

Web Services Overview

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Agenda

- What is a Web Service?
- Why Web Services?
- Where are & where are Web Services going?
- Types of Web Services
- Web services over Java platform

What is a Web Service?

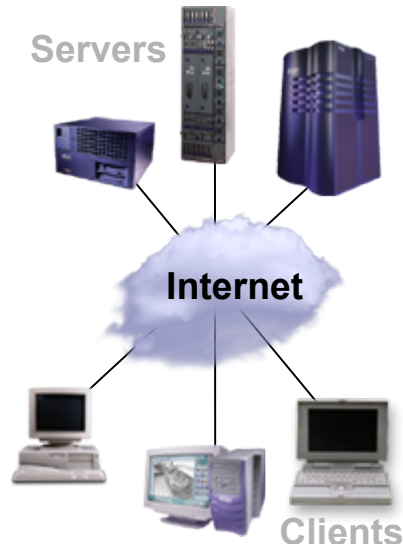
Web Services Definition by W3C

- A Web service is a **software application**
- identified by a **URI**,
- whose **interfaces and binding** are capable of being defined, described and discovered by **XML artifacts** and
- supports direct **interactions** with other software applications
- using **XML based messages**
- via **Internet-based protocols**

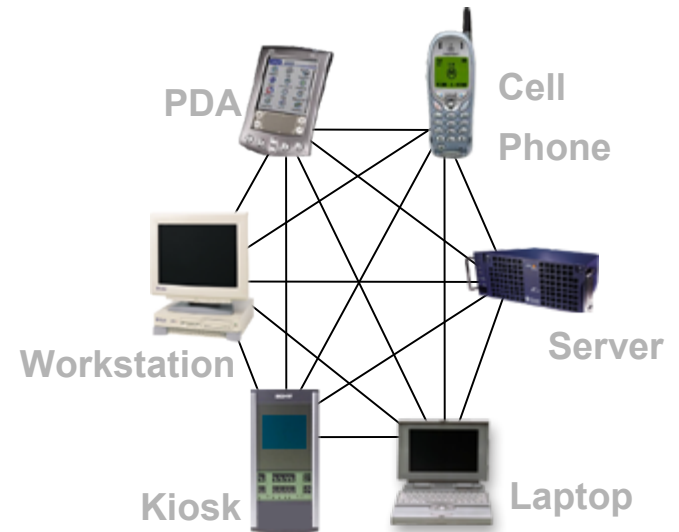
Distributed Computing Evolution



**Client-
Server(C/S)
silos**



**Web-based
computing**



**Web Services/Peer-to-
Peer**

Traditional C/S vs. Web Services

Traditional C/S

- Within enterprise
- Tied to a set of programming languages
- Procedural
- Usually bound to a particular transport
- Tightly-coupled
- Efficient processing (space/time)

Web Services

- Between/within Ent.
- Program language independent
- Message-driven
- Easily bound to different transports
- Loosely-coupled
- Relatively not efficient processing

Web Application vs. Web Services

Web Application

- User-to-program interaction
- Static integration of components
- Monolithic service

