

Date: 26/01/2024

Lab Assignment No 2

Aim: To install and configure network simulator and learn basics of TCL scripting.

Lab Outcome Attained: Demonstrate the installation and configuration of network simulator.

Theory

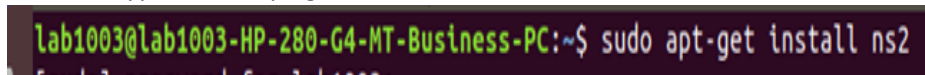
- What is ns2?
NS2 stands for Network Simulator Version 2. It is an open-source event-driven simulator designed specifically for research in computer communication networks.
- How to install ns2?
A command is run in the command prompt: **"sudo apt-get purge nam"**
- What is nam?
NAM stands for Network Animator. It is a TCL/TK based animation tool used to view real world packet traces and network simulation traces. It supports Topology layout, Packet level animation, Various data inspection tool, supports for graphical interface.
- How to install nam?
A command is run in the command prompt: **"sudo apt-get install ns2"**
- What is TCL programming?
TCL stands for Tool Command Language. It is the scripting language of choice in the business. Control structures, variables, network socket access, and APIs are all supported by the Tcl language. This is a high-level, general-purpose, dynamic programming language that is interpreted. Shell program TCL reads the TCL command from its standard input or a file and returns the required output.
- Explain each of the lines:
>set ns [new Simulator]- generates an NS simulator object instance, and assigns it to variable ns. It initializes the packet format, creates a scheduler, selects the default address format.
>\$ns at 1 "puts\ "hello world\""- Is used to print text on screen. Here we schedule an event to write at the time 1, by this script simulator instance "ns" writes "hello World"

>\$ns at 1.5 “exit”- Is used to exit the simulator object.

>\$ns run- This starts the ns and prints Hello world.

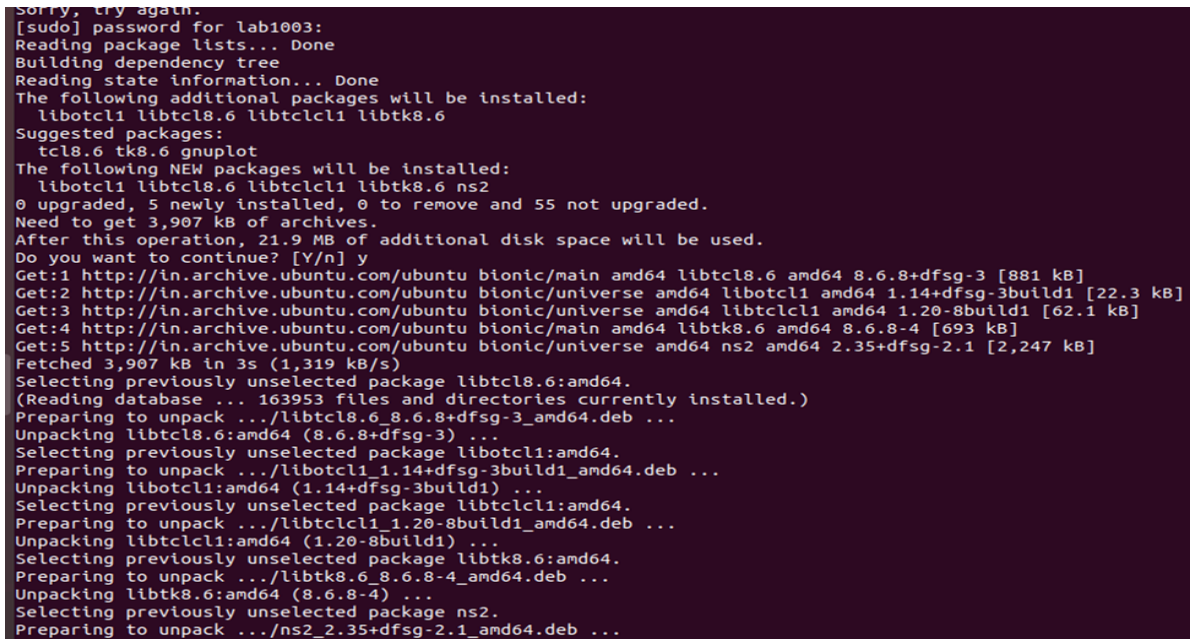
Screenshots

1. Typed sudo apt-get install ns2 to install ns2.



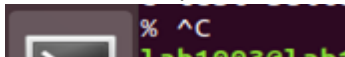
```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ sudo apt-get install ns2
```

