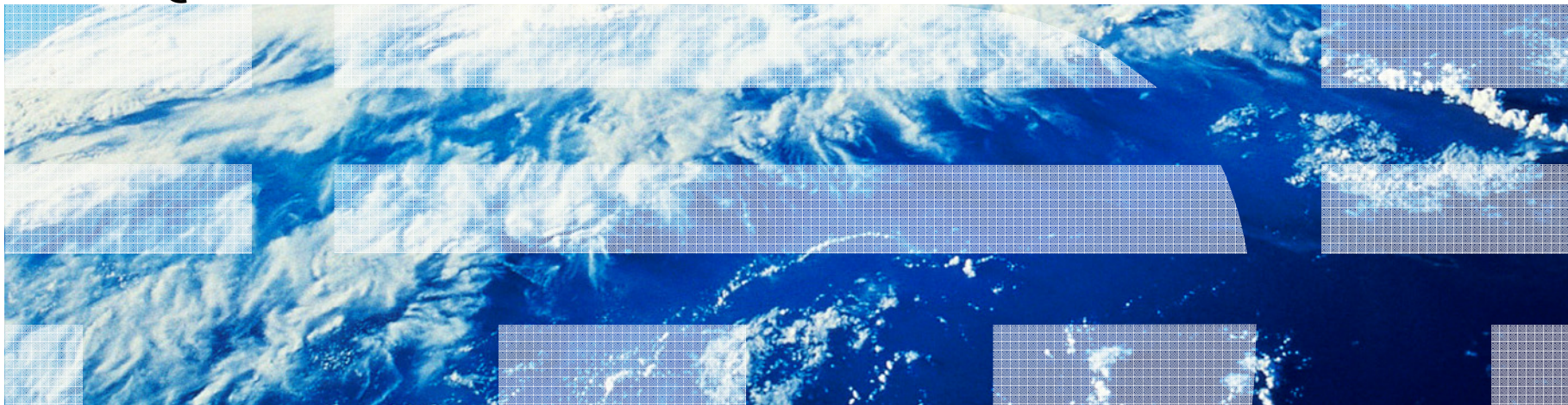


IBM Cloud Computing Reference Architecture

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May, 2010

Cloud: Consumption & Delivery Models Optimized by Workload

“Cloud” is a **new consumption and delivery model** inspired by consumer Internet services.

Cloud enables:

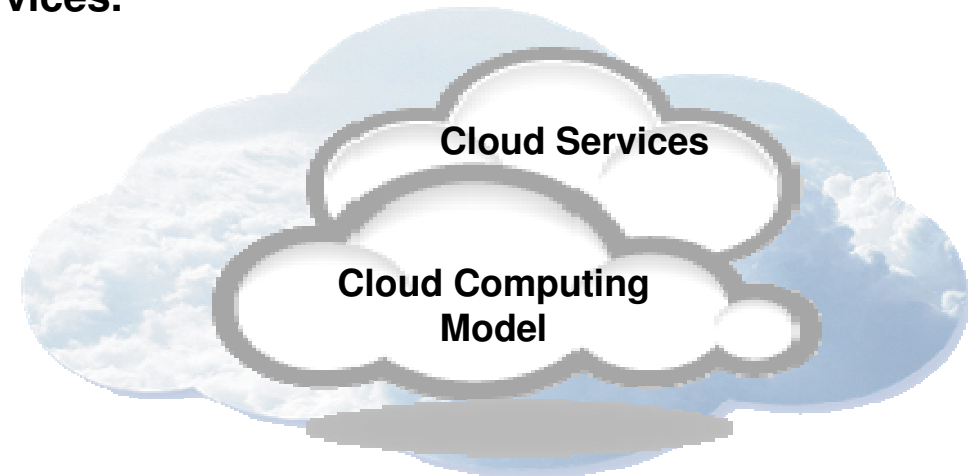
- Self-service
- Sourcing options
- Economies-of-scale

“Cloud” represents:

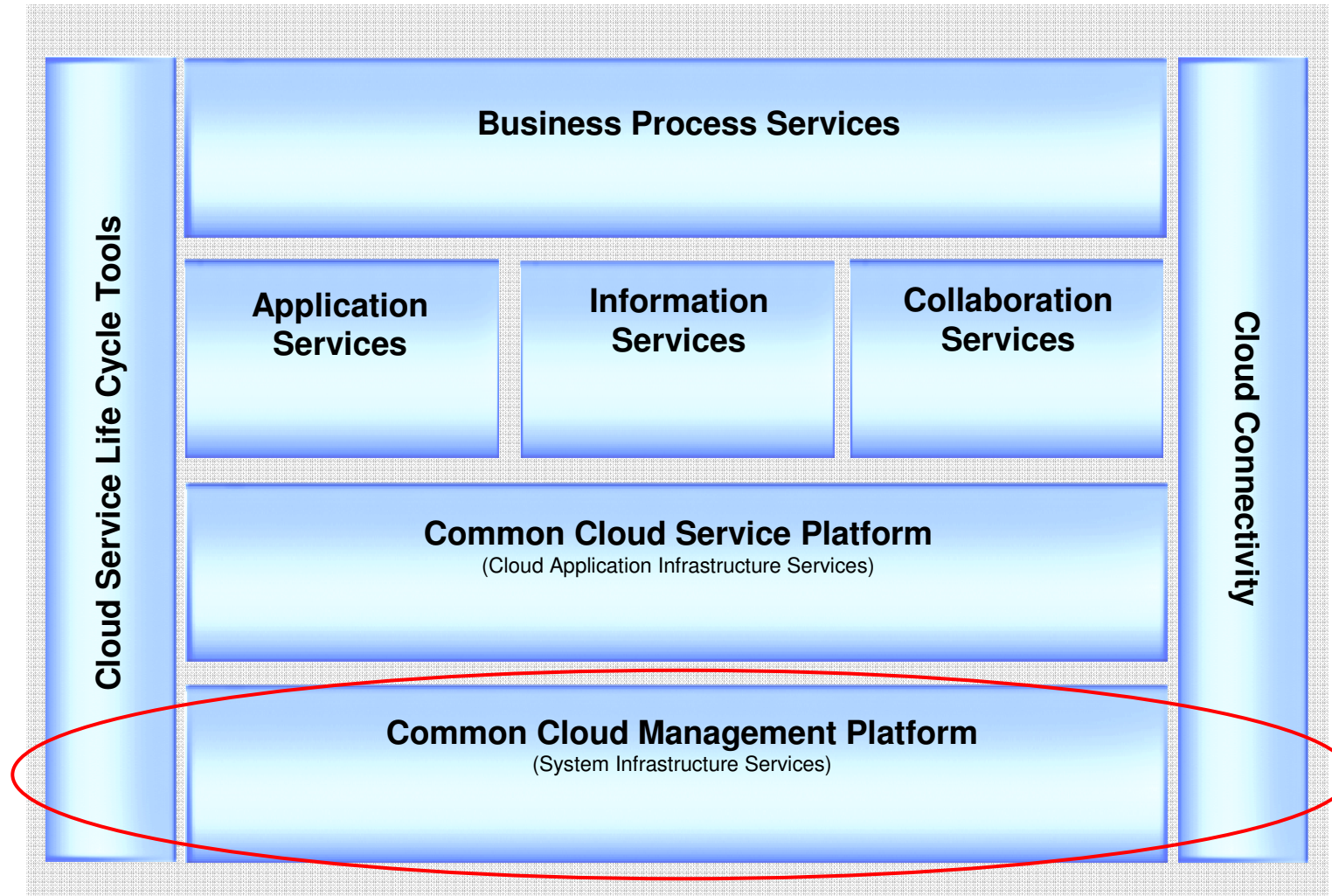
- The **Industrialization** of **Delivery** for IT supported **Services**

