COMPUTER NETWORKS LAB
ITL355: SPRING 2023

Report: Semester Project Submission

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Network Simulator

We have developed the all the layer of network simulator i.e., Physical Layer, Data link layer, Network Layer, Transport Layer and Application Layer.

- **Language used:** Code has been written in C++ language.

- **IDE used:** We have implemented and compiled this code on **CodeBlocks** and **VS Code** as we have used many features that may or may not be supported by IDE. It is good to run this code on either **CodeBlocks** or **VS Code**.

- **Libraries Used:**
  iostream
  string
  bitset
  sstream
  algorithm
  vector
  random
  ctime
  fstream
  map

functional
unordered_map
iostream
limits

Objectives

1. Developed functionalities at the Physical Layer

- Generated End Devices and Hubs
- Established connections between them to form a network topology
- Enabled data transmission and reception
- Displayed the topology of the network visually

2. Developed functionalities at the Data Link Layer

- Built Layer 2 devices such as Switch
- Implemented address learning when using Switch
- Applied at least one Access Control Protocol, Token Passing
- Implemented three Flow Control Protocols for noisy channels: Stop & Wait and Selective Repeat
- Calculated the number of Broadcast and Collision domains present in the network

3. Developed functionalities at the Network Layer

- Created and configured a router
- Assigned well formatted classless IPV4 address to the devices
- Using ARP find the MAC address of a host within a network
- Performed static routing
- Implemented RIP protocols for dynamic routing

4. Developed functionalities at the Transport Layer and Application Layer

- TCP (Transport Layer)
- UDP (Transport Layer)
- HTTP (Application Layer)
- FTP (Application Layer)
- SSH (Application Layer)
- DNS (Application Layer)

References

- https://piazza.com/class_profile/get_resource/lemb8epwmnz3wd/leqzw7703si27a
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- https://www.geeksforgeeks.org/transport-layer-responsibilities/