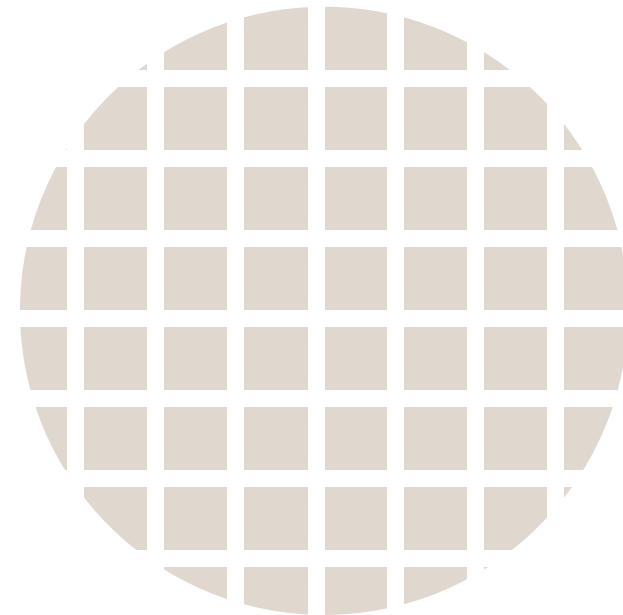


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THE POSSIBILITIES ARE INFINITE

Standards for Web Service Grid Infrastructures



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Abstract

- Some Stable WS Standards for Grids
 - WS-Addressing, WS-Security, ...
- Others are Still in Flux
 - In particular the management infrastructure specifications.
- Stateful Resources for Management
 - Widely accepted by most segments of the community.
 - However, details of it's rendering are still evolving.
- In this talk
 - A quick look at history
 - Look at this stable set of concepts
 - Review the current status

A History of Grid Infrastructure Specifications

- Open Grid Services Infrastructure
 - First specification and standard for Web service Grids
- Web services Resource Framework
 - Based on Open Grid Services Infrastructure specification
 - Published OASIS Standard
- Web services Management
 - Microsoft lead collection of specifications
 - WS-Man, WS-Transfer, WS-Eventing
 - Resource Specifications Convergence
 - Roadmap
 - Draft of Resource Transfer



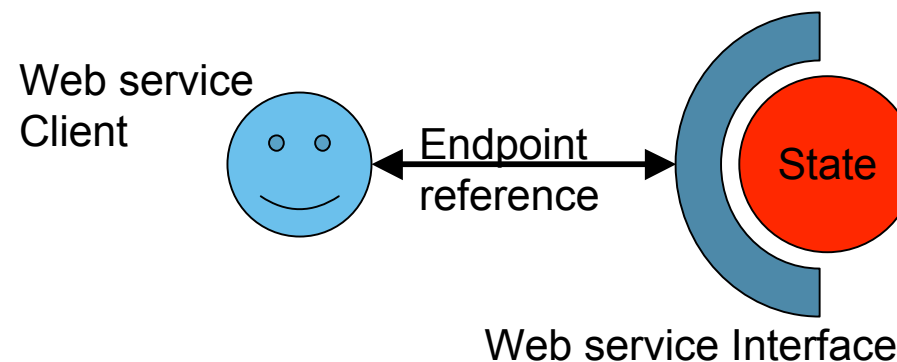
Core Concepts for Grid Management

- Resource
 - Addressing and State
- Properties
- Notification
 - Property Change Events
 - General Topics
- Lifecycle Management
 - Factory pattern
 - Destruction and garbage collection
- Interface Composition
- Fault Hierarchies
- Collections
 - Registries
- Naming



Resources in a Web service Context

- Definition
 - It must be identifiable.
 - It may have a set of properties.
 - It may have lifecycle.
- WSRF Rendering
 - WS-Addressing EPR
 - Resource Properties Document
 - Resource Lifetime



Properties

- Elements of State
 - XML Document
 - Accessible for read [and write]
 - Very limited coherence semantics
- WSRF Rendering
 - XML Schema
 - QName identified elements
 - Operations
 - Get/Set RP Document
 - Get/Set Property by QName
 - single and multiple properties
 - Query Document



```
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  <ssc:Item>
    <ssc:ProductCode>
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    </ssc:ProductCode>
    <ssc:Description>
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    </ssc:Description>
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    <ssc:Price>1.59</ssc:Price>
  </ssc:Item>
</ssc:SimpleShoppingCart>
```

