Service Oriented Architecture :

Technology Overview

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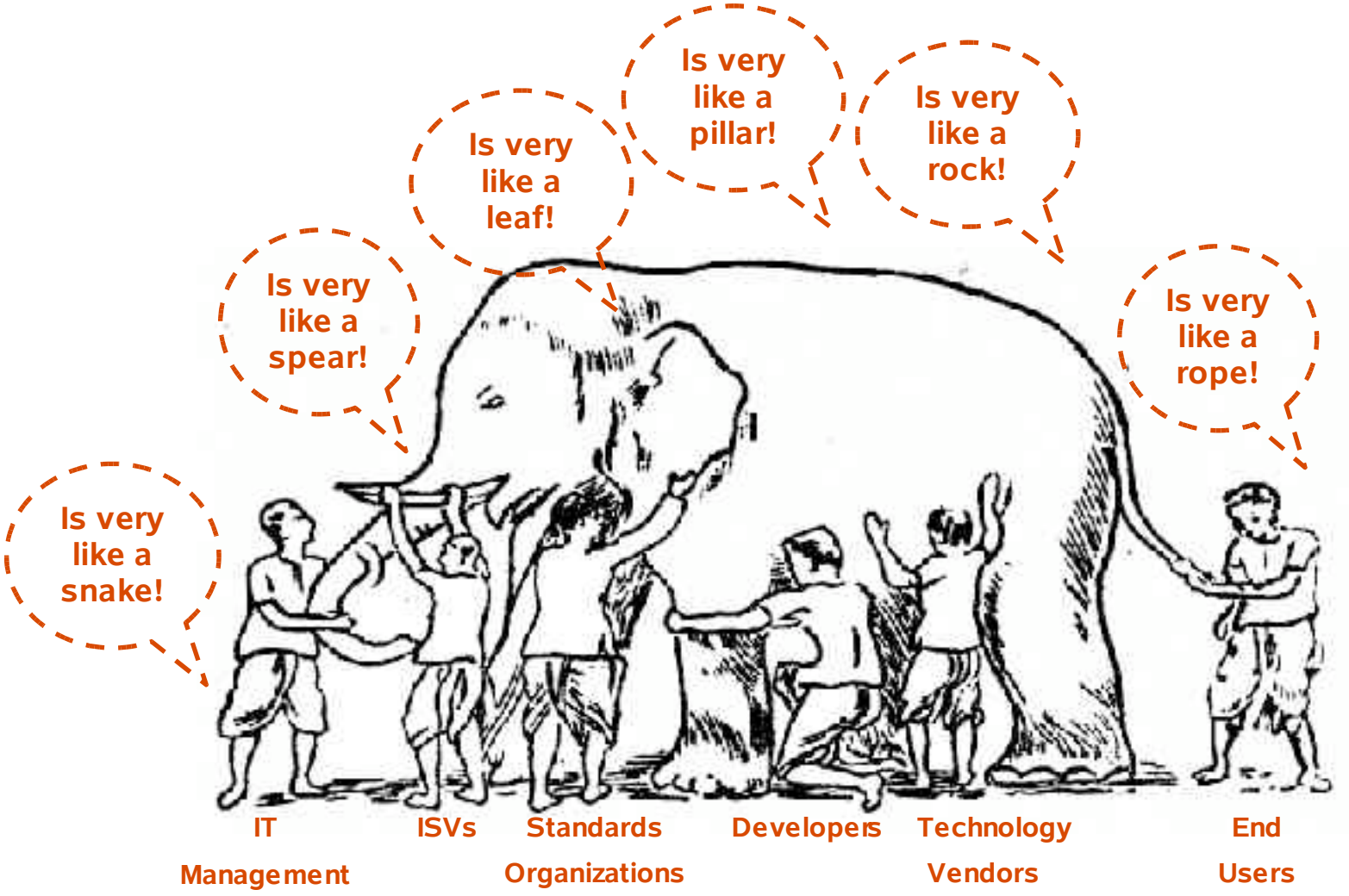
Agenda

- Introduction to SOA
  - SOA Technology Perspectives
  - SOA Benefits
- Pragmatic SOA @ Sun
  - SOA and Standards
  - SOA Big Rules
- Understanding SOA Technologies
  - ESB
  - JBI
  - Registry & Repository
  - Security
- Sun SOA Platform Vision
  - Composite Applications
  - Sun Product Offerings
- Q & A

Section

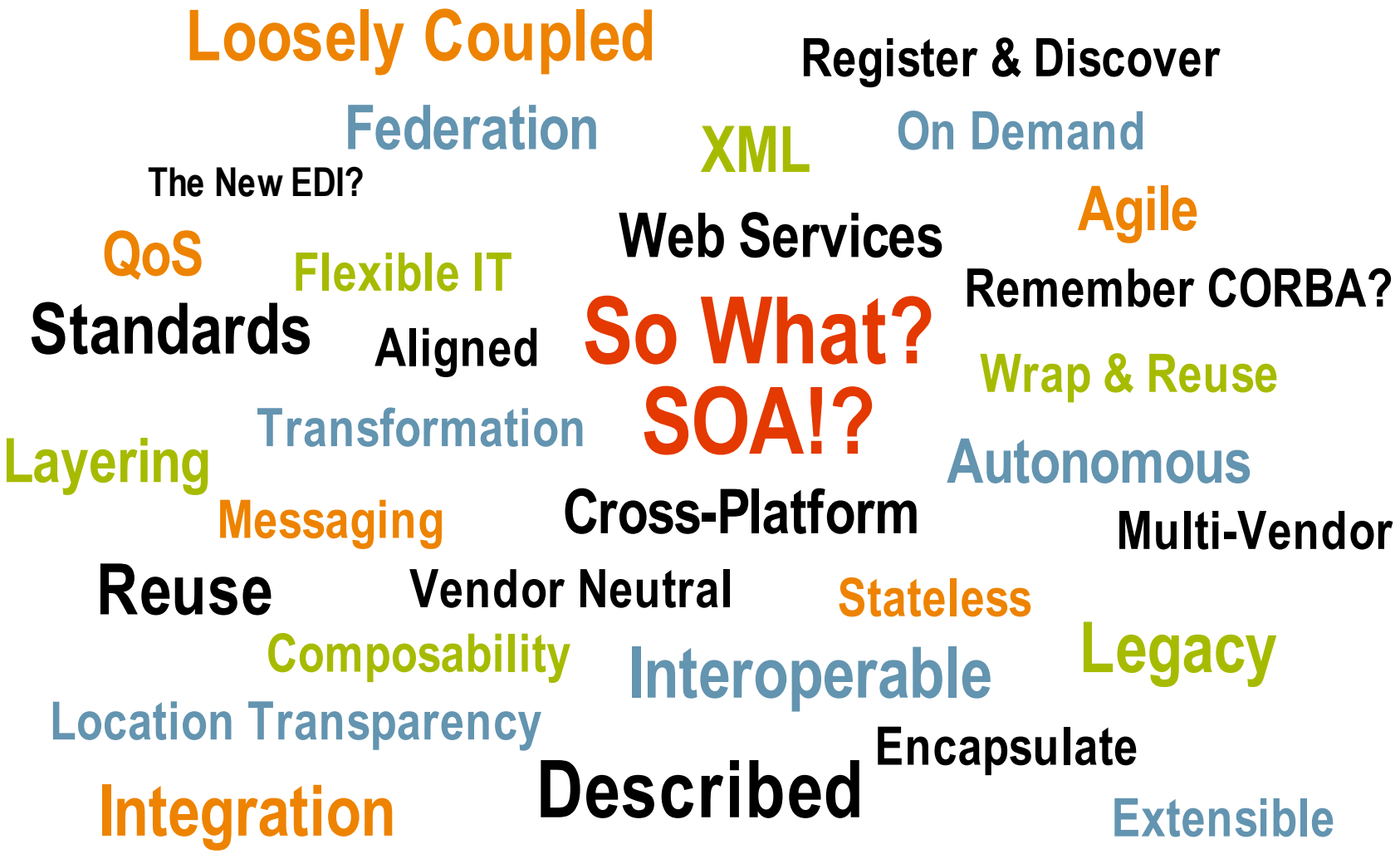
Introduction to SOA

The state of SOA Mythology



Cartoon Based on ancient Asian Indian fable

Hype or Reality?



SOA Buzz (the obligatory analyst quotes)

- SOA is a **catalyst for business transformation** enabling your business to thrive on change. . . . SOA is a technology-based embodiment of your business (Forrester Research)
- IT must change its primary operating mode from delivering applications to a mode of **delivering strategic business flexibility** . . . (Forrester Research)
- By 2006, more than 75% of midsize and large enterprises will have **deployed** SOA-enabled development tools and middleware (Gartner)
- By 2006, more than 60% of enterprises will consider SOA a **guiding principle** in designing their new mission-critical business applications and business processes. (Gartner)
- By 2007, focus will **shift** from basic infrastructure **to business frameworks** via Web services-based, Service-Oriented Architectures. (Meta Group)
- By 2008, SOA will be a **prevailing software engineering practice**, ending the 40-year domination of monolithic software architecture (Gartner)

What is SOA? (the obligatory definition slide)

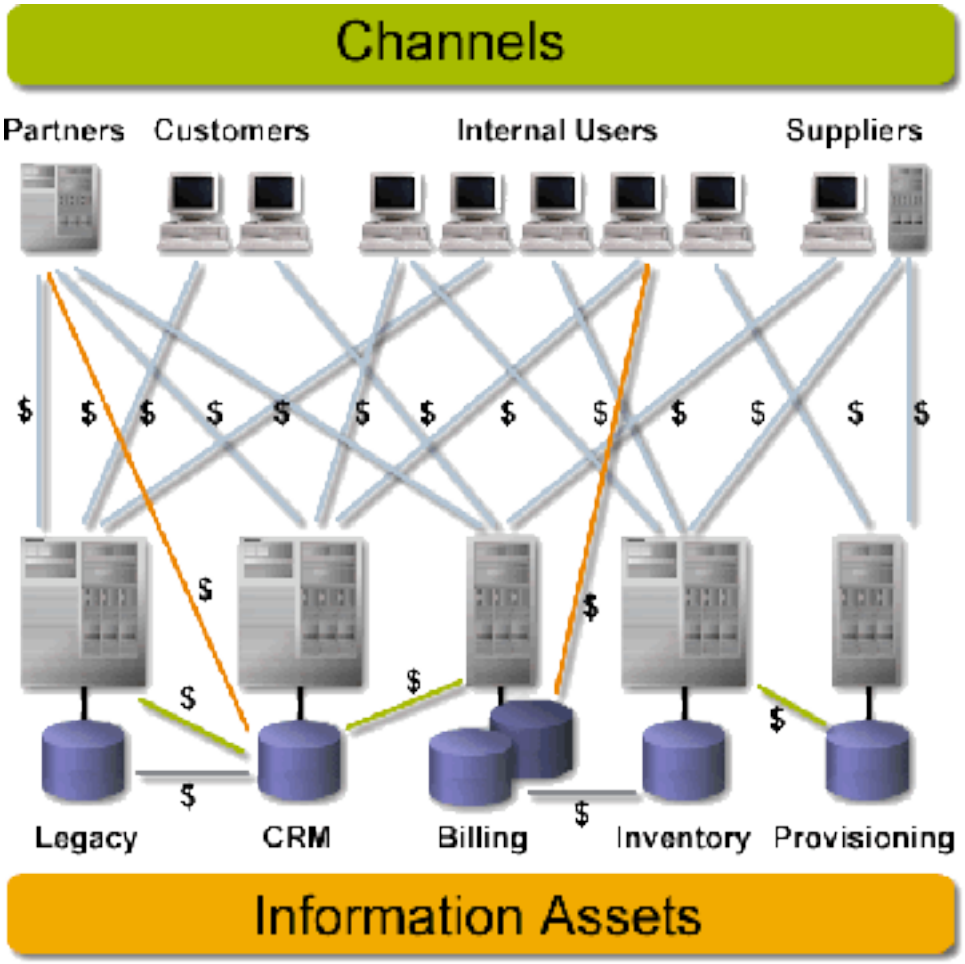
- SOA is an *architectural style* that emphasizes **loosely coupled**, **coarse-grained**, **shareable**, secure, network based services to enable business flexibility in an **interoperable** technology agnostic manner.
- SOA is a business & technical *strategy* to **expose** business functionality & data within and between enterprises
- SOA is a *design paradigm* for the creation of applications via the orchestration of stateless services that interact through a variety of **standards** based interfaces
- SOA is an integrated software *infrastructure and design approach* based on **best practices**

What is SOA? (the obligatory definition slide – part 2)

- Service Oriented Architecture **implies** that the IT organization of an enterprise pursue business and technical strategies which promote the exposure of business functionality and data within and between enterprises in a manner which is:
  - > **Consistent**
  - > **Published**
  - > **Secure**
  - > **Contractual**

Accidental Architecture?

Silo Oriented Architecture



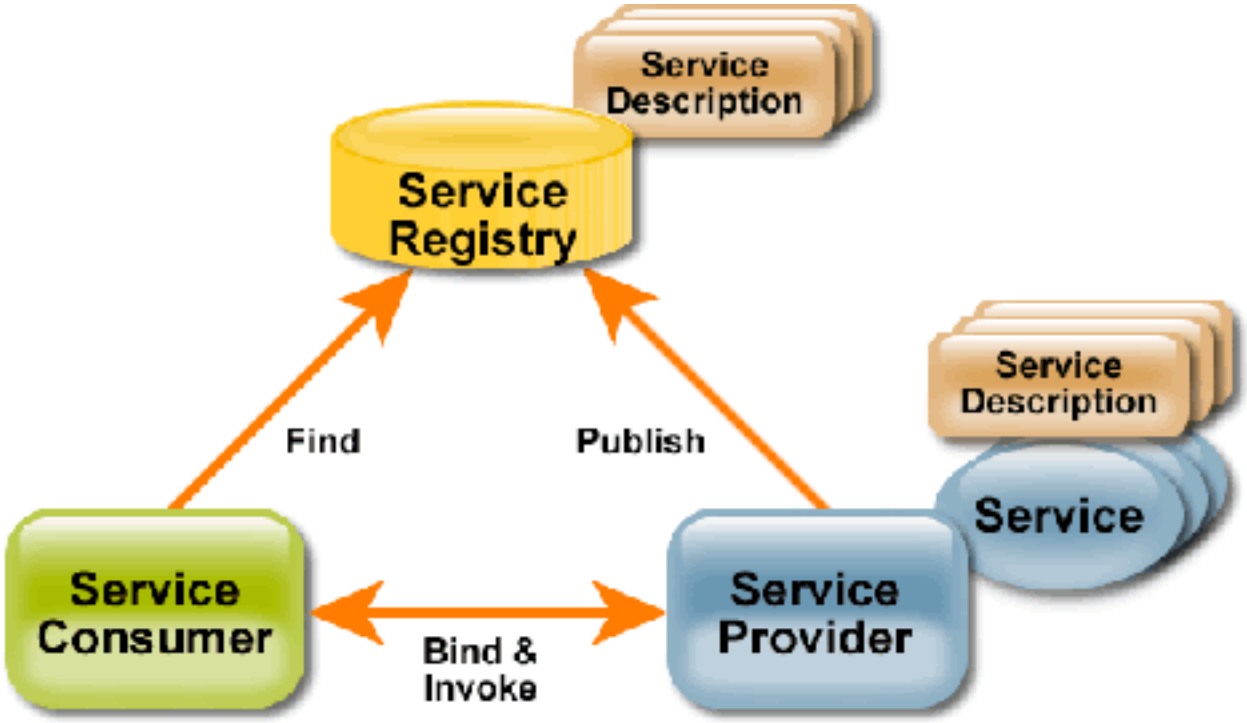
Mature information systems grow old disgracefully as successive waves of hacking result in accidental architectures which resist the reflection of on-going business process change.
- Anthony Lauder & Stuart Kent; University of Kent. (2000)

