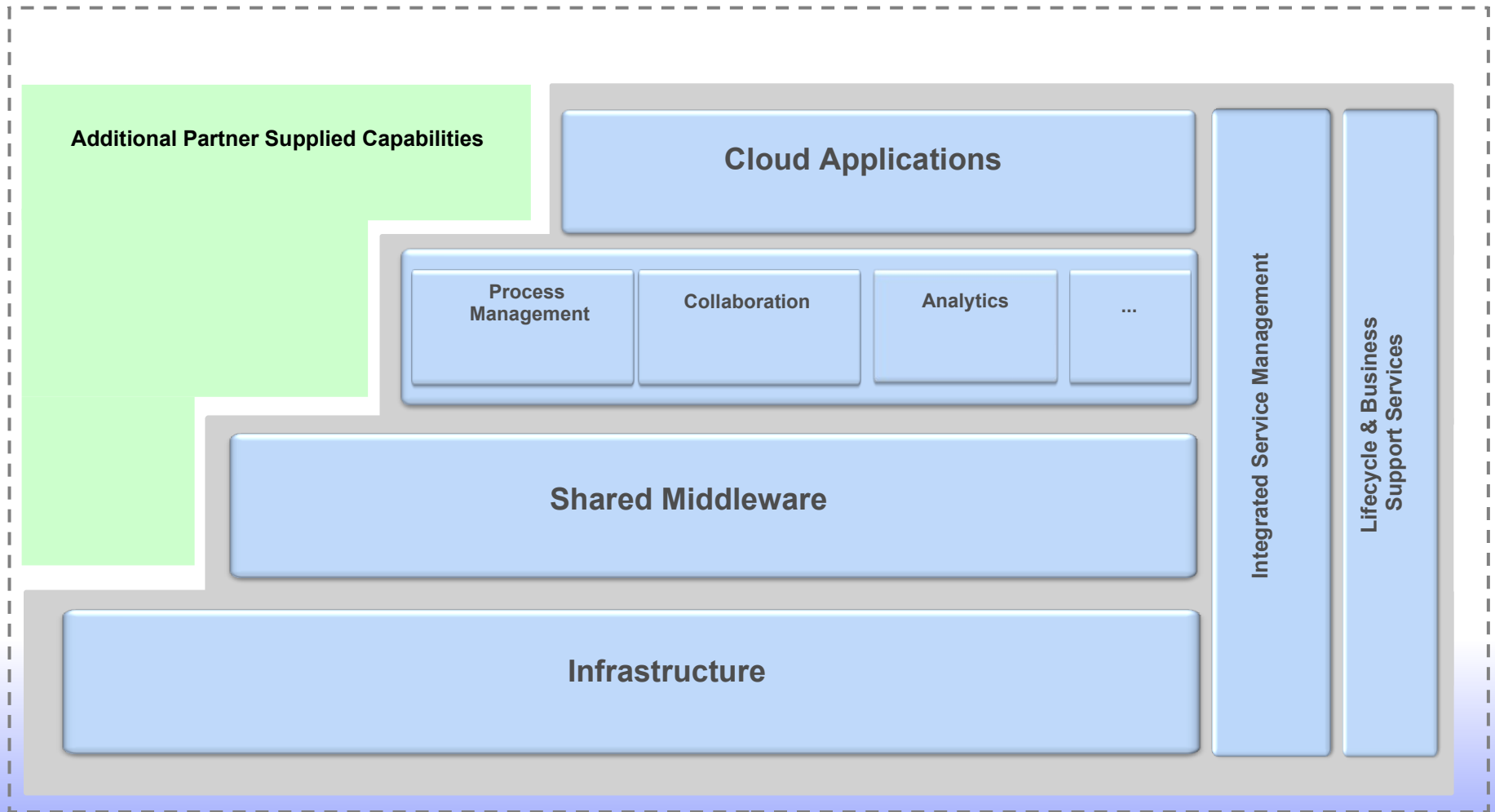
CULTURE

GOVERNANCE

There are a range of layers to clouds



An IBM architectural view of cloud computing





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The Value of Application Aware Cloud Computing



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What is Shared Middleware?

Infrastructure View (aka IaaS)

Central Abstraction: **Virtual Machine**

Cloud provides:

- CPUs
- Memory
- Storage
- Networking

IaaS does not understand, or care, about the software running inside the virtual machine

Shared Middleware (aka PaaS)

Central Abstraction: **Application**

Cloud provides:

- Middleware runtimes
 - Databases, Connectivity, Queues
- Security
- Caching
- Routing
- Storage

PaaS has a **viewpoint** on application, supporting a particular set of programming models and **understanding** the execution of the application deeply

Running Your Application - Native Hardware



Running Your Application – Infrastructure Cloud



Running Your Application – Middleware-aware Cloud



Tune/Admin/Maintain Environments
(Performance, Security, Patches, etc)



Script Application onto Pattern
(Standardized Patterns, Automation)