Property Change Notification

- Send Messages
 - To clients and other resources
 - When properties change
- Linking to properties simplifies the notification pattern
 - Event not related to properties also possible
- WS-Notification Rendering
 - Publish Properties
 - Subscribe to changes
 - Push and Pull Notification

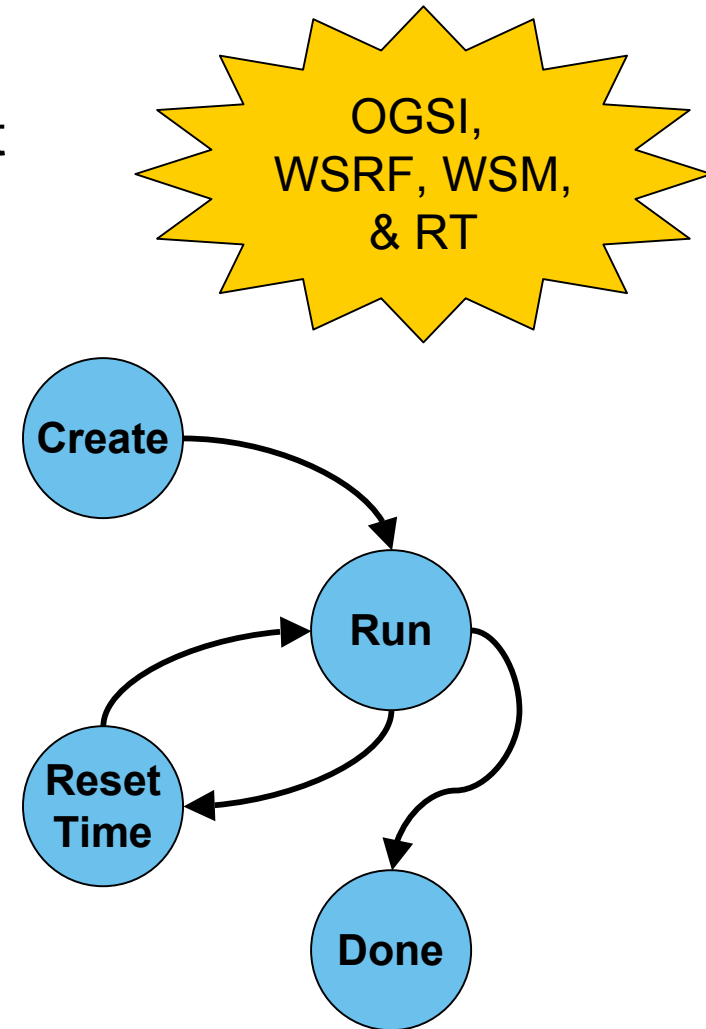
[Other Topics also possible]



Resource Lifecycle Management

- Lifecycle
 - Fundamental aspect of management
 - Needed for loosely coupled Grids
- WSRF Rendering
 - Explicit Destroy
 - Time Based Termination
 - Termination Time Extension
 - Absolute & relative time
 - [Refresh on use pattern]
 - [Factory to create new resources]

[] not supported in WSRF.



Interface Composition and Hierarchal Faults

- Interface Composition
 - Ability to add independent functionality
 - Fundamental premise of Objects and WSs
- Hierarchal Faults
 - Standard behavior
 - Implementations may refine
- Example
 - BaseFault
 - ResourceNotFound
 - ResourceKilled
 - ResourceMoved
 - ResourceMovedWithReferral



