Introduction

IS660G – Professor Burns

Class Text

- Developing Enterprise Web Services An Architect's Guide.
  Chatterjee and Webber. Prentice Hall 2004.
  ISBN: 0-13-140160-2

  Text Organization:

  •**Part I** Fundamentals

  •**Part II** Advanced Technologies

  •**Part III** Real World Examples and Best Practices

Review

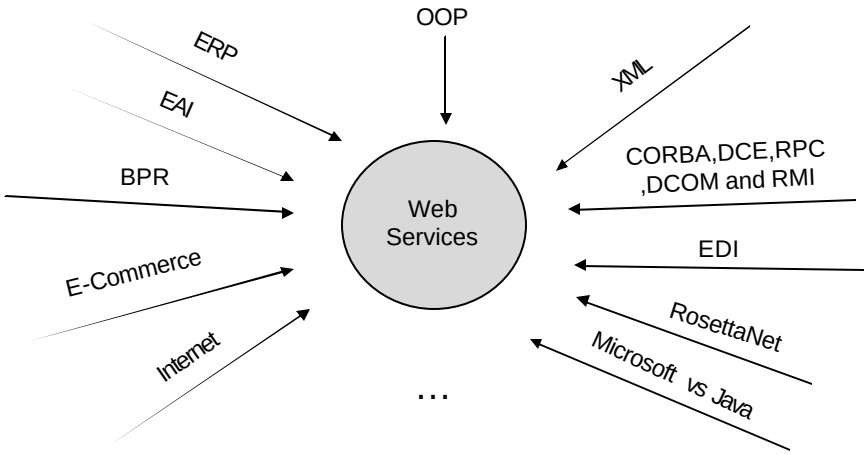
- Syllabus
- Grading Policy
- Class Website

Motivation

- Increased productivity
- Reduced risks and costs
- Lower barrier to entry (vs. point-to-point)
- New revenue opportunities
- New knowledge

➢ Partnering
➢ New Business Models

Web Services Convergence (Evolution)



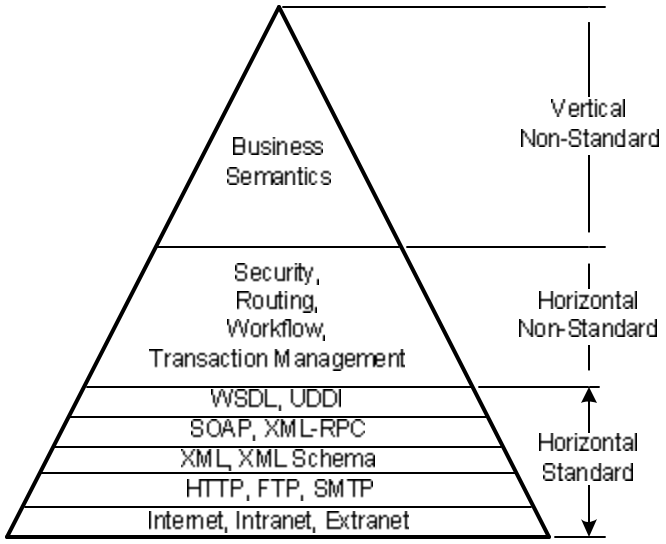
WS Benefits

- Independence from programming languages, operating systems and hardware vendors
- Standardization of how and what to communicate
- Less granularity when dealing with a service (group of components) as opposed to finely-grained individual components
- Reusability of the service, not the source or object code
- Lower cost of ownership driven by standardization which will make integration more generic and easily repeatable
- Loosely coupled systems can communicate using system independent formats and techniques
- Reduced brittleness, or said another way, less likely to break when the internals of one service are changed and new services are connected
- Reuse and standardization of web services makes possible one-to-many rather than one-to-one solutions, thereby reducing the incremental cost of adding an additional partner to an existing web-services system trending towards zero (scalability)