Multiple Types of Clouds will co-exist:

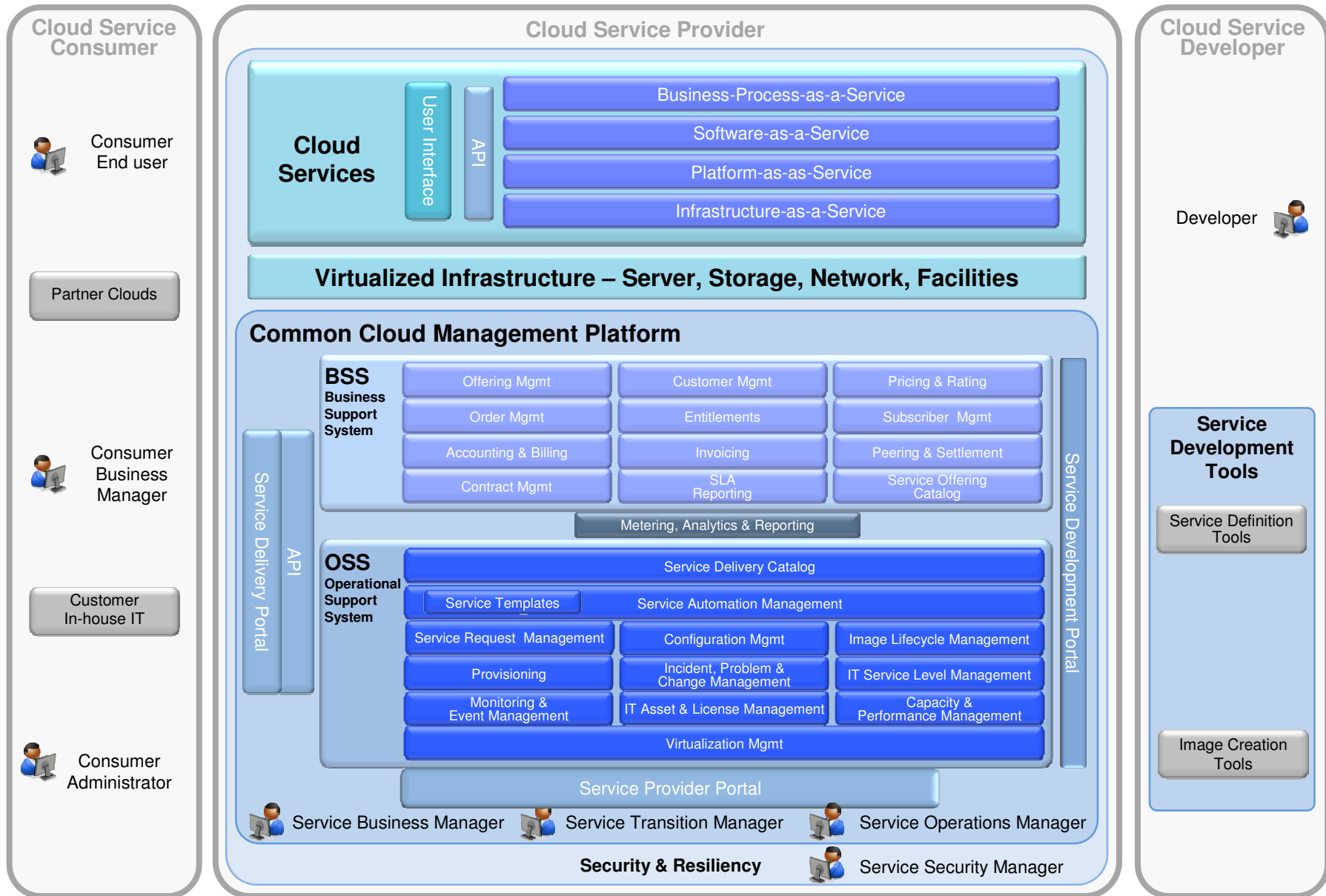
- **Private, Public** and Hybrid
- **Workload** and / or **Programming Model** Specific



