Rethink:

Tool-belt of the Technology Strategist and Architecture Practitioner

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Synopsis of Talk

The mandate of your CIO cannot be cloud. The real mandate of your CIO lies in a mix of *4 patterns*. These patterns are the essential image in which an IT function is viewed by its business and customers – based on face-to-face input of 3,000 CIO's worldwide. We will mind-meld on the choices of *4 cloud delivery models* and *5 cloud deployment* models being adopted to serve the business and these mandates. The session will also briefly touch on the *Cloud Computing Reference Architecture* – an instance of Service Oriented Architecture – submitted to The Open Group. In that light, an emerging solution for *3 models of cloud integration* is also introduced. This session rethinks what's available to apply for the tool-belt of strategists and practitioners.

www.cloudleadershipforum.com

Topics

Why
Patterns of Context & The CIO Mandate

What
Choices in Cloud Models

How
Reference Architecture, Standards & Interoperability

How
Cloud Integration

"And capacity is just one example of a measurement whose meaning varies depending on context" – WSJ, 6/18/11

THE NUMBERS GUY | JUNE 18, 2011

With Arresting Numbers, Context Can Be Everything

| **Article** | **Comments (2)** |

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The Supreme Court recently ordered California to reduce its prison population to 137.5% of capacity, citing unsafe overcrowding. How did the prisons manage to exceed the maximum number of inmates they could hold? It turns out that capacity is a surprisingly flexible concept.
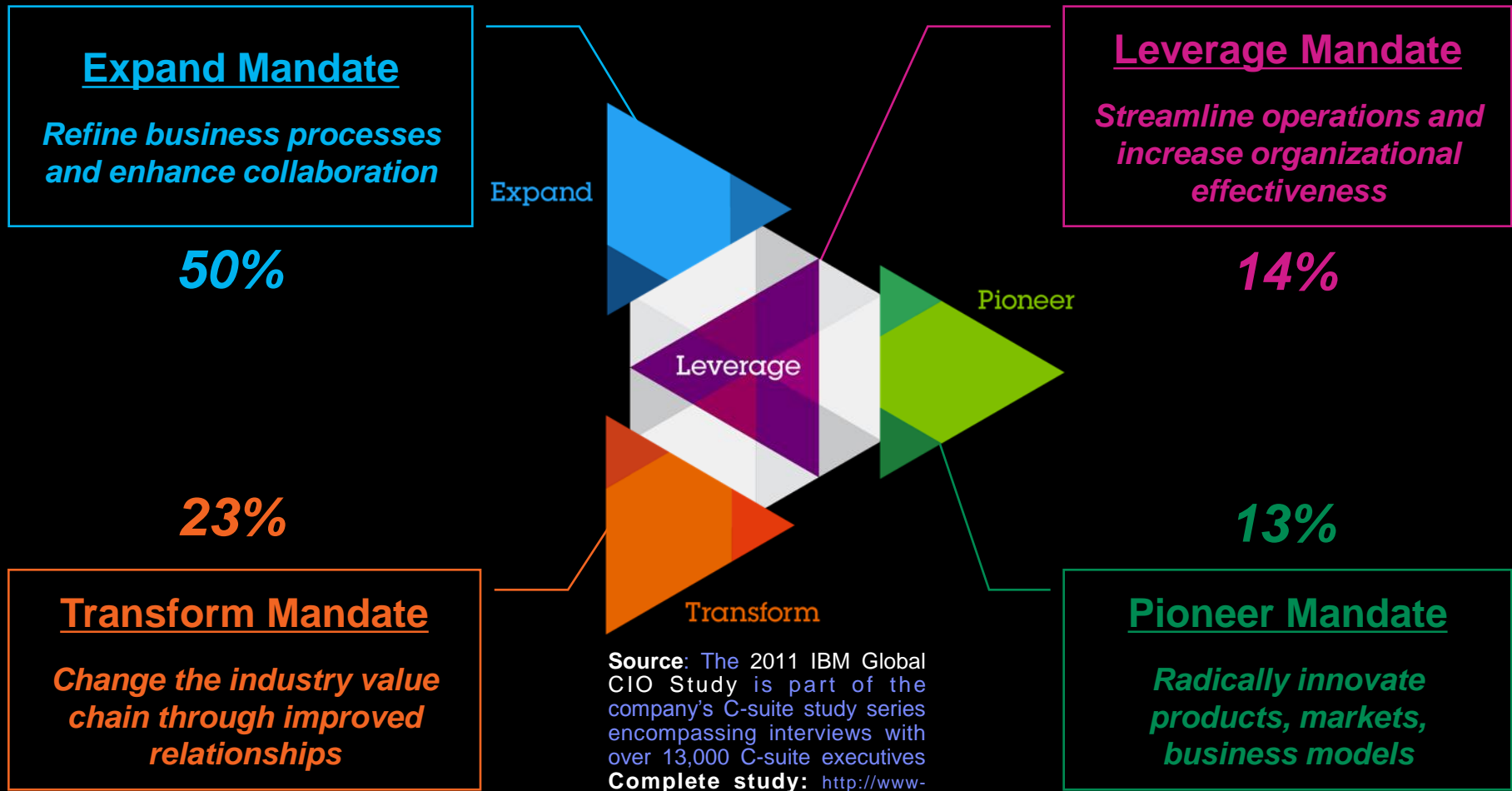
Since capacity typically refers to the maximum amount of something that can be contained, it is hard to comprehend filling a space beyond 100% of that limit. But in prisons, the definition isn't so clear-cut. It varies from state to state, and even within states, depending on the type of capacity measured.

