JBoss WORLD CHICAGO 2009

Managing the Data Center Using the JBoss Enterprise SOA Platform

Isaac Christoffersen
Contributor,
inCommon, Inc

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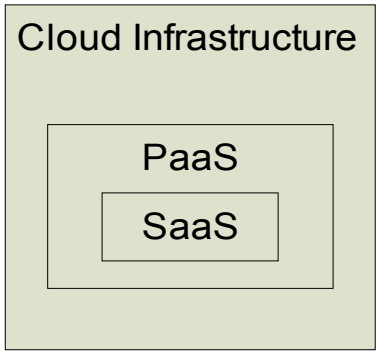
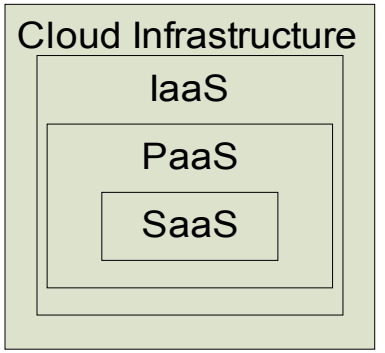
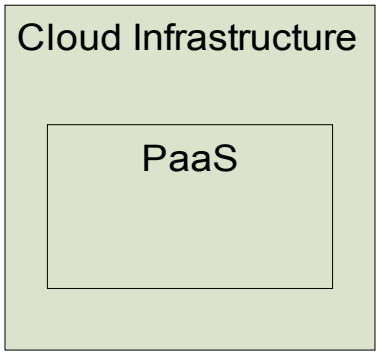
presented by

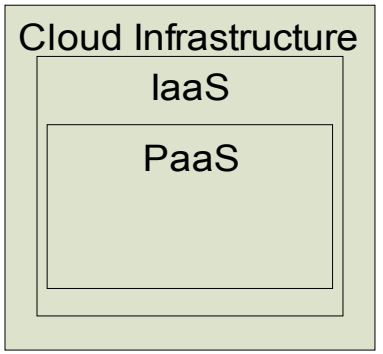
Service Architectures



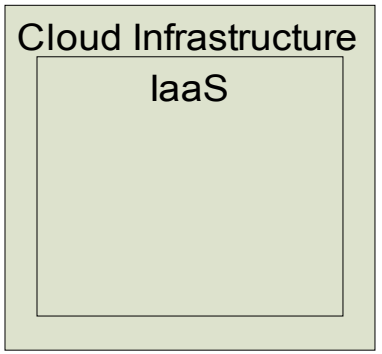


Software as a Service (SaaS) Architectures





Platform as a Service (PaaS) Architectures

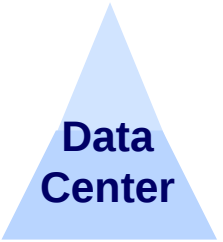


Infrastructure as a Service (IaaS) Architectures

Source: *NIST, Information Technology Laboratory*
http://csrc.nist.gov/groups/SNS/cloud-computing/cloud-computing-v25.ppt

As a Service or at your service?

How can I build my web hosting business?
How can I manage my customer relationships?
How can I run my company's IT department?



Capability Provisioning
Enterprise Service Providers

How can I collaborate across the enterprise?
How can I view my corporate sales data?

