

**Smarter Systems for a
Smarter Planet**

How to Make Cloud Computing Work for You

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Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

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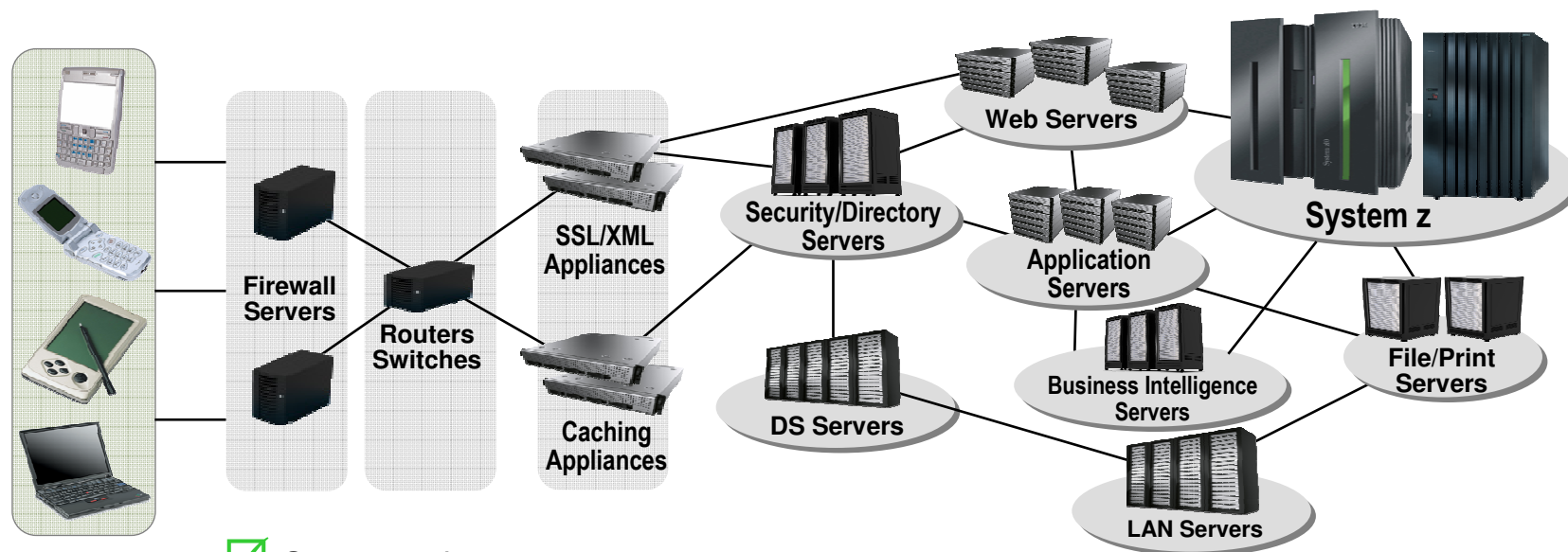
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A Typical IT Infrastructure Hinders Competitiveness

Businesses spend too much time and money managing their assets instead of managing their business!

- Islands of computing create organizational inefficiencies
- IT complexity constrains business responsiveness



- Connected
- Integrated
- Flexible, Dynamic, and Responsive
- Aligned with Business Objectives

IT needs to become smarter... about delivering “services”



- The growing complexity of IT systems and soon a trillion connected things demand that sprawling **processes become standardized services** that are efficient, secure, and easy to access
- A **Service Management System** will provide visibility, control, and automation across IT and business services to ensure consistent delivery
- A **consistent, trusted service** will drive down operational costs, unlock productivity, and ensure security

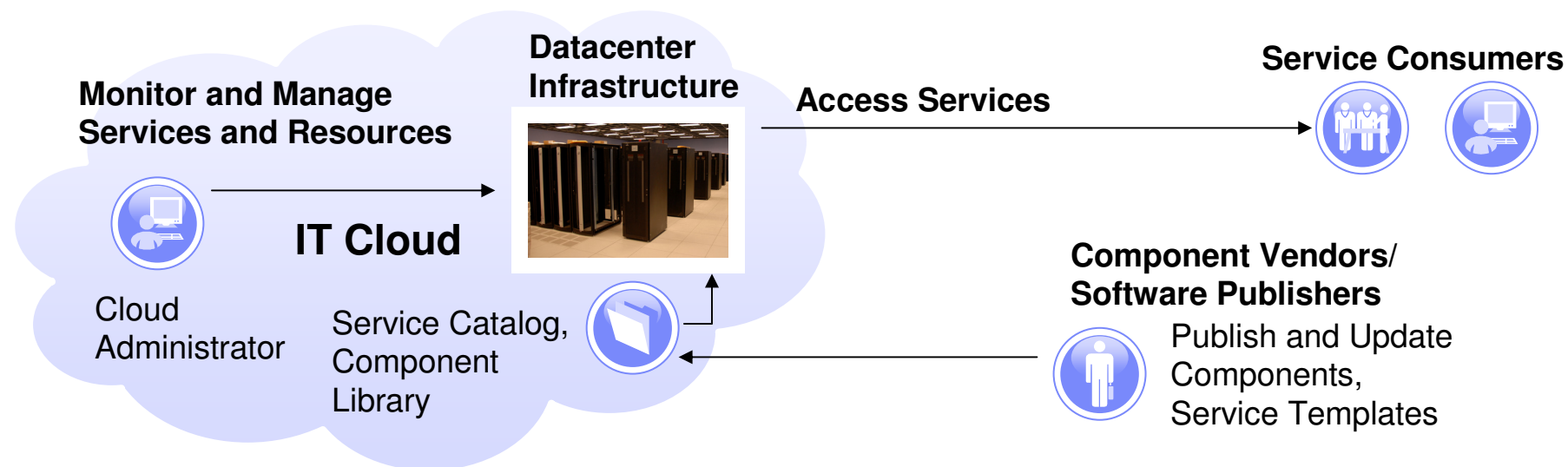
Cloud Computing...