And capacity is just one example of a measurement whose meaning varies depending on the context. The wildfires still

Even in light of cloud capacity and elasticity,
context must not be forgotten. So, how do we capture context?

4

3,000 CIO's world-wide provided context that fall into 4 co-existing patterns we define as "The CIO Mandate"

Expand Mandate

Refine business processes and enhance collaboration

50%

Leverage Mandate

Streamline operations and increase organizational effectiveness

14%

Expand

Leverage

Pioneer

Transform

23%

Transform Mandate

Change the industry value chain through improved relationships

13%

Pioneer Mandate

Radically innovate products, markets, business models

Source: The 2011 IBM Global CIO Study is part of the company's C-suite study series encompassing interviews with over 13,000 C-suite executives **Complete study:** http://www-935.ibm.com/services/c-suite/cio/cio-study-registration-2011.html

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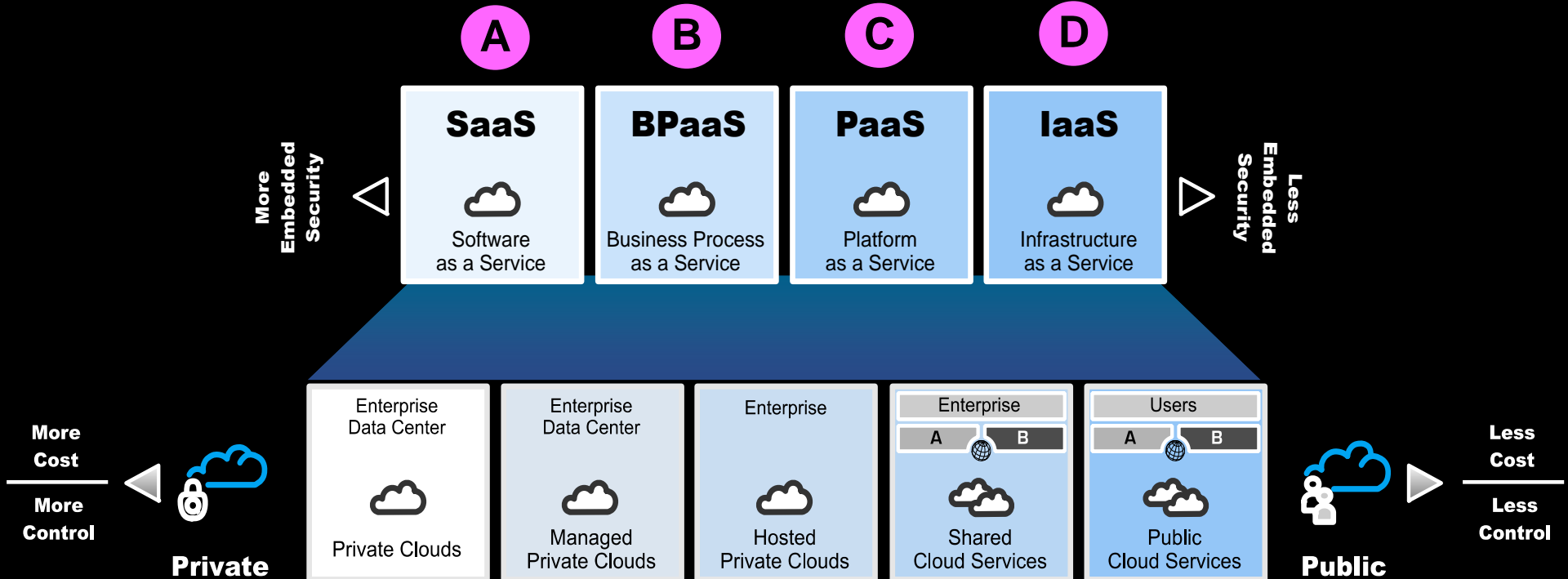
One size does not fit all
Drill down shown for 1 pattern, similar readouts available for other 3

