Cloud Considerations for Governance: How SOA can enable Cloud Governance

John Falkl

IBM Distinguished Engineer and Chief Architect, SOA Governance

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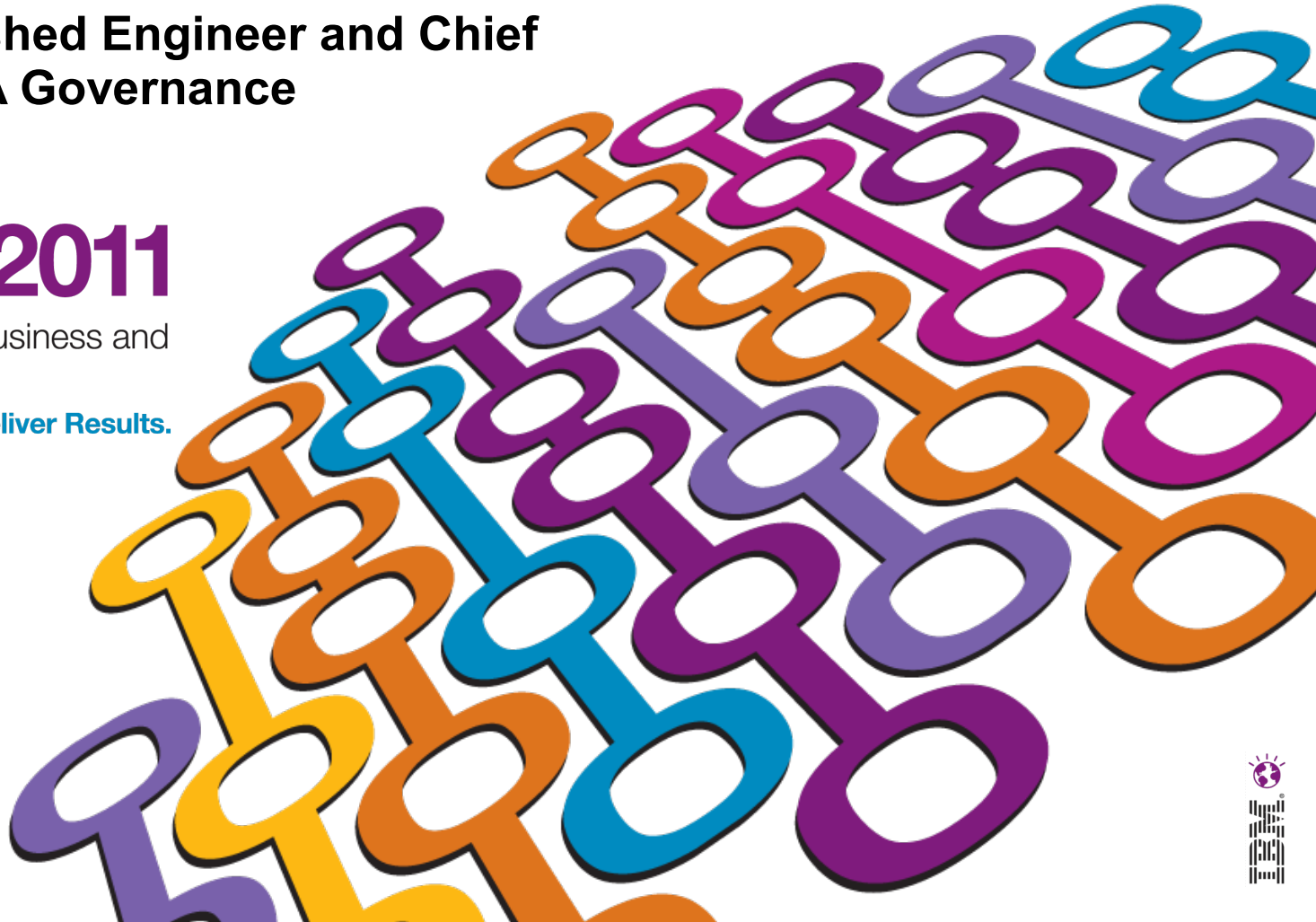
Session 1833