Select and Customize Topology Pattern

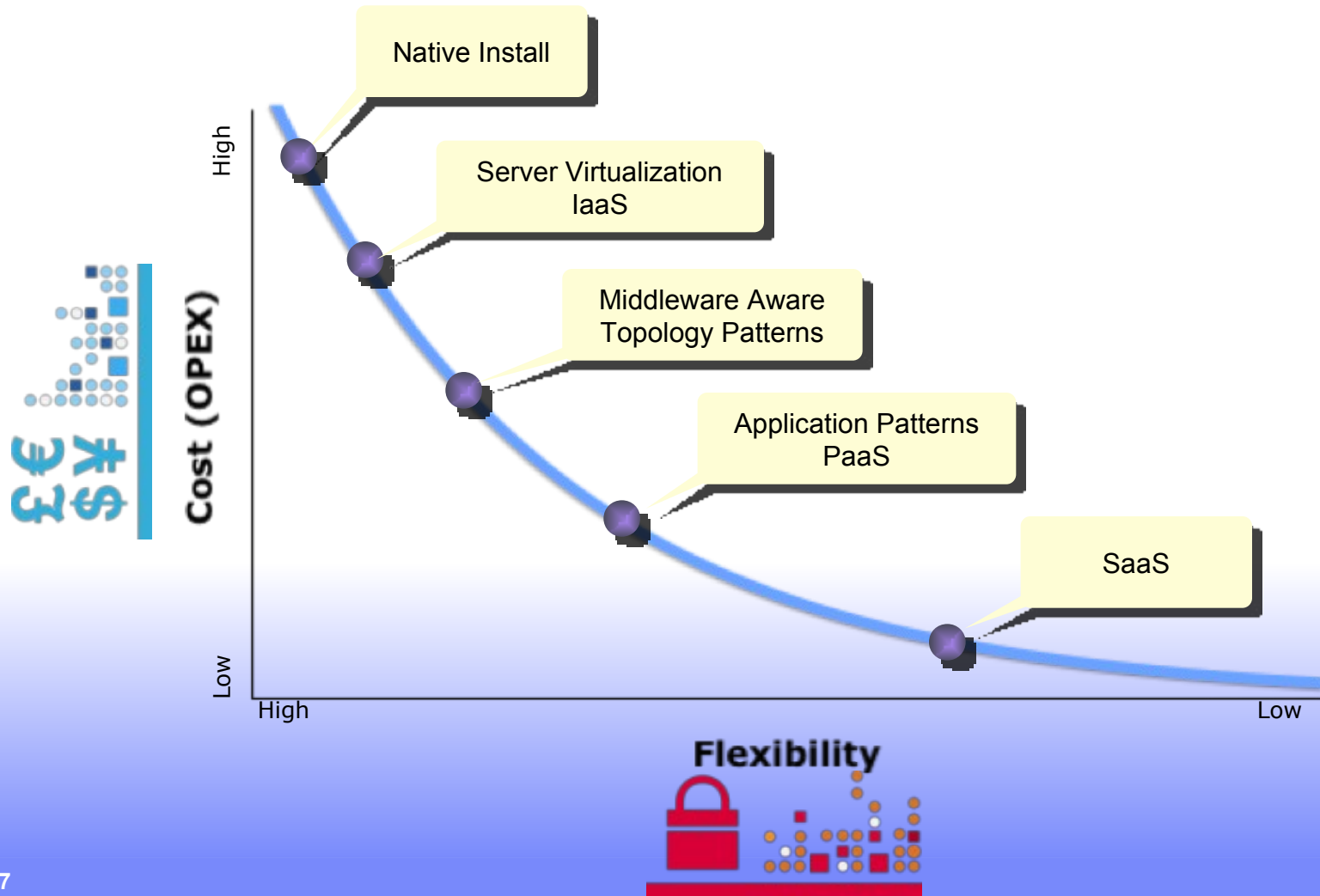


Includes OS & Middleware, Clustering, HA and other characteristics