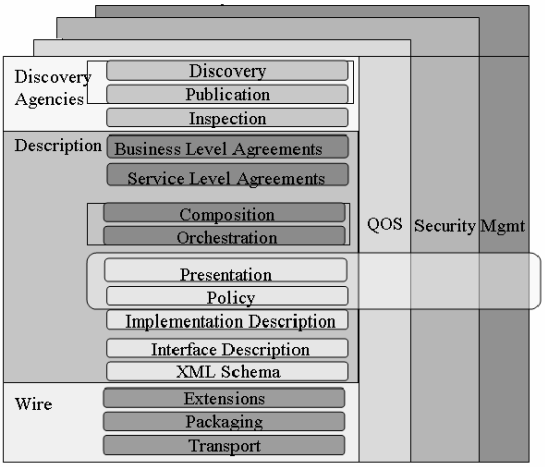
Web Services

- A2A
- Web – ubiquity
- Service – service-oriented architectures
- Standard technologies
  - eXtensible Markup Language, or, XML (language independent)
    - Simple Object Access Protocol, or, SOAP
    - Web Services Definition Language, or, WSDL
    - Universal Description Discovery and Integration, or, UDDI

The Web-Services Pyramid



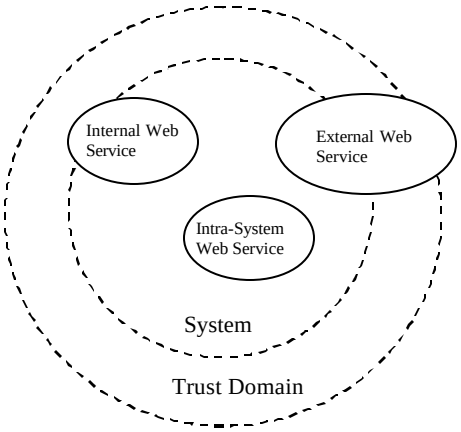
Web Services Architecture



Loosely Coupled vs. Tightly Coupled Systems

	Tightly Coupled	**Loosely Coupled**
Interaction	*Synchronous*	*Asynchronous*
Messaging Style	*RPC*	*Document*
Message Paths	*Hard Coded*	*Routed*
Technology Mix	*Homogenous*	*Heterogeneous*
Compliance	*Autonomous*	*Autonomous Collaboration*
Data Types	*Dependent*	*Independent*
Syntactic Definition	*By Convention*	*Published Schema*
Bindings	*Fixed and Early*	*Delayed*
Semantic Adaptation	*By Re-coding*	*Via Transformation*
Software Objective	*Reuse; Efficiency*	*Broad Applicability*
Transaction Failure	*ACID [27]*	*Evolving*
Scalability	*Relatively high cost and effort*	*Relatively low cost and effort*

An *internal web service* crosses the boundaries that separate systems, while *intra-system web services* are contained within a single system. *External web services* cross the trust domain boundaries that separate departments, divisions, or companies, linking the systems controlled by these separate entities.



Intra-System WS vs. External WS

External web services are generally more difficult to design and implement because of the expanded trust domains and the challenges include:

- Security – authentication, authorization
- Business Agreements – business contracts and agreements
- Technology Agreements – business semantics of what the data means
- Support Agreements – who troubleshoots problems and fixes them?
- Quality of Service – reliability and availability

Organizations

- W3C (www.w3c.org)
- United Nations Centre for Trade Facilitation and Electronic Business (www.unece.org/cefact/)
- OASIS (www.oasis-open.org/home/index.php)
- ebXML (www.ebXML.org)

Readings and Assignments

- Read Part I of the text – Chaps 1 thru 4 – and Chap 12
- Tutorials can be found on www.w3schools.com
- Quiz 1 & 2 will cover Chaps 1 thru 4 on Blackboard
  - http://blackboard.pace.edu/
- Install and setup Apache Tomcat
- Download and setup Apache AXIS
- Download and setup Apache Xerces
- Assignment 1
  - Run examples locally in Chap 12
  - Connect to Pace website via user accounts and run examples on server
  - Printout results and submit to me on Mar 8th

Teams

- Skills assessment
- Number of students → Number of teams
- Ground Rules