Application Provisioning
Service Composition
Composable Applications

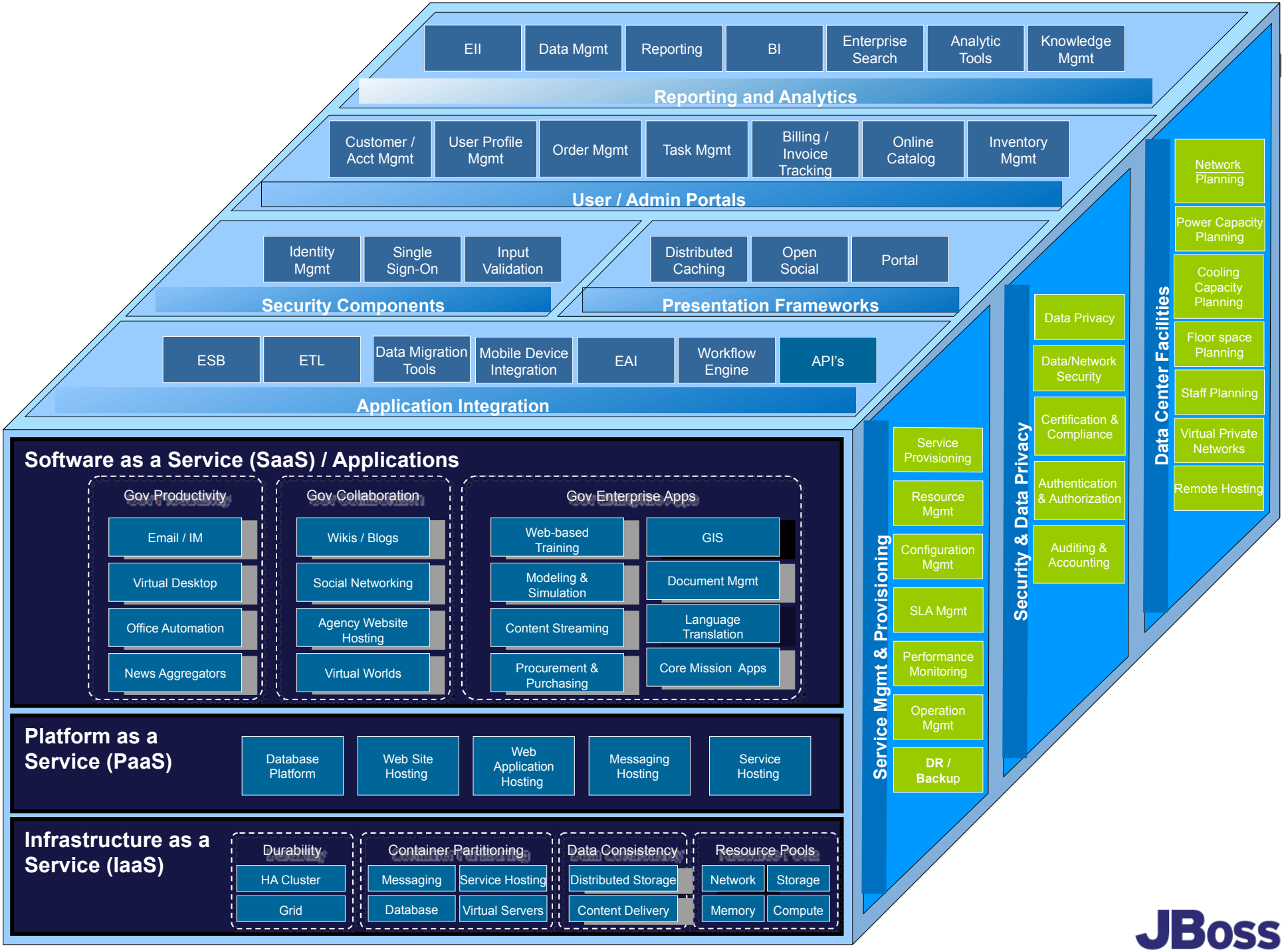
How do I store & retrieve my inventory data?
How do I deploy my web services?

