

مباحث پیشرفته در نرم افزارهای شبکه  
Advanced Topics in Network Softwares

**Prerequisite:** Knowledge of Distributed Systems and Advanced Computer Networks Subjects

**Objectives:**

1- To Study:

- TCP Algorithms (An Overview), Tahoe, Reno, SACK, Westwood, etc
- TCP/IP performance over Mobile Networks
- TCP Performance in Ad Hoc Networks

2- Scheduling Algorithms in Wireless Multimedia Networks

- Scheduling Algorithms
- Scheduling disciplines, Scheduler Classification: WFQ, WF<sup>2</sup>Q, SCFQ, WRR, DRR, SFQ
- Fair Queuing, Fair Scheduling for Wireless Networks

3- To Study Clustering Algorithms in Wireless Networks and the relevant Simulators

4- Grid Computing Systems: Structure, Features, Applications, Resource Management, Security

5- To Study Architecture, Processes, Communication and Security of the below Distributed Systems:

- Distributed Object-Based Systems
- Distributed Web-Based Systems

## Details of subject #5:

### 1- SECURITY

- 1 INTRODUCTION TO SECURITY
  - 1.1 Security Threats, Policies, and Mechanisms
  - 1.2 Design Issues
  - 1.3 Cryptography
- 2 SECURE CHANNELS
  - 2.1 Authentication
  - 2.2 Message Integrity and Confidentiality
  - 2.3 Secure Group Communication
  - 2.4 Example: Kerberos
- 3 ACCESS CONTROL
  - 3.1 General Issues in Access Control
  - 3.2 Firewalls
  - 3.3 Secure Mobile Code
  - 3.4 Denial of Service
- 4 SECURITY MANAGEMENT
  - 4.1 Key Management
  - 4.2 Secure Group Management
  - 4.3 Authorization Management

### 2- DISTRIBUTED OBJECT-BASED SYSTEMS

- 1 ARCHITECTURE
  - 1.1 Distributed Objects
  - 1.2 Example: Enterprise Java Beans
  - 1.3 Example: Globe Distributed Shared Objects
- 2 PROCESSES
  - 2.1 Object Servers
  - 2.2 Example: The Ice Runtime System
- 3 COMMUNICATION
  - 3.1 Binding a Client to an Object
  - 3.2 Static versus Dynamic Remote Method Invocations
  - 3.3 Parameter Passing
  - 3.4 Example: Java RMI
  - 3.5 Object-Based Messaging
- 4 SECURITY
  - 4.1 Example: Globe
  - 4.2 Security for Remote Objects

### 3- DISTRIBUTED WEB-BASED SYSTEMS

- 1 ARCHITECTURE
  - 1.1 Traditional Web-Based Systems
  - 1.2 Web Services
- 2 PROCESSES
  - 2.1 Clients
  - 2.2 The Apache Web Server
  - 2.3 Web Server Clusters
- 3 COMMUNICATION
  - 3.1 Hypertext Transfer Protocol
  - 3.2 Simple Object Access Protocol