

Department of Computer Engineering

Academic Term : Jan-Apr 2023

Class : T.E Computer Sem -VI

Subject : Mobile Computing

Practical No:	1
Title:	Implementation of Mobile Network (MANET) using Network Simulator (NS2):
Date of Performance:	3/02/2025
Date of Submission:	3/02/2025
Roll No:	9913
Name of the Student:	Mark Lopes

Evaluation:

Sr. No	Rubric	Grade
1	On time Completion & Submission(2)	
2	Output(3)	
3	Code Optimization(3)	
4	Knowledge of the topic(2)	
5	Total (10)	

Signature of the Teacher :

PRACTICAL - 1

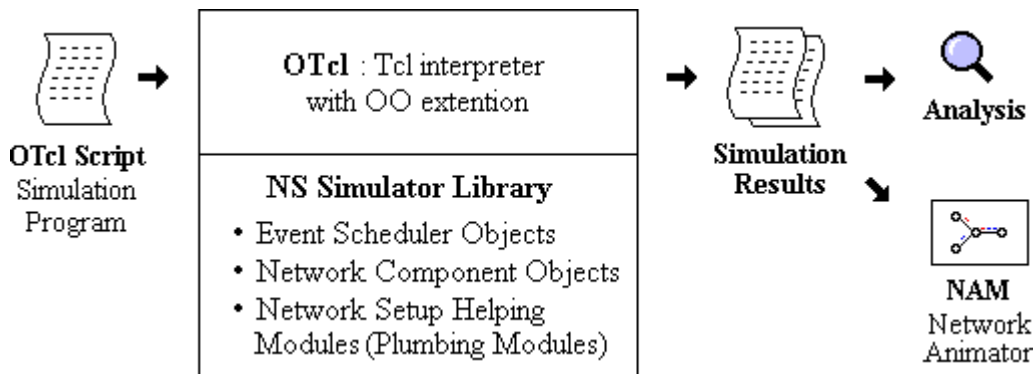
Title: Implementation of Mobile Network using Network Simulator (NS2): Create a Mobile Ad hoc network

Objective: To study Routing in MANET

Pre-Requisite: Basic knowledge of wireless networking

Description:

NS (version 2) is an object-oriented, discrete event driven network simulator developed at UC Berkely written in C++ and OTcl. NS is primarily useful for simulating local and wide area networks. It implements network protocols such as TCP and UDP, traffic source behavior such as FTP, Telnet, Web, CBR and VBR, router queue management mechanism such as Drop Tail, RED and CBQ, routing algorithms such as Dijkstra, and more. NS also implements multicasting and some of the MAC layer protocols for LAN simulations.



Program description:

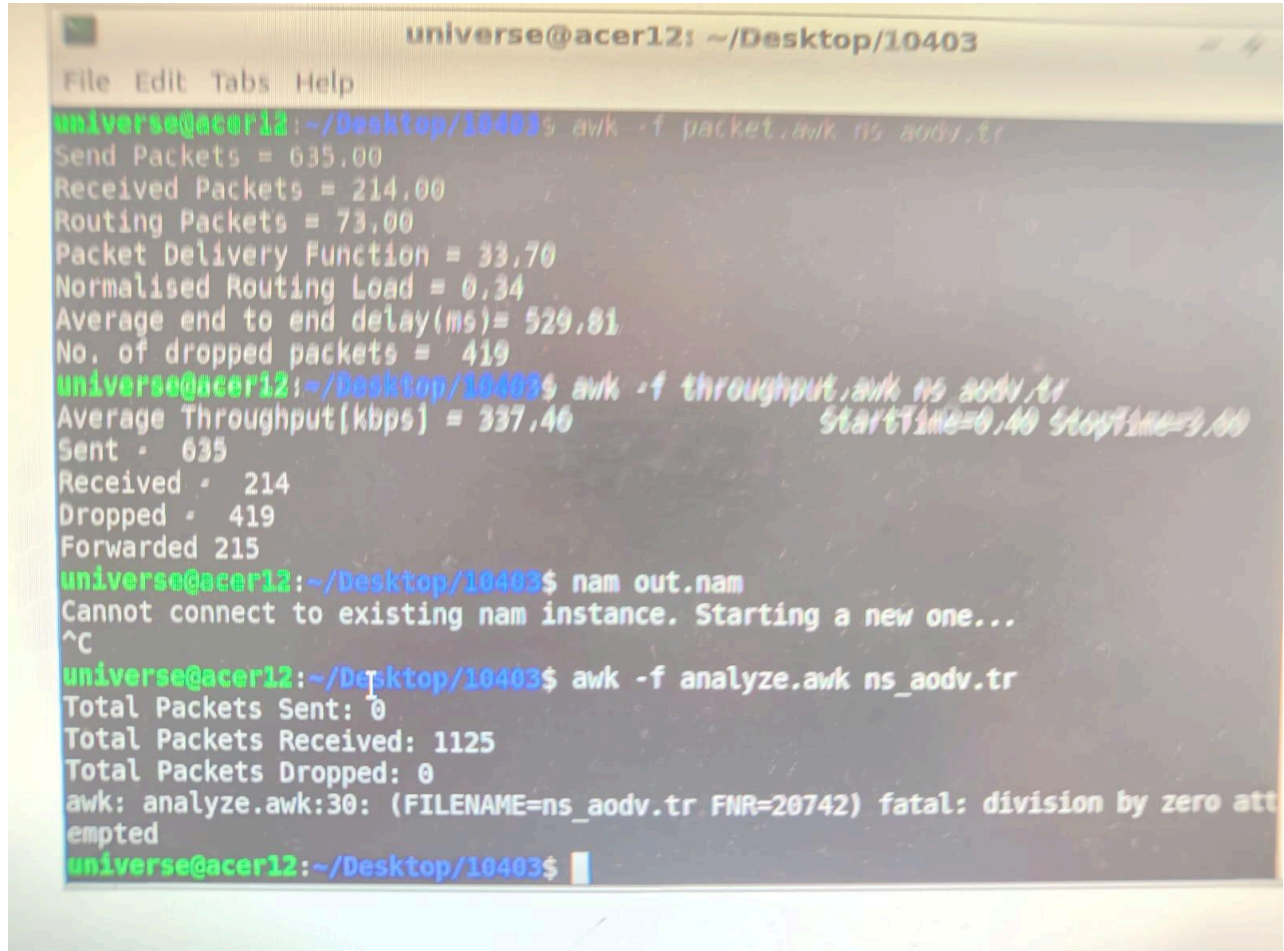
Each agent keep track of what messages it has seen and only forwards those which it has seen and only forwards those which it hasn't seen before. Each message is of the form "ID:DATA" where ID is some arbitrary message identifier and DATA is the payload. In order to reduce memory usage , the agent store only the message ID.

Steps:

1. Set the following configuration for each node's interface
 - Type of channel - WirelessChannel
 - Type of propagation – TwoRayGround
 - Physical Layer – Wireless
 - Mac Layer – MAC 802.11
 - Type of Queue – DropTail/PriQueue
 - LinkLayer – LL
 - Type of Antenna –OmniAntenna
 - Maximum Packet in Queue - 50
2. Open Trace file in write mode
3. Open NAM file in write mode.
4. Create a topology containing 6 groups each having 4 nodes. Use FlatGrid topology

5. Configure each node using the configuration set in step 1.
6. Create a simple MessagePassing/Flooding agent
7. Create Receive procedure that receives each packet and maintain list of unseen messages
8. Create send procedure that broadcasts message.
9. Create MessagePassing/Flooding agent and attach it with every node.
10. Set up some events.
11. Write finish procedure.