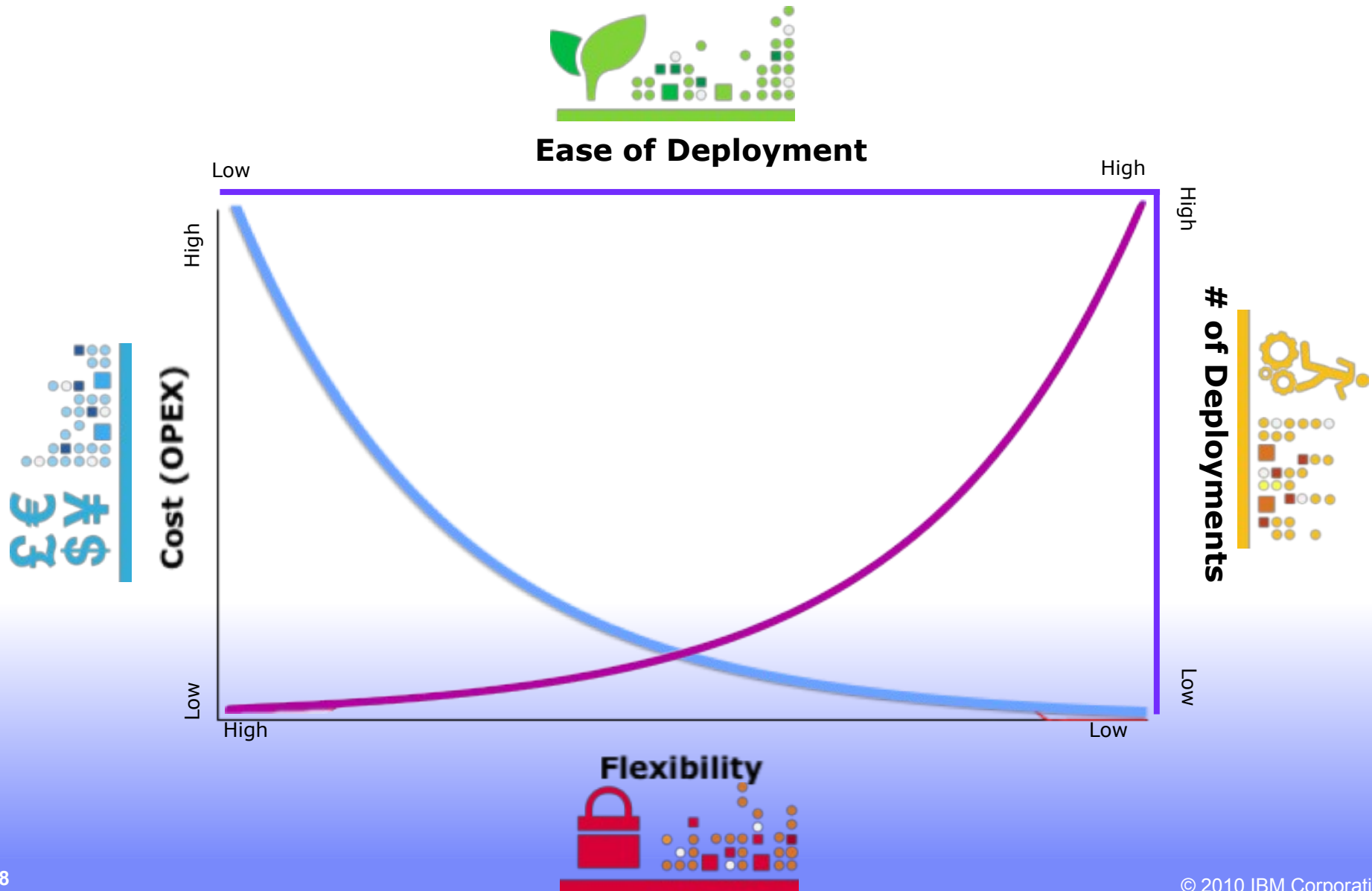
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Nothing is Free...

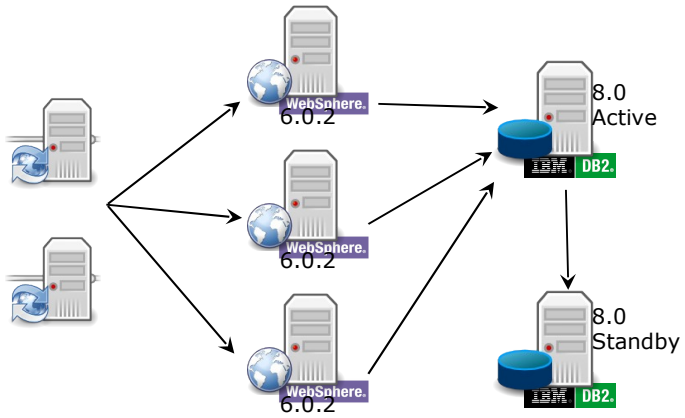


Unexpected Effects...