Cloud Platforms and Services

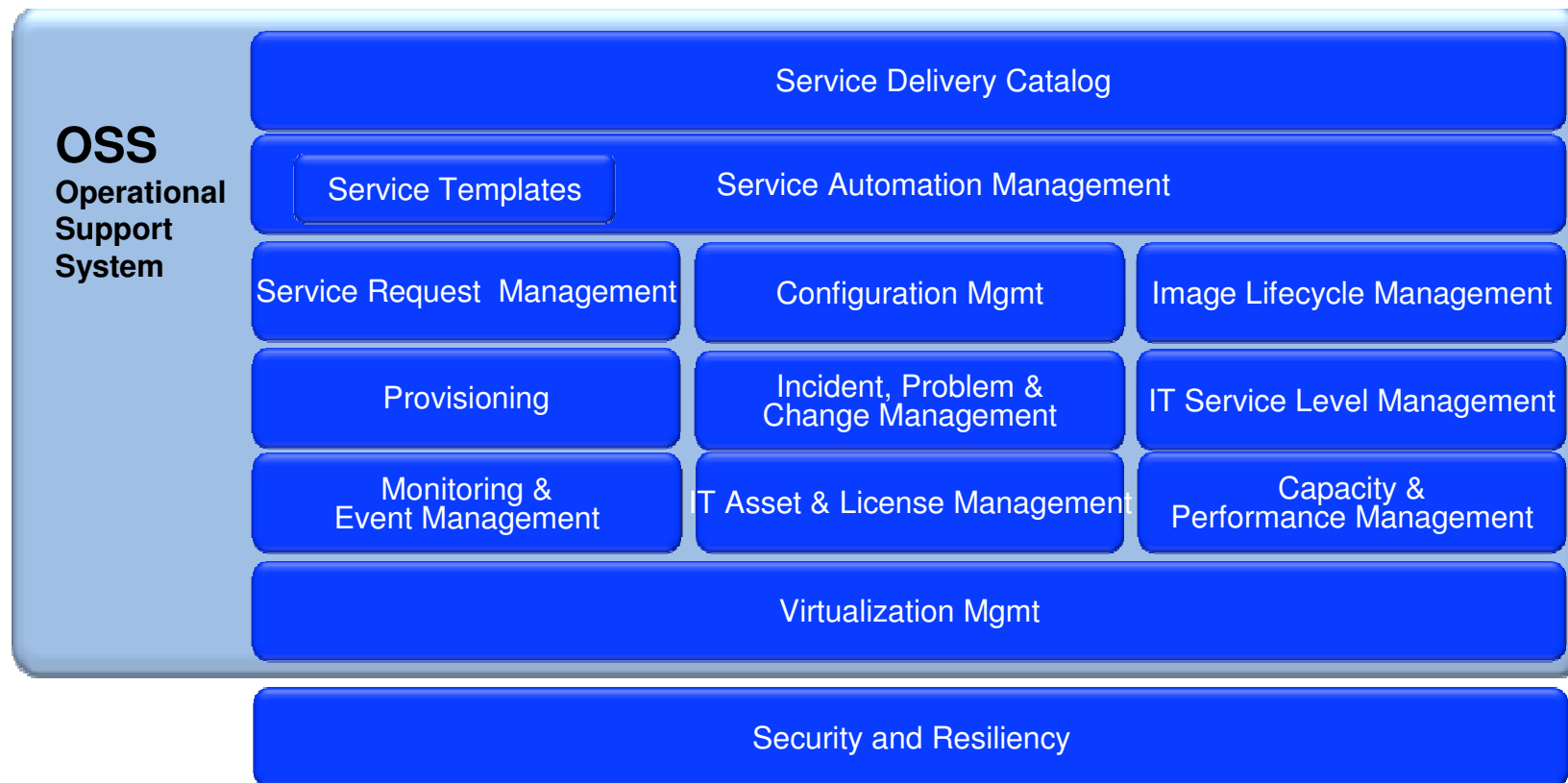


Common Cloud Management Platform Reference Architecture

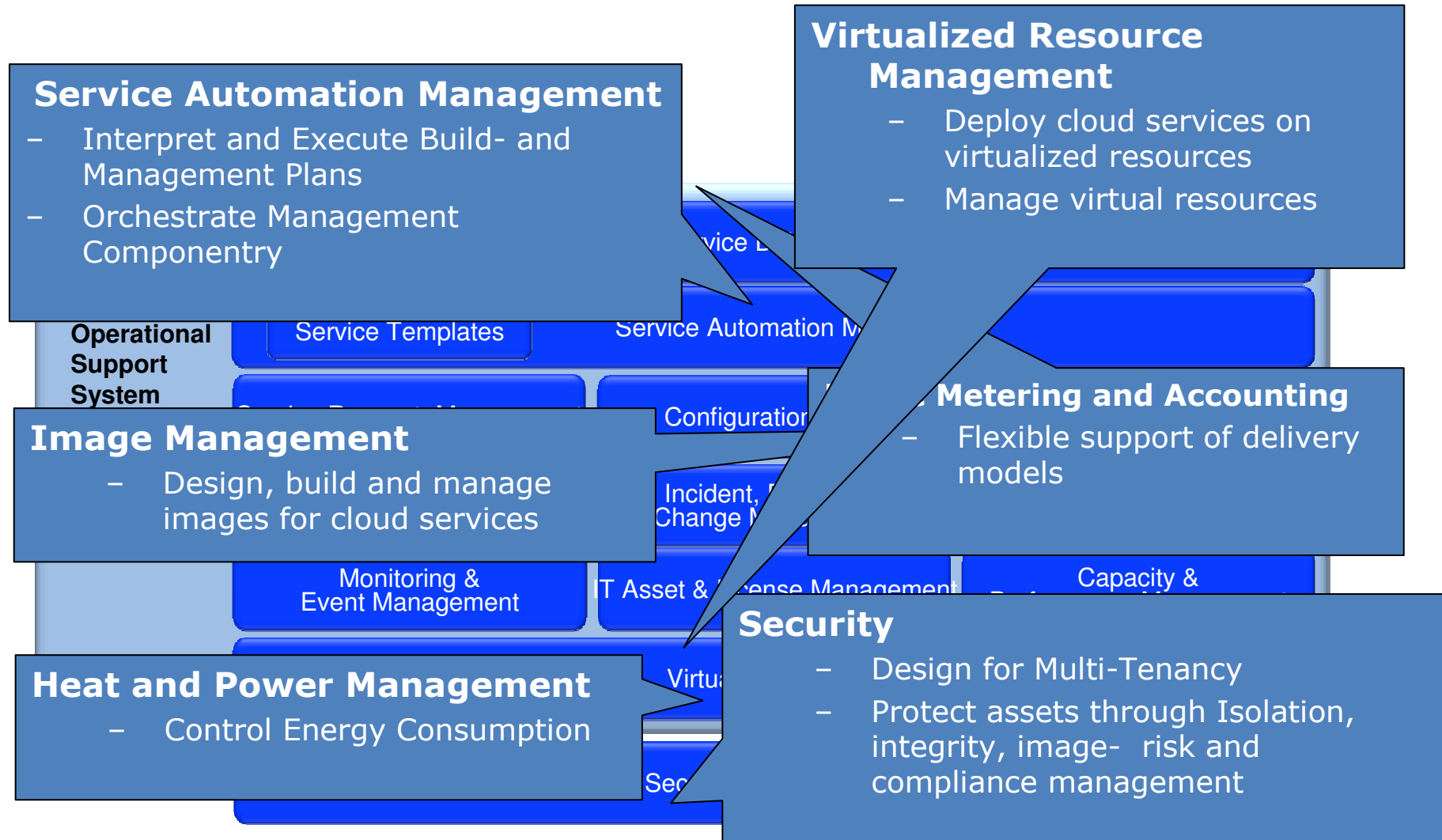


Core operational support capabilities required for a Cloud platform

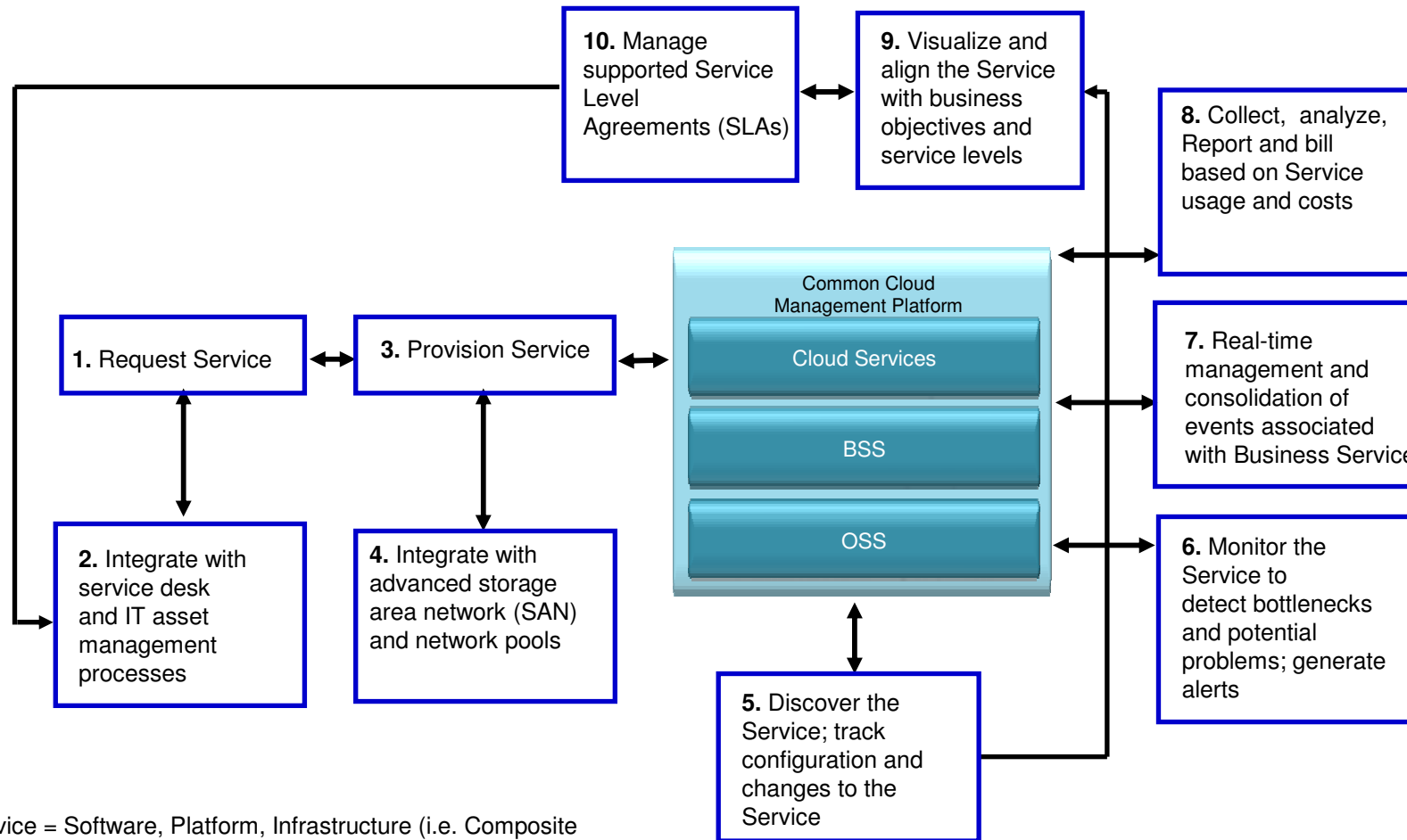
- An operational support system is required to deliver cloud services
- Key capabilities are provided below and need to work together as a basis for customer cloud service delivery



