MONASH University

Information Technology

FIT5183: Mobile and Distributed Computing Systems (MDCS)

Lecture 12 – Course Summary and Exam Practice

Outline

- Discuss likely exam formats and rules
- Review each or (3) main parts of course
- Practice answering questions in class (leave some which can be answered in your own study)
  - Multiple choice style questions – Part A
  - Short answer style questions – Part B
- General format of Part C exam question

Proposed Exam Structure

Assessment Weighting: 50% **Total Marks available: 100**

Reading Time: 10 Minutes **Exam Duration: 2 Hours**

No calculator needed. (You may like to bring an unmarked English dictionary)

- **Part A**: Approximately 10 Multiple Choice Questions (1 mark each)
- **Part B**: Approximately 4 Short Answer Questions (5 marks each)
- **Part C**: 1 Long Answer Question (with 3 sub-parts worth 20 marks)

Sample Exam questions – Part A

Question 1. Which of the following REST's architectural constraints reduces the number of client-server interactions?

A. Cacheable.
B. Code on Demand.
B. Stateless.
C. Uniform interface.

Question 2. Which of the following statements is not TRUE?

A. A bundle can be used to start an activity.
B. A bundle is a mapping from String keys to various Parcelable values.
B. The putExtra() method allows adding a bundle to the intent.
C. A bundle enables carrying data between activities.

Sample Exam questions – Part B

Question 1. Compare fingerprinting and trilateration in location-aware computing.

Question 2. Briefly explain the purpose of AsyncTask in Android and how it is related to the UI Thread

Question 3. How does fog computing relate to cloud computing? Explain.

Question 4. Describe how Client and Server Side Stubs are generated using WSDL files

(…)

- ❑ We will look at several more examples of Part A and Part B questions related to each of the three main parts of the course.

Sample Exam questions – Part C

You could expect a design problem drawing upon experience gained throughout the tutorials and assignments. This would start with a detailed specification of a problem scenario to be solved through the use of a Mobile and Distributed Computing System. The question would be comprised of different components, *for example*:

- A question to outline an overall system to meet the requirements based on a client-server (or related) architecture, including how the processes would be divided between tiers or layers.
- A question to describe RESTful web service methods including input and output parameters to be used at the server side
- Description of suitable views, activities and UI widgets in an Android-based front-end (client)

Other types of medium to long answer question could relate to other major concepts covered in the course such as: (i) the evolution of middleware, web services and related MDCS architectures; (ii) comparison of suitability of different mobile and wireless technologies, (iii) the future of pervasive and ubiquitous computing.

Weeks 1-4: MDCS overview & Web Services

Main Topics (**note:** not a complete list!)

- ✓ Distributed Computing types, principles, physical system architectures, architectural styles and design challenges
- ✓ Layers of distributed computing systems and the evolution of tiered Client-Server models
- ✓ Inter-Process Communications, synchronous and asynchronous messaging. Conventional and Web-Service middleware
- ✓ Service Oriented Architecture and cloud computing
- ✓ SOAP Web Services, standards and technologies
- ✓ RESTful Web Service principles, architectural and interface constraints
- ✓ Extended REST methods involving named queries and JPQL

Weeks 1-4: MDCS overview & Web Services

❑ Sample Multiple Choice Questions (Part A):

Q1. If you want to use cloud services in your growing business to control the underlying cloud infrastructure including network, servers, operating systems, or storage, you will choose: A. SaaS (Software as a Service) B. PaaS (Platform as a Service) C. IaaS (Infrastructure as a Service) D. DaaS (Data as a Service)

Q2. SOAP provides a basic mechanism for: A. Encapsulating messages into an XML document, B. Mapping the XML document with the SOAP message into an HTTP request, C. Transforming RPC calls into SOAP messages, D. Using XML Schema language to represent data and data structures, E. None of the Above, F. All of the above (A-D)

Q3. Which of the following is NOT an open standard used in web services? A. SOAP, B. WSDL, C.UDDI, D.HTTP, E.JSON

Weeks 1-4: MDCS overview & Web Services (cont'd)

❑ Sample Short Answer Questions (Part B):

Q1. What is a distributed system? Discuss the key characteristics of a distributed system that makes it different from a centralised system.

Q2. What do you see as the most significant challenge that needs to be addressed in the current web services landscape? What are your ideas for addressing this challenge?

Weeks 5-8: Mobile & wireless Technology. Android

Main Topics (**note:** not a complete list!)

- ✓ Main features, motivations and unique challenges of *Mobile* Distributed Systems
- ✓ Fundamentals of cellular mobile telephony, including basic technology evolution of 2G, 3G, 4G/LTE (high level only!)
- ✓ General principles of WiFi as one of the enabling wireless technology for MDCS. (Don't need to know details of each of the 802.11X protocols for this subject)
- ✓ Wireless Personal Area Networks (WPAN) and 802.15 standards and technologies; particularly Bluetooth and Zigbee
- ✓ Functions, types and distributed systems applications of RFID and NFC technology
- ✓ Comparison of main features, strengths, weaknesses and applications for different wireless technologies.
- ✓ The Android Operating System and basic aspects of Application development
- ✓ More advanced Android concepts *such as* activities, services, intents, bundles, fragments and thread management

Part C

- It ***will*** be a design question
  - Only one Part C Question, divided into three parts, together worth about 40% of the exam
  - Refer to previous page for a general description of each part
  - This will draw upon what you have learned this semester about Mobile and distributed computing architectures, web services and Android application programming during the tutorials and assignments

- GOOD LUCK!! ☺