...is a user experience and a business model

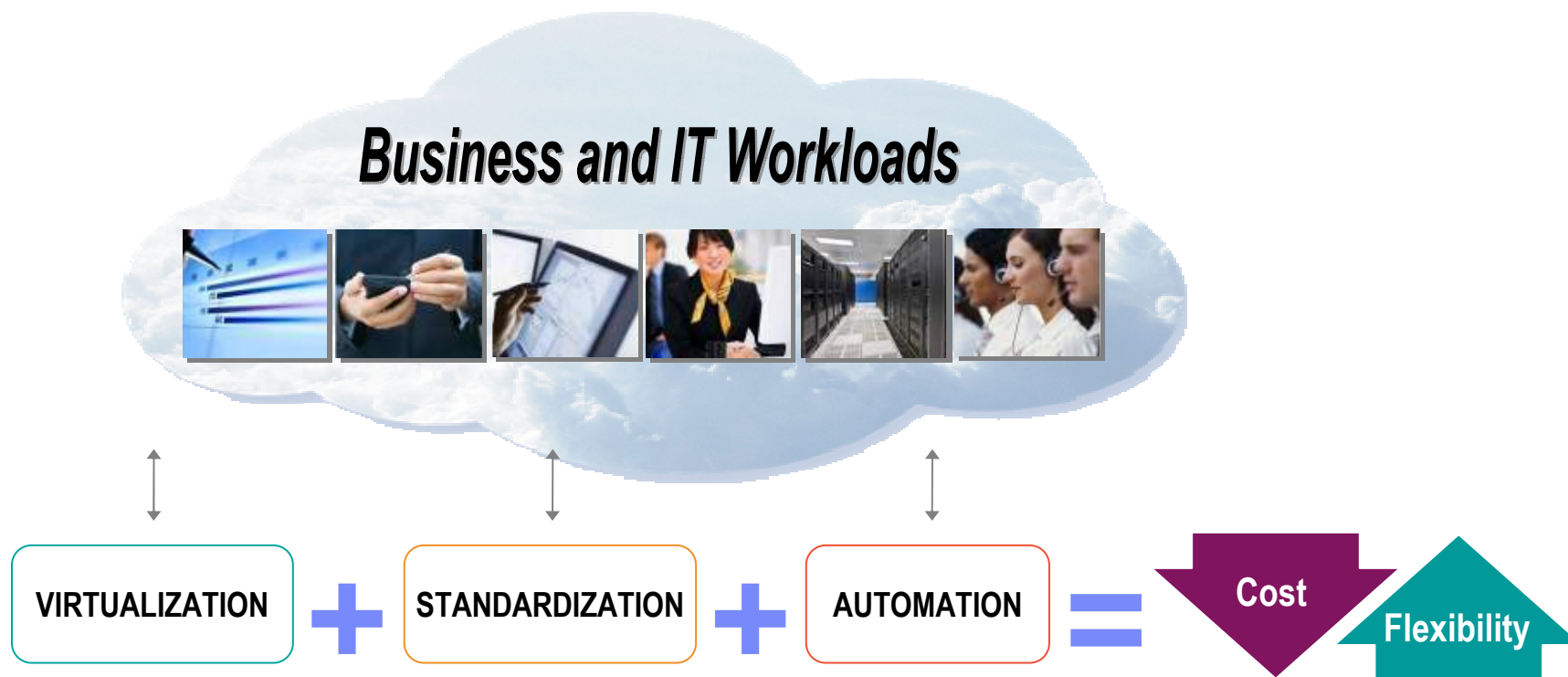
Cloud computing is an emerging style of computing in which applications, data, and IT resources are provided as services to users over the network.

...is an infrastructure management methodology

Cloud computing is a way of managing large numbers of highly virtualized resources such that, from a management perspective, they can be automatically aggregated to deliver services.



An effective cloud computing environment is highly optimized to dynamically “do more with less”



...to free budget for new investment and speed deployment of new capabilities

Why deploy on larger, scale-up servers, like IBM System z?



Higher Utilization

- CPU and memory
- I/O ports & adapters
- Large or small workloads



Efficient Data Center

- Power and generator
- Cooling
- Floor space



Increased Productivity

- Order, track, retire
- Install, cable, maintain
- Patch fewer hypervisors



Greater RAS

- More RAS features
- Fewer parts
- Capacity on Demand

System z Cloud Computing Solutions

In Q4 2009, IBM announced two new cloud computing offerings:



Smart Analytics Cloud

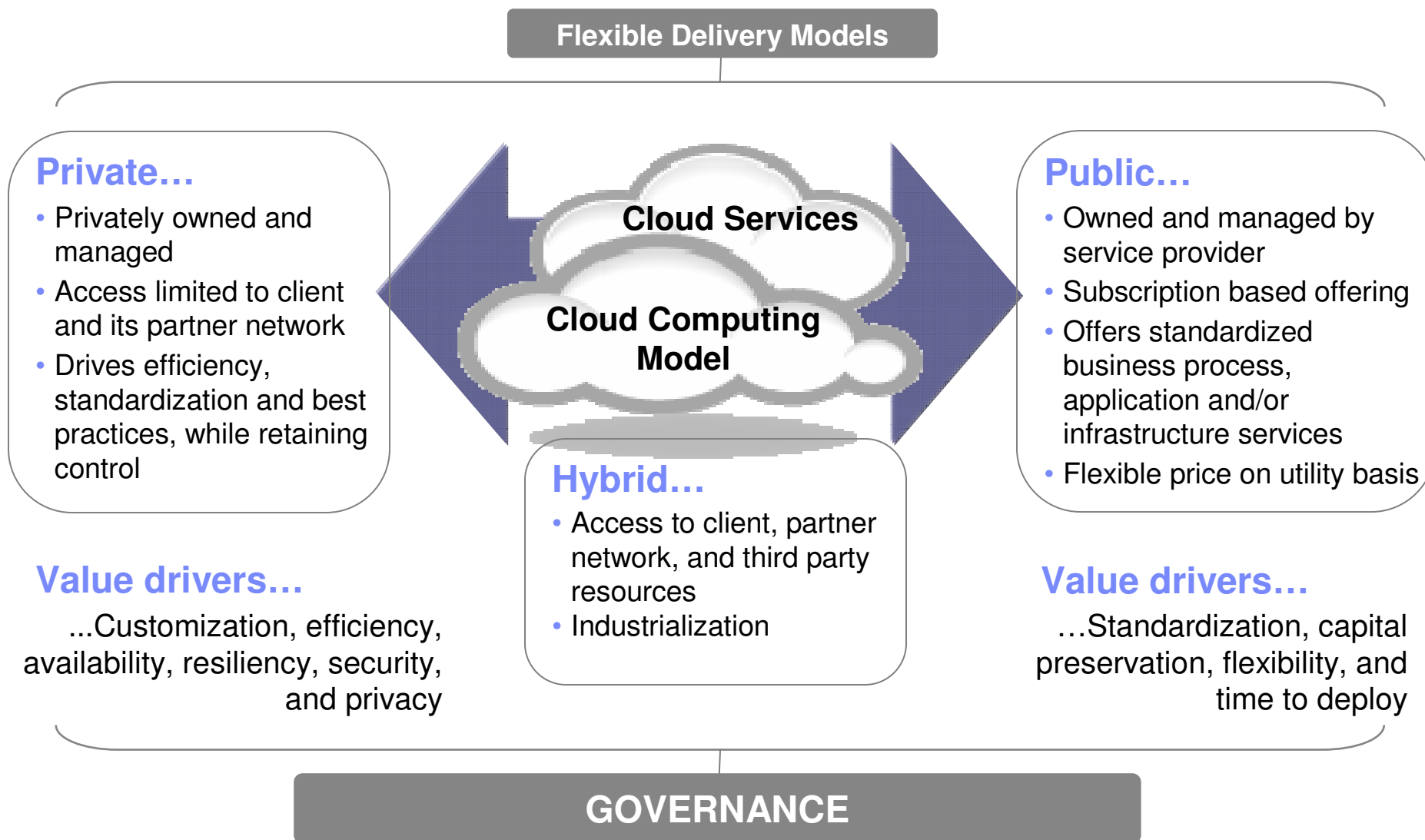
... a cloud computing solution for the delivery of business intelligence & analytics optimized for the large enterprise client



