COMP3017
Service Computing

Tools we will use in this subject

- Communication
  - WeChat group
- Lecture materials and assignment submission
  - Blackboard - https://bb.hitsz.edu.cn/
- Online lectures – I will send the invitations in our course WeChat group
  - Tencent Meetings
  - Rain Classroom

Contact information

- Lecturer: Dr Joanna Siebert
- WeChat ID: JoannaSiebert

COMP3017
Service Computing

Introduction to the course

Intended Learning Outcomes

- By the end of this lesson you will be able to:
  - Estimate your workload in this subject
  - Understand the main concepts and importance of service computing

Subject Objectives

- Understand the basic concepts and ideas of service-oriented computing
- Master the key techniques and programming methods of Web services
- Understand and master the main technologies of service-oriented computing and service engineering methods
- Develop ability to use service-oriented computing techniques to solve real-world problems in engineering practice.

Assessment

- 5% - Participation
- 15% - Hot topic study journal
- 20% - Exercises - Case study and programming tutorial
- 60% - Final examination

Topics

Introduction to the course: objectives, plan, assessment

Module 1	Introduction to service computing: concept of “service-oriented”, background of service computing”; XML-RPC: basics of XML-RPC technology
Module 2	1. Service Message Exchange SOAP: basic components of the SOAP protocol, common programming languages to support SOAP 2. Service description WSDL: basic concepts of WSDL, generating WSDL, using WSDL to provide Web services
Module 3	1. Service Publishing and discovery UDDI: basic concepts of UDDI,UDDI structure, using common programming languages 2. Service composition: basic concepts of service composition, using BPEL to express a service composition
Module 4	Basics of web service programming; developing web services with JEE platform
Module 5	Service Oriented Architecture: architectural patterns and modelling methods of SOA, designing a distributed service system with SOA
Module 6	Service engineering: life cycle of service systems, service engineering methodologies, design and development of the service system life cycle applied to the real service system
Module 7	Hot topics in Service Computing

Summary

Module One: Introduction to Service Computing and XML-RPC

- Understand the basics of web service terminology and architecture
- Understand how the main web service technologies work together
- Understand the main concepts and history of XML-RPC
- Be able to use XML-RPC in different scenarios
- Understand the XML-RPC data types, requests, responses and other technical details

Module Two: SOAP and WSDL

- Understand the basics of the SOAP protocol
- Understand the details about the SOAP XML Message specification
- Understand the SOAP encoding rules
- Be able to use SOAP via HTTP
- Understand the four main SOAP implementations
- Understand main SOAP interoperability issues
- Understand the basics of WSDL
- Know WSDL invocation tools
- Be able to automatically generate WSDL files from existing SOAP services
- Be able to use XML Schema types within WSDL

Module Three: UDDI and BPEL

- Understand the main concepts of UDDI
- Understand main uses of UDDI,
- Understand the technical aspects of UDDI
- Be able to search UDDI via a web-based interface
- Be able to use the UDDI programmatic API
- Be able to publish new companies and services to UDDI
- Be familiar with popular UDDI implementations
- Understand basic concepts of BPEL
- Understand BPEL basic structure
- Be able to create business process

Module Four: Basics of Web Service Programming

- be familiar with JAX-WS
- create a SOAP web service using two ways: top-down approach and bottom-up approach
- use *wsimport* tool
- generate web service source files from WSDL
- publish the web service end points
- connect to the web service
- create a JAX-WS client
- make web service calls

Module Five: SOA

- Analyze common characteristics of SOA
- List common benefits of using SOA
- Assess common pitfalls of adopting SOA
- Understand the service orientation in the enterprise
- Be familiar with anatomy of a service oriented architecture
- Be able to explain the common principles of service orientation
- Understand how service orientation principles inter-relate
- Be able to evaluate Web service support for service-orientation principles

Module Six: Service Engineering

- Understand the common phases of an SOA delivery lifecycle
- Understand the difference between different SOA delivery strategies
- Be able to conduct a service-oriented analysis
- Be able to use WSDL, SOAP and BPEL in service design

Module Seven: Hot topics in Service Computing

- Become familiar with some of the recent topics in Service Computing area,
- Share your topic with other classmates.

