

# Introduction

IS660G – Professor Burns

## Class Text

- Java Web Services Unleashed

*Brunner, Robert J.*

*Cohen, Frank*

*Curbera, Francisco*

*Govoni, Darren*

*Haines, Steven*

*Kloppmann, Matthais*

*Marchal, Benoit*

*Morrison, K. Scott*

*Ryman, Arthur*

*Weber, Joseph*

*Wutka, Mark*

- SAMS, 2002

**Text Organization:**

•**Part I** Introduction

•**Part II** Basic Concepts

•**Part III** JAX Pack

•**Part IV** Completing Web Services

•**Part V** Implementing Web Services

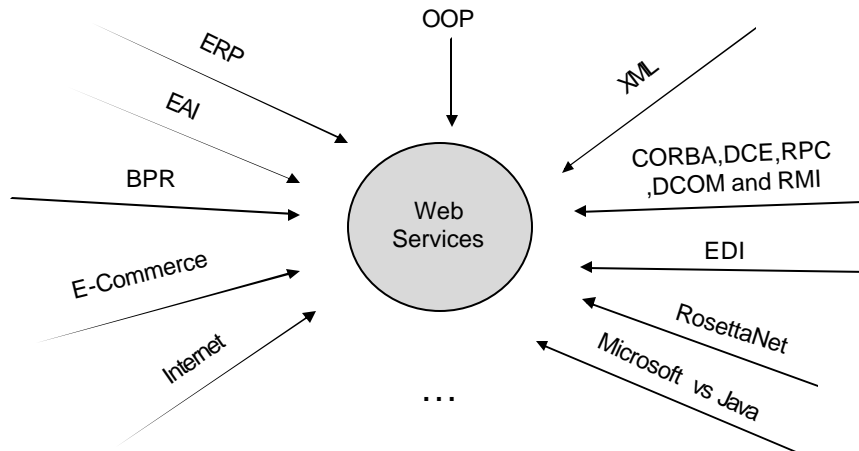
## Review

- 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)



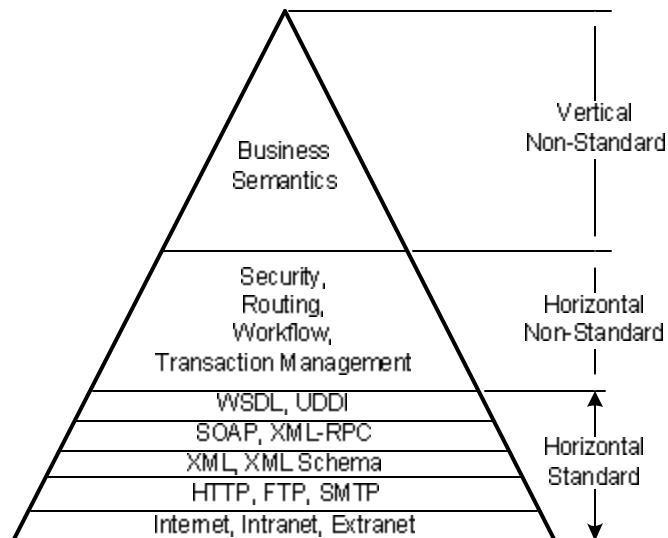
## WS Benefits

- 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)

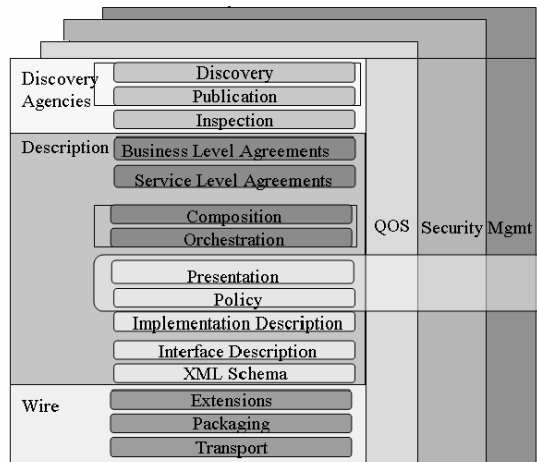
# Web Services

- 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



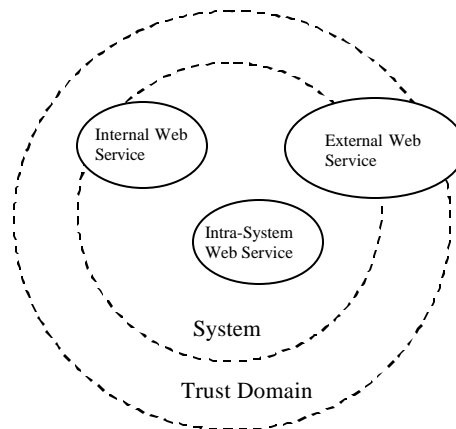
# Web Services Architecture



## Loosely Coupled vs. Tightly Coupled Systems

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

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

## Readings and Assignments

- Read Part I of the text – Chaps 1 thru 6
- Tutorials can be found on [www.w3schools.com](http://www.w3schools.com)
- Quiz 1 on Chaps 1 thru 3 on Blackboard
  - <http://blackboard.pace.edu/>
- Install and setup Apache Tomcat (see Chap 4)
- Download and setup Apache AXIS (see Chap 5)
- Download and setup Apache Xerces (see Chap 5)
- Assignment 1
  - Run examples locally in Chaps 5 & 6
  - Connect to Pace website via user accounts and run examples on server
  - Printout results and submit to me on Feb 24<sup>th</sup>

# Teams

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