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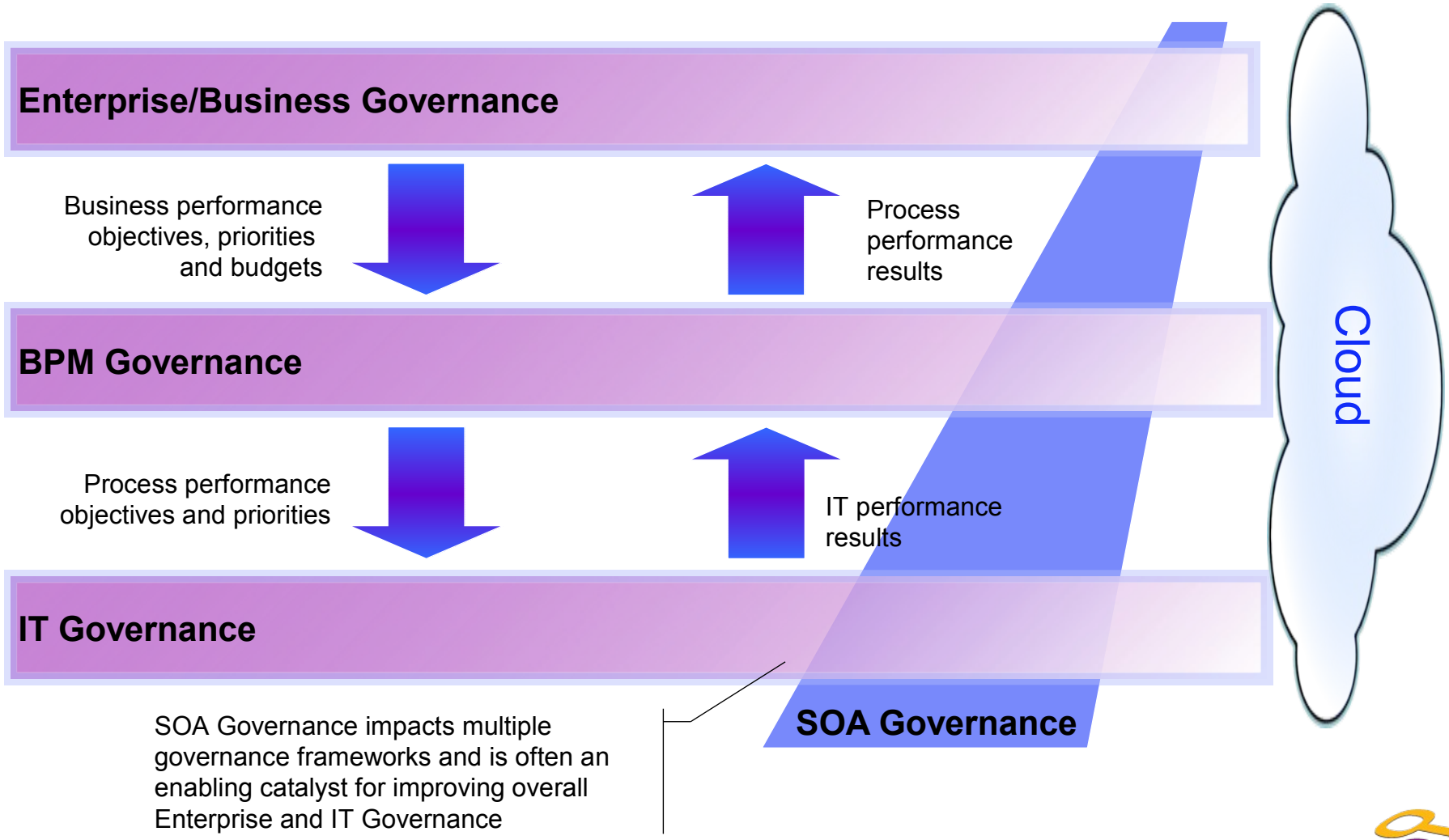
Key Points:

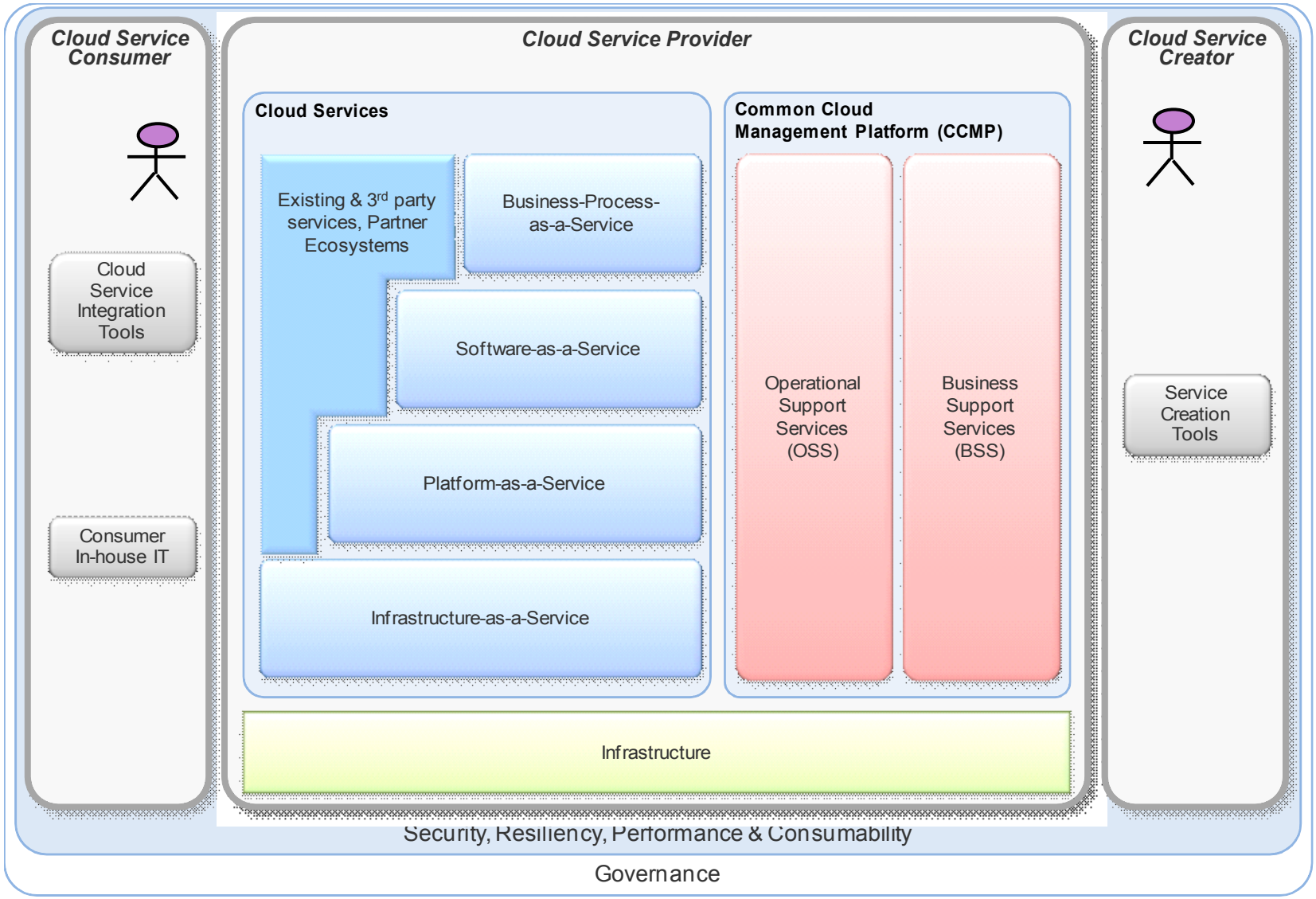
- Cloud Architecture drives strong interdependence on multiple reference architectures and models:
  - IT Service Management
  - SOA Reference Architecture
  - IT virtualization, provisioning and security
- Standards are emerging, but the challenge will be to leverage current models that work and not re-invent the wheel
  - e.g. COBIT, ITIL, SOA Governance
- Cloud Architecture draws heavily on SOA Architecture
- Subsequently, SOA Governance in combination with other governance models (like IT) can provide significant value to governing Cloud environments.