Solution Edition for Cloud Computing

... a cloud computing foundation solution that can be customized by the client for a wide range of cloud workloads

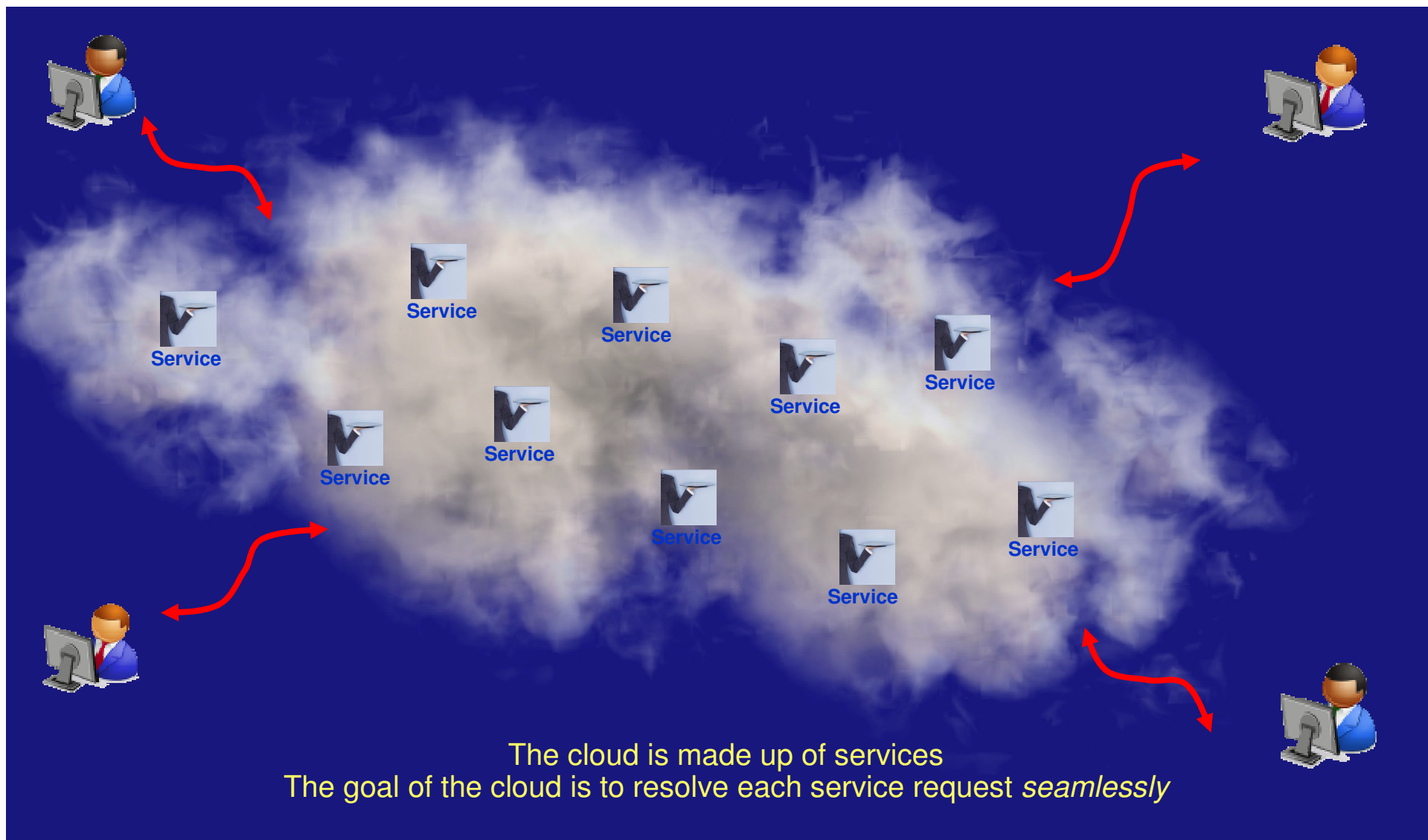
There are multiple delivery models for cloud workloads



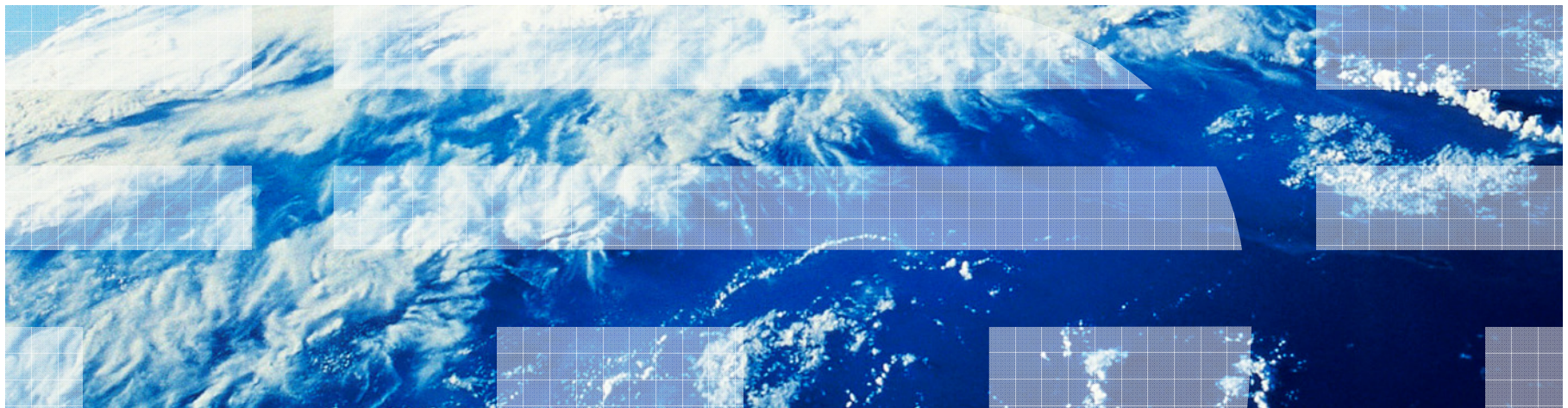
Characteristics of Cloud Computing

- Cloud consumers do not own the physical infrastructure
 - Avoid capital expenditure
- Pay only for resources that they use
- Multi-tenancy
- Shared infrastructure cost
- Access to a range of applications
- Terminate at any time
 - Resources returned to pool
- Accessed via internet
- Reliable, scalable, ubiquitous