- Rigid
- Complex
- Expensive
- Slow to Market
- Monolithic
- Hard to Integrate

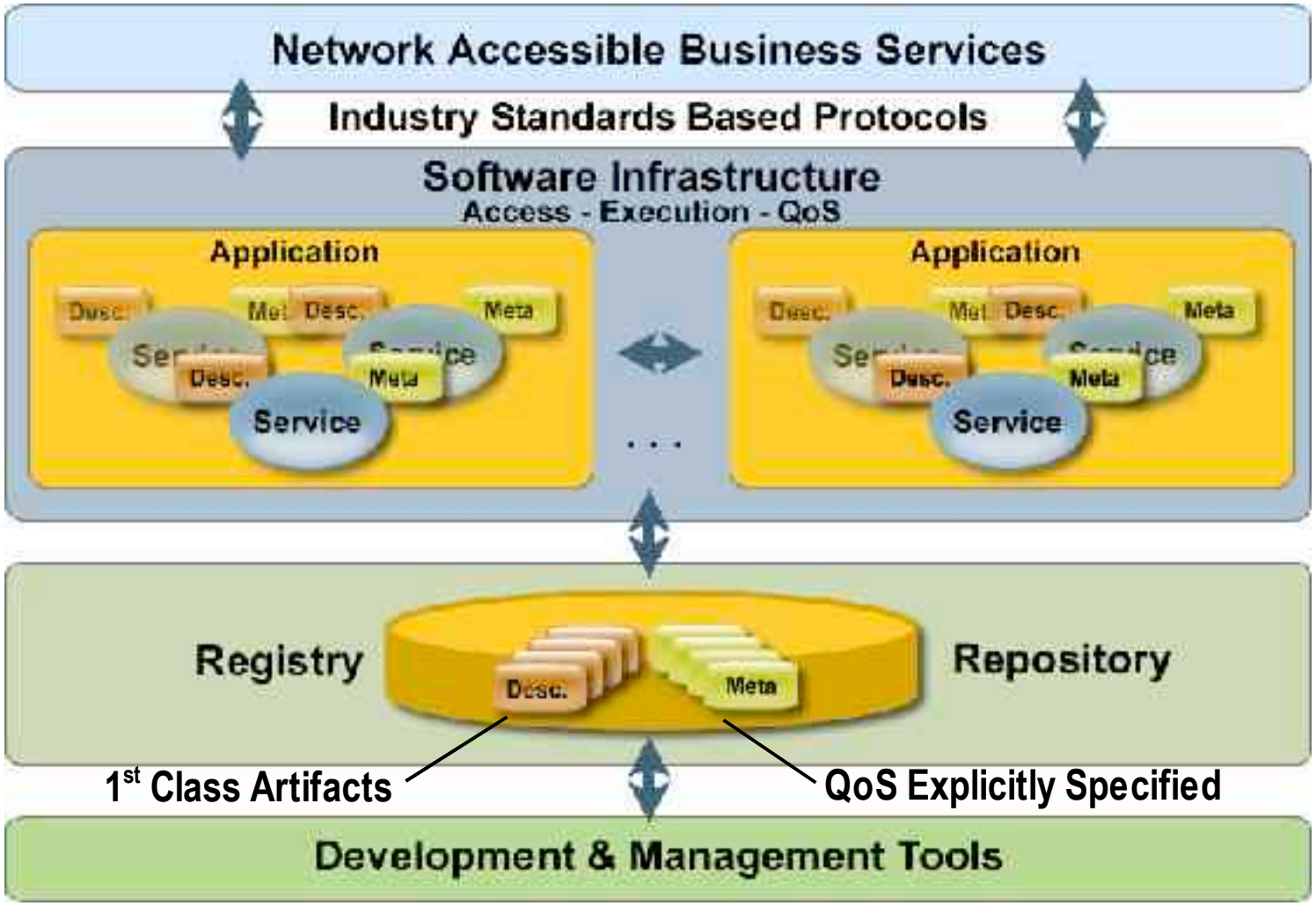
Promise of SOA

- Interoperability
- Federation
- Dynamic Discovery
- Loose Coupling
- Reuse and Composition
- Evolution, not Revolution
- Wrap and Reuse; Not Rip and Replace
- Standards based approach
- Alignment of Business and Technology

SOA Conceptual Model

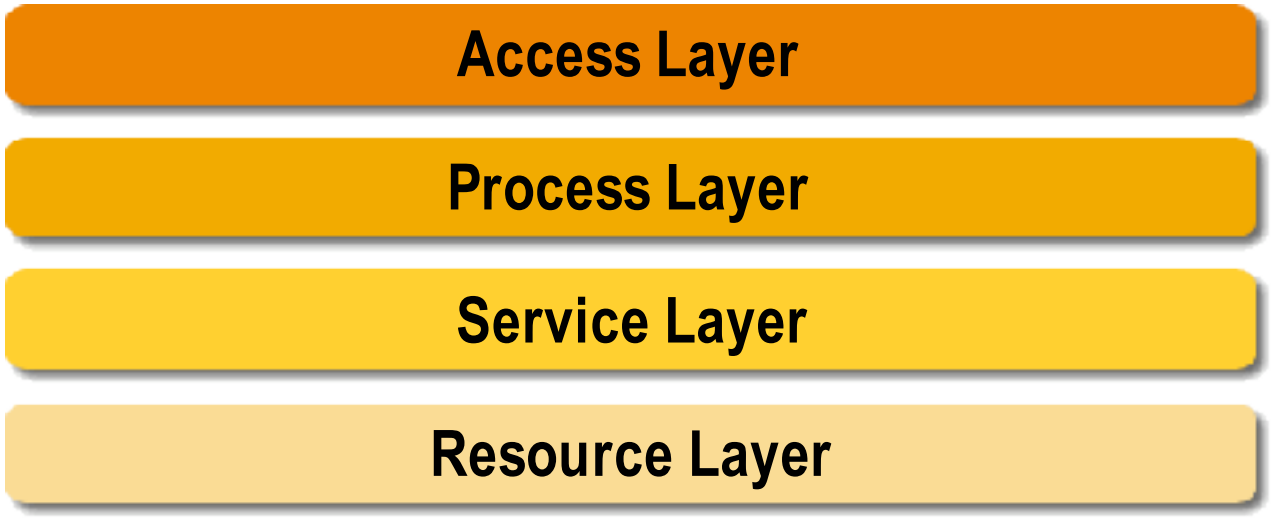


Elements of SOA



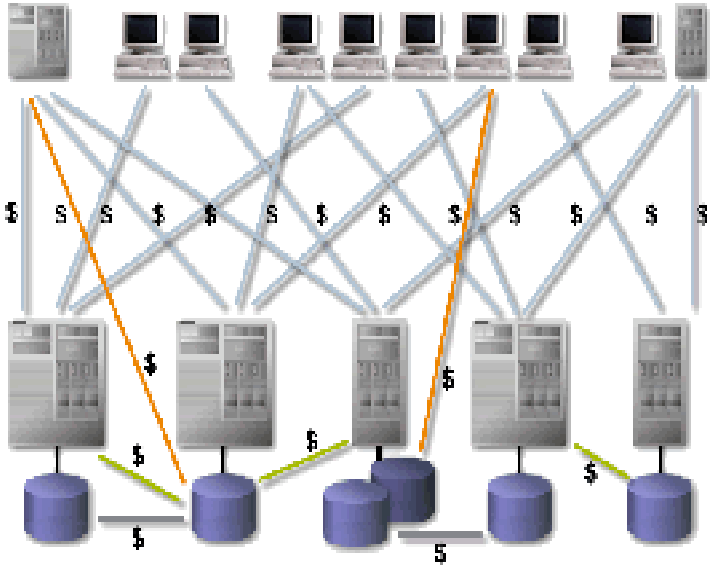
Layering Principle

- Shared Network-based **Layered** Services

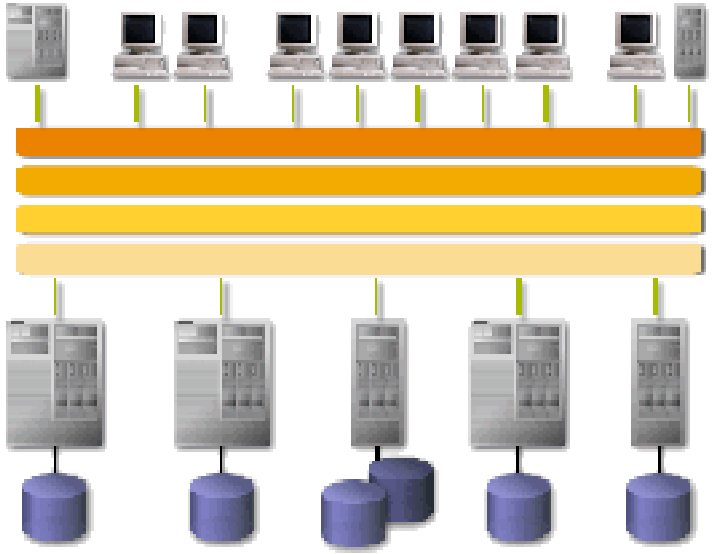


The “Move” to Service Orientation

Accidental
Rigid
***Silo*-Oriented**



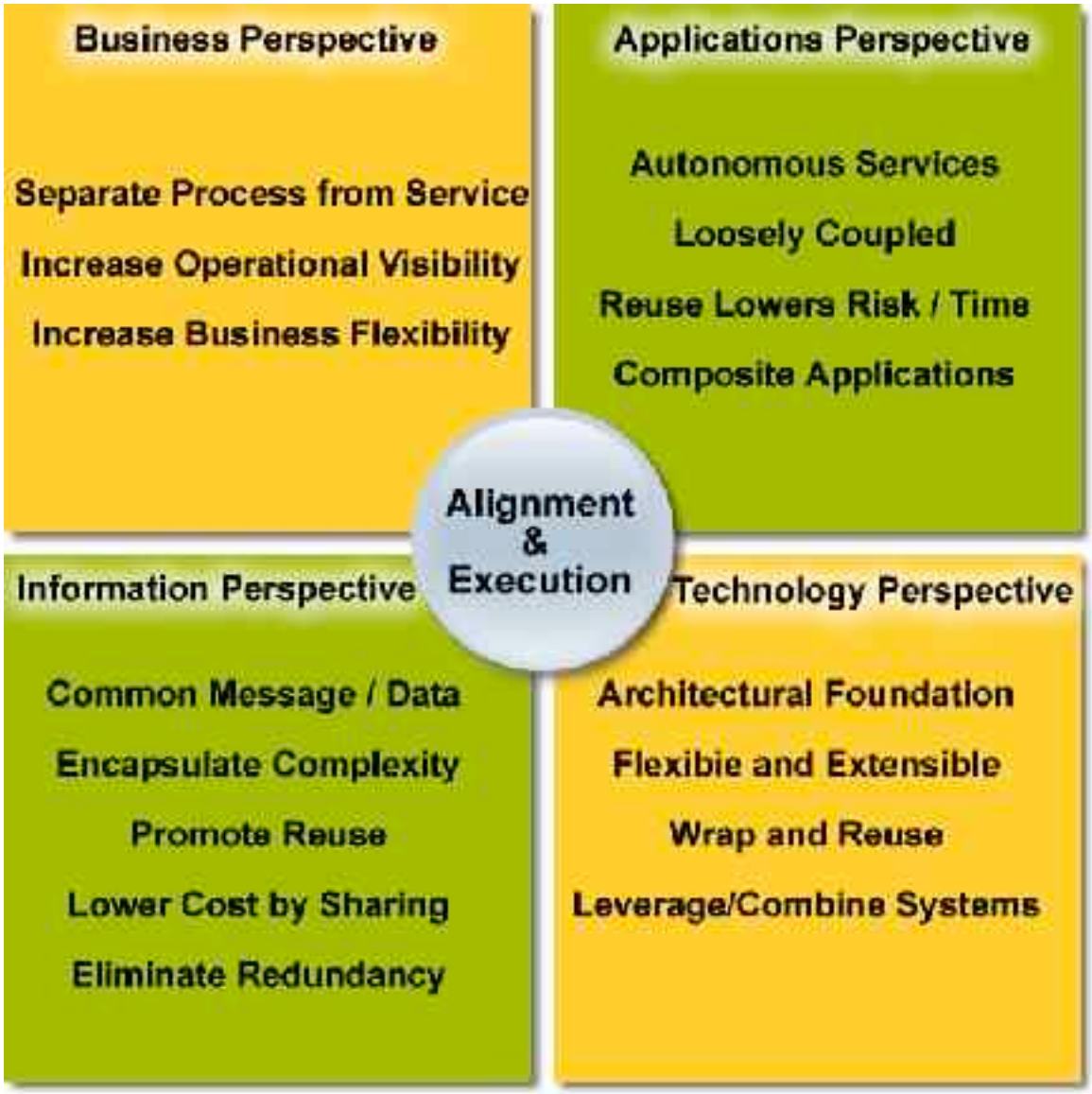
Layered
Extensible
***Service*-Oriented**



Section

SOA Benefits and Perspectives

SOA Perspectives



Benefits of SOA

- Flexible IT
  - > Faster to Market
  - > Changeable Business Processes
    - > Meet current/future market conditions
- Simplified Business Integration
  - > Seamless integration with customers and partners
- Visible Business Process
  - > Mutable, Extensible, Reusable
  - > IT Governance and Compliance
- Align IT and Business Units

Section

Pragmatic SOA @ Sun

Sun's Pragmatic SOA Approach

- Iterative, Incremental adoption and build out
- Interoperable
- Integrated and Integratable
- Simple to understand;
  Sophisticated to fulfill real-world needs
- Comprehensive Design;
  Pragmatic Implementation
- Standards-based

Pragmatic SOA: What It Is Not

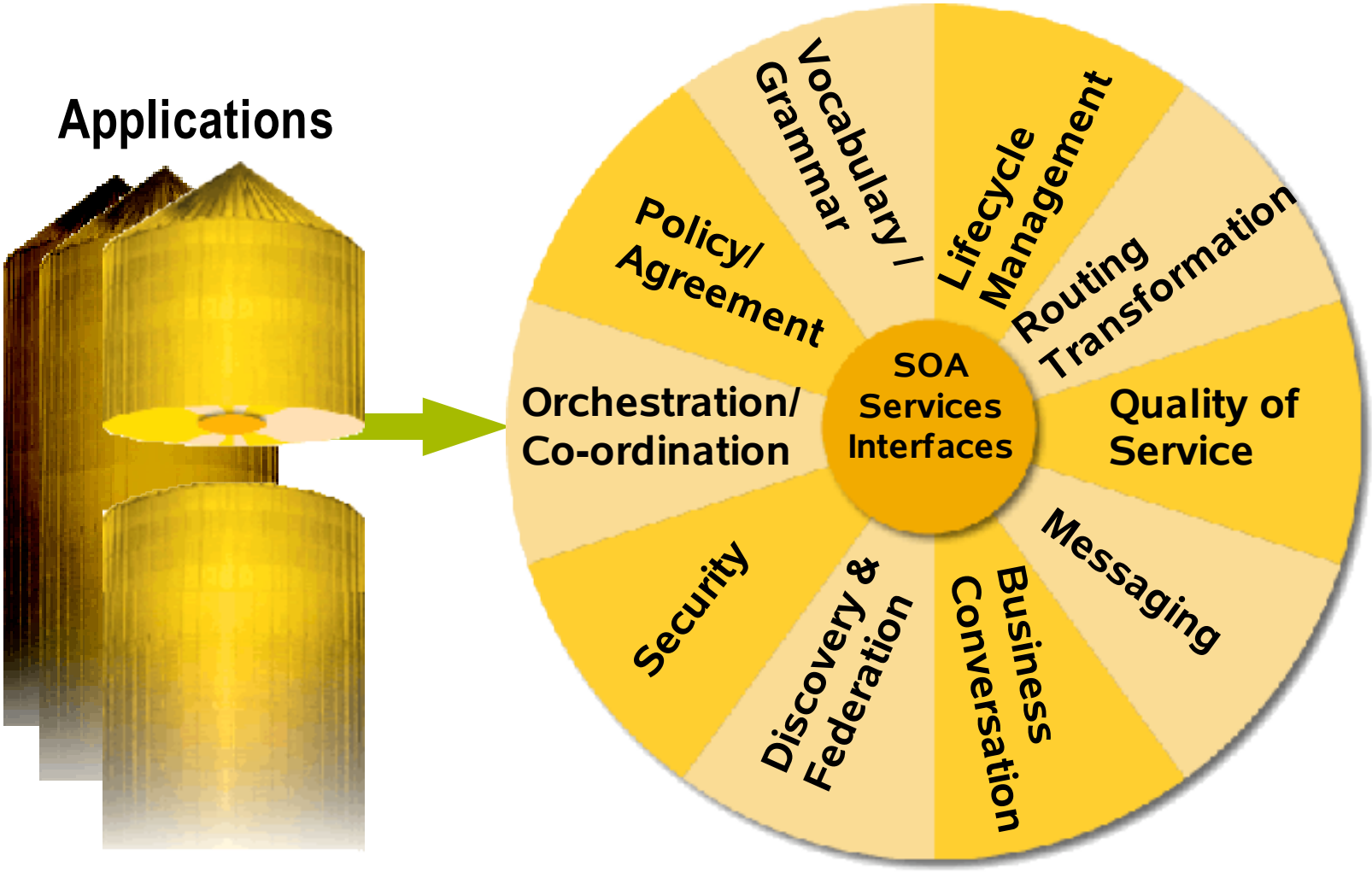
- SOA ≠ Products
- SOA ≠ Middleware
- SOA ≠ Software
- SOA ≠ Enterprise Service Bus
- SOA ≠ Web Services
- SOA ≠ ...

