CS 696 Advanced Distributed Systems

Syllabus – Spring 2015

MW 16:00 - 17:15, GMCS 327

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Class Web Page
Homeworks and announcements are posted on the class web page:
http://www-rohan.sdsu.edu/~taoxie/cs696
Handout, assignments, and important course information will be posted periodically on the class web page, which you have to regularly check.

Prerequisite: CS 570 - Operating Systems

Course Information
A distributed system is one in which components located at networked computers communicate and coordinate their actions only by passing messages. A major motivation for developing distributed systems is to share resources, which may be managed by servers and accessed by clients. The design and implementations of distributed systems are challenging, because (1) components in a distributed system are in most cases heterogeneous, (2) components may be dynamically added or replaced, and (3) the systems must work well when the number of users increases.

In this course, we will address the issues of design of distributed systems. In particular, we will investigate successful approaches in the form of abstract models, algorithms, and cases studies of real-world systems. We presume that students who will take this class have a basic knowledge of operating systems, computer architecture, and object oriented programming. The course will be research intensive, aiming at deriving practical and achievable ground rules for distributed systems design. Each group (with 2 or 3 students) is expected to do a project including a written report and an in-class presentation on a topic to be arranged with the instructor. You will be expected to collaborate with other students toward the completion of the research project related to distributed systems.
Objectives

Students who have completed this course should be capable of doing the following:

- understand the characterization of distributed systems
- understand the well-established topics of data replication, distributed file systems, and the like
- familiarize yourselves with new topics, including web services, the Grid, peer-to-peer and ubiquitous systems
- design a scalable and heterogeneous distributed systems
- Improve technical writing and oral presentation skills.

Textbook


Topics Covered  (These topics may change)

- Characterization of distributed systems
- Distributed system models
- Distributed algorithms
- Distributed objects and RMI
- Web services
- Transactions and concurrency control
- Distributed transactions
- Replication
- Distributed file systems
- Distributed shared memory
- Peer-to-Peer systems
- Mobile and ubiquitous computing

Exams and Grading

Assignments  30%
Lab Assignment  10%
Midterm Exam  20%
Project Proposal  10%
Technical Report  30%

Scale

Letter grades will be awarded based on the following scale. This scale may be adjusted upwards if it is necessary based on the final grades.

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<th>Grade</th>
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<tr>
<td>A</td>
<td>≥ 90</td>
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<tr>
<td>A-</td>
<td>86−90</td>
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<tr>
<td>B+</td>
<td>82−85</td>
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<td>B</td>
<td>78−81</td>
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<td>B-</td>
<td>74−77</td>
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<td>C+</td>
<td>70−73</td>
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<td>C</td>
<td>66−69</td>
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<td>C-</td>
<td>62−65</td>
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<td>D+</td>
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Reading
Students are expected to read the appropriate sections of the book before each lecture.

Cheating
Unless otherwise specified in writing, all assignments are individual tasks. If any assignment permits teamwork, it will be explicitly stated so in the assignments, and the work must be only the work of the people on the team. Students are encouraged to work together on homework assignments. However, you have to explicitly acknowledge any help received from other students during the course of the preparation of your homework solutions.

If you make use of ideas obtained from previous work of another person, you must give credit by commenting in your report, explaining where you obtained ideas, what you have used, and who developed the ideas. If you use any code provided by another person, you must obtain permission from the copyright owner, then comment in your code, including a statement explaining where you found the code and who is the author. Failure to follow these rules will be considered a violation of the Academic Honor Code.

For Students with Disabilities
If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that accommodations based upon disability cannot be provided until you have presented your instructor with an accommodation letter from Student Disability Services. Your cooperation is appreciated.