Governance frameworks are linked and aligned around the achievement of business performance objectives

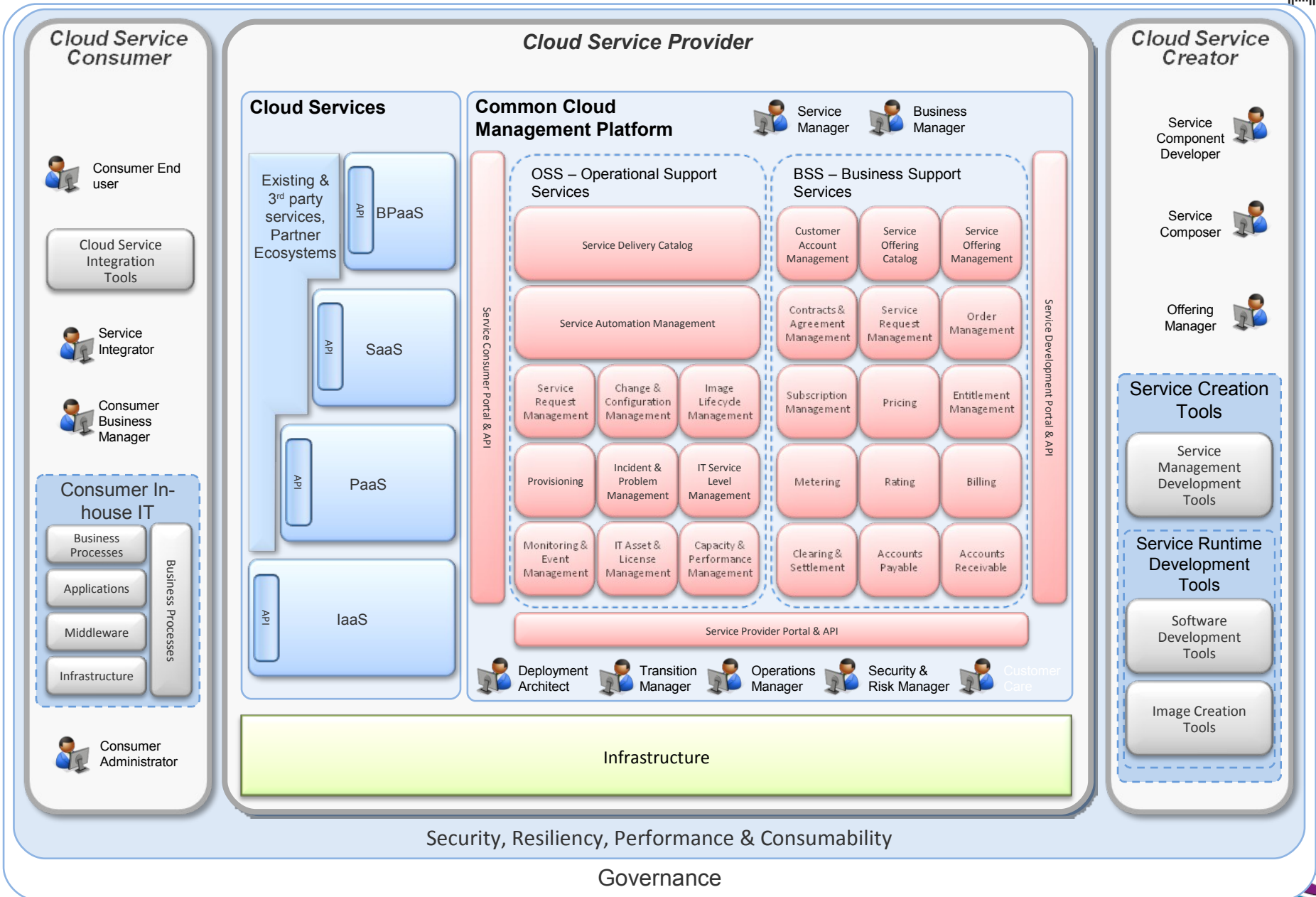


SOA Governance impacts multiple governance frameworks and is often an enabling catalyst for improving overall Enterprise and IT Governance