SOA and Web Services

Section

SOA and Standards

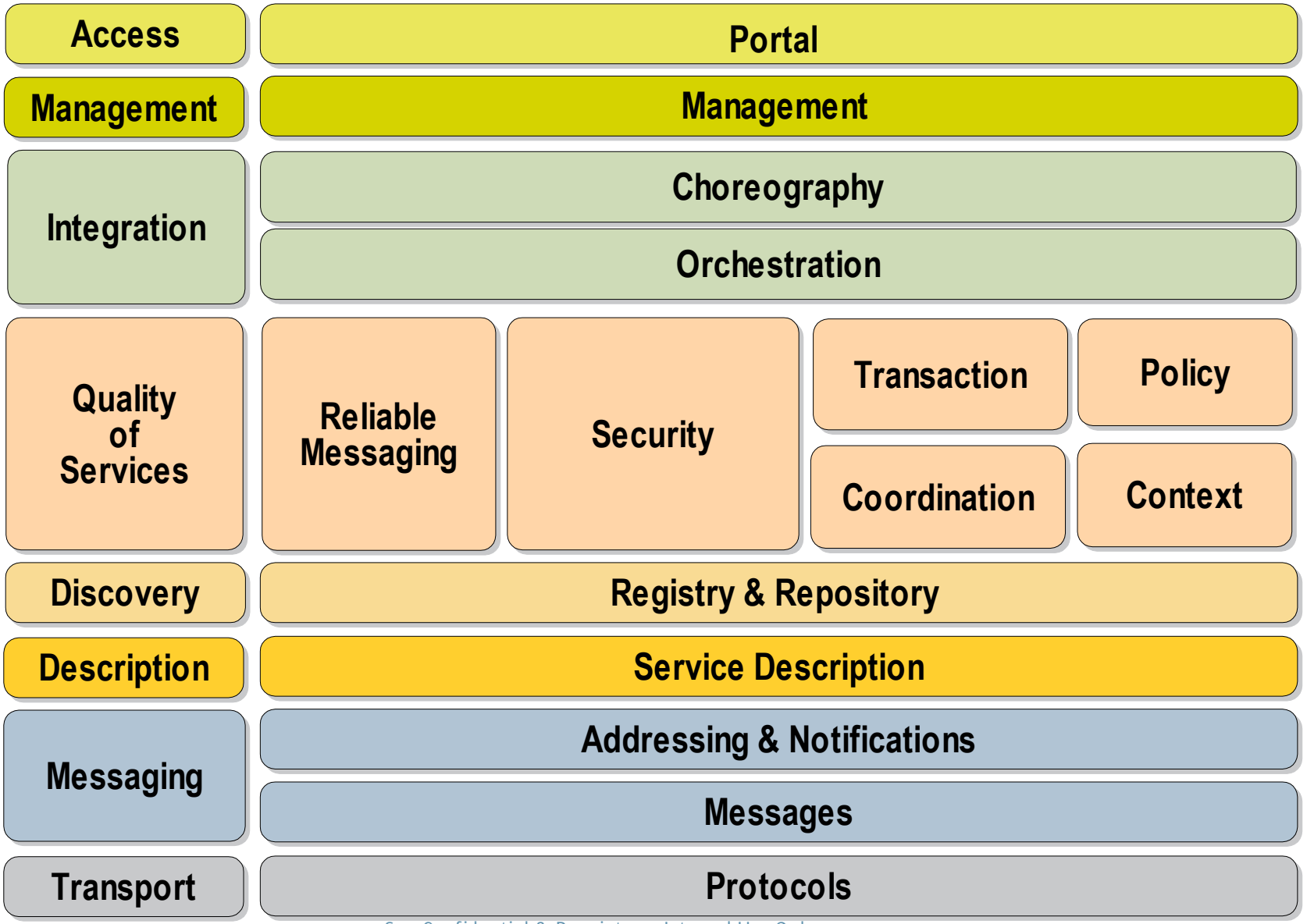
Facets of Enterprise Interoperability



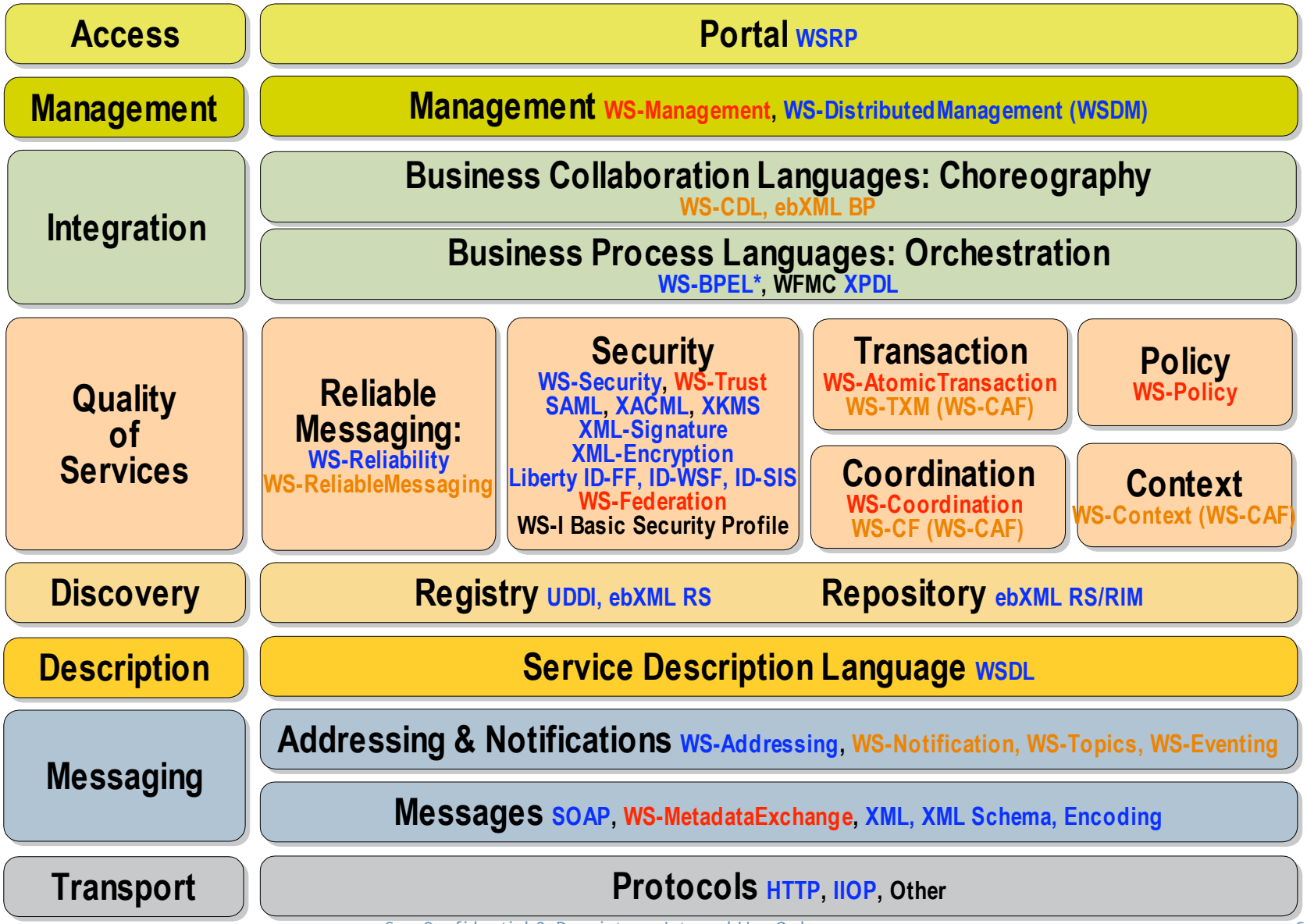
SOA and Standards

- Conformance to Standards is required
  - Interoperability
- Many areas of SOA are not standardized or have competing standards/specifications:
  - QoS: Security, Management, Monitoring, …
  - Software Development Life Cycle
  - Service Description
  - Contracts & Agreements
  - Enterprise Service Bus

SOA and Standards



SOA and Standards



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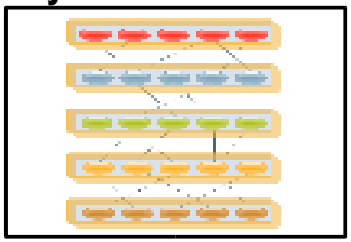
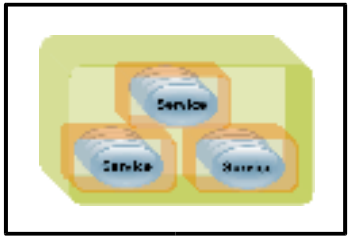
SOA Big Rules

SOA Big Rules – Eye Chart

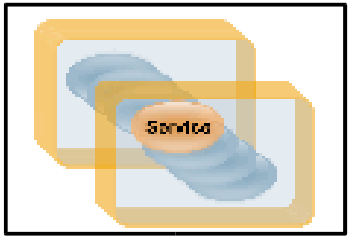
Layered



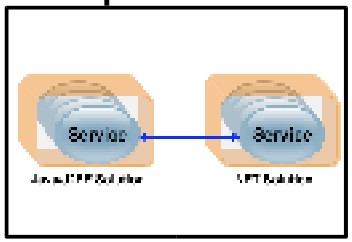
Modular & Autonomous



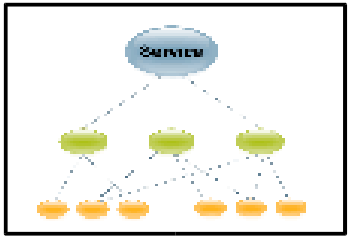
Service Reuse



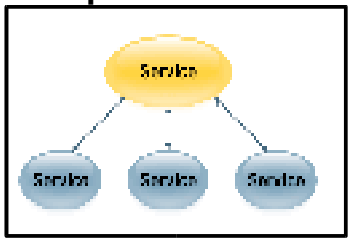
Interoperable



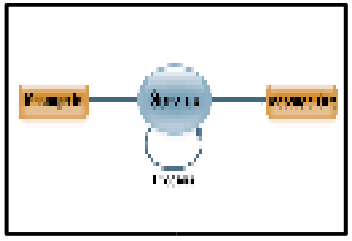
Coarse-Grained Business Services



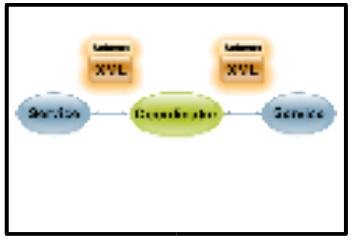
Composable



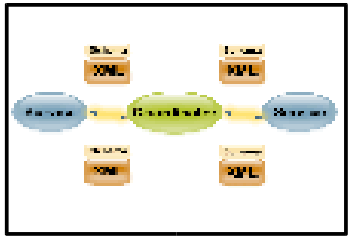
Stateless



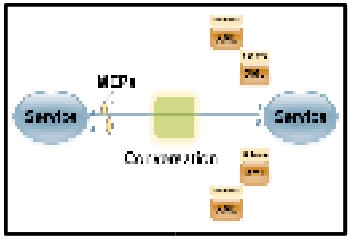
XML Doc-Based



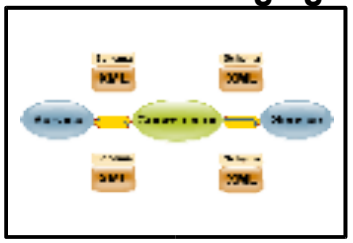
Asynchronous



Conversational

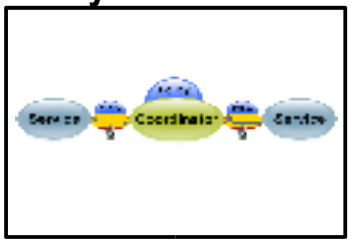


Reliable Messaging



Secure

Policy-Driven



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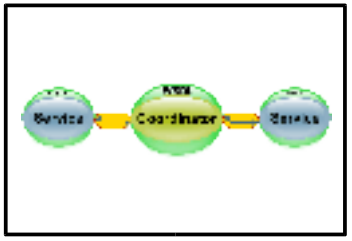
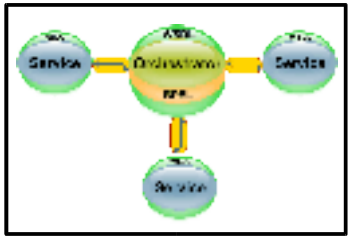


Orchestrated



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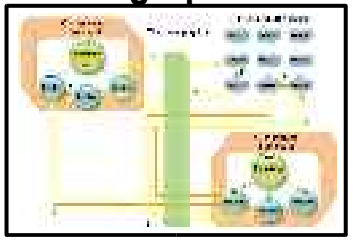

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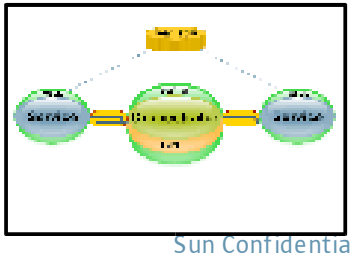
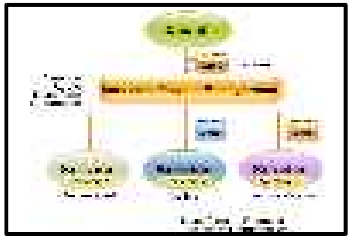
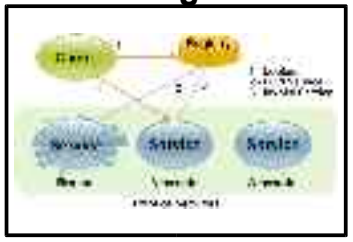


Loosely Coupled

Versioned



Self Healing



SOA Big Rules – Eye Chart

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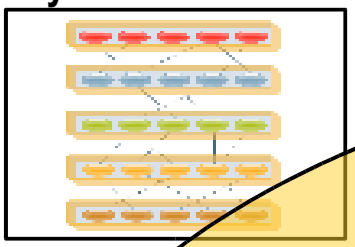

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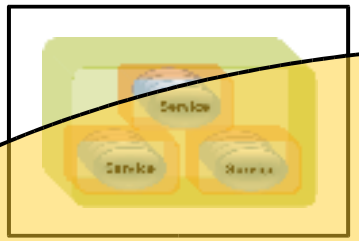
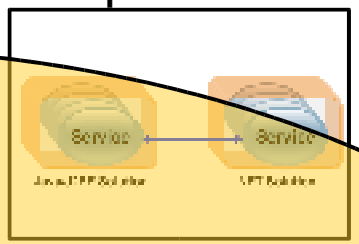
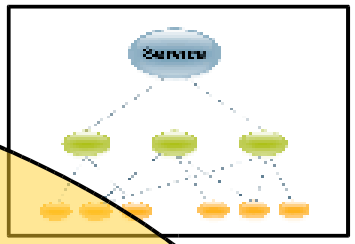


Service Reuse

Interoperable



Coarse-Grained Business Services



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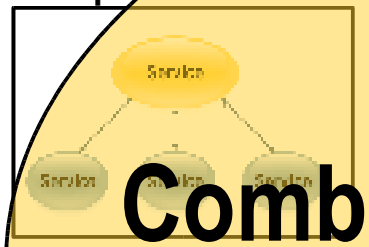
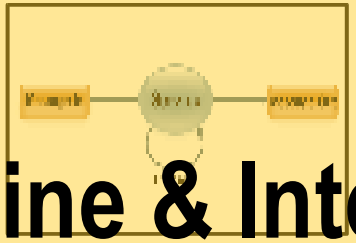


Stateless



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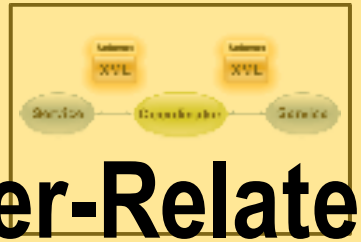

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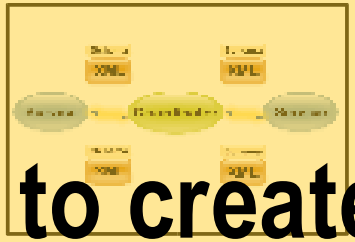

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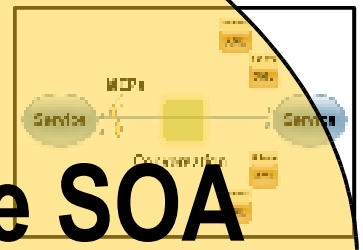
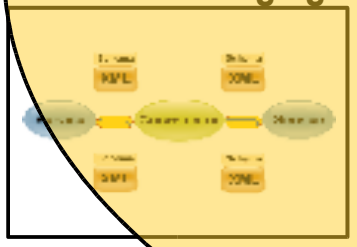
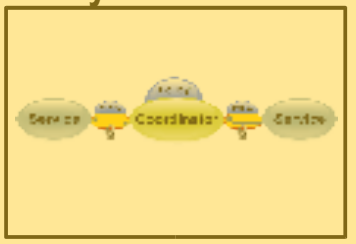


Reliable Messaging



Secure

Policy-Driven



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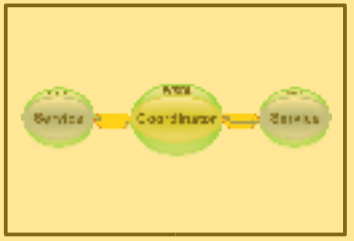

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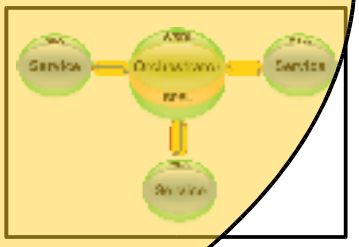

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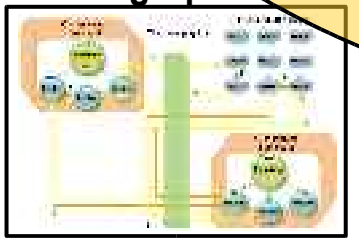

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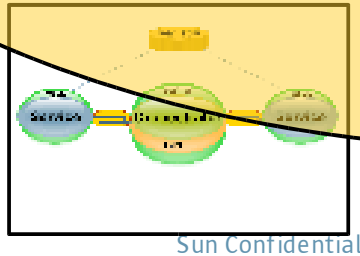

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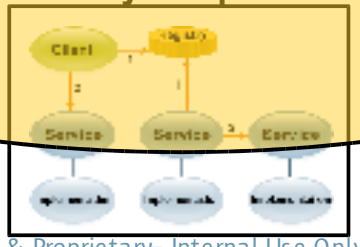

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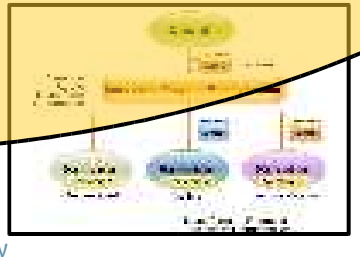
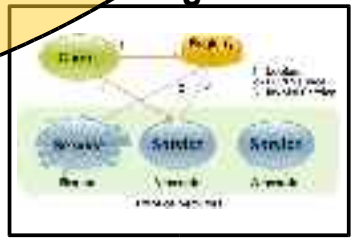


