



Sun Java System Architecture: Java Enterprise System Technical Introduction

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Session Objectives

- Introduce Sun's current thinking on application software infrastructure
- Discuss Java Enterprise System from an architectural perspective
- Stimulate discussion and feedback
- Incite you to learn more about Sun's software centerpiece: Java Enterprise System

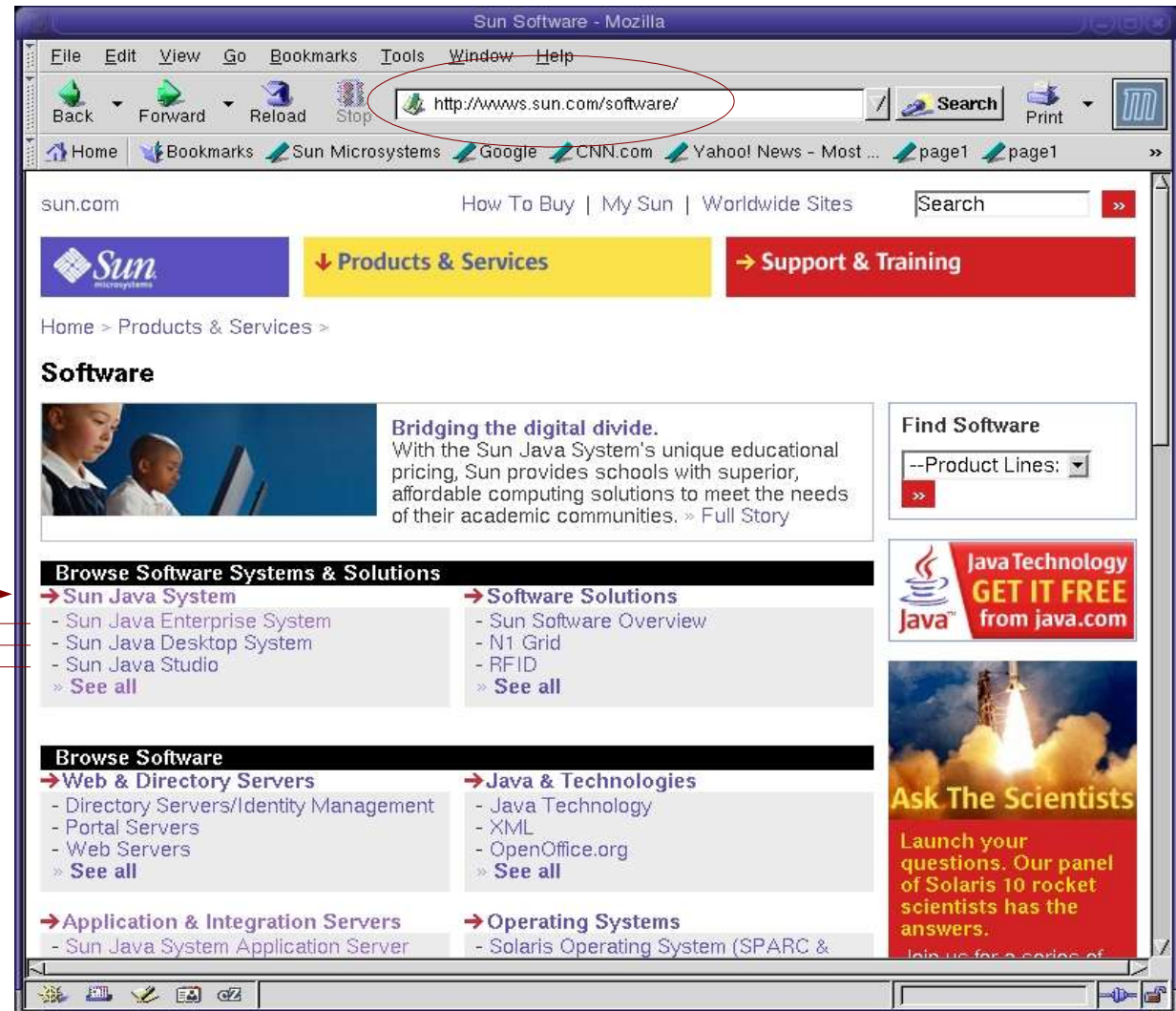
Agenda

Sun Java System Architecture

- What is it?
- Why is it important?
- How are the key services fulfilled?

But First ...

What's Java Enterprise System? Product Family



Overall Branding
Product Families

But First ...

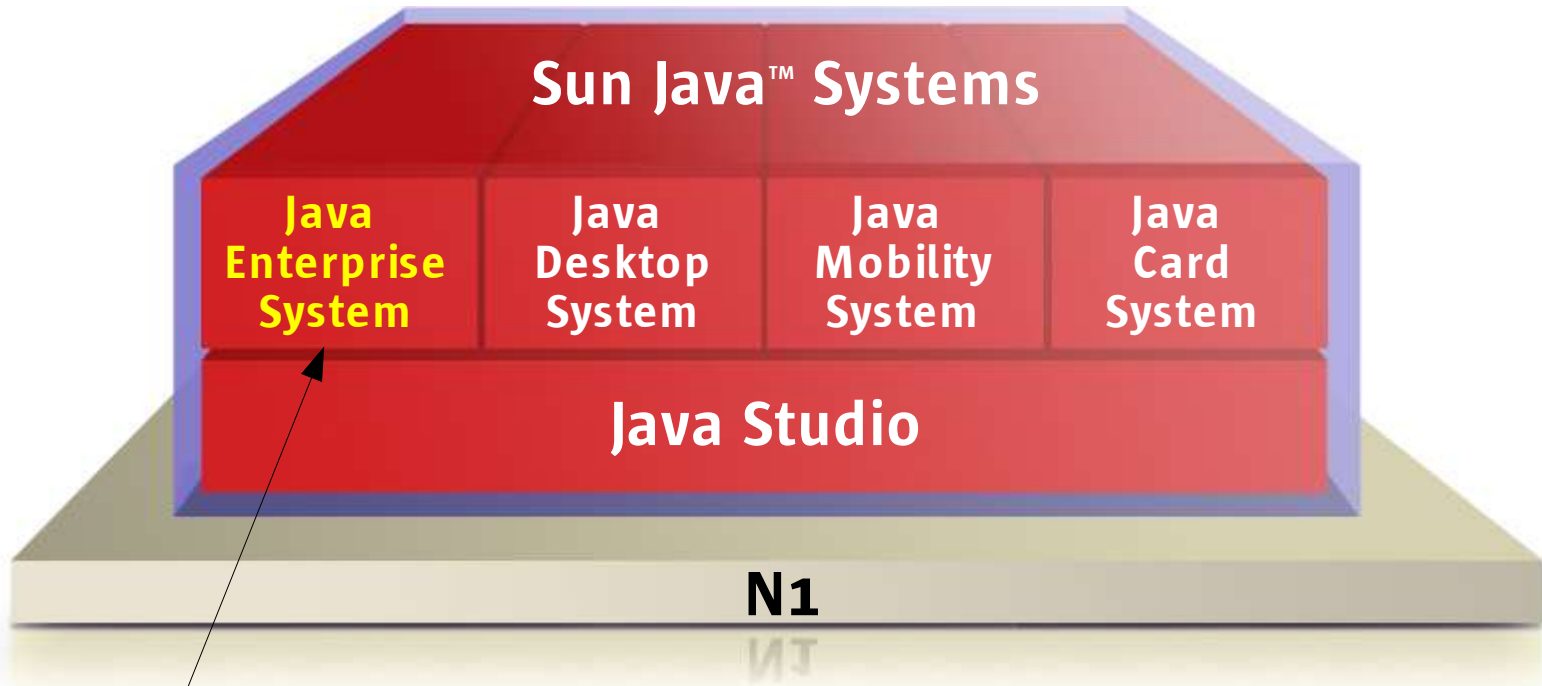
What's Java Enterprise System? Product Family



**Full Java System
Product Family**

But First ...

What's Java Enterprise System? Product Family



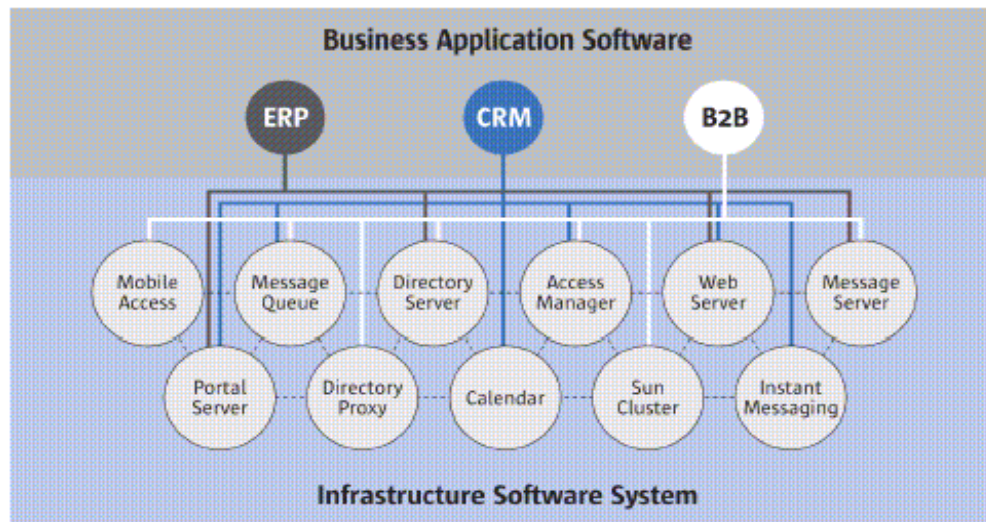
Services Provided:

- Identity/Security
- Web and Application
- Portal
- Communication/Collaboration
- Availability

But First ...

What's Java Enterprise System? Marketing Themes

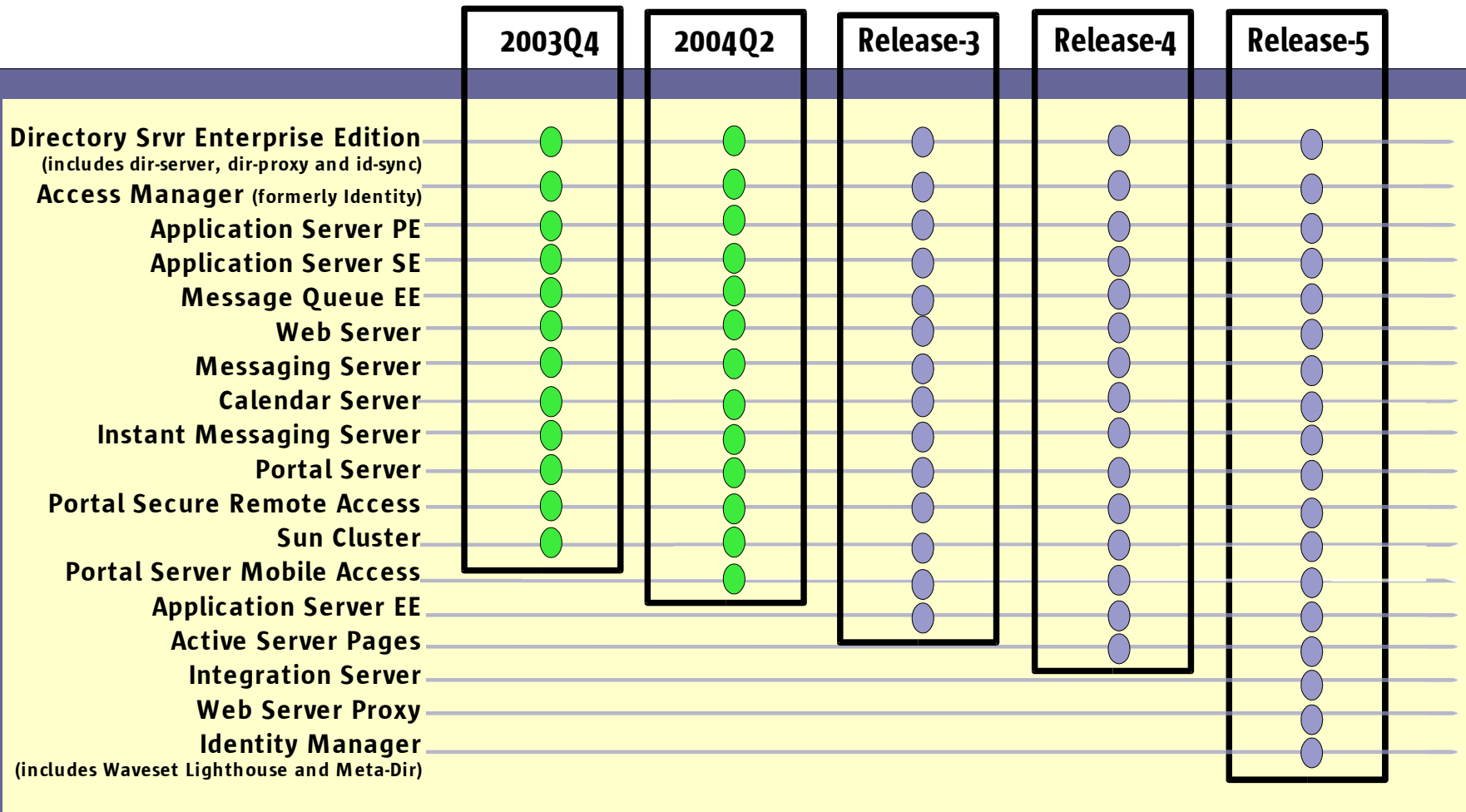
- “Radical New Approach to Enterprise Software” - software/services for subscription on per employee or per citizen basis
- **Simple** – All products integrated with common installer and docs
- **Predictable** – Updates on a predictable cadence like Solaris
- **Affordable** – Dramatically lower acquisition cost
- **Software Stack** – network identity, web/application, portal, communication/collaboration, availability



Solaris 8 & 9 (SPARC and x86) and Red Hat Enterprise Linux AS 2.1

But First ...

What's Java Enterprise System? Predictable Cadence

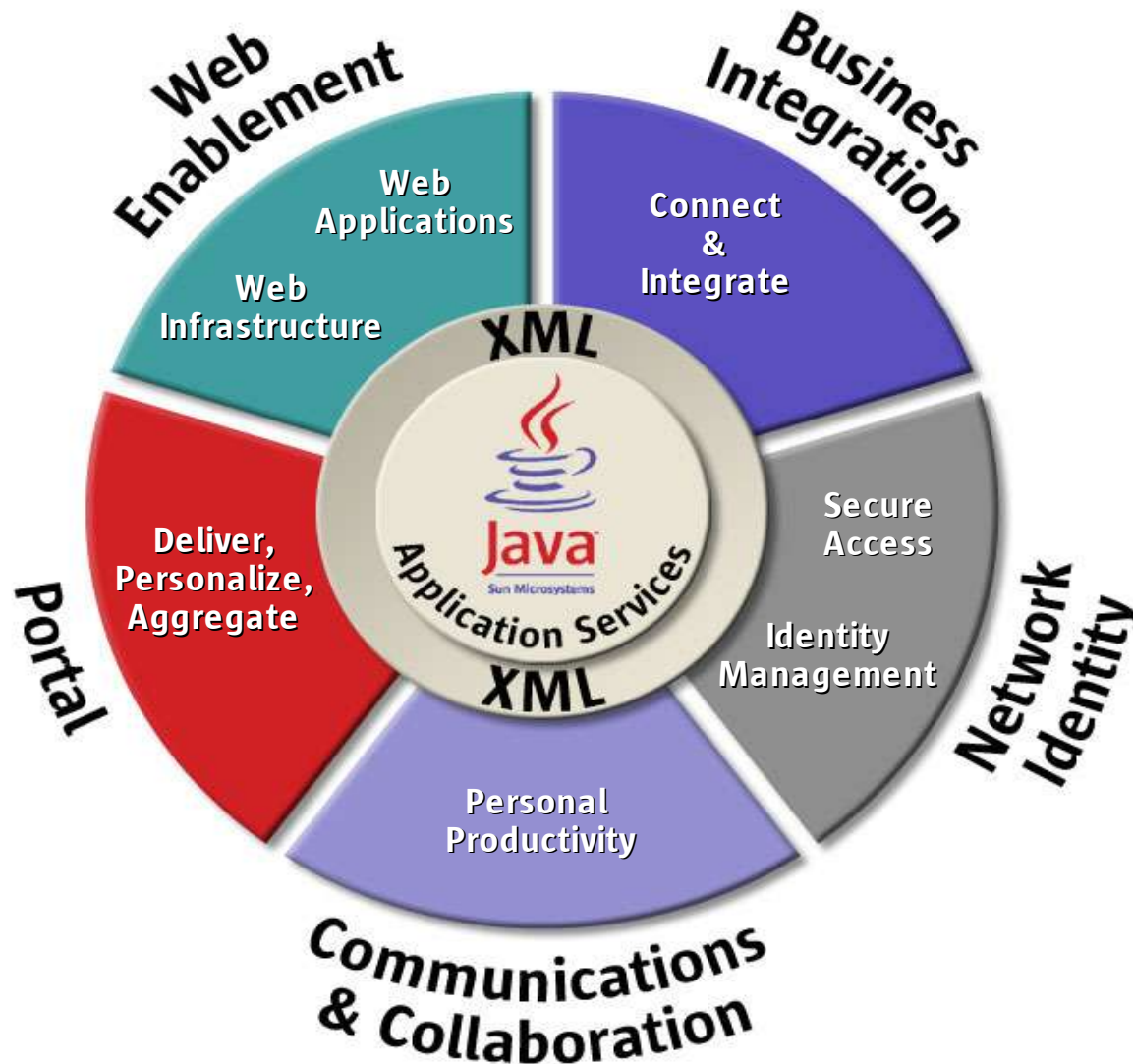


Security Services (end-to-end)

Roadmap Subject To Change

But First ...

What's Java Enterprise System? Java Enabler



But First ...

What's Java Enterprise System? Press-Worthy!

"[JES] shows that there are finally some smart people at Sun thinking about doing things right"

"Most portals are really built of a dozen or so applications like the portal application framework, Web server, application server, calendar, e-mail, instant messaging, LDAP, single sign on and many others"

"[JES is a] clean integration of all of these tools that runs smoothly and is tested as a unit to discover integration problems"

"[JES is] not really innovative ... [but] a lot of the core business software is up and ready to use in a few hours"

"They [Sun] could be a market leader in their own J2EE market ... Stay tuned"



Java Enterprise Server "Might Give JBoss a Run for Their Money" (SYS-CON) - Mozilla

File Edit View Go Bookmarks Tools Window Help

"Sorta Close?"