Business view of IT	Expand (50% of sample)	Key focus areas based on Expand mandate CIO responses
Provider of fundamental technology services	27%	**Refine business processes and enhance collaboration**
Facilitator of organizational process efficiency	32%	1. Explore and identify outsourcing opportunities for non-critical IT functions
Provider of industry specific solutions to support business	27%	2. Enhance internal communication and collaboration
Critical enabler of business/organization vision	15%	3. Review, analyze and implement business process management
		4. Continually review and update legacy environment

In order for Cloud to serve any business with context – choices in delivery and deployment must be provided

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Any of the **4 delivery models** can be deployed on any of the **5 deployment models** (+1 more – as traditional enterprise)

A **B** **C** **D**

SaaS
Software as a Service

BPaaS
Business Process as a Service

PaaS
Platform as a Service

IaaS
Infrastructure as a Service

More Embedded Security ◁ ▷ Less Embedded Security

More Cost / More Control ◀

Enterprise Data Center
Private Clouds

Enterprise Data Center
Managed Private Clouds

Enterprise
Hosted Private Clouds

Enterprise | A | B
Shared Cloud Services

Users | A | B
Public Cloud Services

▶ Less Cost / Less Control

Private

Public

IT capabilities are provided "as a service" over an intranet, within the enterprise and behind the firewall

IT activities/functions are provided "as a service" over the Internet

1 **2** **3** **4** **5**

Hybrid

Internal and external service delivery methods are integrated through hybrid cloud gateways

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Resolving the various choices requires guidance from a well-patterned reference architecture – Cloud Computing Reference Architecture
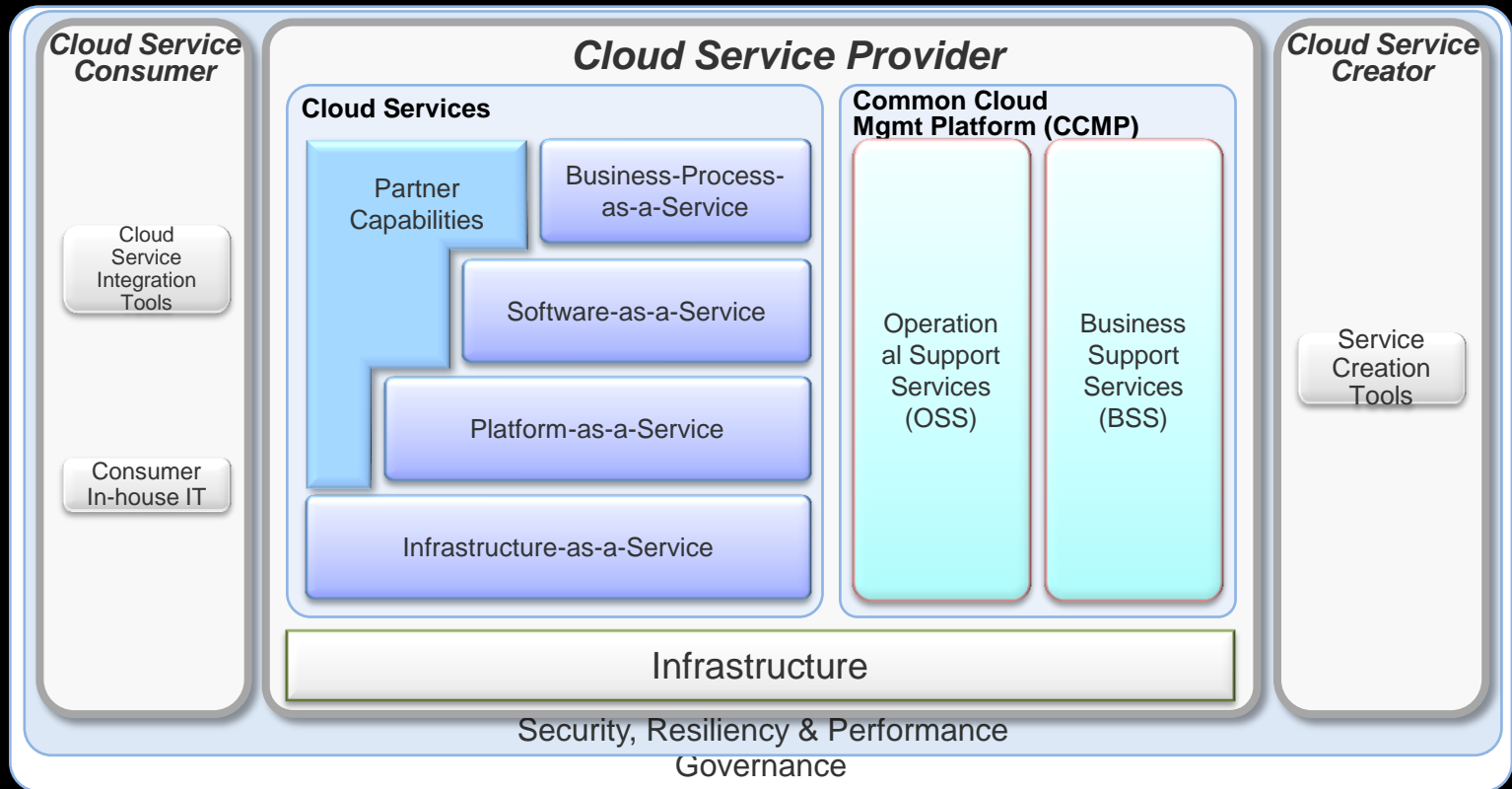
IBM has donated the Cloud Computing Reference Architecture to the industry
Currently in "Submission" status with Cloud Architecture Project of The Open Group

