NS2 Simulation Project Report

Report Title: Determining the Packet Transmit Time in NS2 with Varying Node Destinations.

1. Introduction

1.1 Background

Network simulations play a crucial role in understanding the dynamics of communication systems. This project focuses on determining packet transmit time in dynamic scenarios using NS2.

1.2 Objectives

The primary objective of this simulation project is to investigate the packet transmit time with varying node destinations in both wired and wireless network scenarios.

2. Simulation Setup

2.1 Wired Simulation (wired.tcl)

In the wired simulation, we created a network with seven nodes interconnected by duplex links. Dynamic routing (DV) was employed, and a CBR traffic source was set up at node n(0) with a corresponding traffic sink at node n(1). The simulation events included the initiation and termination of CBR traffic and concluded after 2.0 seconds.

2.2 Wireless Simulation (wireless.tcl)

The wireless simulation involved a mobile ad-hoc network with 20 nodes. Two-ray ground radio-propagation model, 802.11 MAC, and PriQueue for interface queue were configured. Each node was assigned an energy model, and random node movement occurred every 100 seconds. Multiple TCP connections were established between sender nodes and a common receiver node.

3. Simulation Execution

The simulation was executed using the NS2 simulator. Specific commands were run to execute the wired and wireless simulations, ensuring the proper setup and initialization of parameters.

4. Results and Analysis

4.1 Wired Simulation Results

In the wired simulation, we observed and analyzed packet transmit times for different node destinations. Variations in transmit times were noted, and trends were analyzed to understand the impact of dynamic routing.

4.2 Wireless Simulation Results

The wireless simulation results encompassed an evaluation of energy consumption, TCP throughput, and delay. Node mobility was considered, and the impact on network performance was analyzed. Insights into the effects of random node movements on the wireless network were derived.

5. Conclusion

The simulation project provided valuable insights into packet transmit times in both wired and wireless network scenarios. The wired simulation demonstrated the impact of dynamic routing on packet transmission, while the wireless simulation highlighted the effects of node mobility on energy consumption and network performance.

6. Future Work

Future work could focus on refining the simulation model, exploring additional network protocols, or investigating the impact of varying mobility patterns on wireless network performance.

7. References

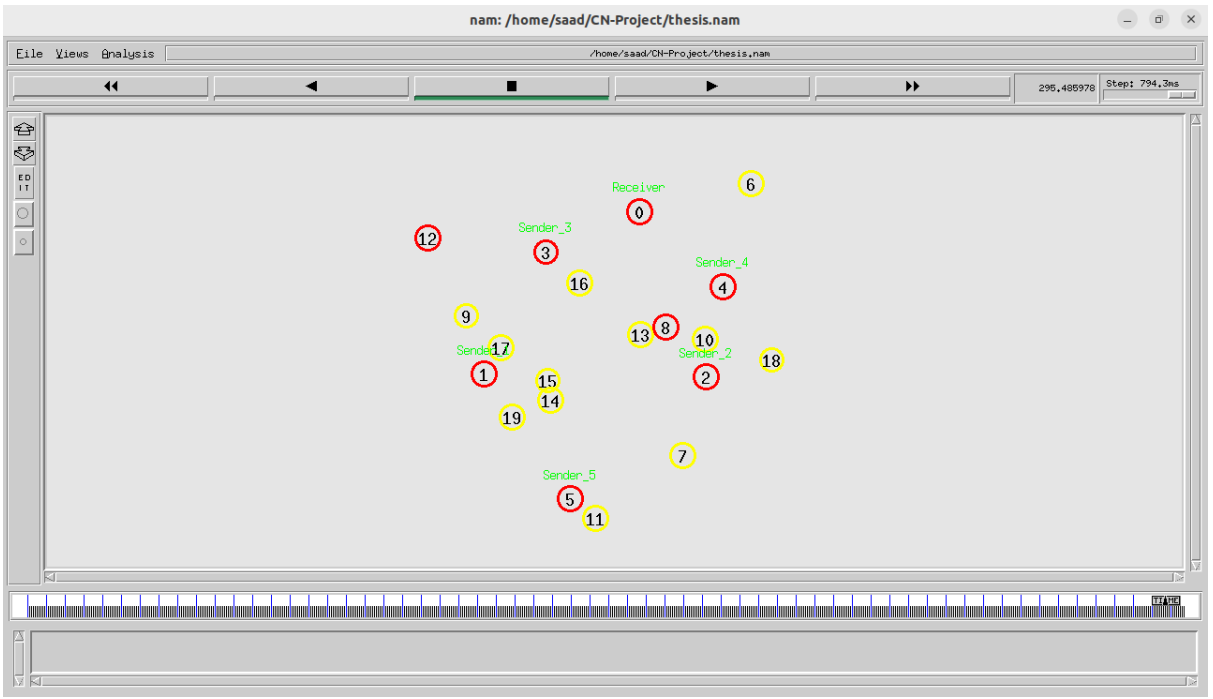
Github repository link:

https://github.com/saadhussain01306/CN-Project

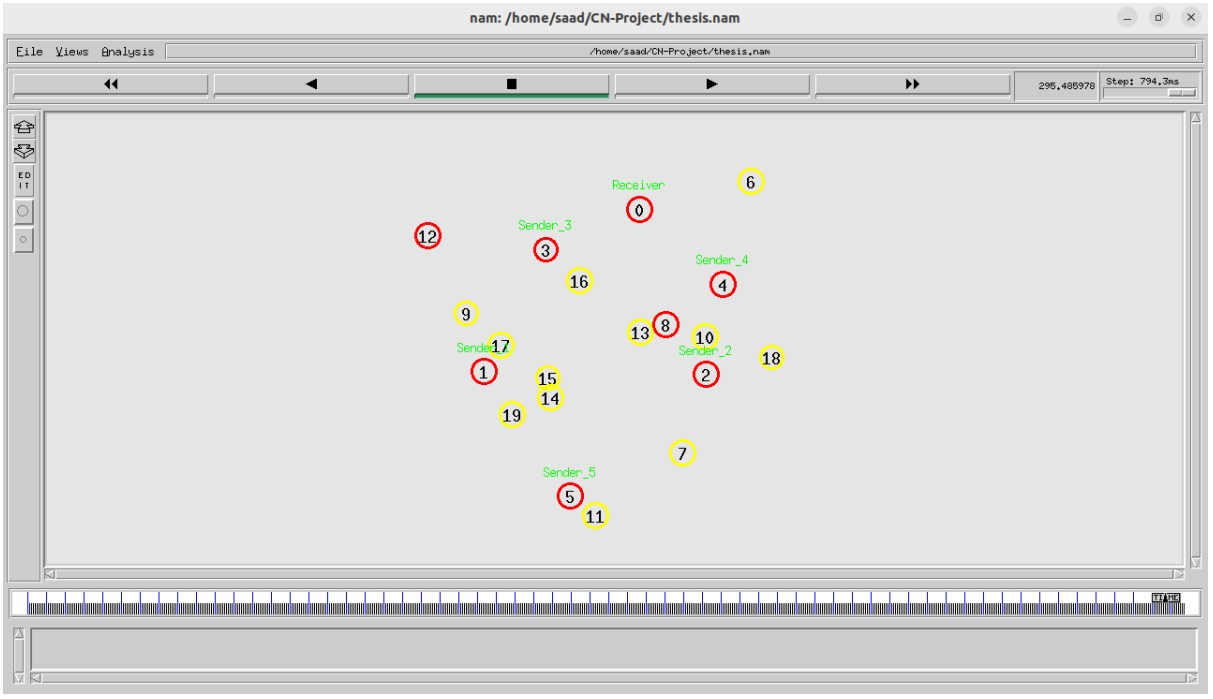
8. Appendices

Include NS2 script files, trace files, and any additional information relevant to the project.
Executing the wired tcl file we obtain the following output:-

Executing the wired tcl file we obtain this output:-



Executing the wireless tcl file we obtain this output:-



Executing wireless tcl file we obtain this output:-

num_nodes is set 20

INITIALIZE THE LIST xListHead

channel.cc:sendUp - Calc highestAntennaZ_ and distCST_

highestAntennaZ_ = 1.5, distCST_ = 550.0

SORTING LISTS ...DONE!

awk: cannot open delay.awk (No such file or directory)

awk: cannot open throughput.awk (No such file or directory)

Problems found with input data.

Problems found with input data.

Missing required flag -x in: W -t 300

Missing required flag -y in: W -t 300

Parsing error in event.