DISTRIBUTED SYSTEMS (CS 6523), FALL 2012

Course Instructor: A. T. Chronopoulos

Office: SB 3.02.16, **Office Hours:** T, Th 10:00-11:00, 6:30-7:00pm,or by appointment

Course Meetings : T, Th. 7-8:15pm, AET 0.214

Textbook

(I) Distributed Systems: Concepts and Design (4th Edition) , J. Dollimore, T. Kindberg, G. Coulouris, Addison Wesley, 2005

(II) Distributed and Cloud Computing : from Parallel Processing to the Internet of Things, Hwang, Fox and Dongarra, Morgan Kaufmann, 2011

Prerequisites

Students are expected to have taken a course in Operating systems, programming experience in at least one of the following programming languages (C, C++ or Java or other System Oriented Language).

Grading Policy: The course work consists of:

Homework Problems (30%) : 6 HWs

Mid-Term Exam (40%) : Covering up to 20 lectures

Term Project and Presentation (30%) : This Project substitutes the final exam, including a written report and a PPT presentation at the end of the course.

Academic Dishonesty: Plagiarism and cheating are serious offenses and may be punished by failure on exam, failure in course; and/or expulsion from the University. For more information, refer to the "Academic Dishonesty" policy in the UTSA graduate Catalog.

Course Description:

This course covers the system architecture and enabling technologies of distributed computing systems and their software environments and innovative applications. Examples include clusters of computers, P2P networks, computational Grids, virtual machines, virtual clusters, Internet Clouds. The course will introduce students to cloud computing paradigms and software support. Cloud Computing is a large-scale distributed computing system consisting of virtualized, dynamically-scalable, computing power and storage resources. Its services are delivered on demand over the Internet. Governments, research institutes, and industries are adopting Cloud Computing to solve their increasing computing and storage problems. Topics include resource management, programming models, application models, system characterizations, and implementations. We will study currently deployed Cloud Computing systems, such as Joyent SmartDataCenter, Amazon EC2 and S3, Microsoft Azure, Google AppEngine, Google's MapReduce, Yahoo's Hadoop, Microsoft's Dryad, Sphere/Sector.

Course Outline : (In total, 28 lectures plus test and final project)

1. **Introduction to Distributed Systems** (1 lecture)
2. **Time and Global States** (2 lectures)
3. **Coordination and Agreement** (2 lectures)
4. **Distributed System Models and Enabling Technologies** (3 lectures)
5. **Computer Clusters for Scalable Computing** (3 lectures)
6. **Virtual Machines and Virtualization of Clusters and Datacenters** (4 lectures)
7. **Cloud Computing Platforms** (3 lectures)
8. **Cloud Programming and Software Environments** (6 Lectures)
9. **Peer-to-Peer and Grid Computing Systems:** (4 lectures)