Topics + assignment

Introduction to the course: objectives, plan, assessment

Module 1 Introduction to service computing: concept of “service-oriented”, background of service computing”; XML-RPC: basics of XML-RPC technology

Module 2
1. Service Message Exchange SOAP: basic components of the SOAP protocol, common programming languages to support SOAP
2. Service description WSDL: basic concepts of WSDL, generating WSDL, using WSDL to provide Web services

+ hot topic study short assignment

Module 3
1. Service Publishing and discovery UDDI: basic concepts of UDDI,UDDI structure, using common programming languages
2. Service composition: basic concepts of service composition, using BPEL to express a service composition

+ hot topic study short assignment

Module 4 Basics of web service programming; developing web services with JEE platform + programming tutorial

Module 5 Service Oriented Architecture: architectural patterns and modelling methods of SOA, designing a distributed service system with SOA + case study

Module 6 Service engineering: life cycle of service systems, service engineering methodologies, design and development of the service system life cycle applied to the real service system + hot topic study short assignment

Module 7 Hot topics in Service Computing

Summary

Assessment

- 5% - Participation
- 15% - Hot topic study journal
- 20% - Exercises - Case study and programming tutorial
- 60% - Final examination

Materials - textbooks

- Ethan Cerami, Web Services Essentials, 出版社： O’Reilly，ISBN： 9780596002244， 出版时间： 2002-02-21
- Thomas Erl, Service-Oriented Architecture, Concepts, Technology, and Design, 出版社： 科学出版社， ISBN： 9787030336422， 出版时间： 2012-03-01

“Post” time

- If you have any questions, please send a post, danmu or a Tencent Meeting message

How you can get help any time during our course

- You do not need to wait for our live sessions,
- I am available to help you on WeChat,
  - WeChat ID: JoannaSiebert
  - Or in our subject group

Please contact me

if you have any concerns about this subject or require special assistance:

- ✓contact me on WeChat

Thank you!

Module One: Introduction to Service Computing and XML-RPC

Our textbook for this module:

- **Ethan Cerami, Web Services Essentials, Publisher： O’Reilly， ISBN：9780596002244，**
- Chapters:
  - Chapter 1 - Introduction to Web Services
  - Chapter 2 - XML-RPC

Intended learning outcomes

- After completing activities in this module, you will:
  - Understand the basics of web service terminology and architecture
  - Understand how the main web service technologies work together
  - Understand the main concepts and history of XML-RPC
  - Be able to use XML-RPC in different scenarios
  - Understand the XML-RPC data types, requests, responses and other technical details

Guided questions for Module 1

- What is a service?
- What is a web-service?
- What is a web-service protocol stack?
- What is XML messaging?
- What is service description?
- What is service discovery?
- What is XML-RPC
- What is XML?
- What is SOAP?
- What is WSDL?
- What is UDDI?

Guided questions for Module 1

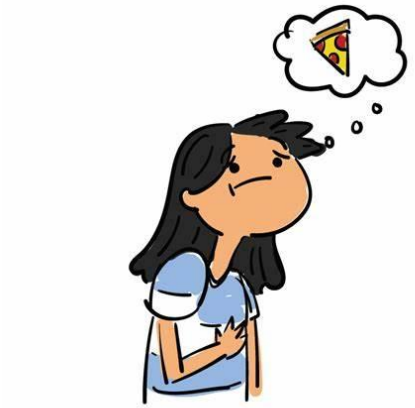
- What is the relationship between XML, XML-RPC, and SOAP?
- What is the relationship between SOAP, WSDL, and UDDI?
- What is the relationship between WSDL and service description?
- What is the relationship between UDDI and service discovery?
- What are the three main actors in service architecture?
- What are the steps in a typical development plan for a service requestor?
- How do we develop web services from the service provider perspective?

Guided questions for Module 1

- Why do we use XML-RPC when developing services? What are its advantages?
- How do we publish services with XML-RPC?
- Combination of what three parts defines a complete RPC?
- What data types are defined in XML-RPC specification and how are they represented?
- What elements are in XML-RPC request?
- What elements are in XML-RPC response?
- How developer uses XML-RPC?

