Introduction

- **Name**- Ravi Shankar Prasad
- **Nationality**- Indian
- **Department**- Electronic and Computer Science
- Bachelor in Electronics and Communication
- **Interest**- Wireless Communication
- **Hobbies**- Playing Badminton, Hiking, Soccer.

Schedule-

Week 4

- Review research paper and understand methodologies.
- Set up NS-3 simulator environment.
- Explore sample simulations and configure environment.

Week 5

- Identify key simulation parameters.
- Draft simulation plan.
- Begin coding initial framework for NS-3 simulation.
- Initialization of p2pnodes,csmanodes and wifi nodes.

Week 6

- Analyze preliminary results.
- Checking results on wireshark and NetAnim.
- Optimize simulation code for accuracy and performance.

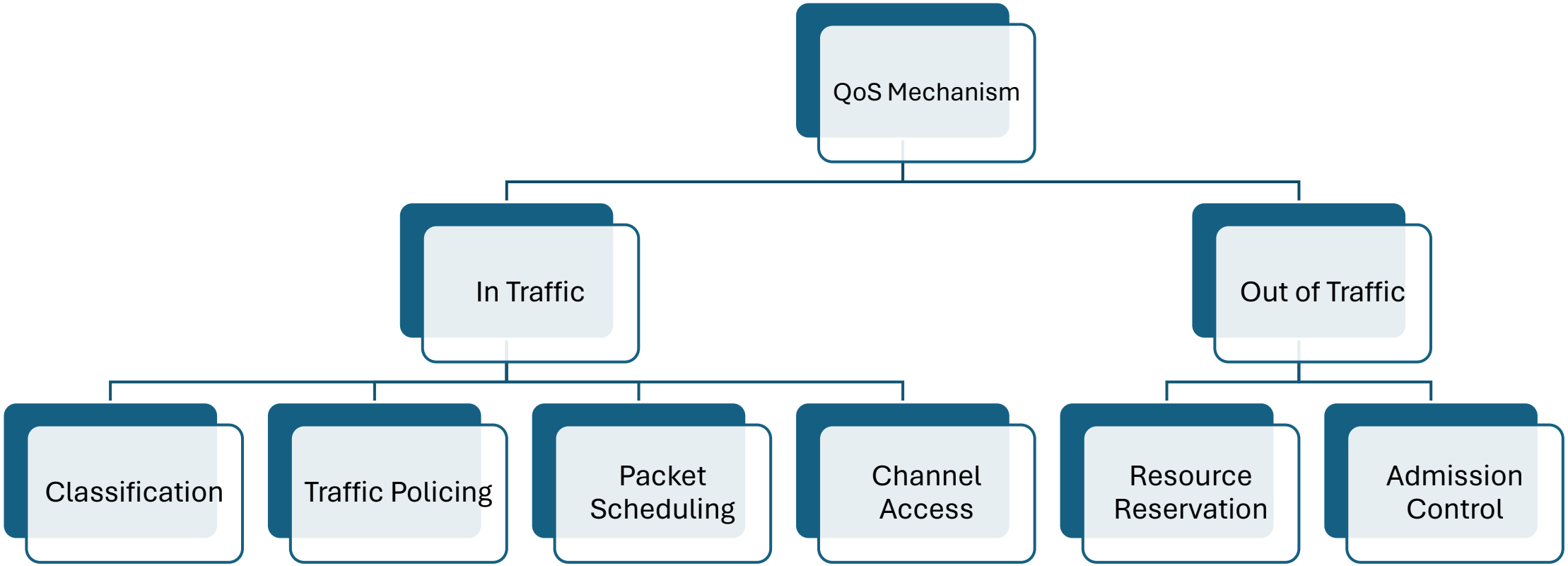
Week 7

- Document simulation process and results.
- Prepare presentation slides summarizing findings.
- Finalize presentation slides and practice delivery.