Management Concerns in Cloud Computing



Typical Cloud Use Case Scenario

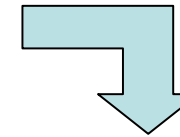
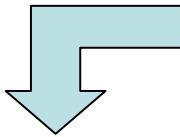
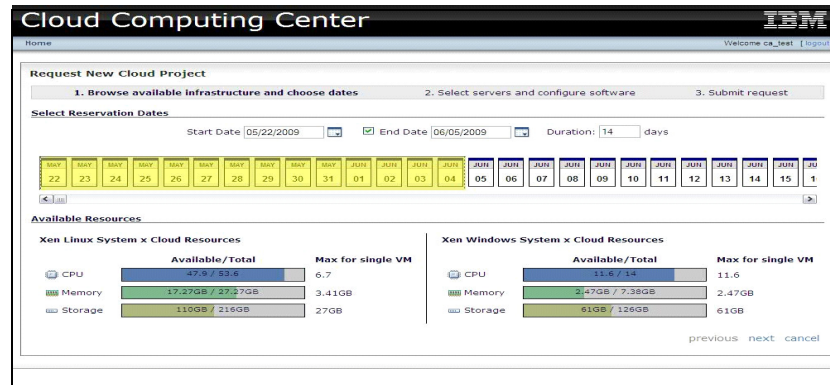


Service = Software, Platform, Infrastructure (i.e. Composite Application, Physical / Virtual OS, Middleware, Network, Storage)

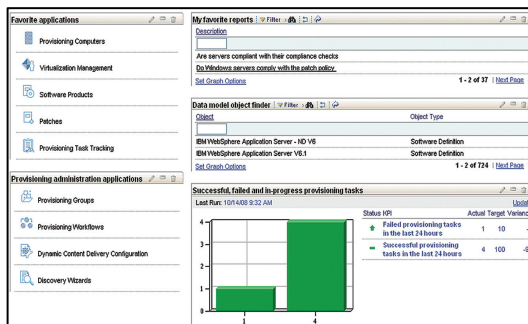
Not in all cases will all steps exist in a client engagement

Core Components of Service Managed Virtualization and Clouds

For Locating and Requesting Services



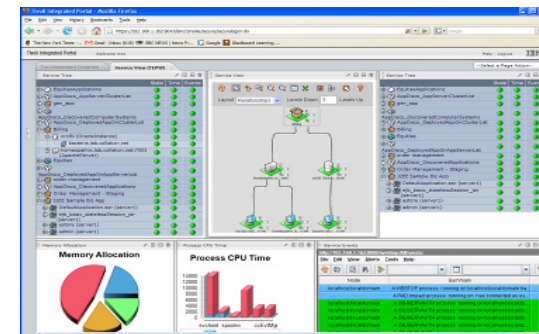
Deploying Cloud Services



Automated Provisioning and Image Management

Secure User Centric Self-Service Portal, Automation engine and Catalog

Managing Cloud Services



Monitoring, Security and Metering

Optimizing Cloud Management Platform deployments

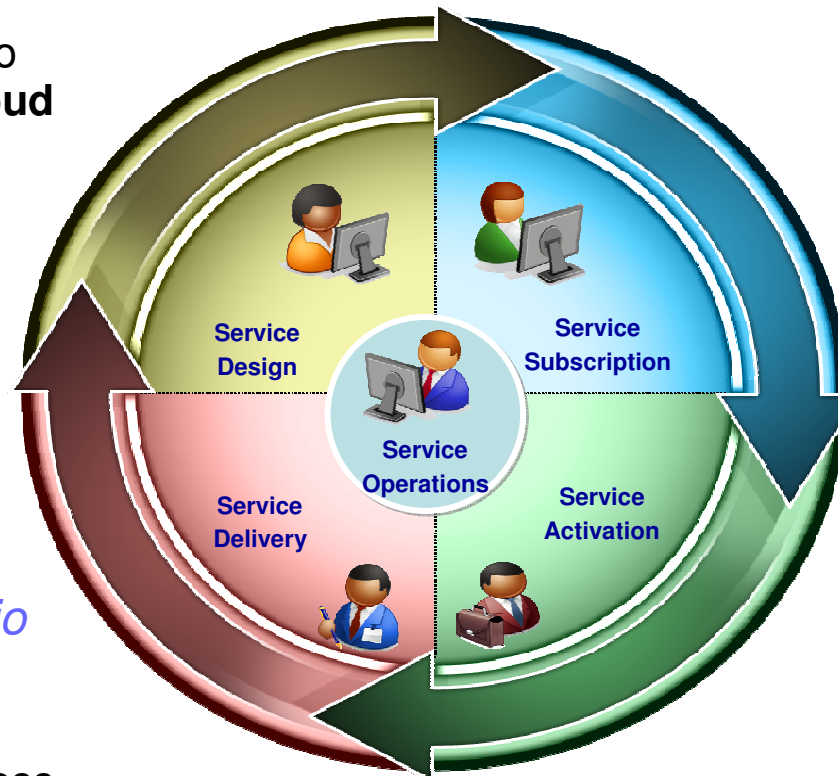
For those clients who wish to leverage a service management portfolio to build a **customized cloud solution**

Tivoli Service Automation Manger (introduced in November 2008)

+

IBM Service Management Portfolio

Powered by Tivoli process automation engine and Service Management products.



For those clients who wish to rapidly deploy a **turn-key environment** with little to no customization

IBM CloudBurst (introduced in May 2009)

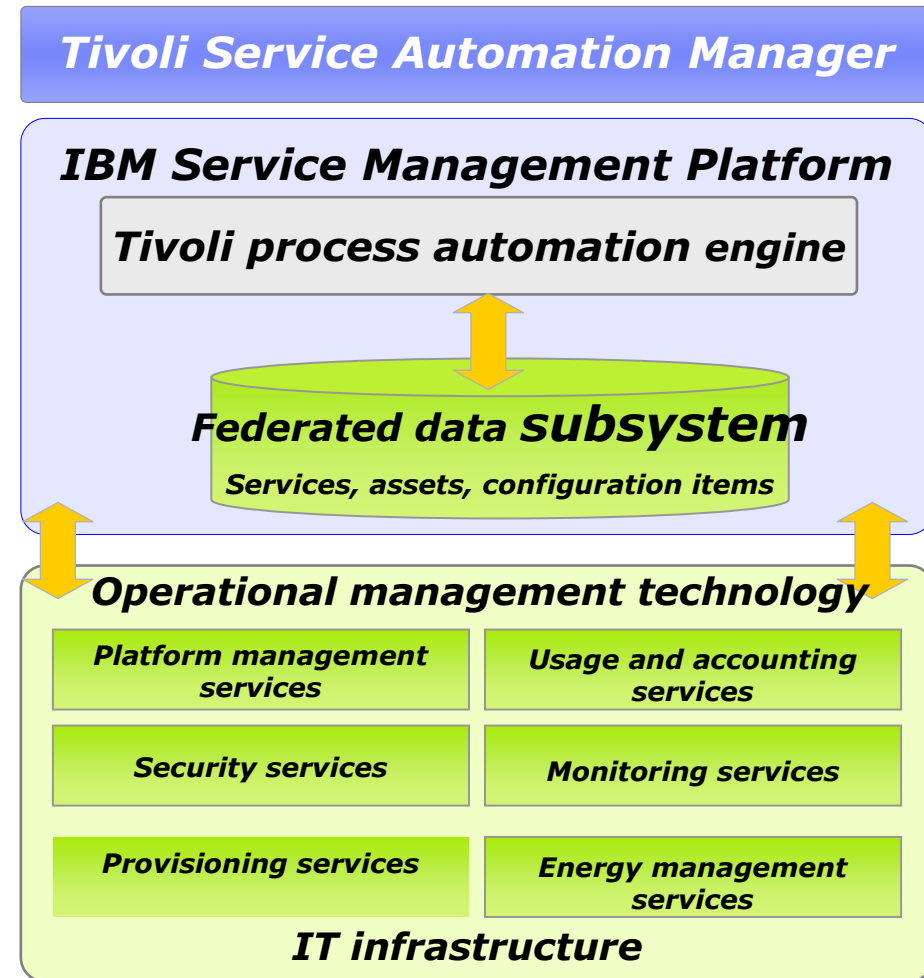
A purpose built service delivery platform that leverages the same software components in the Tivoli Service Automation Manager as well as integrated purpose built workflows