Self Healing



Combine & Inter-Relate to create SOA

Section

SOA And …

Enterprise Service Bus (ESB)

JBI

Registry/Repository

Security

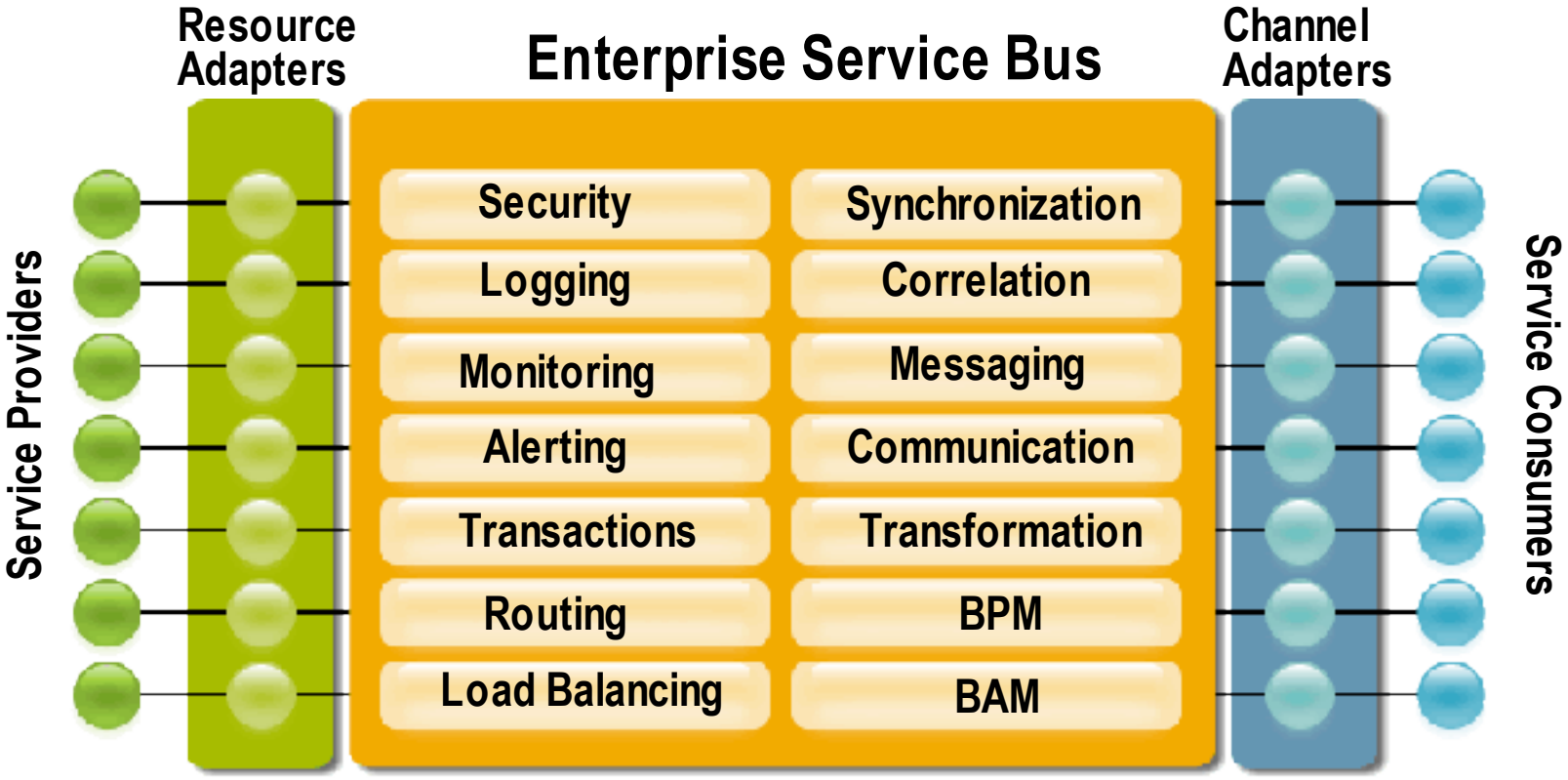
Composite Applications

Section

SOA and the Enterprise Service Bus (ESB)

ESB Features

Open standards, reliable, message-based, distributed, integration solution and mediation services



SOA and ESB

- ESB is a technology to implement SOA
  - Multiple connection types (Web Services, MOM, ...)
  - Multiple service protocols (Sync/Async)
- ESB alone is not enough to implement SOA
  - Application Platforms, Integration Platforms, and MOMs that support services
- A pluggable ESB architecture supports
  - Many value-added technical & application services

Section

SOA and
Java Business Integration (JBI)
JSR-208

SOA and Java Business Integration
JBI (JSR 208)

- Current Integration Industry
  - > Proprietary Approaches
  - > Converging on a service-based model
  - > Converging on standard messaging model

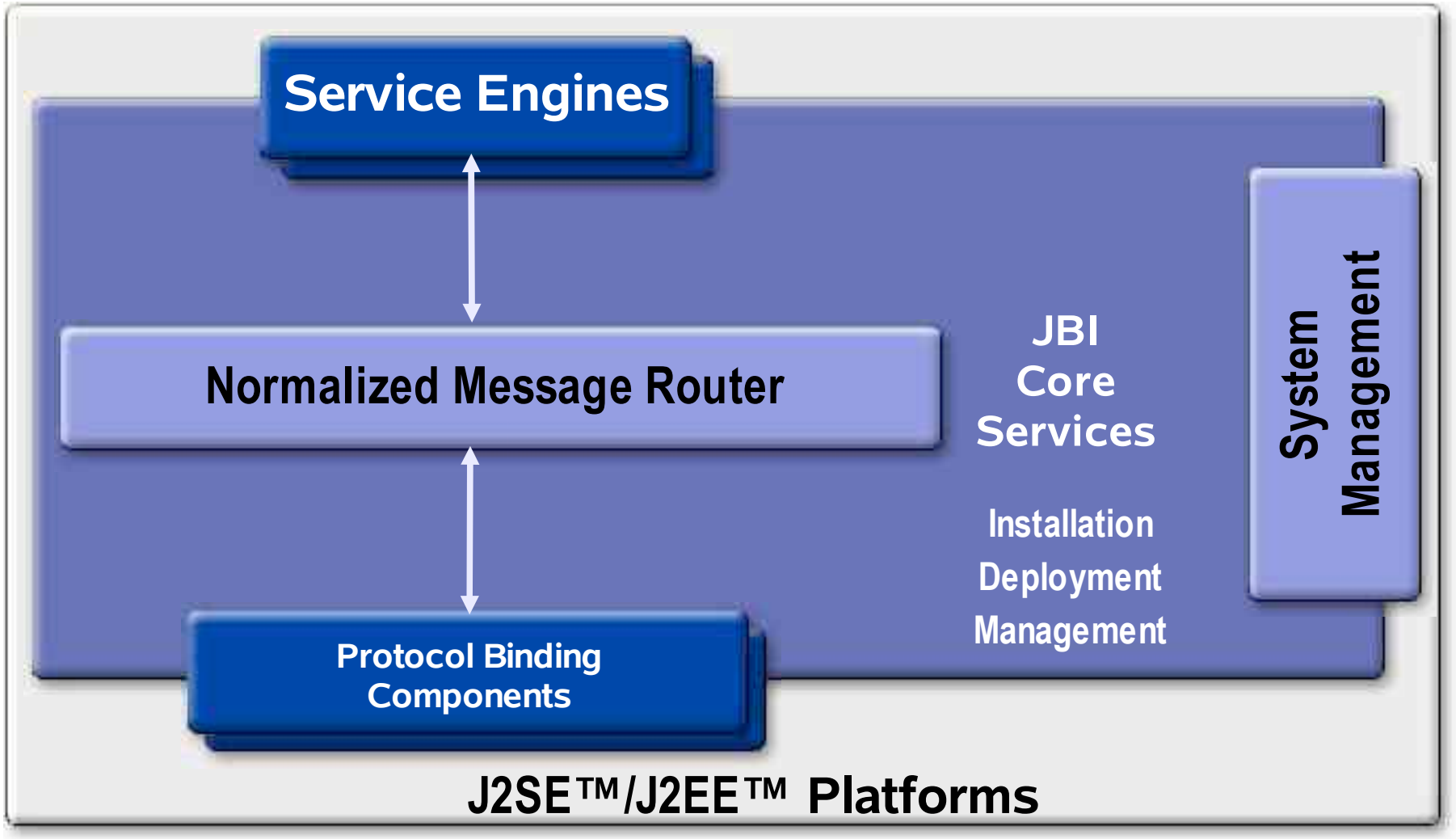
>> Ready for Standardization

>> JBI

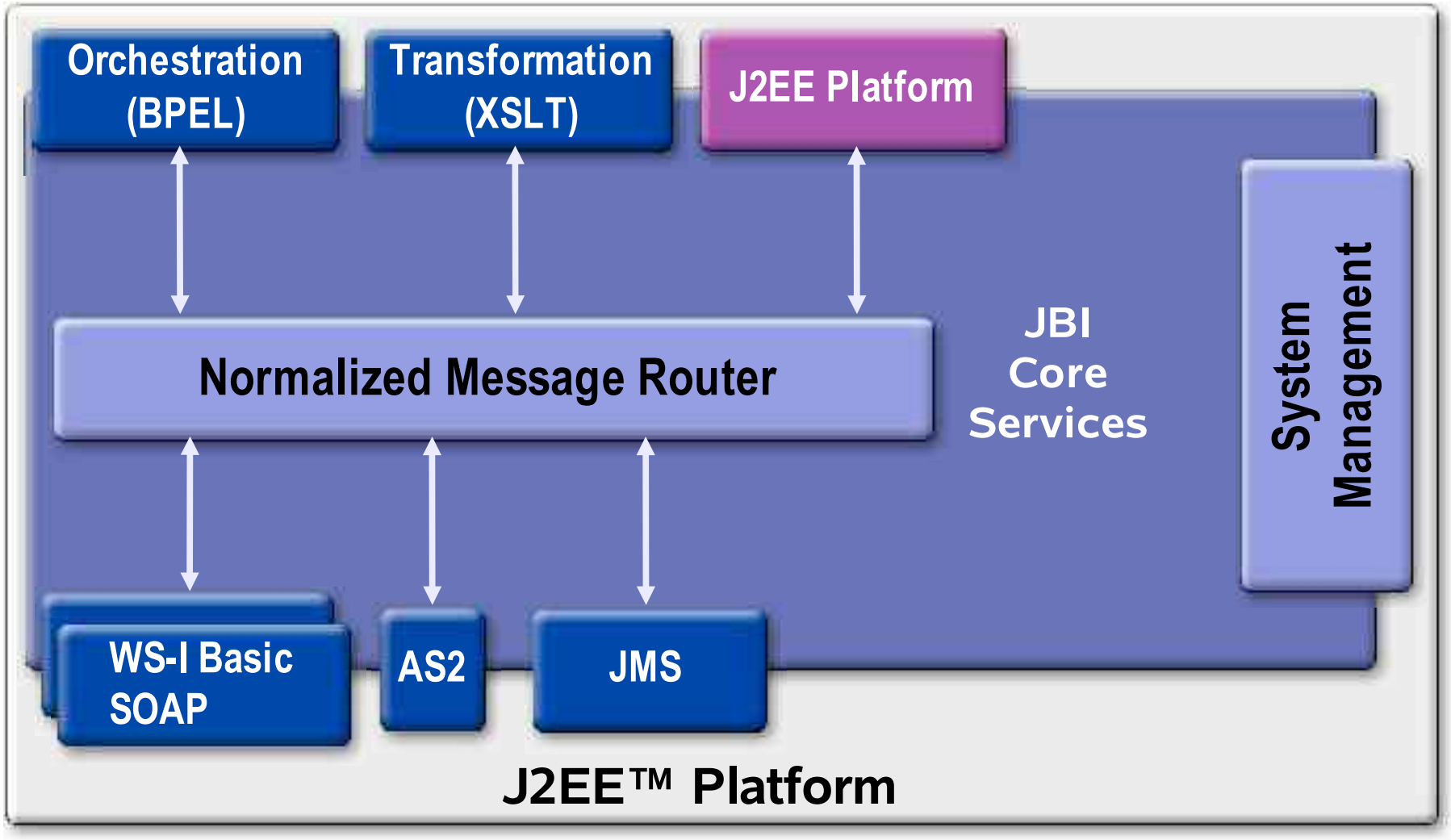
What is JBI?

- Standard “meta-container” for integrated services
- Service-Oriented Architecture infrastructure
- Provides for plug-in:
  - Engines — providing business logic and functions
  - Bindings — providing communications protocols:
    - Access to remote services
    - Allowing access to other services

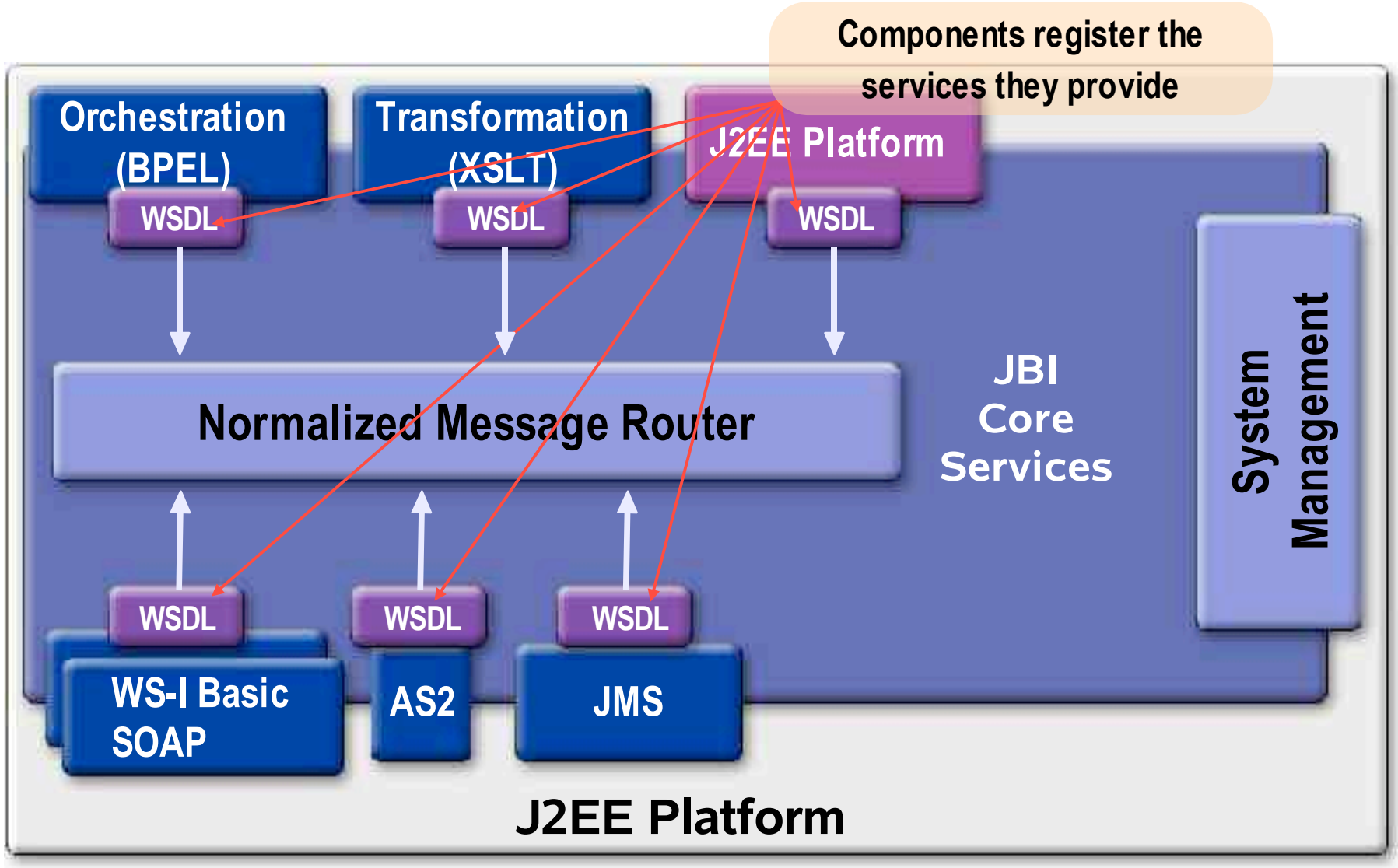
What is JBI?