Service

Service



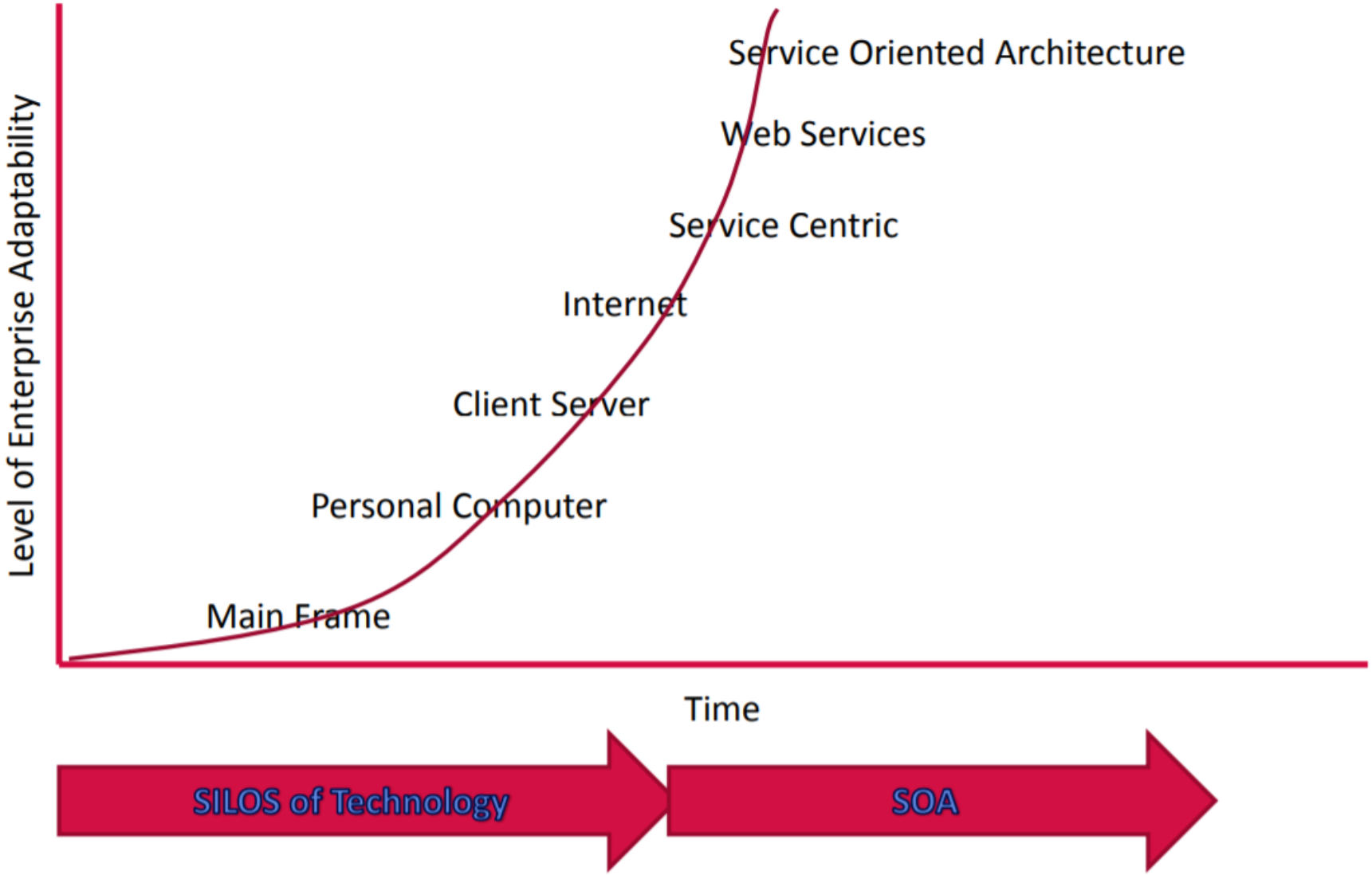
Service

- Services represent a type of relationships-based interactions (activities) between at least one service provider and one service consumer to achieve a certain business goal or solution objective.

What is Service Computing?

- Services Computing is a cross-discipline that covers the science and technology of bridging the gap between business services and IT services.
- Supports integrating the business as linked, repeatable business tasks, or services.