IBM Tivoli Service Automation Manager

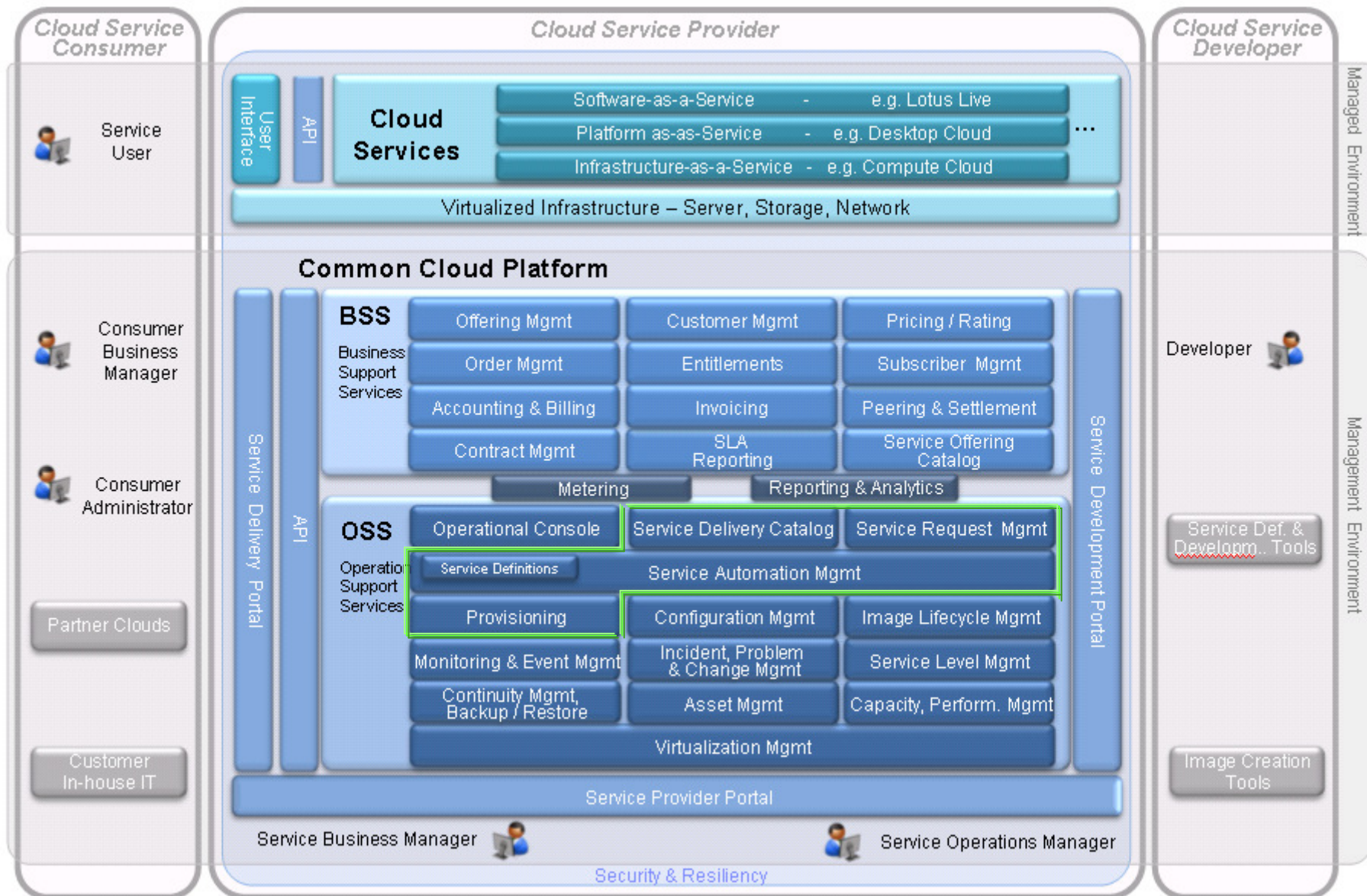
Aggregated capabilities for managing your cloud environment

IBM Tivoli Service Automation Manager

- **Built on top of the IBM Service Management Platform**
- **Orchestrates technology, processes, people and data to provide cloud computing services and service management of cloud computing**
- **Provides rapid provisioning of physical and virtual resources**