Java Enterprise Server "Might Give JBoss a Run for Their Money"
July 6, 2004

Summary
"There are finally some smart people at Sun thinking about doing things right," says Daniel Brookshier. With its innovative pricing model, he adds, Sun's Java Enterprise System "might give JBoss a run for their money."

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By Daniel Brookshier
Page 1 of 1

I spent one morning last week at Sun looking at the Java Enterprise System (JES).

JES is a new way to deploy and license the infrastructure of an Internet business. Sounds innovative, but I would say it just shows that there are finally some smart people at Sun thinking about doing things right.

JES is built on the idea that most portals are really built of a dozen or so applications like the portal application framework, Web server, application server, calendar, e-mail, instant messaging, LDAP, single sign on and many others. All of these pieces are usually put together one at a time and with a lot of work dedicated to getting them to actually work as a single unit. My past is littered with the wasted and long hours or complete failures because of applications not working well. What Can we do...

Advertisement

A new approach to J2EE development is here

Visual Struts Page Flow

ORACLE 10g JDEVELOPER

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(April 6, 2004) - SYS-CON Media, the world's leading i-technology magazine publisher, announced today that its flagship print magazine, JDJ, ranked number 1 in the world in digital circulation delivery. JDJ's most recent six-month average circulation was 162,019 copies, of which 43% was requested by its subscribers to be delivered digitally. JDJ's monthly digital edition is an identical replica of its print edition, and SYS-CON's advertising partners enjoy an incredible bonus exposure they receive beyond its 60,000 rate base, which was never increased since its first issue.(continued...)

Read more at the following sites:

- DM News
- Circulation Management Magazine
- Folio:
- M10Report Magazine

Success, Arrogance, Rise

Agenda

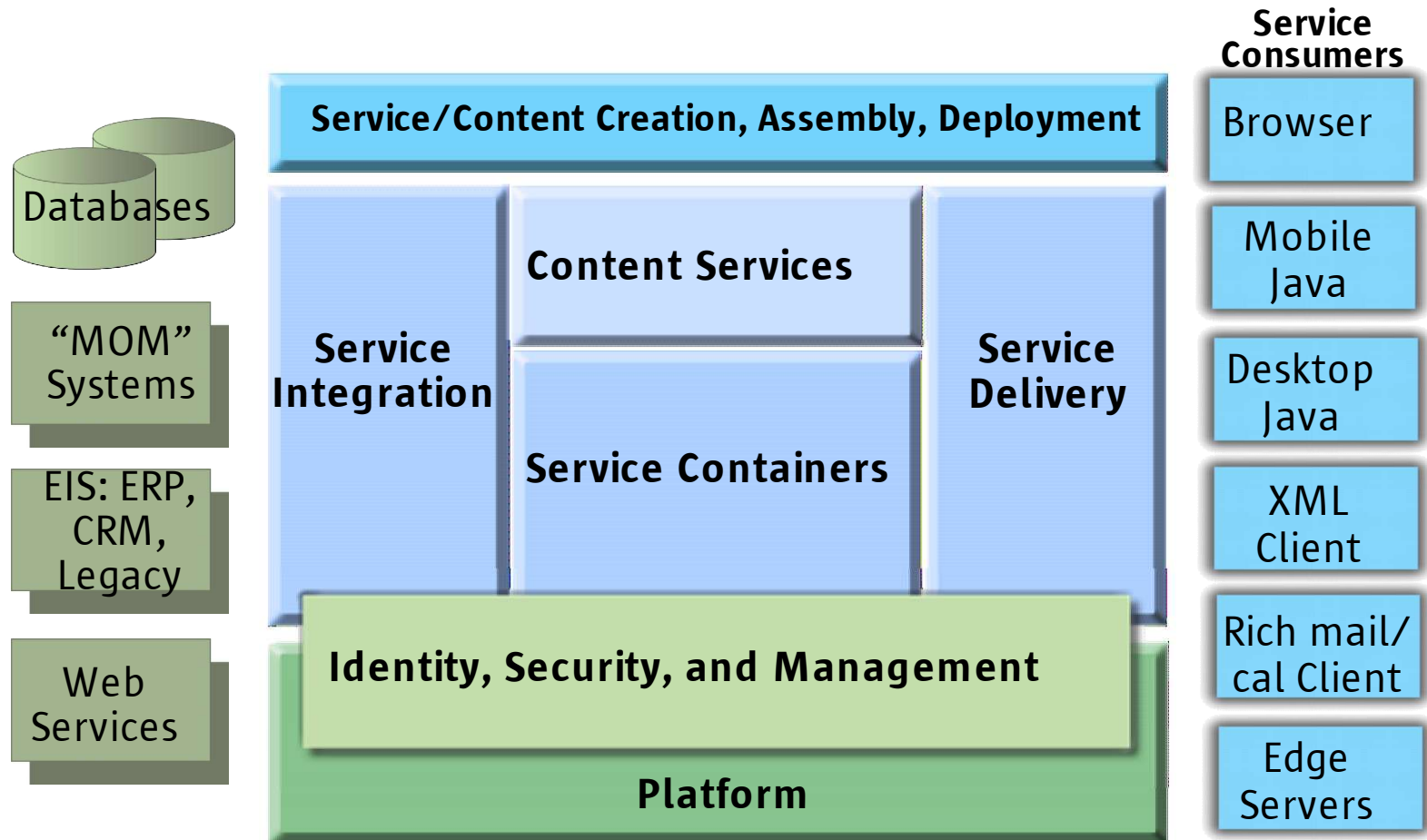
Sun Java System Architecture

- What is it?
 - Standards-Based Building Blocks Approach
 - Taxonomy for Java Enterprise System Components
 - Collection of Service-Providing Capabilities
- Why is it important?
- How are the key services fulfilled?

What is it?

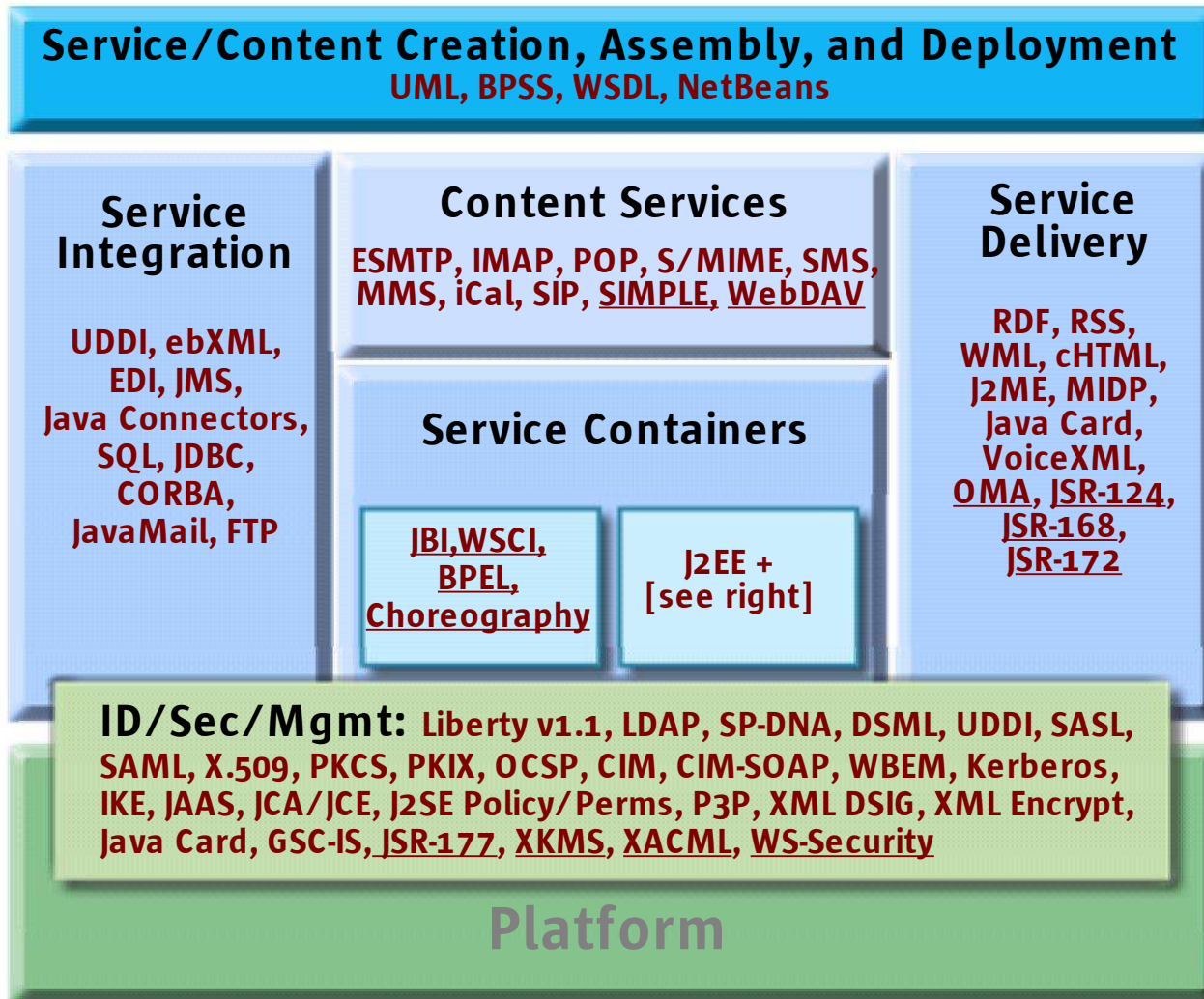
Building Blocks

- Java System Architecture is Sun's standards-based software **architecture** supported by Java Enterprise System
- Encompasses building and deploying content and services



What is it?

Open Standards-Based



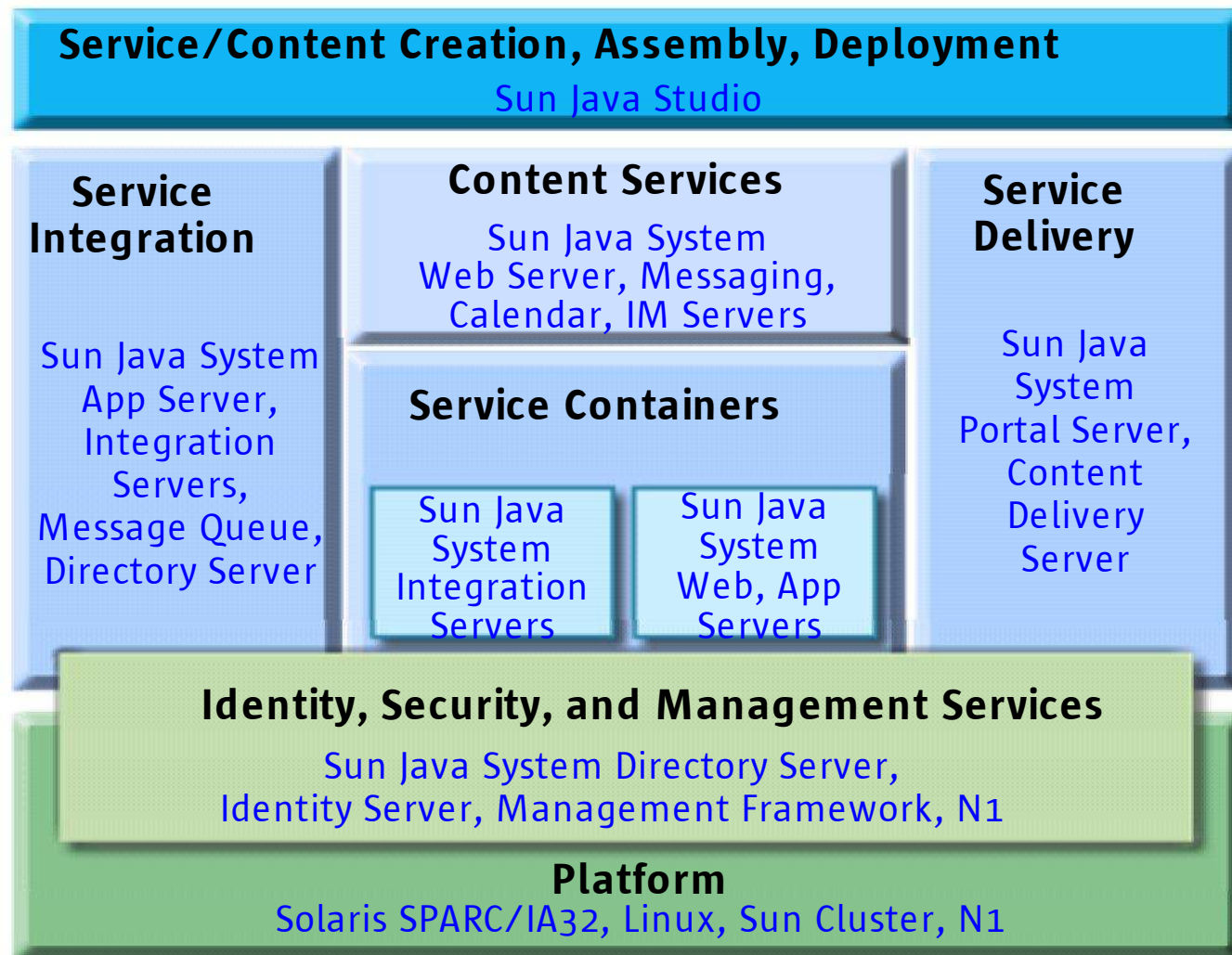
Throughout:

HTML, XHTML, HTTP(S), SSL/TLS, Java, J2SE, J2EE 1.4 (EJB, JSP, Servlets, JNDI, JMS, ...)
 JAXM, JAXR, JAX-RPC, JAXB, JAXP, JMX, SOAP, WSDL, XML, XSLT, XML Schema, SAX, DOM, WS-I Basic Profile, WS-Reliability

underlined == emerging/future standard

What is it?

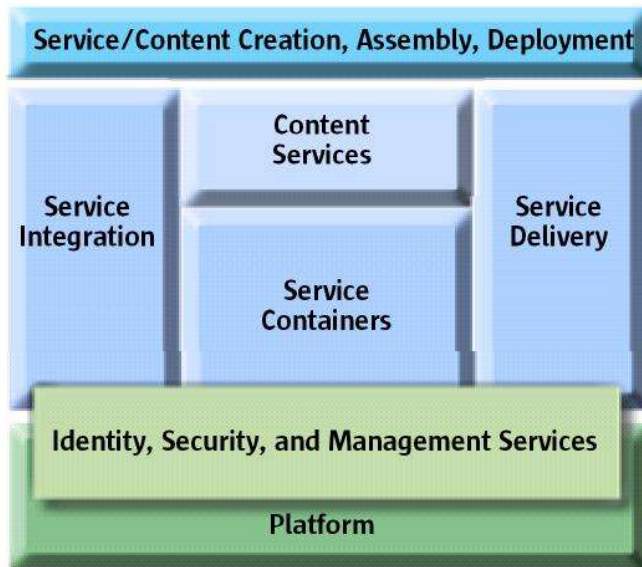
Our Collection of Software Service Enablers



What is it?

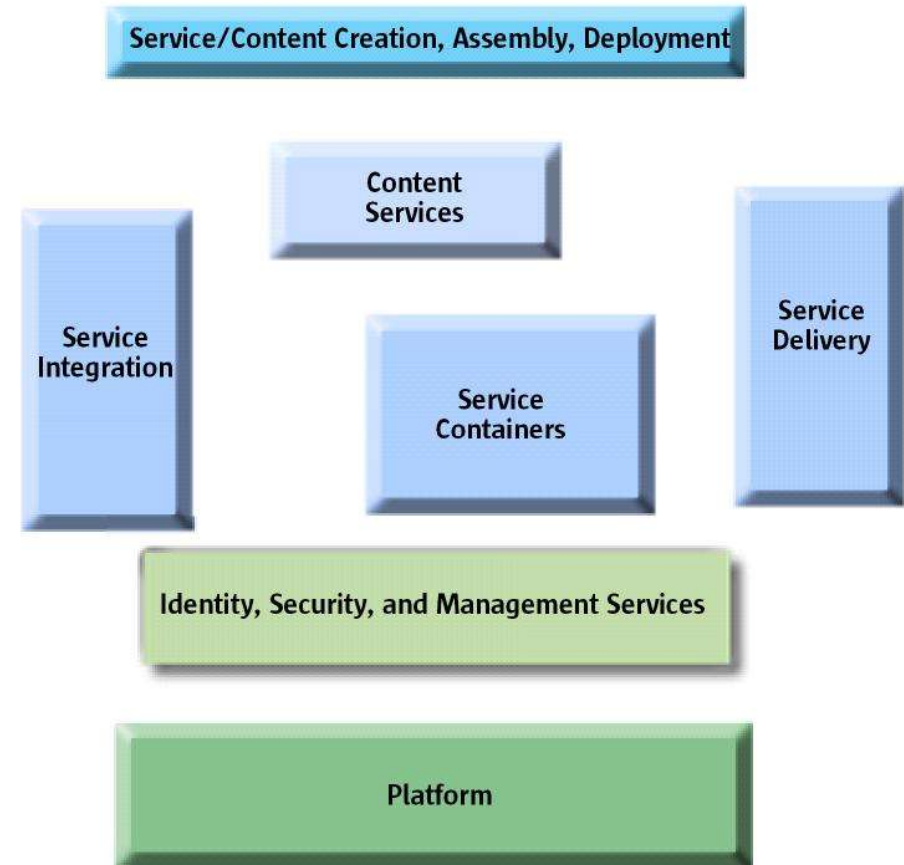
Open Systems Platform

Integrated Stack



- **Common installer**
- **System Testing**
- **Reference Architectures**
- **Standardized Documentation**