Complete IBM work on the Cloud Computing Reference Architecture submission to OMG:
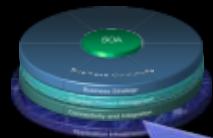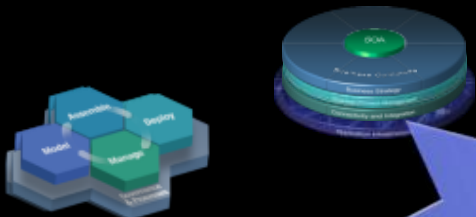https://www.opengroup.org/cloudcomputing/uploads/40/23840/CCRA.IBMSubmission.02282011.doc

**The Cloud Computing Reference Architecture (CC RA)
is a continuation of SOA standards work IBM contributed to standards
bodies**

- Cloud Architecture is service oriented

- Cloud Architectures are instances of Service Oriented
  Architecture

- All Cloud services are SOA services

- BUT NOT all SOA services are also Cloud services

- SOA is the meta model for Cloud Architecture

- Earlier adoption of SOA applied emphasis to applications

- Cloud computing puts the SOA emphasis on
  infrastructure

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The Cloud Computing Reference Architecture (CC RA) is an evolution of standards work on WWW, WS, and SOA to which IBM has contributed

IBM SmartCloud

www.ibm.com/smartcloud

Business Process as a Service

Platform as a Service

Infrastructure as a Service

| Design | Deploy | Consume |

Cloud Computing

Cloud architecture at The Open Group (TOG)

DMTF Open Virtualization Format (OVF)

DMTF Cloud Management WG (IAAS APIs)

OASIS Cloud Identity Management TC

Business agility

BPMN, SBVR, RIF, …

Service *orientation*

WS*, WS-I, SCA, BPEL, SAML, XACML …

Dawn of the world wide web

HTTP, HTML, WSFL, XLANG, REST…

Rise of the application server

Java, Java EE, XML, XML Schema, SOAP, WSDL, UML, Web2.0, ...

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The customers voice in cloud standards: IBM partners with the CSCC – hosted and managed by the Object Management Group

Cloud Standards Customer Council OMG OBJECT MANAGEMENT GROUP

- Provides guidance to the multiple cloud standards-defining bodies
- Establishes the criteria for open-standards-based cloud computing
- Best practices, case studies, use cases, requirements, gap analysis and recommendations for cloud standards
- To join: *http://www.cloudcustomercouncil.org*

45+

companies signed up prior to Apr 2011 launch, largest in OMG history

150+

companies are participating today

50+

operate outside the IT realm

citigroup | LOCKHEED MARTIN | JOHN DEERE | Kroger | SOGETI | NC STATE UNIVERSITY

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3 Integration models arise from Cloud

