Practical:01

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Objective**:**

Install ns-2 and get familiar with the basic commands and script structure.

- Run a simple wired network simulation.
- Analyze the output trace files and understand the format.

The provided script is written in Tcl (Tool Command Language) for use with NS-2 (Network Simulator 2), a popular discrete event simulator for networking research. This script sets up a basic network simulation. Let's break down each part of the script for better understanding:

1. Create a Simulator Object

>>set ns [new Simulator]

This line creates a new instance of the Simulator object, which is the main object in NS-2 to control the simulation.

2. Setting Up Tracing

NAM Trace (Network Animator**)**

>>set ns [new Simulator]

2. Setting Up Tracing

set namf [open wired1.nam w]

$ns namtrace-all $namf

Opens a file named wired1.nam for writing (w) to store the NAM trace.

Instructs the simulator to log all network events into this NAM trace file.

General Trace

set tracef [open wired1.tr w]

$ns trace-all $tracef

3. Setting the Color Values

$ns color 1 blue

$ns color 2 yellow

$ns color 3 red

$ns color 4 green

$ns color 5 purple

4. Create Nodes

set n0 [$ns node] ;# Client1

set n1 [$ns node] ;# Client2

set n2 [$ns node] ;# Client3

set n3 [$ns node] ;# Client4

set n4 [$ns node] ;# Router

set n5 [$ns node] ;# Server

Creates six nodes in the network, assigning each to a variable (n0 to n5).

These nodes represent four clients (n0 to n3), one router (n4), and one server (n5).

5. Establish Links Between Nodes

$ns duplex-link $n0 $n4 2Mb 10ms DropTail

$ns duplex-link $n1 $n4 2Mb 10ms DropTail

$ns duplex-link $n2 $n4 2Mb 10ms DropTail

$ns duplex-link $n3 $n4 2Mb 10ms DropTail

$ns duplex-link $n4 $n5 1Mb 20ms DropTail

6. Label the Nodes

$ns at 0.0 "$n0 label Client1"

$ns at 0.0 "$n1 label Client2"

$ns at 0.0 "$n2 label Client3"

$ns at 0.0 "$n3 label Client4"

$ns at 0.0 "$n4 label Router"

$ns at 0.0 "$n5 label Server"

Labels the nodes at simulation time 0.0 for better visualization in the NAM trace.

7. Set Node Colors

$n0 color blue

$n1 color yellow

$n2 color red

$n3 color green

$n4 color purple

$n5 color orange

Assigns specific colors to each node for visualization purposes.

9. Finish Procedure

```
proc finish {} {
   global ns tracef namf
   $ns flush-trace
   close $tracef
   close $namf
   puts "Opening nam..."
   exec nam wired1.nam &
   exit 0
}
```

10. Schedule the Finish Procedure

Schedules the finish procedure to run at simulation time 5.0 seconds.

11. Run the Simulation

$ns run

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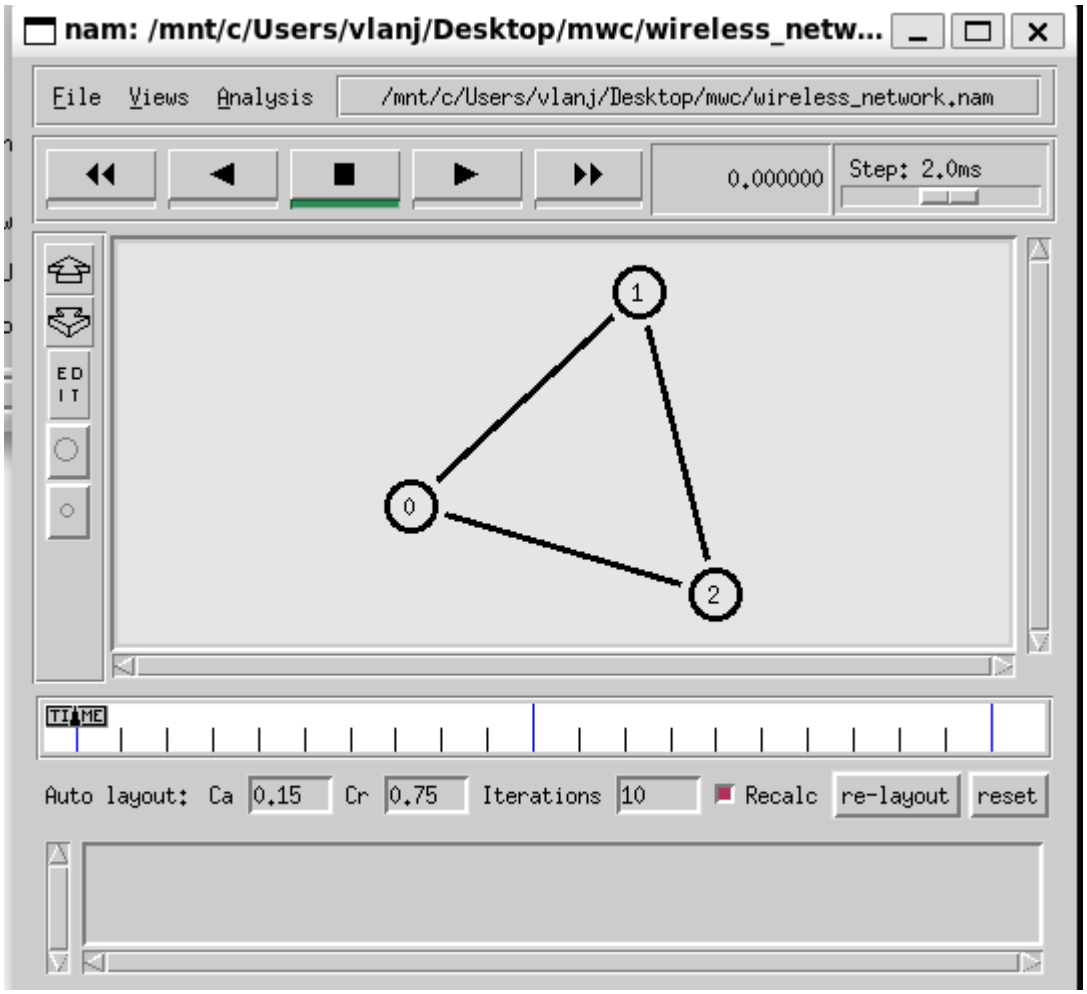
```
vnbl@LAPTOP-6B7F23AA:/mnt/c/Users/vlanj/Desktop/mwc$ ns ex1.tcl
vnbl@LAPTOP-6B7F23AA:/mnt/c/Users/vlanj/Desktop/mwc$
```



Summary

This script sets up a network simulation with six nodes connected through a router, assigns colors and shapes for visualization, and logs the simulation events to trace files. The simulation runs for 5 seconds and then visualizes the results using NAM.