Topics Covered So far

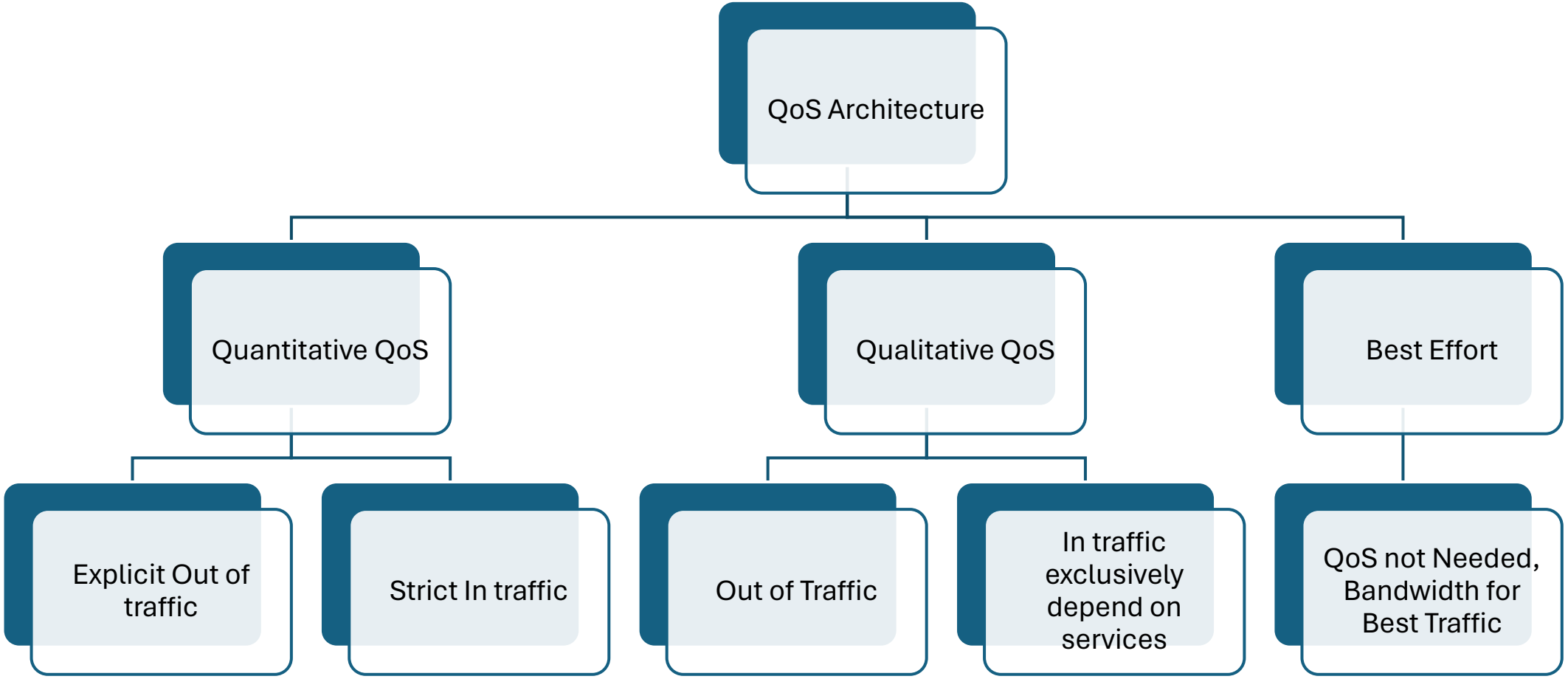
- Multimedia Applications
- QoS Fundamentals
- QoS Mechanisms
- Classification
- Channel Access Mechanism
- Packet Scheduling Mechanisms
- Traffic Policing Mechanism
- Resource Reservation Signaling Mechanisms
- Admission Control
- QoS Architecture

QoS Mechanism



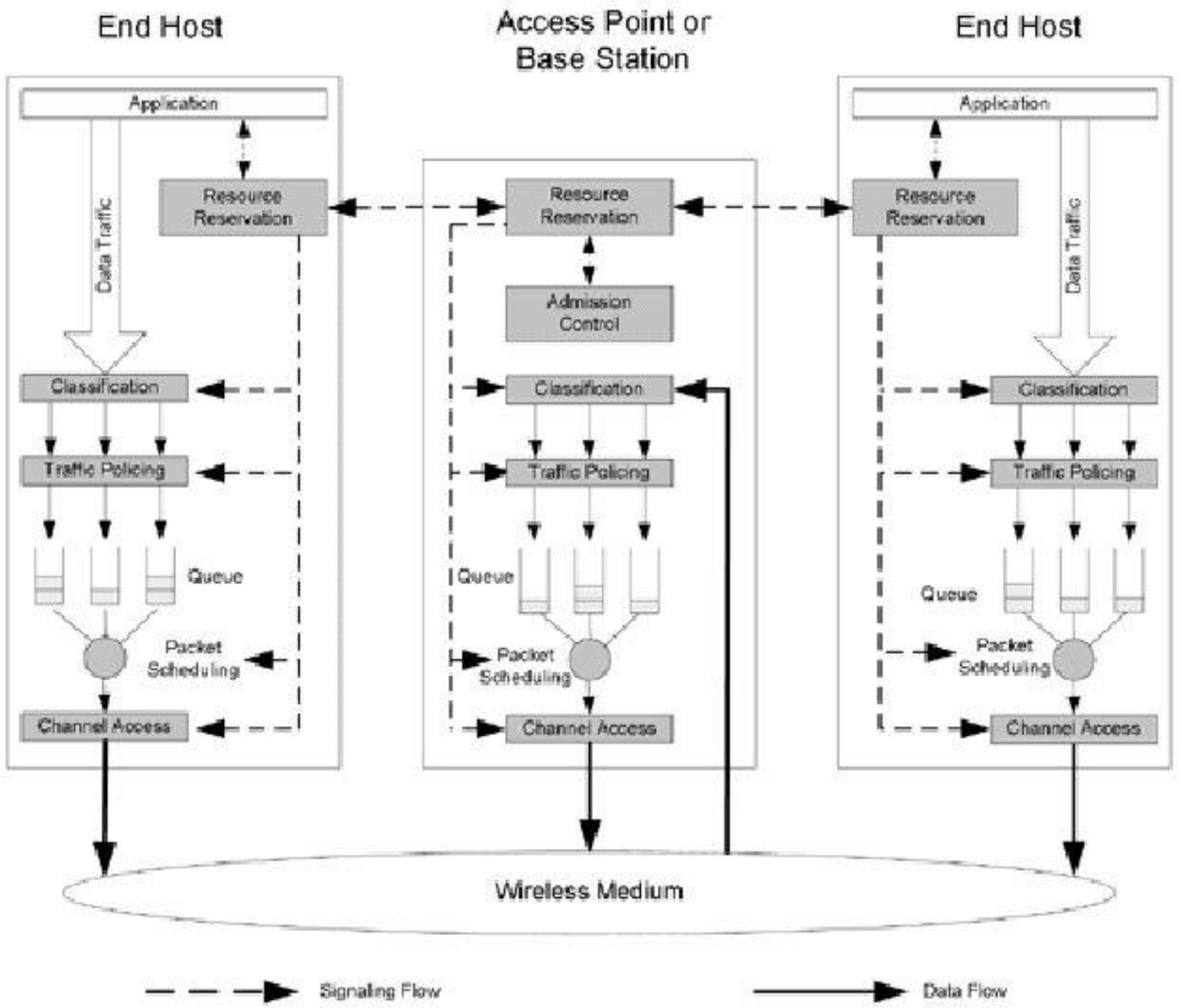
QoS Architecture

Applications may require different combinations of QoS mechanisms.