Standards Taxonomy
Types of Standards

Cross - Cloud

| SaaS | PaaS | IaaS |

Across Vendors within a cloud

Cloud to Enterprise

Enterprise

Within an Enterprise
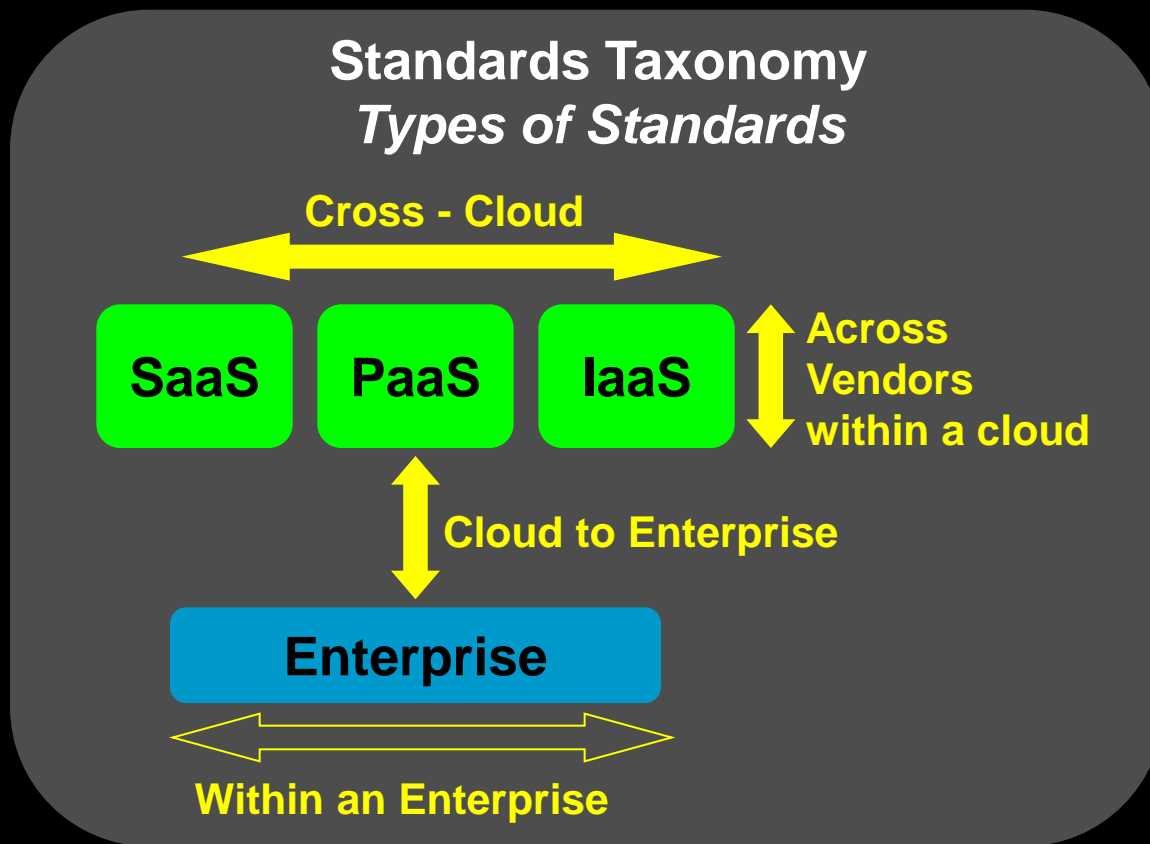
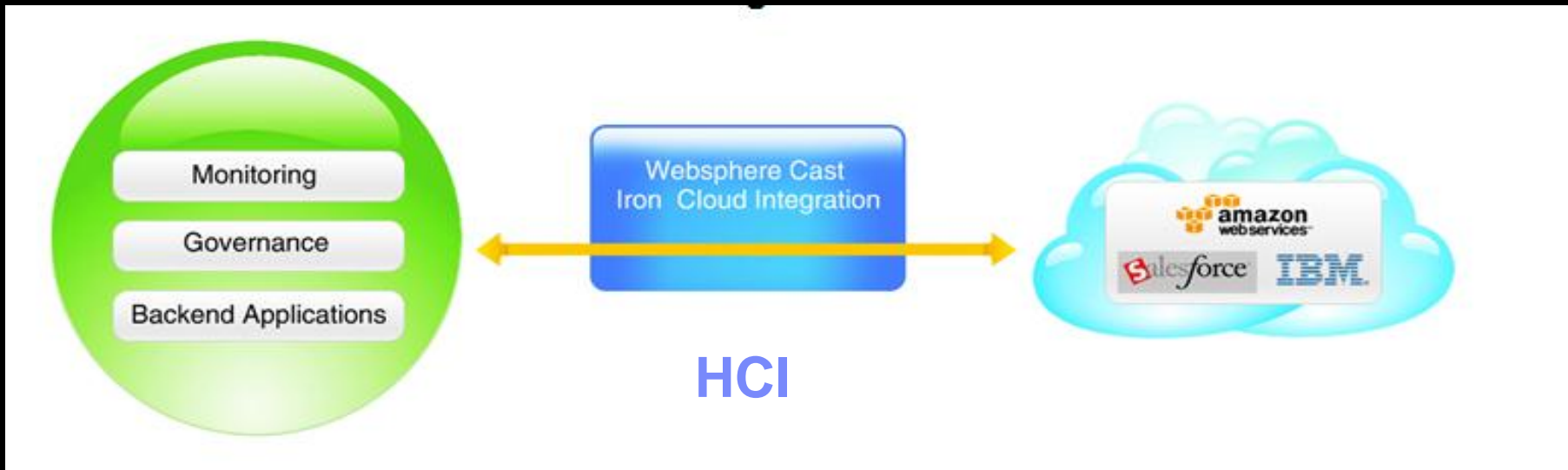Source: Cloud Computing Use Case Group, www.cloudusecases.org

IBM Hybrid Cloud Integration Solution steps up to execute the models

On-Premise…

… Application and Service Management integration…

…with Off-Premise Clouds

Monitoring

Governance

Backend Applications

Websphere Cast Iron Cloud Integration

amazon webservices

salesforce   IBM

HCI

Simplify
Use of single physical appliance for application integration and management of IaaS, PaaS & SaaS