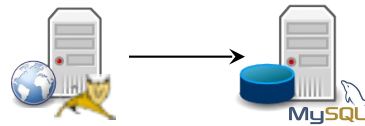


Silo'ed Applications on Virtualized Hardware

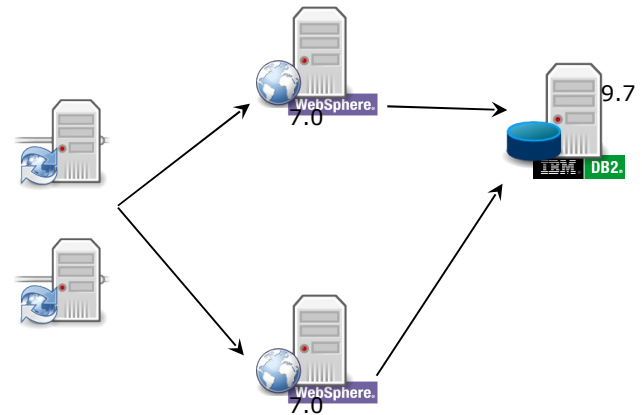
Application A



Application B



Application C



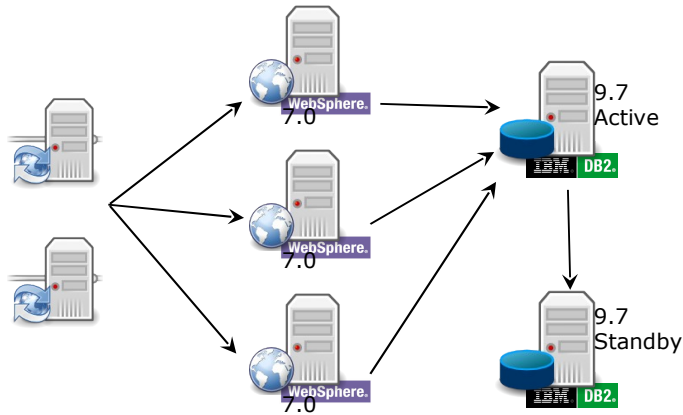
Shared Virtualized Infrastructure



Value of Patterns and Standardization

HA Pattern

Application A



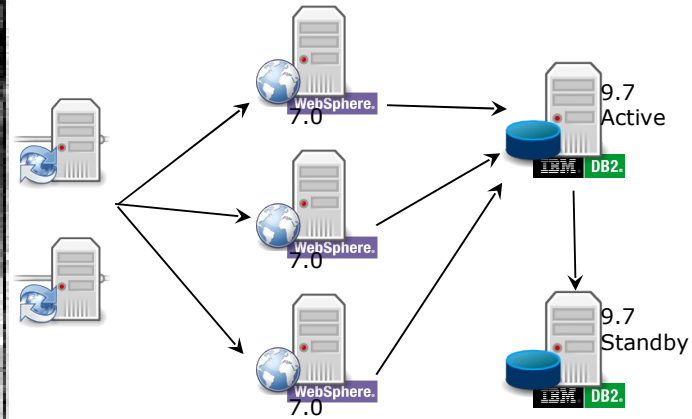
Simple Pattern

Application B



HA Pattern

Application C

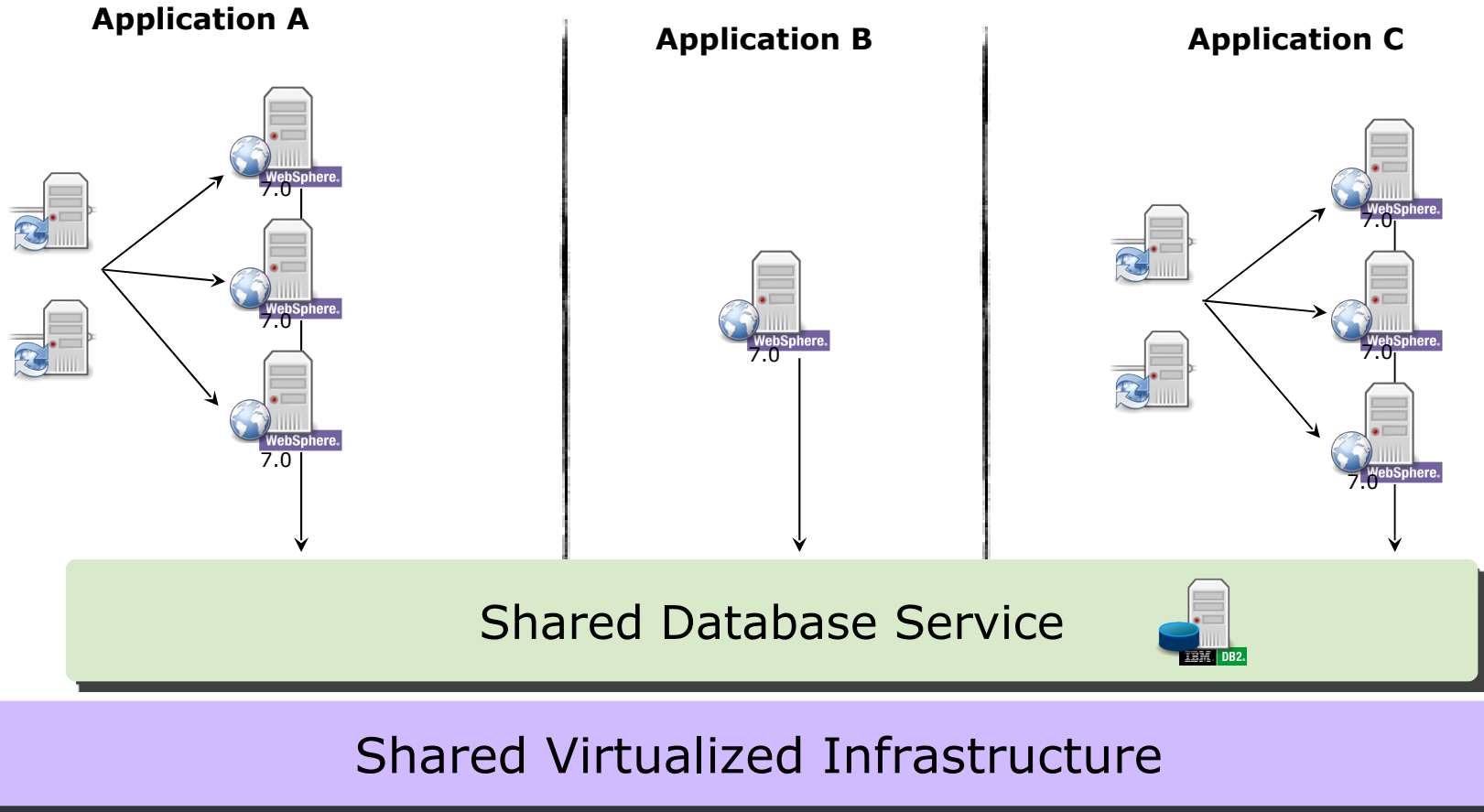


Shared Virtualized Infrastructure



Standardized Patterns reduce cost through reduced complexity and increased automation