QoS Architecture for Infrastructure Wireless Networks

- Resource Reservation
  - Classification
  - Traffic Policing
  - Packet Scheduling
  - Channel Access
- Wireless Medium

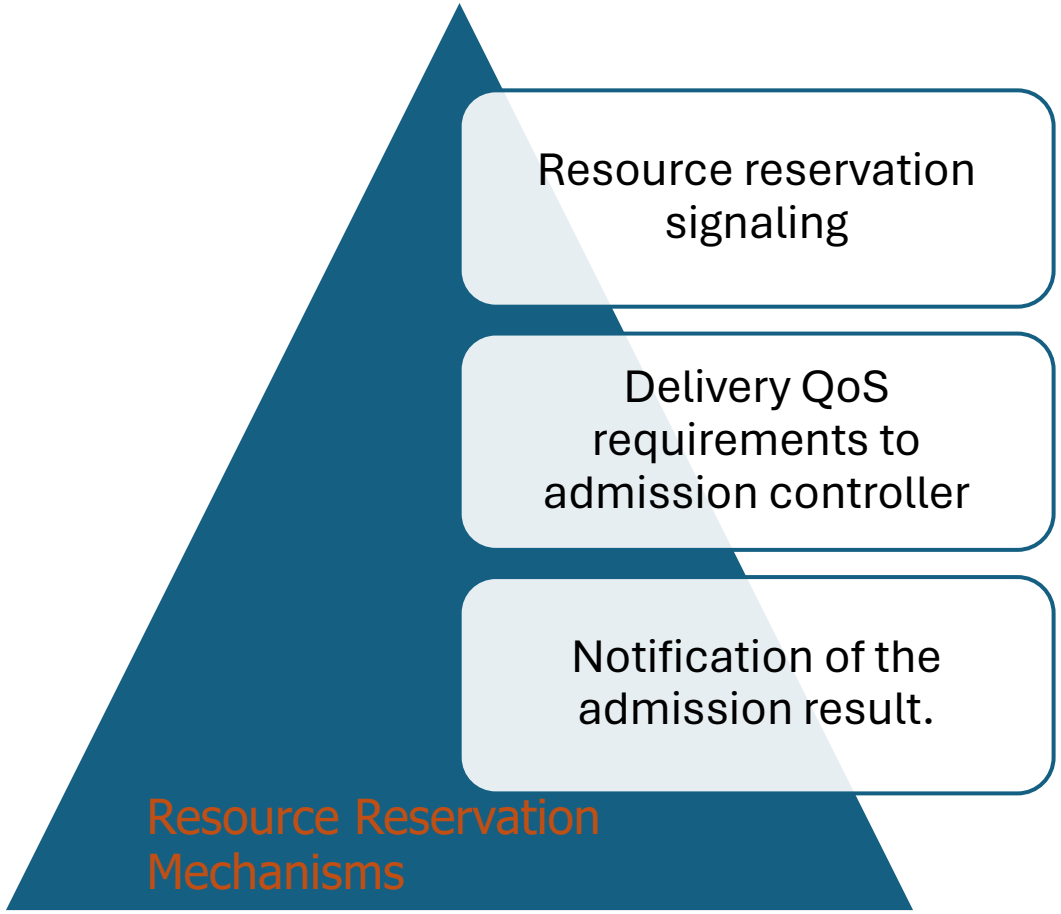


Out of Traffic Mechanism- Resource reservation

RSVP operates on top of IP, in the transport layer

-Resource Reservation Protocol (RSVP)