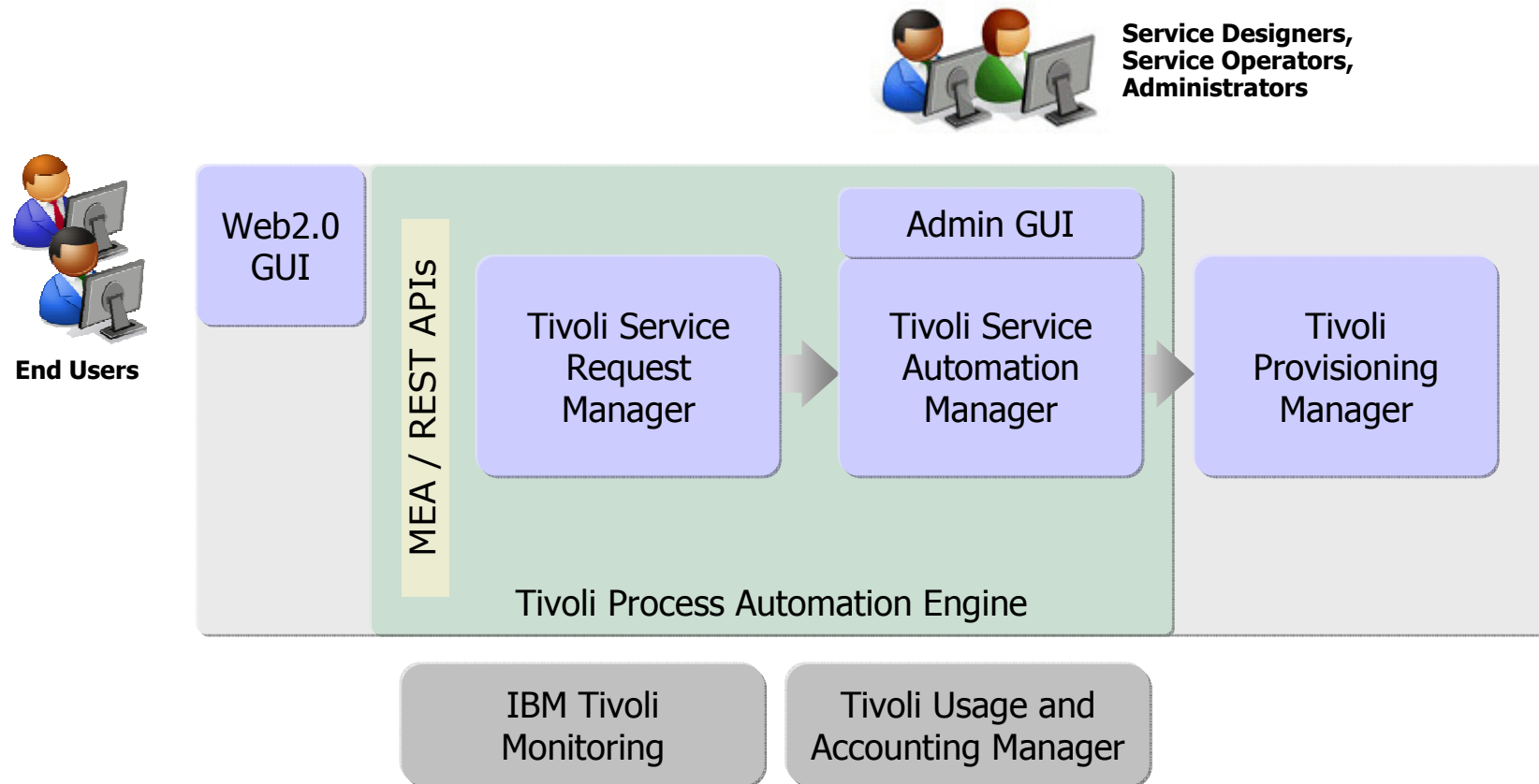


Tivoli Service Automation Manager

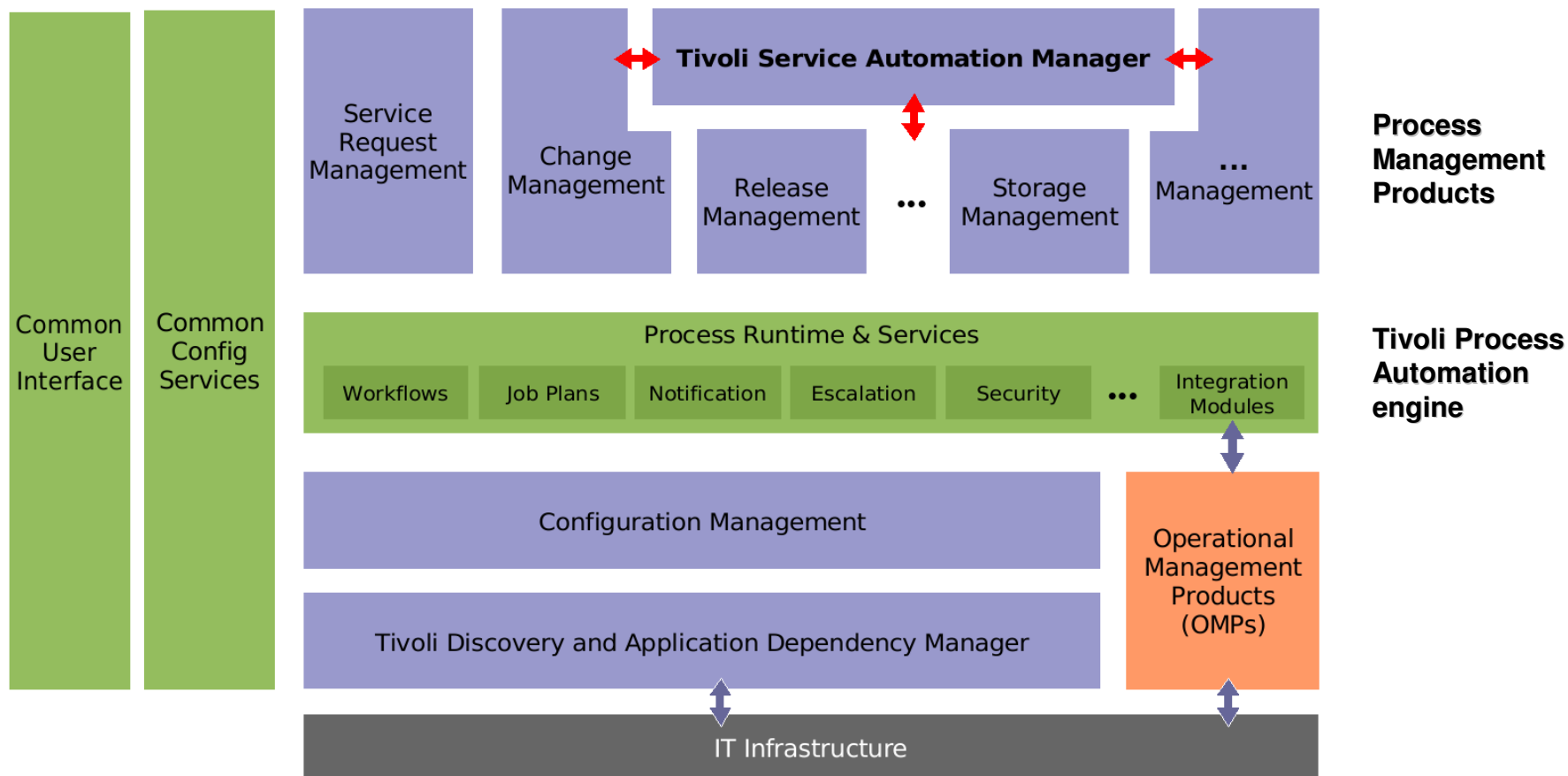


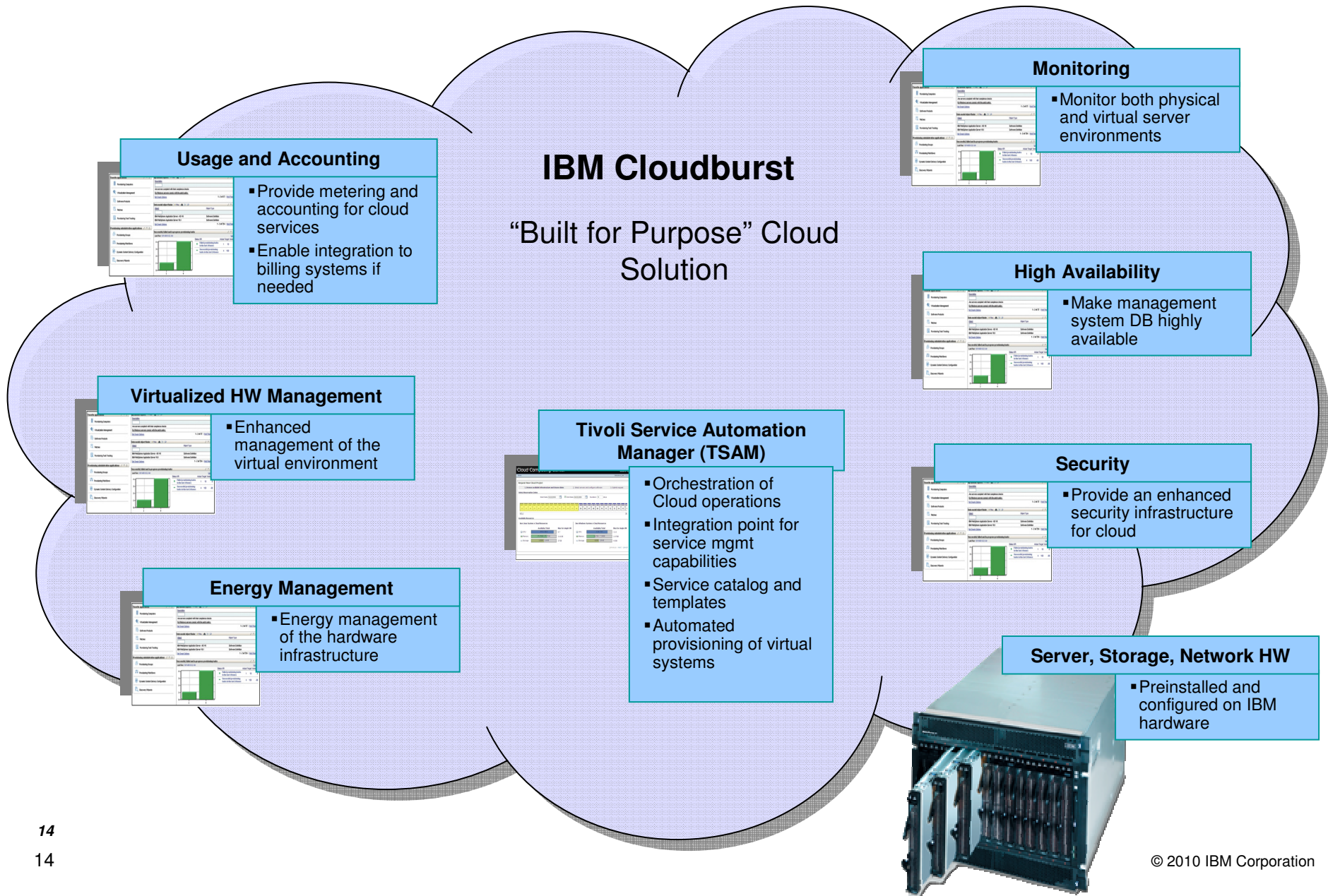
Tivoli Service Automation Manager High-Level Component Architecture