Service Engines
Normalized Message Router
Protocol Binding Components
JBI Core Services
Installation
Deployment
Management
System Management
J2SE™/J2EE™ Platforms

Example SEs & BEs

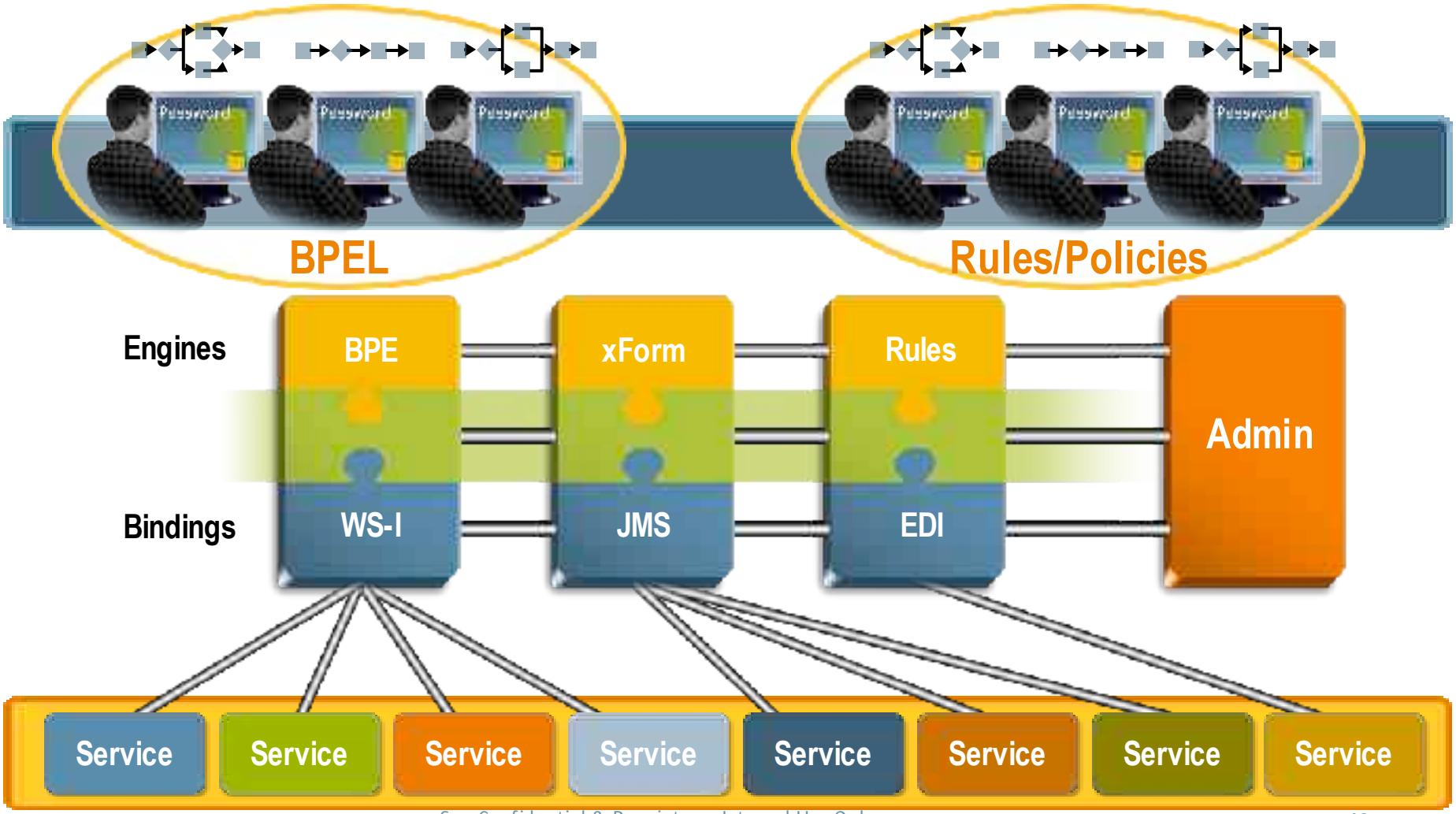


Service Provider Self-Description



Java Business Integration

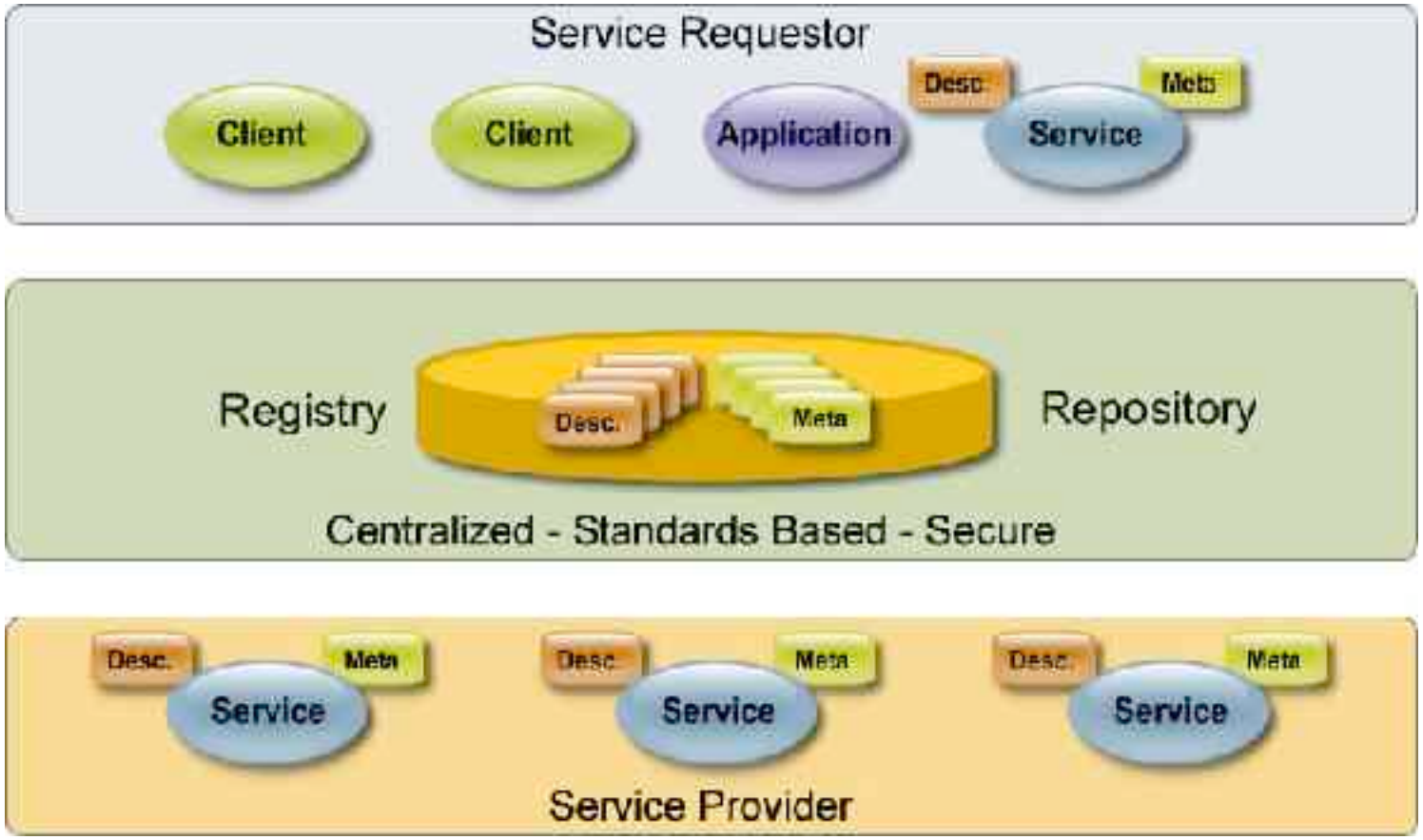
Evolution of the Platform to Enable SOA



Section

SOA and
Registry / Repository

Why a SOA Registry?



SOA Project Inter-dependent Artifacts:

- **XML Schemas, XSLT Transforms, etc.**
- **Descriptions: WSDL, WSRP, etc.**
- **Definitions: BPEL, etc. & Policies**

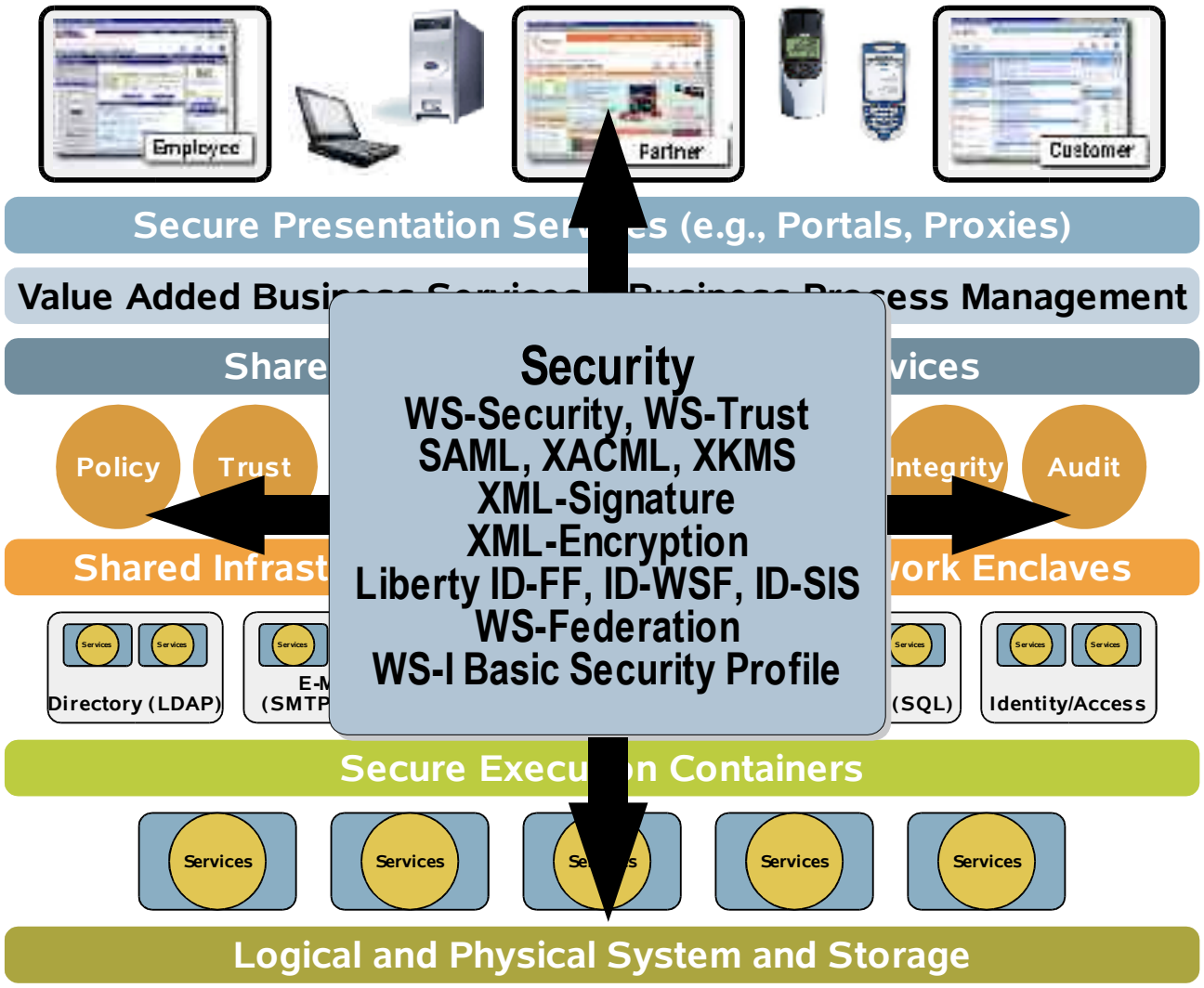
SOA Governance: Role of Registry/Repository

- Centralized manageability & Point of Control
- Policy Management Enforcement
  - > Service Management
  - > Security
  - > Versioning, Deprecation/Retiring, etc.
- ebXML Registry standard includes functions supporting governance use

Section

SOA and Security

SOA and Security



Section

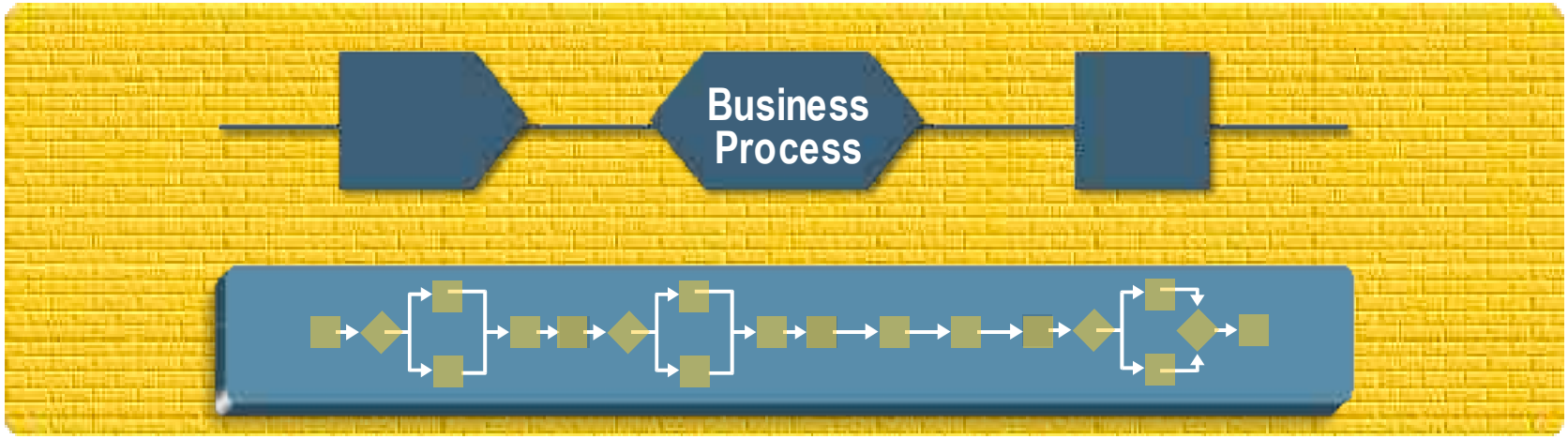
SOA and Composite Applications

Composite Application

- Set of reusable services composed into a new application
- Consumes existing services
- Exposes new service interfaces
- Encapsulates business processes/collaboration
- Unit of deployment for services
- May or May not expose a user interface