- Supports Per class and Per flow reservation



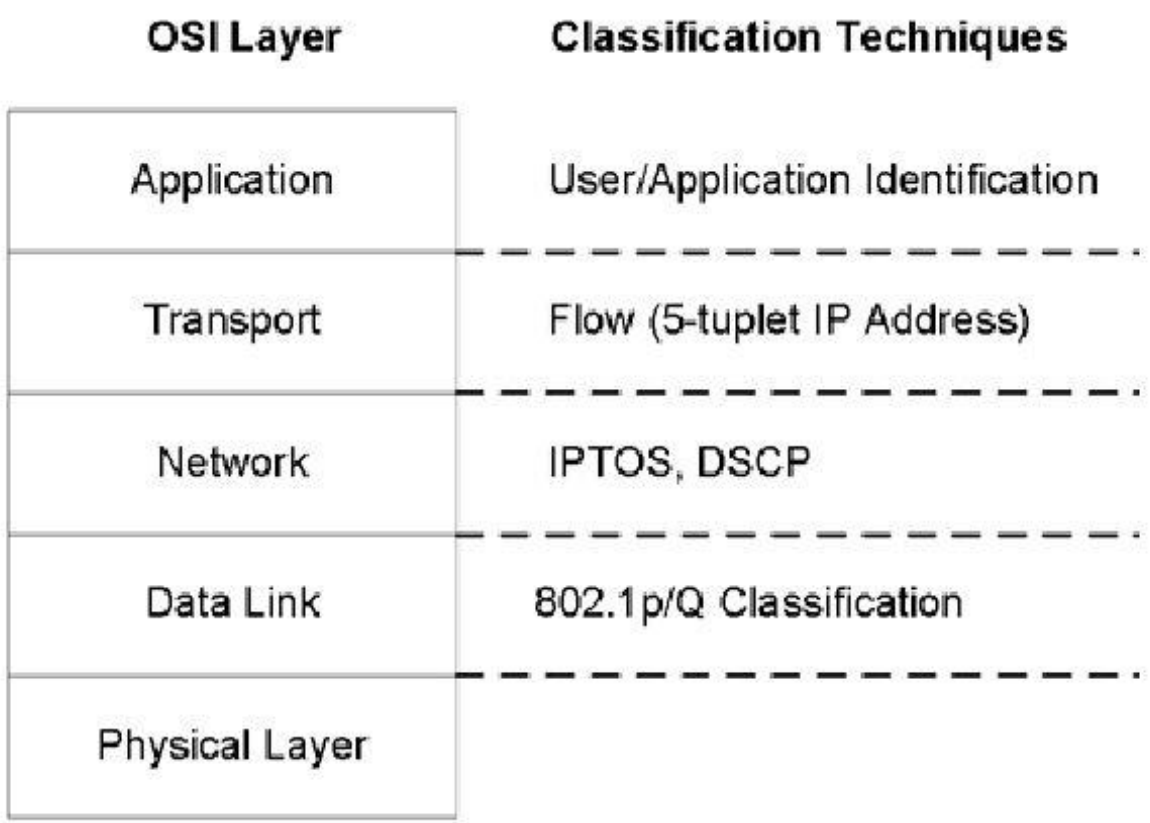
Admission Control

- *Explicit admission control*
  - decision is based on QoS requirements, available
  - resources, performance criteria, and network policy

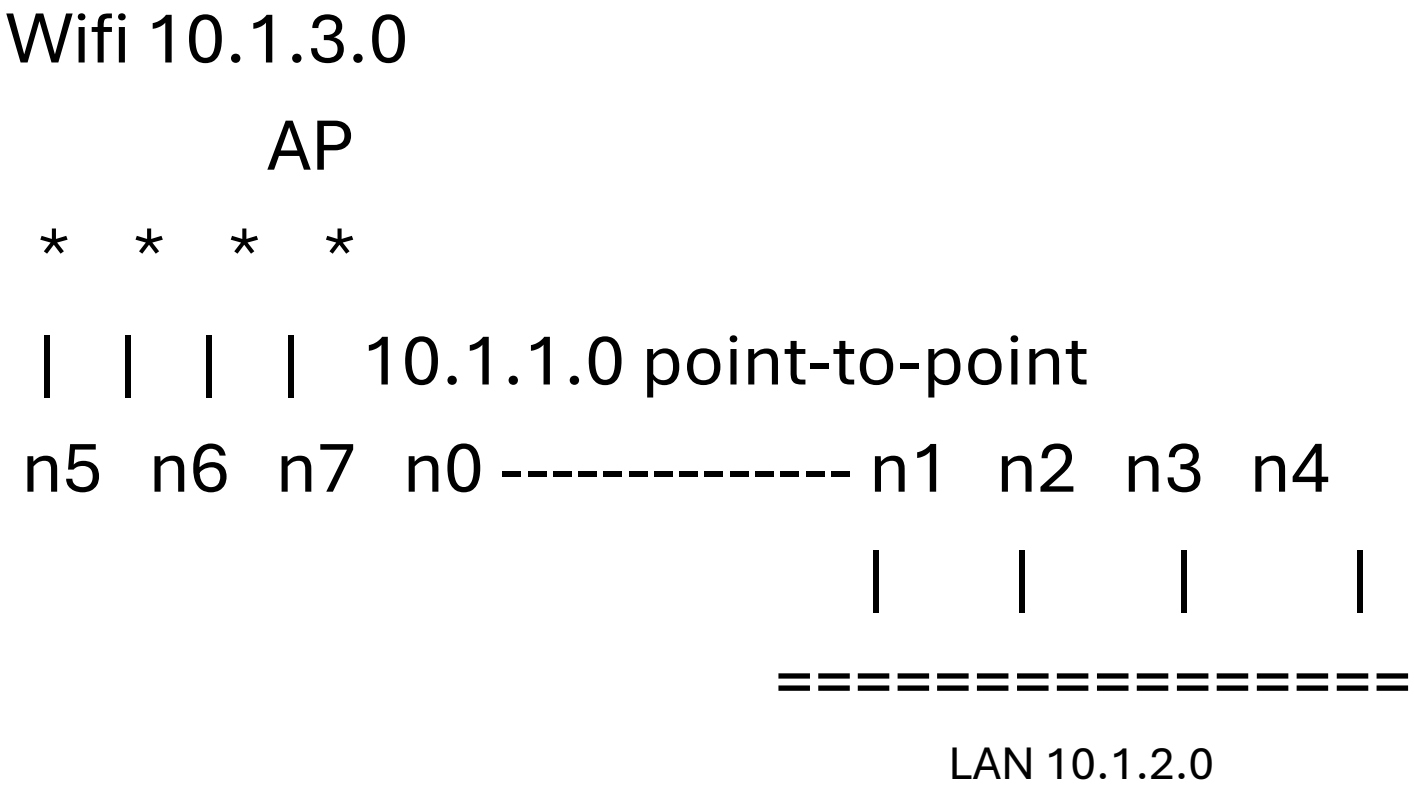
- *Implicit admission control*
  - relies on bandwidth over-provisioning and traffic control

In Traffic Mechanism- Classification

Can be per-user, per-flow, or per-class depending on the type of QoS services provided