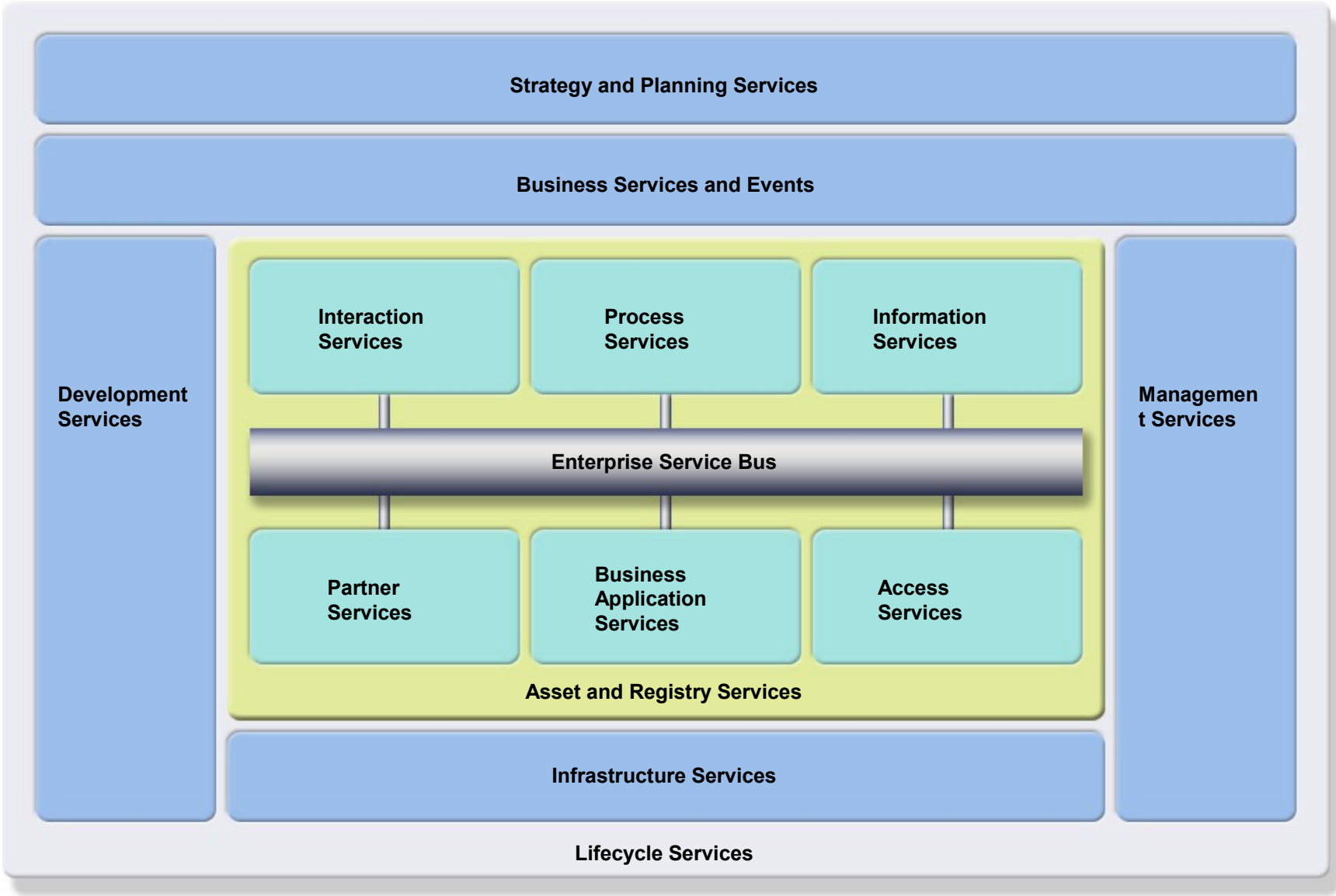
IBM's Cloud Computing Reference Architecture



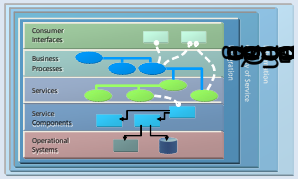
Cloud Computing Reference Architecture (CC RA) – Overall drill-down



Refresher: The SOA Foundation Reference Model



From SOA to Cloud Architecture



SOA Reference Architecture

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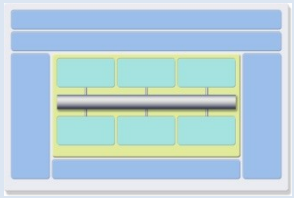

SOA Reference Architecture – Middleware View

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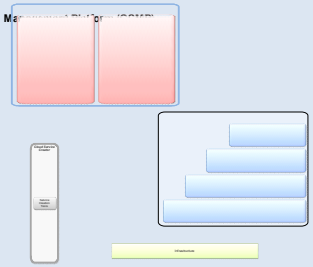

Cloud specifics

- Problem domain constrained to "service delivery & consumption"
- Ecosystem Aspects (Consumer, Provider, Creator)
- Mgmt & delivery
- I/P/S/BPaaS
- Virtualization
- Engineering of infrastructure

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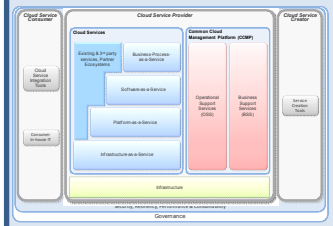