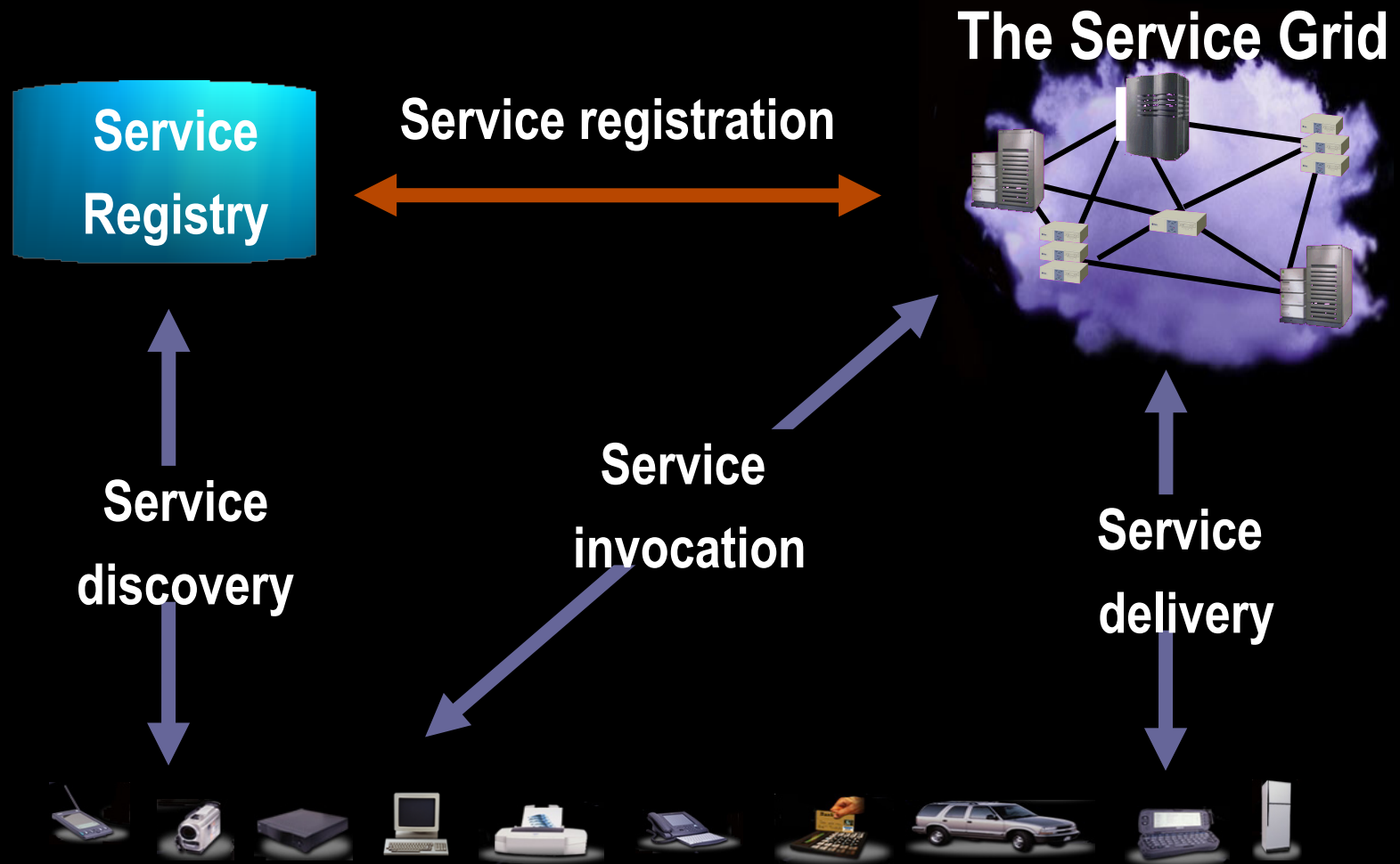
Web Services

- Program-to-program interaction
- Possibility of dynamic integration of components (in the future)
- Possibility of service aggregation (in the future)