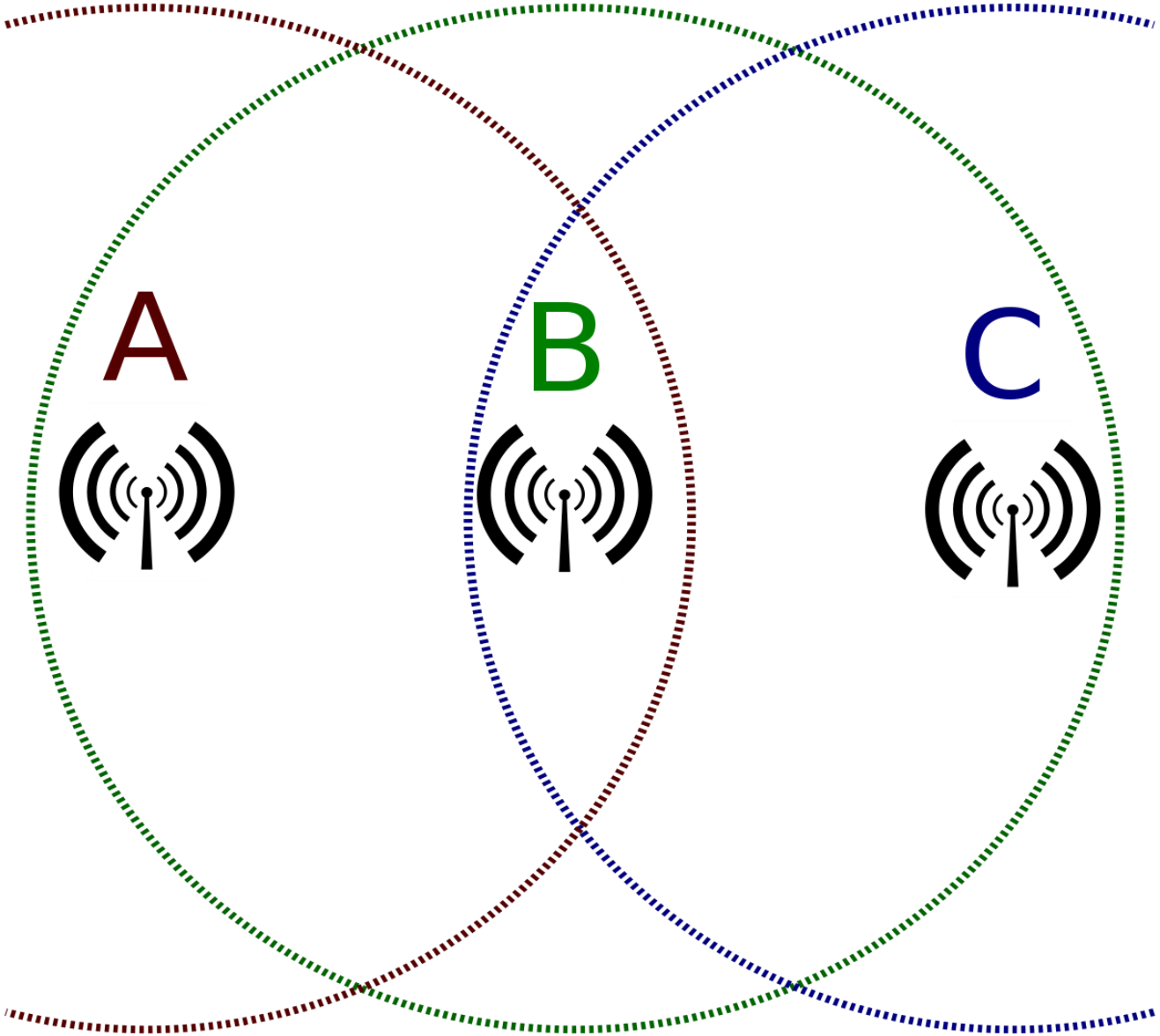


Research Paper



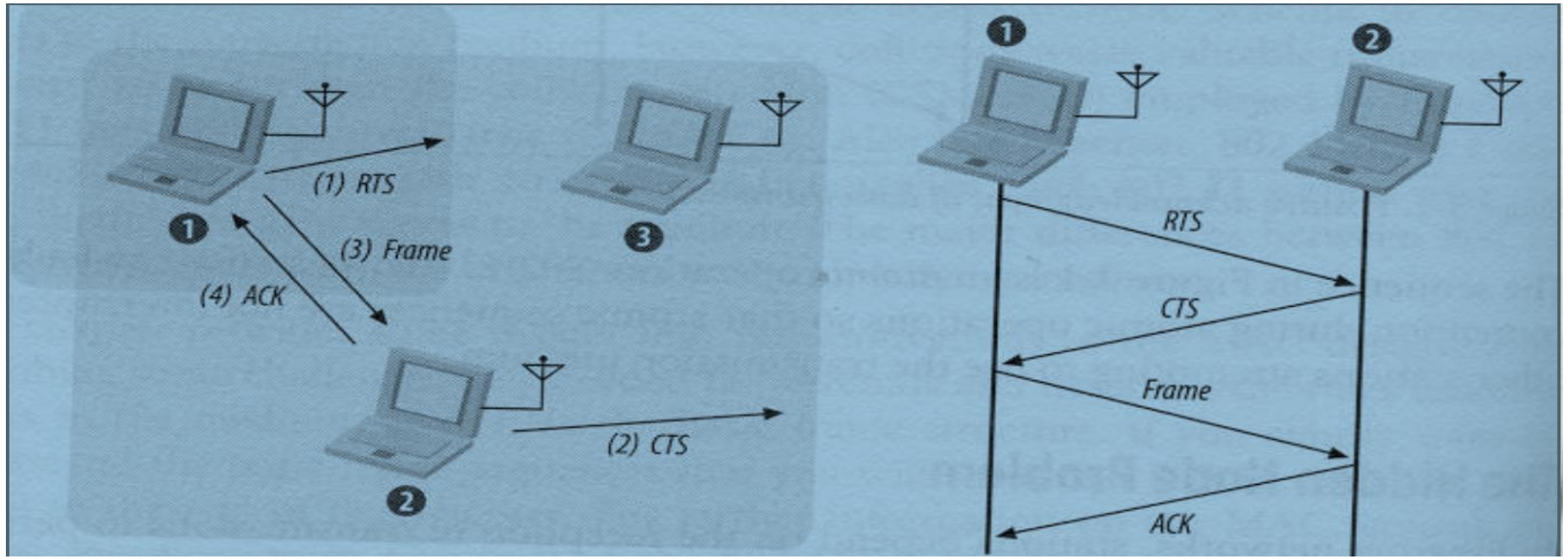
Wifi Hidden Nodes-

- Topology-



RTS and CTS

