Introduction
Service Oriented Architecture

Oxford University

Software Engineering Programme

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Introduction

- Aims
- Pre-requisites
- Contents
- Connections
- Resources
- Rules of Engagement
- Introductions

Aims

- Understanding of Principles
- Exploration of de facto and de jure standards
- Practical experience of different technologies
- Architecture and Design
- Wider context

Pre-requisites

Covered by the Pre-Study Guide!

- **XML** including XML namespaces and XML schema
- **JSON**

  JSON is dead simple but it would help if you have looked at it before
- **Java**

  Basic Java language skills

Contents

- Evolution of distributed computing
- REST Architecture: HTTP, Resources, URIs, HATEOAS
- JAX-RS
- Web Services: WS-*, etc
- JAX-WS
- REST and SOAP compared
- SOA in Action – Amazon and Amazon EC2, Netflix, PEPPOL

Contents continued

- Intermediation: ESBs and Enterprise Integration Patterns
- Quality of Service: WS-Security, SAML2, XACML, OAuth, etc
- Governance
- API Management
- Composition and Orchestration: BPEL and BPMN
- Other Patterns: Thrift, Protocol Buffers, EDA, MQTT, AMQP, etc

Practicals

- Creating a REST Service using JAX-RS
- Creating a SOAP Service using JAX-WS
- Security
- Governance and Registry lookup at runtime
- ESB intermediation and transformation
- API Management and OAuth2
- BPEL and process orchestration

Connections

- Objects (OOR, OOD, OOP, DPA, SPL)
- Formal techniques (SEM, SDE)
- Concurrency (CDS, ACT, MOB)
- Security (SPR, SRO, DES, NES)

Resources

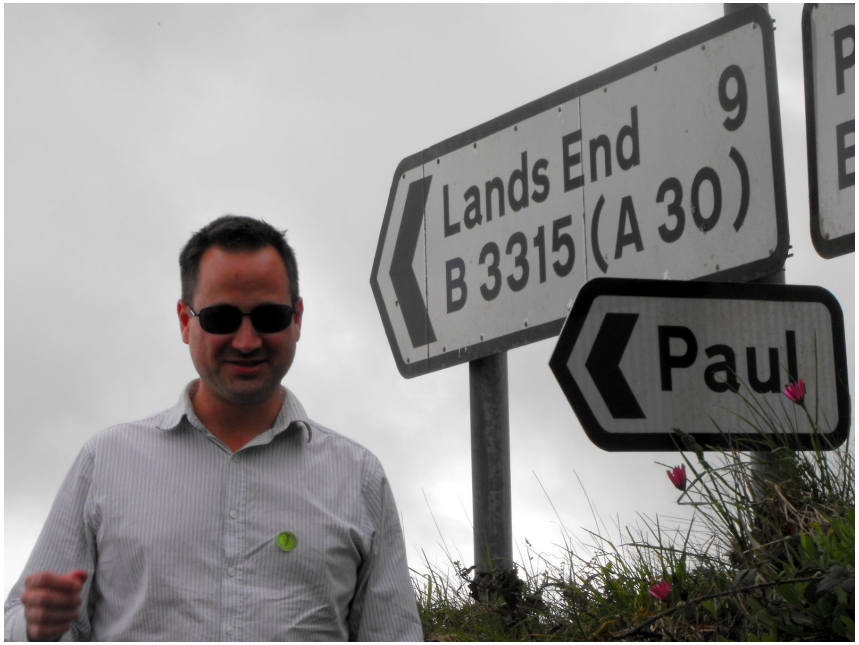
- Singh and Huhns, *Service Oriented Computing* (Wiley, 2005)
- Josuttis, *SOA in Practice* (O'Reilly, 2007)
- Erl, *SOA* (Prentice-Hall, 2005)
- Szyperski, *Component Software* (Addison-Wesley, 2nd Ed, 2002)
- Richardson and Ruby, *RESTful Web Services* (O'Reilly, 2007)
- Weerawarana et al, *Web Services Platform Architecture,* (Pearson, 2005)
- Fielding, *Architectural Styles and the Design of Network-based Software Architectures,* (University of California, 2000)
- Various W3C, OASIS, IETF, OMG standards

Rules of Engagement

- Ask questions as we go along
  - We will "park" any that are better answered later
  - Don't wait till the end to ask or raise concerns
- Timings are flexible
- Please keep mobile phones silent or better still turned off

Paul Fremantle

- CTO and Co-Founder of WSO2
- Previously Senior Technical Staff Member, IBM WebSphere architecture
- Co-Chair Web Services Reliable eXchange at OASIS (WSRM)
- VP, Apache Synapse and Member of ASF
- MA in Maths and Philosophy
- MSc in Computation (1995)
- Part time PhD student
- Plays the tin whistle



You?

Approximate Schedule

Monday	Tuesday	Wednesday	Thursday	Friday
Introduction	SOAP and WS-* SOA in Action	ESB, Intermediation Architecture	Orchestration, Choreography	Other Models: Thrift, ProtoBuf, Avro Event Driven Architecture
Evolution of Distributed Computing	JAX-WS Practical	ESB Practical	BPEL Practical	Engineering Conclusion
REST/JAX-RS	QoS and WS- Security Other Security: SAML2, XACML, OAuth2	Governance, Dependency Management	API Management APIs vs Services	
JAXRS Practical	WS-Security Practical	Registry Practical	API Management Practical	

Let’s get started