Database Provisioning
Web Site Provisioning and Hosting

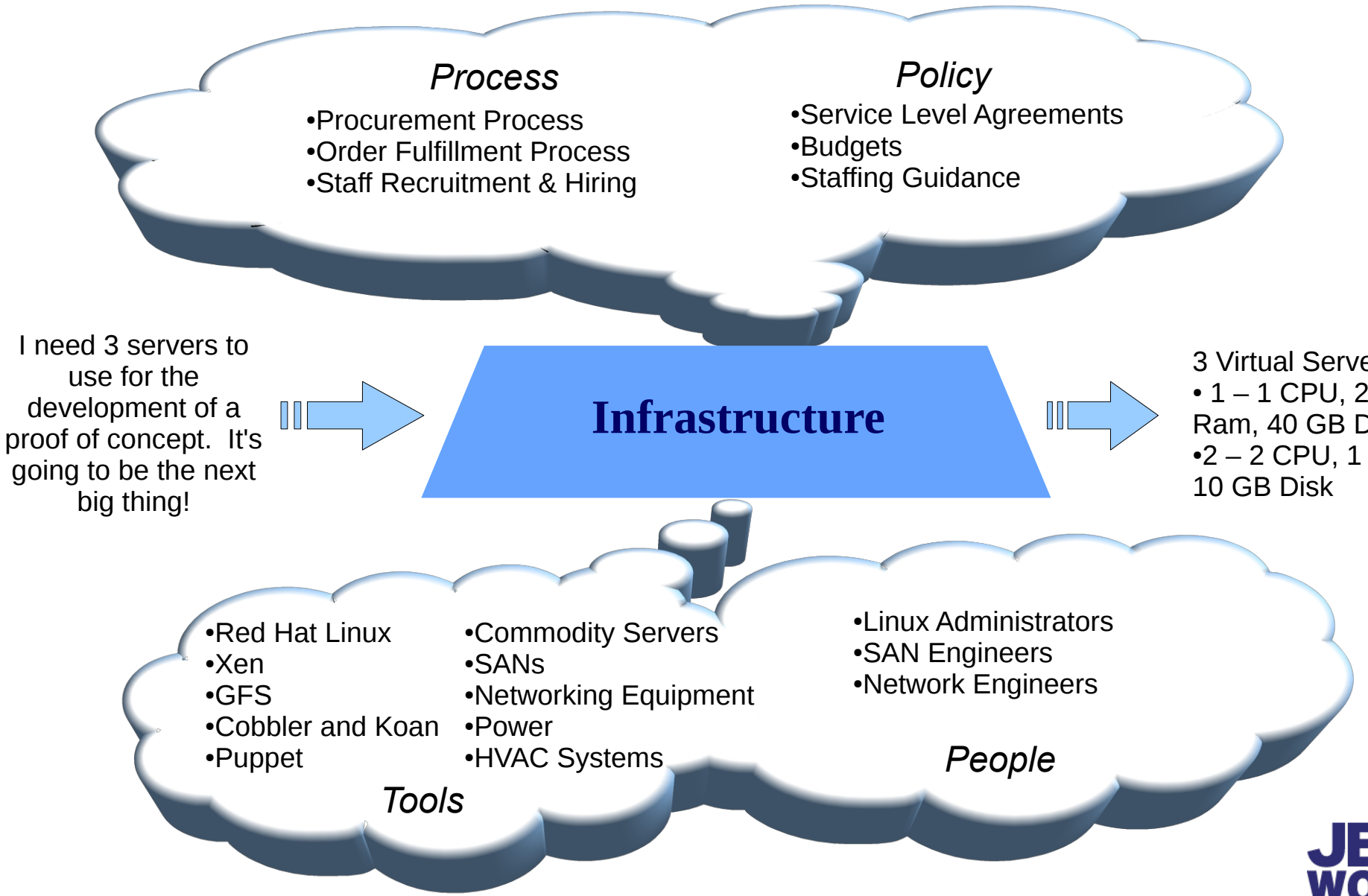
How do I get the most of my IT and personnel resources?

Server, Storage, and Network provisioning

The Intelligent Data Center is built on top of separate service layers that make it easier to address individual business concerns across different technical domains. It marks the shift from technology and business driven solutions to the era where technology and business both share the driver's seat.


EII
Data Mgmt
Reporting
BI
Enterprise Search
Analytic Tools
Knowledge Mgmt
Reporting and Analytics
Customer / Acct Mgmt
User Profile Mgmt
Order Mgmt
Task Mgmt
Billing / Invoice Tracking
Online Catalog
Inventory Mgmt
User / Admin Portals
Identity Mgmt
Single Sign-On
Input Validation
Distributed Caching
Open Social
Portal
Security Components
Presentation Frameworks
ESB
ETL
Data Migration Tools
Mobile Device Integration
EAI
Workflow Engine
API's
Application Integration
Software as a Service (SaaS) / Applications
Gov Productivity
Email / IM
Virtual Desktop
Office Automation
News Aggregators
Gov Collaboration
Wikis / Blogs
Social Networking
Agency Website Hosting
Virtual Worlds
Gov Enterprise Apps
Web-based Training
GIS
Modeling & Simulation
Document Mgmt
Content Streaming
Language Translation
Procurement & Purchasing
Core Mission Apps
Platform as a Service (PaaS)
Database Platform
Web Site Hosting
Web Application Hosting
Messaging Hosting
Service Hosting
Infrastructure as a Service (IaaS)
Durability
HA Cluster
Grid
Container Partitioning
Messaging
Service Hosting
Database
Virtual Servers
Data Consistency
Distributed Storage
Content Delivery
Resource Pools
Network
Storage
Memory
Compute
Service Mgmt & Provisioning
Service Provisioning
Resource Mgmt
Configuration Mgmt
SLA Mgmt
Performance Monitoring
Operation Mgmt
DR / Backup
Security & Data Privacy
Data Privacy
Data/Network Security
Certification & Compliance
Authentication & Authorization
Auditing & Accounting
Data Center Facilities
Network Planning
Power Capacity Planning
Cooling Capacity Planning
Floor space Planning
Staff Planning
Virtual Private Networks
Remote Hosting