OGSI,
WSRF, WSM,
& RT

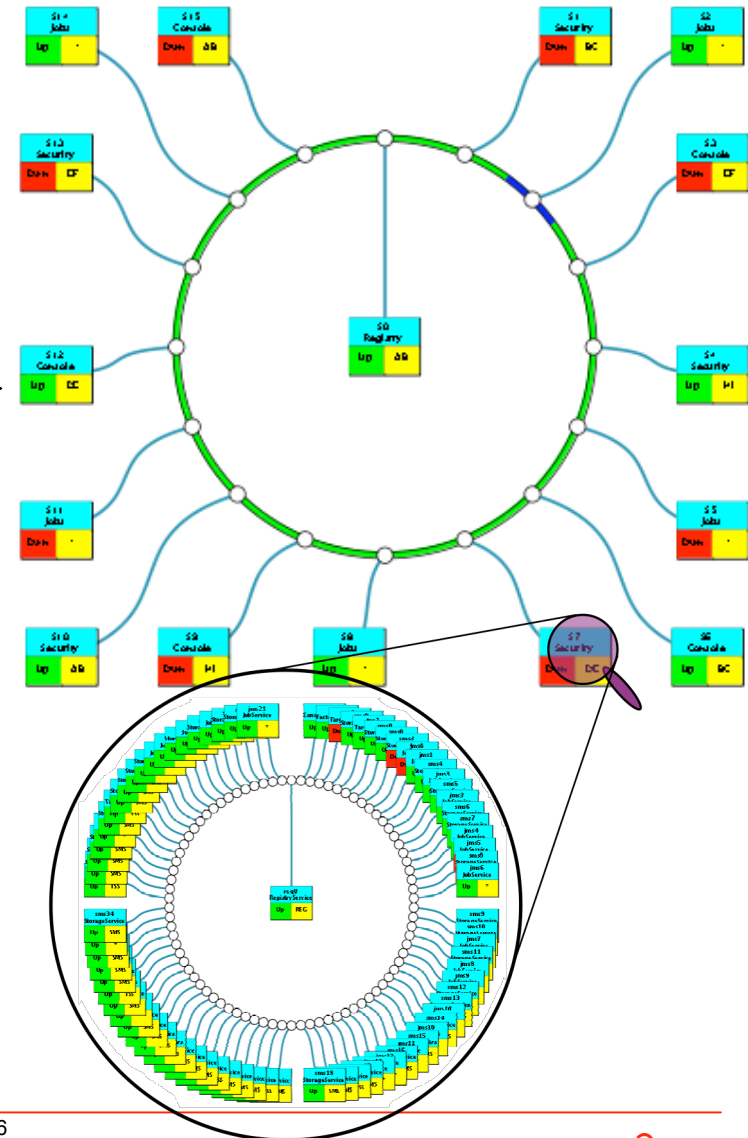


OGSI, WSRF

Collections

- Grouping Uses
 - Complexity management
 - Control
 - Discovery
- WSRF Rendering
 - Service Groups
 - Registration
 - Adding to collections
 - Composition from
 - Lifetime: Deletion
 - Resource properties: Query

OGSI, WSRF



Naming

- Naming Use Cases
 - Service Mobility
 - Resource Virtualization
 - Replica Management
- OGSI Rendering
 - Grid Service Handle (GSH)
 - Grid Service Reference (GSR)
 - Resolver PortType
- OGSA Naming Rendering
 - WS Endpoint Identifier (EPI)
 - Endpoint Reference (EPR)
 - Resolution and Referral PortTypes



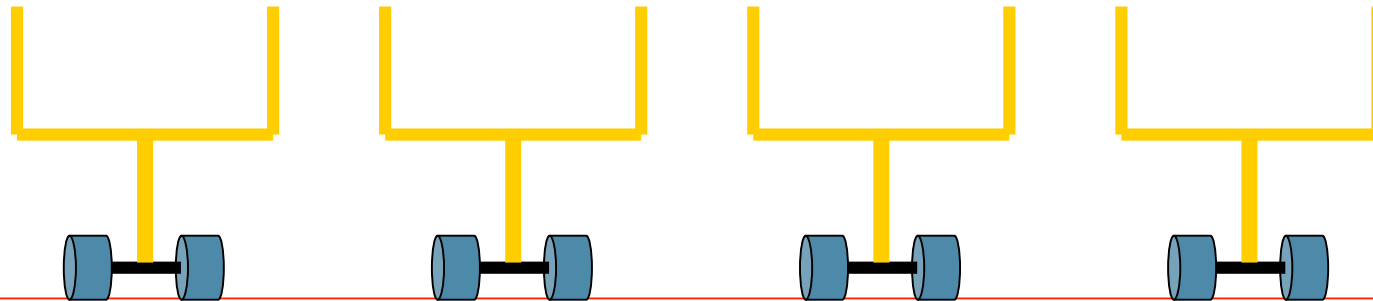
Status Summary

Concept	OGSI	WSRF	WS-M	RW-RT	OGSA-*
Resource		✓	✓	✓	✓
Properties	✓	✓	✓	✓	✓
Notification	✓	✓	✓		✓
Lifecycle	✓	✓	✓	✓	✓
Composition	✓	✓	✓	✓	✓
Faults	✓	✓			✓
Collections	✓	✓	✓		✓
Naming	✓				✓