Integratable Stack



- **Partner products**
- **Standard and open APIs**

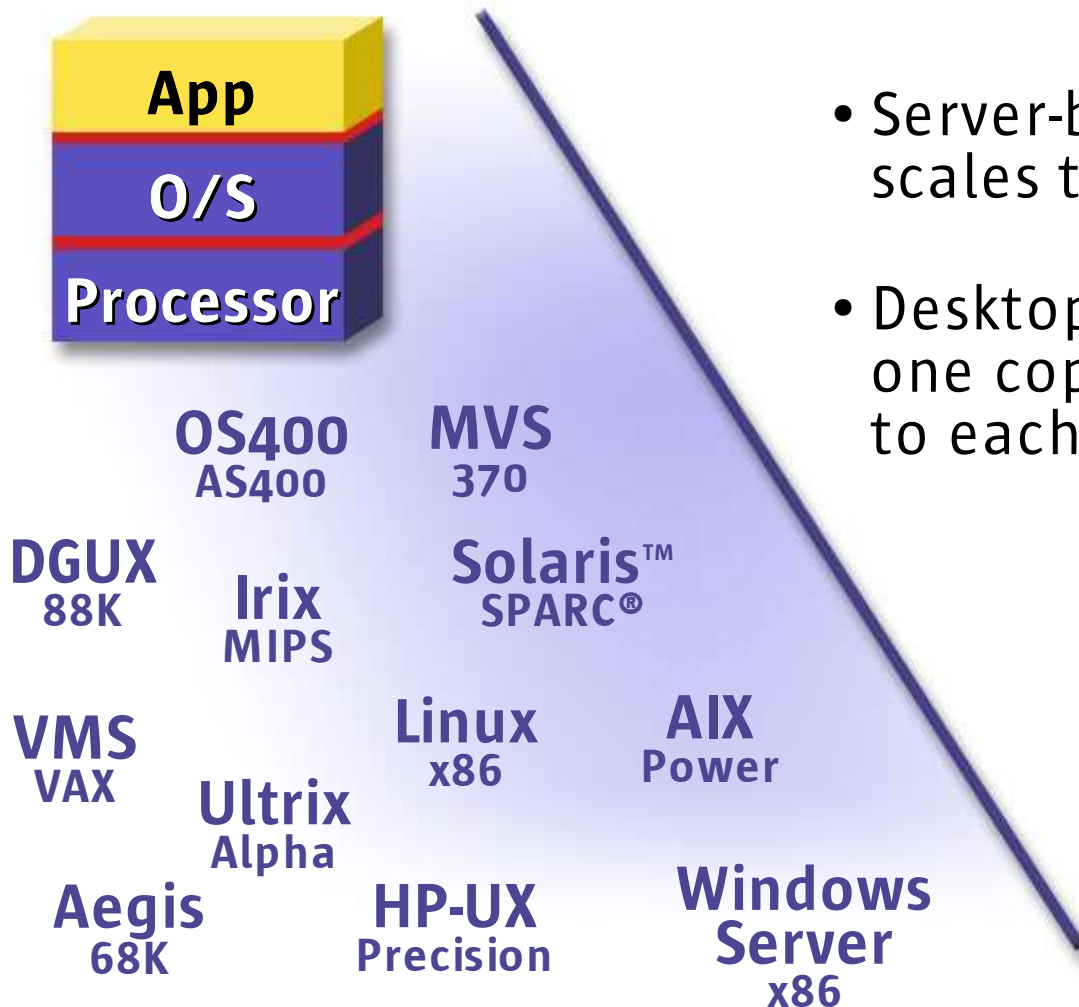
Agenda

Sun Java System Architecture

- What is it?
- Why is it important?
 - Architecture for Future Systems
 - Evolution of Software Abstraction
- How are services supported?

Why is it important to you?

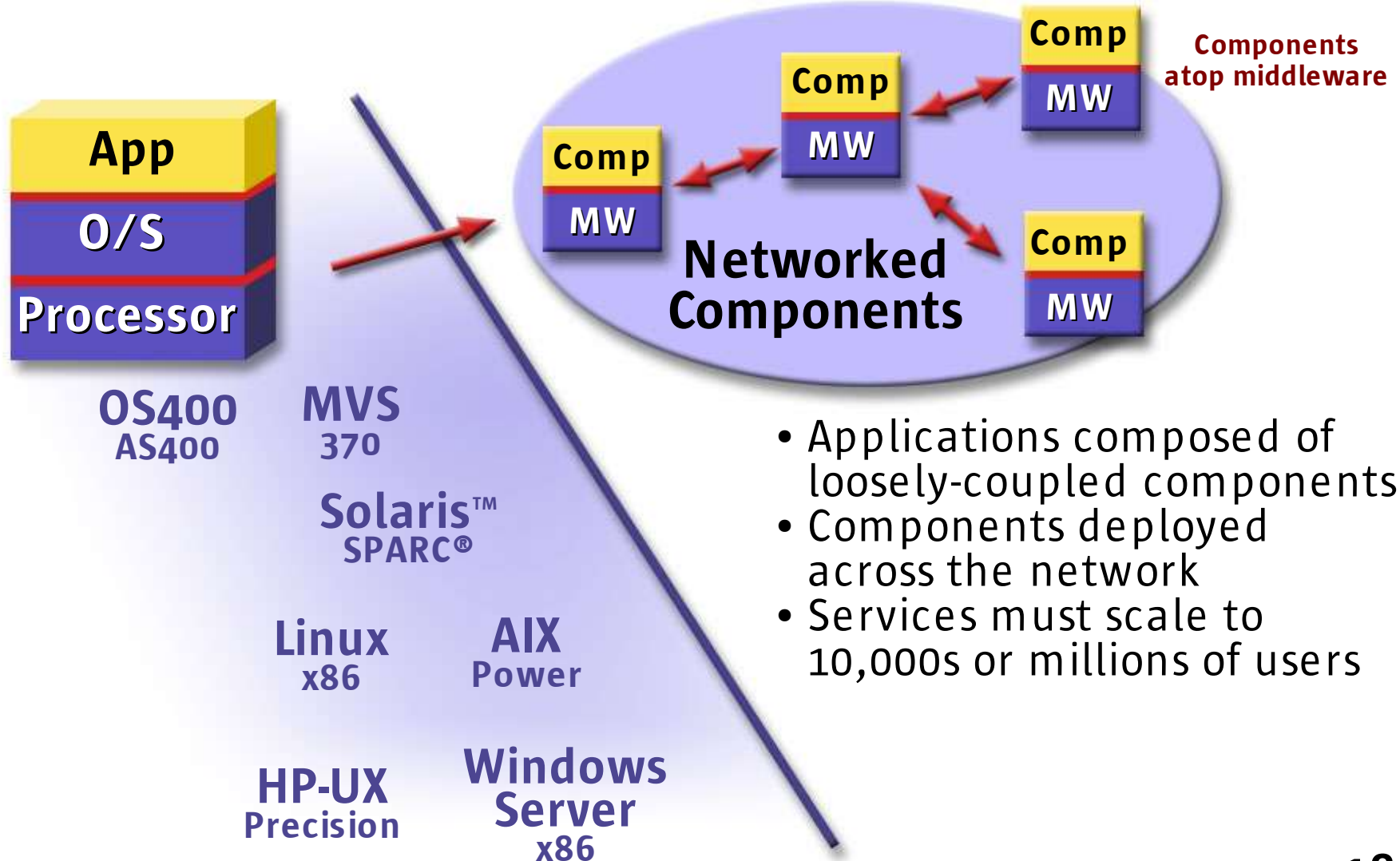
Past Architectures



- Server-based applications scales to perhaps 100s of users
- Desktop applications mean one copy of software mapped to each personal computer

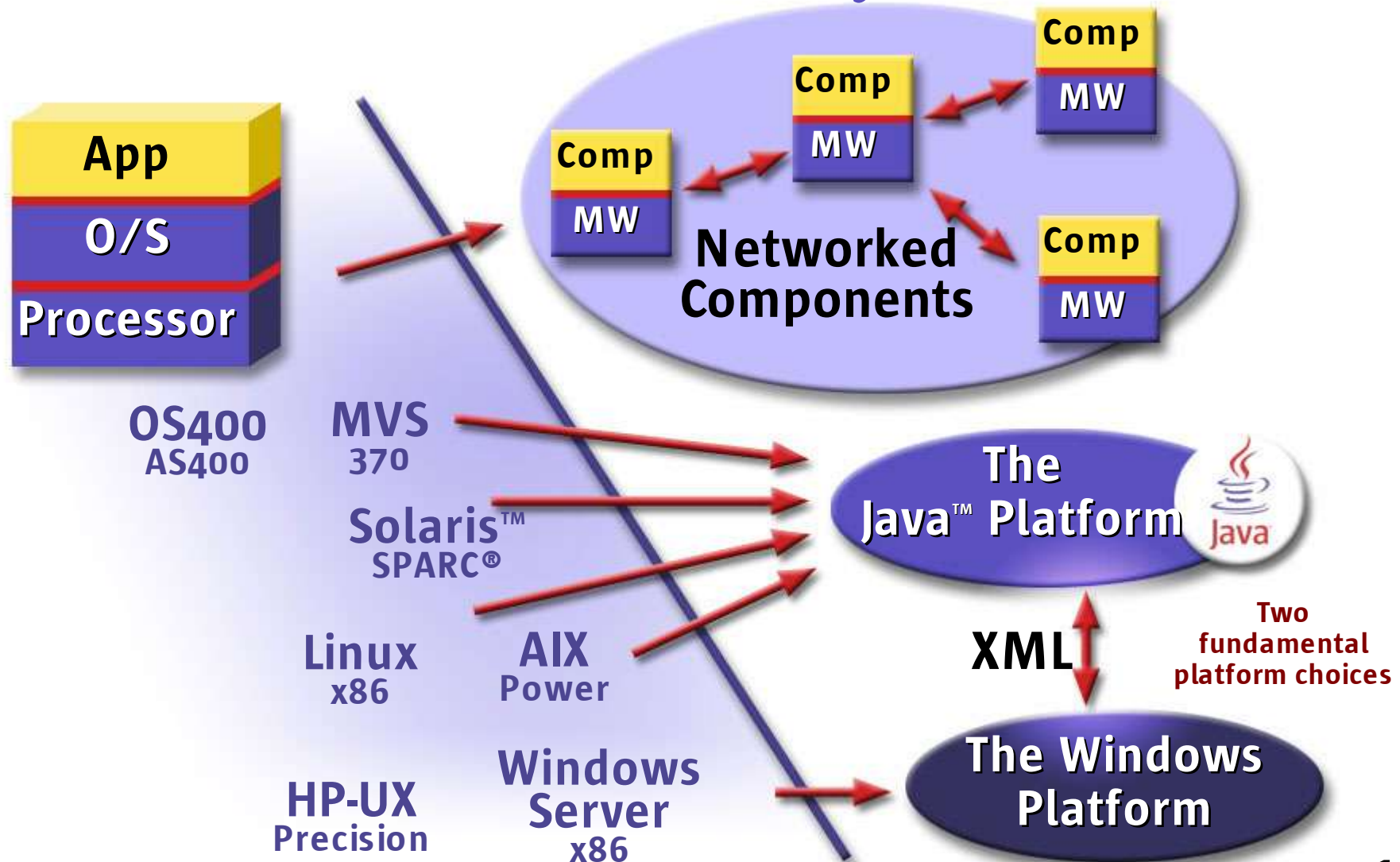
Why is it important?

Modern Architecture for Future Systems



Why is it important?

Modern Architecture for Future Systems



Why is it important?

Modern Architecture for Future Systems

A Look Ahead: Applications as Service Graphs

**Client/
Server**



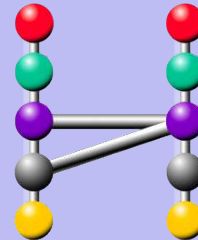
**Distributed
Objects**



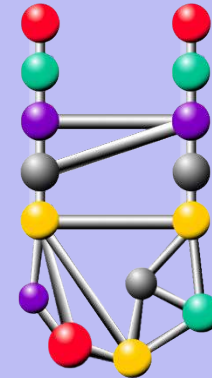
**Web
Application**



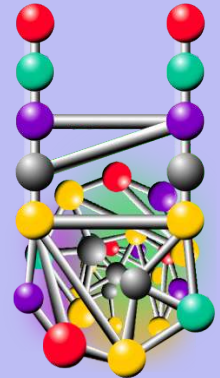
**Web
Service**



Next






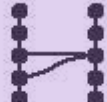
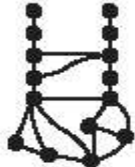

**Next
Next**



**MOST OF US
ARE HERE**

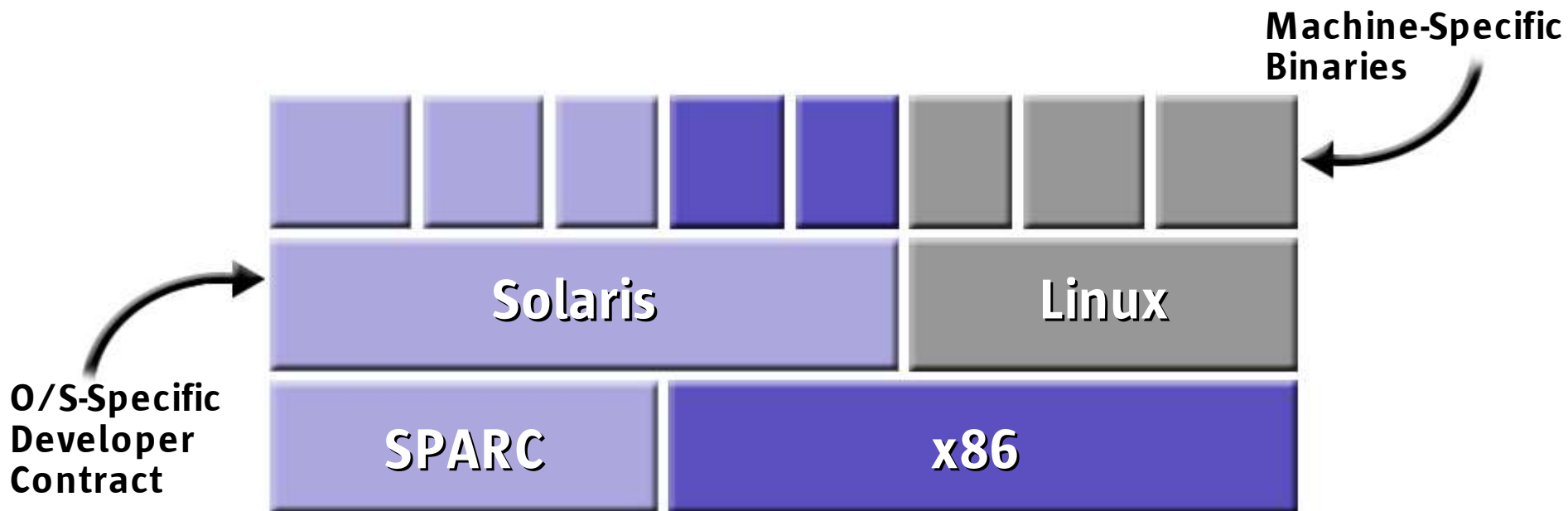
Why is it important?

Modern Architecture for Future Systems

			Java Enterprise System Focus			
Catch Phrase	The Network is the computer	Objects	Legacy to the Web	The Computer is the Network	Network of embedded things	Network of things
Scale	100s	1000s	1000000s	10000000s	100000000s	100000000s
When/Peak	1984/1987	1990/1993	1996/1999	2001/2003	1998/2004	2004/2007
Leaf Protocol(s)	X	X	+HTTP (+JVM)	+XML, Portal	+RMI	Unknown
Directory(s)	NIS, NIS+	+CDS	+LDAP(*)	+UDDI	+Jini	+?
Session	RPC, XDR	+CORBA	+CORBA, RMI	+SOAP, XML	+RMI/Jini	+?
Schematic						
			Current Java System Architecture Focus			
			Client/Server	Early Distributed Object Computing	J2EE	Web Services
			Technologies like Jini and JXTA			

Why is it important?

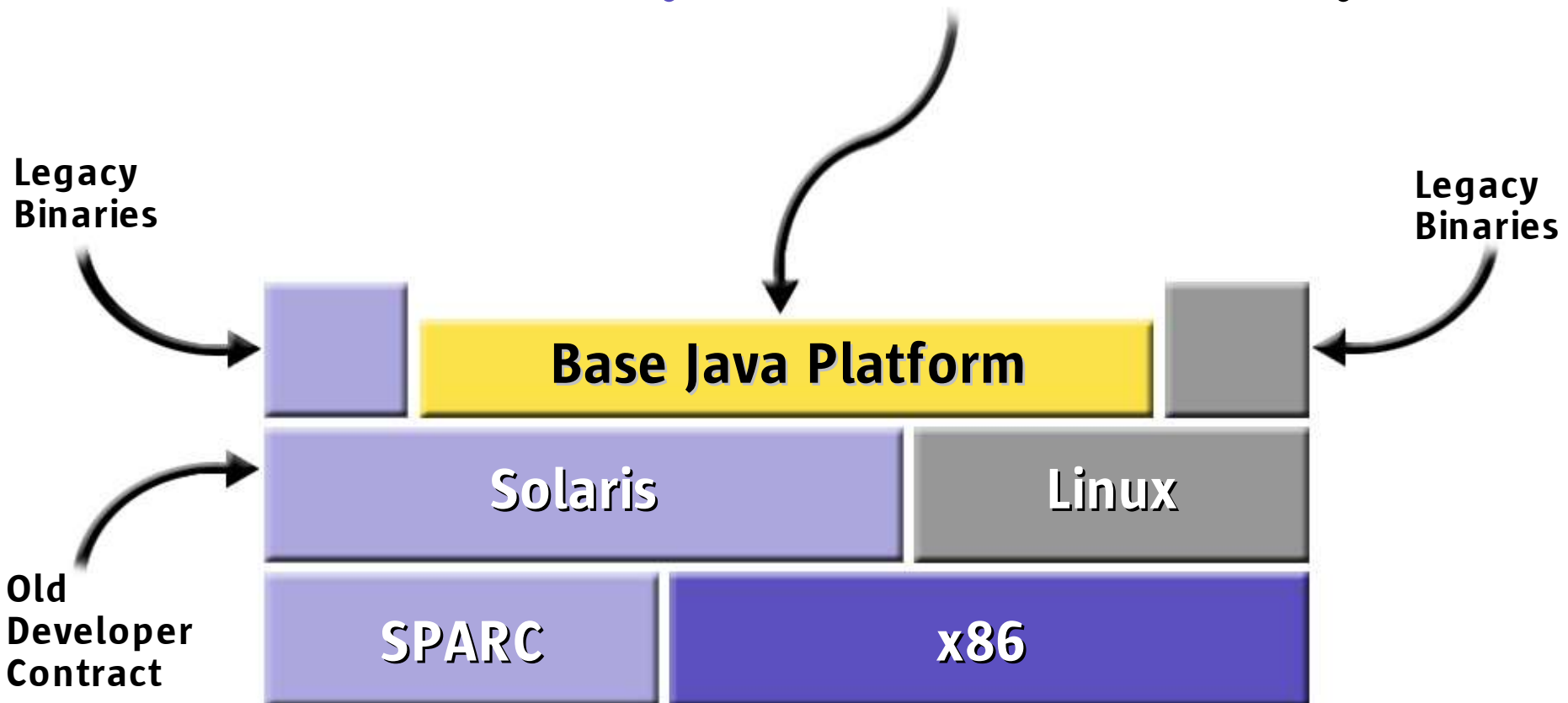
Evolution of Software Abstraction: Traditional Thinking



Why is it important?