Infrastructure At Your Service



The Obligatory Call for Standards

- The call for cloud and grid standards is deafening
- Some new standards are being developed:
  - Distributed Management Task Force
  - Open Grid Forum
  - Sun Cloud API – Project Kenai
    http://kenai.com/projects/suncloudapis/pages/Home
- Some have existed for a while:
  - Open Grid Services Architecture
  - WS-Management, WS-Resource, WS-Distributed Management, etc...
- Some are becoming defacto standards:
  - Amazon EC2 APIs

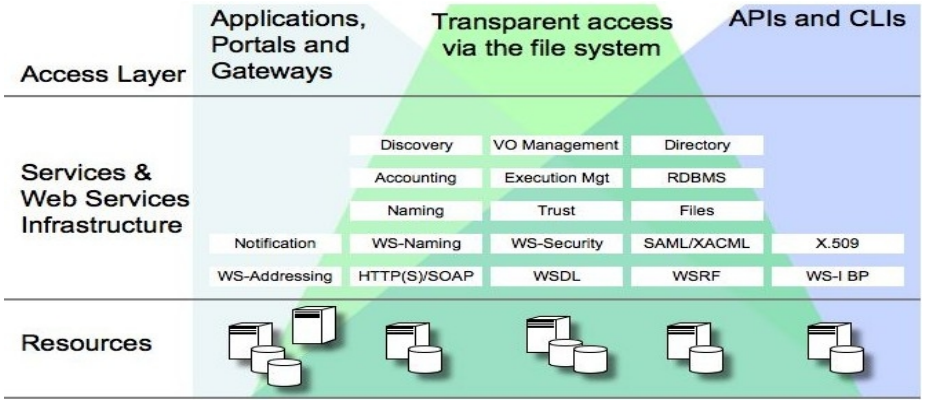
One Standard to Rule Them All?

- Open standards...not standards that are reverse engineered from vendor apis.
  - Favor standards driven by the community's needs
- Standards provide semantic context
  - As long as we can communicate, we don't have to dominate

Conway's Law: "Any organization that designs a system (defined broadly) will produce a design whose structure is a copy of the organization's communication structure."

The Open Grid Services Architecture

- Adopted as a grid architecture by a number of grid projects including the Globus Alliance
- Includes multiple service categories:
  - Infrastructure services
  - Execution Management
  - Data Services
  - Resource Management Services
  - Security Services
  - Self-management Services
  - Information Services
- Uses WS-Resource Framework and WS-Management specifications
- Check out for more info: http://www.ogf.org/OGSA_Primer/



Source: *OGSA Primer, http://www.ogf.org/OGSA_Primer/*

WS-Resource Framework

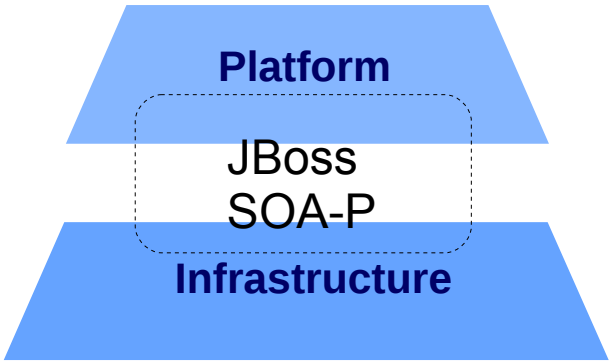
- OASIS Standards - http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wsrf
- Multiple Java Frameworks available:
  - Apache Muse - http://ws.apache.org/muse/
  - Globus - http://www.globus.org/
- Provides a framework in which any manipulated resource can be identified and described via an exchange of messages
- Comprised of several specifications:
  - WS-Resource specification
  - WS-ResourceProperties (WSRF-RP) specification
  - WS-ResourceLifetime (WSRF-RL) specification
  - WS-ServiceGroup (WSRF-SG) specification
  - WS-BaseFaults (WSRF-BF) specification

