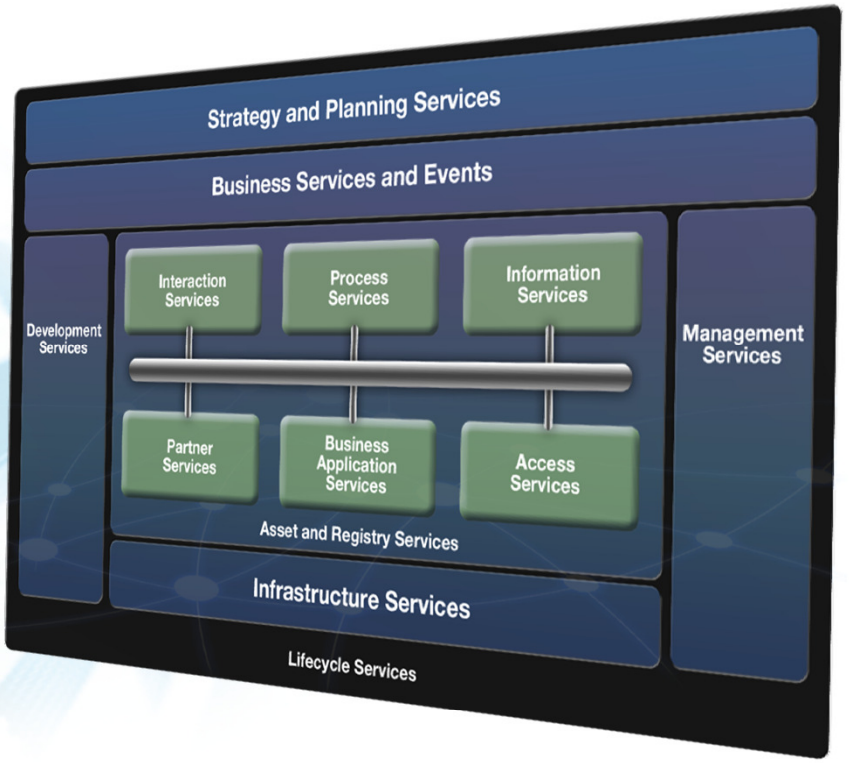
Simply Good Design:
2012 IBM SOA Architect Summit

SOA on Your Terms

And Our Expertise

SOA Design Principles and Cloud



Infrastructure considerations leveraging SOA and Cloud

- **How do I architect the right Infrastructure?**
- **What are the best practices and how can I ensure compliance?**
- **How do I build my applications to run well in a highly virtualized environment?**
- **How do non-functional requirements impact my choices for infrastructure?**
- **How do we manage our infrastructure?**

Agenda

- Business Drivers
- Architectural Context
- SOA, Cloud, and Service Management
- Considerations and Requirements
- Summary

A crisis of complexity and inefficiency:
The need for progress is clear

1.5x

Explosion of information driving 54% growth in storage shipments every year.

70¢ per $1

70% on average is spent on maintaining current IT infrastructures versus adding new capabilities.

85% idle

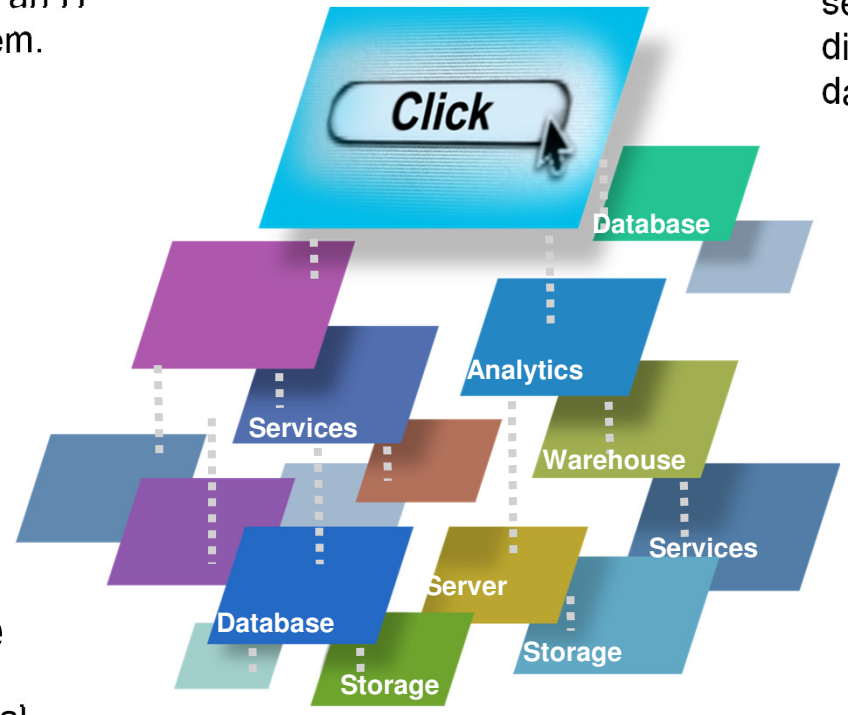
In distributed computing environments, up to 85% of computing capacity sits idle.

Siloed, Do-It-Yourself ISM Imparts a Tax on an Organization

Specify/Design
It takes 30 days to specify and design an IT infrastructure system.

Procure
Software and hardware components are ordered separately with potentially different lead times from 5-20 days.

Integrate
Components arrive as a "bag of parts" or separately over time and must be configured to work optimally together.



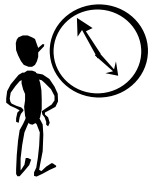
Deploy
Deployment of workloads onto systems can take weeks to months requiring custom tools and scripts.

Customize/Tune
Meeting required service levels may require additional customization and ongoing manual tuning.

Manage
Time consuming management from development, provisioning to monitoring with multiple tools for each component.

Scale
Lack of elasticity in responding to changing business demands. Cumbersome to re-allocate or add resources

Growing customer pains & increased time to market



Creation of middleware infrastructure takes too long

- Avg. lead time to get new application up – **4 to 6 months**
- Delay caused by approvals, procurement, shipment, HW installation, license procurement, OS installation, application installation, configuration

Manual or semi-automated efforts are error-prone

- Bugs are introduced by inconsistent configurations – **30%**
- Often most difficult variety of bugs detected during the move from development to QA or production

Poor resource utilization results in increased cost of labor and hardware

- Setting up an environment is expensive and hence there is an incentive to hold onto it – even when no longer needed "just in case."
- Slow down in technology adoption
- Future environments costs new hardware, instead of recycling returned hardware – costing time and money