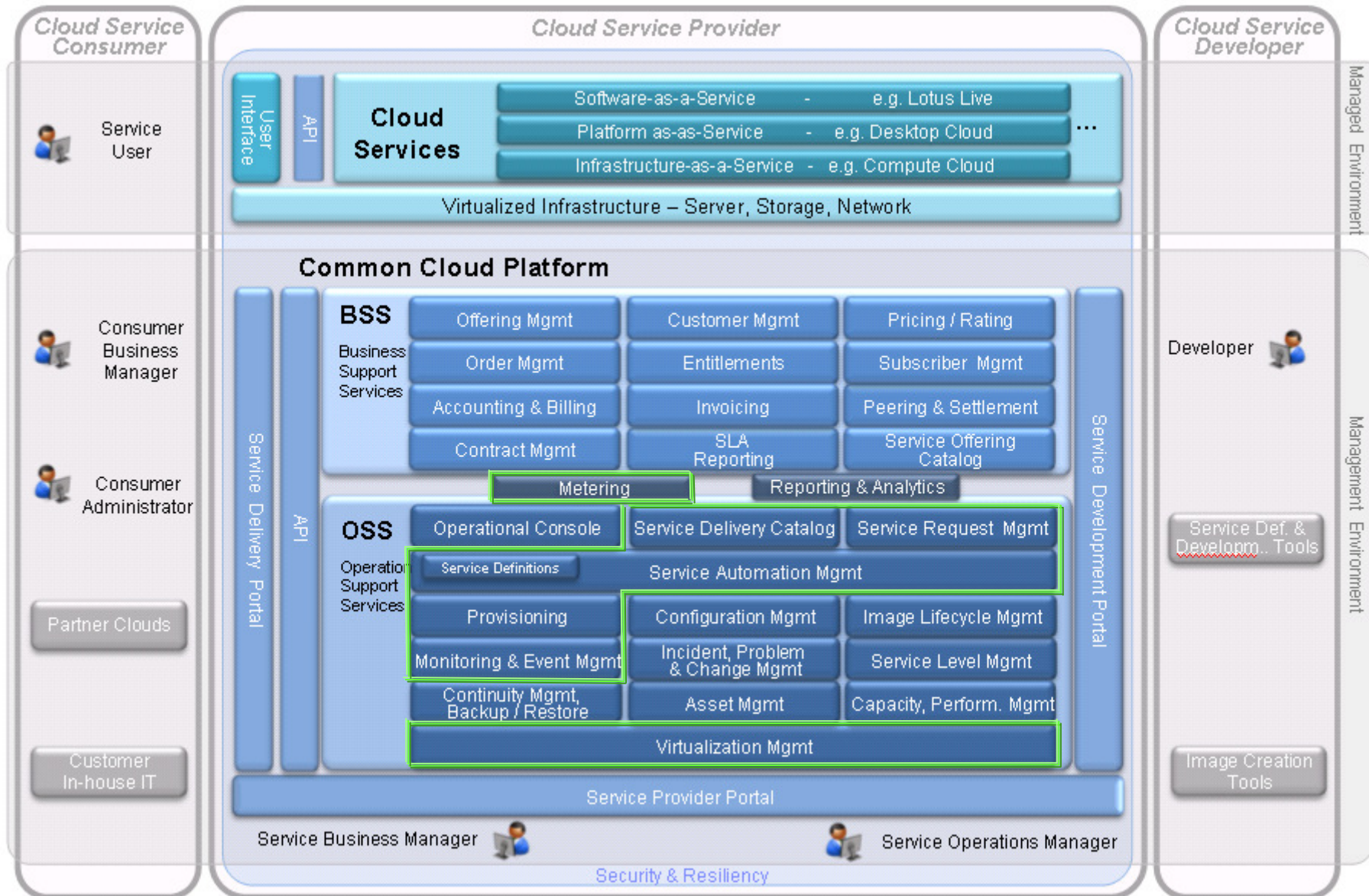
- Tivoli Service Automation Manager is a component based on the Tivoli Process Automation Engine (TPAe), implementing a data model, workflows and applications for automating the management of IT services



Tivoli Service Automation Manager and the IBM Service Management Architecture







IBM CloudBurst: an integrated service delivery platform

- **Self contained on-premise cloud:** Prepackaged hardware, software, and services based on System x Blade Center platform and Tivoli Service Management products.
- **Web 2.0 Self-service portal:** Automated request, (de-) provisioning of production or development/test workloads utilizing virtualization technologies across server, network, and storage, including reservation of compute and storage resources.
- **Pre-packaged automation templates and workflows** for most common resource types, such as VMWare and KVM virtual machines (provisioned-to capabilities).
- **Integrated core service management capabilities:** Real-time monitoring of virtualized resources, energy management, (de-)provisioning, patch management and remediation, security, usage and accounting, reusable library for rapid deployment, pre-built reports (BIRT).
- **Modular/Plug and Play:** Incrementally, automatically expandable and scalable.
- **Multi-tenant:** Management of multi-customer, multi-project collections of virtual systems.
- **Quickstart implementation** services included to get Cloud platform up and running in days.
- **Extensibility** across data center with TSAM integration.
- **Enablement for WebSphere Cloudburst** outside-the-box integration.