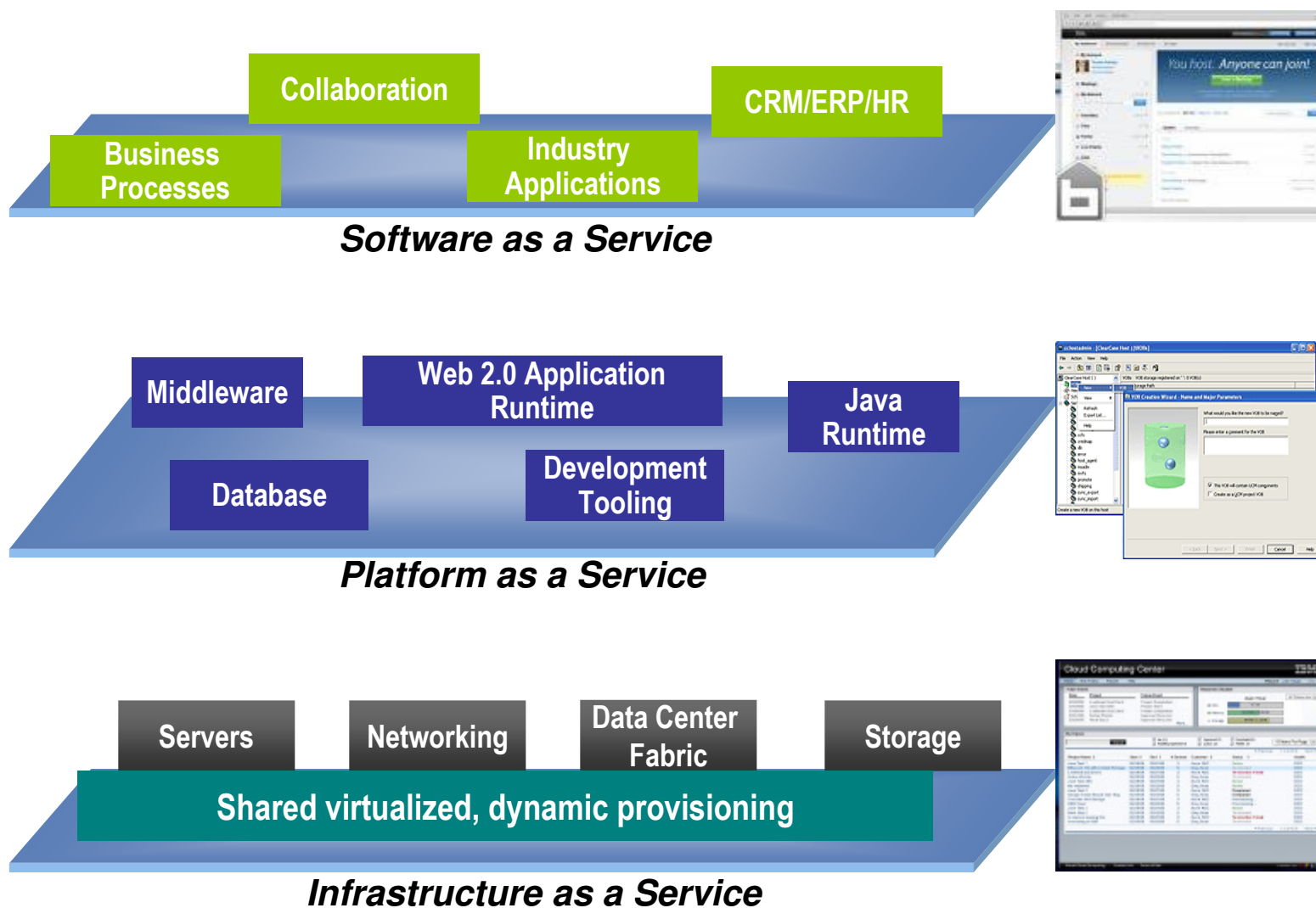
Cloud Consumers View



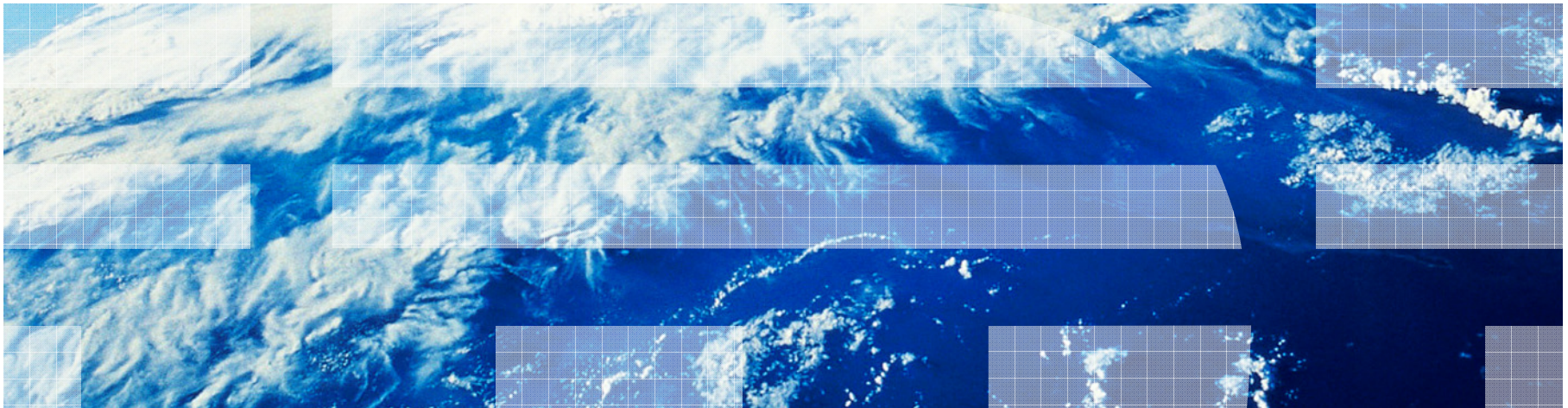
Cloud Demo using Tivoli Service Automation Manager