The value of Cloud Computing

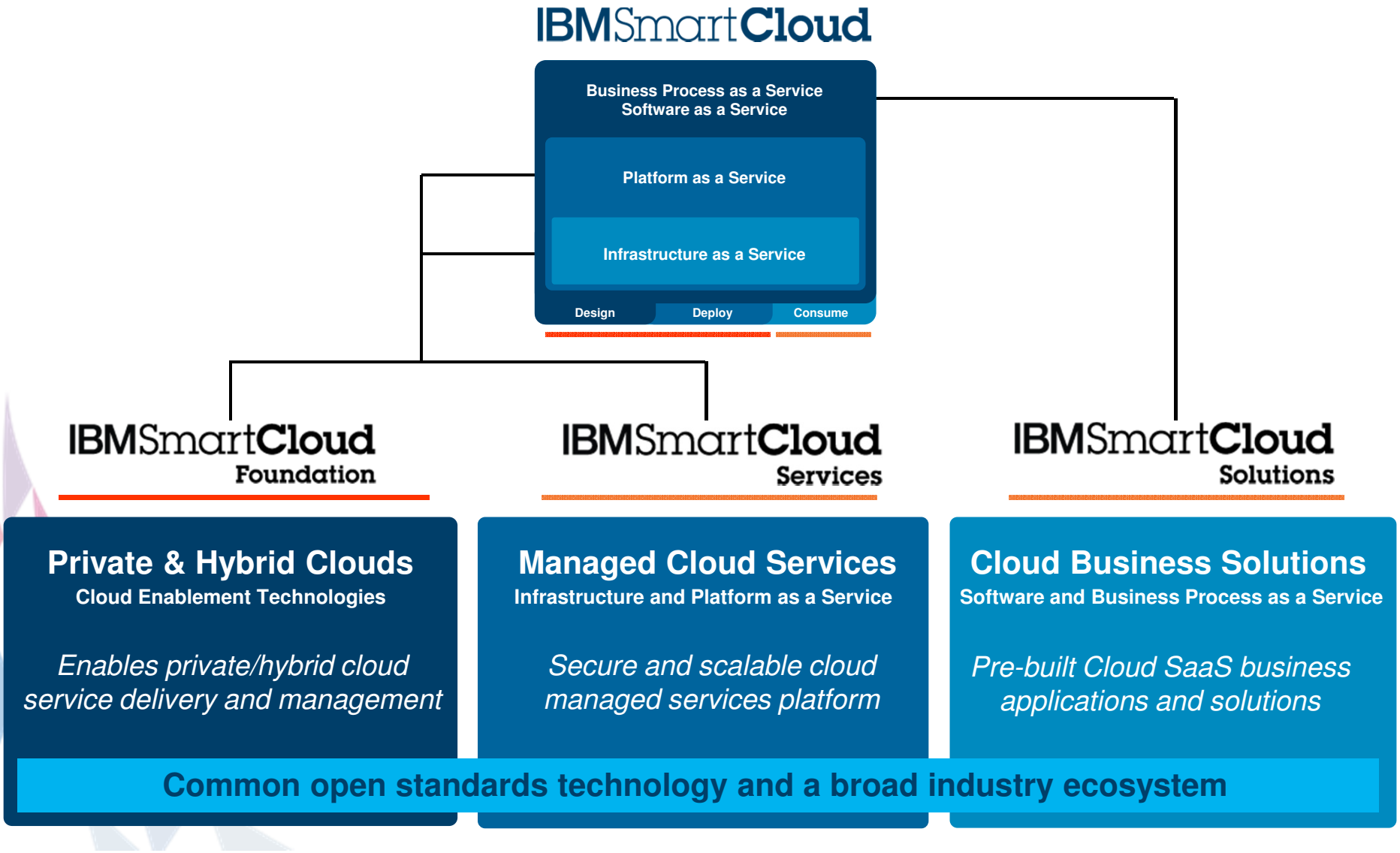
Value delivered	From traditional	To cloud
Change management	Months	Days or hours
Test provisioning	Weeks	20 minutes
Install database	1 day	12 minutes
Install of operating system	1 day	30–60 minutes
Provisioning environment	■	51% cost savings
Design and deploy business applications	Months	Days/Weeks

"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 +$20M savings over 5 years."

– IBM Office of the CIO

IBM SmartCloud – things you can do now

Cloud capabilities built upon a common platform, with a commitment to open standards



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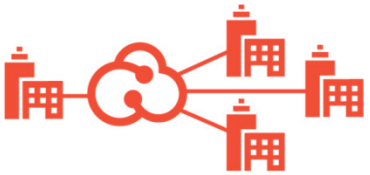
One view of Cloud: Type of Delivery model

Private cloud

On or off premises cloud infrastructure operated solely for an organization and managed by the organization or a third party



Public cloud

Available to the general public or a large industry group and owned by an organization selling cloud services.