Cloud Reference Architecture

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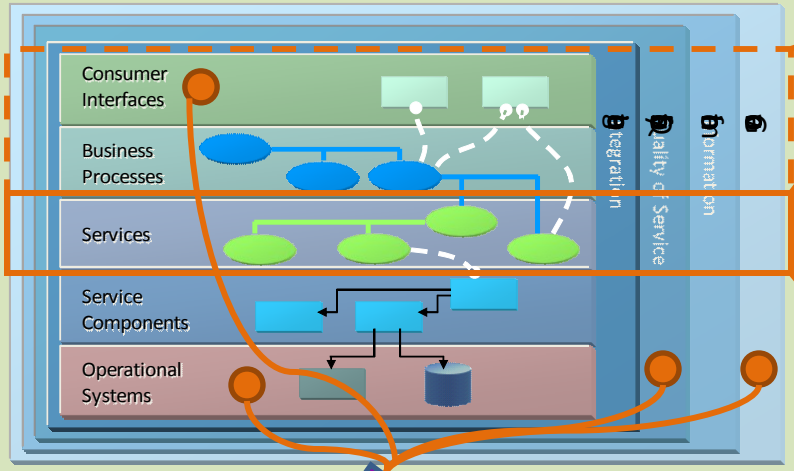
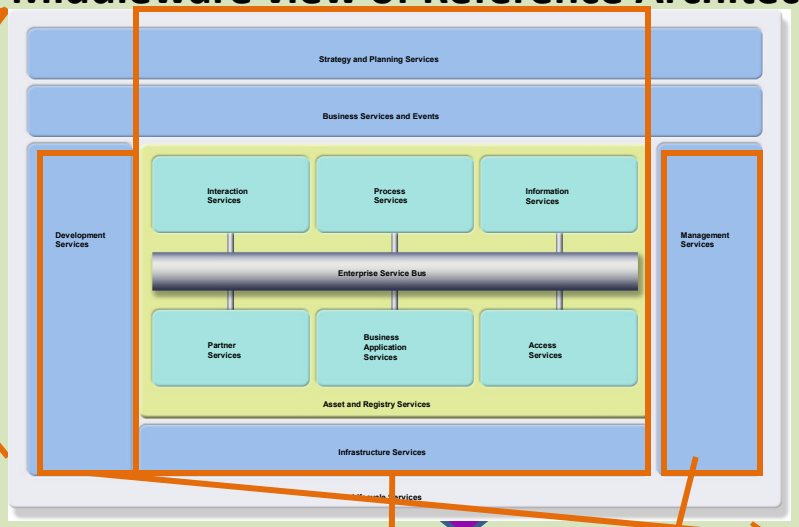
SOA Reference Architecture



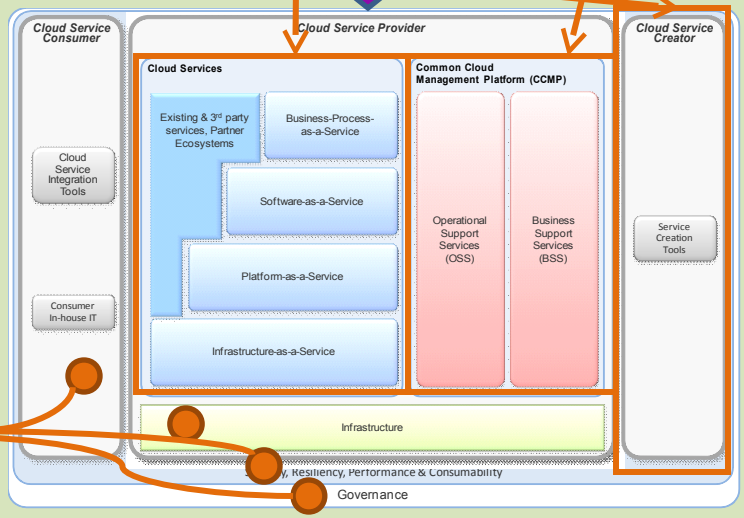
Middleware view of Reference Architecture