Value of Shared Services

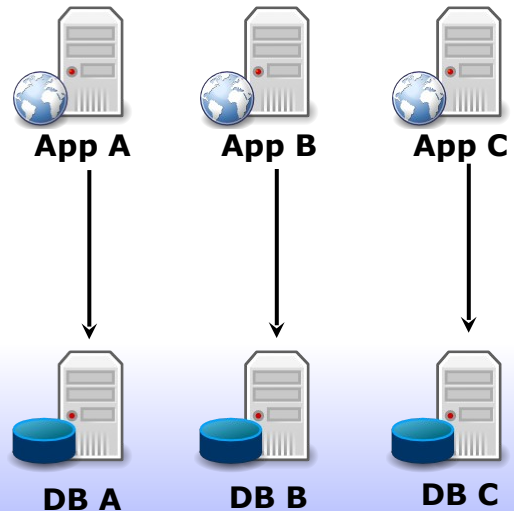


Sharing across silos reduces cost through increased sharing of physical infrastructure and human labor

Viewing Middleware as Services

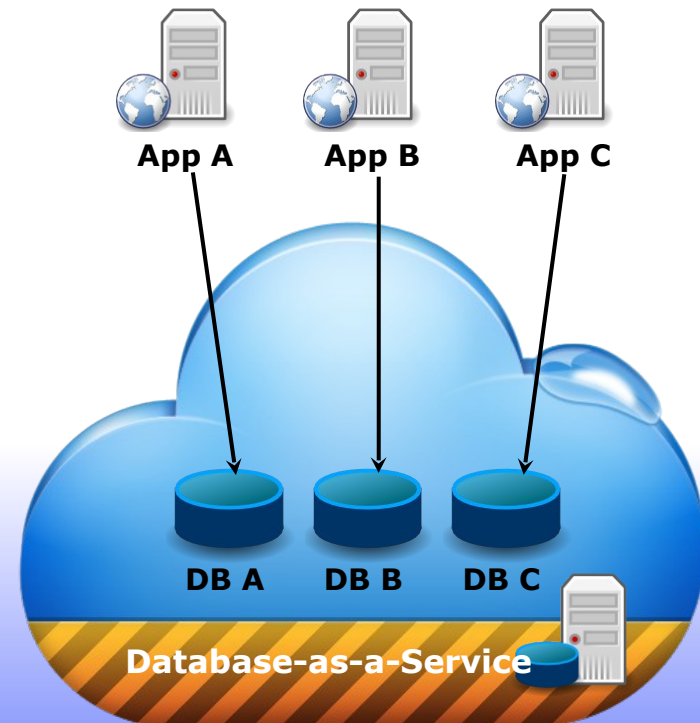
Patterned Services

- OPEX savings
 - Reduced complexity through standardized patterns
 - Automated QoS characteristics and middleware operations