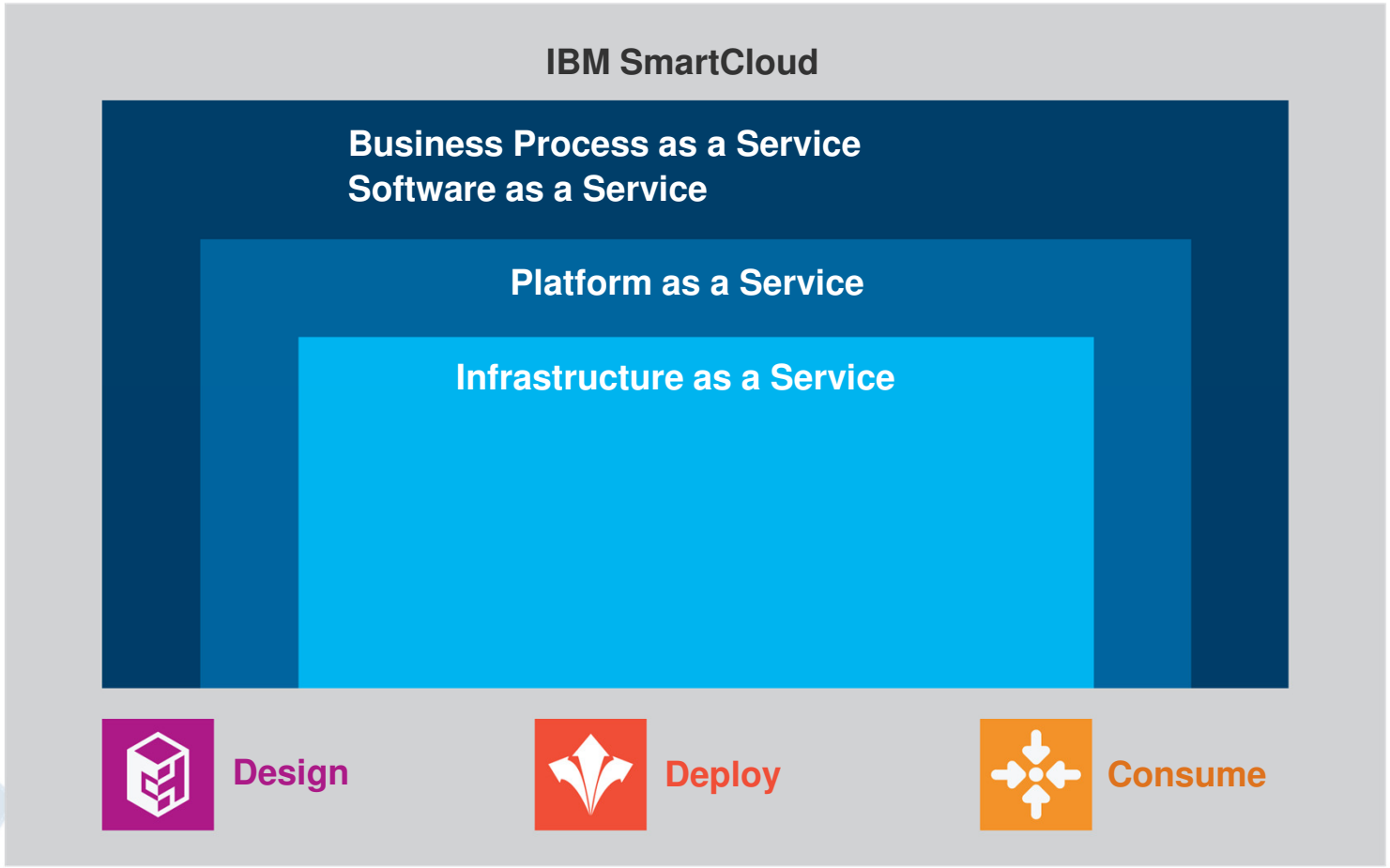
Hybrid IT

Traditional IT and clouds (public and/or private) that remain separate but are bound together by technology that enables data and application portability

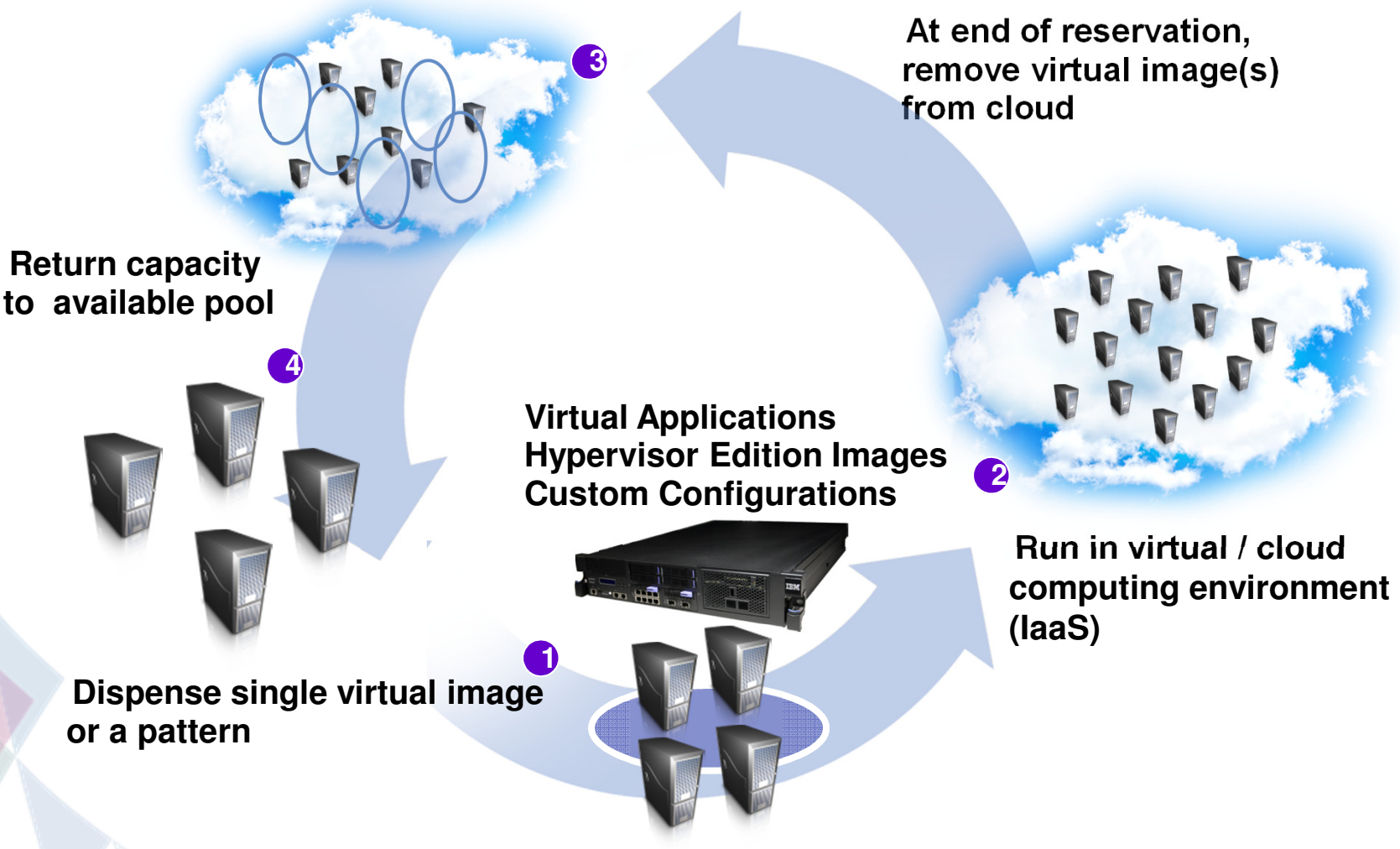
Traditional IT

Appliances, pre-integrated systems and standard hardware, software and networking.

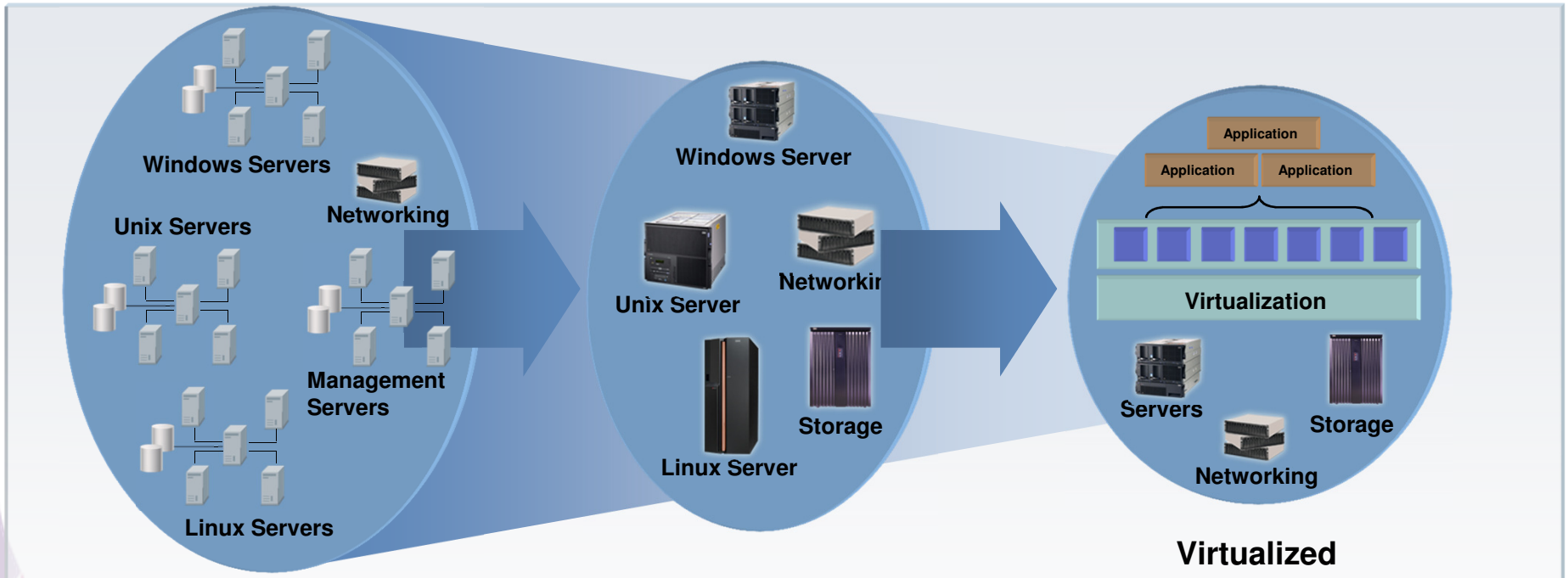
Another view of Cloud: Type of Cloud Service



Virtualization is key to Cloud Computing….



