Introduction to Cloud Computing

Spring 2017

Course Code: CS 499
Credit Hours: 3
Course Instructor: Muhammad Saqib Ilyas
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Office Hours: Monday, Wednesday 3:30 – 4:30 pm

Course Objectives

- To familiarize the students with the need for cloud computing
- To familiarize the students with cloud computing service and deployment models
- To familiarize the students with virtualization and the Internet as enabling technologies for cloud computing
- To familiarize the students with data center architecture
- To familiarize the students with the use of popular public clouds

Pre-requisites

- CS 205 Operating Systems
- CS 307 Computer Networks

Textbook

- [CCP] Cloud Computing: Principles and Paradigms by Buyya R.

Reference Books

- [PEC2] Programming Amazon EC2 by Jurg van Vilet
- [DCC] Distributed and Cloud Computing by Kai Huwang, Geoffrey C. Fox and Jack J. Dongarra
- [MOS] Modern Operating Systems by Andrew S. Tanenbaum 4th edition
- [CCT] Cloud computing Concepts, Technology and Architecture by Thomas Erl

Teaching Assistant

TBA

Grading Scheme

Midterm(2)	30%
Quizzes	15%
Project	15%
Final	40%

Tentative course outline and lecture plan

Week	Topic	Readings
1	Understanding cloud computing, its need, service models and deployment models	Ambrust et al. “Above the clouds: A Berkeley view of cloud computing”
2	Virtualization	MOS Chapter 7
3	Virtualization (contd) Data center architecture	MOS Chapter 7 Bugnion et al. “Bringing virtualization to the x86 architecture with the original VMWare Workstation”
4	Data center architecture (contd) Data center networks	DCC Chapter 4 Krishna Kant, “Data center evolution” Raj Jain, “Data center network topologies” lecture slides
5	Energy efficiency in data centers Cloud security	Krishna Kant, “Data center evolution” CCT chapter 10
6	Midterm 1	
7-9	Content delivery networks	Patahan et al. “A taxonomy and survey of content delivery networks”
10	Cloud management mechanisms	CCT chapter 9
11	Google File System	Br

12	Midterm 2 Google Search Cluster	Brinn and Page "The anatomy of a large-scale hypertextual web search engine"
13	Google Search contd Dropbox architecture	Barroso et al. "Web search for a planet: The Google cluster architecture" Architecture talks by Dropbox engineers
14	Youtube architecture Netflix architecture	Miscecllaneous architecture talks by Youtube and Netflix engineers
15	Openstack	Openstack.org
	Final	

Miscellaneous

- Academic integrity is expected of all the students. Plagiarism or cheating in any assessment (assignment, quiz, etc.) will result in forwarding the case to Departmental Disciplinary Committee.
- Quizzes may be unannounced. There is no makeup for a missed quiz or assignment.
- Knowledge of C/C++, Java and computer networks is assumed for this course. Code written for assignments must be intelligently documented. Undocumented code may not be given any credit.