+Cloud Specifics

Cloud RA

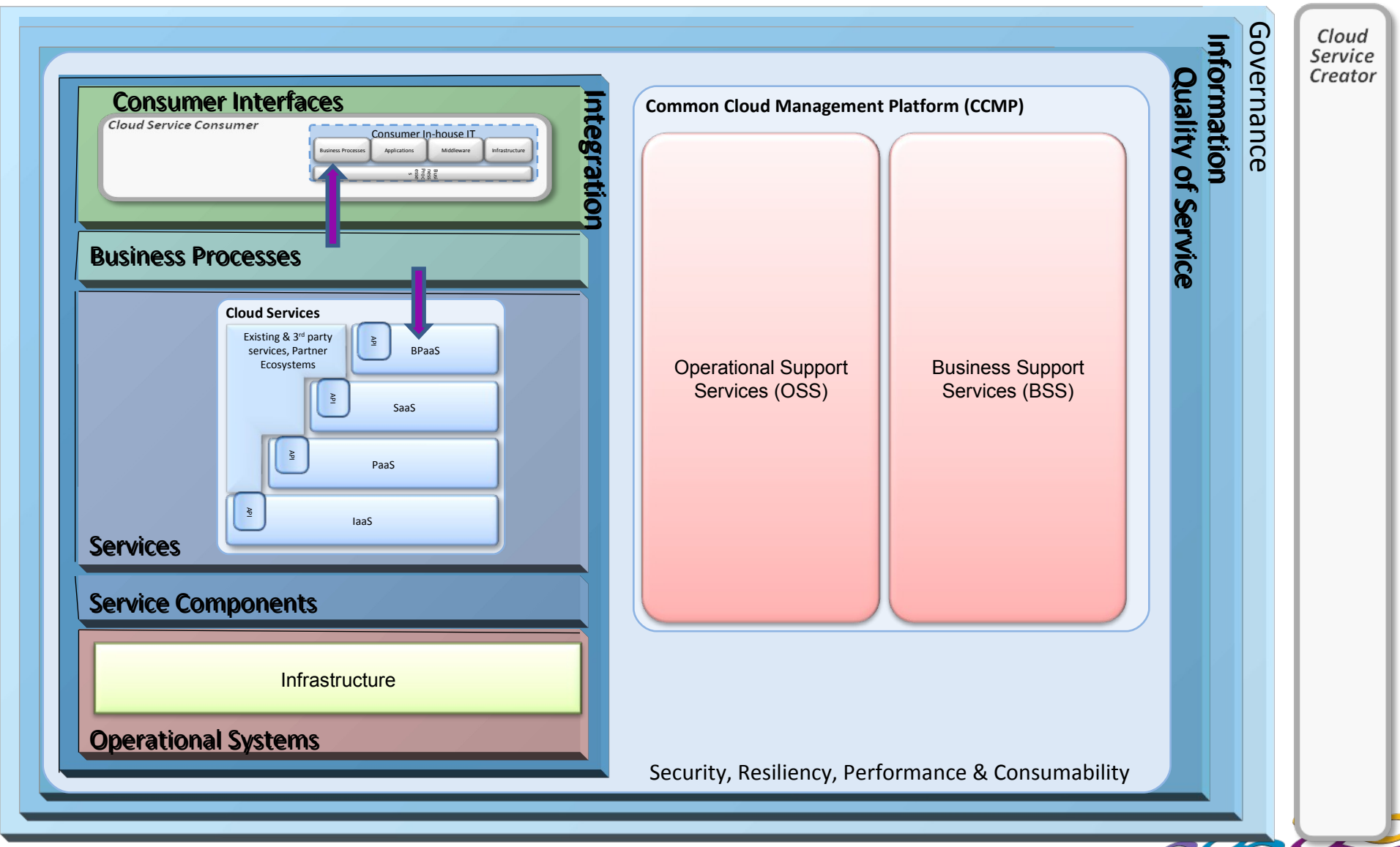
Combination of SOA Reference Architecture, SOA Middleware View and Cloud-specifics



1. **Cross-cutting aspects important for cloud** (security, resiliency, performance, consumability, governance) focusing on cloud-specific challenges (e.g. new cloud security issues beyond typical SOA security)
2. **(HW) infrastructure** requiring intensive engineering to achieve cloud-scale costs

1. **All cloud services adhere to SOA reference architecture**
2. **SOA allowed great degree of flexibility**
   → Cloud RA constrains SOA concepts to problem domain of "service delivery & consumption" to drive simplification
3. **Combines services structure, QoS, mgmt & delivery and ecosystem aspects (consumer, provider, creator) in one view**

Cloud Computing Reference Architecture rearranged into the SOA Reference Architecture style



The reality of cloud standards

	DMTF	The Open Group	OASIS Standard	ETSI	CSA Cloud Security Alliance	OpenGridForum	tmforum	SNIA
Architecture		✓	✓	✓			✓	
API	✓			✓		✓		✓
Virtualization	✓							
Management	✓	✓	✓			✓		✓
Storage						✓		✓
SLA		✓	✓				✓	
Network	✓							
Security	✓	✓	✓		✓			

ETSI · Open Cloud Consortium · ISO International Organization for Standardization · simple cloud · GICTF · Apache · NIST · δ·CLOUD · ncoic · ITU International Telecommunication Union · libcloud · RESERVOIR

Dozens of new communities and organizations have formed around cloud standards including industries and governments

✓ IBM Leadership / Participation ✓ IBM Monitoring

Cloud Standards Landscape

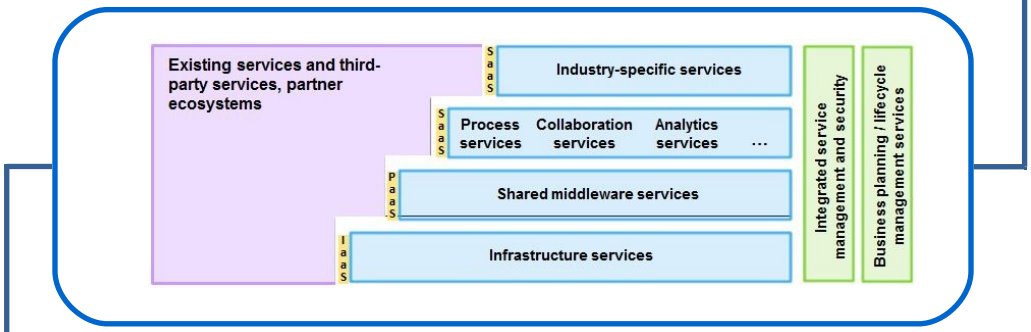
While there is a lot of hype around cloud standards, existing IT and SOA standards apply to the cloud and should be reused.

Our approach to standards is to address inhibitors to cloud adoption, avoid vendor lock-in and enable portability.

Relative cloud standards activity

Cloud standard focus: Architecture

✓Ensure industry reference architectures are alignment with IBM's view of SOA and Cloud architectures.
✓Leverage existing standards for SOA in Cloud architectures
✓Define meta model and extensions to The Open Group's SOA reference architecture for Cloud Computing *2Q2011*
✓Defining cloud security reference architecture for confidentiality, integrity, and availability requirements of SOA and Cloud computing *1Q2011*



IBM CCMP Reference Architecture
Participants: IBM Internal effort for now

Status: The Common Cloud Management Platform (CCMP) team, focused on delivering a reference architecture that will be used for all IBM public and private cloud implementation projects.