Composite Application Equation

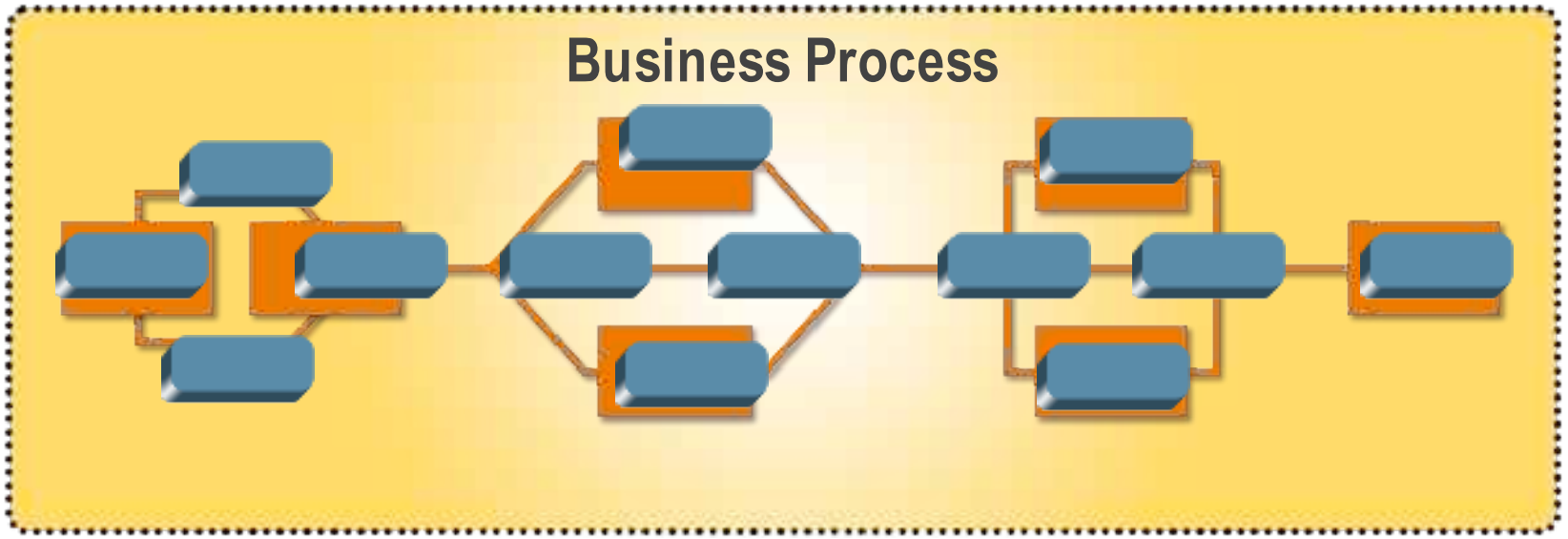
Monolithic Applications – Poor Fit



Monolithic Application with Business Logic Built-in

- Expensive to maintain – $$$
- Inflexible
- Highly custom

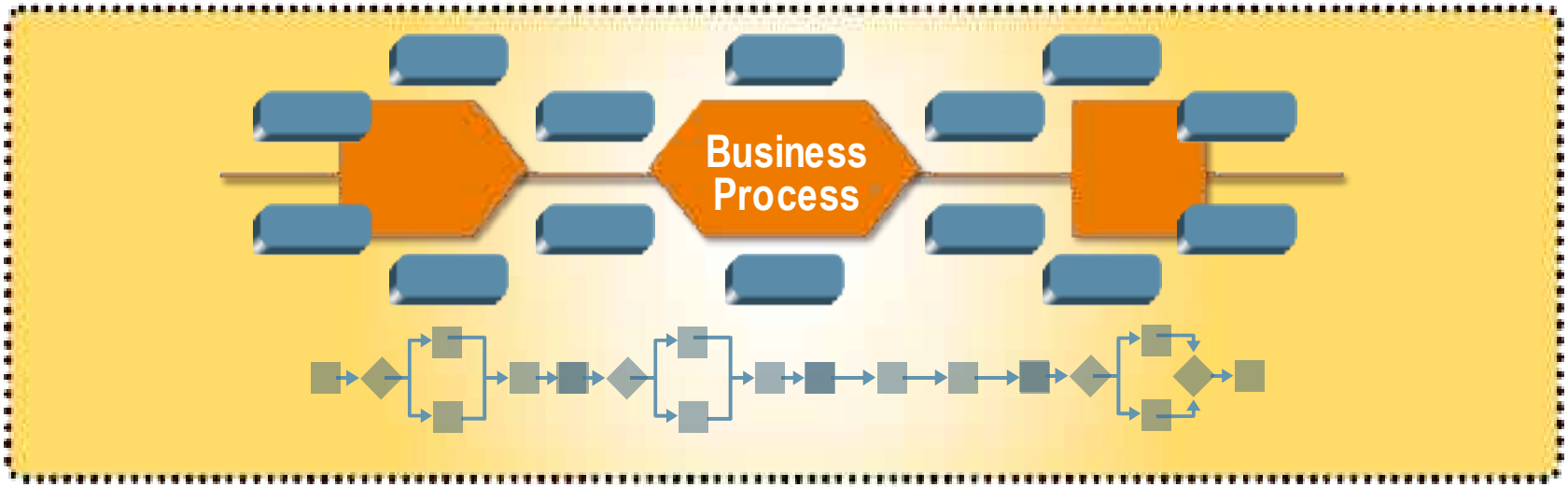
Composite Applications – Best Fit



Orchestrated Business Services: Composite Applications

- Closely aligned with business
- Easy to maintain
- Easy to change

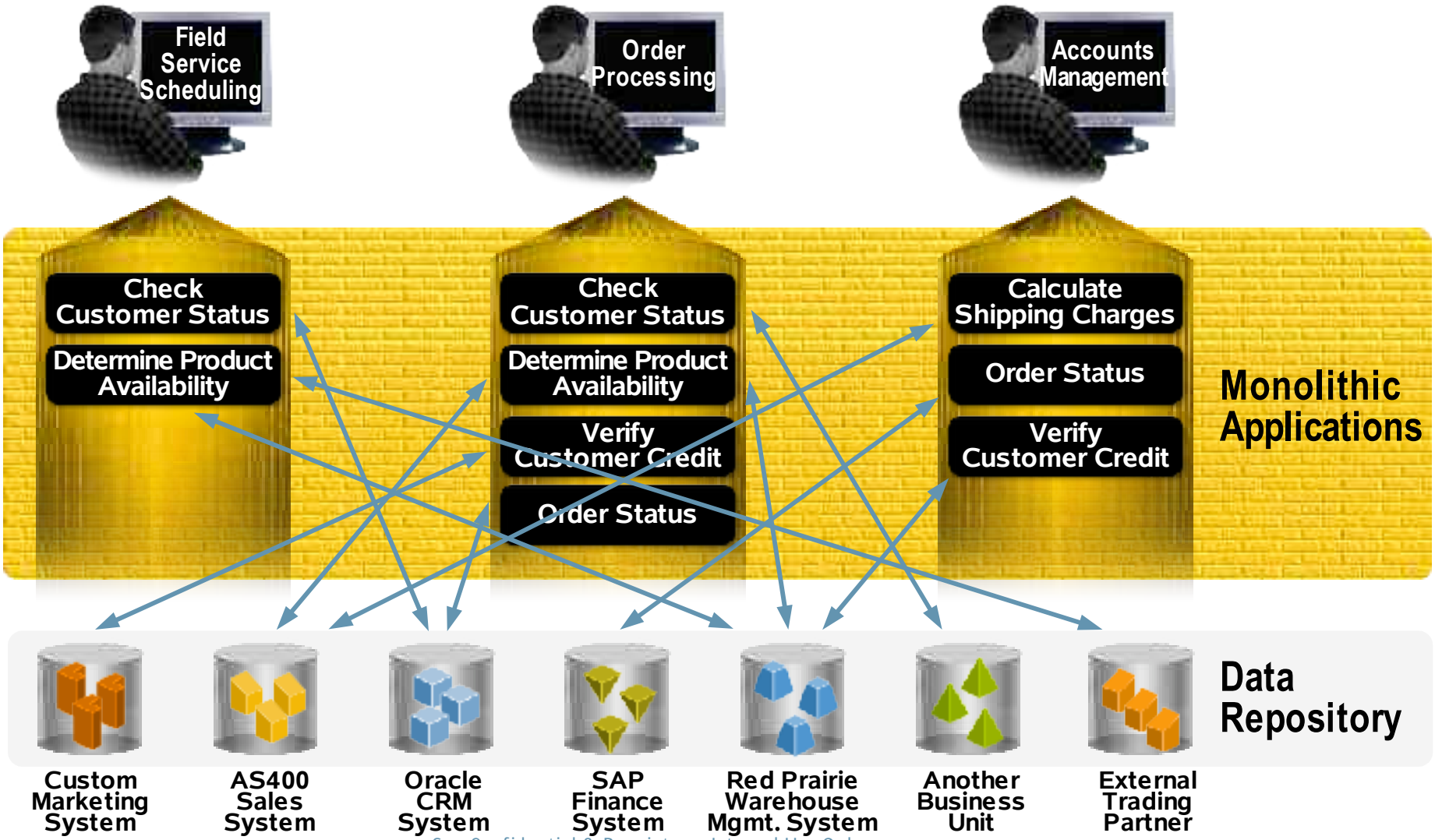
Composite Applications – Best Fit



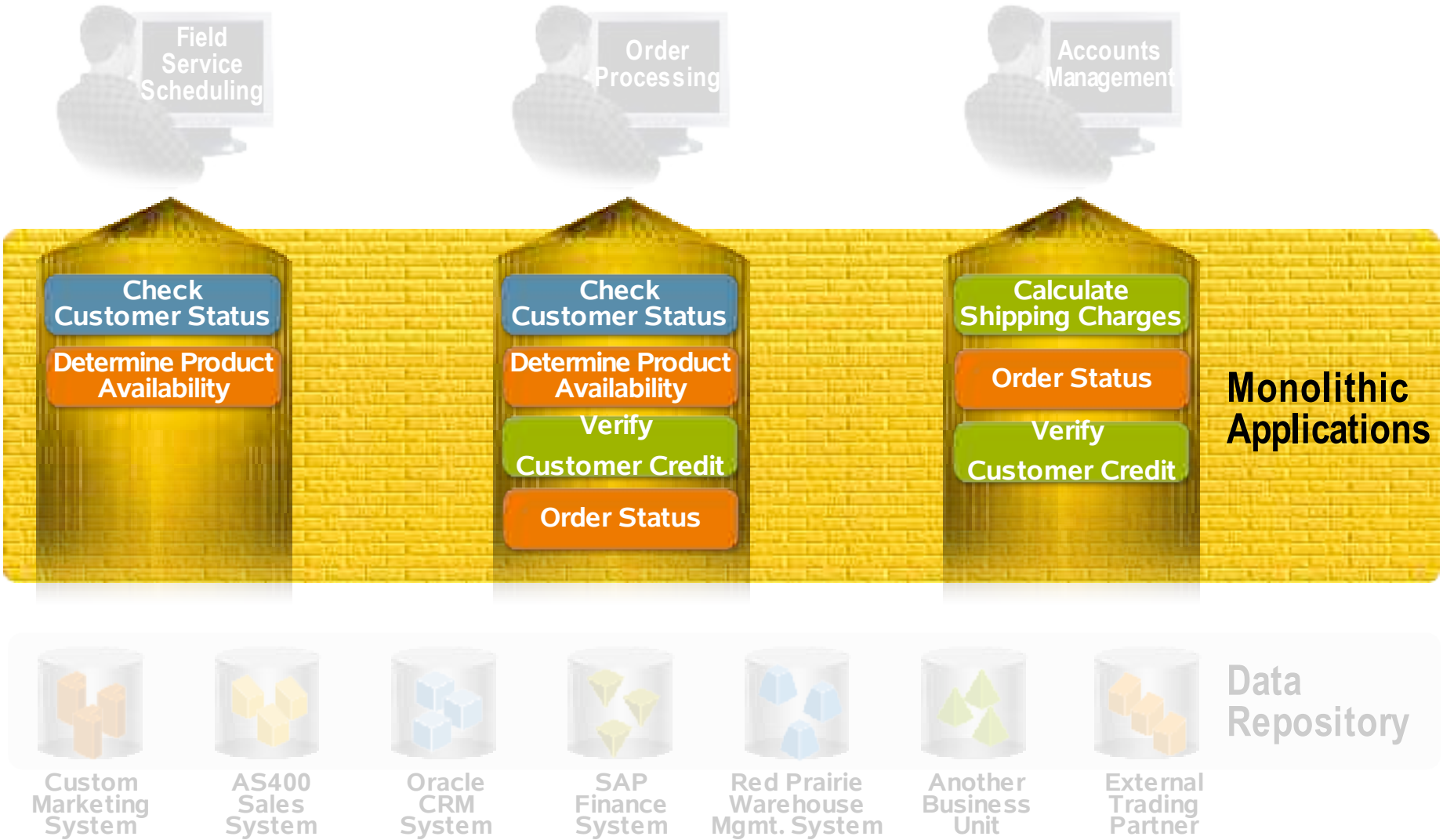
Orchestrated Business Services: Composite Applications

- Closely aligned with business
- Easy to maintain
- Easy to change

IT Silo


Field Service Scheduling
Order Processing
Accounts Management
Check Customer Status
Determine Product Availability
Check Customer Status
Determine Product Availability
Verify Customer Credit
Order Status
Calculate Shipping Charges
Order Status
Verify Customer Credit
Monolithic Applications
Data Repository
Custom Marketing System
AS400 Sales System
Oracle CRM System
SAP Finance System
Red Prairie Warehouse Mgmt. System
Another Business Unit
External Trading Partner

IT Silo


Field Service Scheduling
Order Processing
Accounts Management
Check Customer Status
Determine Product Availability
Check Customer Status
Determine Product Availability
Verify Customer Credit
Order Status
Calculate Shipping Charges
Order Status
Verify Customer Credit
Monolithic Applications
Data Repository
Custom Marketing System
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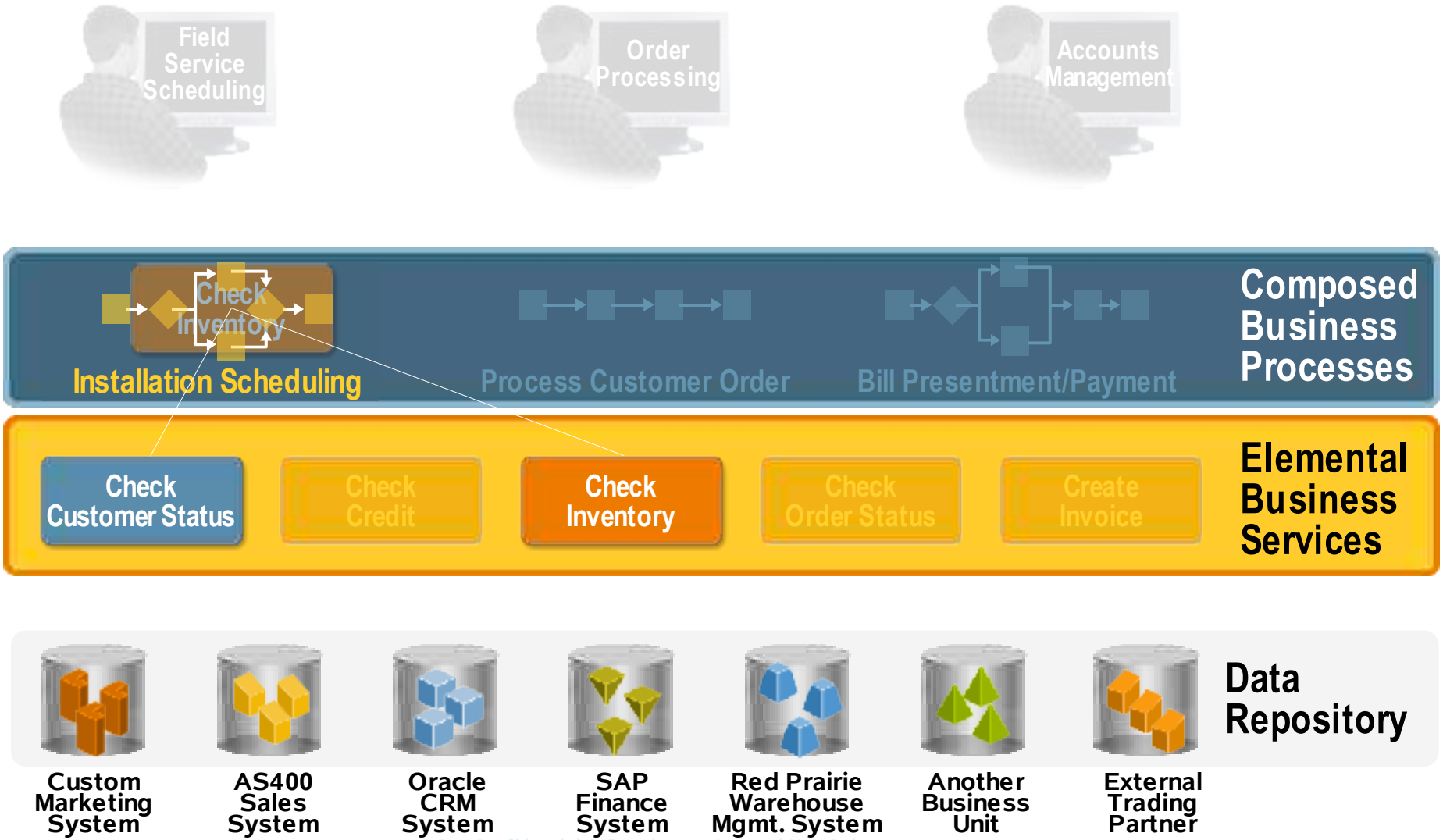
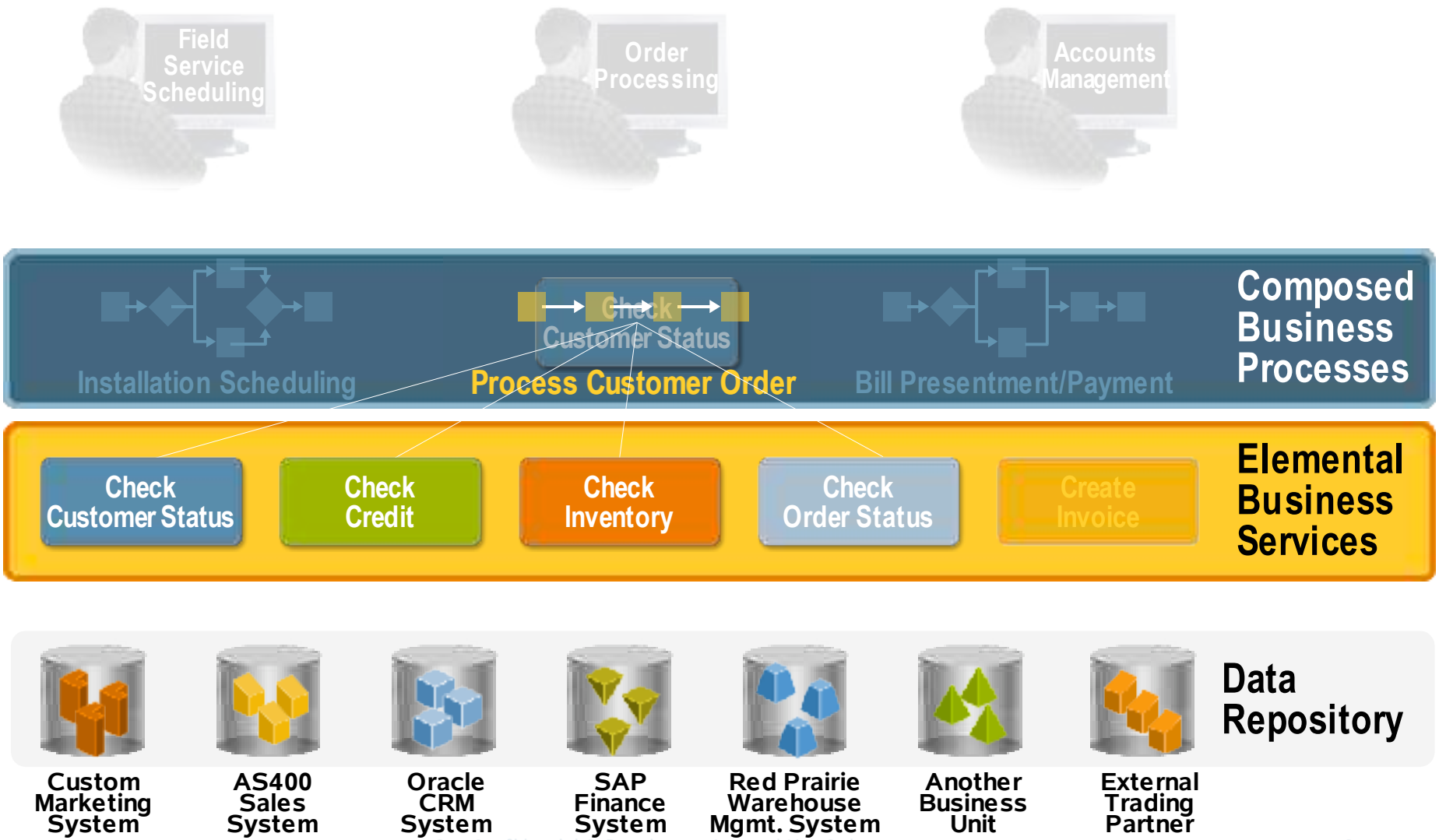
Red Prairie Warehouse Mgmt. System
Another Business Unit
External Trading Partner