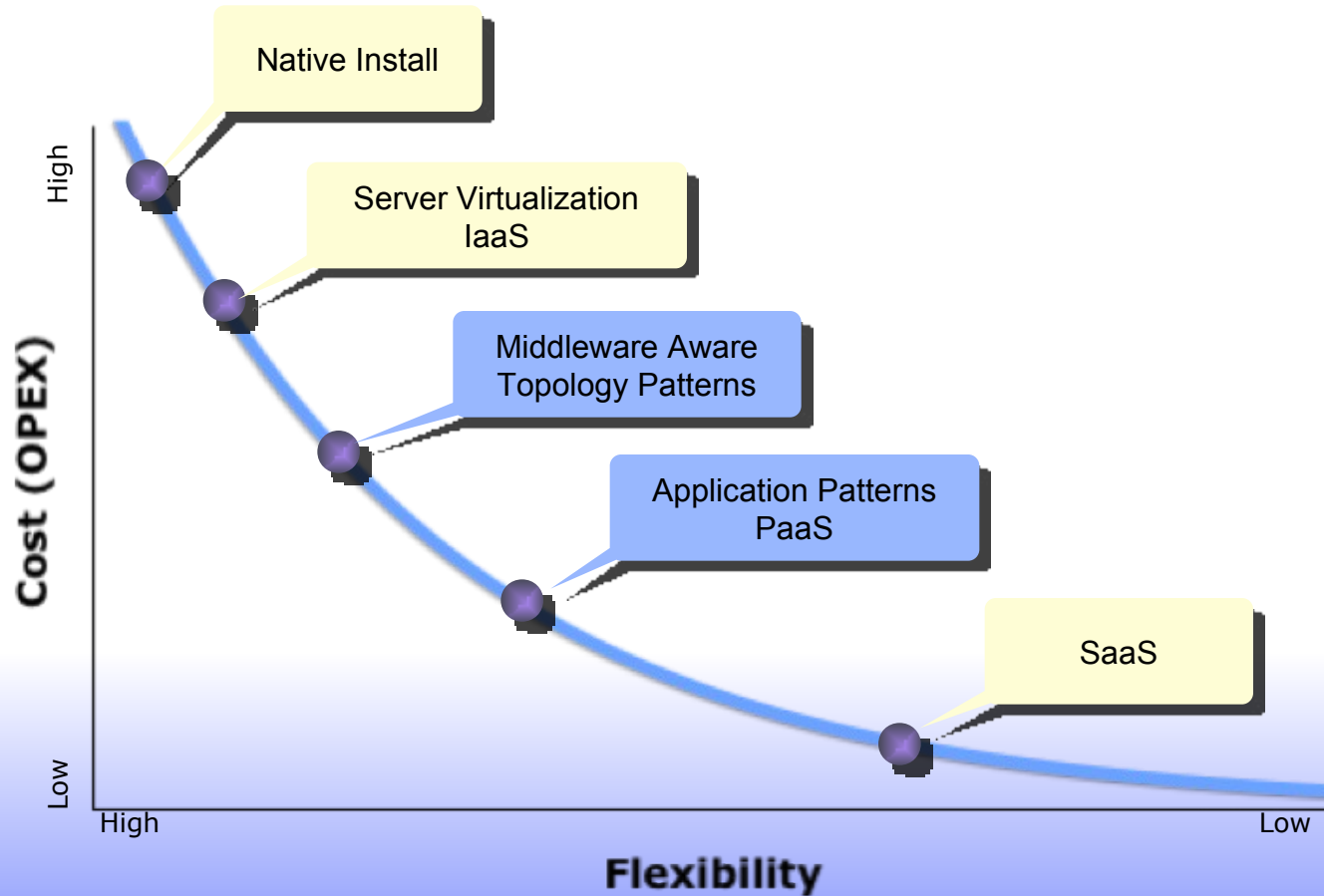


Shared Services

- Administration and operation amortized across all applications
- OPEX savings
 - Reduced complexity
 - Increased reuse



Cost versus Flexibility











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Required Capabilities



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Shared Middleware Layer Desired Capabilities - Today

- Standardized Patterns for Workloads with automated deployment
 - Topology patterns in WebSphere Cloudburst Appliance (WCA) 
- Automated Application lifecycle management, including maintenance/patching/upgrades
 - WCA has fixpacks and Emergency fixes 
 - WebSphere Virtual Enterprise (WVE) has application editions 
- Standardized and automated QoS (High availability, elastic scaling, etc)
 - Clustered patterns in WCA 
 - Dynamic clusters in WVE 
- Self-service user model
 - ▶ Allow application owners to deploy and manage applications
 - ▶ as a cost-effective platform service 

Shared Middleware Layer Desired Capabilities - Tomorrow

- Application-centric Deployment Model
 - ▶ Reduce middleware skills for deployment and management
- Shared service model for middleware services
 - ▶ e.g. Database, caching, queuing, logging
 - ▶ Reuse by multiple applications
 - ▶ Shares administrative workload
 - e.g. configuration, backup, tuning
- Multi-tenant applications and services
 - ▶ Frameworks to enable MT in existing applications
 - ▶ MT application and database tiers for increased reuse





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Getting Started Today

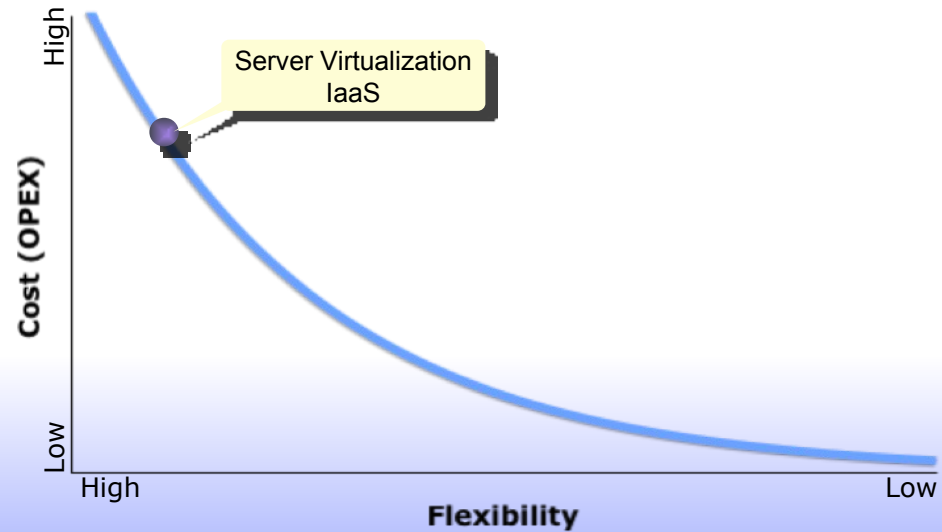


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Getting Started on the Public Cloud



amazon.com[®]



IBM Smart Business Development & Test on the IBM Cloud

- Excellent for PoCs, Dev/Test, Capacity Scale-up and Steady state usage
- Bring your existing IBM software licenses or pay-as-you-go
- Numerous products available with existing images
 - ▶ IBM WebSphere Application Server
 - ▶ IBM WebSphere sMash
 - ▶ IBM WebSphere Portal
 - ▶ Rational Software Architect
 - ▶ Rational Application Developer
 - ▶ more....