Enable
Unified GUI for application integration, platform, and infrastructure management

Control
Manage off-premise resources to the same standard - with the same infrastructure - as resources inside enterprise walls

http://www-947.ibm.com/support/entry/portal/Overview/Software/WebSphere/WebSphere_Cast_Iron_Cloud_integration

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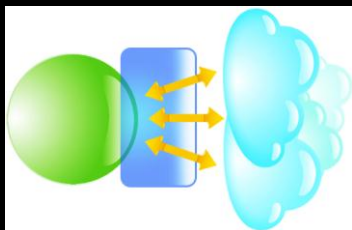
Hybrid Cloud Integration Features and Differentiators
Available as a Technology & Customer Preview

One-Stop Integration

Unified management of SaaS and IaaS.

Supports IBM and 3rd party clouds

IBM Compute Cloud, Lotus Live.
Connectivity to Amazon AWS, other IaaS vendors as appropriate

Workload Governance and Management

Resource Overflow and Underutilization thresholds.

Workload resources can be automatically balanced based on the dynamics of system load.

Monitoring integration with ITM (IBM Tivoli Monitoring)

Integrated monitoring dashboard creates a single-pane of glass for monitoring of off-premise resources.

Provisioning and governance integration with TSAM (Tivoli Service Automation Management)

Ability to request and provision ICC and EC2 hybrid resources through TSAM GUI.

User Directory integration for Lotus Live with TDI (Tivoli Directory Integrator)

Unified user ID between "enterprise" and Lotus Live.

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Another IBM Offering: IBM SmartCloud

IBMSmart**Cloud**

	Enterprise	Enterprise+
	Rapid access, multi-tenant solution scaled and priced based on usage.	**Robust multi-tenant solution, including managed production services.**
Workloads	Ideal for developing and deploying new application designs	Ideal for migration of traditional and higher availability applications
Operating system	Linux, Windows	Windows, Linux, AIX
Management level	Self Service with advanced premium support	Fully managed
Availability	99.5%	99.9%
Security	Virtual and some physical isolation	Multiple levels of isolation
Software usage	Bring your own / pay as you go / free developer use	IBM provides operating system and tool licenses
Pricing	Hourly usage-based with reserved options	Monthly usage-based and fixed contract

http://www.ibm.com/smartcloud

Summary

Why

Context of cloud is critical

Your CIO's mandate – Leverage, Pioneer, Expand Transform

What

Translate the Context / CIO Mandate to range of choices

Delivery models –
    BPaaS, SaaS, PaaS, IaaS

Overlay in various ways on …

Deployment Models –
    On-site Self-Managed (Private),
    On-site Remote Managed (Private),
    Hosted Private,
    Shared Cloud (Shared Private),
    Public

Service orientation of the infrastructure

How

IBM Cloud Computing Reference Architecture

The Open Group

Cloud Standards Customer Council

Other interoperability bodies

How

Integration scenarios –
    Enterprise to Cloud
    Across Cloud Delivery Layers
    Across Cloud Vendors

Hybrid Cloud Integration
    Application & Service Mgmt Integration
    Between on / off premise

One stop integration for SaaS and IaaS

Connectivity to AWS and other vendors

Market-maker – Cloud Adoption through IBM

2,000
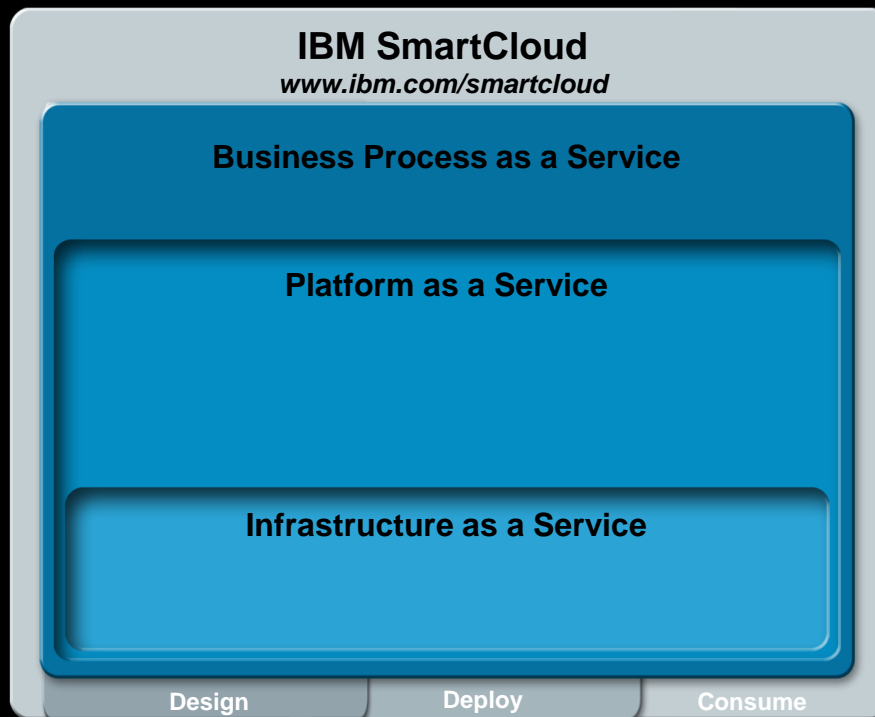Successful private cloud engagements in 2010