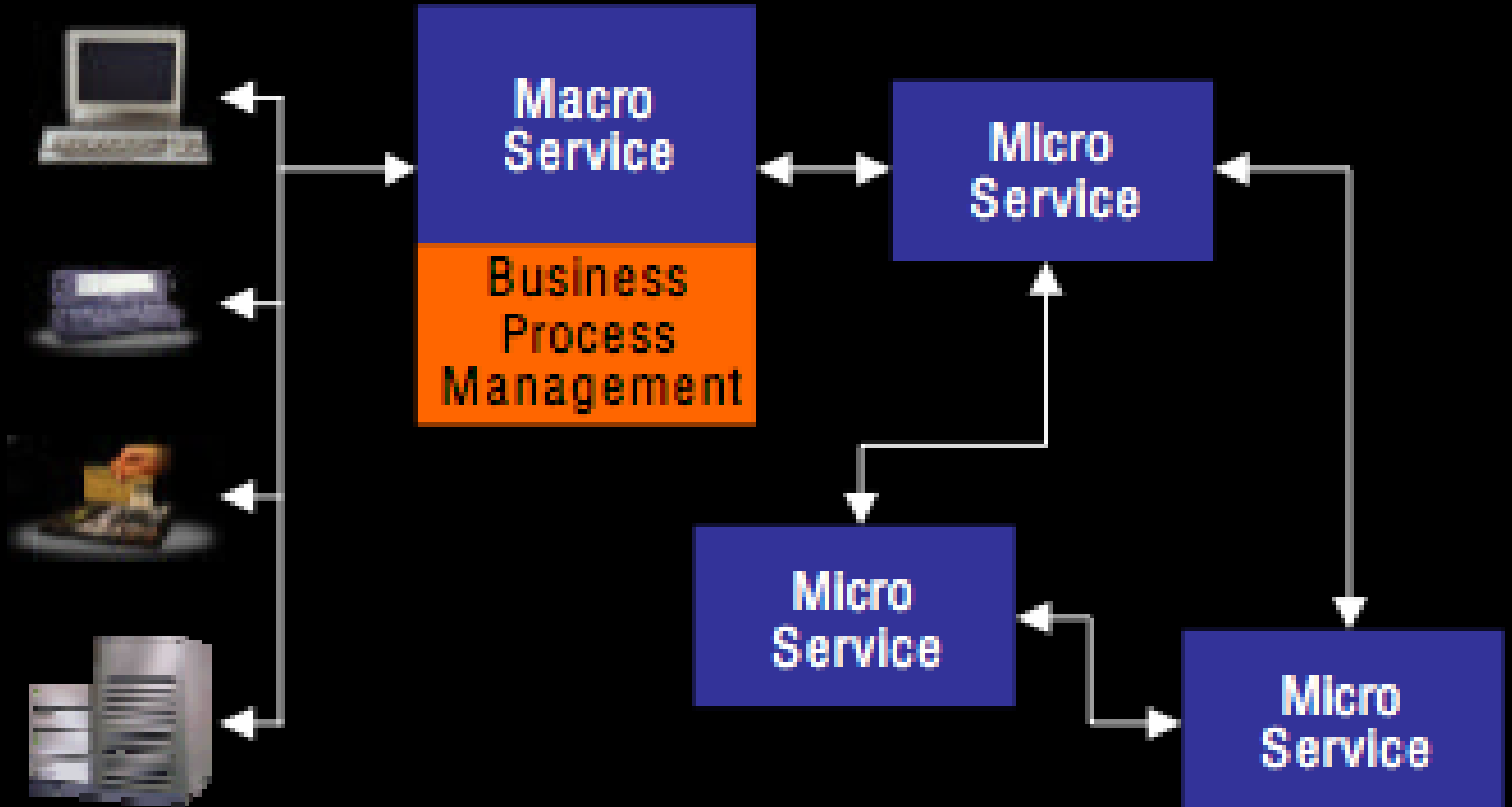
Characteristics of Web Services

- XML Based everywhere
- Message-based
- Programming Language independent
- Could be dynamically located
- Could be dynamically assembled or aggregated
- Accessed over the Internet
- Loosely coupled
- Based on industry standards