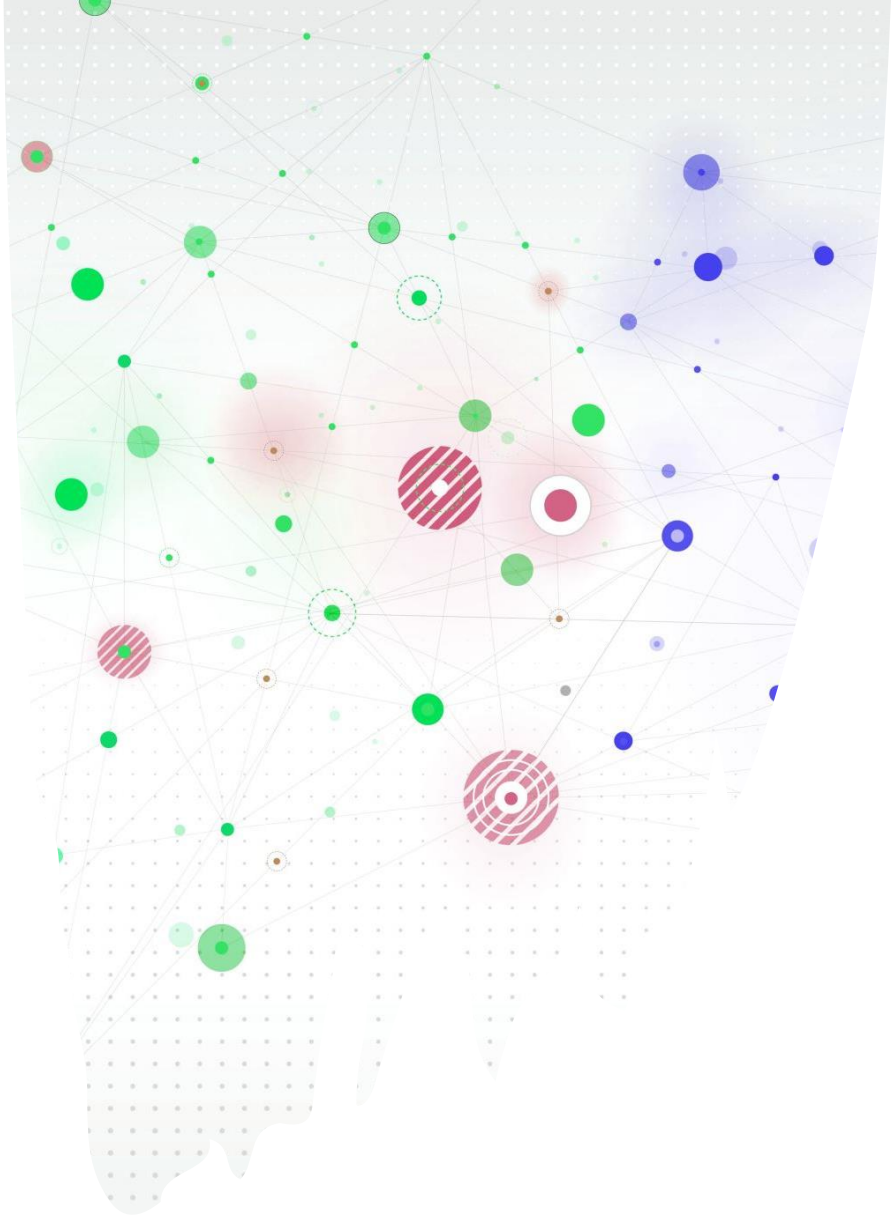
- Request to send (RTS) and Clear to send (CTS) procedure.



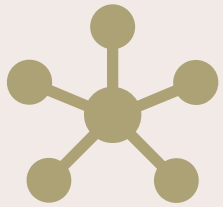
Analyzing wireless Network 802.11 Using NS-3