19M
Public cloud users

1M
Managed virtual machines

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IBM is a leader in cloud

- *2k successful cloud engagements in 2010*

- *50% of Fortune 10 and Fortune 50 working with IBM on private clouds*

- *80% of Fortune 500 companies using IBM cloud capabilities*

- *Managing >1M virtual machines worldwide*

- *35K Marketers across 6 continents utilize IBM Marketing Operations on demand daily on the IBM Cloud*

IBM SmartCloud
www.ibm.com/smartcloud

Business Process as a Service

Platform as a Service

Infrastructure as a Service

| Design | Deploy | Consume |

- *19M SaaS users*

- *4.5M Client transaction managed per business day on the IBM Smart Cloud*

- *13B Security events managed / Day for more than 4,000 clients*

- *6B consumer interactions managed in 2010 on the IBM Smart Cloud*

- *9K North American shipping carriers use an IBM Software as a Service application*

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CIO visionary plans are evolving: business intelligence and analytics remain at the top, with cloud computing moving into the top four

Most important visionary plan elements
(Interviewed CIOs could select as many as they wanted)

Element	2011	2009
Business Intelligence and analytics	83%	83%
Mobility solutions	74%	68%
Virtualization	68%	75%
Cloud computing	60%	33%
Business process management	60%	64%
Risk management and compliance	58%	71%
Self-service portals	57%	66%
Collaboration and Social Networking	55%	54%
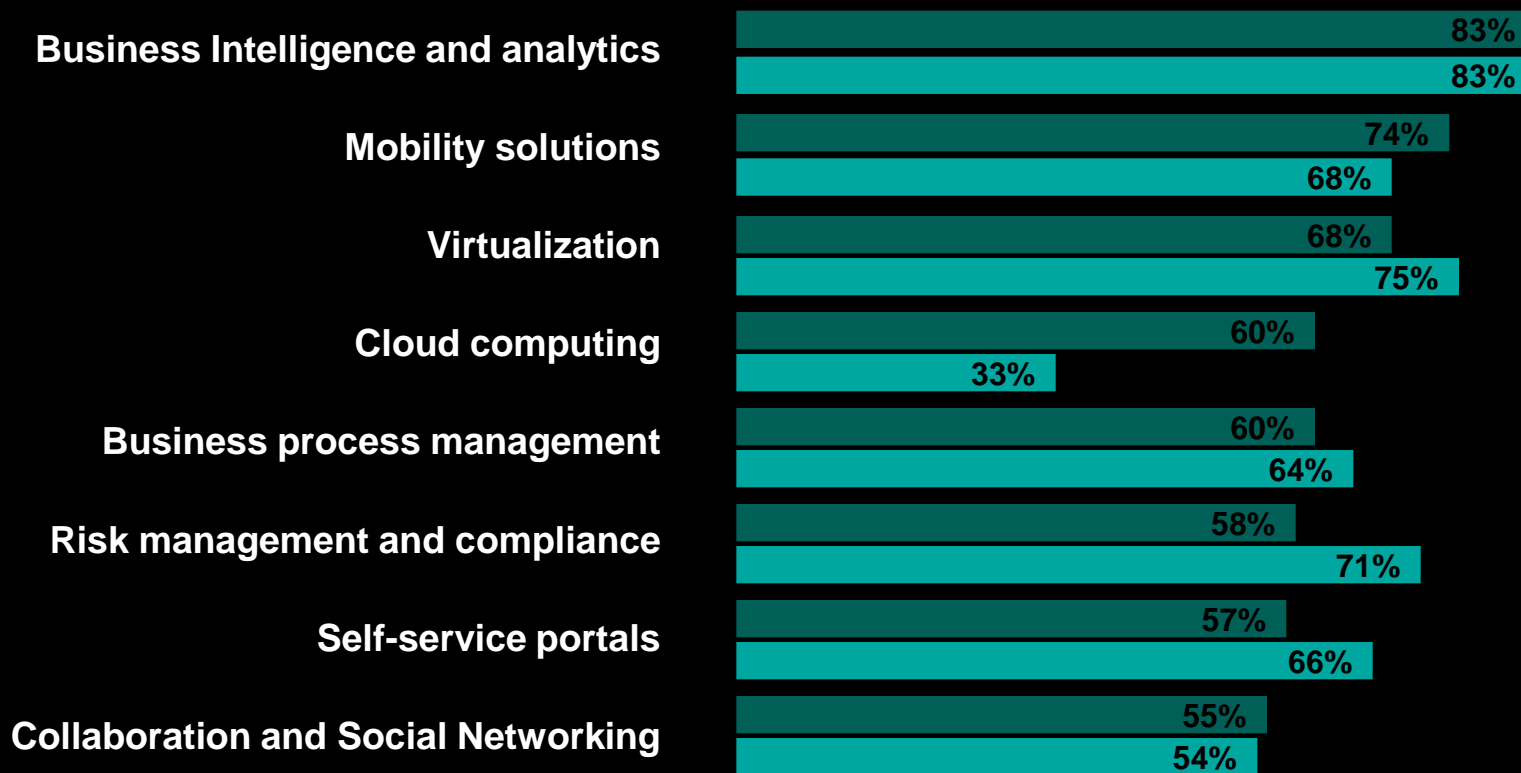
Source: 2011 CIO Study, Q12: "Which visionary plans do you have to increase competitiveness over the next 3 to 5 years?" (n=3,018)

