Assignment BI.

Problem Statement:

Study of any network simulation tools to create a network with three nodes and establish a TCP connection between node 0 and node 1 such that node 0 will send TCP packet to node 2 via node 1.

Requirements:

Fedora 20 with Pentium IV, and other 1 GB RAM, 120 GB HDD, Monitor, Keyboard, Mouse, IDE.

Theory:

Generally speaking network simulators try to model the real world networks.

The principal idea is that if a system can be modeled, then features of the model can be changed and the corresponding results can be analyzed.

As the process of model modification is relatively cheap then the complete real implementation, a wide variety of scenarios can be analyzed at low cost (relative to making changes to real world)

However network simulators are not perfect. They cannot perfectly model all the details of the network. However, if well modeled they will be close enough so as to give the researcher a meaningful insight into the network under test.

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What is a network simulator?
A network simulator is a software that predicts the behaviour of a computer network.

In simulators, the computer network is modeled with devices, links, applications, etc and the performnance is analyzed.

Simulators come with support for the most popular technologies and networks in use today as wireless LANs, Mobile Adhoc networks, wireless sensor networks, Vehicular Adhoc networks, kongitive radio networks, LTE/ LTE - Advanced networks Internet of things (IOT) etc.

Type of simulators:
Different types of network simulators can be catgorized and explained based on some criteria such as if they are commercial or free or if they are simple ones or complex ones.
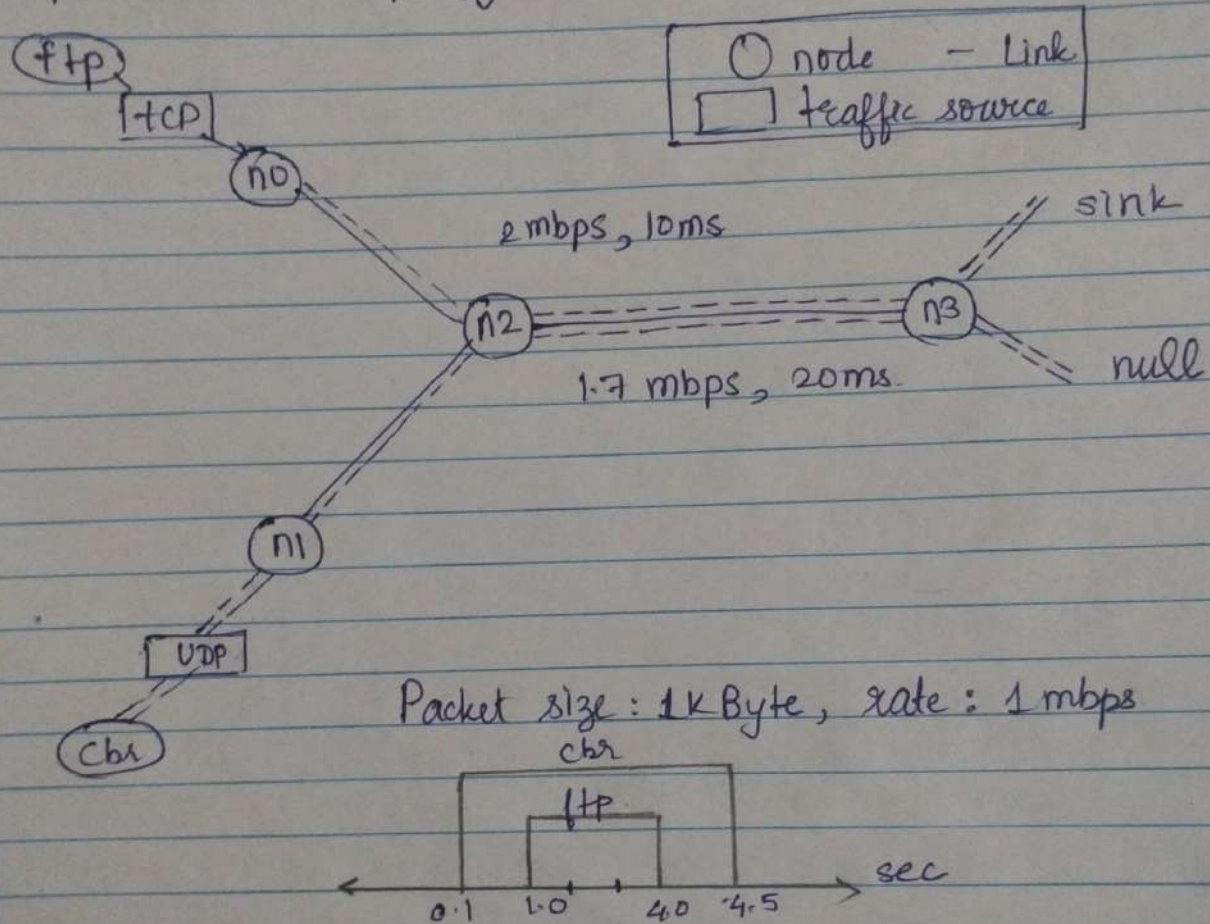
1) Commercial and open source simulation
2) Simple and complex simulators.

TCP connection establishment and termination.
. To aid in our understanding of the connect, accept and close functions and help us debug TCP applications using the netstat program, we understand how TCP connections

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are established and terminated, and TCP's state transition diagram.

Simple network topology and simulation scenario:

ftp

tCP

n0

┌─────────────────────────┐
│ ○ node — Link   │
│ ☐ traffic source   │
└─────────────────────────┘

2 mbps, 10ms

sink

n2 ═══════════════════ n3

null

1.7 mbps, 20ms.

n1

UDP

Packet size: 1K Byte, rate: 1 mbps

Cbr

cbr

ftp

sec

0.1   1.0   4.0   4.5

Conclusion:

Successfully studied and installed network simulation tool NS-2.35 and also simulated a TCP packet between 3 nodes.