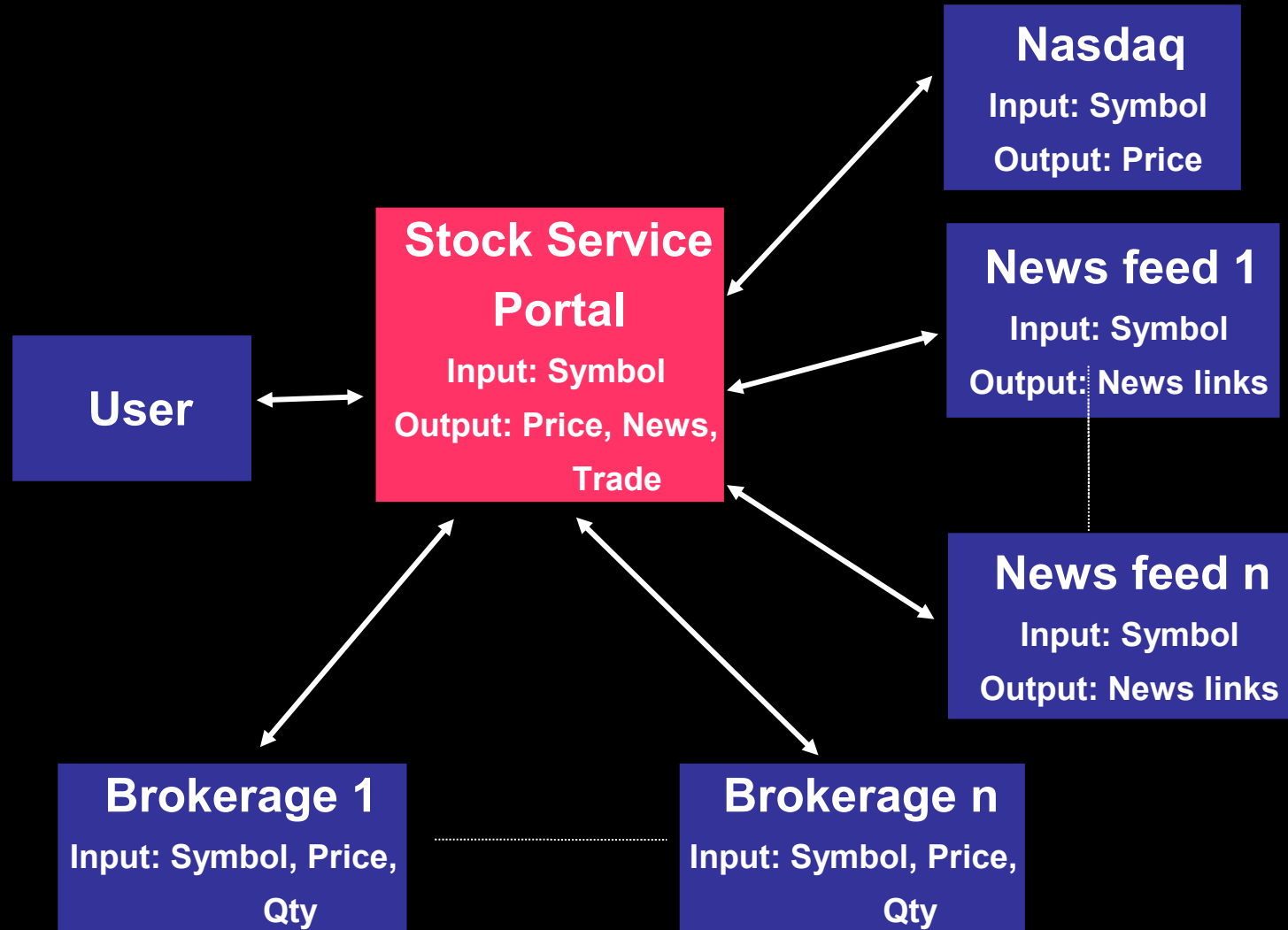
Web Services



Service Aggregation

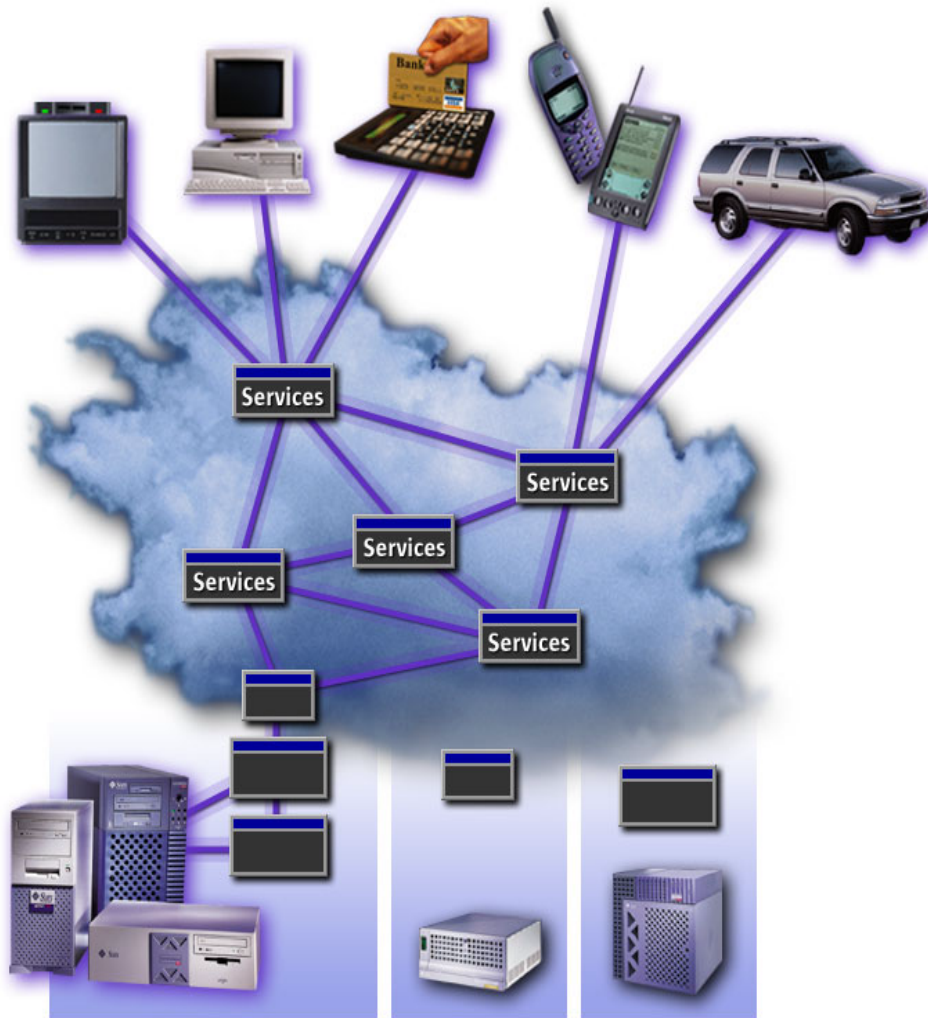


Service Aggregation Example



Why Web Services?

Why Web Services?



Web Services are:

- Are platform neutral
- Are accessible in a standard way
- Are accessible in an **interoperable** way
- Use simple and ubiquitous plumbing
- Simplify **enterprise integration**

Why Web Services?

