Experiment No. 4

Aim: To install and configure NS2 and write a program to display, "Hello world".

Apparatus (software): System with Ubuntu

Procedure:

1. Open Terminal in windows Type following commands one by one to install NS2, Network Animator and other dependencies.
    a. sudo apt-get update
    b. sudo apt-get upgrade
    c. sudo apt-get install ns2
    d. sudo apt-get install nam
    e. sudo snap install openjdk
    f. sudo apt install tclsh
    g. sudo apt-get update
    h. sudo apt-get upgrade
2. To install 'xgraph':
    a. Download file 'xgraph_4.38_linux64.tar.gz'.
    b. In terminal change the directory where 'xgraph_4.38_linux64.tar.gz' file is downloaded and type following command in Terminal
        $ tar xvfz xgraph_4.38_linux64.tar.gz
    c. The executable is under the 'bin' directory, called 'xgraph'.
    d. In terminal change the directory to 'bin' and type following command in Terminal
        $ ./xgraph
    It will open xgraph window.
3. To check if NS2 is installed properly or not, type following command in Terminal
    $ ns
    If you get the '%' sign (NS2 prompt) in terminal, it indicates that NS2 is installed properly. Else, install the missing dependencies depending on the error message. Use 'exit' command to break out of NS2 prompt.
4. To check if Network Animator is installed properly or not, type following command in Terminal
    $ nam
    It will open Network Animator window indicating that Network Animator is installed properly. Else, perform following steps:
    a. Download the file 'nam_1.14_amd64.deb'.
    b. In terminal change the directory where 'nam_1.14_amd64.deb' file is downloaded and type following command in Terminal
        $ sudo dpkg --install nam_1.14_amd64.deb
    c. Check if Network Animator window opens or not.

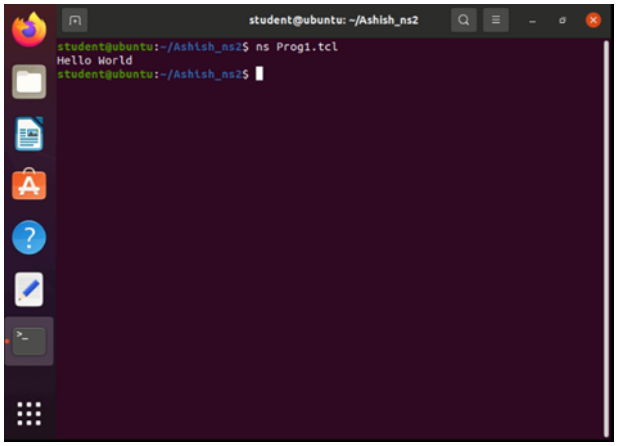
5. Create on file name 'Prog1.tcl' and type in program to display "Hello world".
6. Change Directory where 'Prog1.tcl' file is saved and type following command in Terminal to execute the program
   $ ns Prog1.tcl
7. Observe the output and save the same.

Program:

Prog1.tcl

```
set ns [new Simulator]
$ns at 1 "puts \"Hello World\""
$ns at 1.5 "exit"
$ns run
```

Outputs:



Conclusion:

Q. What is NS2? List its important features.

Ans.- NS2 stands for Network Simulator Version 2. It is an open-source event-driven simulator designed specifically for research in computer communication networks. The important features of NS2 are:

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