The Open Group (TOG)
http://www.opengroup.org/cloudcomputing
TOG Cloud Work Group is focused on enabling buyers and suppliers to include Cloud Computing technology in their architecture.
Participants: HP, Capgemini, CGI, Boeing… Note: Microsoft has stated an intent to join the Cloud WG
Status: IBM co-chairs the 4 of 5 projects in progress but just lost Cloud WG cochair. . IBM has represented TOG at Cloud events.

Key partners & standards venues

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THE Open GROUP
Making standards work®

CloudUseCases.org

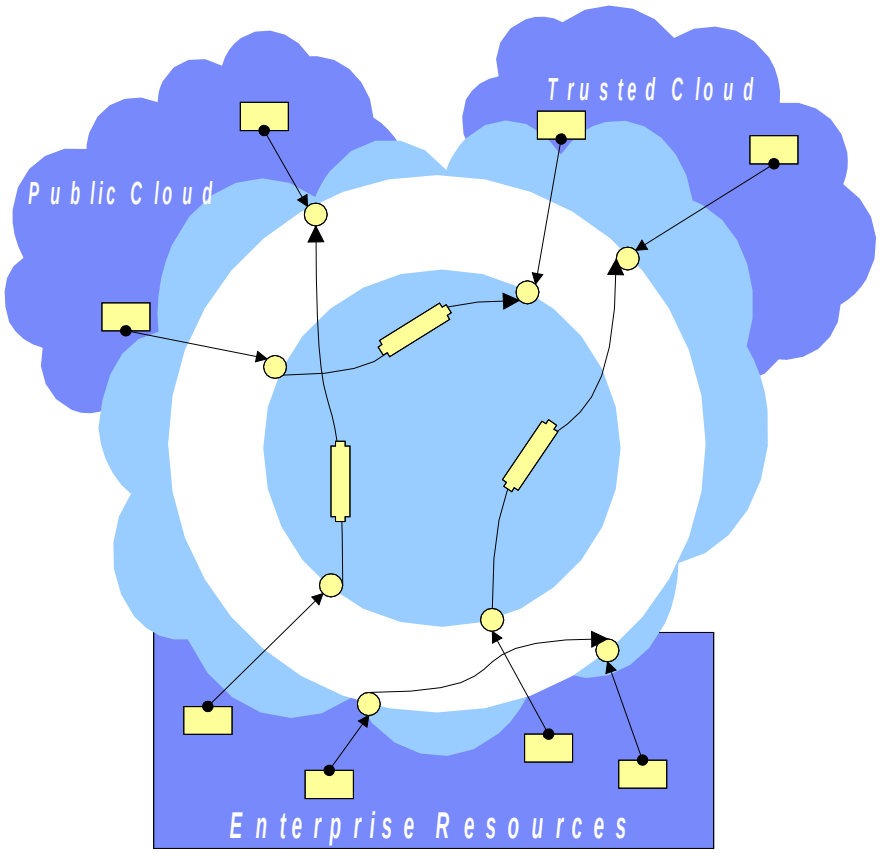
Moving Forward

- In order to drive Cloud adoption, we must drive standardization, including lifecycle management processes, asset metadata, and other business enabling processes including:
  - Virtualization
  - Load Balancing
  - Service deployment
  - Provisioning
  - Contract Management
  - Change management/notification
  - Security, etc
  - Non-repudiation
  - Isolation, including information and process

Hybrid Cloud Management, Security and Integration

From the Enterprise Client's perspective:

- *Management of workloads running off-premise on clouds*
- *Security for Hybrids*
- *Integration of applications & data*
- *Application and Workload migration workbench*



'existing/legacy' datacenter and private cloud

Example areas of consideration when implementing cloud services

Aspect to be considered
What do I want to expose as a cloud service / what is my “unit of delivery & mgmt” and which (self-service) execution functionality?
What is the scope of management (mgmt up to hypervisor, OS, MW, App) and the associated management processes?
Which underlying provisioning functionality do I need for my cloud service?
Which assets do I need to maintain (servers, storage, SW licenses, etc.)?
Which rates should be applied to the metered information?

Provisioning Considerations for Cloud

- Resource provisioning based on provider/consumer agreements
- Fixed vs variable costs for service consumption
- Ensure the cloud services you consume are appropriate for the task
- Make vs Buy

Governance Considerations for Cloud

- How (and when) to provision additional virtual devices (like compute capabilities) are more directly tied to contracts
- Cloud Governance models are usually extensions of existing IT, SOA and BPM governance models
- Be aware of regulatory requirements
- Automation is key to optimal service automation (e.g. policy) across all realms of Cloud
- Additional business enablement requirements

Governance processes should make it easy to do things the right way and hard to do them the wrong way. Build schools, not prisons. The goal is to help people conform to best practices, not police them.