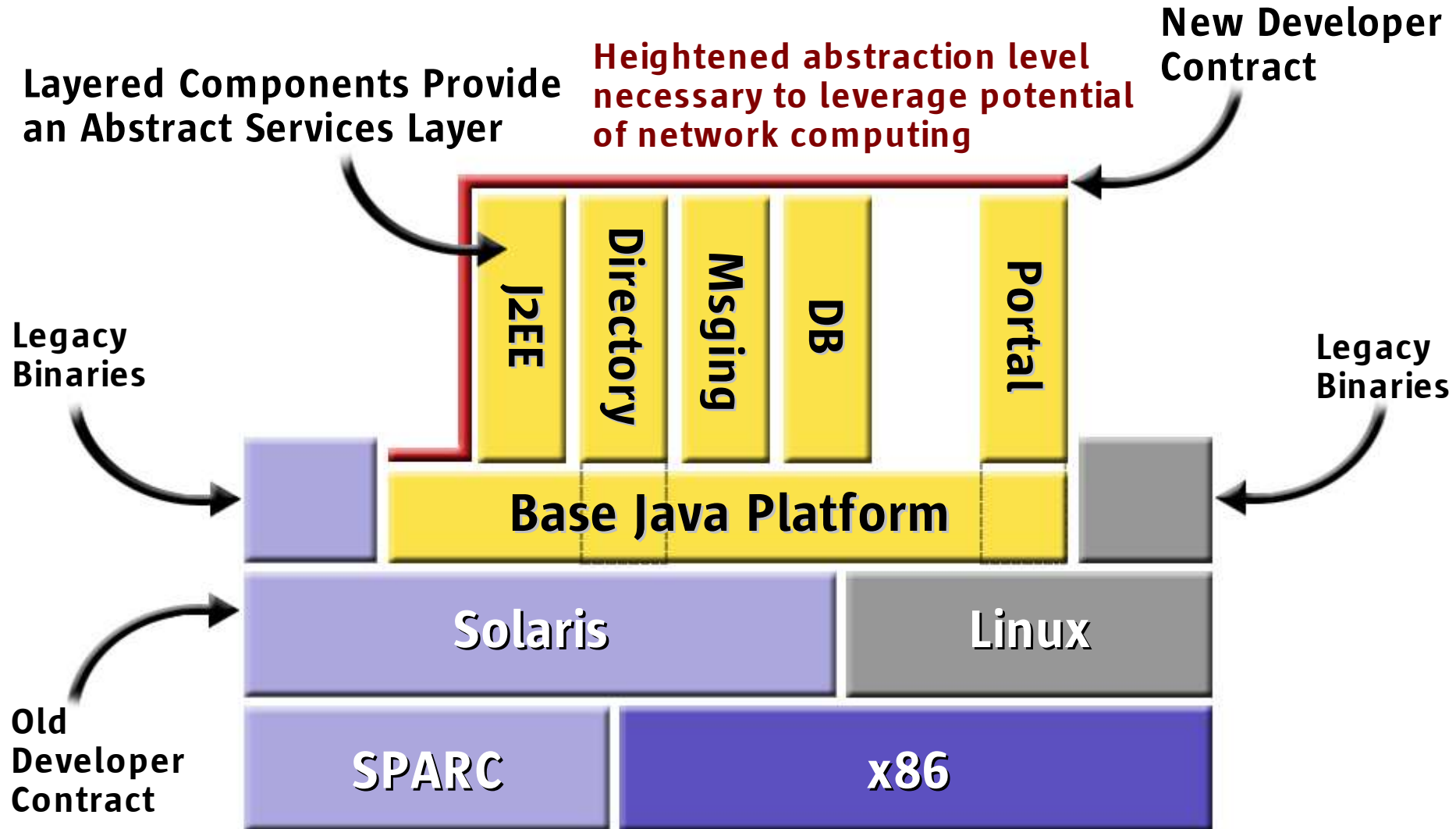
Evolution of Software Abstraction: Traditional Thinking

The Base Platform (J2SE) Means
that **Byte Codes** are the New Binary



Why is it important?

Evolution of Software Abstraction: New Realization



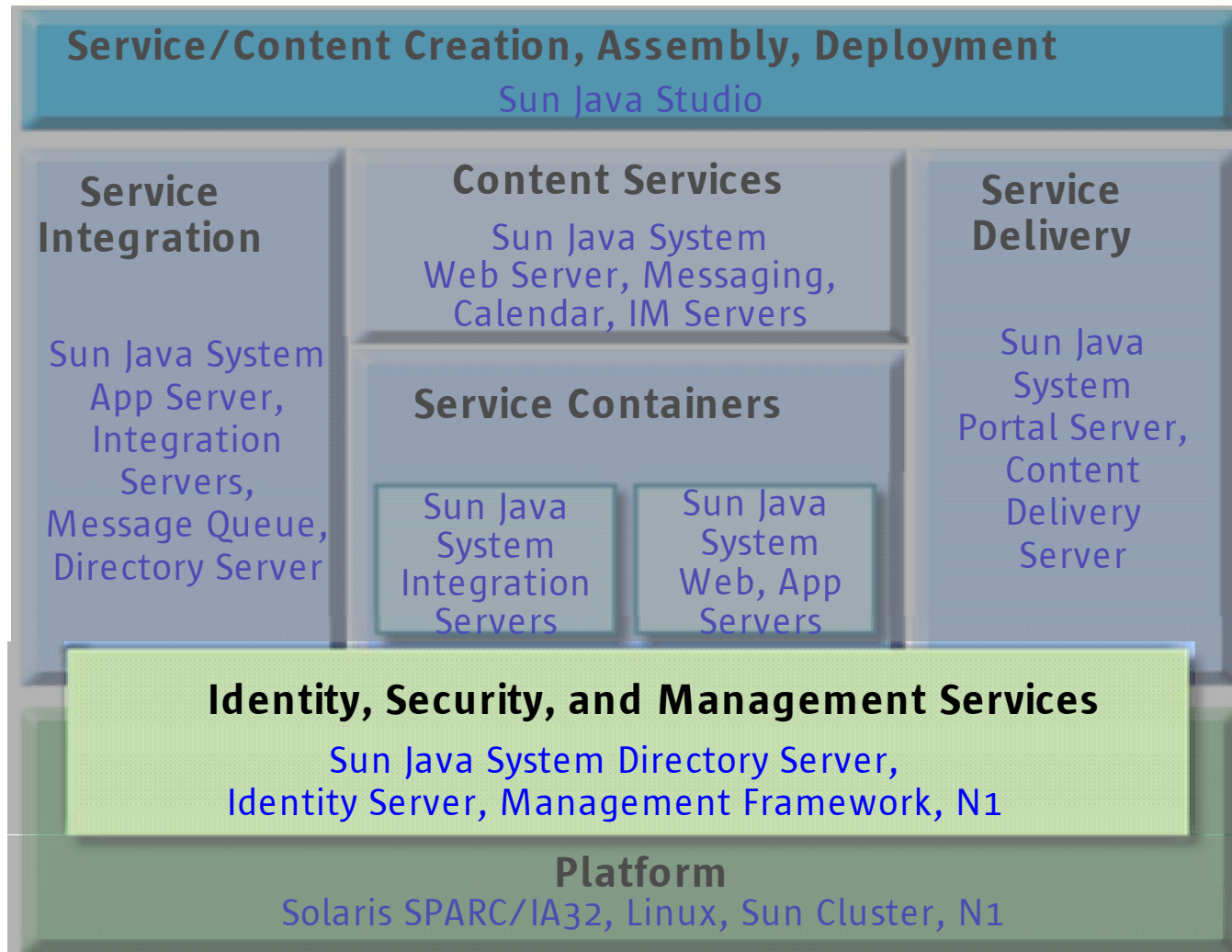
Agenda

Sun Java System Architecture

- What is it?
- Why is it important?
- How are the key services fulfilled?
 - Identity Management
 - Service Containers (web and application servers)
 - Service Integration (connectors, messaging, web services)
 - Content Services (email, instant messaging, calendaring)
 - Service Delivery (portals)

How are services fulfilled?

Identity Management



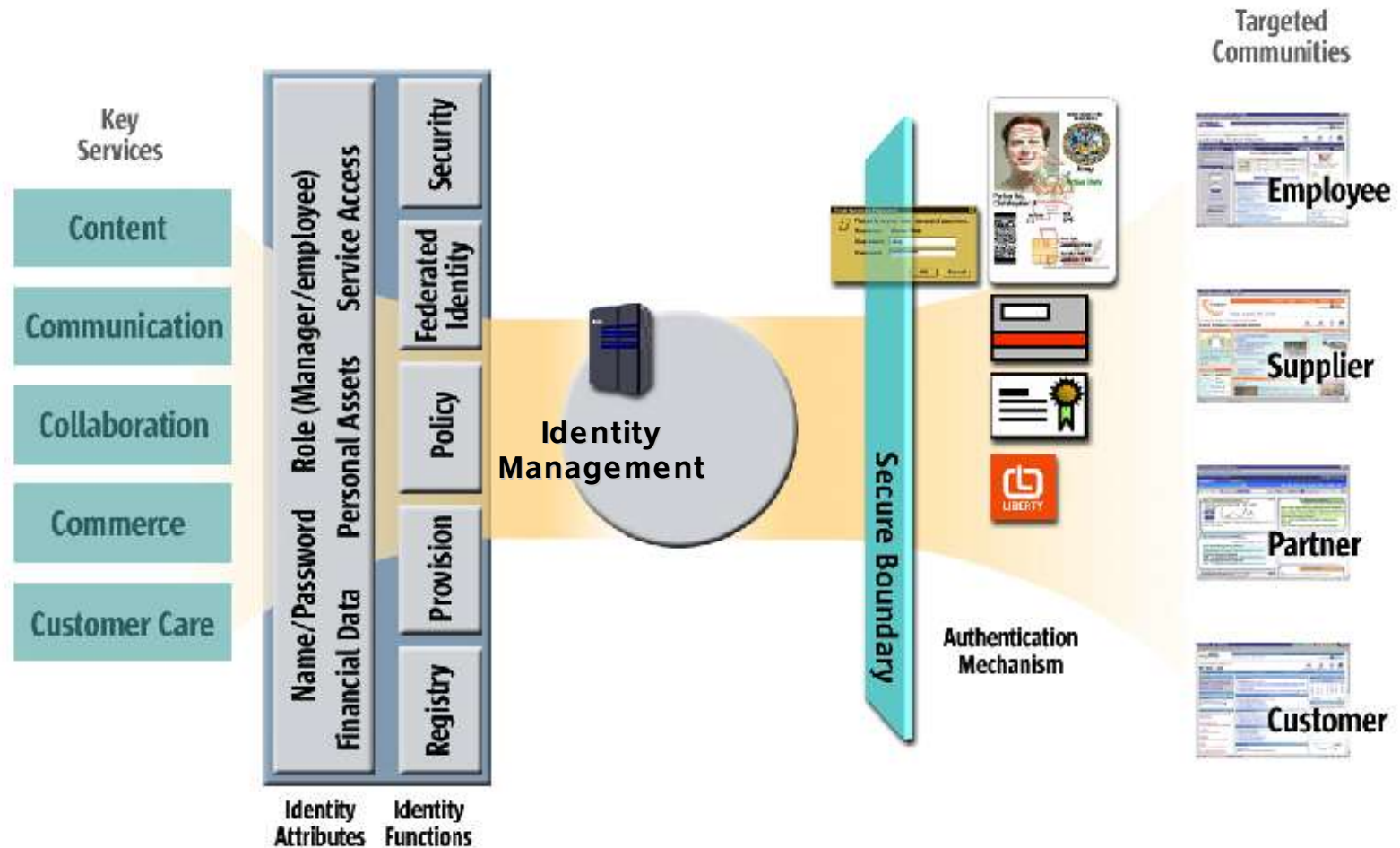
How are services fulfilled?

Identity Management Challenge

- Web applications are proliferating
- Many applications developed as silos with their own security, provisioning and user management mechanisms resulting in:
 - Higher admin costs
 - Poor flexibility
 - Security risks
- Solution is a shared identity management to control the lifecycle of an identity and its relationship to business applications and services

How are services fulfilled?

Identity Service Role



How are services fulfilled?

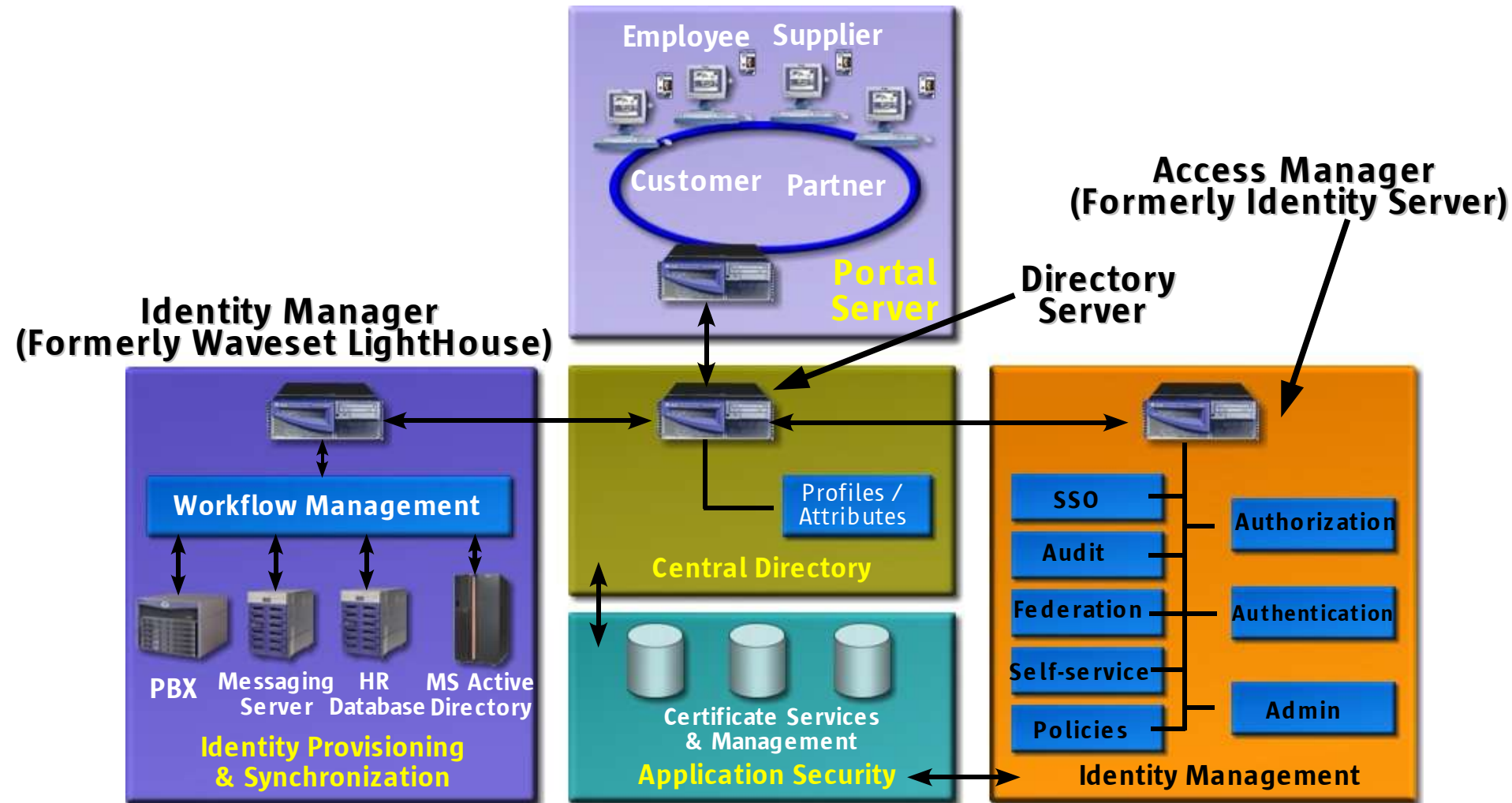
Identity Key Features

- Single Sign-On
- Rule-Based Policy Engine
- Delegated Administration
- URL and J2EE policy agents
- SAML & Liberty Enablement
- JAAS authentication framework basis
- Java & XML interfaces

SAML (Security Assertion Markup Language) defines mechanisms to exchange authentication, authorization and nonrepudiation information, allowing single signon capabilities for Web services. Liberty is based upon SAML.