■ 2009   ■ 2011

20

Spectrum of Deployment Options for Cloud Computing

Private Cloud	Managed Private Cloud	Hosted Private Cloud	Shared Cloud Services	Public Cloud Services
Enterprise Data Center	**Enterprise Data Center**	**Enterprise**	**Enterprises**	**Users**
	Third-party operated	**Third-party hosted and operated**		▪ **Free** ▪ **Register** ▪ **Credit Card** ▪ **Click to contract**
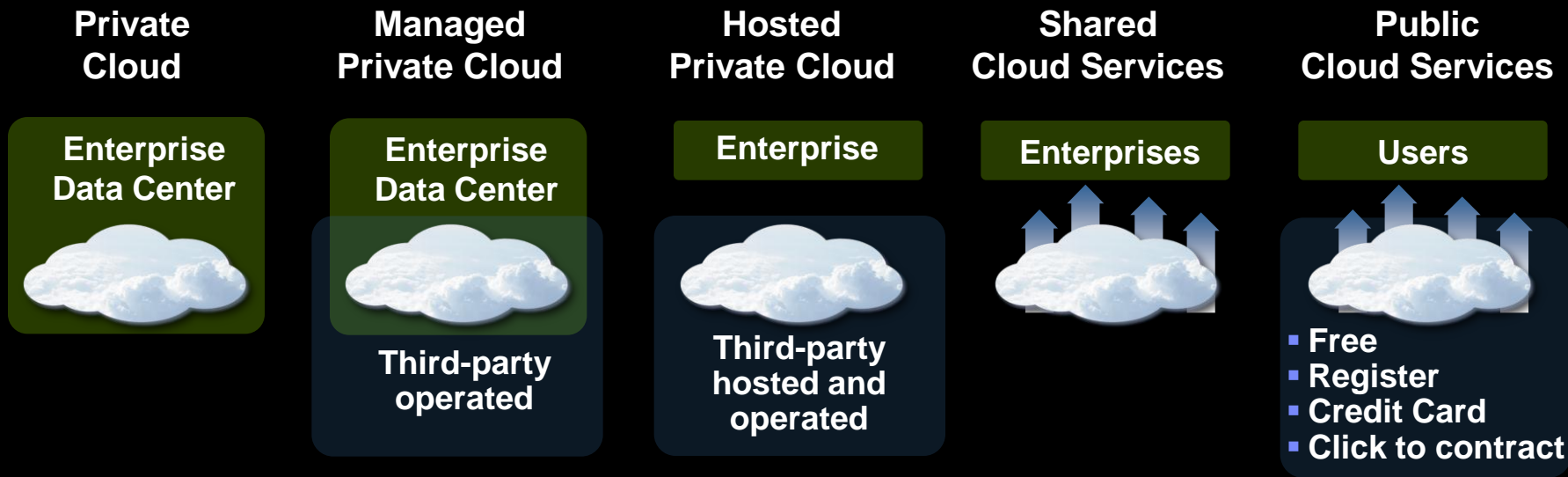
Private
IT capabilities are provided "as a service," over an intranet, within the enterprise and behind the firewall

Public
IT activities / functions are provided "as a service," over the Internet

Hybrid Internal and external service delivery methods are integrated

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The **IBMSmartCloud** delivers a robust set of services from IBM and an ecosystem of partners to deploy along side your own services

Client Defined Services

Unified communications

Backup

Desktop

Security

Compute & Storage

SAP

Partner Services

IBMSmart**Cloud**

Enterprise   Enterprise+

Management, support and deployment

Security and isolation

Availability and performance

Technology platform

Payment and billing

Enterprise data center

Managed private cloud

Enterprise

Hosted private cloud

Enterprise

A   B

Shared cloud services

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