ET5907701-MULTIMEDIA
WIRELESS NETWORKS

RAVI SHANKAR PRASAD



Main Objective



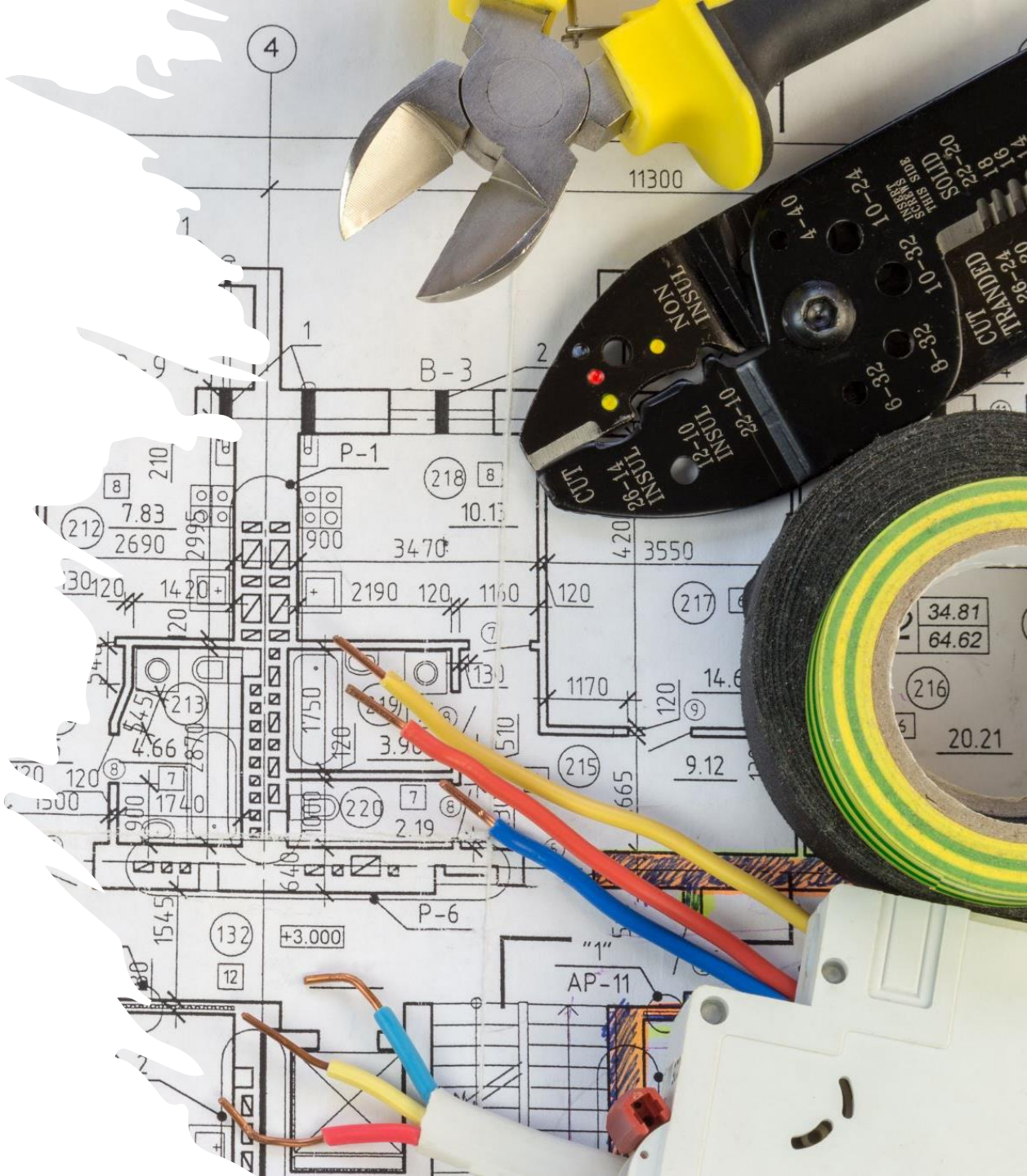
Number of Nodes

Implementation of RTS/CTS

Distance between Nodes.