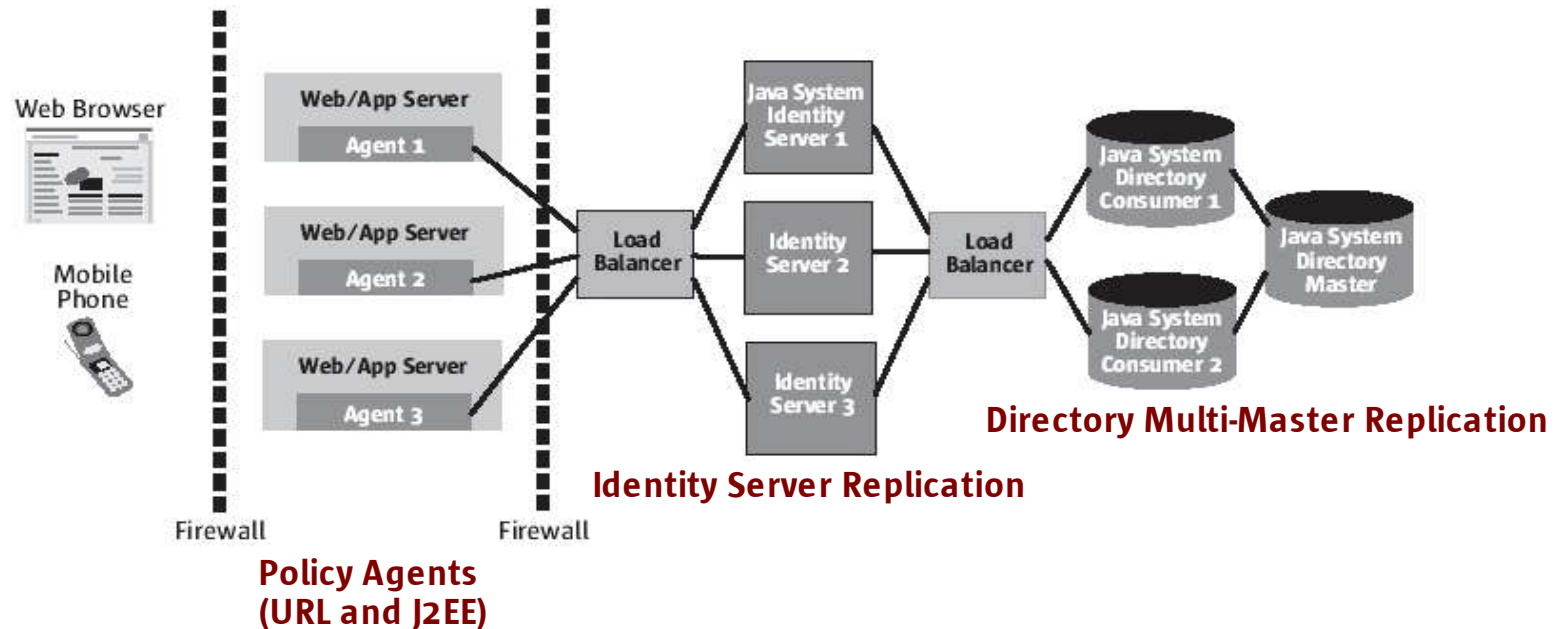
How are services fulfilled?

Identity Architecture



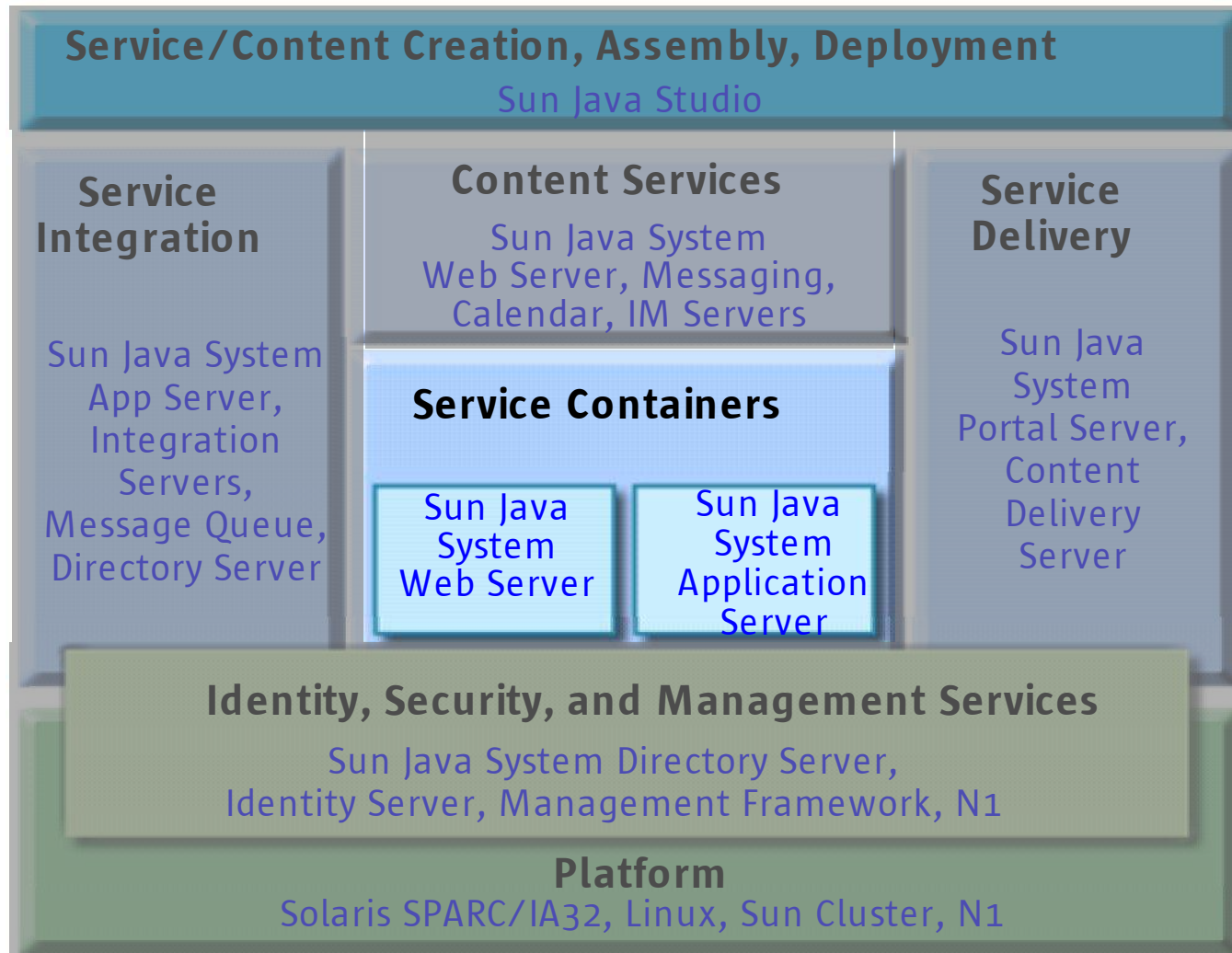
How are services fulfilled?

Identity Service Deployment



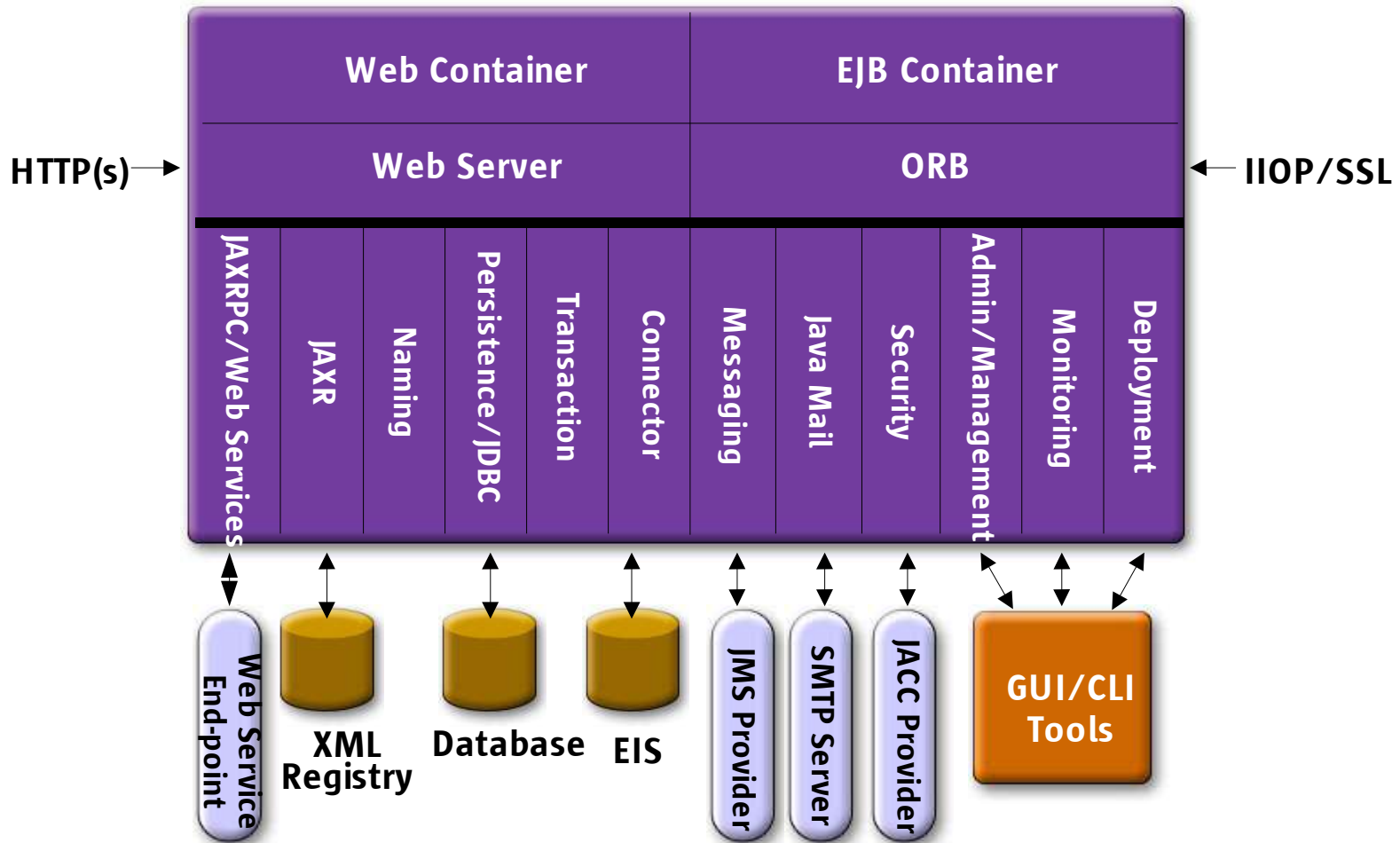
How are services fulfilled?

Service Containers



How are services fulfilled?

J2EE Container Services



How are services fulfilled?

J2EE Container Services: Application Server 7 Family

Sun Java System Application Server

The Sun Java System Application Server (formerly Sun ONE Application Server) provides a Java 2 Platform, Enterprise Edition (J2EE platform) 1.3 and 1.4 compatible platform for developing and delivering Java web services. It integrates a powerful application development environment with the Sun Java Studio Enterprise, that increases developer productivity and speeds overall time to market. Available in three editions, each designed to provide specific functionality for different usage scenarios and service levels, the Java System Application Server delivers end-to-end high performance across a broad range of Web and enterprise application requirements. As your needs change and expand you can seamlessly upgrade from one edition to the next, leveraging your existing code base.

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Get the Software »

Free Downloads

- » Java 1.4 SDK
- » Java AVK

Migration and Upgrade Program

Edition	Good For
Java System Application Server Platform Edition 8	Industry's first production quality J2EE 1.4 Compatible application server. Designed for developer productivity, this J2EE 1.4 container is FREE for development, production deployment, and redistribution.
Java System Application Server Platform Edition 7	A free high performance, small footprint, J2EE 1.3 compatible platform suitable for broad adoption and embedding in third party systems and applications
Java System Application Server Standard Edition 7 2004Q2	Adds ease of operations management and monitoring to the Platform Edition, providing lower total cost of ownership to enterprise customers
Java System Application Server Enterprise Edition 7 2004Q2	Adds the patented Always On technology to the Standard Edition, suitable for the most demanding mission critical applications

EE

PE

Enterprise Edition (EE) is not a first class citizen in Java Enterprise System yet, but a license to use is included

EE

High Availability & Scalability

SE

Admin Tools & Optimized Runtime

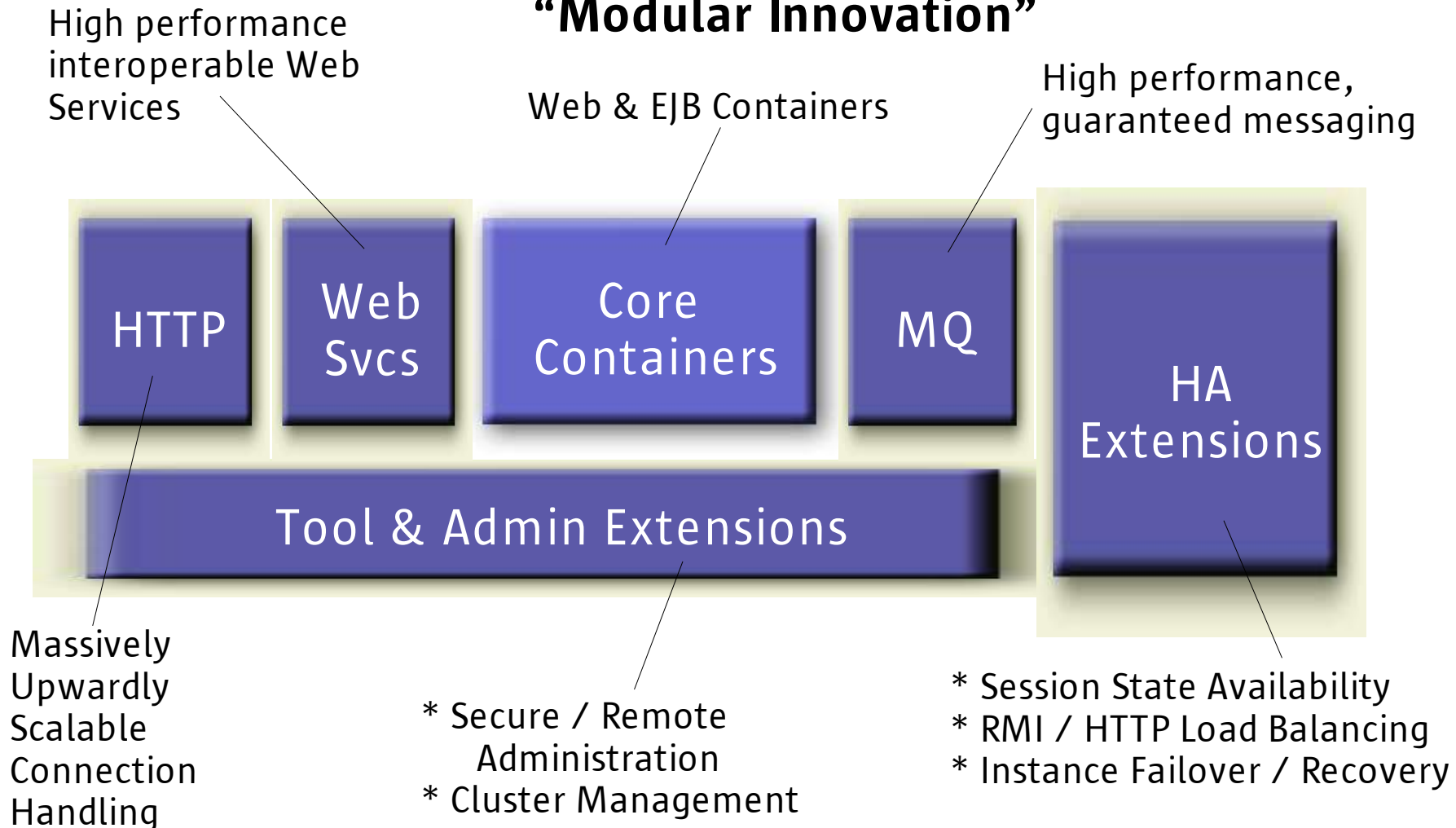
PE

J2EE Platform Binary

How are services fulfilled?

J2EE Container Services: Application Server 7 Family

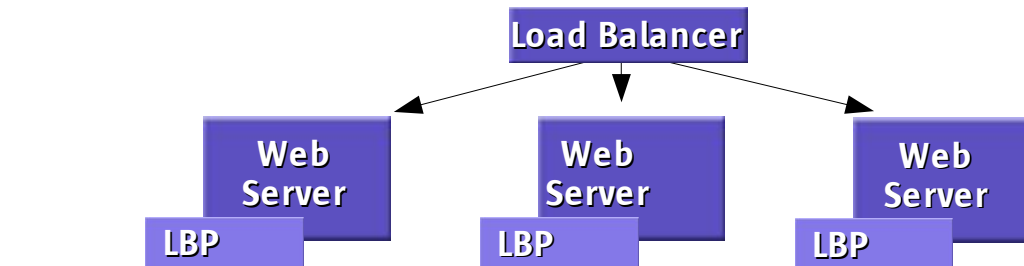
“Modular Innovation”



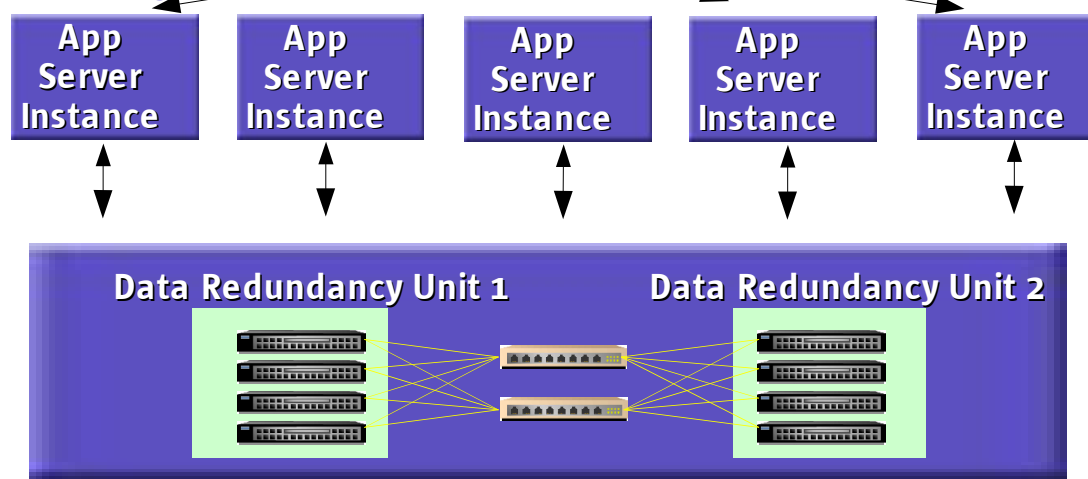
How are services fulfilled?