Single product, single delivery, single installation,
single invoice, single support structure

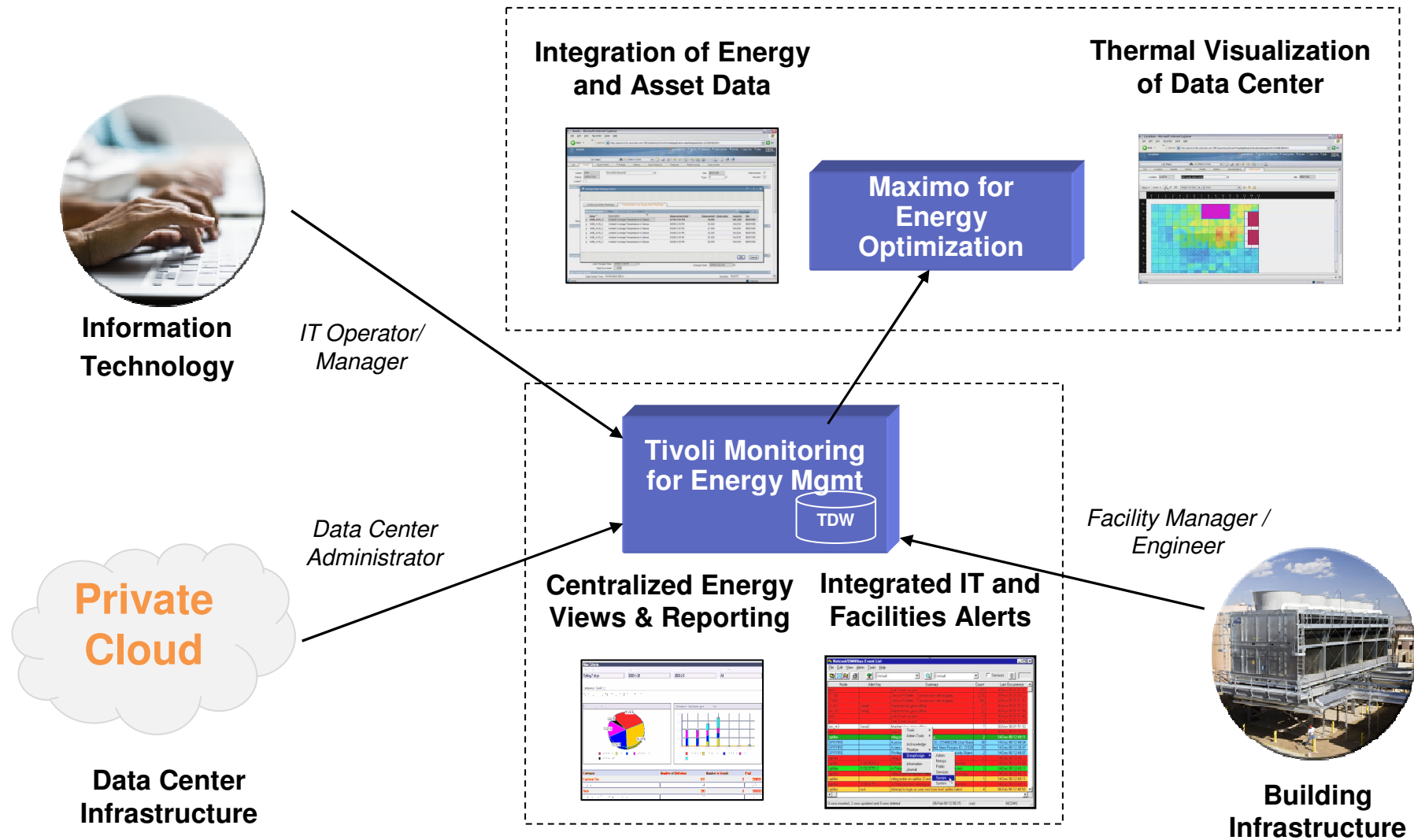
Built-in Metering, Usage and Accounting

- Understand costs, track, allocate and invoice by department, user and many additional criteria.
- Collect, analyze and bill based on usage and costs of shared assets.
- Deliver detailed information and reports about the intricate use of shared resources.



...provide data for planning, budgeting, billing and accurate chargeback for services

Cloud Energy Monitoring and Optimization



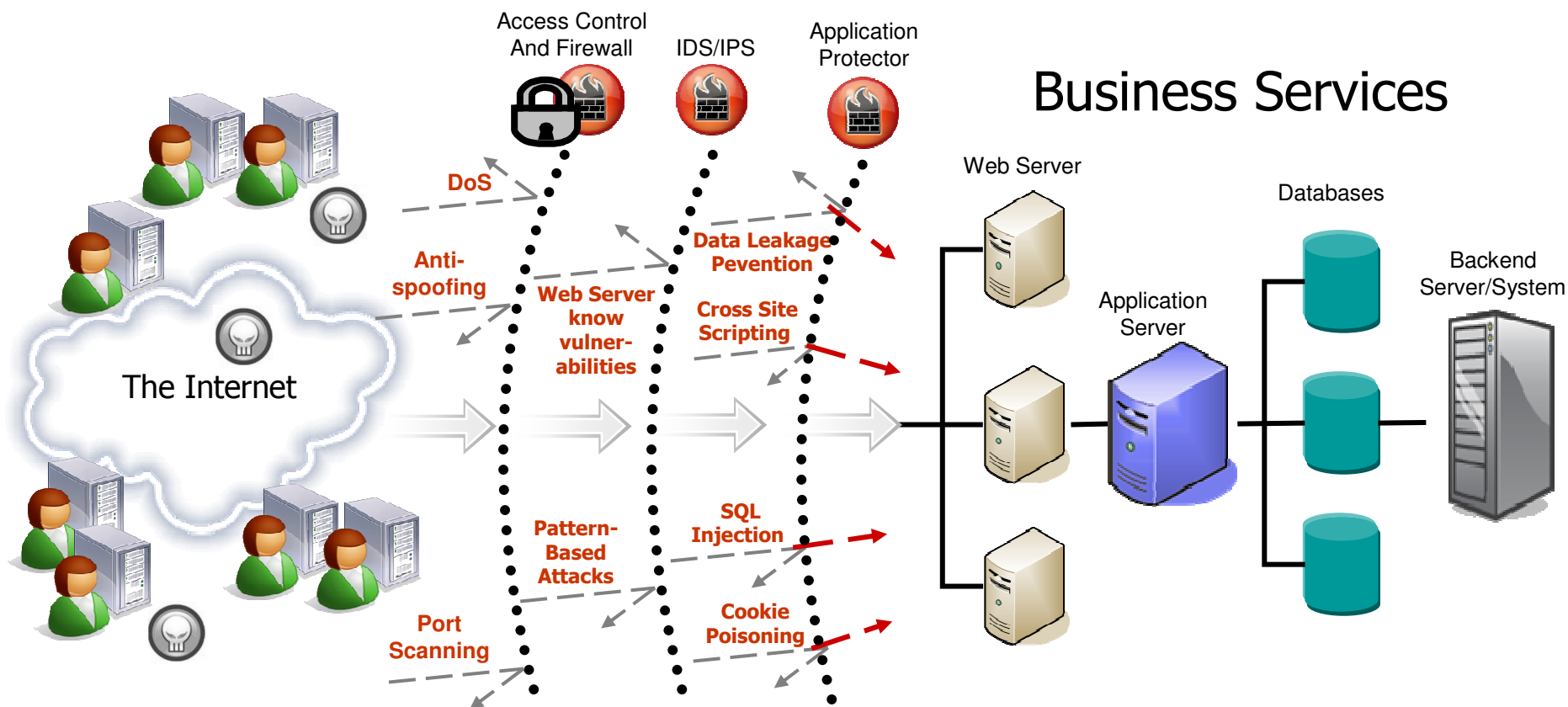
Optional security to protect your production cloud

- Help detect and block network attacks, and unauthorized network access.
- Enable cloud computing service providers to deliver segmented security in multi-tenant virtual environments.
- Integrate virtualized security with traditional network protection to reduce complexity of security operations



...stay ahead of evolving threats and compliance measures

整體雲端安全架構，在不同層級分別提供不同的安全防護機制，從網路層的防火牆存取控制，到入侵偵測防護，最後應用程式防火牆的內容過慮掃描，提供雲端應用與資料最完整的安全防護方案



The End