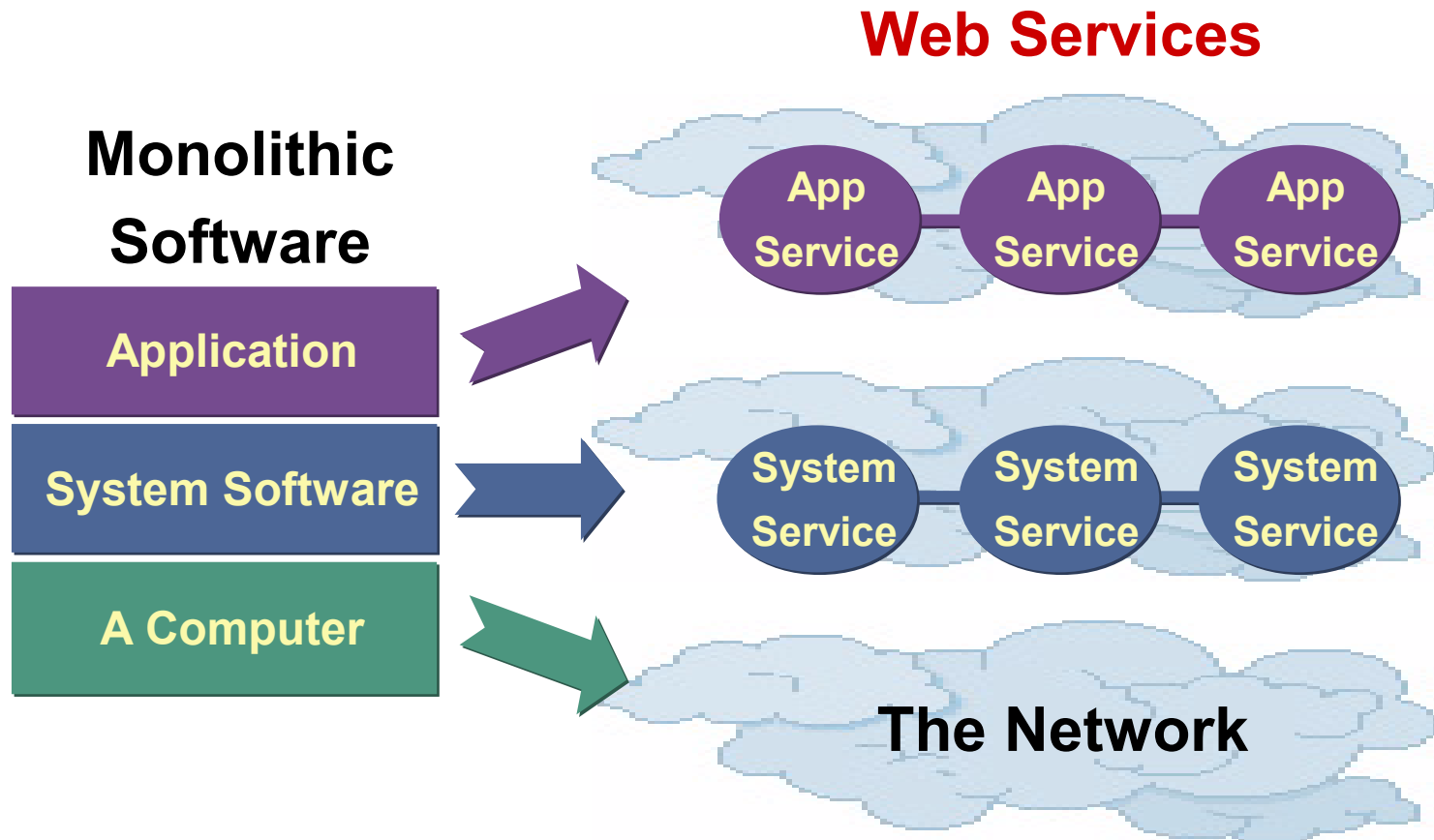
- **Interoperable** – Connect across heterogeneous networks using ubiquitous web-based standards
- **Economical** – Recycle components, no installation and tight integration of software
- **Accessible** – Legacy assets & internal apps are exposed and accessible on the web
- **Available** – Services on any device, anywhere, anytime
- **Scalable** – No limits on scope of applications and amounts of heterogeneous applications

State of Web Services

State of Web Services

- Basic Technology/Standards are well established
 - > Service definitions, protocols – SOAP, WSDL
 - > Security, transaction, state, and user context
 - > Workflow, Identity management
- Abundant implementations
- **Business Web Services** are the next big thing, but **more works are needed** in:
 - > Quality of Service, management
 - > Provisioning, Accounting
- SOA is becoming reality

Impact of Web Services on Software: “Application Dis-Integration”



Types of Web Services

Types of Web Services

- SOAP-based Web services
 - > Based on SOAP, WSDL, WS-* specification
- RESTful Web services
 - > Gaining more traction these days over SOAP-based Web services due to its simplicity

We are going to cover both types of Web services in this course.