Sophisticated Fault Tolerance Support with EE

Tier 1 : Content Firewall



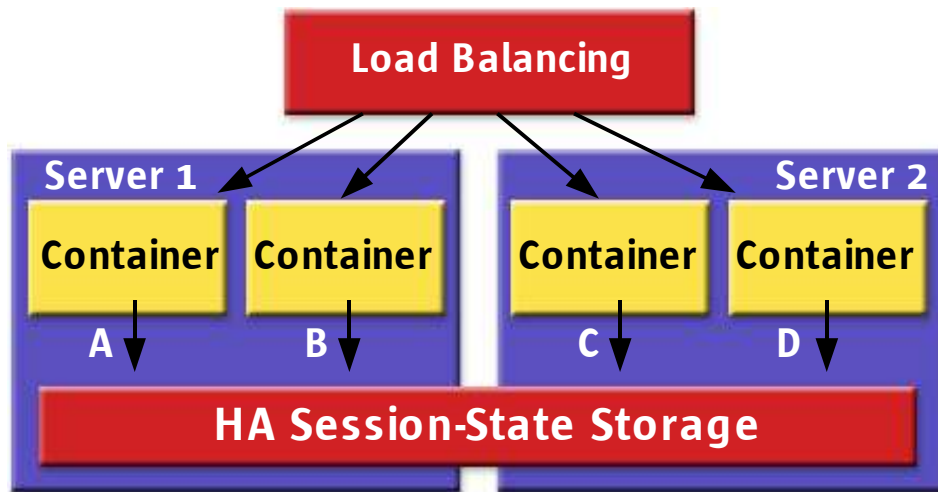
Tier 2 : Business Logic Firewall



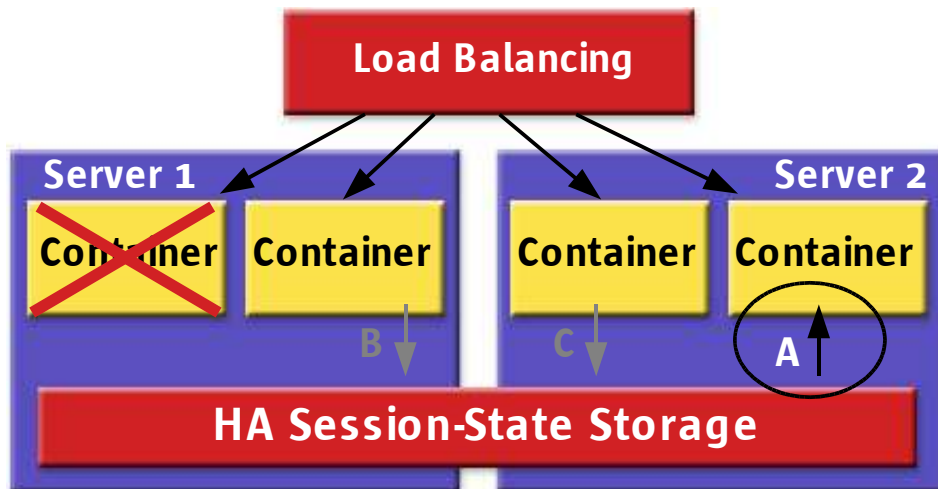
**“Always On”
Session State
Repository**

How are services fulfilled?

Sophisticated Fault Tolerance Support with EE



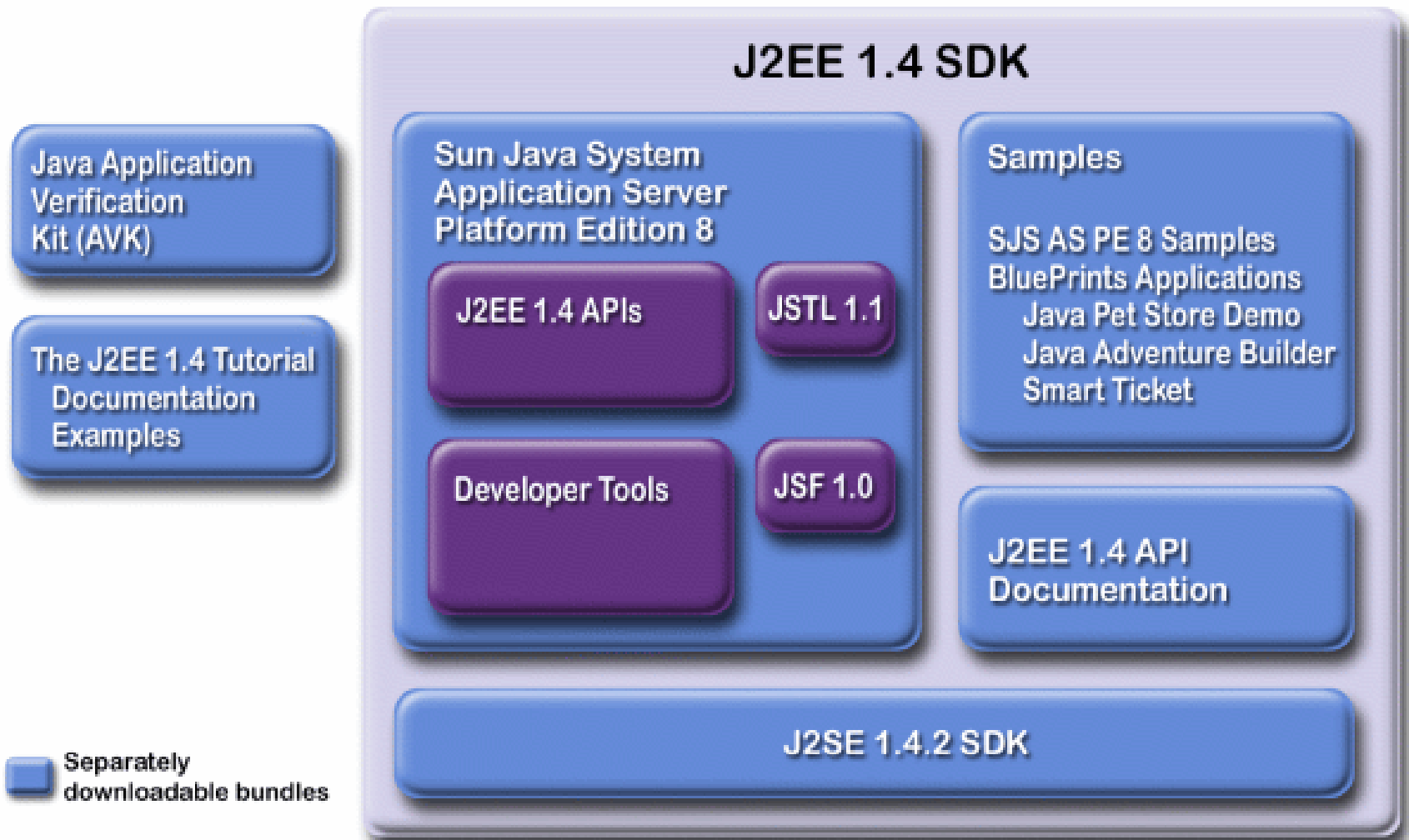
Session state is stored in a highly available data manager that is distributed across all servers.



If the sessions in any container fails, any other container can retrieve the session state so the application can continue from where it left off

How are services fulfilled?

J2EE Container Services: Application Server 8 PE



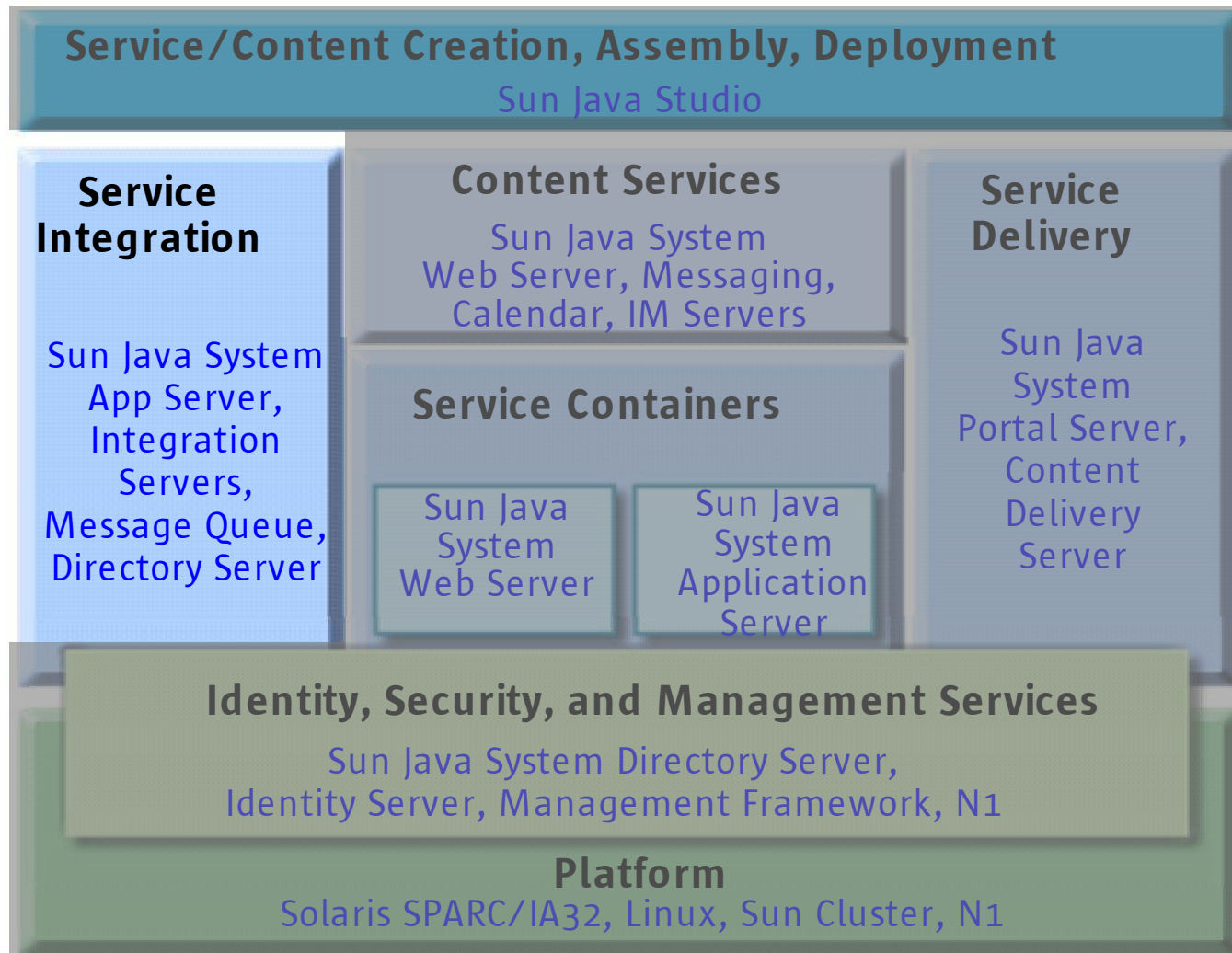
How are services fulfilled?

J2EE Container Services: Application Server 8 SE & EE

- Improved Manageability & Usability
 - Cluster support in admin GUI & admin CLI
 - Remote JMX support
 - Improved Diagnostics / Logging
 - Solaris 10 Zones support – resource management
 - Monitoring enhancements in J2SE 1.5
- All-round Enhanced Performance
 - Continued WS performance lead
 - Major CMP / EJB performance improvements
- Target Availability: Q4 2004

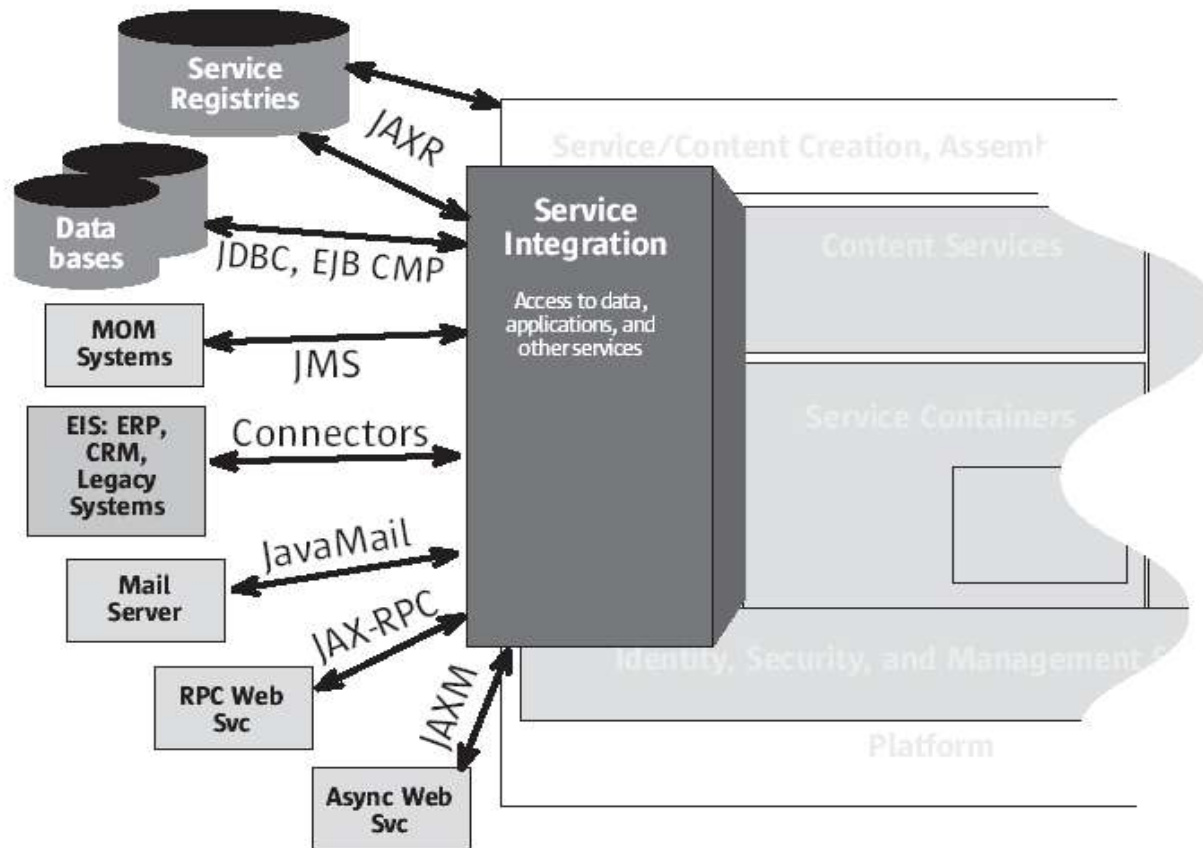
How are services fulfilled?

Service Integration



How are services fulfilled?

Service Integration: Current Capabilities

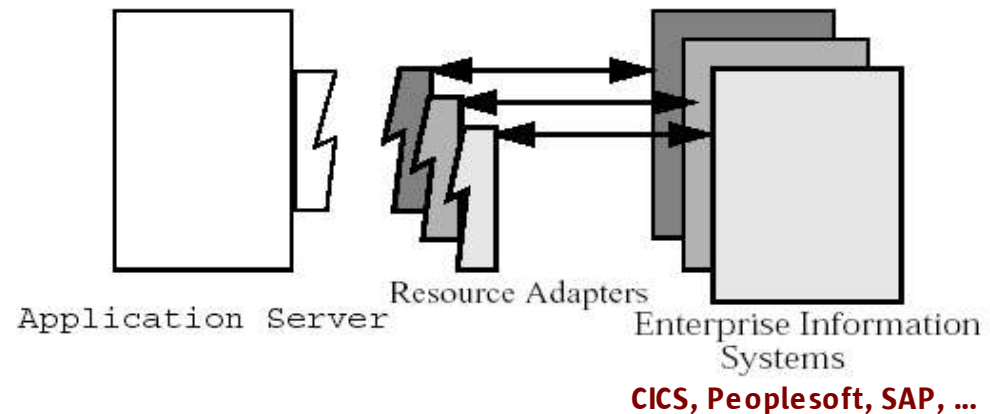


- J2EE Connectors
- Asynchronous Messaging
- Web Services

How are services fulfilled?

Service Integration: J2EE Connectors

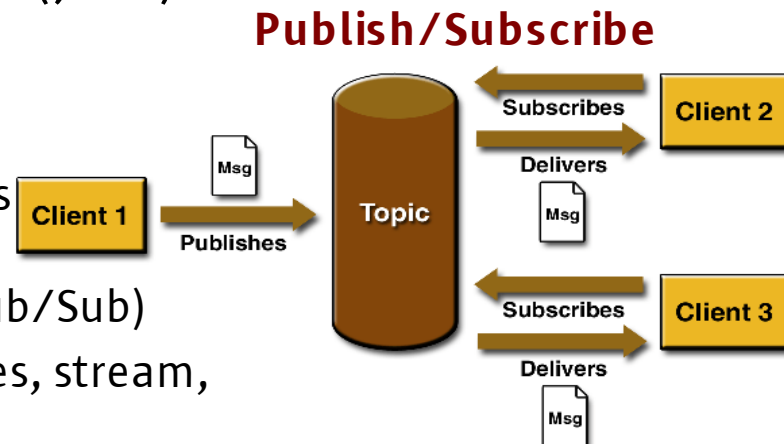
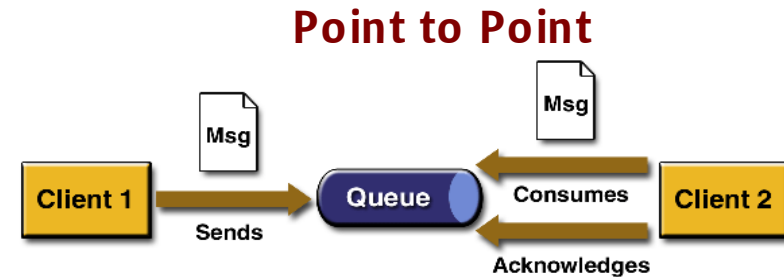
- Java Connector Architecture (JCA) **does for Enterprise Information System (EIS) what JDBC does for databases**
- Surfaces often **arcane EIS capabilities** in a standards-compliant way
- Provides **tight coupling, high performance**, high reliability and fine-grained access to “foreign” capabilities
- Links your **J2EE container's** connection pooling, transaction and security **services** to those of the target EIS
- Defines an **Service Provider Interface (SPI)** for plugging adapters into containers
- Documents a **Common Client Interface (CCI)** for application to interact with the adapter
- Third-party **connector provider industry** has emerged



How are services fulfilled?