WebSphere on IBM Cloud

IBM Smart Business Welcome Jason McGee | Sign out

Development & Test

Overview | **Control panel** | Account | Support | About

Instances | Images | Storage View asset catalog →

Find instance by tag name: + Add instance

Current filters: None

Instance name	OS	IP	Running	Created on	Status
IBM WebSphere Lombardi 7.1	Redhat Enterprise Linux (32-	129.33.196.133	3 Days	Apr 9, 2010	Active
WebSphere Application Server	SUSE Linux Enterprise v10	129.33.194.149	0 Days	Apr 12, 2010	Active

WebSphere Application Server Expires: 4/19/10 **7 Days** | Extend |

+ Reboot instance - Delete instance + Create image

OS: SUSE Linux Enterprise v10 SP2
IP: 129.33.194.149
Size: MEDIUM
Hostname: vm893.developer.ihost.com
Image: WebSphere Application Server and Rational Agent Controller
Storage: Not available

Access:
 → Generate key pair
 → Instructions

Instance tags:
 +

Type	Notifications	Date
●	Instance active	4/12/10 3:46 PM
●	Instance provisioning	4/12/10 3:39 PM

Add Instance Close [x]

Step 1 of 4: select image View: Public | My Images

- WebSphere Application Server and Rational Agent Controller**
 WebSphere Application Server and Rational Agent Controller enables a performance based foundation to build, reuse, run, integrate and manage Service Oriented Architecture (SOA) applications and services.
- WebSphere Feature Pack for OSGI Apps and JPA 2.0**
 IBM WebSphere Application Server V7.0 Fix Pack 7, Feature Pack for OSGI Applications and Java Persistence API 2.0 Open Beta, and Feature Pack for Service Component Architecture (SCA) V1.0.1 Fix Pack V1.0.1.1
- WebSphere Portal/WCM 6.1.5**
 IBM® WebSphere® Portal Server enables you to quickly consolidate applications and content into role-based applications, complete with search, personalization, and security capabilities.
- WebSphere sMash with AppBuilder**
 WebSphere sMash® provides a web platform that includes support for dynamic scripting in...

Next Cancel

IBM Software on Amazon EC2

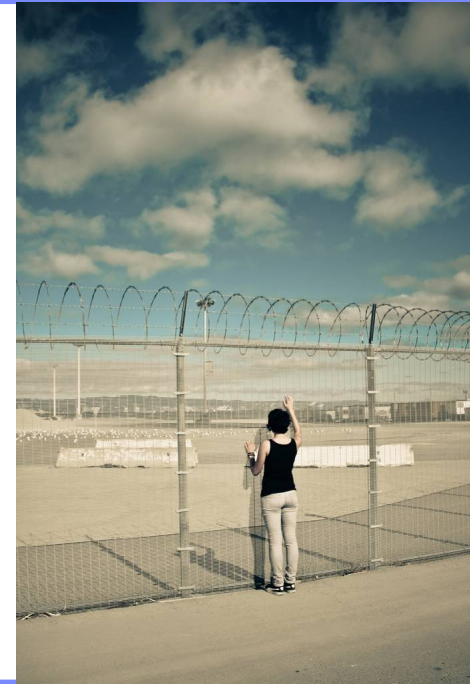
- Excellent for PoCs, Dev/Test, Capacity Scale-up and Steady state usage
- Bring your existing IBM software licenses or pay-as-you-go
- Numerous products available with existing AMIs
 - ▶ IBM WebSphere Application Server
 - ▶ IBM WebSphere sMash
 - ▶ IBM WebSphere eXtreme Scale
 - ▶ IBM DB2 Express and Workgroup
 - ▶ IBM Tivoli Monitoring
 - ▶ more....

The logo for amazon.com, featuring the word "amazon.com" in a bold, black, sans-serif font. Below the text is a curved orange arrow that starts under the letter 'a' and points towards the letter 'z', resembling a smile.



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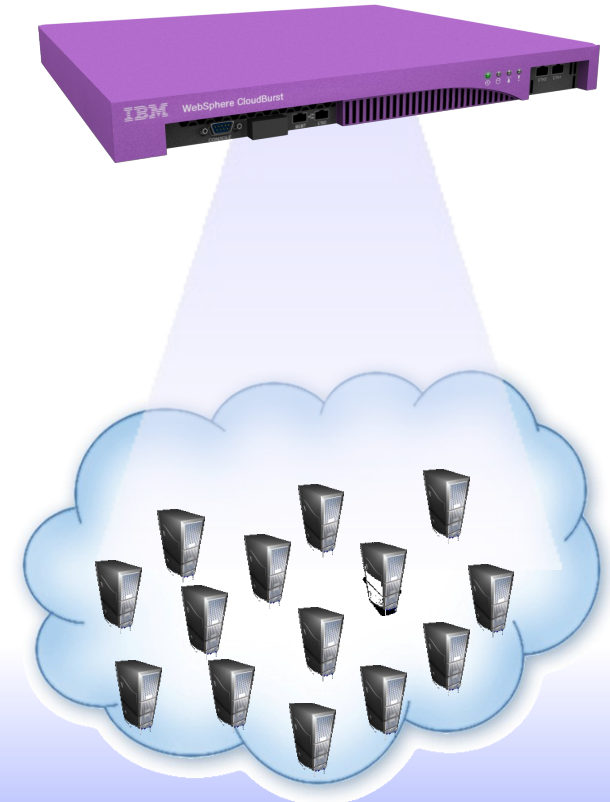
Getting Started on the Private Cloud



