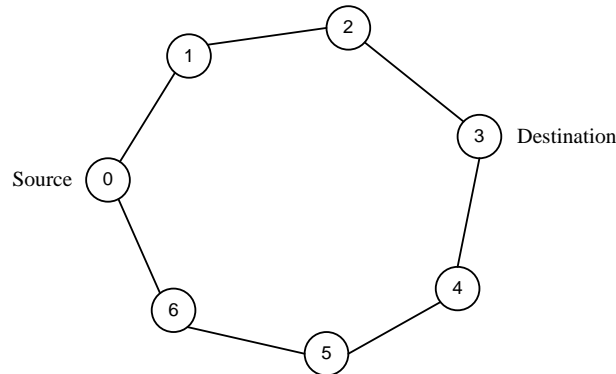




Experiment No. 8

Aim: To implement the given network topology and perform dynamic routing.



Apparatus (software): System with Ubuntu, NS2, NAM

Procedure:

1. Create a Simulator Object.
2. Open the nam trace file.
3. Define a 'finish' procedure.
4. Close the Trace file.
5. Execute nam on the Trace file.
6. Create nodes.
7. Create a duplex link between the nodes as per the topology.
8. Create agents for sending and receiving data and attach them to appropriate nodes.
9. Create traffic sources and attach them to appropriate agents.
10. Program when to send data and when to stop sending data.
11. Program down time and up time for the link.
12. Call the finish procedure and run the simulation.
13. Observe the output and save the same.

Program:

```
#Create a simulator object
set ns [new Simulator]

#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 $nf
    exec nam out.nam &
    exit 0
}
```



Vidyavardhini's College of Engineering & Technology

Department of Information Technology

```
#Create seven nodes
for {set i 0} {$i < 7} {incr i} {
    set n($i) [$ns node]
}

#Create links between the nodes
for {set i 0} {$i < 7} {incr i} {
    $ns duplex-link $n($i) $n([expr ($i+1)%7]) 1Mb 10ms DropTail
}

#Create a UDP agent and attach it to node n(0)
set udp0 [new Agent/UDP]
$ns attach-agent $n(0) $udp0

# Create a CBR traffic source and attach it to udp0
set cbr0 [new Application/Traffic/CBR]
$cbr0 set packetSize_ 500
$cbr0 set interval_ 0.005
$cbr0 attach-agent $udp0

#Create a Null agent (a traffic sink) and attach it to node n(3)
set null0 [new Agent/Null]
$ns attach-agent $n(3) $null0

#Connect the traffic source with the traffic sink
$ns connect $udp0 $null0

#Tell the simulator to use dynamic routing (Link State routing)
$ns rtproto LS

#Schedule events for the CBR agent and the network dynamics
$ns at 0.5 "$cbr0 start"
$ns rtmodel-at 1.5 down $n(1) $n(2)
$ns rtmodel-at 2.5 up $n(1) $n(2)
$ns at 3.5 "$cbr0 stop"

#Call the finish procedure after 5 seconds of simulation time
$ns at 5.0 "finish"

#Exit
$ns at 5.5 "exit"

#Run the simulation
$ns run
```



Vidyavardhini's College of Engineering & Technology

Department of Information Technology

Conclusion:

Q. What type of services are used in this program, connection-oriented or connectionless? What protocol is used for same?

Ans.- In this program, connectionless services are used. The same is implemented using UDP protocol.

Q. How dynamic path is set? What happens in case of link failure? Does it choose the alternate path?

Ans.- At the start each nodes floods the information about the links to which they are connected. The Link-Sate Routing Protocol is then implemented to find the shortest path. In case of link failure, the alternate shortest path is chosen.