Orange = Historical, Blue = Evolving, Green = Standard

Conclusions

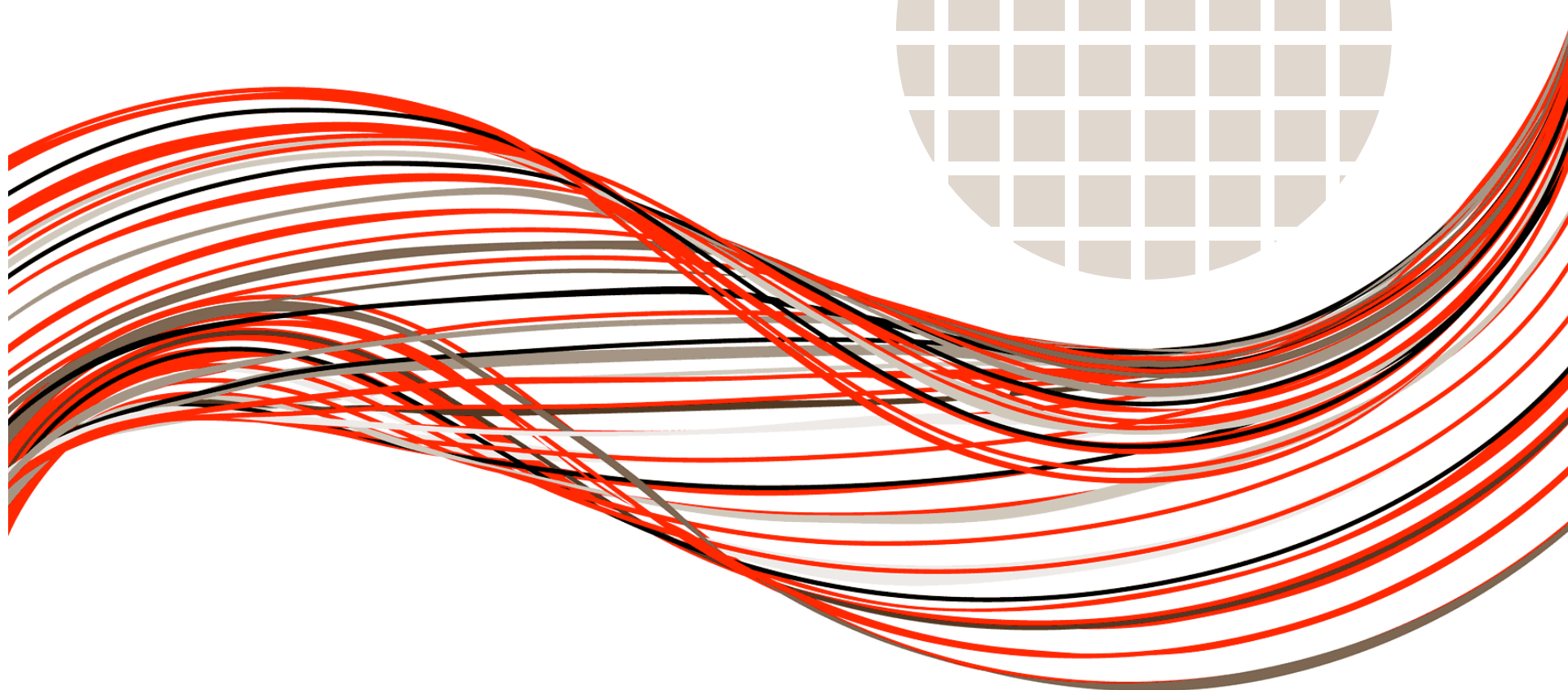
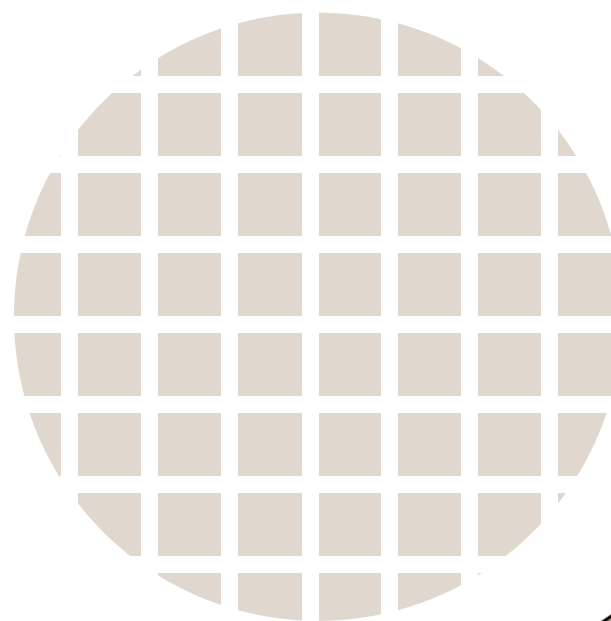
- Develop Infrastructure using these Concepts
 - Use the concepts when they make sense
 - Rendering is a matter of choice
- Aim for “Architectural Interoperability”
- Don’t wait for convergence to be complete
- Prepare for the Landscape to Continue to Change
 - “Build your goal posts with wheels pre-installed”
- Develop and use API for these concepts
 - Language specific, but rendering independent



