IS 2739: Web Services
Course Introduction

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Overview

• Contacts
• Resources
• Important Points
• Coverage
• A Word about Presentation Style
• Tentative Schedule

Fall 2015 (216-1)

• Web Services and Distributed Computing
  • IS 2739
  • CRN: 20088
  • Monday 3:00-6:00 Room 403 (12-3 828)
• Contact Information
  • Instructor: Michael B. Spring
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  • Website: http://www.sis.pitt.edu/~spring
  • Personal Email: spring@pitt.edu
  • Class Email: mbsclass@pitt.edu
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Resources

- Syllabus
  - www.sis.pitt.edu/~spring/courses/IS2739_Syl_161.htm
- Class materials
  - www.sis.pitt.edu/~mbsclass/ --> web services
  - PowerPoint PDFs
  - Reference documents
  - Software

Books

- Required

Important Points

- Evolution of Distributed systems
  - Datagrams
  - Channels and dialogs
  - Procedure calls and Method invocations
  - Repositories and Registries
  - Wrappers
- The nature of an SOA
  - An architecture, not a technology
  - Services versus objects
  - Recursively granular, composable, and reusable
  - Marketplace envisioned
Goals of the Course

• To implement XML based interface solutions between loosely coupled services.
• To integrate the knowledge and skills you have developed in the prerequisite courses.
• To provide a hands on experience with the full range of technologies that support service oriented approaches.
• To reflect on the differences between traditional client server, SOA and Web service and Web 2.0 approaches.

Imperatives for 2739

• Understanding the evolution of distributed systems – communications oriented, procedure oriented, n-tier, services
• Develop an understanding of the scope of XML as an abstract syntax
• Become conversant with design tools and frameworks that allow components to be easily built and maintained
• Become conversant with the emerging technologies and their capabilities

Course Expectations

• Prerequisites
  • Familiarity with basic security issues
  • Knowledge of operating systems, particularly unix
  • Ability to write solid code in Java
• Preparation
  • Reading and thinking
  • Thinking and “doing” – beyond what I have “done”
• Engagement
  • Experimentation
  • Planning
• Expectation is 3 hours out of class for every one in
Tentative Ordering of Topics

- Understanding SOA and WS
- Restful web services
- Services, descriptions, and messaging
- Coordination, Orchestration, and Choreography
- Advanced Messaging, Metadata, and Security
- Service Orientation Principles
- Application and Business Layers
- Service Oriented Analysis
- SOA Design – WSDL and SOAP
- WS-* Extensions

Assignments

- Note that the instructor reserves the right to shift from project based grading to examination based grading.
- There are four assignments for the course:
  - Configuration and understanding of the J2EE Development environment (10 pts)
    - Netbeans
    - Android
    - XML tools
  - Development of a Restful Web Service i.e. a mashup (15 pts)
  - Develop a Set of Services for Feed Aggregation or Social Networking (30 pts)
  - Develop a simple multi-level message based web service to support a business application (45 pts)

Assignment 1: Understanding J2EE

- The goal of the first exercise is to become familiar with:
  - Application Servers, and Registries
  - Version Control Systems – Subversion
  - JSP/Servlets and MVC
- Read:
  - Chapters 1-2 of Service Design Patterns
  - J2EE Overview and Tutorial
- Install the development environment:
  - Netbeans and J2EE
- Read about and be prepared to discuss:
  - Java Message Queue
  - JAXB
  - Java Persistence
XML Plugins for Netbeans

• XML schema editor in NetBeans
  • Go to Tools | Plugins in NetBeans IDE 7.0.1.
  • In the Settings tab, register this update center:
    – http://deadlock.netbeans.org/hudson/job/xml/lastSuccessful
    Build/artifact/build/updates/updates.xml
  – Now go to the Available Plugins tab and search for XML Tools.
  – Install the plugin.
  • And now you have a pretty cool XML schema editor. Go to the New File dialog and pick an XML...

Assignment 1 (cont)

• Download, install, configure, and run test applications on:
  • Netbeans (most recent)
  • J2EE
  • Subversion
  • Glassfish (Sun Application Server)
• Research the APIs shown below and develop a brief – 5 to 10 minute – overview
  • Java Message Queue for loosely coupled communication.
  • Java and XML Binding JAXB for device independent messaging

Assignment 2

• Select one of the Web Services available in Netbeans
• Develop a set of servlets to access the web services one of the providers.
• Document the services as described on the providers website and compare and contrast them with the Netbeans descriptions
• Prepare a demo of your project along with a power point presentation on what you did
Assignment 3: RSS Feed Service

- Assignment 3 will involve the development of some small system of web services we will design ourselves. (The class may convince the instructor to allow them to define a project of their own choosing.) If not, the instructor will assign:
  - An SOA for RSS feed aggregation or Social Networking

Assignment 4: Business Infrastructure

- The final assignment will involve the development of a system of web services we will design ourselves. (The class may convince the instructor to allow them to define a project of their own choosing.) If not, the instructor will assign an SOA for business services:
  - Basic Services
    - Ordering, Billing, Invoicing, etc.
  - Support Services
    - Access Control
    - Logging
    - Version Control
    - Reporting
  - Infrastructure Services
    - DBMS
    - External Services
Imperatives for 2739

- Develop an understanding of the history and evolution of the web
- Develop and understanding of the history and evolution of the enabling technology
- Become conversant with design tools and frameworks that allow e-business sites to be easily built and maintained
- Become conversant with the capabilities of the emerging technologies