Distributed Programming II

Course Introduction
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Course Introduction

• Objectives and Program
• Organization
• Textbooks and Teaching Material
• Exam Rules
Main Objectives

• Enlarge the knowledge already acquired in DP1 and OOP:
  – enlarge the knowledge of the main techniques for developing distributed software applications (B2B)
  – get skills about designing and programming
    • JSON/XML data formats
    • RESTful Web Services / REST APIs
  – improve Java programming skills

• Main aspects targeted by the course:
  – robustness, security, portability, interoperability, performance, concurrency
How is the landscape studied in DP1 enlarged in DP2?

- Web services used in Web applications for B2B interactions
- Micro services in the Internet of Things
- Programmatic access to Cloud Computing infrastructures based on web services
- ...

Distributed Programming II

Introduction
Web Applications
Web services used in **Web applications** for B2B interactions
Internet of Things
Micro services in the Internet of Things
Programmatic access to Cloud Computing infrastructures based on web services

XaaS (X as a Service)
X stands for Software, Infrastructure, ...
Programmatic access to Cloud Computing infrastructures based on web services

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X stands for Software, Infrastructure, ...
Course Pre-requisites

• Operating Systems
• Computer Networks
  – in particular, TCP/IP, and HTTP
• Distributed Programming I
  – in particular, web programming
• Object Oriented Programming in Java
Course Topics

• XML, JSON: design principles and Java programming tools
  – JAXB
• Service-oriented distributed architectures
• Web Services (with special focus on REST APIs): design principles and Java programming tools
  – JAX-RS
• Further Java programming concepts and tools
  – Build automation (ant), annotations, ...
Exercises and Laboratories

• Exercises in classroom:
  – Examples and exercises on the explained techniques
  – Use case developed throughout the lectures

• Laboratories:
  – Total of 7 labs at LABINF (3 hours each)
    • Exercises similar to the ones in the final test (variations on
      the baseline developed in classroom)
  – Submission of assignments
    • NOT mandatory for passing the exam, but useful for being exempted from final Lab test
Timetable

• Lectures
  Thursdays 13.00-16.00 room 7

• Laboratories (LABINF):
  SLOT 1  Mondays  13.00-16.00
  SLOT 2  Mondays  16.00-19.00
  SLOT 3  Fridays  14.30-17.30

You will be soon invited to fill a form useful for defining groups

LABORATORIES WILL START AFTER OCTOBER 14!

The exact Labs schedule will be published asap
Textbooks and Teaching Material

• Material available in electronic form:
  – Copy of the slides used for lectures
  – Teaching material / tutorials / readings
  – Reference documents/ standards

Course Web Portal:

https://pad.polito.it  https://pad.polito.it:8080

• Video-recording of lectures of past year available on https://didattica.polito.it
Textbooks and Teaching Material

• Textbooks about RESTful web services:

  Java Programming of RESTful web services:
  – Bill Burke, RESTful Java with JAX-RS 2.0, 2nd Edition, O'Really Media, November 2013

  REST principles and RESTful web services design:
  – L. Richardson, S. Ruby, "RESTful Web Services", O'Reilly 2007, now freely available at
    http://restfulwebapis.org/RESTful_Web_Services.pdf
Exam Rules

• Exam goal: verify the expected knowledge and skills have been acquired

• The exam consists of:
  – A final test at LABINF
  – An optional final discussion
Final Test

• The final test is a practical test at LABINF:
  – A **programming assignment** (similar to those assigned in the course Labs)
  – One or more open-answer **questions**
  – Open-book test, but you may consult only your own previously uploaded material (no internet)
  – Total time: 2-2.5 hours
  – Samples will be made available
Evaluation and Final Discussion

• The final test is evaluated and a final mark is proposed
  – Programming exercise: 60% of mark
  – Questions: 40% of mark
• Normally, this mark is registered directly if the student doesn’t show at the final discussion
• The final discussion may include extra questions, which can influence the final mark
• Laude requires final discussion with questions
Exemptions

• Students who submit particularly good and original solutions of the assignments by the deadlines are exempted from the Final Test
  – A list of these students and their preliminary marks will be published before the first exam call
  – These students have the possibility to substitute the final test with a short oral exam

• Same for students who complete a special project or related thesis
  – A (limited) number of these projects/theses will be soon available
Submitting Solutions of Assignments

• Only some of the proposed assignments may be submitted
  – Submission is done via the course web portal
  – Each assignment that may be submitted has its own deadline

IMPORTANT: the submitted solutions should be developed individually and shouldn't be shared with other students

=> Be very careful in keeping your solutions private!
Cross-Checking of Submissions

• Submissions of all students are cross-checked to evaluate their originality
• Students with similar solutions cannot be exempted from the final test
Asking for Questions

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We receive by appointment