

Lecture 0 (1 hour)

Web Services

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(You can use this material in any way you want,
but please drop me an email if you do.)



Topics

- Motivation for Web Services
- Characteristics of Web Services
- Service Taxonomy
- Building blocks
 - ◆ XML
 - ◆ UDDI
 - ◆ SOAP
 - ◆ ebXML

Web Services

- Describes specific **business functionality** exposed by a company, usually through an Internet connection, for the purpose of providing a way for another company or software program to use the service.

Motivation for Web Services

- Growing need for **light-weight, standard** way of offering services
- Need for standard way of **publishing, discovering, and subscribing** services
- Need for **global-scale** communication infrastructure
- Need to handle **dynamic** nature of network, applications

Characteristics of Web Services

- XML based
- Dynamically located
- Accessed over the network
- Loosely coupled
- Message-based
- Using standard protocols

Service Characteristics

- Bidirectional or one-way
- Synchronous or asynchronous
- High or low risk
- Range of mission criticality
- Device independence
- Priced in bulk or by transaction

A Strawman Service Taxonomy

- Subscription services
- Platform services
- Portal services
- Trading services

Subscription Services

- Information sent in response to simple request
- Tolerant of low, intermittent bandwidth
- Served to wide variety of devices
- User may not expect "high quality of service"
- SOAP - a key technology and likely standard
- e.g. sales force notification, news feeds, financial info, internet appliances

Trading Services

- Loosely coupled, distributed computing model based on asynchronous messaging
- XML document-centric
- Reliable and open interoperability at the business process level
- Definition of business services in terms of documents and document exchange coreography
- Flexible packaging that provides a migration path for traditional EDI systems
- Standardization within the existing framework of international agreements governing trade

Web Services Infrastructure

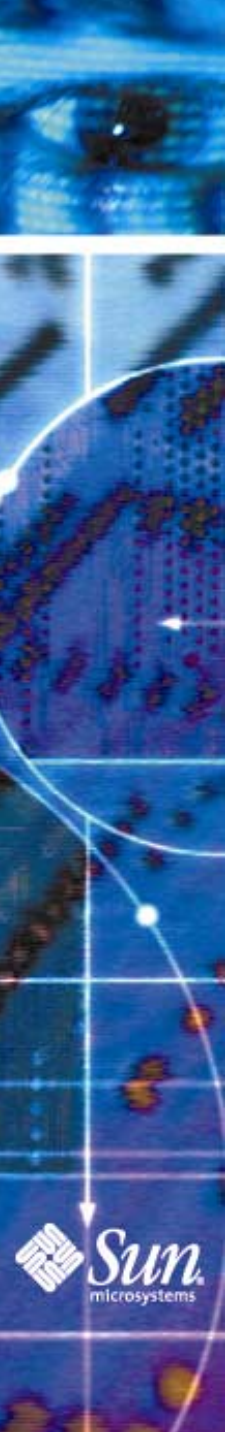
- Discovery
- Description
- Transport
- Event notification
- Environment

Building Blocks

- XML
- UDDI
- SOAP (W3C XP)
- WSDL
- ebXML

UDDI

- Define a way to **publish and discover** information about Web services
 - ◆ Uses SOAP for publishing and discovery
 - ◆ Service access can be in any protocol
- Distributed registries
 - ◆ Registration is described in XML (WSDL)
- Three components
 - ◆ White pages (who)
 - ◆ Yellow pages (what)
 - ◆ Green pages (how)



SOAP

- Good for simple quality of service
- Lack of business semantics invites proprietary extension
- Functionality insufficient for some kinds of services

WSDL

- Description language for Web services
- Independent of underlying protocol (I.e. SOAP)
- Independent of encoding
- Key part of UDDI

What Is ebXML?



Creating A Single Global Electronic Market

- ebXML is a joint effort between
 - ◆ OASIS (Organization for Advancement of Structured Information Standards) and
 - ◆ UN/CEFACT (United Nations Center for Trade Facilitation and Electronic Business)
- Goal is to establish a standard global EC framework
- Focus is on Electronic Business XML

ebXML.org

- 8 working groups, a new WG (proof-of-concept) has just been created
- ebXML requirements doc is now public
- Transport, Routing and Packaging WG has made the following public
 - ◆ Overview and Requirements Doc.
 - ◆ Message Envelope Spec.
 - ◆ Strawman Message Header Spec.

ebXML

- Enterprises of any size, anywhere can
 - ◆ Find each other electronically
 - ◆ Conduct business through the exchange of XML based messages
 - using standard message structure
 - according to standard business process sequences
 - with clear business semantics
 - ◆ Using off the shelf purchased business applications

ebXML Concepts

- Horizontal framework on which the verticals can build
 - ◆ Business messages - expressed in XML
 - ◆ Business processes - defined in UML, expressed in XML
 - ◆ Business service interface - handles one role in a business process - expressed in XML
 - ◆ Trading partner agreement - Specifies protocol properties required for two specific business services interfaces to talk to each other - expressed in XML
 - ◆ Transport and Routing layer - moves the actual data between business services interfaces

ebXML Highlights

- Global in scope, participation and support
 - ◆ participation is free and open to anyone, anywhere
 - ◆ focus on needs of 99% not using EDI
 - ◆ UN/CEFACT, OASIS
 - ◆ 2000 participants around the world

ebXML Highlights

- Evolutionary development and deployment
 - ◆ simple, low cost, technologies (HTTP, SMTP, XML, UML)
 - ◆ complement not compete with EDI
 - ◆ modular

Summary



- Motivation for Web Services
- Characteristics of Web Services
- Service Taxonomy
- Building blocks
 - ◆ XML, UDDI, SOAP, WSDL, ebXML

References