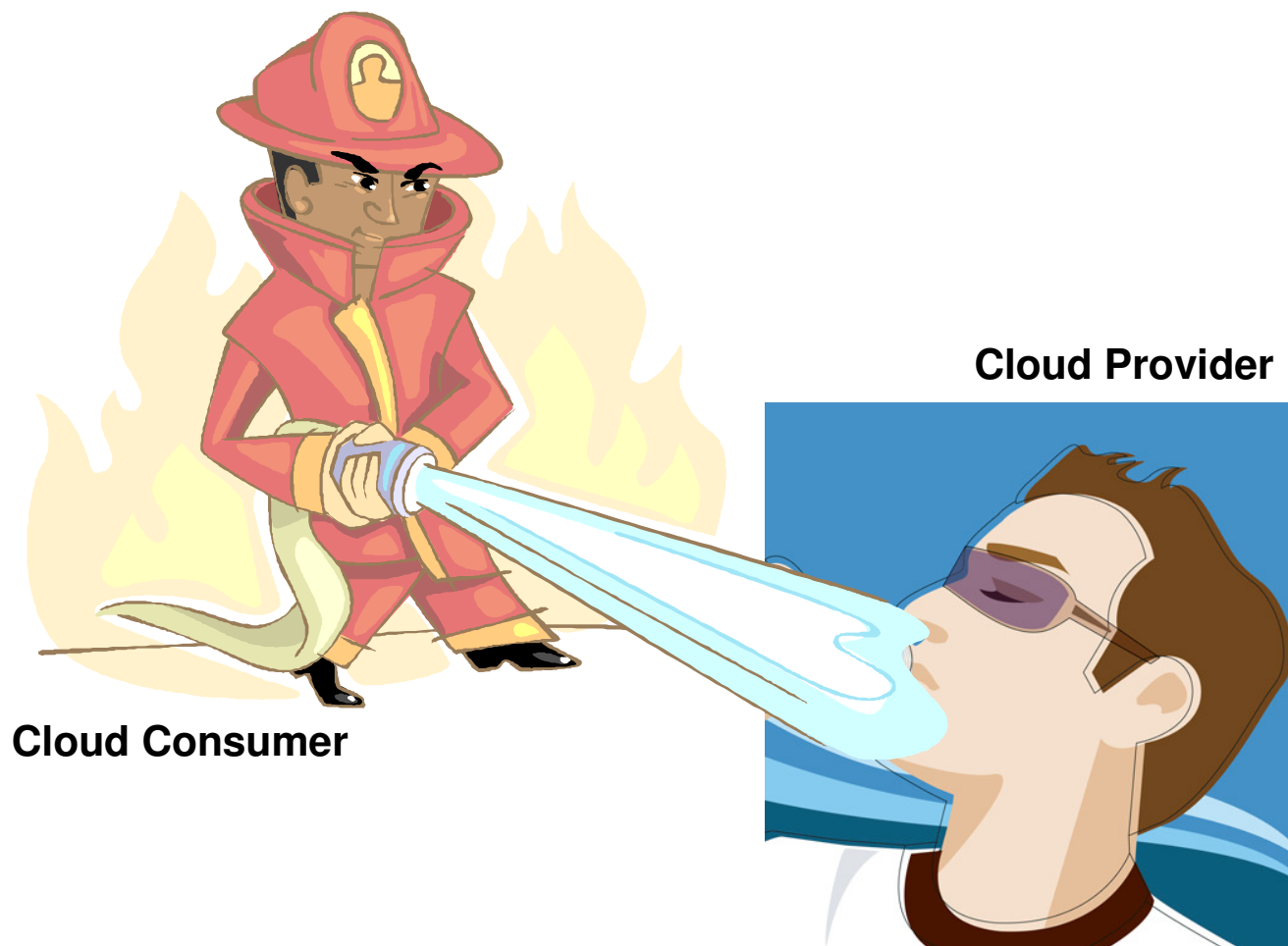
The layers of IT-as-a-Service



Great...so you (or someone) has decided to deploy cloud computing...NOW WHAT?