… but virtualization is not new



Complex

- Islands of computing and data
- Physical resources are bound to applications
- Disparate management tools
- Manual provisioning

Consolidated

- Fewer devices and licenses
- Increased utilization
- Physical resources still bound to applications
- disparate management tools
- Labor intensive provisioning

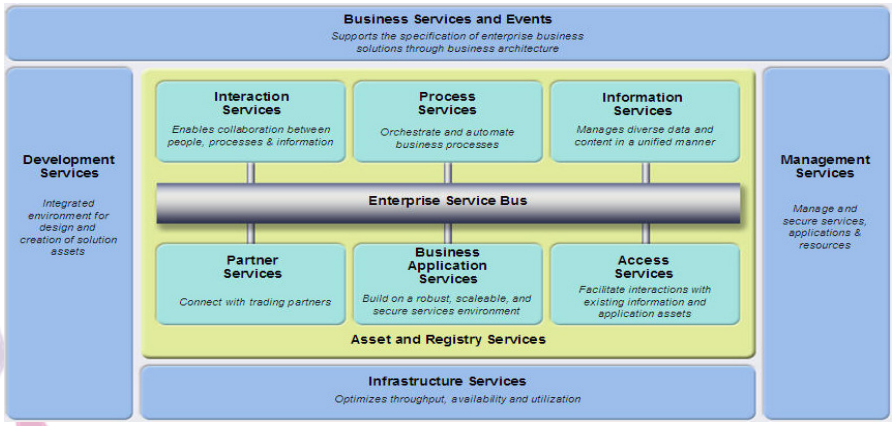
Virtualized

- Pools of resources
- Logic and physical resources decoupled
- Standardized, automated infrastructure management
- Automated, Self-Service provisioning

SOA and dynamic infrastructure next to each other

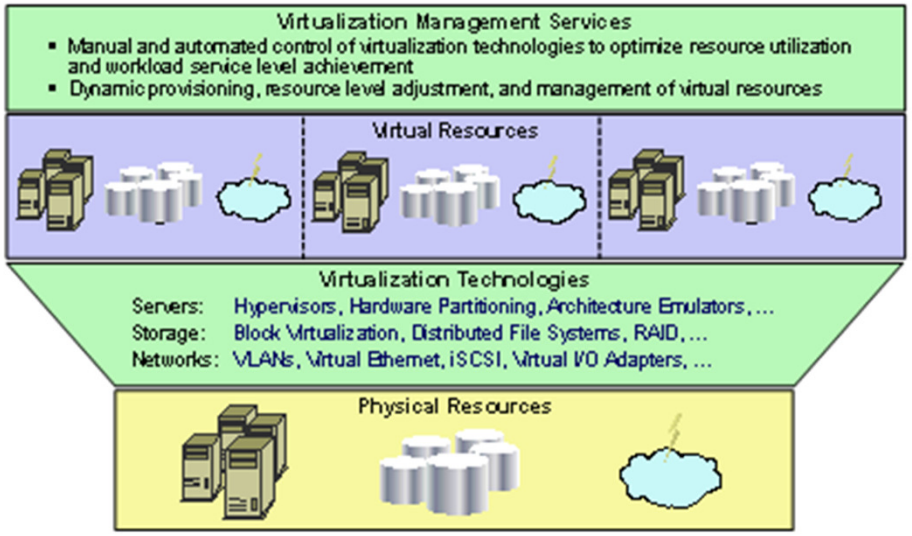
SOA

Focus on Efficiency in Application Development and Reuse tied to Business Process



Dynamic Infrastructure

Focus on Dynamicity / Elasticity / Scalability



Together, SOA and dynamic infrastructure result in Cloud

SOA Framework

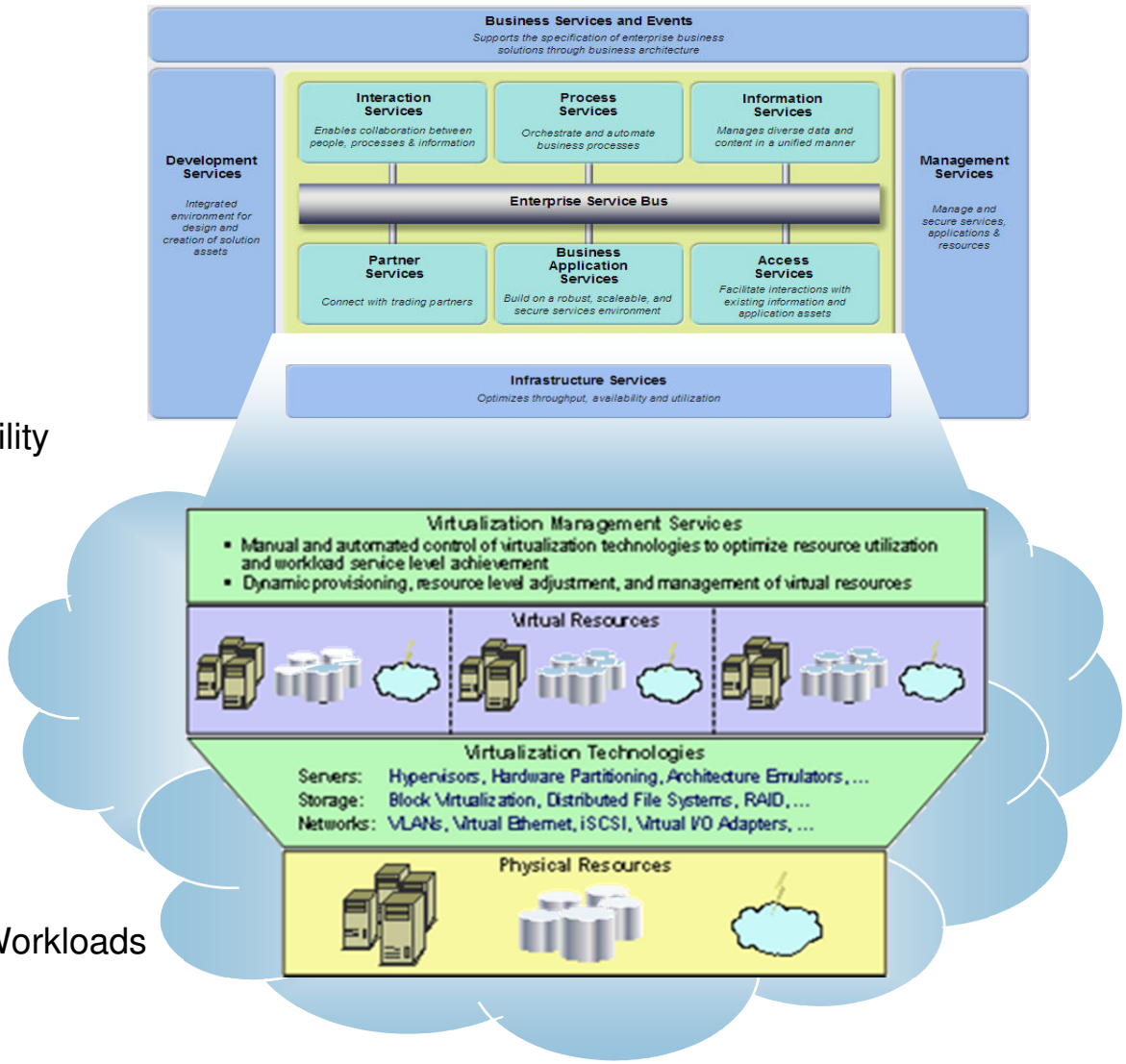
Applications are:

- Reused as appropriate
- Decoupled
- Easily composed
- Conform to standards for interoperability

Dynamic Infrastructure

The Cloud Infrastructure is:

- Completely Virtualized
- Continuously Optimized
- Dynamically Responsive
- Heterogeneous to Support Differing Workloads



SOA Design Principles applied to Cloud

- ✓ **Service orientation at the core** leads to well-defined consumable services that can have policies applied to them and whose consumption can be monitored and managed.
- ✓ **Process integrity at Internet scale** leads to well-defined requirements for elasticity and transactionality across an end-to-end environment.
- ✓ **Integration with enterprise capabilities and back-end systems** enables the creation of hybrid solutions that mix cloud and on-premises capabilities.
- ✓ **A basis in industry standards** enabled cloud computing in the first place; it also plays an important role in the creation and integrated service management of hybrid solutions.
- ✓ **Leveraging and extending open-source technologies** comes into play because many cloud environments are based on an open-source core.
- ✓ **Providing the platform for a growing ecosystem** applies to cloud computing because the cloud itself is a prime example of an ecosystem-centric environment that enables goods and services to be exchanged way outside the traditional boundaries of the enterprise.

What is Cloud Computing?

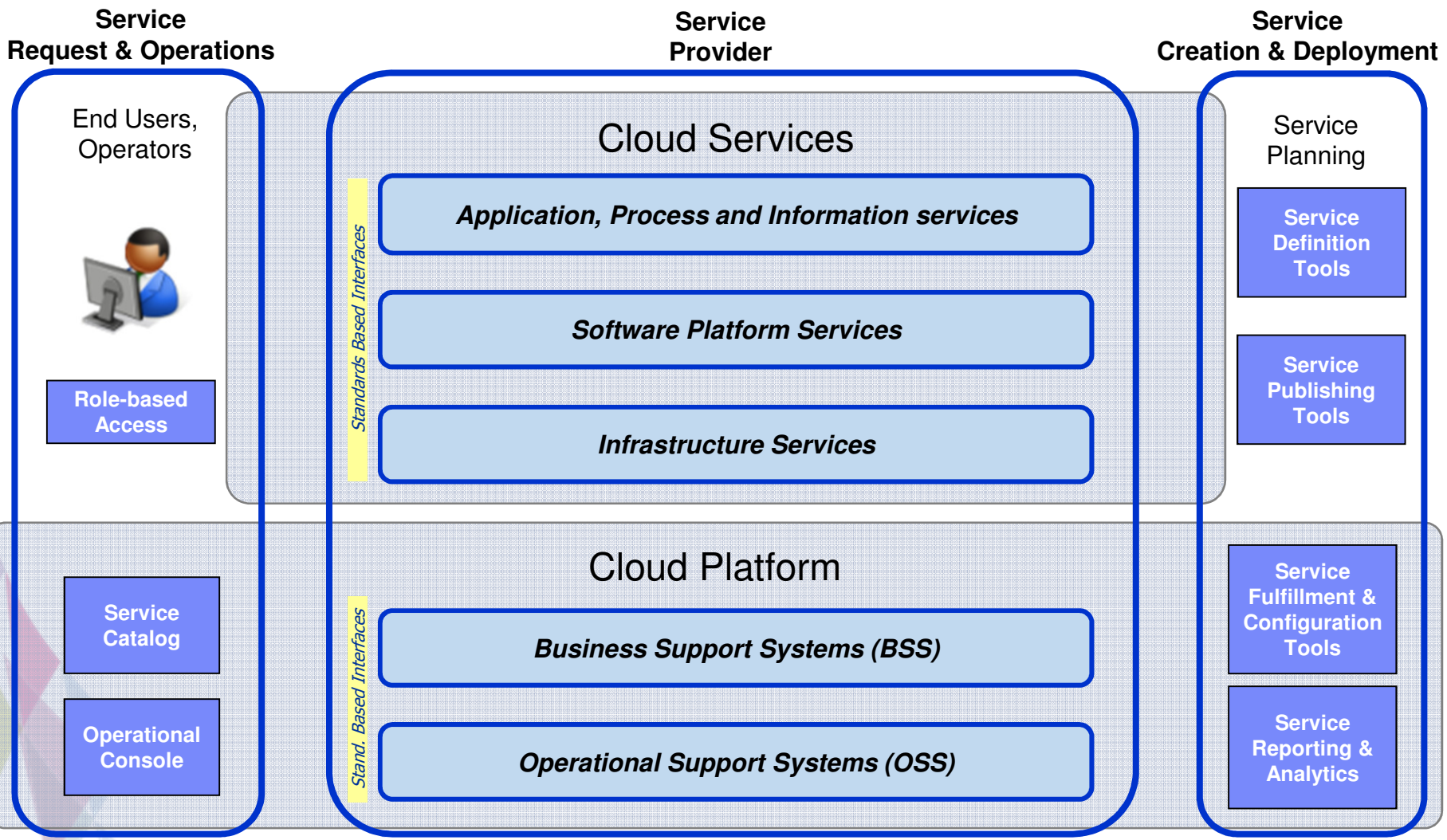
- A user experience and a business model
  - Standardized offerings
  - Rapidly provisioned
  - Flexibly priced
  - Ease of access

- An infrastructure management and services delivery method
  - Virtualized resources
  - Managed as a single large resource
  - Delivering services with elastic scaling

Similar to Banking ATMs and Retail Point of Sale, Cloud is Driven by:

- Self-Service
- Economies of Scale
- Technology Advancement

An architectural model for cloud computing



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Integrated Service Management

Visibility, control and automation of data center management configuration and topology

Visibility of ….

All Elements and Services
e.g. Assets, server, storage, network, and virtual / logical elements and relationships for configuration, availability, security and performance)

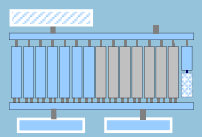
Control of ….

