Introduction to Assignment 2
Distributed Systems Lecture
HS 2011, ETH Zurich

Simon Mayer
simon.mayer@inf.ethz.ch
Today’s Menu

- Quick rundown of Web application architectures
  - WS-* Web Services
  - Representational State Transfer

- Exercise 2
  - Overview
  - Tasks
  - Hints
Web Services in a Nutshell

- **UDDI**
- **WSDL**
- **SOAP**

**Lookup**
- Request
- Reply

**Publish**
- Request
- Reply

**Client** → **Server**
- Request/Reply

**Server**
- SOAP
- WSDL

**UDDI**
- Lookup-Service
Web Services in a Nutshell

- For the exercise, we let the service publish its WSDL without going through a UDDI...
Web Services - WSDL Overview

Exercise: http://vswot.inf.ethz.ch:8080/SunSPOTWebServices/SunSPOTWebservice

- types, messages, portType, binding, port, service
Quick WS-* Overview on next slide…

REST in a Nutshell

- Every resource gets an ID
  e.g., a sensor node: http://vswot.inf.ethz.ch:8081/sunspots/

- Resources are linked

- Resources have multiple representations

- Resources provide a uniform interface

- Stateless communication
REST and HTTP...

- REST and HTTP are not equivalent!

- REST uniform interface
  - REST nouns and verbs
    - HTTP: GET, POST, PUT, DELETE, OPTIONS, HEAD,...
  - WS-* verbs
Assignment 2 – Overview

- Objectives – Exercise 2
  - Learn to develop distributed Web applications
  - Use the two different paradigms seen in the lecture:
    - Representational State Transfer (REST)
    - Web Services (WS-*)

- Dates
  - Exercise begins: Now (October 10, 2011)
  - Exercise is due: 9:00am, October 24, 2011
Assignment 2 – System Setup

- Access Sun SPOTs through WS-*/REST
- Sun SPOTs: Wireless sensor nodes (temp, acc, light,...)

[http://code.google.com/p/hcsfsp/]
Assignment 2 – Tasks

1. Experimenting with RESTful Web Services (2P)
   - Create an HTTP request
     a) “by hand” (i.e., without the use of any HTTP library)
   - Use HTTP content negotiation to get machine-readable data
   - Connect to a Sun SPOT and retrieve the temperature value.

2. Experimenting with WS-* Web Services (2P)
   - Explore WSDL, create SOAP requests
   - Connect to a Sun SPOT and retrieve the temperature value.

3. Assessing Web Service Technologies (1P)
Assignment 2 – Tasks

4. Cloud Services (1P)
   - Visualization of retrieved measurements
     a) Using the native Android graphics libraries
     b) Using the Google Chart API

5. Your Phone as a Server (2P)
   - Implement a Web Server on your phone that allows to access the phone’s sensors and actuators

6. Report (2P)
Assignment 2 – Feedback & Study

- Study on REST and WS-*
  - [https://docs.google.com/spreadsheet/viewform?hl=en_US&pli=1&formkey=dFFsbS1OVUVSaV9ld1dUYjZ1N0Jsdmc6MA#gid=0](https://docs.google.com/spreadsheet/viewform?hl=en_US&pli=1&formkey=dFFsbS1OVUVSaV9ld1dUYjZ1N0Jsdmc6MA#gid=0)

- Perceived easiness/speed of learning of technologies
- Feedback: Previous knowledge, time spent for assignment

- Anonymous & individual
Assignment 2 Hints - Relevant Terminology

- Media types: HTML, XML, JSON
- ROA – Resource-oriented Architecture
- REST – Representational State Transfer
- SOA – Service-oriented Architecture
- SOAP – Simple Object Access Protocol (deprecated)
- WSDL – Web Services Description Language
REST Hints

- http://www.infoq.com/articles/rest-introduction

- RESTful Web Services (Leonard Richardson und Sam Ruby)
  - Available at D-INFK library

- Apache HTTP library (simplest sample code alive... 😊)
WS-* Hints

- Patched version of kSOAP2

- Short tutorial on kSOAP2 for Android
Visualization Hints

- Google charts API example:
  
  https://chart.googleapis.com/chart?chs=250x100&chd=t:60,40&cht=p3&chl=Hello|World

- Getting started:
  
  http://code.google.com/apis/chart/image/docs/making_charts.html#usingthewizard
Submission

- Same as for Assignment 1
  - Programs/Code, Report

+ Assignment form:

  https://docs.google.com/spreadsheet/viewform?hl=en_US&formkey=dDlPSFRvV1BocjNCTIA0d1FpMERGRIE6MA#gid=0

+ Feedback form (individual, anonymous):

  https://docs.google.com/spreadsheet/viewform?formkey=dFFsbS1OVVVSaV9lId1dUYjZ1N0Jsdmc6MA#gid=0
Introduction to Assignment 2
Distributed Systems Lecture
HS 2011, ETH Zurich

Simon Mayer
simon.mayer@inf.ethz.ch