Subject:	**Networking Lab (ITL401)**		
Class:	**SE IT / Semester – IV (CBCGS) / Academic year: 2017-18**		
Name of Student:	**Kazi Jawwad A Rahim**		
Roll No:	**28**	**Date of performance (DOP) :**	
Experiment No:	**05**	**Date of checking (DOC) :**	
Title: Graphical simulation of routing protocol using NAM with TCP.			
Marks:		**Teacher's Signature:**	

1. Aim: To implementation a network topology with respect to a routing protocol and observe graphical simulation in NAM with data transfer through TCP protocol.

2. Prerequisites:

Knowledge of

1. TCL programming
2. NS2 commands
3. Network Layers and protocols

3. Hardware Requirements:

1. PC with minimum 2GB RAM

4. Software Requirements:

1. Linux (Ubuntu 10.04)
2. ns-2.34 package
3. Text editor

5. Learning Objectives:

1. To understand the network simulator environment and visualize a network topology.
2. To understand the behavior of network protocols.
3. Understand the wired network using NS2.

6. Course Objectives Applicable: LO 3

7. Program Outcomes Applicable: PO2, PO4

8. Program Education Objectives Applicable: 1

Steps to create and execute tcl script:
Step 1: Open any text editor (vi, nano).
Step 2: Write the program using ns2 tcl script and save with extension as “filename.tcl”
Step 3: Execute tcl script as “ns filename.tcl”
Step 4: Press the “play button” and Observe the output.

SOURCE CODE:

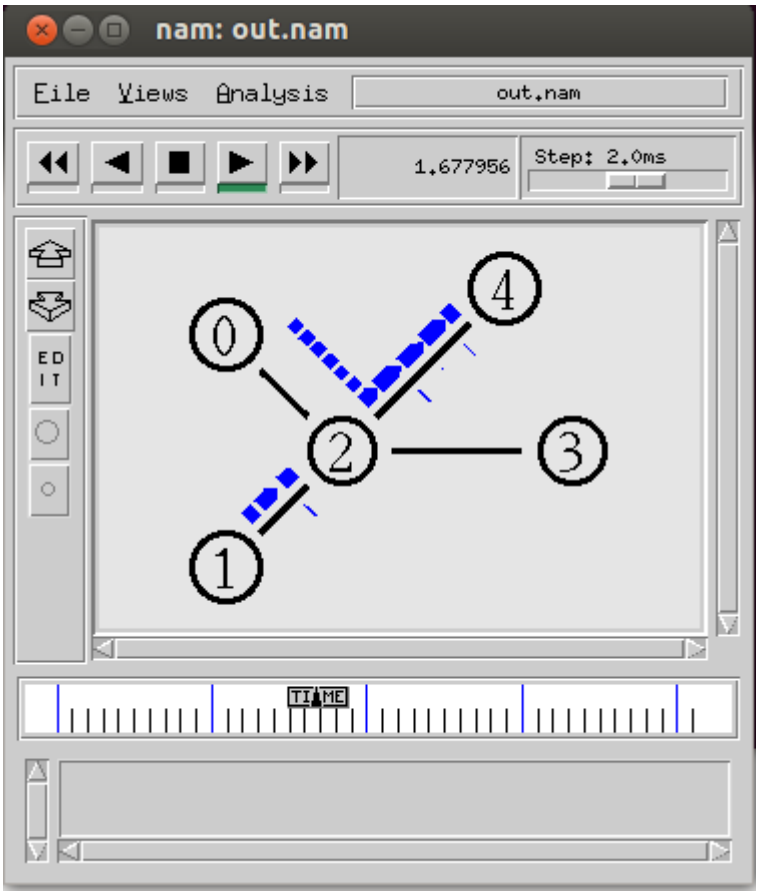
```
#Create a simulator object
set ns [new Simulator]
#Define different colours for data flows (for NAM)
$ns color 1 Blue
$ns color 2 Red
$ns color 3 Yellow
#Open the NAM trace file
set nf [open out.nam w]
$ns namtrace-all $nf
#Define a 'finish' procedure
proc finish {} {
global ns nf
$ns flush-trace
#Close the NAM trace file
close $nf
#Execute NAM on the trace file
exec nam out.nam &
exit 0
}
#Create four nodes
set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]
set n3 [$ns node]
set n4 [$ns node]
#Create links between the nodes
$ns duplex-link $n0 $n2 2Mb 10ms DropTail
$ns duplex-link $n1 $n2 2Mb 10ms DropTail
$ns duplex-link $n2 $n3 1.7Mb 20ms DropTail
$ns duplex-link $n2 $n4 1.7Mb 20ms DropTail
#Set Queue Size of link (n2-n3) to 10
$ns queue-limit $n2 $n3 10

#Give node position (for NAM)
$ns duplex-link-op $n0 $n2 orient right-down
$ns duplex-link-op $n1 $n2 orient right-up
$ns duplex-link-op $n2 $n3 orient right
$ns duplex-link-op $n2 $n4 orient right-up
#Monitor the queue for link (n2-n3). (for NAM)
$ns duplex-link-op $n2 $n3 queuePos 0.5
$ns duplex-link-op $n2 $n4 queuePos 0.5
#Setup a TCP connection
set tcp [new Agent/TCP]
$tcp set class_ 2
$ns attach-agent $n0 $tcp
$ns attach-agent $n1 $tcp
```

```
set sink [new Agent/TCPSink]
$ns attach-agent $n3 $sink
$ns attach-agent $n4 $sink
$ns connect $tcp $sink
$tcp set fid_ 1
#Setup a FTP over TCP connection
set ftp [new Application/FTP]
$ftp attach-agent $tcp
$ftp set type_ FTP
#Schedule events for the FTP agent
$ns at 1.0 "$ftp start"
$ns at 4.0 "$ftp stop"
#Detach tcp and sink agents (not really necessary)
$ns at 4.5 "$ns detach-agent $n0 $tcp ;
$ns detach-agent $n3 $sink"
$ns at 4.5 "$ns detach-agent $n1 $tcp ;
$ns detach-agent $n4 $sink"
#Call the finish procedure after 5 seconds of simulation time
$ns at 5.0 "finish"
#Run the simulation
$ns run
```

OUTPUT:

```
students@ubuntu:~$ ns exp5.tcl
students@ubuntu:~$
```



13. Experiment/Assignment Evaluation

SR	Parameters	Weight	Excellent	Good	Average	Poor	Not as per requirement
		Scale Factor ->	5	4	3	2	0
1	Technical Understanding	25					
2	Performance / Execution	25					
3	Question Answers	20					
4	Punctuality	20					
5	Presentation	10					
	Total out of 100 --> #(to be converted as per term-work evaluation applicable to the subject)		**∑ (Weight * Scale Factor)/5 = _____**				

References:

[1] http://www.jgyan.com/ns2/trace%20file.php
[2] https://www.tcl.tk/man/tcl8.5/tutorial/Tcl1.html
[3] http://www.jgyan.com/ns2/link%20command.php

Viva Questions

1. What are the TCP services?
2. What is the difference between connection oriented and connection less services?
3. What is ftp?
4. What are the types of application in NS2?