IT Policy to assures service delivery and compliance
e.g. correlation of resources against desired compliance patterns)

Automation of ….

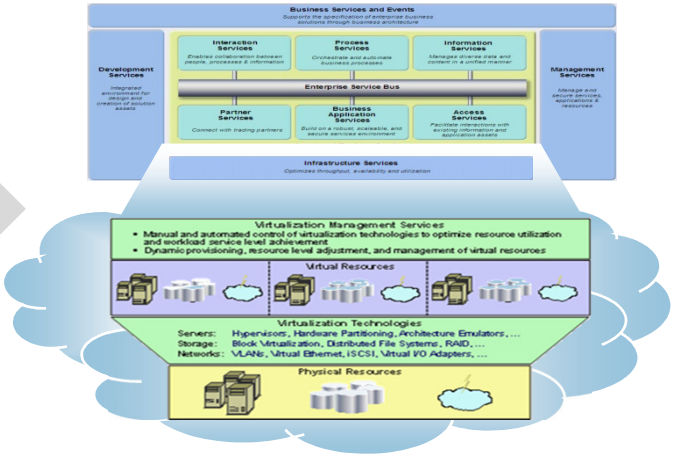
All datacenter processes from element run-books to broad provisioning and compliance scenarios
(e.g. Industry specific process standards for Enterprises, Telcos or Utilities)

Management Services



Integrated Service Management

- Discovery
- Monitoring
- Security
- Provisioning
- Dashboards & Reporting
- Usage & Accounting
- Dynamic Workload Management
- Image Management

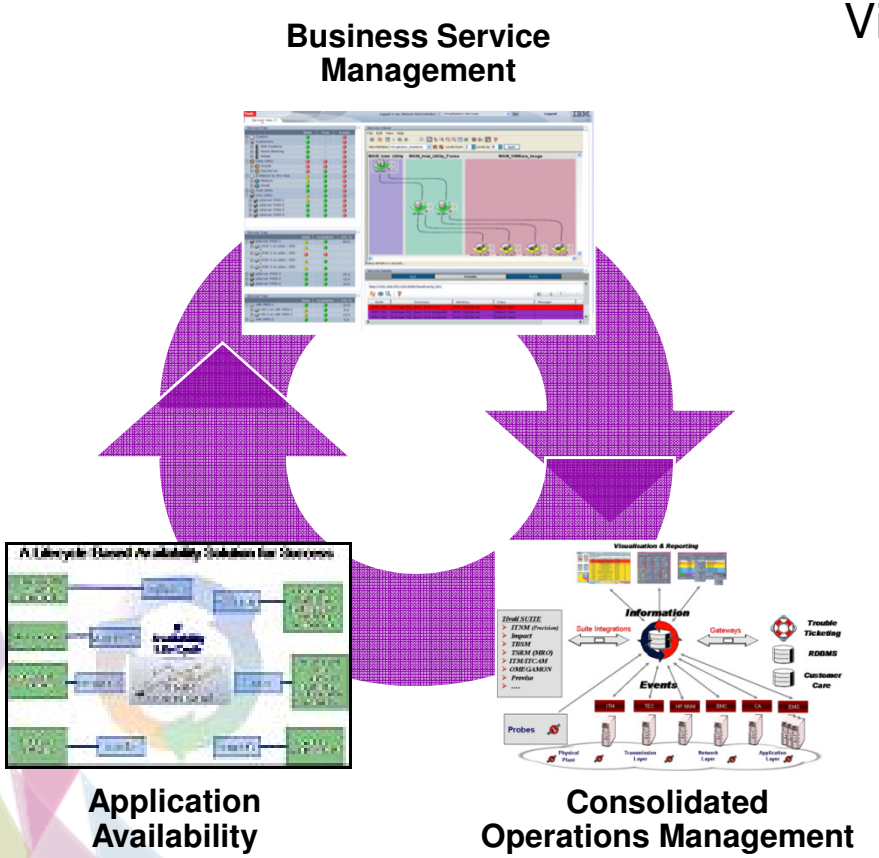


ISM - Service Delivery and Process Automation

Visibility, Control and Automation of all aspects of the IT service delivery and support lifecycle:

- Single role-based service management environment to manage, inventory, and execute client processes and work
- Enforce process standards and controls through defined, managed, workflows and auditable approvals and escalations
- Eliminate cost and error by automating change, configuration, provisioning, release and asset management tasks

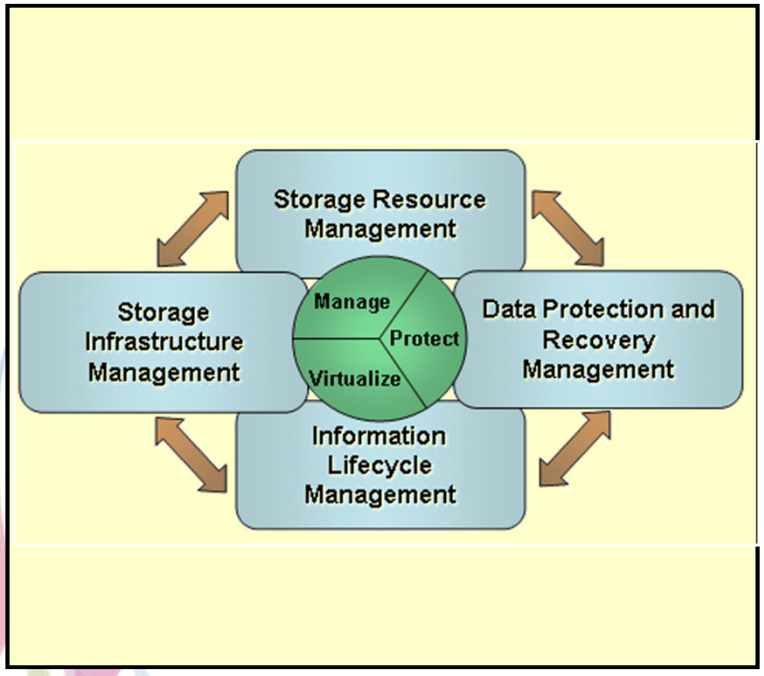
ISM - Service Availability and Performance Management



Visibility, Control and Automation of all aspects of managing the availability and performance of infrastructure, applications and business services:

- Visualize service performance and health across all network, server, middleware and application components.
- Increase effectiveness and productivity, reduce errors and improve availability through consolidated tooling.
- Keep costs under control as all aspects of infrastructure grows with integrated policy-based automation.

