

EXPERIMENT 2

Aim: Installation and configuring of NS-2 simulator and introduction to Tcl using Hello program

LO 2: Demonstrate the installation and configuration of network simulator.

Theory:

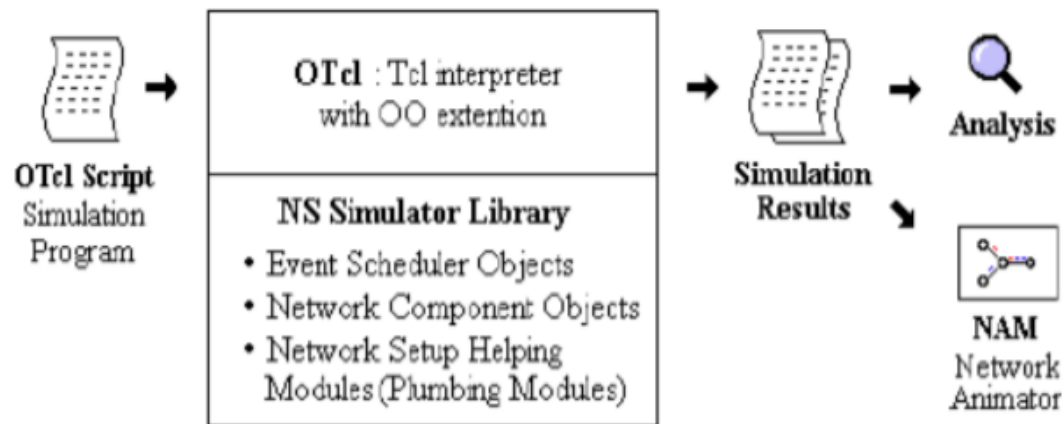
Introduction to NS2 -

NS2 is an open-source simulation tool that runs on Linux. It is a discrete event simulator targeted at networking research and provides substantial support for simulation of routing, multicast protocols and IP protocols, such as UDP, TCP, RTP and SRM over wired and wireless (local and satellite) networks.

Widely known as NS2, is simply an event driven simulation tool. Useful in studying the dynamic nature of communication networks. Simulation of wired as well as wireless network functions and protocols (e.g., routing algorithms, TCP, UDP) can be done using NS2.

In general, NS2 provides users with a way of specifying such network protocols and simulating their corresponding behaviors.

Basic Architecture of NS2



Introduction to TCL script -

TCL – Tool Command Language

Tcl is a very simple programming language.

Basic syntax

Tcl scripts are made up of commands separated by newlines or semicolons.

Commands all have the same basic form illustrated by the following example:

```
expr 20 + 10
```

This command computes the sum of 20 and 10 and returns the result, 30.

Each Tcl command consists of one or more words separated by spaces. In this example there are four words: `expr`, `20`, `+`, and `10`. The first word is the name of a command and the other words are arguments to that command.

All Tcl commands consist of words, but different commands treat their arguments differently.

The `expr` command treats all of its arguments together as an arithmetic expression, computes the result of that expression, and returns the result as a string.

However, for most commands the word structure is important, with each word used for a distinct purpose. All Tcl commands return results.

Output:

```
soham32@soham32-VirtualBox:~$ sudo apt install ns2
[sudo] password for soham32:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libfwupdplugin1 linux-headers-5.13.0-27-generic
  linux-hwe-5.13-headers-5.13.0-27 linux-image-5.13.0-27-generic
  linux-modules-5.13.0-27-generic linux-modules-extra-5.13.0-27-generic
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 0 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 1s (7,847 kB/s)
Selecting previously unselected package libtcl8.6:amd64.
(Reading database ... 220184 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) ...
Selecting previously unselected package libotcl1:amd64.
Preparing to unpack .../libotcl1_1.14+dfsg-4_amd64.deb ...
```

```
Processing triggers for libc-bin (2.31-0ubuntu9.1) ...
soham32@soham32-VirtualBox:~$ sudo apt install nam
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libfwupdplugin1 linux-headers-5.13.0-27-generic
  linux-hwe-5.13-headers-5.13.0-27 linux-image-5.13.0-27-generic
  linux-modules-5.13.0-27-generic linux-modules-extra-5.13.0-27-generic
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  nam
0 upgraded, 1 newly installed, 0 to remove and 0 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 0s (899 kB/s)
Selecting previously unselected package nam.
(Reading database ... 220555 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) ...
```

```
1 puts "Hello World"
```

```
soham32@soham32-VirtualBox:~$ ns hello.tcl
Hello World
```

Conclusion: From the experiment we learn to install NS2 and how to write code in TCL scripts.