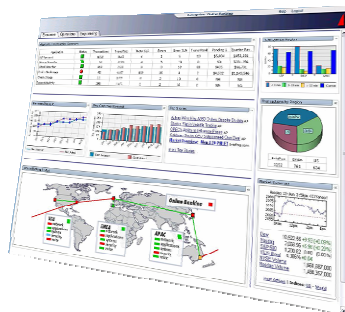


Potential Scenario



IBM Service Management

Enabling quality service delivery and business innovation



Visibility:
See your Business

Respond faster and make better decisions



Control:
Manage your Business

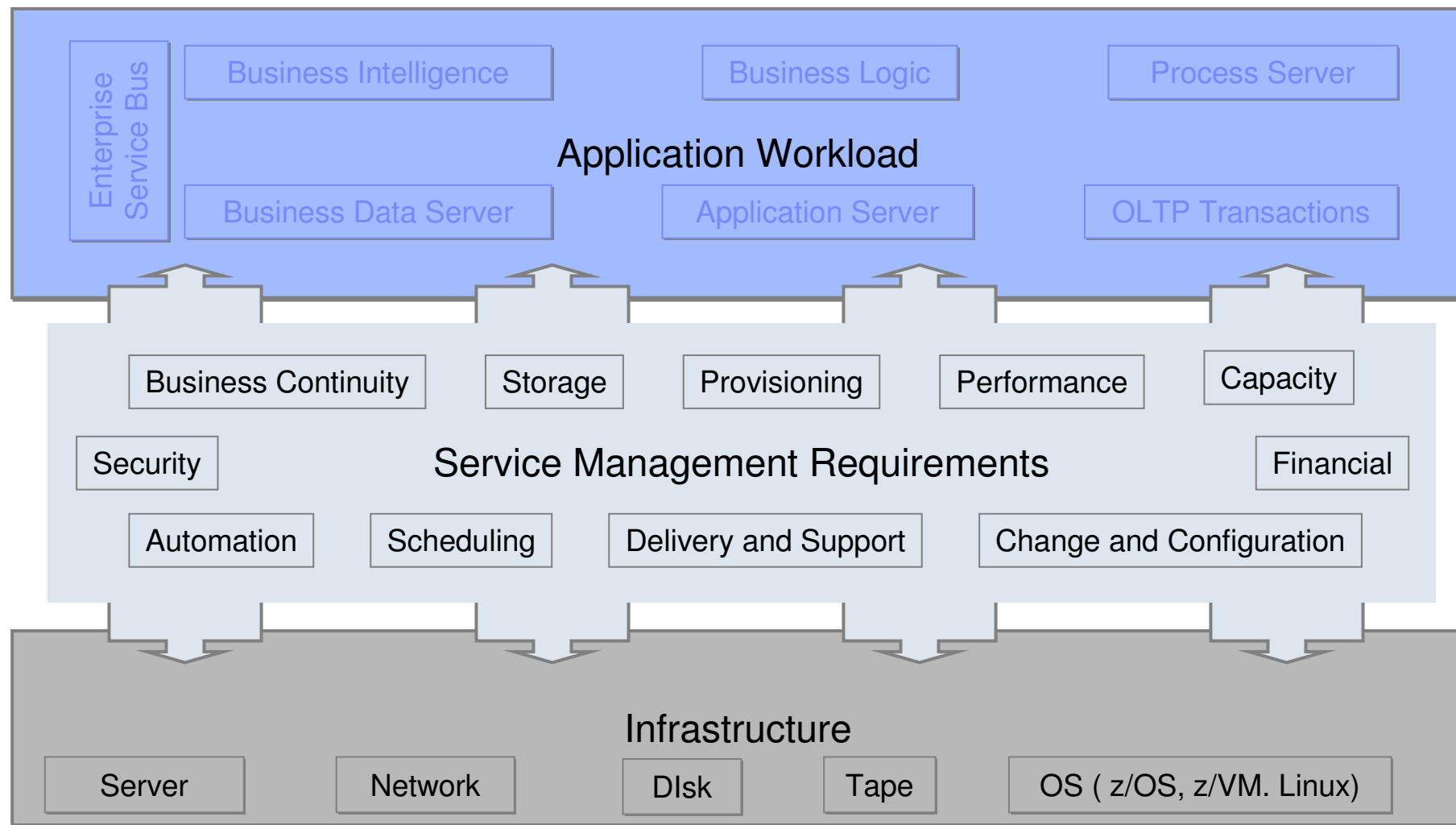
Manage risk and compliance



Automation:
Improve your Business

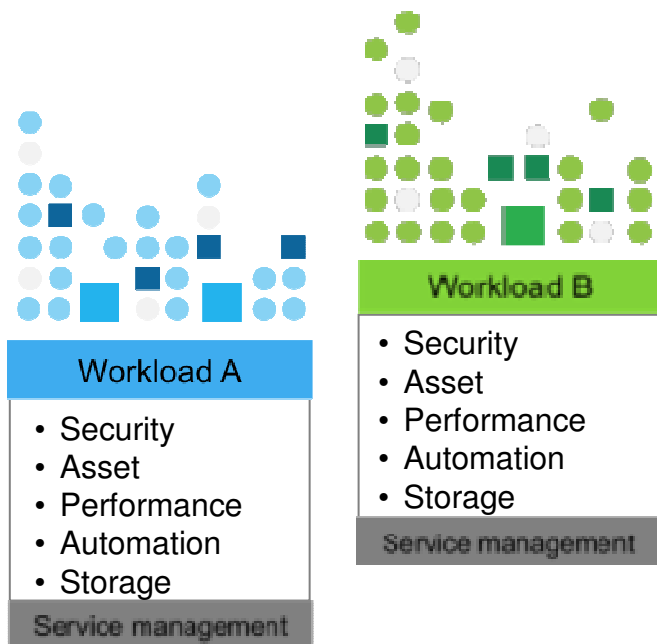
Lower costs and build agility

Managing the Cloud Workload



What is different about cloud computing?

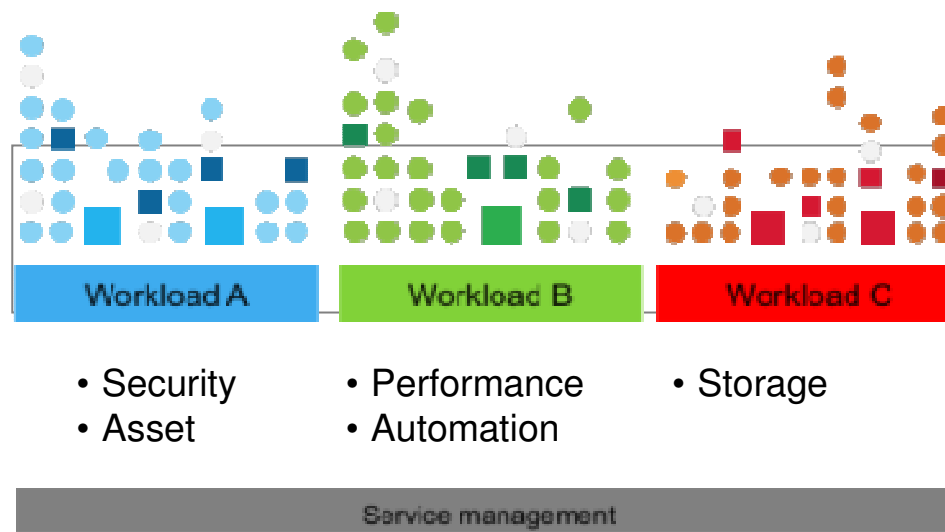
Without cloud computing



With cloud computing

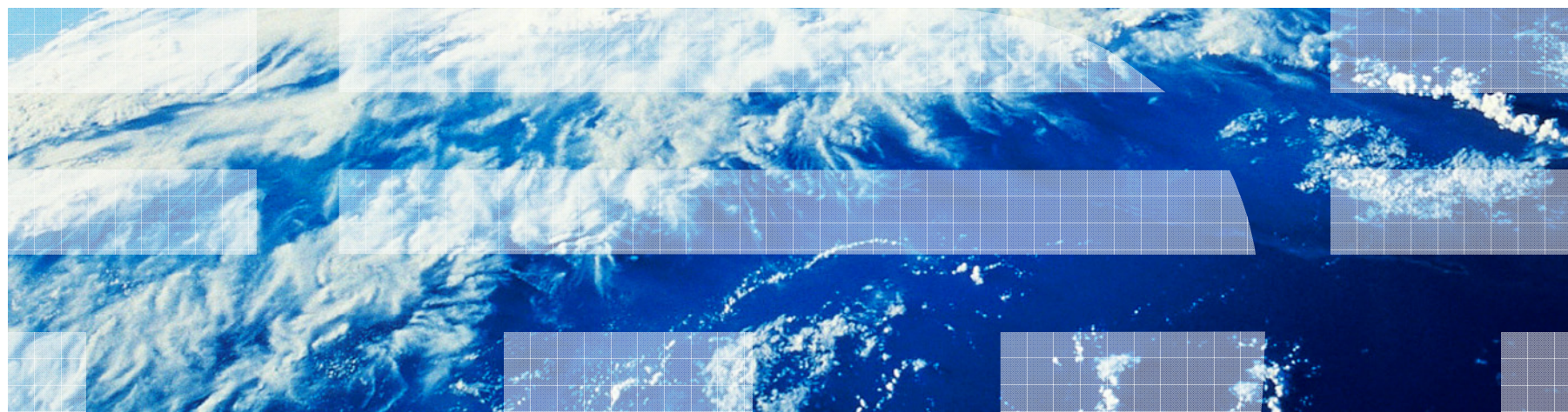


- Virtualized resources
- Automated service management
- Standardized services
- Location independent
- Rapid scalability
- Self-service



