COMPUTER NETWORKS PROJECT REPORT OF SUBMISSION 1

Submitted By-

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We have created the Physical Layer and Data Link Layer, the first two layers of the network simulator.

☐ **LANGUAGE USED**: *Python*

☐ **IDE USED**: *VS code and jupyter*

☐ **LIBRARIES USED:**

❏ *Networkx*

❏ *threading*

❏ *time*

❏ *random*

NetworkX – used for visualizing complex network or in easy language I have used to show the diagram of he network in test_case_5.py

Physical layer

We have created class of End Device, hubs (layer 1 device)

Data Link Layer

Built Layer 2 devices class of Switch

Implemented address learning when using Switch

We have implemented one access control protocol ***Token passing*** (Controlled Access protocol)

Token Passing: Token passing is a network communication protocol where a "token" is passed around a network of nodes, allowing each node to take turns transmitting data. Nodes can only transmit data when they possess the token, which ensures that only one node can transmit data at a time. Once a node has finished transmitting, it passes the token to the next node in the network, allowing the cycle to continue.

Also, we have implemented 2 flow control protocols for noisy channels ***Stop-and-wait ARQ*** and ***GO-BACK-N***

Stop-and-wait ARQ: Stop-and-wait is a basic flow control protocol used in communication systems, particularly in noisy channels, to ensure reliable data transmission. The sender transmits a data packet and waits for an acknowledgment (ACK) signal from the receiver before sending the next packet. If the sender does not receive an ACK within a specified time frame, it resends the packet. This helps to prevent data loss due to errors caused by noise in the channel. The stop-and-wait protocol is simple and easy to implement but can lead to low channel utilization in high-latency or high-error environments.

Go-Back-n: Go-Back-N is a protocol used in data communication to ensure reliable transmission of data between a sender and a receiver over an unreliable network. It works by sending multiple data packets at once and waiting for an acknowledgment from the receiver. If an acknowledgment is not received within a specified time, the sender retransmits the packets from the last acknowledged packet. This process continues until all packets are successfully received by the receiver

References:

Geeks for geeks

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Piazza

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