Security and Privacy Issues in Distributed Systems and Cloud Computing

Bharat Bhargava, CS department, Purdue University, West Lafayette, Indiana, USA

www.cs.purdue.edu/homes/bb

**Objectives**

Main objective of this seminar course is to learn about Privacy, Security, Integrity, Recovery, and Consistency issues and methods to enforce them. The ideas from research in distributed systems in the last thirty years will be briefly reviewed to set up the background. Both internet and mobile environments and how to deal with denial of service and routing attacks (including collaborative attacks) will be presented. Privacy issues in Peer to Peer (P2P) systems will be discussed and various approaches to deal with them will be presented. The relationship among distributed systems and cloud and the need for ACID properties will be investigated. Security and privacy issues in cloud computing including identity management will be presented. Privacy in cloud computing is the ability of user to control what information they reveal about themselves over the cloud or to a cloud service provider, and the ability to control who can access that information. Identity management (IDM) is the central component in cloud privacy and security. One objective of this seminar class is to show how cloud computing can help blind and hearing impaired persons.

The course will study various aspects of cloud computing system including issues of virtualization, multi-tenancy, privacy, security. The answers to these problems are not fully understood and are research topics for Ph. D thesis. The students will be encouraged to read research papers and write a three page report at the end of seminar. This report will include a problem statement, what needs to be done, what has been done, and what a student can do.

**Topics:**

Introduction to Security , Introduction to Privacy in Computing , Introduction to Trust in Computing Privacy Enhancing Technologies , Security Paradigms and Pervasive Trust , Trust Negotiations and Trading Privacy for Trust , Using Trust for Role-Based Access Control , Trust in P2P Systems , Role-Based Access Control (RBAC) , P2D2: A Mechanism for Privacy Preserving Data Dissemination , Private and Trusted Interactions , Detecting Service Violations in Internet & Mobile Ad Hoc Networks , Vulnerabilities and Threats in Distributed Systems, Secure Communication in Cellular and Ad hoc networks, National Institute of Standards and Technology (NIST) cloud computing, Cloud computing at Yahoo, Privacy and identity management in cloud, Secure data warehouse, Multi-tenancy issues.