National Institute Of Technology, Srinagar

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Network Simulator Project Report

Physical and Data Link Layer

GitHub Repository: `https://github.com/SF404/Network-Simulator.git`

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1 Description

Computer Network Simulator focusing on the Physical and Data Link Layers. It's implemented in JavaScript and requires Node.js to run.

2 Requirements

- Node.js

3 Getting Started

1. Clone this repository.

   ```
   git clone https://github.com/SF404/Network-Simulator.git
   ```

2. Navigate to directory

   ```
   cd Network-Simulator
   ```

3. Start the simulator by running `node main.js` command.

   ```
   node main.js
   ```

4 Configuration

To configure inputs, edit the `config.js` file in the project directory. The `config.js` file allows you to specify parameters such as network topology, error probability, and data packet received from Network layer.

5 Working

The main functionality of the simulator is implemented in the `main.js` file. It simulates the transmission of data packets through the network layers, focusing on the Data Link Layer.

The simulator uses a Hamming Code for error detection and correction. It generates frames with Hamming Codes from data packets received from the Network Layer. These frames are then transmitted through various network topologies, where errors might occur due to noise in the transmission medium. The simulator simulates these errors by randomly flipping bits in the received frames. After receiving the frames, the simulator checks for errors using the Hamming Code and corrects them if possible.

6 References

1. Hamming Code, Mod8_Error_control.pdf — Lecture Notes — ITT 305 - Data Communication, *IQRA ALTAF*, NIT Srinagar - Fall 2023.
2. JavaScript, https://www.w3schools.com/js/

7 Video Demo

Video Demo.