Thank you,
and Questions



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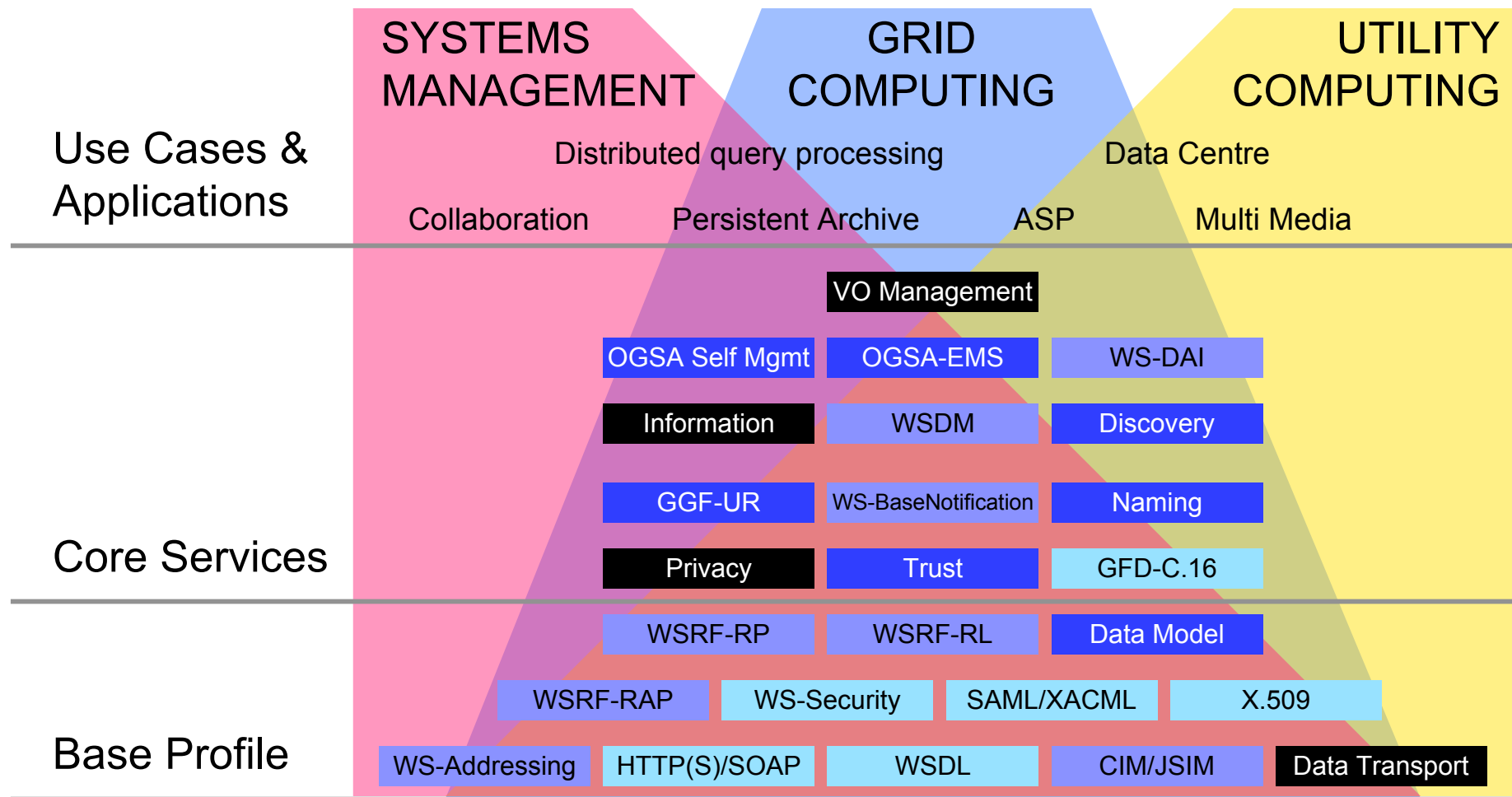