Towards Service Computing in an Enterprise

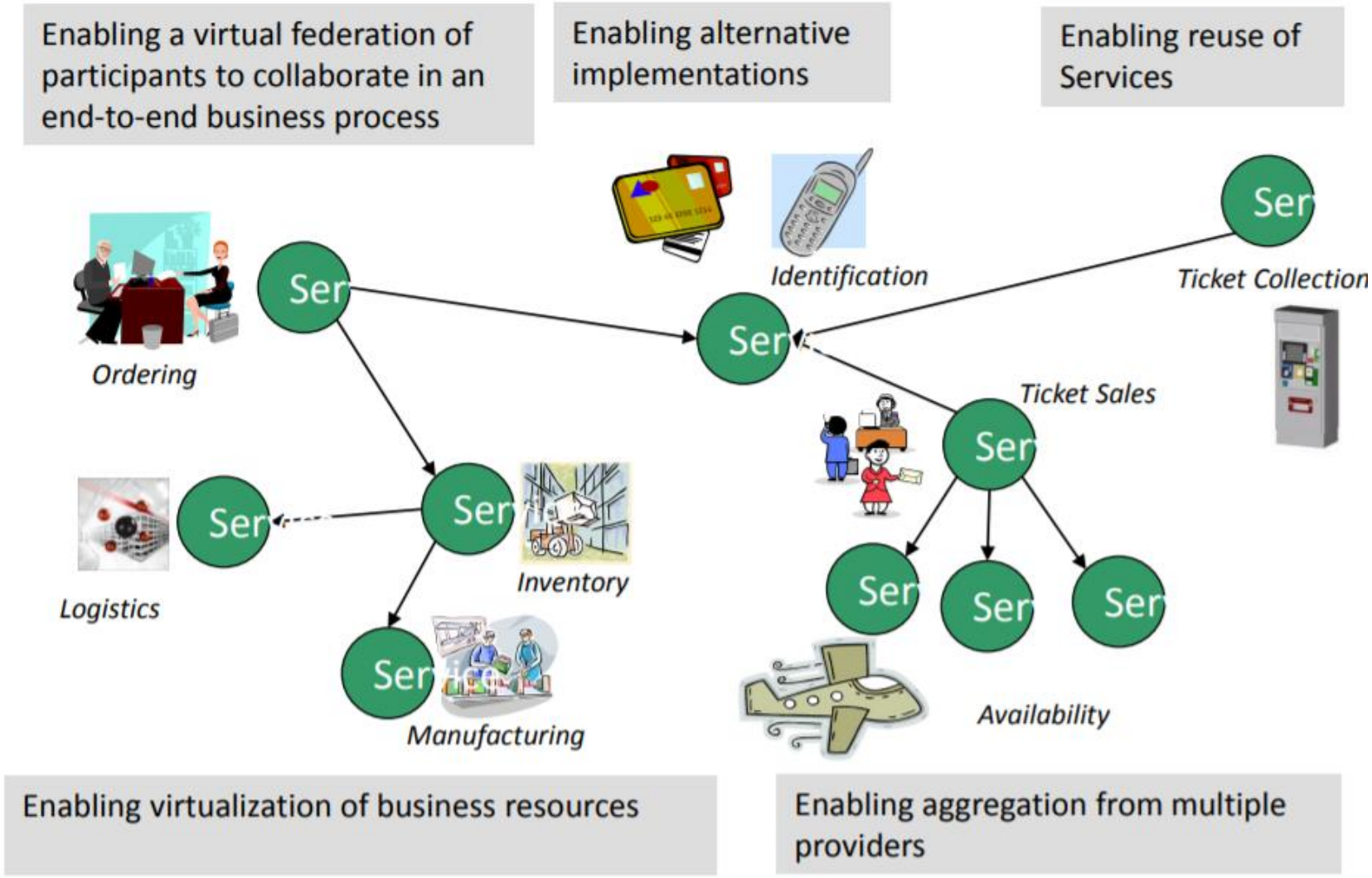


Enterprise

- Enterprises (bank, aviation, restaurant)are made up of a set of Business Processes
  - manufacture products
  - buy and/or sell
  - receive money
  - issue invoices
  - pay staff
  - …
- Most of these processes can be broken down into more fundamental discrete building blocks known as services.

Motivation - ENABLE FLEXIBLE, FEDERATED BUSINESS PROCESSES

- Enable flexible, federated business processes



- We will continue to study this Module on Wednesday