Reuse Services Via Re-composition

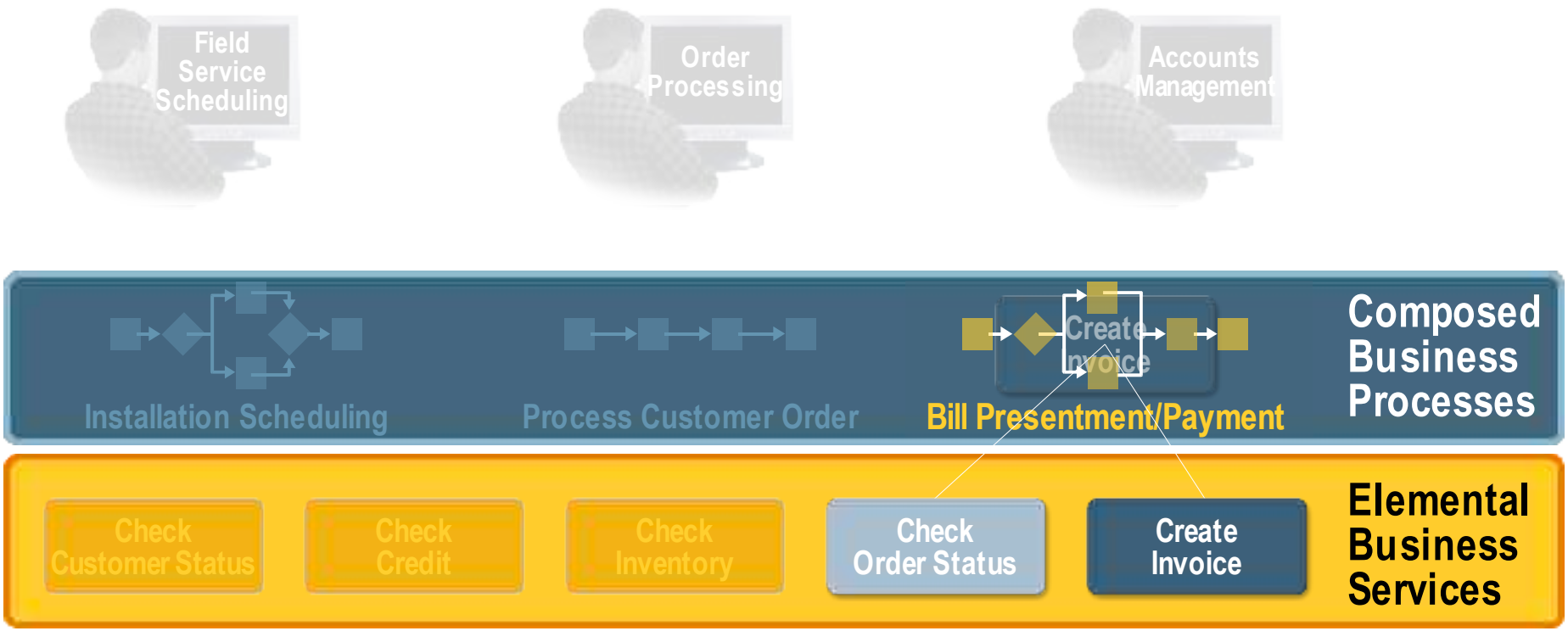
Reuse Services Via Re-composition



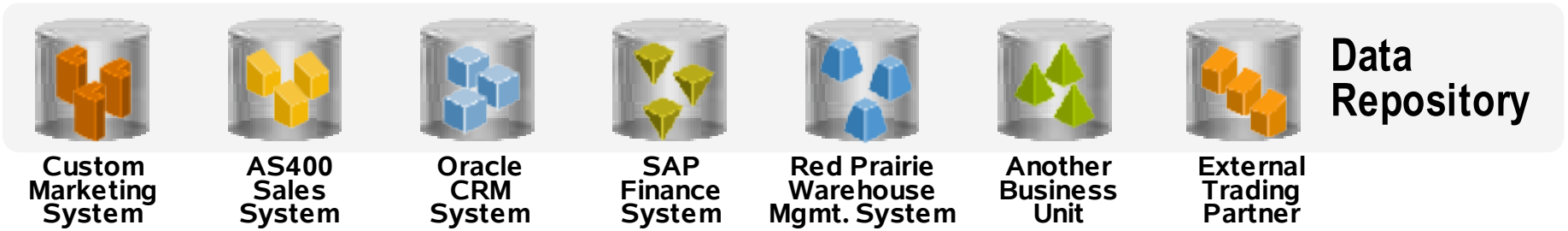
Reuse Services Via Re-composition

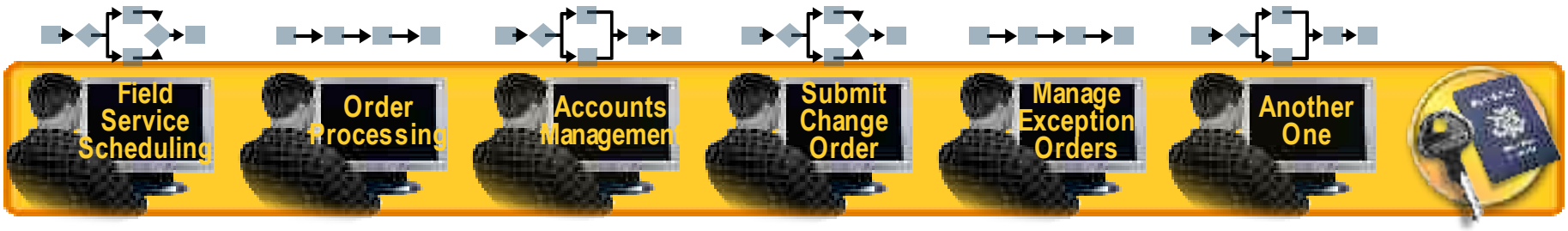


Reuse Services Via Re-composition

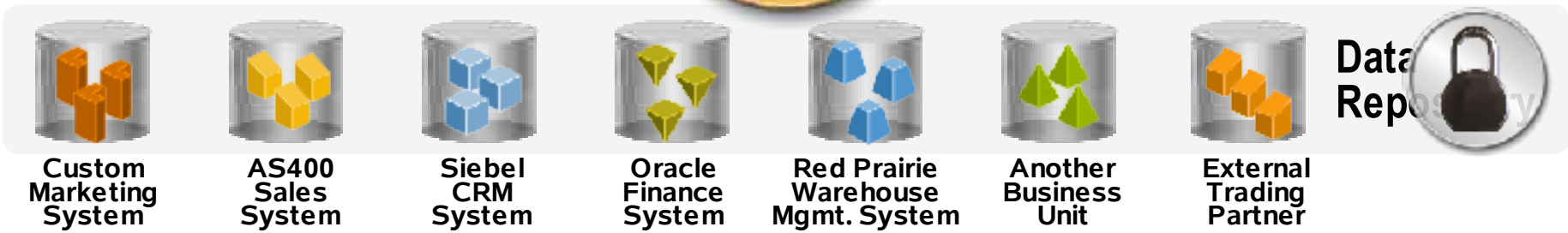


Business Processes Are Composed Hierarchically to Create Composite Applications

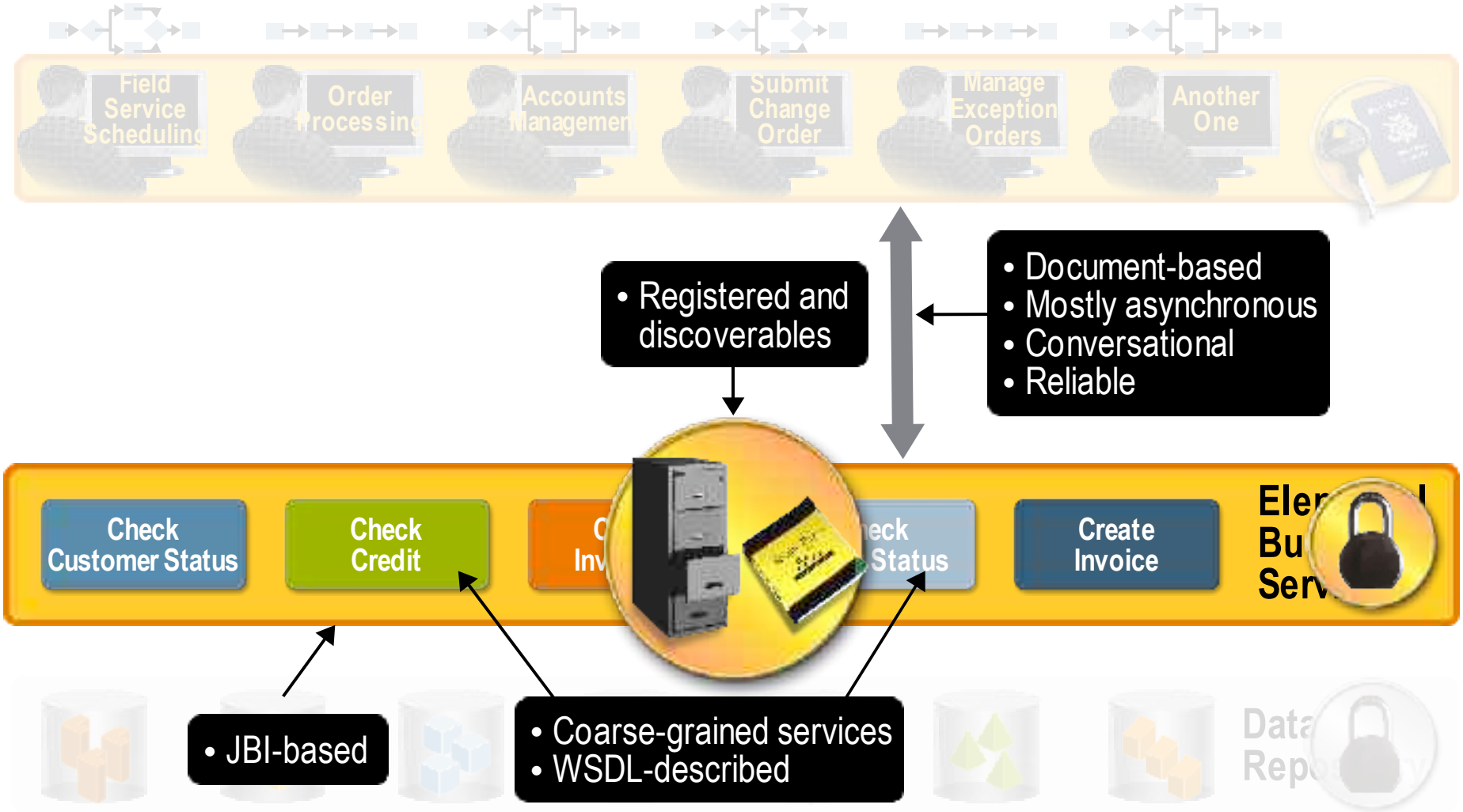




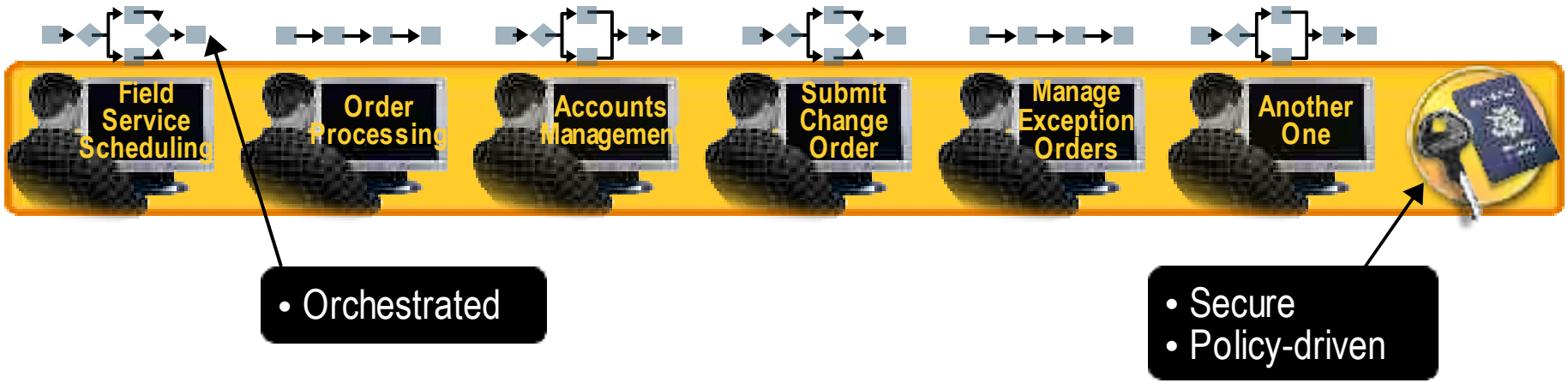
Shared Services – Composite Apps – Increased Functionality