Service Integration: Asynchronous Messaging

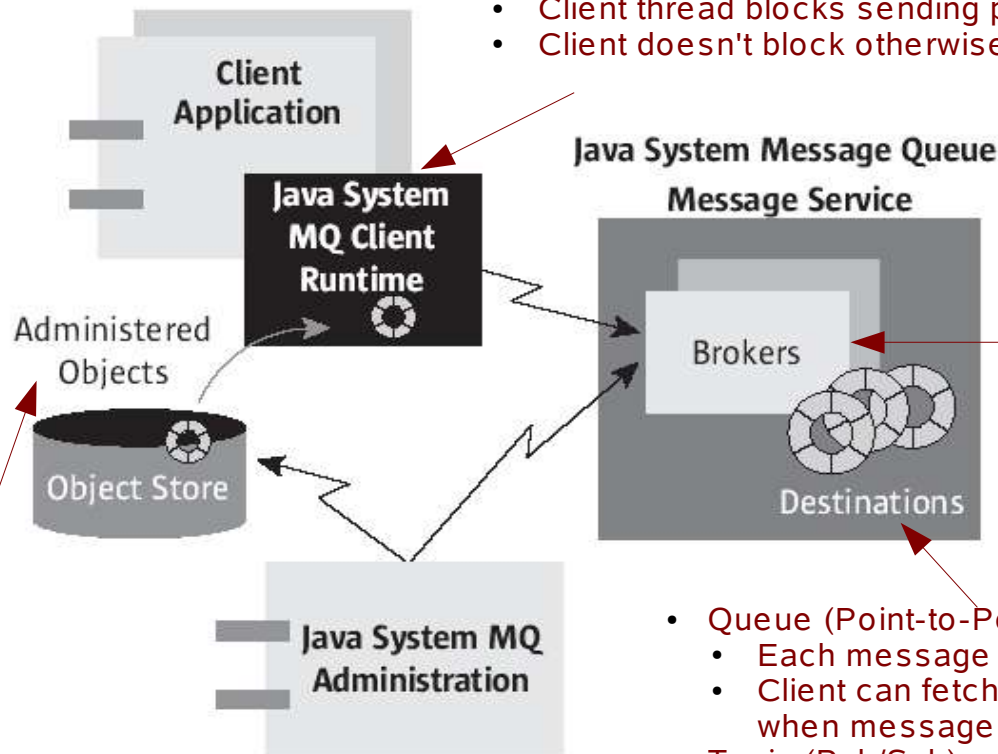
- Peer-to-peer exchange of messages
- Doesn't depend on all elements in distributed system being available at time of the transaction
- Java community embraced asynchronous messaging via Java Message Service (JMS)
- Roles
 - Provider: broker hosting the message service
 - Client: producers and consumers of messages
 - Domains: interaction styles include point-to-point (PTP) and publish-subscribe(Pub/Sub)
 - Message: five types including text, map, bytes, stream, object and message (empty)



How are services fulfilled?

Service Integration: Messaging Architecture

- Utilizes JMS API to send and receive messages to/from destinations
- Client thread blocks sending persistent messages
- Client doesn't block otherwise



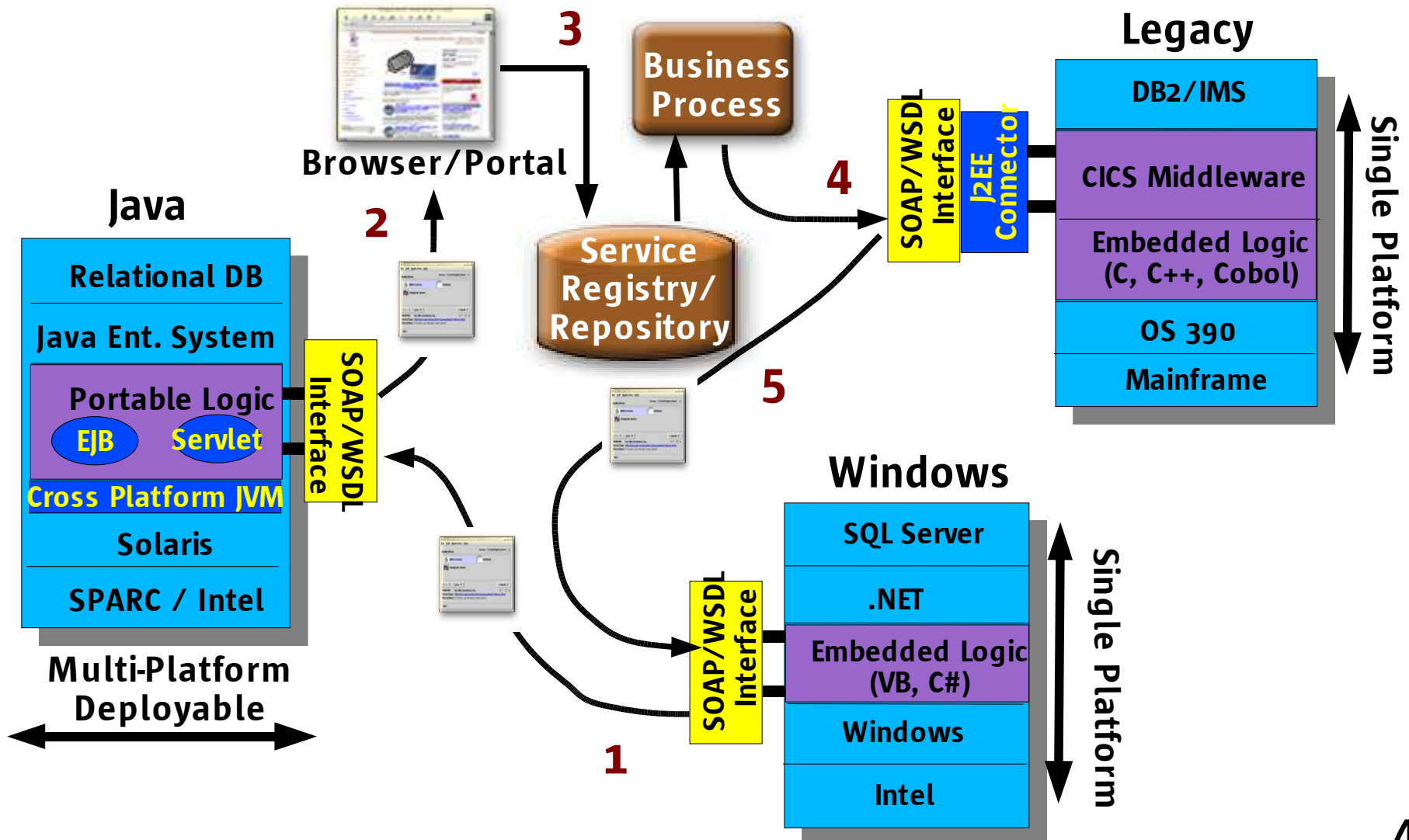
- Manages connections to clients and admin
- Routes messages to/from queues and topics
- Writes data to disk for recovery
- Performs authentication and authorization checks
- Logs broker activities

- **Queue (Point-to-Point):**
 - Each message has only one consumer
 - Client can fetch message even if it wasn't active when message was sent
- **Topic (Pub/Sub):**
 - Each message may have multiple consumers
 - Client must have been subscribed to topic when message was published
 - Client must be active in order receive messages (unless subscription is durable)

- **ConnectionFactory** – create connections to message service
- **Destinations** – represent physical locations (queues and topics) where messages are sent

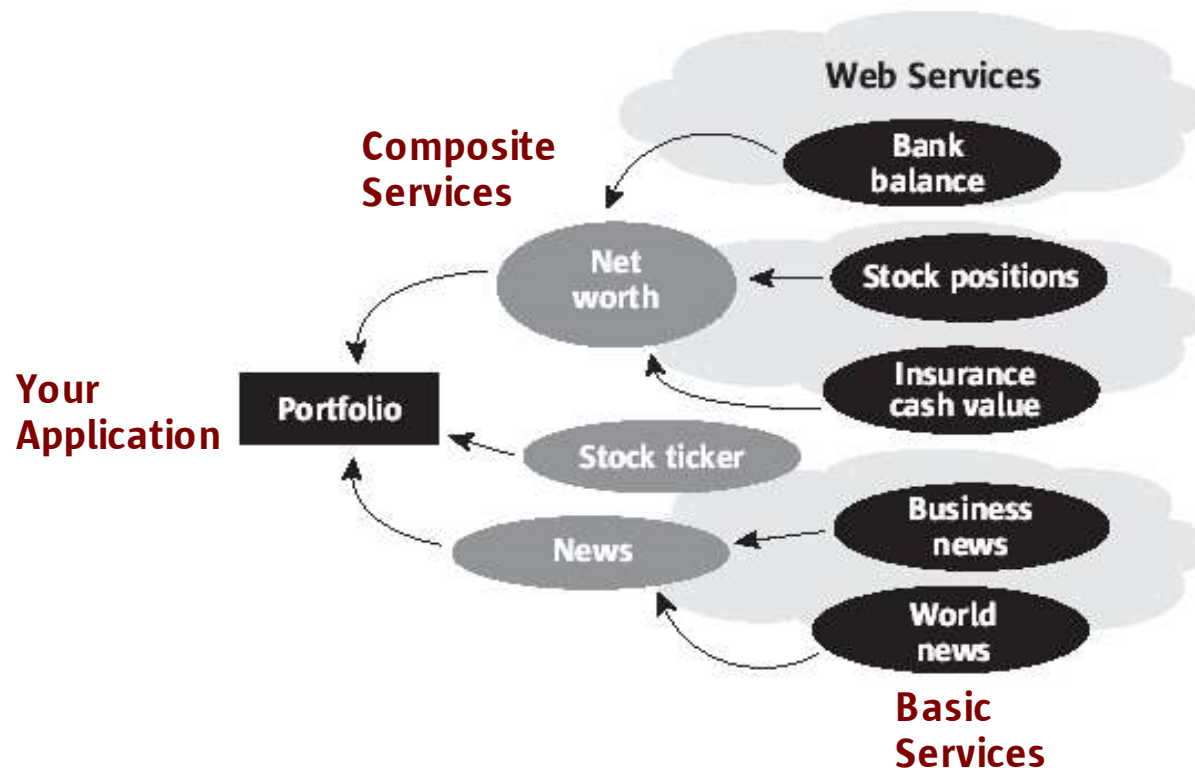
How are services fulfilled?

Service Integration: Web Services



How are services fulfilled?

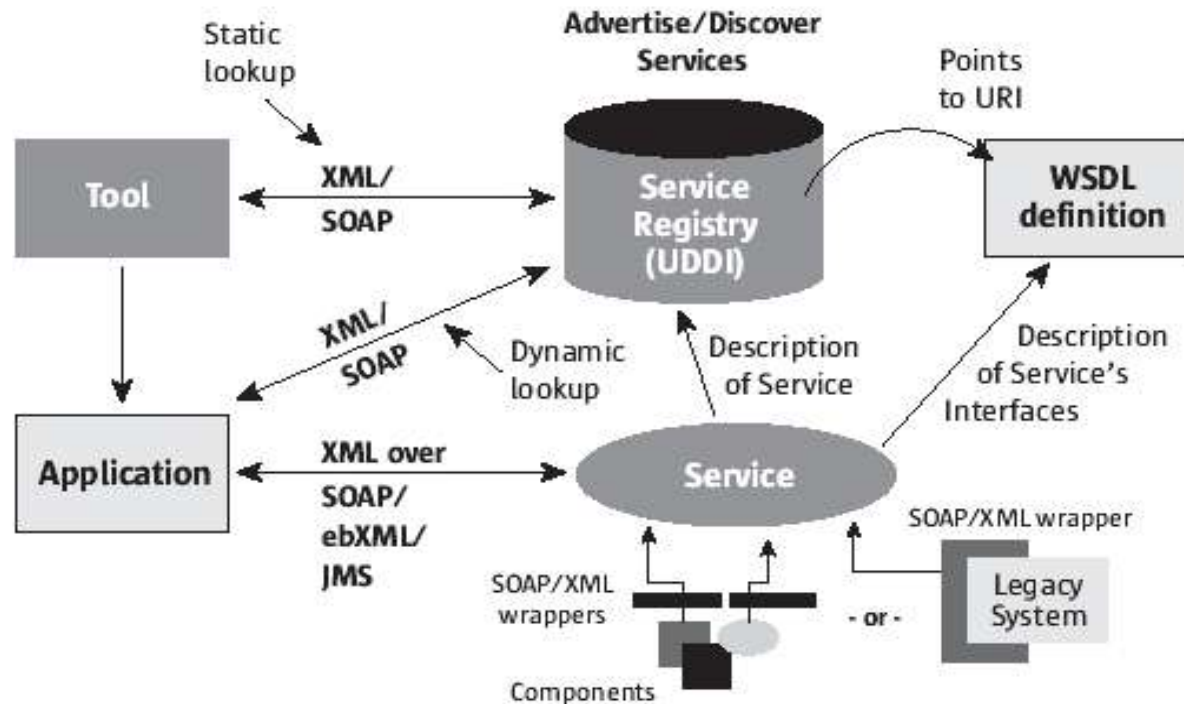
Service Integration: Future Web Services



- Web services are accessible programmatically
- XML offers a lingua franca to support data interchange for heterogeneous environments

How are services fulfilled?

Service Integration: Future Web Services



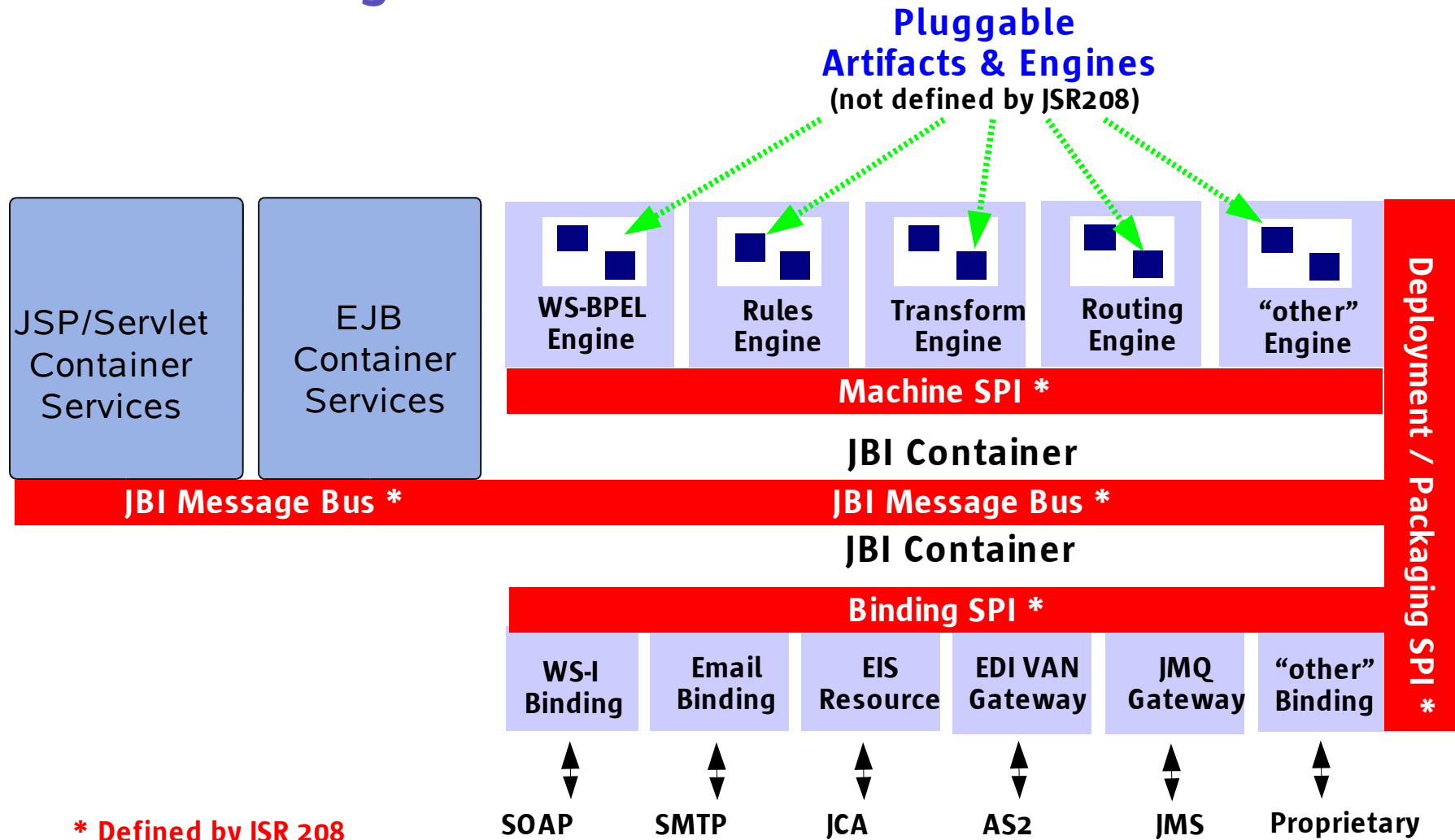
Phase 3: Dynamic Binding

Phases of Adoption

1. Statically-bound RPC-style interaction
2. Dynamically-bound on corporate intranets, limited, prearranged B2B on the Internet
3. Dynamically-bound, spontaneous interaction across the Internet

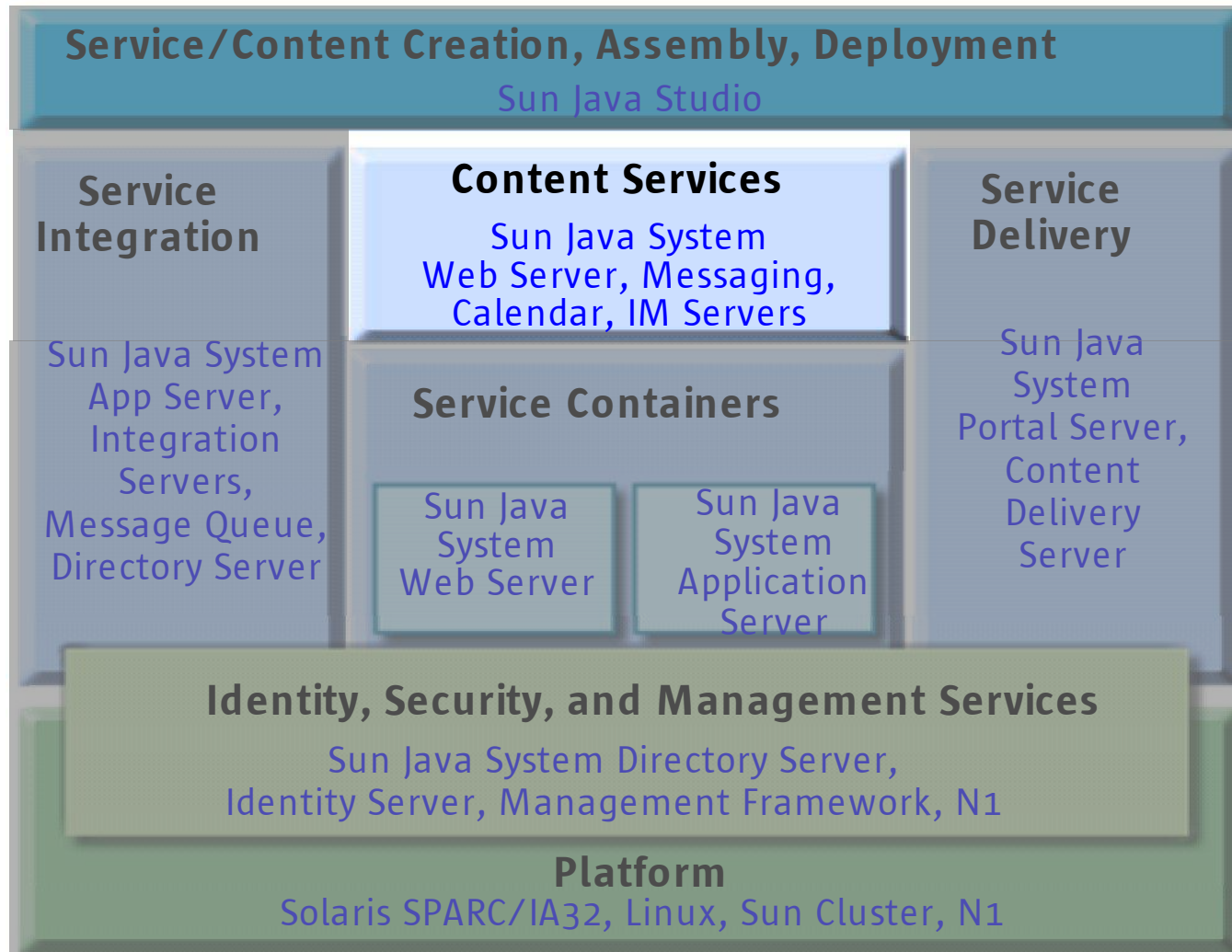
How are services fulfilled?

