EXPERIMENT NO: 8

AIM: Implementataion of DVR/LSR in NS2.

DESCRIPTION:

In Distance Vector (DV), each node sends periodic route updates for every 2 seconds. Apart from the periodic updates, each node/agent sends triggered updates as a result of changes in the forwarding table in the node if any. This occurs either due to changes in the network topology or the node received a route update and as a result, it composes a fresh route.

DEFINITION:

A distance-vector routing (DVR) protocol requires that a router inform its neighbors of topology changes periodically. Historically known as the old ARPANET routing algorithm (or known as Bellman-Ford algorithm). Distances based on a chosen metric, are computed using information from the neighbors' distance vectors.

Distance Vector Algorithm –
1. A router transmits its distance vector to each of its neighbors in a routing packet.
2. Each router receives and saves the most recently received distance vector from each of its neighbors.
3. A router recalculates its distance vector when:

It receives a distance vector from a neighbor containing different information than before.
It discovers that a link to a neighbor has gone down. The DV calculation is based on minimizing the cost to each destination. LINK STATE ROUTING (LSR)Link State Routing. Link state routing is a technique in which each router shares the knowledge of its neighborhood with every other router in the internetwork.

The basic concept of link-state routing is that every node constructs a map of the connectivity to the network, in the form of a graph, showing which nodes are connected to which other nodes. Each node then independently calculates the next best logical path from it to every possible destination in the network.

Features of link state routing protocols –
  • Link state packet – A small packet that contains routing information.
  • Link state database – A collection information gathered from link state packet.

Shortest path first algorithm (Dijkstra algorithm) – A calculation performed on the database results into shortest path
Routing table – A list of known paths and interfaces.

There are three major protocols for unicast routing:

1. Distance Vector Routing
2. Link State Routing
3. Path-Vector Routing

PROGRAM:

```
set ns [new Simulator]
set nf [open out.nam w]
$ns namtrace-all $nf
set tr [open out.tr w]
$ns trace-all $tr
proc finish {} {
        global nf ns tr
        $ns flush-trace
        close $tr
        exec nam out.nam &
        exit 0
        }
set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]
set n3 [$ns node]
$ns duplex-link $n0 $n1 10Mb 10ms DropTail
$ns duplex-link $n1 $n3 10Mb 10ms DropTail
$ns duplex-link $n2 $n1 10Mb 10ms DropTail
$ns duplex-link-op $n0 $n1 orient right-down
$ns duplex-link-op $n1 $n3 orient right
$ns duplex-link-op $n2 $n1 orient right-up
set tcp [new Agent/TCP]
$ns attach-agent $n0 $tcp
set ftp [new Application/FTP]
$ftp attach-agent $tcp
set sink [new Agent/TCPSink]
$ns attach-agent $n3 $sink
set udp [new Agent/UDP]
$ns attach-agent $n2 $udp
set cbr [new Application/Traffic/CBR]
$cbr attach-agent $udp
set null [new Agent/Null]
$ns attach-agent $n3 $null
$ns connect $tcp $sink
$ns connect $udp $null
$ns rtmodel-at 1.0 down $n1 $n3
$ns rtmodel-at 2.0 up $n1 $n3
$ns rtproto DV
$ns at 0.0 "$ftp start"
$ns at 0.0 "$cbr start"
$ns at 5.0 "finish"
$ns run
```

OUTPUT:
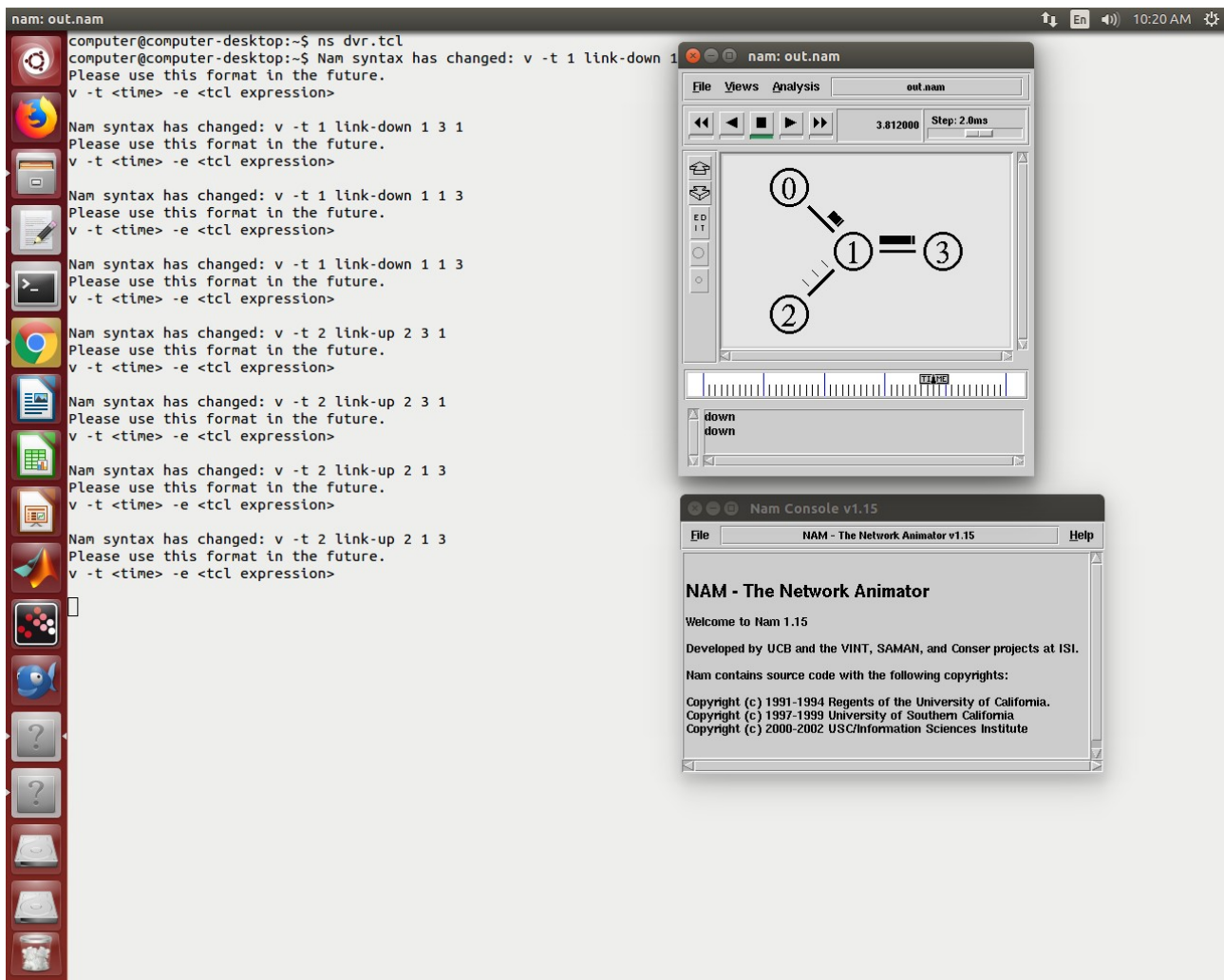
CONCLUSION: Implementation of DVR is successfully executed.