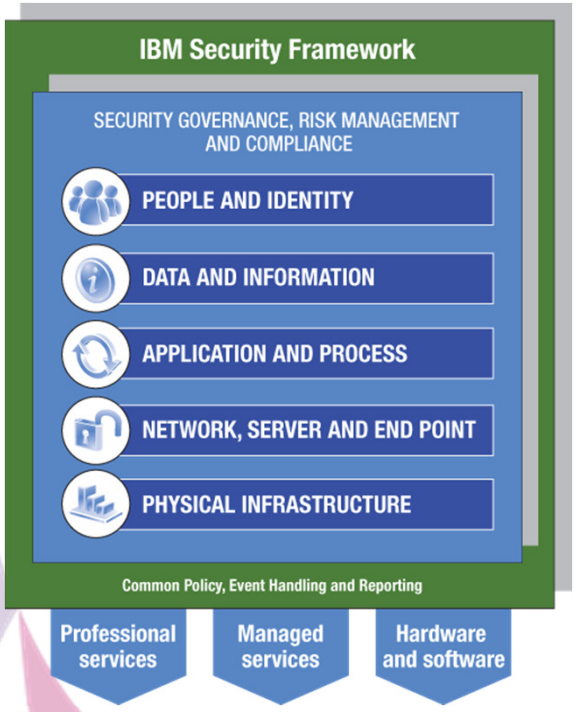
ISM: Storage Management



Visibility, Control and Automation of all aspects of protecting data, managing storage infrastructure and resources, and controlling the information lifecycle:

- Create complete transparency across the information lifecycle for all business data and records
- Policy-based management of information access, retention, and disposal of data aligned to business controls
- Increase productivity of storage and security personnel though integrated tooling and policy-based workflows

ISM: Security, risk and compliance



Visibility, Control and Automation of all aspects of securing the IT infrastructure, applications and business services:

- Timely insight into business continuity risks and compliance posture across infrastructure, data and applications.
- Effective control of the configuration, protection, access and utilization of information, applications, networks, servers and end-points.
- Efficient automation of the identification and remediation of vulnerabilities and addressing compliance mandates.

ISM: Datacenter transformation

Visibility, Control and Automation of all aspects of creating a simplified, shared and dynamic data center:

- Eliminate silo views of infrastructure and applications and monitor workloads across physical, logical and grid/cloud infrastructure.
- Transform provisioning and change management to create a dynamic computing, middleware and application environment.
- Increase agility and responsiveness to business demands by creating a flexible, self-managing computing and data infrastructure.

ISM: Asset and financial management

Visibility, Control and Automation of all aspects of managing both IT and non-IT assets.

- Enable access to all aspects of asset description, configuration and financial information in a service context.
- Improve quality and reduce risks across the asset management lifecycle through integrated management tools.
- Create integrated workflows to speed delivery and service times, increase efficiency and reduce re-work costs and quality problems.

ISM: Network and service assurance

Integrated Service Quality Assurance for converged (triple-play) voice, video, data networks.

Visibility, Control and Automation of all aspects of all aspects of managing networks and service quality.

- Deliver a single point of monitoring for all network traffic, event/fault and service quality management across converged infrastructures.
- Enforce policies for service quality and traffic prioritization to deliver optimized service within agreed service levels.
- Speed problem resolution times and reduce diagnostic errors through automated root cause analysis.

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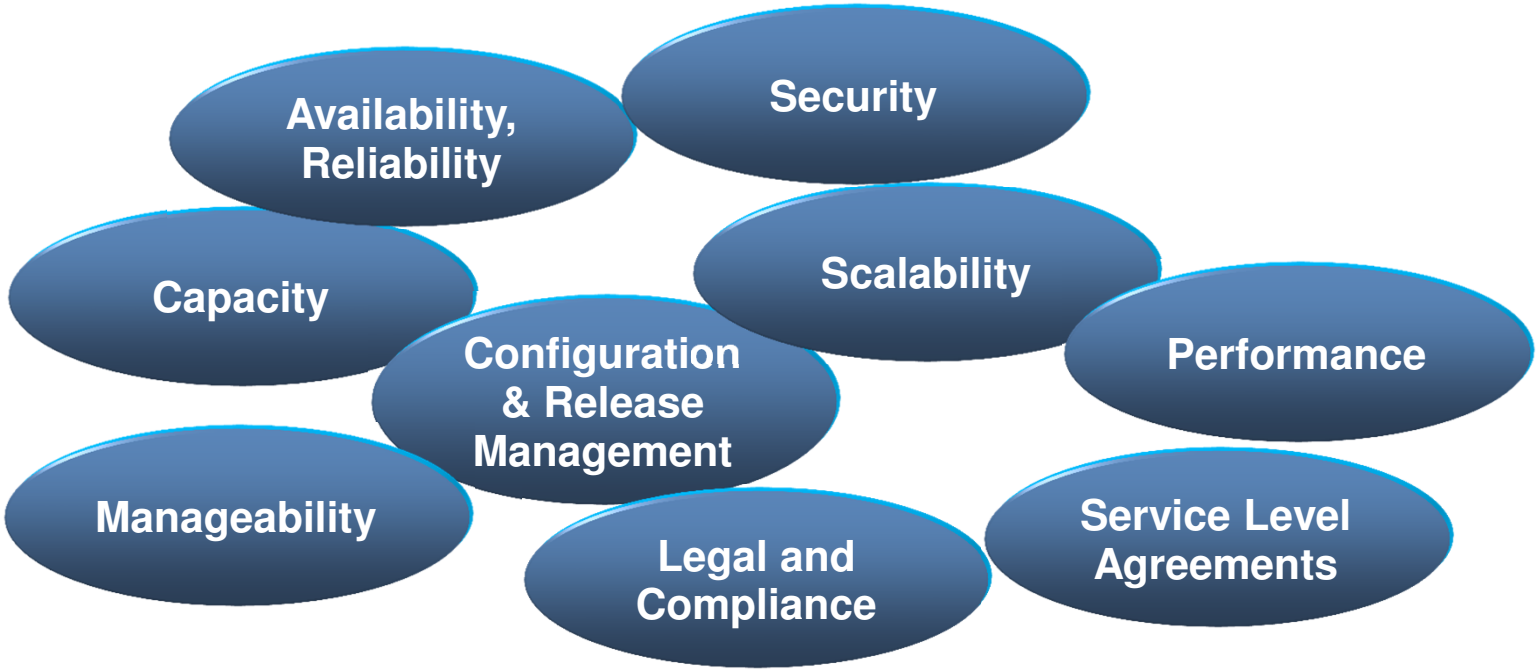
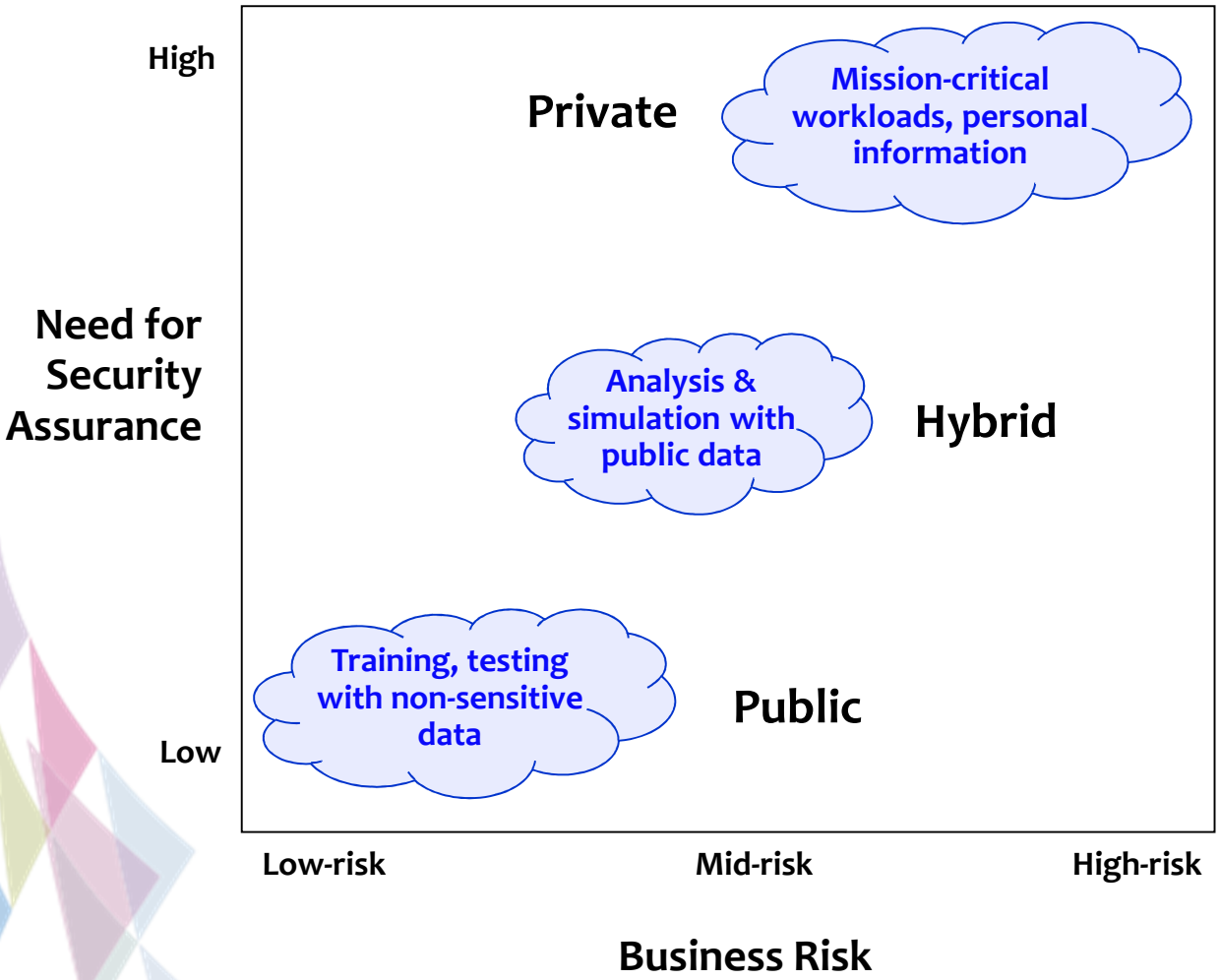
Non-functional requirements



