



## **Veermata Jijabai Technological Institute, Mumbai 400019**

**Assignment No.:** 01

**Objective:** To install NS2 and explore commands on it.

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**Batch:** D

**Theory :**

Network simulation (NS) is one of the types of simulation, which is used to simulate the networks such as in MANETs, VANETs, etc. It provides simulation for routing and multicast protocols for both wired and wireless networks. NS is licensed for use under version 2 of the GNU (General Public License) and is popularly known as NS2. It is an object-oriented, discrete event-driven simulator written in C++ and Otcl/Tcl.

NS-2 can be used to implement network protocols such as TCP and UDP, traffic source behavior such as FTP, Telnet, Web, CBR, and VBR, router queues management mechanism such as Drop Tail, RED, and CBQ, routing algorithms, and many more. In ns2, C++ is used for detailed protocol implementation and Otcl is used for the setup. The compiled C++ objects are made available to the Otcl interpreter and in this way, the ready-made C++ objects can be controlled from the OTcl level.

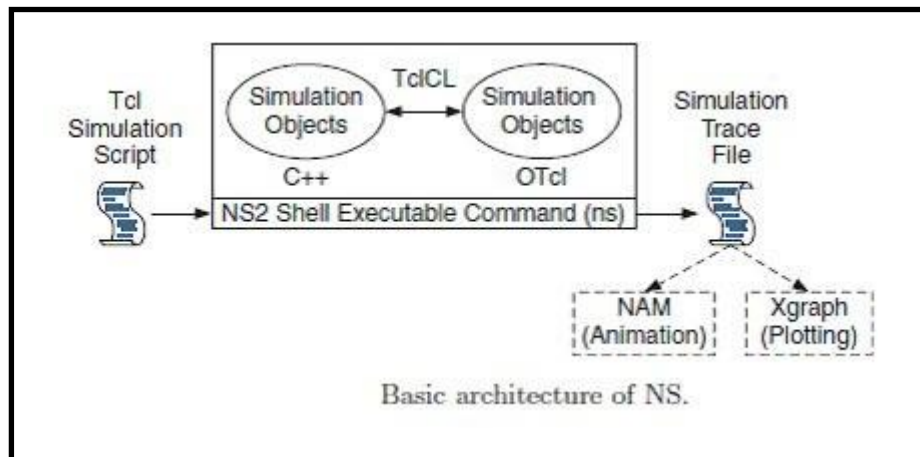
NS2 stands for Network Simulator Version 2. It is an open-source event-driven simulator designed specifically for research in computer communication networks.

**Features of NS2**

1. It is a discrete event simulator for networking research.
2. It provides substantial support to simulate bunch of protocols like TCP, FTP, UDP, https and DSR.
3. It simulates wired and wireless network.
4. It is primarily Unix based.
5. Uses TCL as its scripting language.
6. Otcl: Object oriented support
7. Tclcl: C++ and otcl linkage
8. Discrete event scheduler

## Architecture of NS2

NS2 consists of two key languages: C++ and Object-oriented Tool Command Language (OTcl). While the C++ defines the internal mechanism (i.e., a backend) of the simulation objects, the OTcl sets up simulation by assembling and configuring the objects as well as scheduling discrete events. The C++ and the OTcl are linked together using TclCL



## Installation

- Install NS-2 using this command : `sudo apt-get install ns2`
- Nam is also needed to install. Nam (Network Animator) is an animation tool to graphically represent the network and packet traces.
- Use this command : `sudo apt-get install nam`

```
kiran@kiran-VirtualBox: ~  
kiran@kiran-VirtualBox:~$ sudo apt install ns2  
[sudo] password for kiran:  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following packages were automatically installed and are no longer required:  
  chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi  
  libgstreamer-plugins-bad1.0-0 libva-wayland2  
Use 'sudo apt autoremove' to remove them.  
The following additional packages will be installed:  
  libotcl1 libtcl8.6 libtclcl1 libtk8.6  
Suggested packages:  
  tcl8.6 tk8.6 gnuplot  
The following NEW packages will be installed:  
  libotcl1 libtcl8.6 libtclcl1 libtk8.6 ns2  
0 upgraded, 5 newly installed, 0 to remove and 61 not upgraded.  
Need to get 4,141 kB of archives.  
After this operation, 22.5 MB of additional disk space will be used.  
Do you want to continue? [Y/n] y  
Get:1 http://in.archive.ubuntu.com/ubuntu focal/main amd64 libtcl8.6 amd64 8.6.10+dfsg-1 [902 kB]  
Get:2 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libotcl1 amd64 1.14+dfsg-4 [22.1 kB]  
Get:3 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libtclcl1 amd64 1.20-9build1 [63.2 kB]  
Get:4 http://in.archive.ubuntu.com/ubuntu focal/main amd64 libtk8.6 amd64 8.6.10-1 [714 kB]  
Get:5 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 ns2 amd64 2.35+dfsg-3build1 [2,440 kB]  
Fetched 4,141 kB in 14s (289 kB/s)  
Selecting previously unselected package libtcl8.6:amd64.  
(Reading database ... 193948 files and directories currently installed.)  
Preparing to unpack .../libtcl8.6_8.6.10+dfsg-1_amd64.deb ...  
Unpacking libtcl8.6:amd64 (8.6.10+dfsg-1) ...
```

```
kiran@kiran-VirtualBox: ~  
kiran@kiran-VirtualBox:~$ sudo apt-get install nam  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following packages were automatically installed and are no longer required:  
  chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi libgstreamer-plugins-bad1.0-0 libva-wayland2  
Use 'sudo apt autoremove' to remove them.  
The following NEW packages will be installed:  
  nam  
0 upgraded, 1 newly installed, 0 to remove and 61 not upgraded.  
Need to get 196 kB of archives.  
After this operation, 695 kB of additional disk space will be used.  
Get:1 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 nam amd64 1.15-5build1 [196 kB]  
Fetched 196 kB in 1s (150 kB/s)  
Selecting previously unselected package nam.  
(Reading database ... 194319 files and directories currently installed.)  
Preparing to unpack .../nam_1.15-5build1_amd64.deb ...  
Unpacking nam (1.15-5build1) ...  
Setting up nam (1.15-5build1) ...  
Processing triggers for man-db (2.9.1-1) ...  
kiran@kiran-VirtualBox:~$
```

**Conclusion:** From this experiment we have learned to installed the ns2 network simulator and understood its features.