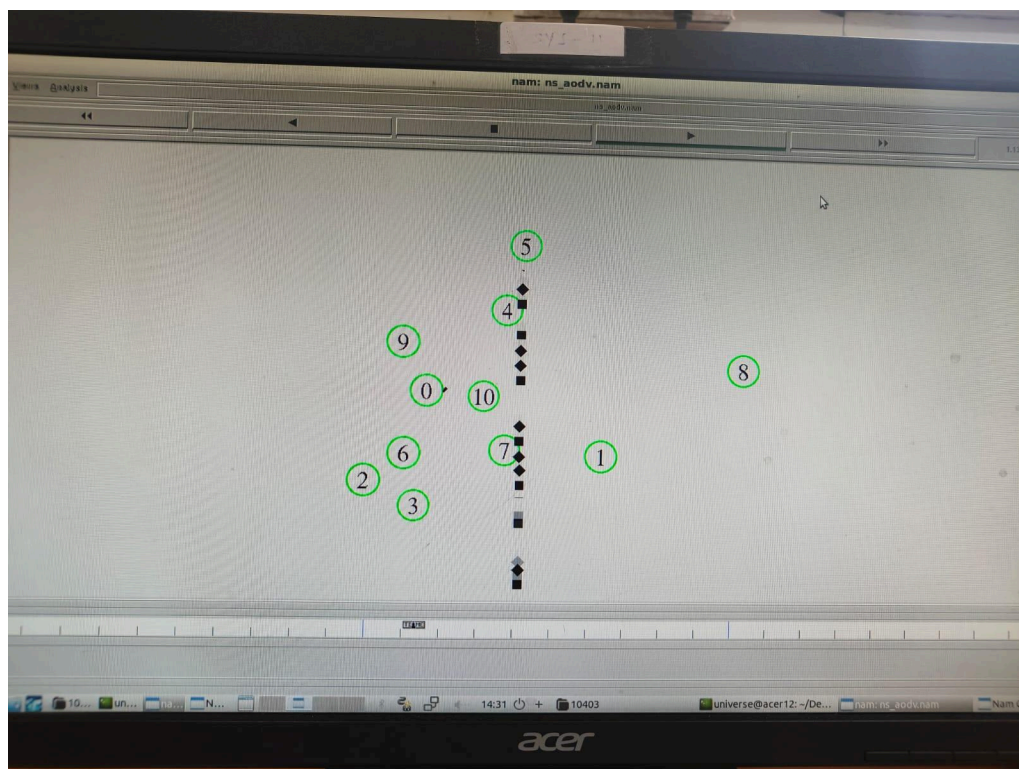
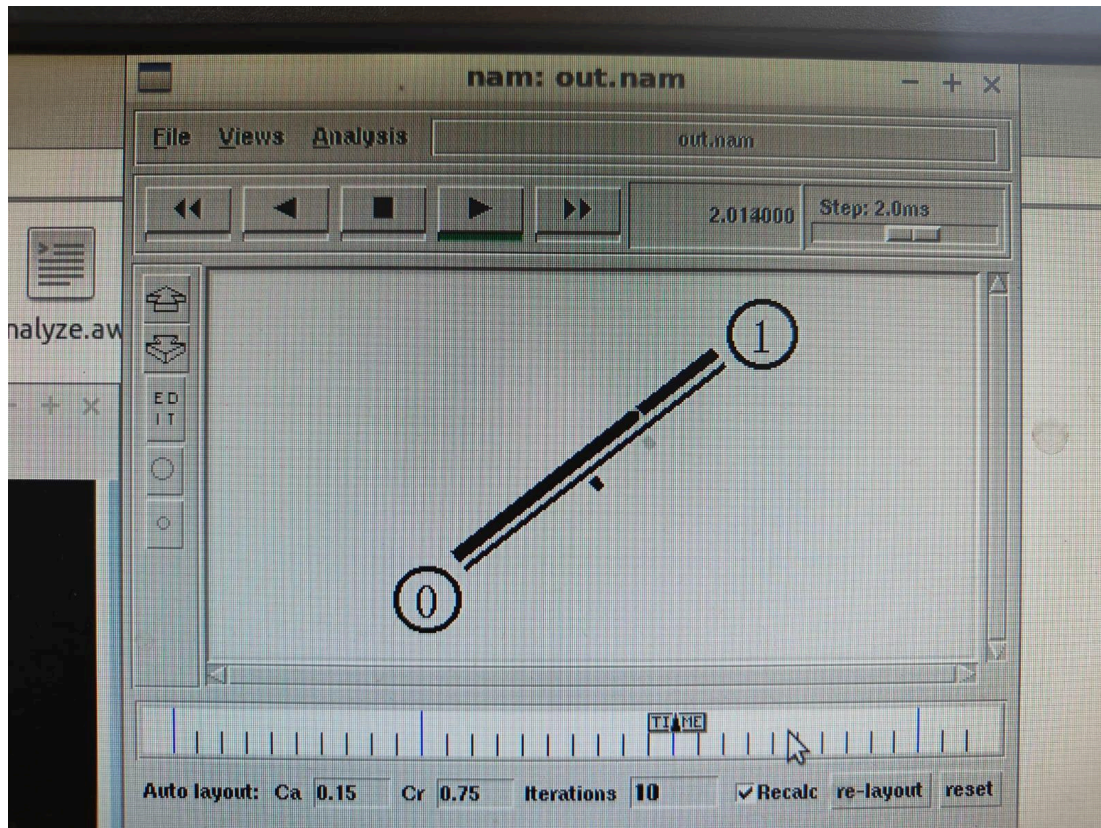
Conclusion: Mobile networks using NS2 has been studied and implemented successfully.



```

universe@acer12: ~/Desktop/10403
File Edit Tabs Help
universe@acer12:~/Desktop/10403$ awk -f packet.awk ns_aadv.tr
Send Packets = 635.00
Received Packets = 214.00
Routing Packets = 73.00
Packet Delivery Function = 33.70
Normalised Routing Load = 0.34
Average end to end delay(ms)= 529.81
No. of dropped packets = 419
universe@acer12:~/Desktop/10403$ awk -f throughput.awk ns_aadv.tr
Average Throughput[kbps] = 337.46      StartTime=0.40 StopTime=3.60
Sent - 635
Received - 214
Dropped - 419
Forwarded 215
universe@acer12:~/Desktop/10403$ nam out.nam
Cannot connect to existing nam instance. Starting a new one...
^C
universe@acer12:~/Desktop/10403$ awk -f analyze.awk ns_aadv.tr
Total Packets Sent: 0
Total Packets Received: 1125
Total Packets Dropped: 0
awk: analyze.awk:30: (FILENAME=ns_aadv.tr FNR=20742) fatal: division by zero att
empted
universe@acer12:~/Desktop/10403$