Service Integration Futures



How are services fulfilled?

Content Services



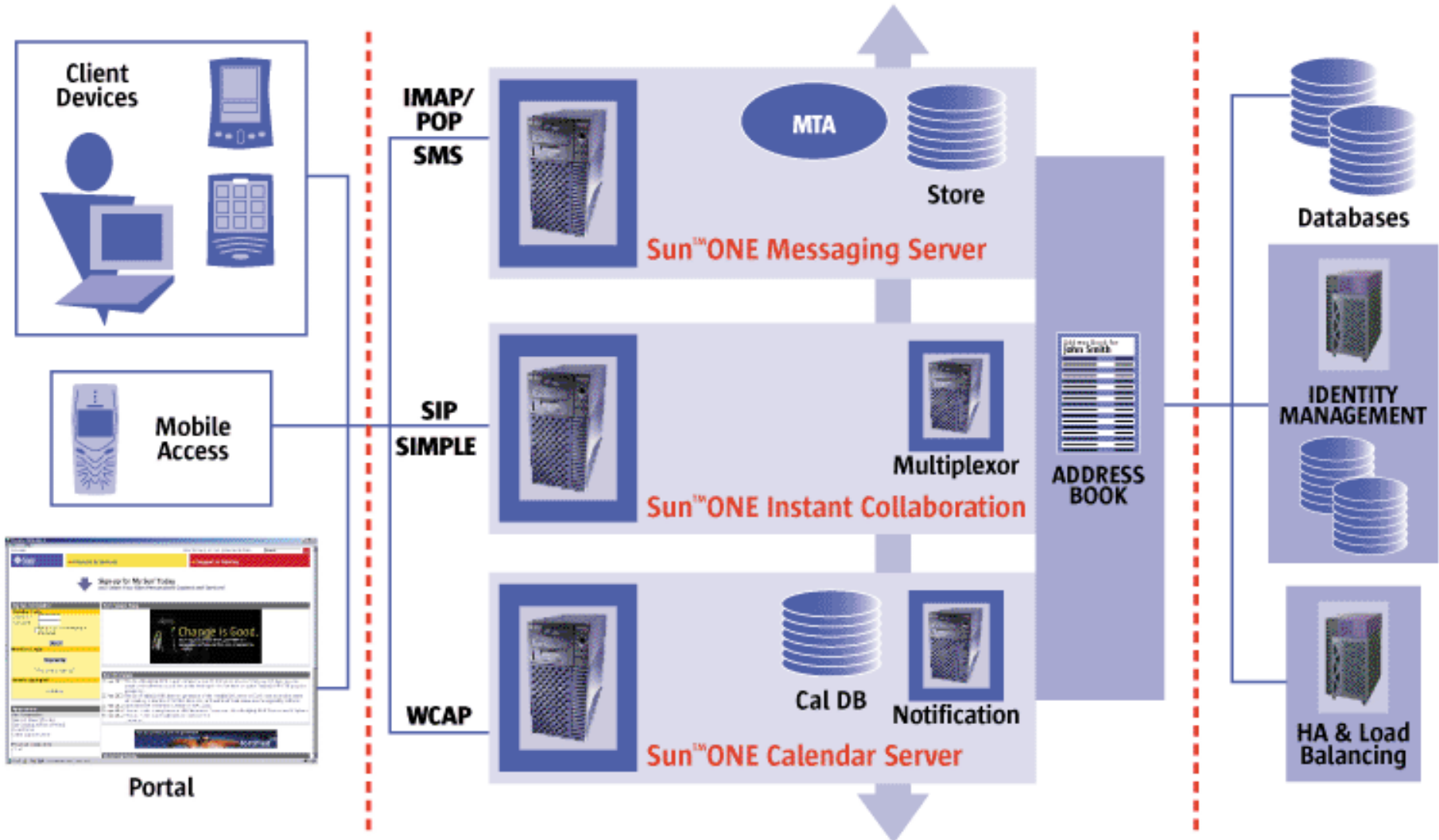
How are services fulfilled?

Content Interfaces

- Web pages
- Portal channels
- Address books
- Calendars
- Email
- Instant messages

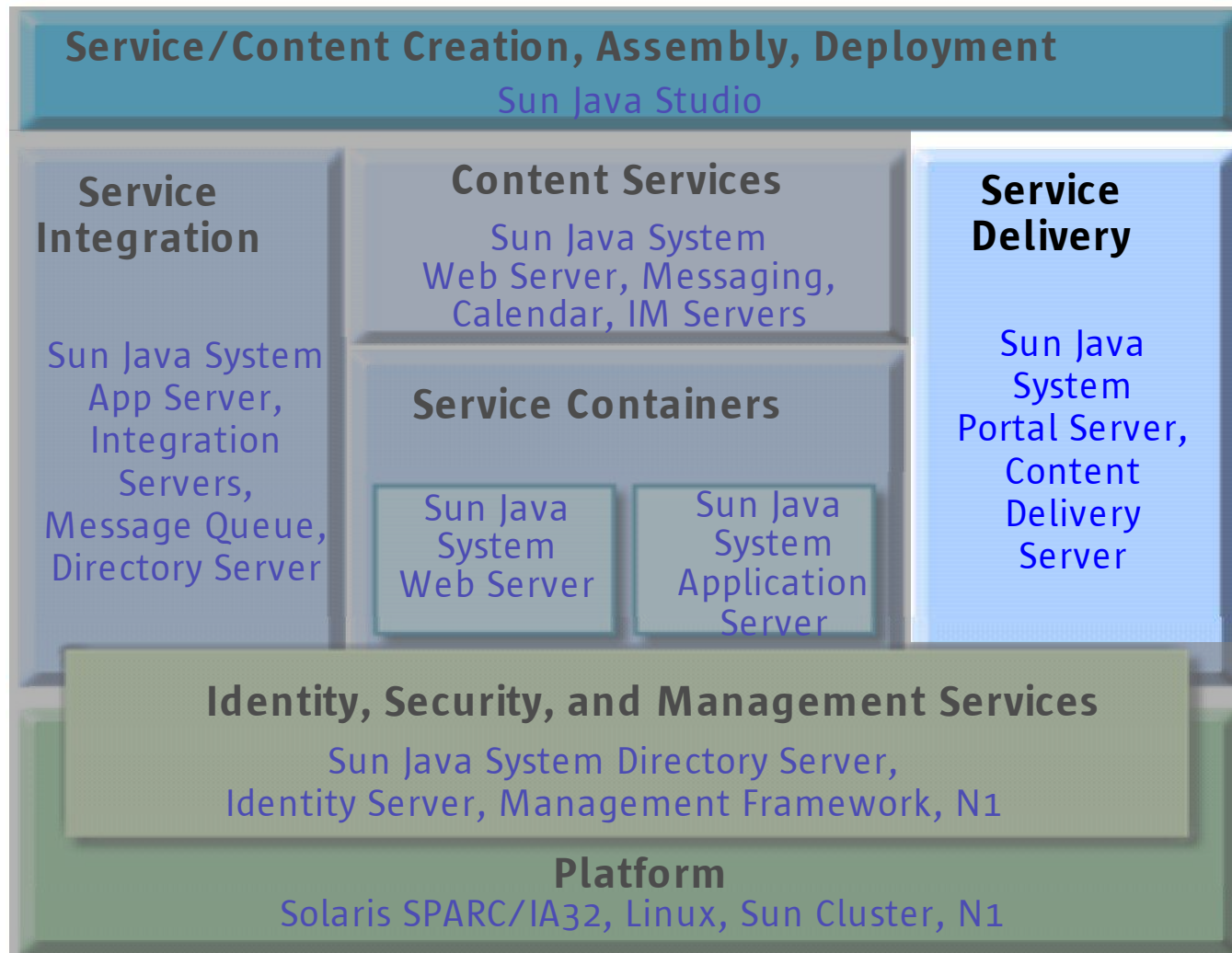
How are services fulfilled?

Content Services: Communication & Collaboration



How are services fulfilled?

Service Delivery



How are services fulfilled?

Service Delivery: Portal Defined

- Goal is to render web application data so that it can be displayed with little or no additional processing on the client device
- Allows multiple sources of information to be displayed within a single page or set of pages
- Terminology:
 - Desktop: page holding the content
 - Channel: individual content sources presented as independent views and aggregated onto the desktop
- Comprehensive portal solution provides:
 - Location
 - Connection
 - Aggregation
 - Presentation
 - Communication
 - Personalization
 - Notification
 - Delivery

How are services fulfilled?

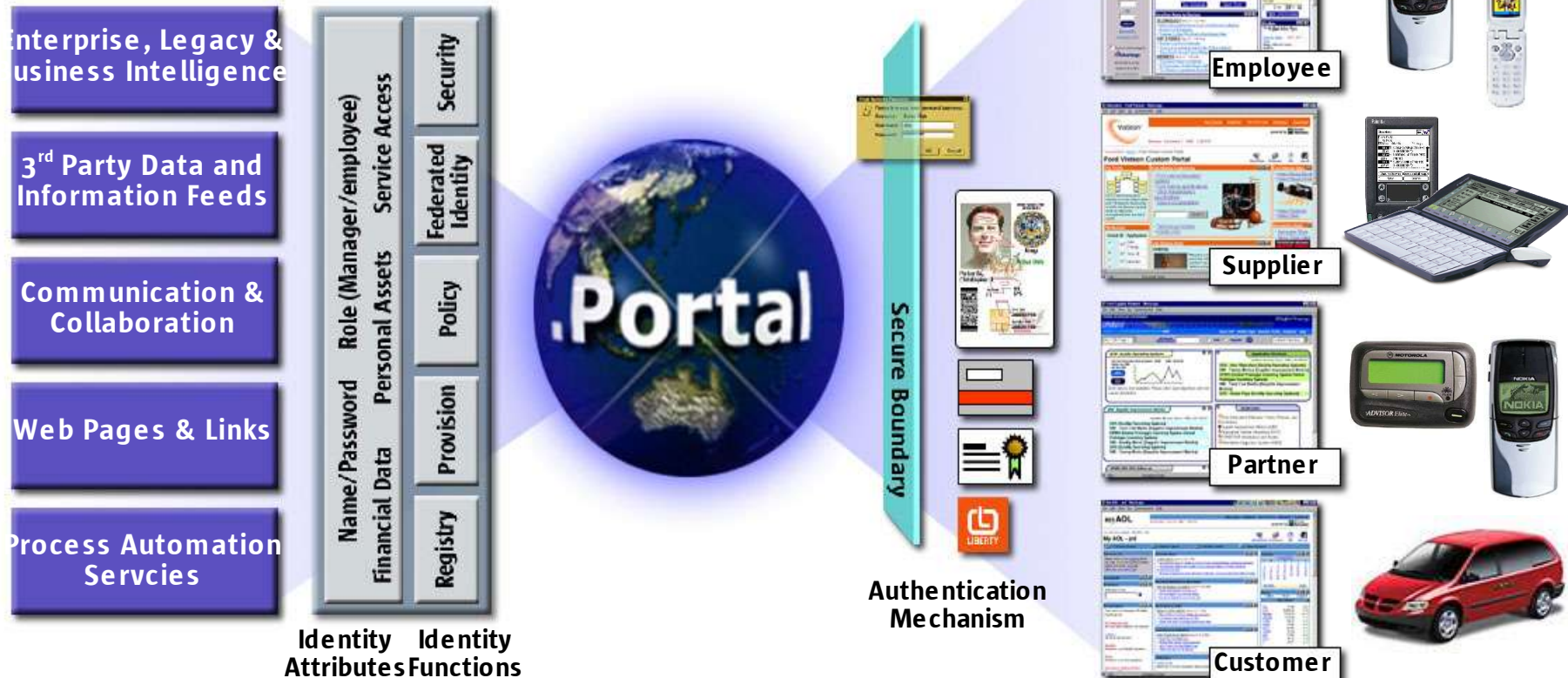
Service Delivery: Big Picture

**Data No Matter
Where It Resides**

**Aggregated
and Personalized**

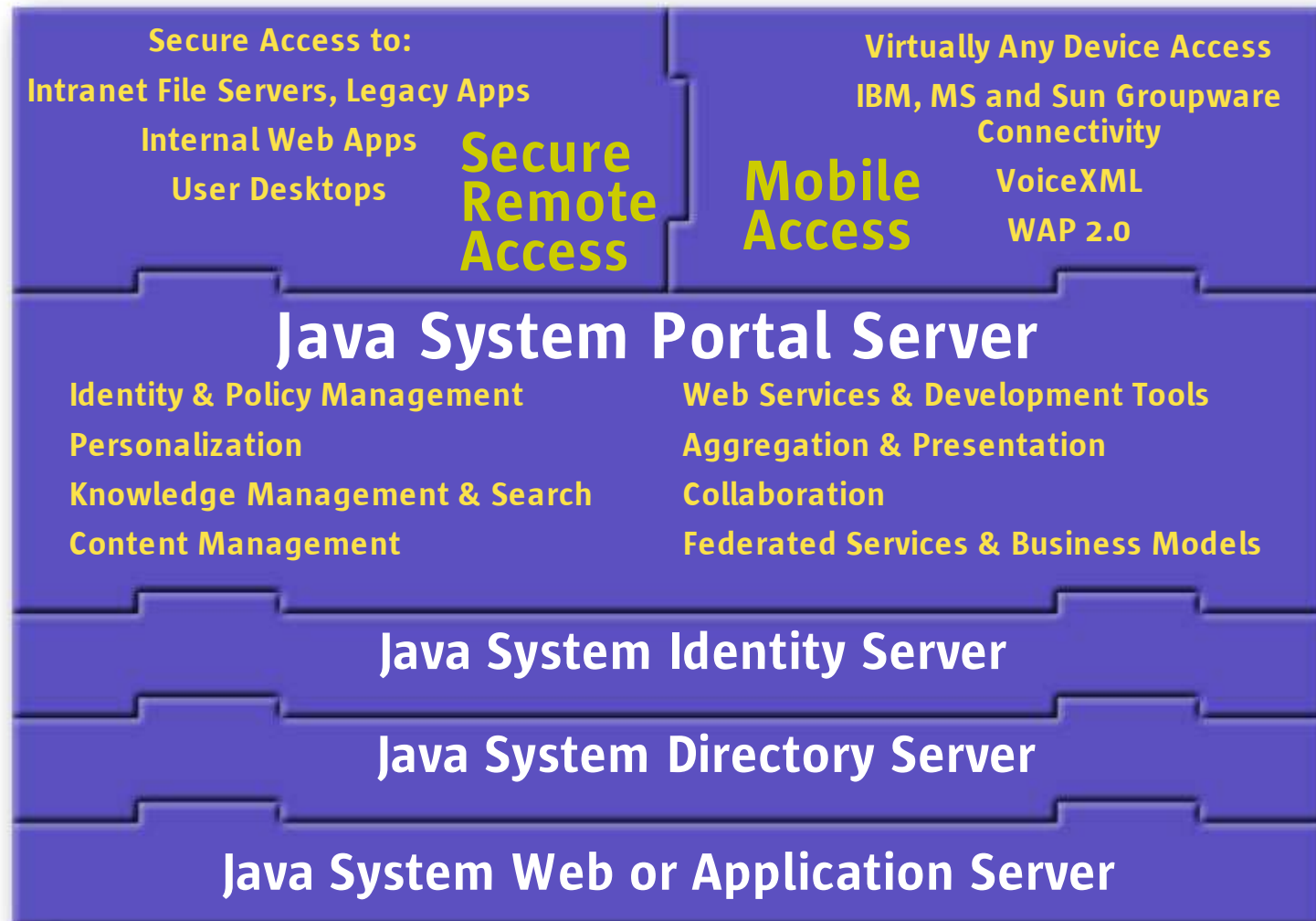
**Securely Delivered to
Targeted Communities**

Via Any Device



How are services fulfilled?

Service Delivery: Building Blocks



Agenda Summary

Sun Java System Architecture

- What is it? (abstraction, product framework, open standards, integrated and integratable)
- Why is it important? (need to embrace componentry for immense, network-based applications)
- How are the key services fulfilled? (identity, containers, integration, content, delivery)



Thank you!

**Sun Java System Architecture:
Java Enterprise System Technical Introduction**

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