

Lab 4: Setup a LAN that can communicate among the virtual devices inside the packet tracer

Lab 5: Extend the LAN that is set up in Lab 4 for so that it works in the real world. Setup a physical LAN network using UTP cables, RJ45, Crimpers, switch/hub and machines connected using this setup should communicate with each other.

Lab 6: Explore possibility of setting up fiber optic connection physically. Identify various components required for setting up a fiber optic connection.

Unit 3: Data link layer

Lab 7: Using packet tracer/wireshark identify the data link layer frame structure

Lab 8: Perform some lab work that demonstrates MAC, ARP etc.

Unit 4: Network Layer

Lab 9: Create a network and multiple subnetworks in the packet tracer and make them able to communicate with each other.

Lab 10: Lab that demonstrate routing in the packet tracer

Lab 11: Configure routing with various protocols like RIP, BGP, EGP etc

Unit 5: Transport Layer

Lab 12: Write a C/C++/Java program to demonstrate socket programming

Lab 13: Write a program to demonstrate client/server communication protocol

Unit 6: Application

Lab 14: Configure an SMTP/IMAP/POP to send/receive email, DHCP server to allocate IP addresses, HTTP server to serve html documents, ftp to access files, ssh to access remote server.

References:

Software: CISCO Packet tracer, Boson NetSim

OS: Linux/Windows having specialised software installed for the specific purpose.

Application Softwares: DHCP Server, FTP Server: filezilla server, openftp, opensmtpd, HTTP-Apache, nginx, SSH-OpenSSH, termius, sshd, putty

Operating System Lab (UCSE572)

L-T-P: 0-0-3

Credits: 3

List of Programs:

1. Simple Unix-C (at least two) programs using system calls to read and write strings on standard I/O devices and files.
2. Implementation of starting a new process, replacing a process image, duplicating a process image, waiting for a process, zombie process.
3. Implementation of the Dining **Philosopher** problem using shared memory and semaphore.

4. Implementation of a bounded-buffer problem using shared memory and semaphore.
5. Implementation of **FCFS** process scheduling techniques.
6. Implementation **Shortest Job First** (both preemptive and non-preemptive version) process scheduling techniques.
7. Implementation **Round Robin** process scheduling techniques.
8. Implementation for simulating page replacement algorithms like **FIFO, Optimal and LRU**.
9. Implementation of threads using **POSIX** or using thread class in Java.
10. Implementation of (at least one) **deadlock** avoidance techniques.

Text Books:

1. Stevens, "UNIX programming", Pearson Education, Pearson Education, 2004.

Hardware Lab (UCSE573)

L-T-P: 0-1-3

Credits: 5

HDL: Verilog/VHDL

List of experiments:

1. Realization of basic digital circuits: Half adder, Full Adder, Ripple Carry Adder, Adder/Subtractor, Multiplexer/Demultiplexer.
2. Complex Arithmetic Units: Carry Lookahead Adder, Unsigned Multiplication, Signed Multiplication, Systolic Array Multiplication, Division
3. Realization of Logic Units: 16 bits greater than, 16 bits less than, 16 bit equals to
4. Development of a 16-bit ALU

Books:

The Verilog® Hardware Description Language 5th Edition by Donald E. Thomas , Philip R. Moorby