Mark Ericson, chief technology officer (CTO), Mindreef

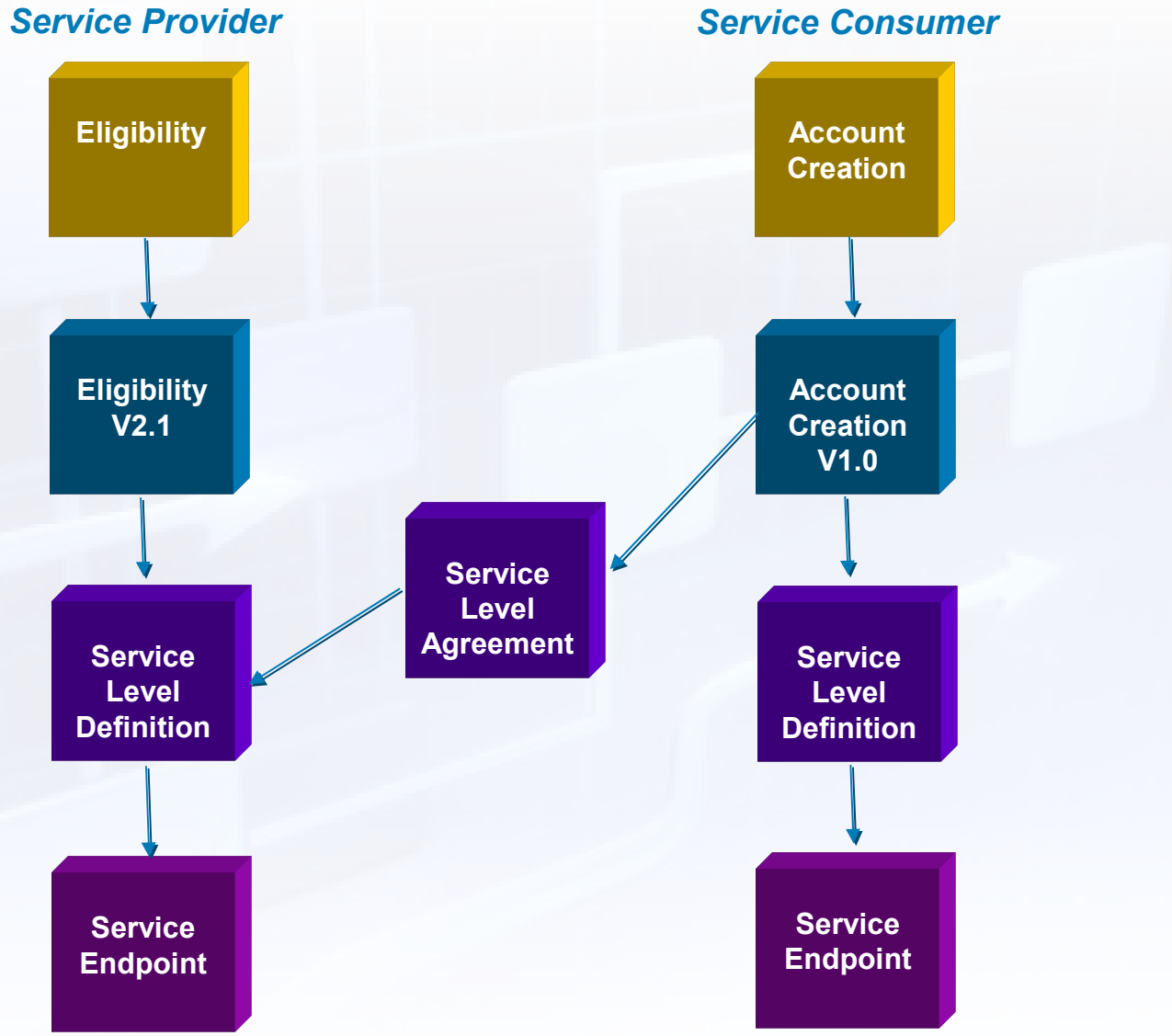
Security Considerations for Cloud

- Federated identity and trusted identify sources are critical
- Understand limitations of security capabilities from cloud provider
- Understand legal requirements (e.g. country boundary regulations)
- Authentication in the Cloud
- Contract and Legal concerns

How SOA Governance enables Cloud Governance

- SOA Governance defines essential governance and management processes for consumer/provider environments
  - Portfolio Management, Project Management, Service Management, Policy Management to name a few
- Cloud Governance requires extensions of SOA/service provisioning, security and federation
  - Business models are more contract driven
  - Technology automation is ‘entry stakes’ for Cloud
- Business and Technology standardization will be crucial for Cloud adoption
  - Metadata exchange and cataloguing techniques will provide faster access to services and drive competition based of superior functionality

Governs the Service Consumers as well as the Service Provider



Cloud computing delivers IT and business benefits

Virtualized

- Higher utilization
- Economy of scale benefits
- Lower capital expense
- Lower operating expense

Standardized

- Easier access
- Flexible pricing
- Reuse and share
- Easier to integrate

Automated

- Faster cycle times
- Lower support costs
- Optimized utilization
- Improved compliance
- Optimized security
- End user experience

Doing more with less

Higher quality services

Breakthrough agility and reducing risk

IT benefits from cloud computing are real

Results from IBM cloud computing engagements

Test provisioning	Weeks	Minutes
Change management	Months	Days/hours
Release management	Weeks	Minutes
Service access	Administered	Self-service
Standardization	Complex	Reuse/share
Metering/billing	Fixed cost	Variable cost
Server/storage utilization	10–20%	70–90%
Payback period	Years	Months

Why take advantage of cloud now?

We asked IBM clients “To what degree would each of these factors induce you to acquire cloud services?”

Reduce costs

77% or higher

- Hardware savings
- Software license savings
- Lower labor and IT support costs
- Lower outside maintenance costs

Faster time to value

72% or higher

- Relieve pressure on internal resources
- Simplify updating/upgrading
- Speed deployment
- Scale IT resources to meet needs

Consider cloud now:

- To lower the costs of delivering IT services
- To deliver flexible IT
- Because your competitors are already thinking about cloud—some are already implementing it
- Because cloud changes the economics of IT and offers competitive advantage

SOURCE: IBM, *Dispelling the vapor around cloud computing: New findings from IBM Market Insights*, 2009.

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