Communication, Communication, Communication

- If technology has taught us anything, it's that there's always more than one way to say the same thing.
- With all the evolving standards, a mediation layer is needed for:
  - Message Mediation
  - Message Routing
  - Protocol Transformation
  - Service Registration
- ***Sounds like an Enterprise Service Bus?***

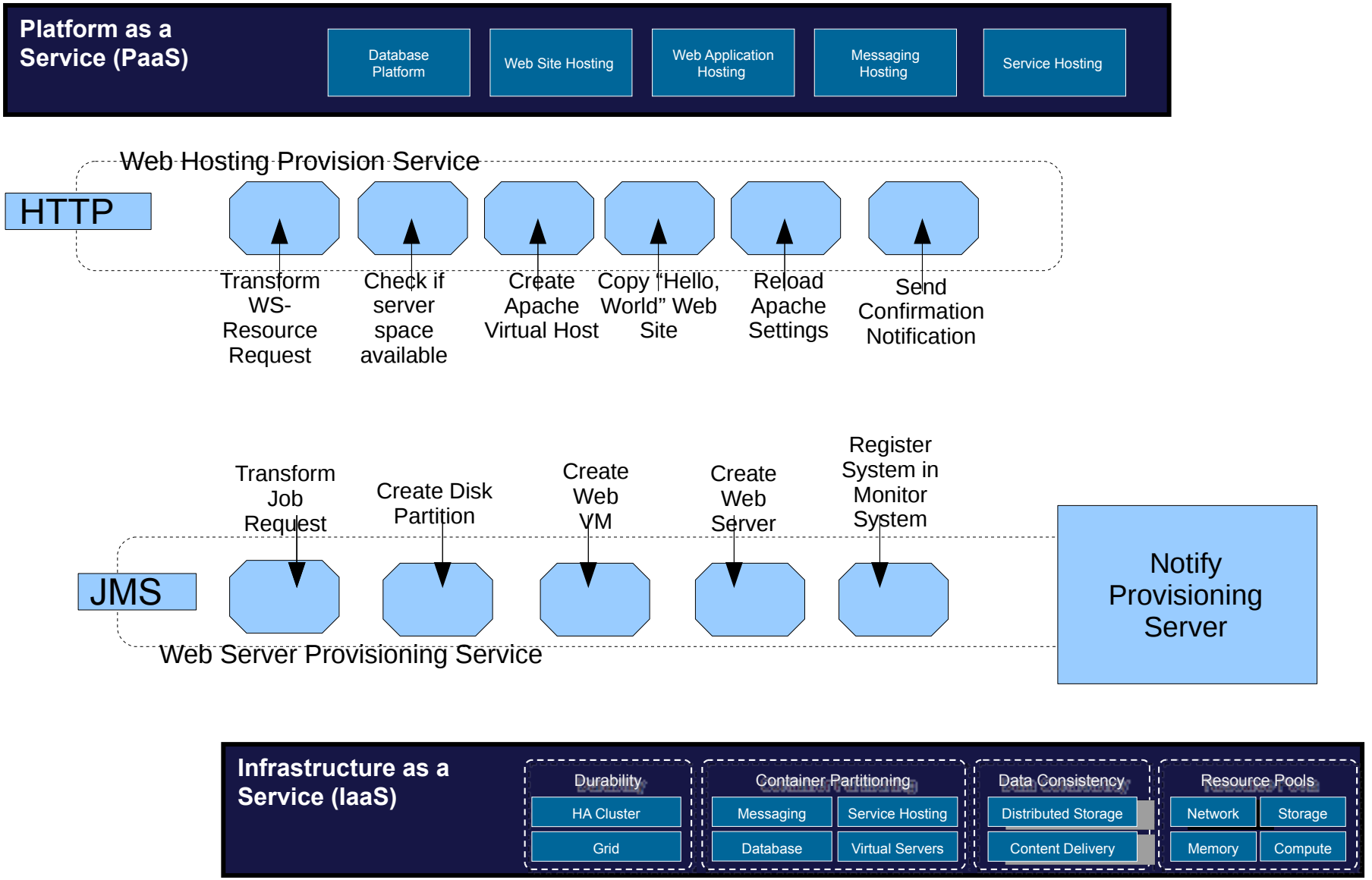
JBoss SOA Platform

- The SOA Platform can be used between the Platform as a Service and Infrastructure as a Service layers
- Business processes can be defined to coordinate the deployment of new infrastructure
- Message Mediation via Smooks
- Message Routing using Drools for Content-based Routing
- Protocol Transformation via built-in transformations for FTP, JMS, SMTP, File, WSDL, etc
- Service Registration via the built-in jUDDI registry