SOA Principles



SOA Principles



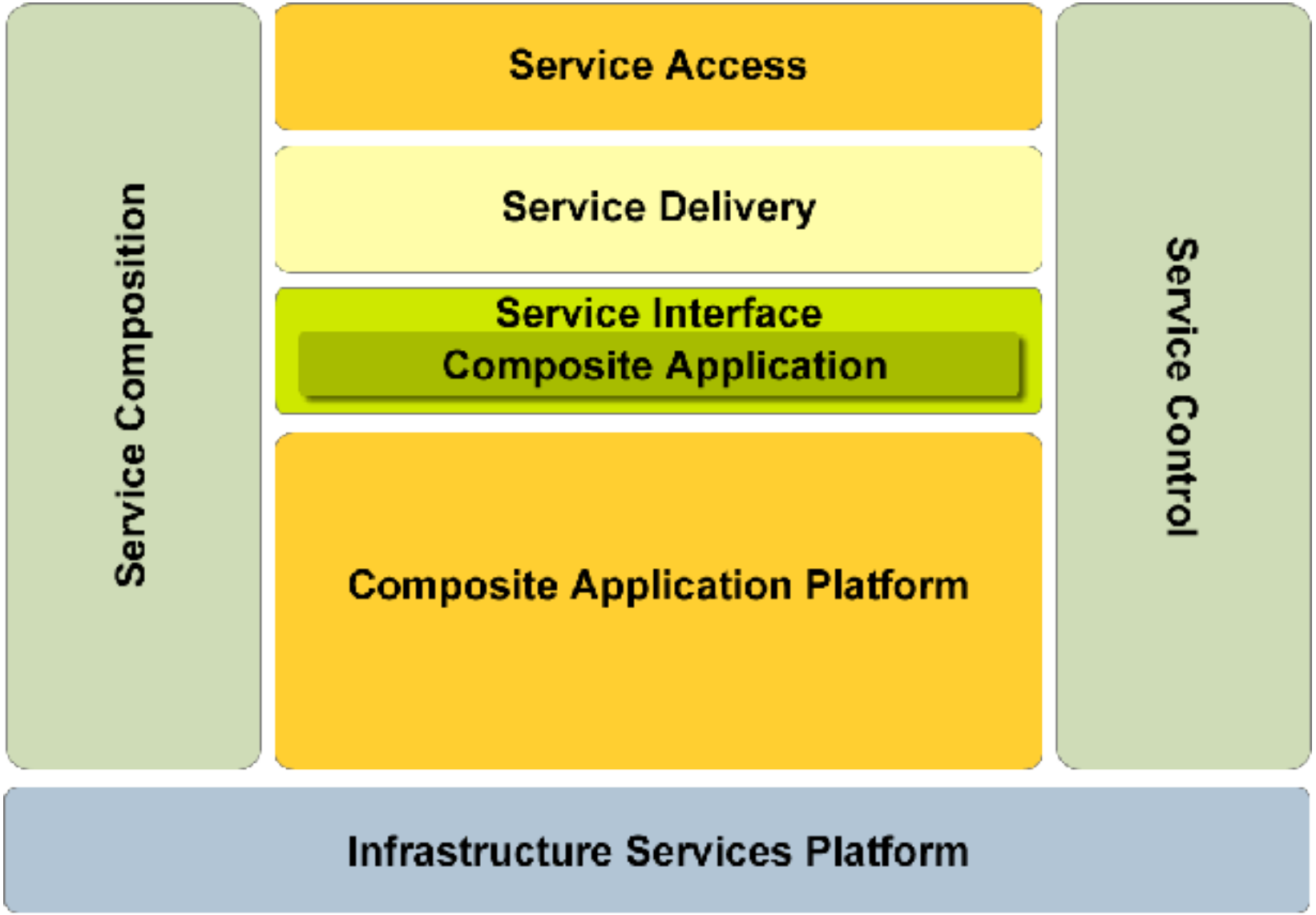
Section

The Sun SOA Platform Vision

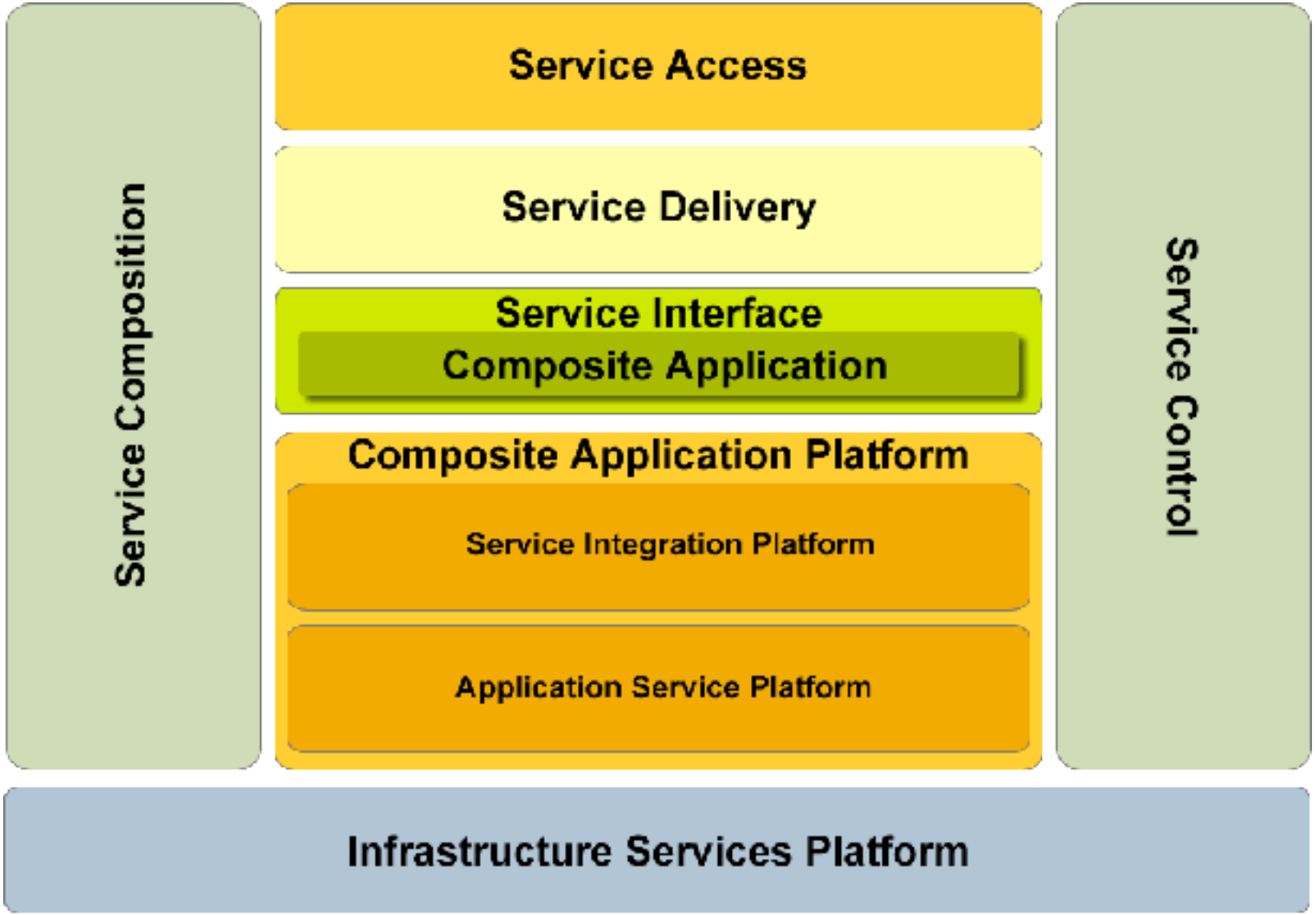
Sun SOA Platform Vision

- Standards-based
- Unifies different collaboration standards
- Integrated, Integratable, Interoperable
- Comprehensive End-to-End platform
- Addresses different design centers:
  - Service Interface
  - Service Composition
  - Service Control
  - Composite Application Platform
  - Service Delivery

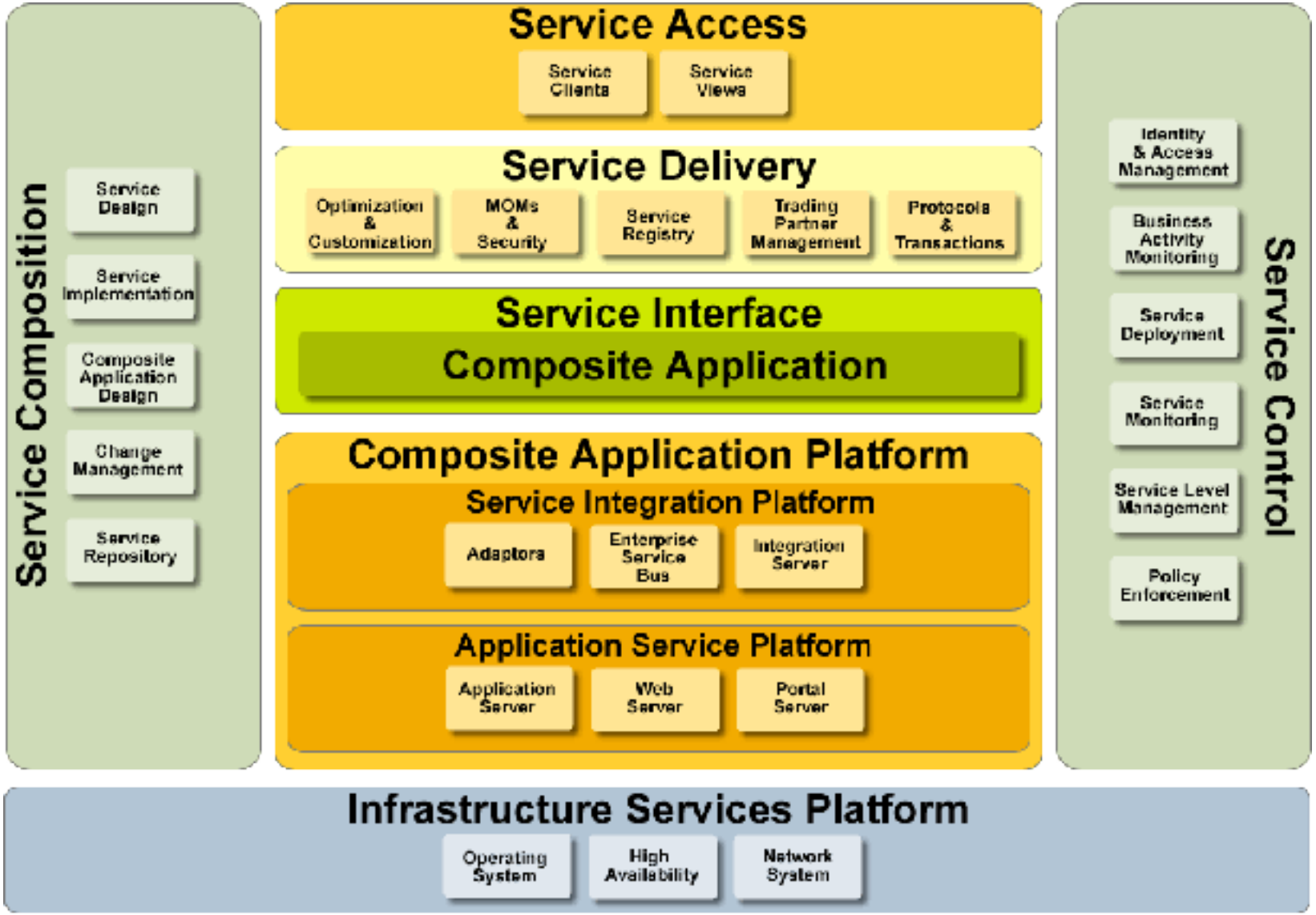
Sun SOA Platform



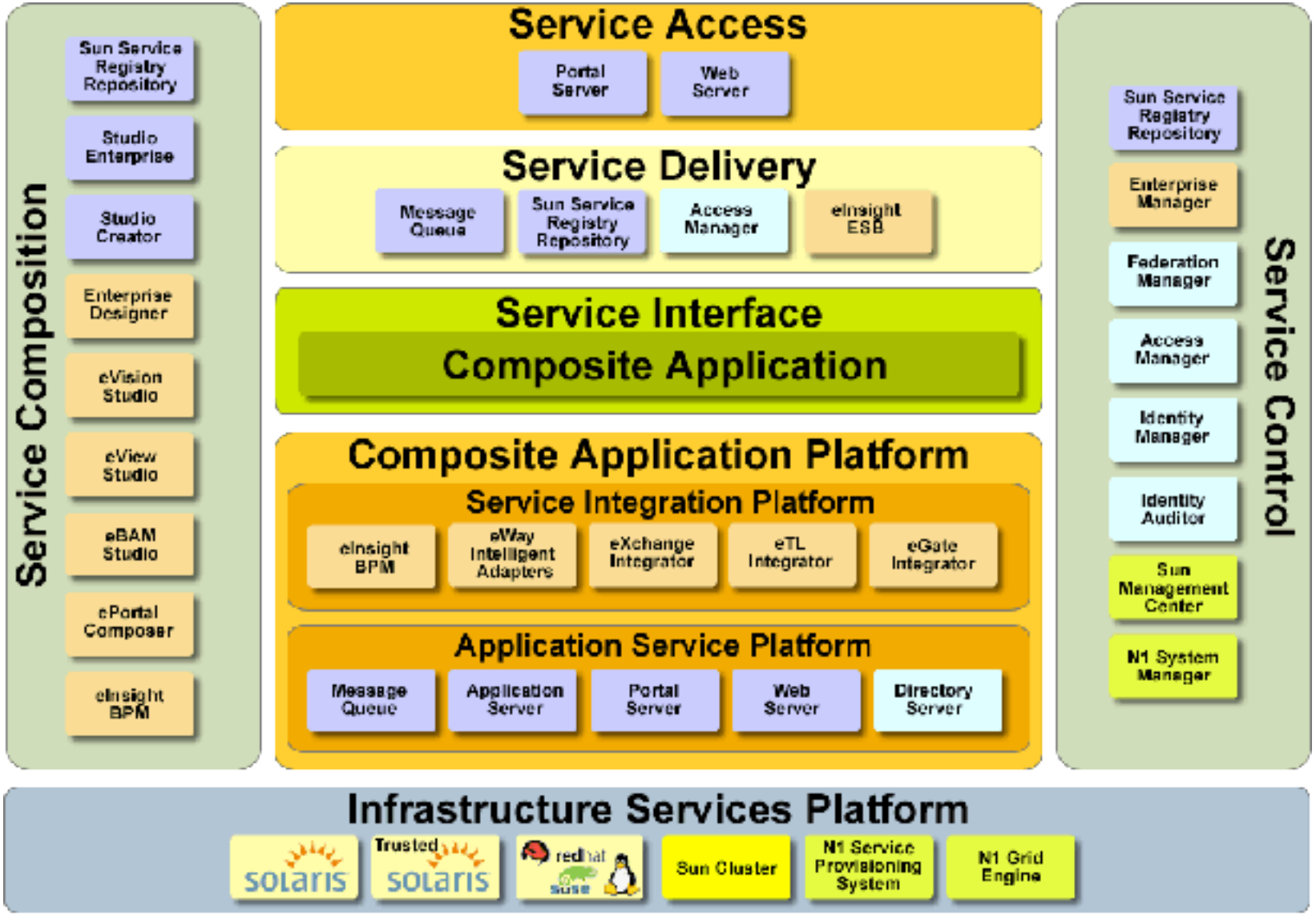
Sun SOA Platform



Sun SOA Platform



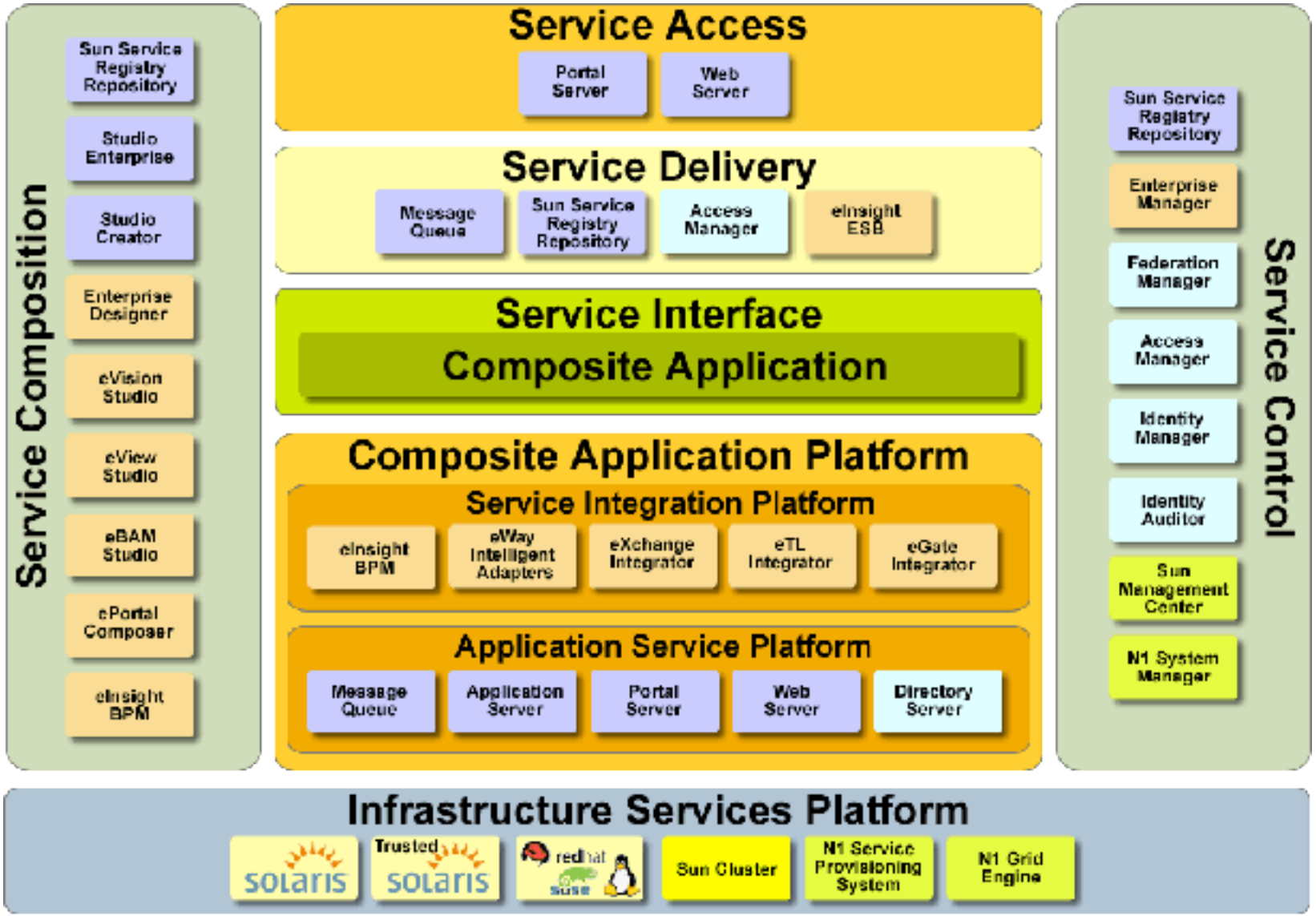
Sun SOA Platform



Section

Sun Product Offerings for SOA

Sun SOA Platform - Comprehensive Product Offering



Solaris 10: Secure by Design

- Zones:
  - Reduce server sprawl
- Process Rights Management:
  - Allow service process to run with only minimal permissions
- User Rights Management:
  - Allow service process to run as a particular user with only few privileges

Sun - Driving Industry Standards

Service Container	Java EE
Integration	Java Business Integration – JSR-208
Presentation	Portlet – JSR-168
Java Web Services	Java WS

Service Container	Java EE
Integration	Java Business Integration – JSR-208
Presentation	Portlet – JSR-168
Java Web Services	Java WS

Service Description	WSDL (WS-I Basic Profile)
Message Exchange	SOAP, MIME (WSI-BP)
Message Exchange	Fast Web Services, Fast Infoset

Registry/Repository	ebRegistry with UDDI support
Transactions	WS-TransMgt, Atomic Transaction
Management	WS-DistributedManagement WS-Management
Metadata Exchange	WS-MetadataExchange
Policy Definition	XACML-WSPL +- WS-Policy
Business Process	WS-Choreography, ebBPSS
Context & Coordination	WS-Context, WS Coordination
Documents	UBL
Horizontal Biz Vocabs	Core Components, UBL

Message Security	OASIS WSS, SAML, X.509 tokens WSS Attachment, WS-I BSP
Presentation	WSRP
Message Reliability	WS-Reliability/WS-Reliable Messaging
Message Addressing	WS-Addressing
Business Process	WS-BPEL

Why Sun ?

- Pragmatic Approach
  - Gartner Quadrant - Visionary
- Proven Foundation
  - SOA Infrastructure
  - Deep Field Expertise
  - Industry Standards Leader
  - Secure by Design (Solaris, JES, JIS)
  - Methodology
- Cost Effective
  - Java ES Licensing Model
  - Multiple Product Suites
  - Reduce integration cost & complexity through Java Business Integration (JBI – JSR 208)
- Technologies & Products Leadership
  - Java Integration Suite Leadership
  - Enterprise Portal Leadership
  - Identity Management Leadership
  - Unique SOA Registry-Repository
  - Best Web Services Infrastructure Support
  - WS-I Basic Profile Support
  - Best WS Developer Tools
  - Java EE & .Net Interoperability
  - SOA Foundation Frameworks
  - Vertical/Horizontal SOA Frameworks

Service Oriented Architecture

Thank You!

Ramesh Nagappan
Java Architect
Email: ramesh.nagappan@sun.com