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WebSphere Cloudburst Appliance

- Secure, self-service cloud management hardware appliance
- Unmatched WAS management (apply maintenance, federate cells, etc. - not black box)
- Dispenses hardened WAS patterns into a pool/cloud of virtualized hardware running a supported hypervisor
- Enables consistent & repeatable deployment of application environments based on patterns



Middleware Patterns in WebSphere CloudBurst

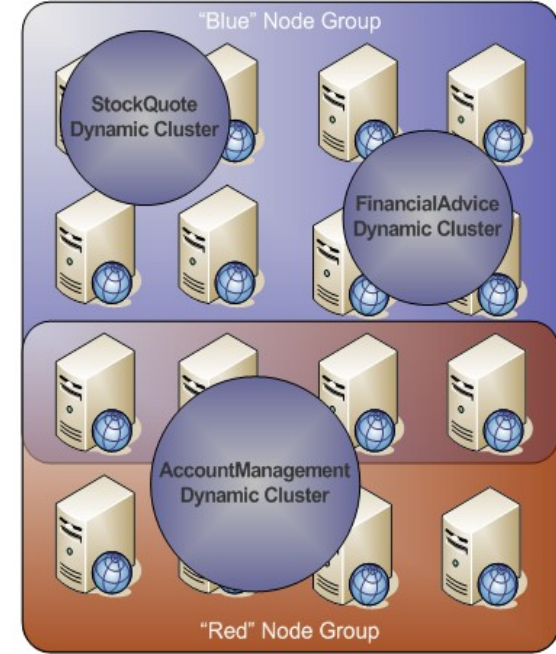
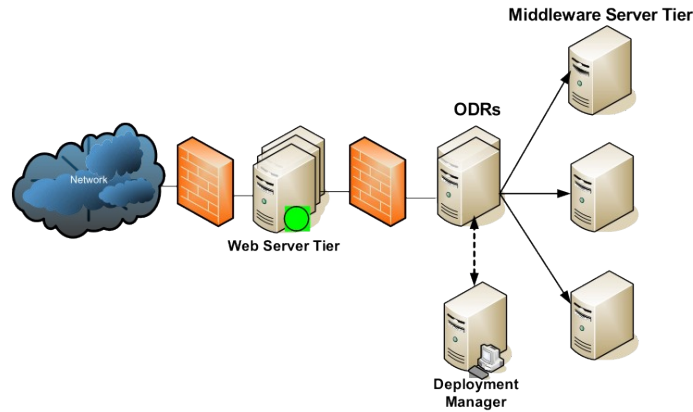
The screenshot displays the WebSphere CloudBurst Pattern Editor interface. The browser address bar shows the URL: `https://rmdp65.rtp.raleigh.ibm.com/dashboard/patterns/editor/?id=16`. The page title is "WebSphere CloudBurst" and the user is identified as "Welcome, Jason McGee".

The interface is divided into two main sections:

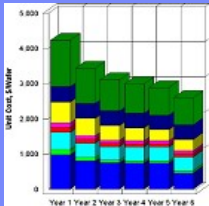
- Pattern Editor (Left Panel):** Contains a search bar and a list of parts and scripts. Under "Scripts (7/7)", the following items are listed:
 - Account Management Application
 - Add IBM HTTP Server node
 - Create Account Management Database
 - Create Data Source
 - Set node maintenance mode
 - Set server maintenance mode
 - WebSphere Application Server Samples
- Editing MyApplication (Main Canvas):** Shows a deployment diagram for "MyApplication" which "Deploys to ESX hypervisors." The diagram includes:
 - Deployment manager (7.0.0.11):** A purple box on the left containing "WebSphere Application Server Samples" and "Create Data Source".
 - Custom nodes (7.0.0.11):** A white box in the center with a count of 3.
 - On demand routers (7.0.0.11):** A green box on the right with a count of 2.
 - Database (9.7.0.0):** A blue box at the bottom with an upward arrow pointing to the Custom nodes.

Navigation and utility elements include "Welcome", "Virtual Systems", "Patterns", "Catalog", "Cloud", and "Appliance" tabs. A "Done editing" button is visible in the top right of the main canvas area. The IBM logo is present in the bottom left corner, and the WebSphere logo is in the bottom right corner.

WebSphere Virtual Enterprise



Resource Optimization



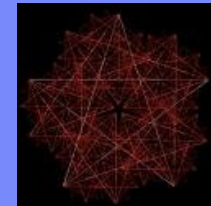
High Availability

Production Management



Application Editions

Health Management



Operational Insight



Thank you!

For more information, please visit:

<http://www.ibm.com/cloud>

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