Management in Action – *User Requests Web Site Hosting*

- Scenario:
  - Request for dedicated web site hosting
- Actions:
  - Receive the hosting request
  - Send provisioning request to infrastructure platform
  - Infrastructure builds new Apache node instance
  - New web virtual host configuration file created
  - Default web site created with appropriate user permissions
  - Notification sent to end user about server availability


Platform as a Service (PaaS)
Database Platform
Web Site Hosting
Web Application Hosting
Messaging Hosting
Service Hosting
Web Hosting Provision Service
HTTP
Transform WS-Resource Request
Check if server space available
Create Apache Virtual Host
Copy "Hello, World" Web Site
Reload Apache Settings
Send Confirmation Notification
JMS
Transform Job Request
Create Disk Partition
Create Web VM
Create Web Server
Register System in Monitor System
Notify Provisioning Server
Web Server Provisioning Service
Infrastructure as a Service (IaaS)
Durability
HA Cluster
Grid
Container Partitioning
Messaging
Service Hosting
Database
Virtual Servers
Data Consistency
Distributed Storage
Content Delivery
Resource Pools
Network
Storage
Memory
Compute

Enablers

- Infrastructure Management
  - Cobbler
  - Puppet
  - Satellite
  - FUNC
  - Directory Server
- Middleware
  - JBoss SOA Platform
  - JBoss BRMS
- Clusters, Grids and Virtualization
  - RHCS
  - GFS
- Monitoring
  - Hyperic HQ
  - Audit

Tomorrow's data center will be radically different in both form & function

The commodity nature of the hardware and software components allows decision makers to move away from expensive maintenance contracts and to replace components as they fail.

The need for **traditional disaster recovery** sites will be drastically reduced as any service can be instantiated anywhere in the environment.

The final resting place for data will continue to **move closer to its computational resources.** The key question is where will the data reside.

Mobile devices continue to **enable users to create massive amount** of content. This content will continue to get archived, sorted, and re-deployed to other people in new and interesting ways.

Our mobile devices will evolve into sensors that are **producers** of information as well as **consumers**

The network will continue to be the ***biggest bottleneck*** in distributed computing.

The **dynamic data center** will be a necessity and **smaller, lighter and more agile** data centers will become a reality.

A complete management strategy for the data center will require a harmonizing of business objectives with information technology infrastructure across eight navigational areas...

Reputation	It takes a lifetime to build a good reputation and one system-wide outage to ruin it.
Partnerships	The data center is a heterogeneous assembly of vendor products. Partnerships help develop interoperability.
Empowerment	Empowering employees and communities encourages growth and development of new capabilities.
Community	The community extends both inside and outside the organization.
Mission	The alignment organization's business objective and the technology potential should support the mission.
Policy	Business objectives and/or the technology potential should help shape policy.
Employees	Employees should have a vested interest in the effectiveness of the data center.
Opportunity	Focus on potential while identifying roadblocks and speed bumps.

...and this alignment can only be achieved through open architecture, open standards, and the open source community

- Open Source Promotes Faster Deployment
- Open Standards and Specifications encourage open collaboration
- Transparent Sharing of Distributed Resources by Multiple Clients
- Reuse of Business Components
- Agile Infrastructure
- Commodity based approach
- Low Start-Up and Maintenance Costs
- Lower Technology Refresh Expenses
- Emphasizes community
- Takes advantage of the scalability obtainable through Internet-based virtual organizations

Conway's Law: "Any organization that designs a system (defined broadly) will produce a design whose structure is a copy of the organization's communication structure."

As community engagement practitioners, we seek to build ongoing, permanent relationships for the purpose of applying a collective vision for the benefit of the community.

inCommon, Inc was started to ***advocate*** the use of Open Source and Open Architecture solutions in the U.S. government market.

As part of this mission, we seek to ***educate*** individuals on the value of Virtual, Grid and SOA architectures based on Open Source and Open Architecture constructs.

We work with clients to efficiently and effectively ***accelerate*** systems delivery while maximizing existing resources whenever possible.

QUESTIONS?

TELL US WHAT YOU THINK:
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