2. Password is asked



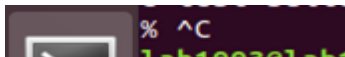
```
Sorry, try again.
[sudo] password for lab1003:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libotcl1.6 libotcl8.6 libtclcl1.6 libtk8.6
Suggested packages:
  tcl8.6 tk8.6 gnuplot
The following NEW packages will be installed:
  libotcl1.6 libotcl8.6 libtclcl1.6 libtk8.6 ns2
0 upgraded, 5 newly installed, 0 to remove and 55 not upgraded.
Need to get 3,907 kB of archives.
After this operation, 21.9 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libtcl8.6 amd64 8.6.8+dfsg-3 [881 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libotcl1.6 amd64 1.14+dfsg-3build1 [22.3 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libtclcl1.6 amd64 1.20-8build1 [62.1 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libtk8.6 amd64 8.6.8-4 [693 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 ns2 amd64 2.35+dfsg-2.1 [2,247 kB]
Fetched 3,907 kB in 3s (1,319 kB/s)
Selecting previously unselected package libtcl8.6:amd64.
(Reading database ... 163953 files and directories currently installed.)
Preparing to unpack .../libtcl8.6_8.6.8+dfsg-3_amd64.deb ...
Unpacking libtcl8.6:amd64 (8.6.8+dfsg-3) ...
Selecting previously unselected package libotcl1.6:amd64.
Preparing to unpack .../libotcl1.6_1.14+dfsg-3build1_amd64.deb ...
Unpacking libotcl1.6:amd64 (1.14+dfsg-3build1) ...
Selecting previously unselected package libtclcl1.6:amd64.
Preparing to unpack .../libtclcl1.6_1.20-8build1_amd64.deb ...
Unpacking libtclcl1.6:amd64 (1.20-8build1) ...
Selecting previously unselected package libtk8.6:amd64.
Preparing to unpack .../libtk8.6_8.6.8-4_amd64.deb ...
Unpacking libtk8.6:amd64 (8.6.8-4) ...
Selecting previously unselected package ns2.
Preparing to unpack .../ns2_2.35+dfsg-2.1_amd64.deb ...
```

3. If the password is correct and the installation of ns2 was successful (%) symbol must come.



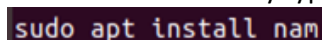
```
% ^C
```

4. We have to then exit this by pressing Ctrl+C



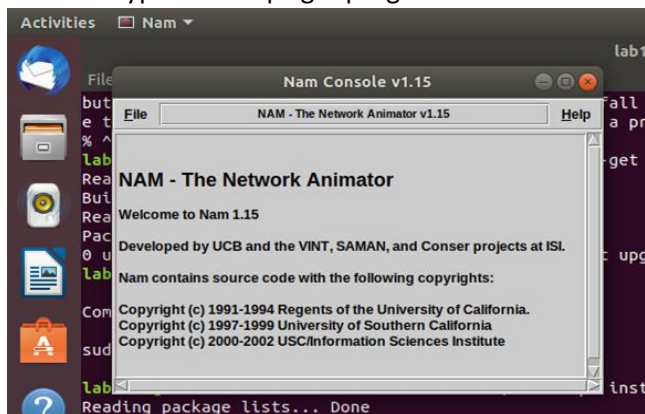
```
% ^C
```

5. Install nam by typing “sudo apt install nam”



```
sudo apt install nam
```

6. Type “sudo apt-get purge nam” then “nam”



Nam Console v1.15

NAM - The Network Animator v1.15

Welcome to Nam 1.15

Developed by UCB and the VINT, SAMAN, and Conser projects at ISI.

Nam contains source code with the following copyrights:

Copyright (c) 1991-1994 Regents of the University of California.
Copyright (c) 1997-1999 University of Southern California
Copyright (c) 2000-2002 USC Information Sciences Institute

Reading package lists... Done

7. In a text editor type the below text and save the file with TCL extension
set ns [new Simulator]
\$ns at 1 "puts\ "hello world\""
\$ns at 1.5 "exit"
\$ns run
8. In the command editor type "ns filename.tcl" The program will be successfully executed if hello world is displayed.

```
(File Saved File 1)  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ ns 3.tcl  
hello world  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$
```

Conclusion: LO2 which was demonstrate the installation and configuration of network simulator was hence achieved.