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Course Name: Computer Network

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Code Documentation

Introduction:

This code implements various networking concepts and protocols such as end devices, hubs, switches, bridges, routers, and different network topologies. It also includes functions for error detection (using CRC), RIP (Routing Information Protocol) for routing tables, stop-and-wait protocol, token passing protocol, and flow control protocol.

Classes:

1.**enddevice**: Represents an end device in a network. It contains attributes such as MAC address, data, IPv4 address, IPv6 address, and subnet.

2.hub: Represents a hub device.

3.**switchdevice**: Represents a switch device. It has attributes for data, connected devices, and gateway.

4.**bridge**: Represents a bridge device.

5.router: Represents a router device. It contains attributes for gate addresses, connected routers, routing tables, and network addresses.

Functions:

1.remove(): Removes duplicate entries from a vector.

2.changeNameTo(): Changes the name of a router to a new specified name.

3.intToStr(): Converts an integer to a string.

4.exor(): Performs XOR operation on two characters.

5.modulo2div(): Performs modulo-2 division (CRC) on data using a specified key.

6.checkdiv(): Checks if the received data is error-free using CRC.

7.err(): Introduces errors in the data by flipping random bits.

8.Ripv4(): Updates the routing table of a router using the Routing Information Protocol (RIP).

9.stopandwait(): Simulates the stop-and-wait protocol for reliable data transmission.

10.transmission(): Simulates the transmission of frames using the sliding window protocol.

11.tokenpassing(): Implements the token passing protocol among network stations.

12.main(): The main function that provides a menu for selecting different network configurations and protocols.

Usage

To use the code, you can compile and run it in a C++ compiler. The code provides a menu for selecting various network configurations and protocols. Choose the desired option and follow the instructions to interact with the program.

Resources:

1.ChatGPT

2.Google

3.Iqra Ma’am’s pdfs