```

```
universe@acer12:~/Desktop/10403$ nam ns aadv.nam
universe@acer12:~/Desktop/10403$ ls
analyze.awk  ns_aadv.nam  ns_aadv.tr  out.tr      simple.tcl
energy.awk   ns_aadv.tcl  out.nam     packet.awk  throughput.awk
universe@acer12:~/Desktop/10403$ awk -f energy.awk ns_aadv.tr
node 0 1.3103
node 1 1.3103
node 2 1.38952
node 3 1.3103
node 4 2.04308
node 5 1.9679
node 6 1.3103
node 7 1.3103
node 8 1.3103
node 9 1.3103
node 10 1.3103
average 1.4439
total energy 15.8829
max energy consumed 2.04308
universe@acer12:~/Desktop/10403$
```

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Post Lab Questions:

1. Describe your observations about output.
2. Explain the working of DSDV protocol.

Name - Mark Lopez

Roll no:- 0913

MC-Postlab-1



2/2/22

Q.1 Describe your observations about output:-

→ 1. Throughput analysis:-

It represents the amount of successfully transmitted data over time, higher throughput indicate efficient routing and minimal data loss.

2. Simulation time:-

Longer simulation time allows more data transmission due to which it affects overall network performance evaluation.

3. Tracefile insights:-

out file provides packet transmission details due to which it ~~overcomes~~ becomes reliable and efficient.

Q.2 Explain working of the DSDV protocol?

→ DSDV is a proactive routing protocol where each ~~vector~~ node maintains a routing table and periodically updates its neighbors. Route advertisements are broadcast when changes occur, using sequence numbers to ensure fresh and loop-free routes. While reliable, its frequent updates generate high control overhead on mobile networks.