- Multi-tenancy
- Metering
- Dynamic workload
- Service level management
- Failover

Thank you



IBM System z Virtualization Infrastructure

- IBM System z hardware (including LPAR hypervisor)
- IBM z/VM Version 5

Monitoring for Virtualization Infrastructure

- z/VM Virtual Machine Resource Manager (included with z/VM)
- IBM z/VM Performance Toolkit for VM (z/VM priced feature)
- IBM Director
- IBM Tivoli OMEGAMON XE on z/VM and Linux
- IBM Tivoli Monitoring
- IBM Tivoli Composite Application Manager for SOA
- IBM Tivoli Usage and Accounting Manager

Automation for Virtualization Infrastructure

- IBM Operations Manager for z/VM
- IBM Tivoli Netcool OMNibus
- IBM Tivoli Workload Scheduler

Provisioning Management

- IBM z/VM DirMaint (z/VM priced feature)
- z/VM Center task of IBM Director
- IBM Tivoli Provisioning Manager

Resiliency Management

- IBM Tivoli System Automation for Multiplatforms

Application Layer Management

- IBM Tivoli Application Dependency Discovery Manager
- IBM Tivoli OMEGAMON XE for Messaging
- IBM Tivoli Composite Application Manager for Response Time
- IBM Tivoli Composite Application Manager for Web Resources
- IBM Tivoli Composite Application Manager for Transactions
- IBM Tivoli License Compliance Manager

Extended Infrastructure Management (*Security*)

- IBM z/VM RACF Security Server (z/VM priced feature)
- IBM Tivoli zSecure
- IBM Tivoli Access Manager for e-business
- IBM Tivoli Access Manager for OS
- IBM Tivoli Federated Identity Manager
- IBM Tivoli Identity Manager
- IBM Directory Server
- IBM Directory Integrator

Extended Infrastructure Management (*Storage*)

- IBM SAN Volume Controller (SVC)
- IBM Tivoli Storage Manager
- IBM TotalStorage Productivity Center
- IBM Backup and Restore Manager for z/VM
- IBM Tape Manager for z/VM
- IBM Archive Manager for z/VM

Extended Infrastructure Management (*Network*)

- IBM z/VM RSCS (z/VM priced feature)
- IBM Tivoli Network Manager IP Edition

Business Services Management

- IBM Tivoli Business Service Manager
- IBM Tivoli Service Request Manager
- IBM Change and Configuration Management Database (CCMDB)

For specific releases, refer to Tivoli Platform Support Matrix at: ibm.com/software/sysmgmt/products/support/Tivoli_Supported_Platforms.html

Smart Analytics Cloud in the IBM Corporation



*Our commitment to informed decision making led us to consider private cloud delivery of Cognos via System z, which is the enabling foundation that makes possible **more than \$20M savings over 5 years.***

– IBM CIO Office

“What IBM has done is come up with a perfect application for a private cloud.”

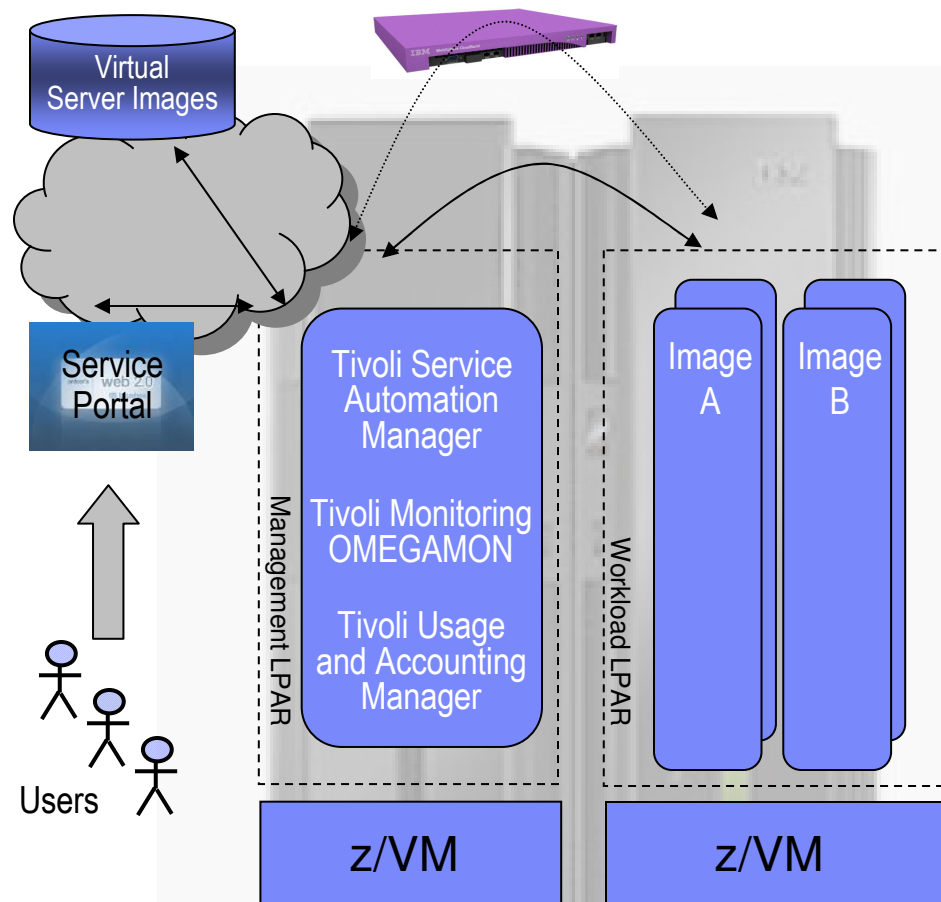
– *John Webster, CNET, Nov. 18, 2009*

- **Blue Insight:** IBM’s deployment is the world’s largest private cloud computing environment for business intelligence and analytics that will empower IBMers from around the world with information and business insight to make smarter decisions – no matter where the data resides
- **IBM Smart Analytics Cloud:** a services based solution offering to enable large enterprise clients to build their own private cloud environment with easily consumable business intelligence services, system and software