Tools Used

- Ubuntu 22.04
- NS-3.41
- Wireshark
- NetAnim
- ASCII



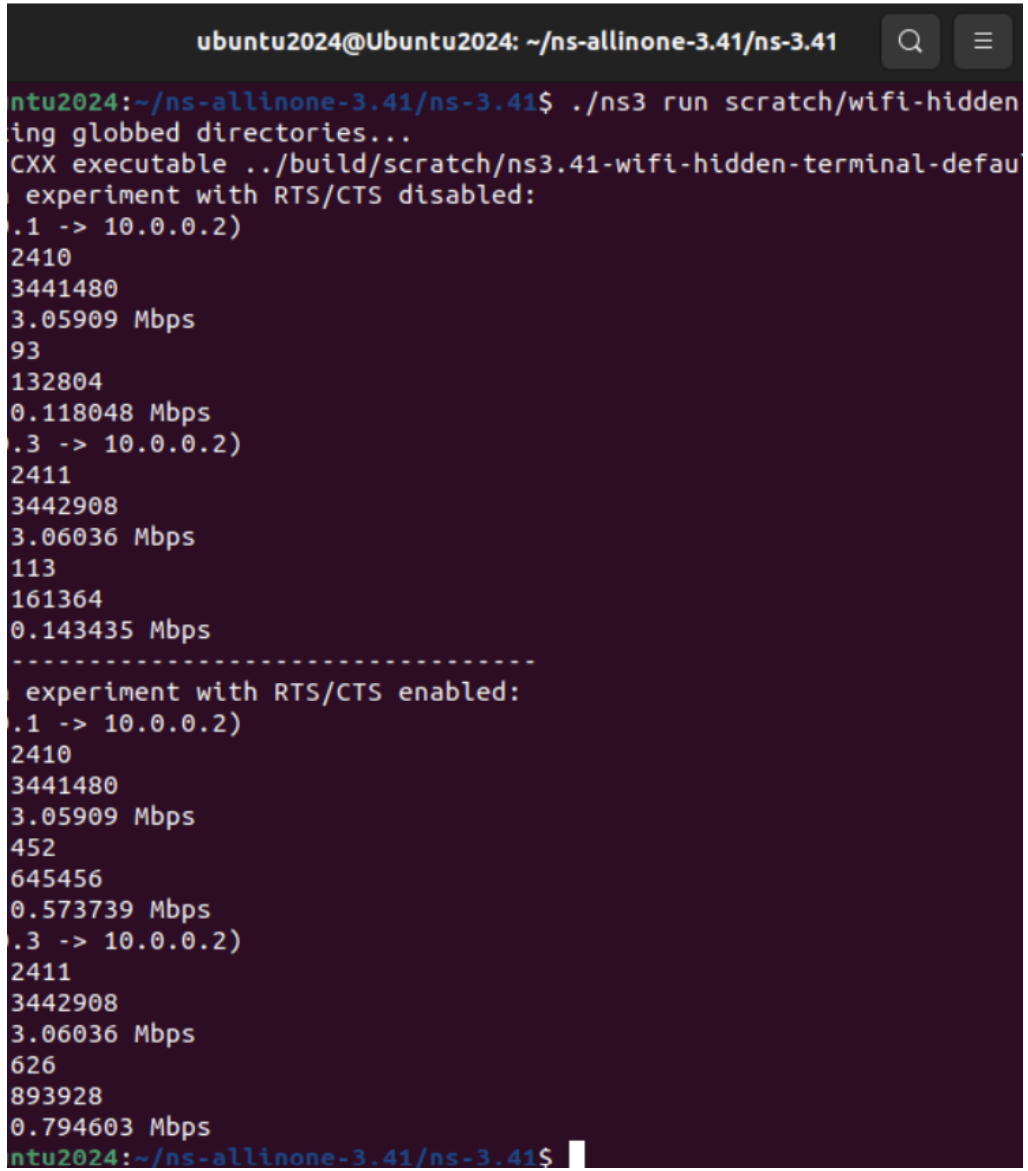
Throughput Calculation

- Thoughput = (Total number of Packets * Packet size)/Total Time

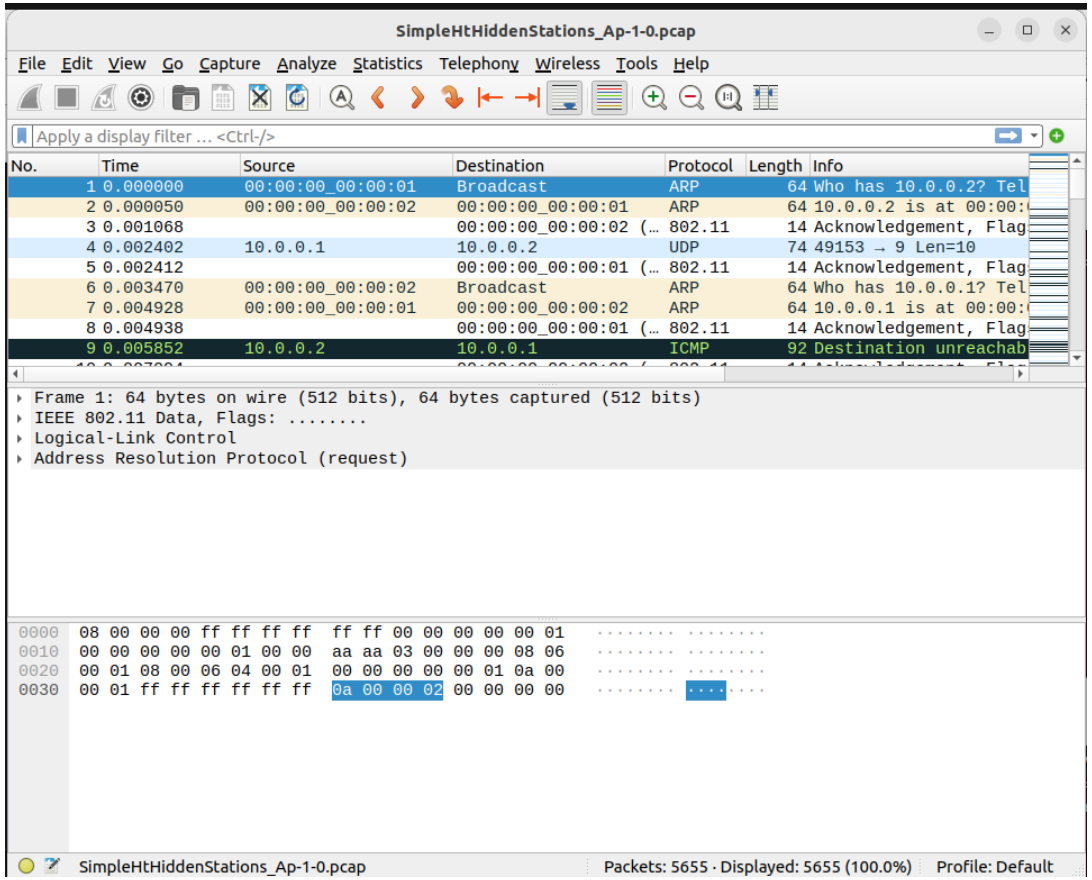
- First Simulation Results

```
ubuntu2024@Ubuntu2024:~/ns-allinone-3.41/ns-3.41$ ./ns3 run scratch/wifi-hidden-terminal
[0/2] Re-checking globbed directories...
[2/2] Linking CXX executable ../build/...ch/ns3.41-wifi-hidden-terminal-default
Hidden station experiment with RTS/CTS disabled:
Flow 1 (10.0.0.1 -> 10.0.0.2)
  Tx Packets: 2410
  Tx Bytes:   3441480
  TxOffered:  3.05909 Mbps
  Rx Packets: 93
  Rx Bytes:   132804
  Throughput: 0.118048 Mbps
Flow 2 (10.0.0.3 -> 10.0.0.2)
  Tx Packets: 2411
  Tx Bytes:   3442908
  TxOffered:  3.06036 Mbps
  Rx Packets: 113
  Rx Bytes:   161364
  Throughput: 0.143435 Mbps
------------------------------------------------
Hidden station experiment with RTS/CTS enabled:
Flow 1 (10.0.0.1 -> 10.0.0.2)
  Tx Packets: 2410
  Tx Bytes:   3441480
  TxOffered:  3.05909 Mbps
  Rx Packets: 572
  Rx Bytes:   816816
  Throughput: 0.726059 Mbps
Flow 2 (10.0.0.3 -> 10.0.0.2)
  Tx Packets: 2411
  Tx Bytes:   3442908
  TxOffered:  3.06036 Mbps
  Rx Packets: 474
  Rx Bytes:   676872
  Throughput: 0.601664 Mbps
ubuntu2024@Ubuntu2024:~/ns-allinone-3.41/ns-3.41$
```

2nd Simulation Throughput



Wireshark output



Wireshark I/O graph