

10B17CI671: Computer Networks Lab

Course Credit: 1

Semester: VI

Objective:

To implement important computer networking protocols in a high – level programming language. Also, to become acquainted with socket programming and some of the important GUI based computer networking tools (NS 2 tool).

Learning Outcomes:

1. Implementing networking protocols of various OSI layers in C / C++ / Java.
2. Implementing routing protocols in C / C++ / Java.
3. Study of various networking and inter – networking devices.
4. Study of some important computer networking tools in UNIX / Windows environment.
5. Studying client – server programming using TCP and UDP sockets
6. Study of important command line utilities involved in computer networks

List of Experiments

S NO	Topics
1.	Representation of a computer network using matrix representation of a graph
2.	Finding shortest path between any two nodes in a computer network using Dijkstra's shortest path algorithm
3.	Finding shortest path between any two nodes in a computer network using Prim's shortest path algorithm
4.	Study of network troubleshooting using Ping and Traceroute commands
5.	Study of various networking and inter – networking devices
6.	Implementation of CRC generator and checker algorithm in C / C++ / Java
7.	Implementation of Hamming code algorithm in C / C++ / Java
8.	Study of client – server programming using sockets in a UNIX / Linux and Windows environment
9.	Implementing client – server program using TCP / UDP sockets
10.	Study of low level socket programming using raw sockets
11.	Implementation of Stop – and – Wait protocol in C / C++ / Java in a client – server environment using sockets
12.	Implementation of Sliding Window protocol in C / C++ / Java in a client – server environment using sockets
	Allocation of Mini project
13.	Study of router, routing, routing table and various routing algorithms in computer networks
14.	Implementation of routing algorithm # 1 in C / C++ / Java

15.	Implementation of routing algorithm # 2 in C / C++ / Java
16.	Implementation of encryption algorithm converting plain text to cipher text using C / C++ / Java
17.	Study of Network Simulator – 2 tool
18.	Lab # 1 using NS – 2
19.	Lab # 2 using NS – 2
	Mini Project Demonstration

References

1. James F. Kurose, Keith W. Ross, “Computer Networking: A Top-Down Approach Featuring the Internet” 3rd Edition Pearson Education.
2. Andrew S. Tanenbaum, “Computer Networks” 4th Edition PHI
3. UNIX Network Programming, Volume 1, Second Edition: Networking APIs: Sockets and XTI, Prentice Hall, 1998, ISBN 0-13-490012-X.
4. Arnold Robbins, “UNIX in a Nutshell”, O’Reilly 4th Edition
5. David I. Schwartz, “Introduction to UNIX”, Prentice Hall, Second Edition
6. BEHROUZ a. Forouzan and Richard F. Gilberg, “UNIX and Shell Programming: A Textbook”
7. NS Simulator for Beginner’s, Lecture notes Univ. de Los Andes, France.
8. Angela Orebaugh, Gilbert Ramirez, Josh Burke, Larry Pesce, Joshua Wright, Greg Morris, “Wireshark & Ethereal Network Protocol Analyzer Toolkit”, Syngress Publishing, Inc.

Evaluation Scheme:

1. Mid Term Exam (Viva and Written Exam)	20
2. End term Exam (Viva and Written Exam)	30
3. Lab Records	5
4. Regular Assessment (Quality and quantity of experiment performed, Learning laboratory skills, Attendance etc.)	30
5. Project	15

Total

100