IBM Blue Insight results:

- Consolidating 20+ multi-product, departmental BI deployments to Cognos 8 BI on System z
- Realizing value from 60+ data sources across IBM representing more than 1 PB of data
- Deploying private cloud self service to support 200,000+ named users across our global workforce (120K by mid-year 2010, expanding to 200K by 2011)
- 56% cost savings per user (grows with volume)
 - \$7,775,767 – Infrastructure cost savings realized with z10 technology
 - \$2,558,525 – Business Intelligence Competency Center (BICC) cost savings
- Elasticity in a shared server model supporting SLAs for diverse tenants; speed to value and reduced capital spend (26 weeks to 2 weeks)

Architecture Overview of Solution Edition for Cloud Computing



- Management LPAR provides rapid provisioning / de-provisioning and services lifecycle management
- Workload LPAR supports the customer-defined cloud images
 - Linux and z/OS running on z/VM
 - A sample workload is provided by eyeOS (web-based desktop)

Available now!

- WebSphere Cloudburst appliance can be used for rapid provisioning of best practice WebSphere workloads onto System z
- IBM Director with VMControl provides a consistent cross-platform approach to cloud

The System z Solution Edition for Cloud Computing can be used to build test and compute clouds, and also provide a foundation for software services in the cloud.

IBM zEnterprise System – Best-in-class Systems and Software Technologies

A system of systems that unifies IT for predictable service delivery

Unified management for a smarter system: **zEnterprise Unified Resource Manager**

- Part of the IBM System Director family, provides platform, hardware and workload management
- Unifies management of resources, extending IBM System z® qualities of service across the infrastructure

The world's fastest server:
IBM zEnterprise™ 196

- Ideal for large scale data and transaction serving and mission critical applications
- Most efficient platform for Large-scale Linux consolidation
- Leveraging a large portfolio of z/OS and Linux on System z applications
- Capable of massive scale up, over 50 Billion Instructions per Second (BIPS)

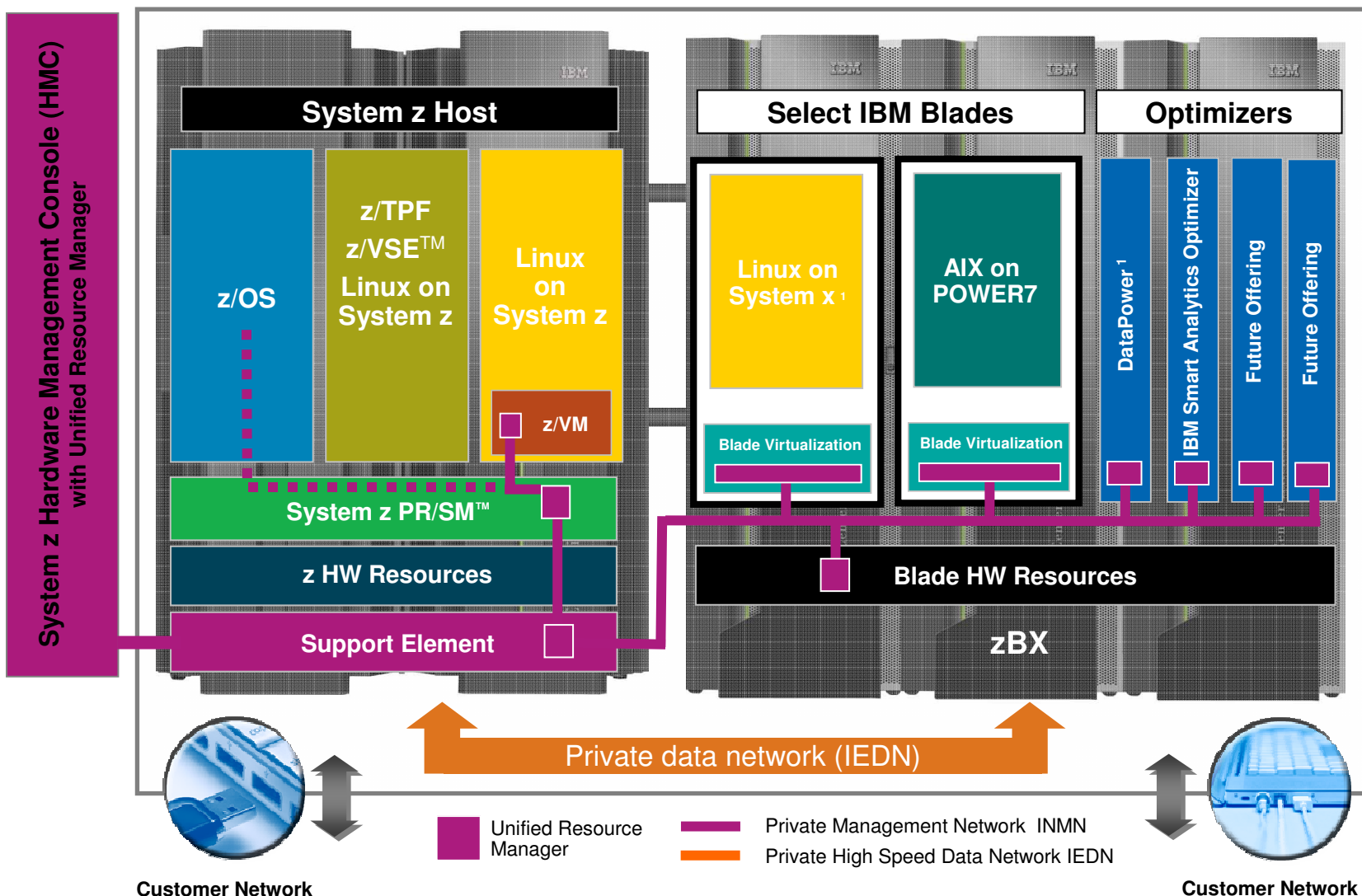


Scale out to trillion of instructions per second:
zEnterprise BladeCenter® Extension (zBX)

- Selected IBM POWER7™ blades and IBM System x® Blades* for tens of thousands of AIX® and Linux applications
- High performance optimizers and appliances to accelerate time to insight and reduce cost
- Dedicated high performance private network

Putting zEnterprise System to the Task

Use the smarter solution to improve your application design



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