Web Services Support over Java Platform

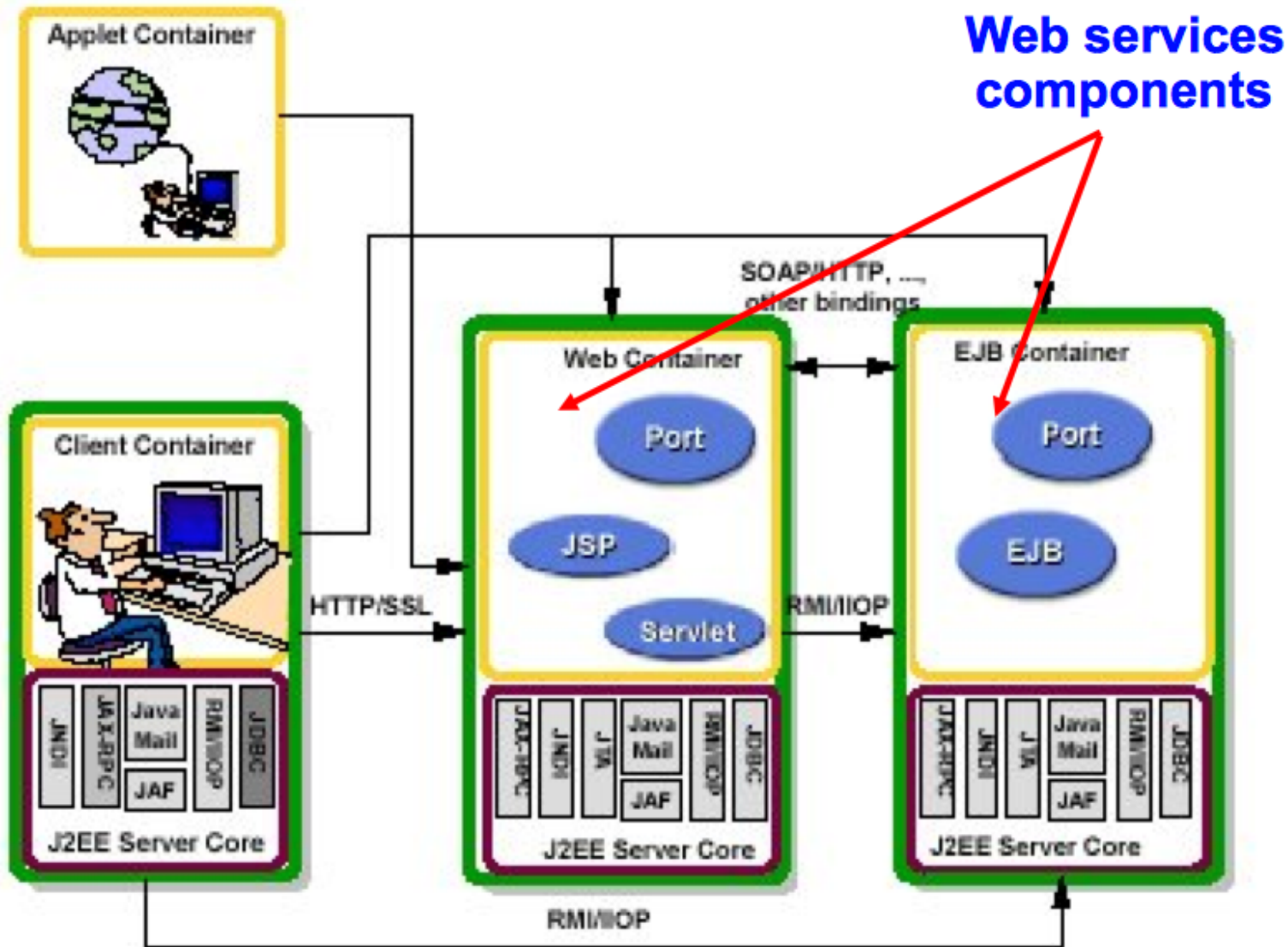
Why Java EE for Web Services?

- Web Services are just **one of many service delivery channels** of Java EE
 - > No architectural change is needed
 - > Existing Java EE components can be easily exposed as Web Services
- Many **benefits** of Java EE are **preserved** for Web Services
 - > Portability, Scalability, Reliability
 - > No single-vendor lock-in

Where are We now?

- **Java APIs** for Web Services are well-accepted
 - > JAX-WS, JAX-RS, JAXB
- **Tools** are available now for exposing existing Java EE components as Web Services
- Java EE community has defined **overall framework** for Web Services (Java EE 1.4, JSR 109)
- Java SE 6 can host Web services

Web Service Components



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