EX NO:1	IMPLEMENT A NETWORK TOPOLOGY WITH NS2 INVOLVING A SET OF NODES(BUS&STAR TOPOLOGY)
DATE:	

Aim:

To implement Bus and Star topologies in Network Simulator 2 (NS2).

Steps to Simulate a Topology in NS2:

1. Define the Network Topology.
2. Simulate a Shared Medium.
3. Simulate Broadcast Communication.

Example of Bus Topology Implementation in NS2 (Hub-Based):

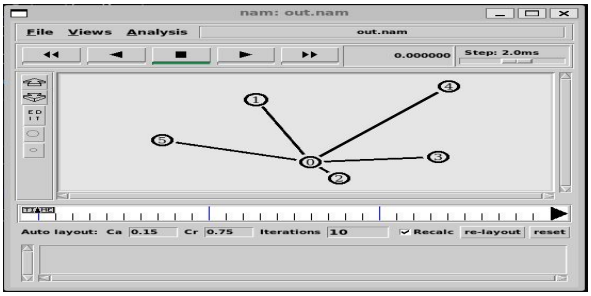
1)nano bus_topology.tcl
2)# Create a new NS simulator instance

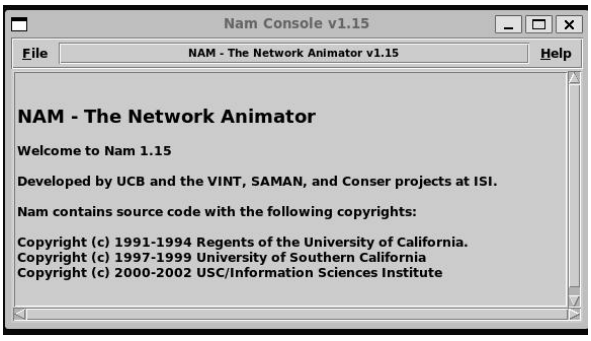
```
set ns [new Simulator]

# Open trace files for NAM visualization
set nf [open out.nam w]
$ns namtrace-all $nf

# Define a 'finish' procedure
proc finish {} {
    global ns nf
    $ns flush-trace
    close $nf
    exec nam out.nam &
    exit 0
}
# Create the central hub (acts as a shared bus)
set hub [$ns node]
# Number of nodes in the network
set num_nodes 5
# Create nodes and connect them to the hub
for {set i 0} {$i < $num_nodes} {incr i} {
    set node($i) [$ns node]
    $ns duplex-link $node($i) $hub 1Mb 10ms DropTail
}

# Define a procedure to simulate broadcast communication
proc broadcast {src} {
    global ns num_nodes node
    for {set i 0} {$i < $num_nodes} {incr i} {
        if {$i != $src} {
            $ns at 1.0 "$node($src) send-to $node($i)"
        }
    }

# Schedule a broadcast from node(0) at 1s
$ns at 1.0 "broadcast 0"

# Call the finish procedure after 5 seconds
```

```
$ns at 5.0 "finish"

# Run the simulation
$ns run
```

After pasting the code, press CTRL + X to exit.
Press Y to confirm saving the file.
Press ENTER to save with the filename bus_topology.tcl.
3) ns bus_topology.tcl

Output:





Example of Star Topology Implementation in NS2 (Hub-Based):

1)Open Terminal
2) Navigate to your project directory:

cd ~/ns2_projects

3)Create a new TCL script:

nano star_topology.tcl

4) Create a new NS-2 simulator instance

sh

CopyEdit
nano star_topology.tcl
set ns [new Simulator]

Open a trace file for NAM visualization
set nf [open out.nam w]
$ns namtrace-all $nf

```
# Define a 'finish' procedure to close files and start NAM
proc finish {} {
    global ns nf
    $ns flush-trace
    close $nf
    exec nam out.nam &
    exit 0
}

# Create the central hub node
set hub [$ns node]

# Define number of nodes (excluding the hub)
set num_nodes 5

# Create and connect nodes to the hub
for {set i 0} {$i < $num_nodes} {incr i} {
    set node($i) [$ns node]
    $ns duplex-link $node($i) $hub 1Mb 10ms DropTail
}

# Simulate traffic (send packets from node(0) to all other nodes)
proc sendPackets {src} {
    global ns num_nodes node
    for {set i 0} {$i < $num_nodes} {incr i} {
        if {$i != $src} {
            $ns at 1.0 "$node($src) send-to $node($i)"
        }
    }
}

# Schedule packet transmission from node(0) at 1 second
$ns at 1.0 "sendPackets 0"

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

# Run the simulation
$ns run
#After pasting the code, press CTRL + X to exit.
#Press Y to confirm saving the file.
#Press ENTER to save with the filename bus_topology.tcl.
```

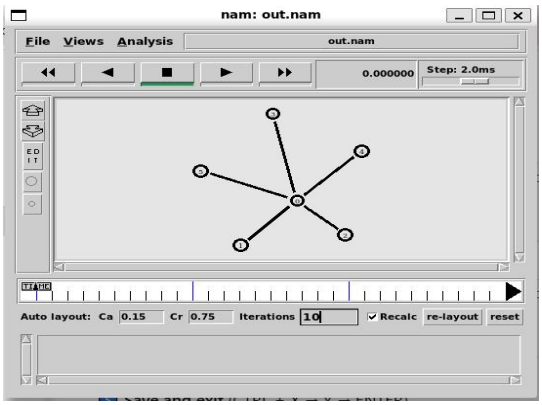
5) **Run the script in NS-2:**

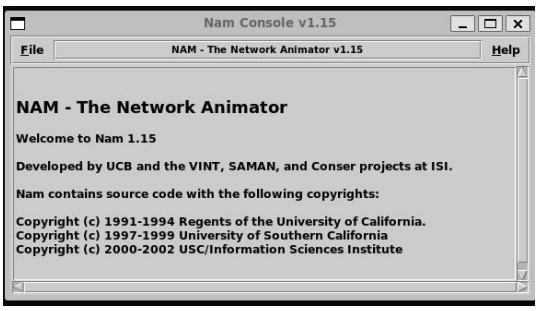
```
ns star_topology.tcl
```

6) View the simulation in NAM:

```
nam out.nam
```

Output:





Result:

Thus, the implementation of Bus and Star Topologies using NS2, involving a set of nodes, has been successfully executed.