The non-functional requirements are the same whether you are deploying into a Cloud or a traditional infrastructure.
But Cloud adds a new dimension to the architecture

Cloud delivery models and workloads



High value / high risk workloads need

- Quality of protection adapted to risk
- Direct visibility and control
- Significant level of assurance

Today's clouds are primarily here:

- Lower risk workloads
- One-size-fits-all approach to data protection
- No significant assurance
- Price is key

Codifying patterns: IBM PureApplication System

A Simple, Efficient, Flexible, Virtualized Application Platform

Complete, Ready-to-Go Systems

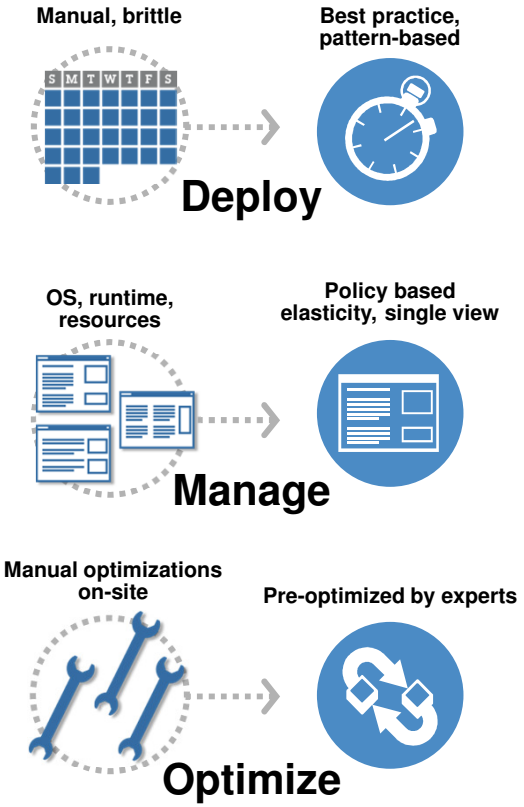
- Pre-integrated, up and running in <4 hours
- Pre-optimized for enterprise application workloads

Simplify Ongoing Tasks

- Single point of platform and application management
- Repeatable self service application provisioning

Built for Cloud

- “Platform as a Service”
- Elastic application runtimes



A Quick Peek at the Development Aspects

- “Not fit for Cloud”
- Cloud tolerant
- Cloud Aware
- Cloud Centric

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The potential value of Cloud Computing is very significant

- Confluence of emerging and maturing capabilities such as Virtualization, Service Oriented Architecture (SOA), Information Architecture and Service Management
  - Both architectural and Organizational models
  - Optimization, Innovation and Value Delivery
  - Flexibility and Agility
  - Secure, reuse and sharing of 'services'
  - Governance becomes ever more important
  - Separation of Concerns (Requestors, Providers, Creators, Brokers, etc.)
  - Improved Admin:Server/Service/Application Ratios
- Virtualization at all layers of the architecture: Abstraction of resources from their physical environment allowing for the flexibility needed from both business and technology perspectives
- Employ SOA for the benefits it provides (flexibility, reuse, separate the concerns, etc.); Exploit a dynamic and elastic environment to enable innovation and to get optimum use from resources
- This is a Journey…Roadmaps need to be defined based on core architectural principles, business purpose, context, security and current environment state

How to get started?

- Identify the workloads that could benefit the most without incurring major risk
  - Public cloud with general workloads such as office tools, collaboration tools etc.
  - Private cloud with non-critical business workloads (get started and get used to the changing business model)
- Be explicit about non-functional characteristics up front
  - And use them to filter the appropriate “form factors” for the workload
- Be precise in the contractual part of the service catalog (whether public, hybrid or private)
  - Financial, QoS, Security, Transparency, Cost benchmarking etc.

References and useful links

- Wikipedia: Cloud Computing
- IBM Cloud Computing
- IBM SOA
- IBM Think
- IBM Service Management (ISM)
- IBM Smarter Planet (Confluence of SOA, Cloud, Service Management, etc.)

धन्यवाद

Hindi

多謝

Traditional Chinese

Teşekkür ederim

Turkish

Спасибо

Russian

Gracias

Spanish

شكرا

Arabic

Thank You

English

Obrigado

Portuguese

Grazie

Italian

Danke

German

Merci

French

Multumesc

Romanian

多谢

Simplified Chinese

감사합니다

Korean

ありがとうございました

Japanese