Extra Slides

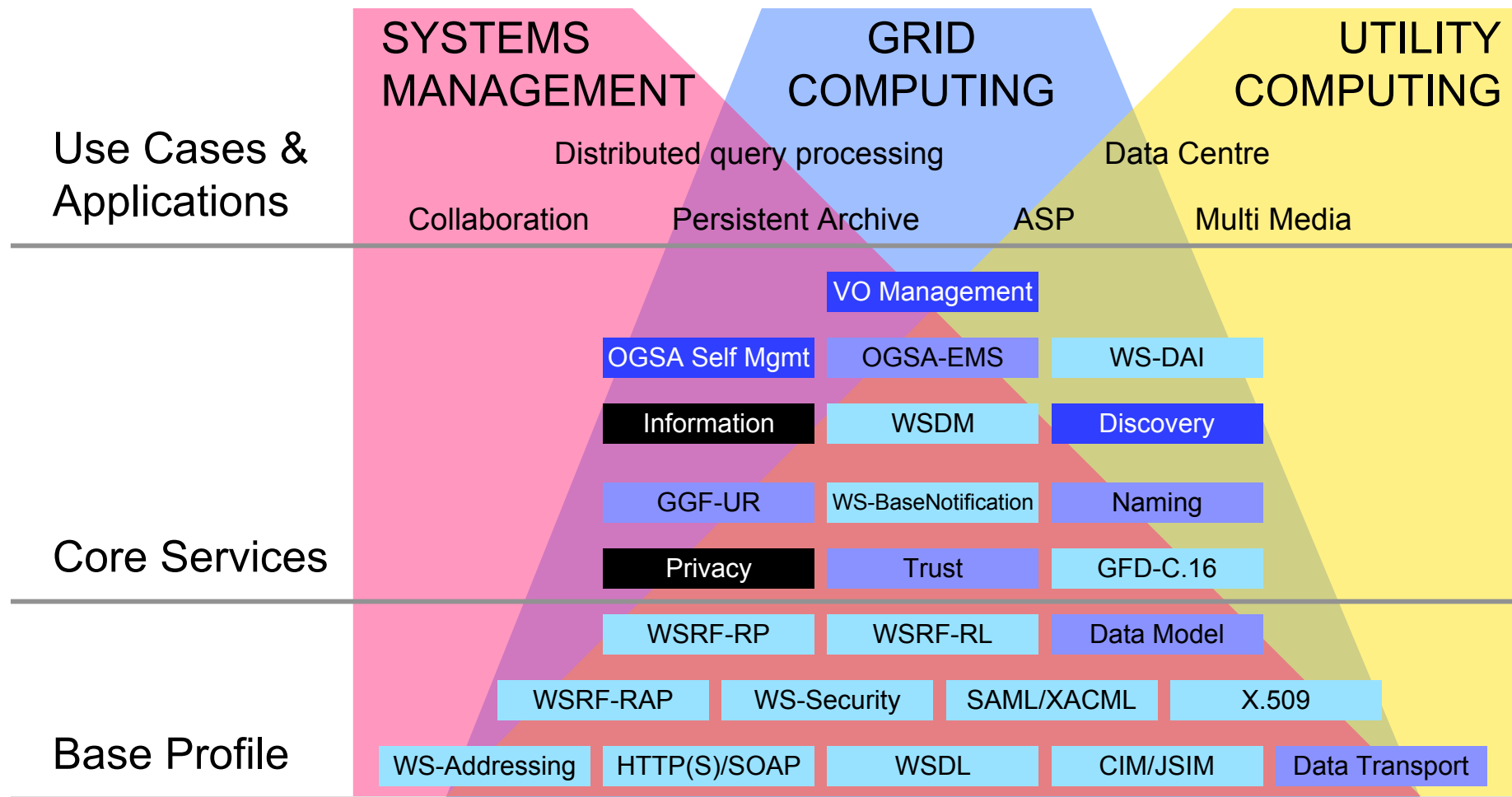
OGSA Status November 2004

Warning: Data may be inaccurate



OGSA Status February 2006

Warning: Data may be inaccurate



OGSA Status September 2006

Warning: Data may be inaccurate

