ENSC 427: COMMUNICATION NETWORKS

ANALYSIS OF VOIP PERFORMANCE OVER WI-FI NETWORKS

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Group #4
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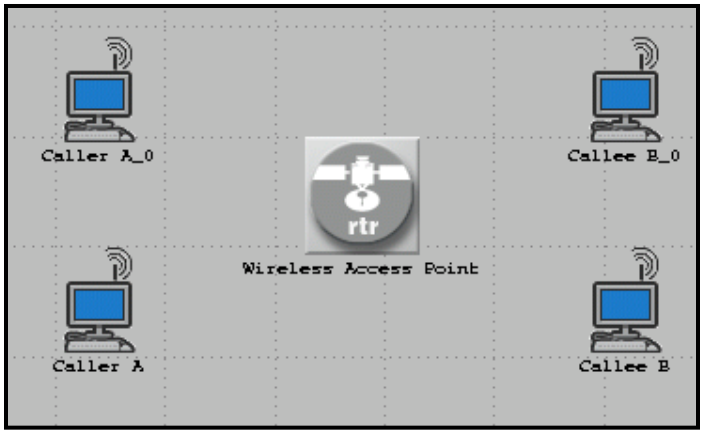
OVERVIEW

- Introduction
- Background Information
- Simulation Guideline
- Analysis of Results
- Conclusion



INTRODUCTION

- Purpose
  - Performance of VoIP over Wi-Fi Networks
  - Implementing this technology campus wide

- Issues to Analyze
  - Quality of Service (QoS)
  - Range vs. power considerations
  - Jitter and delay
  - Packet loss

WI-FI TECHNOLOGY

- Advantages
  - Large throughput
  - Handles large file transfers
  - Already available in most areas

- Disadvantages
  - Limited range
  - Require access points (costly)

- City-Wide Wi-Fi
  - Blanket city or certain area in Wi-Fi

VOICE OVER IP TECHNOLOGY

- Advantages
  - Alternative to public switched telephone networks
  - Low cost
  - Efficient bandwidth and flexibility

- Disadvantages
  - Concerns for QoS over Wi-Fi

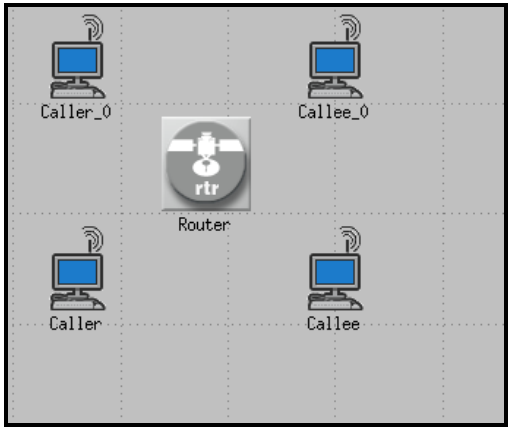
SIMULATION SET-UP

- Network Topology
  - Campus Network
  - Two Calling Pairs

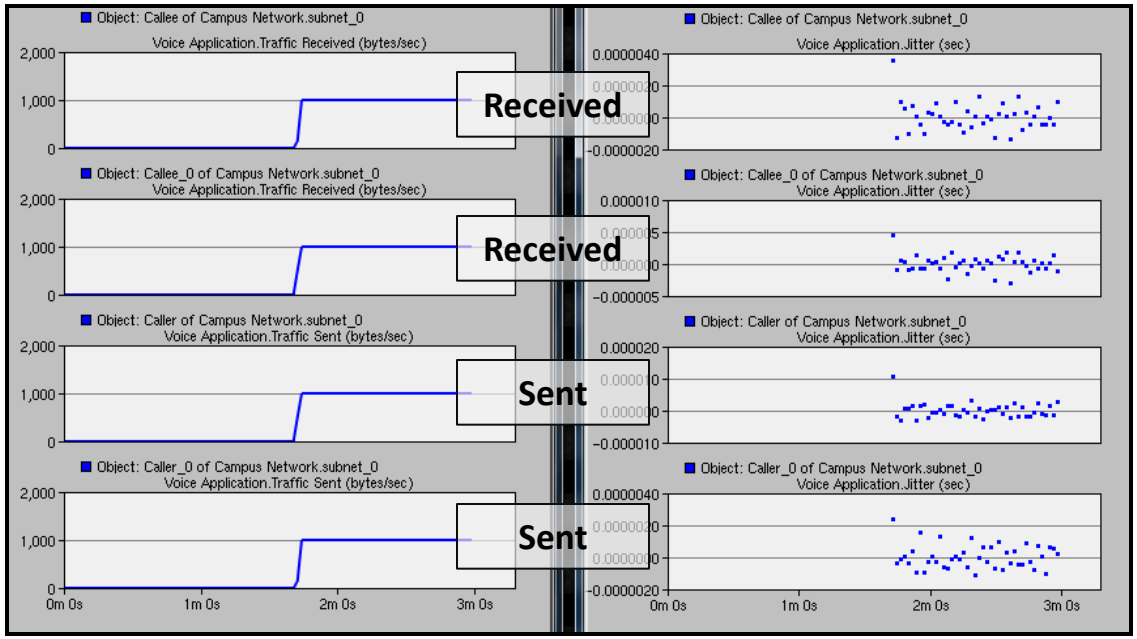
- Technology
  - Wi-Fi: 802.11g
  - VoIP: G.729a encoding

- Scenarios
  - Single and multiple stationary calling pairs
  - Multiple moving calling pairs
  - Power modifications

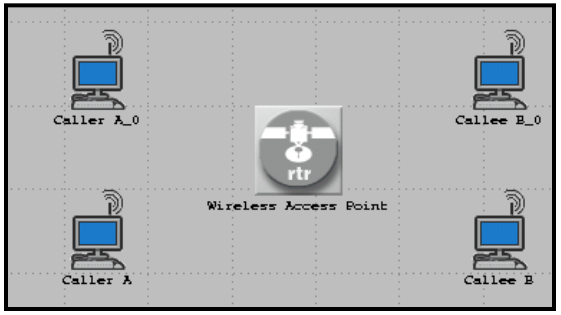
STATIONARY CALLING PAIRS



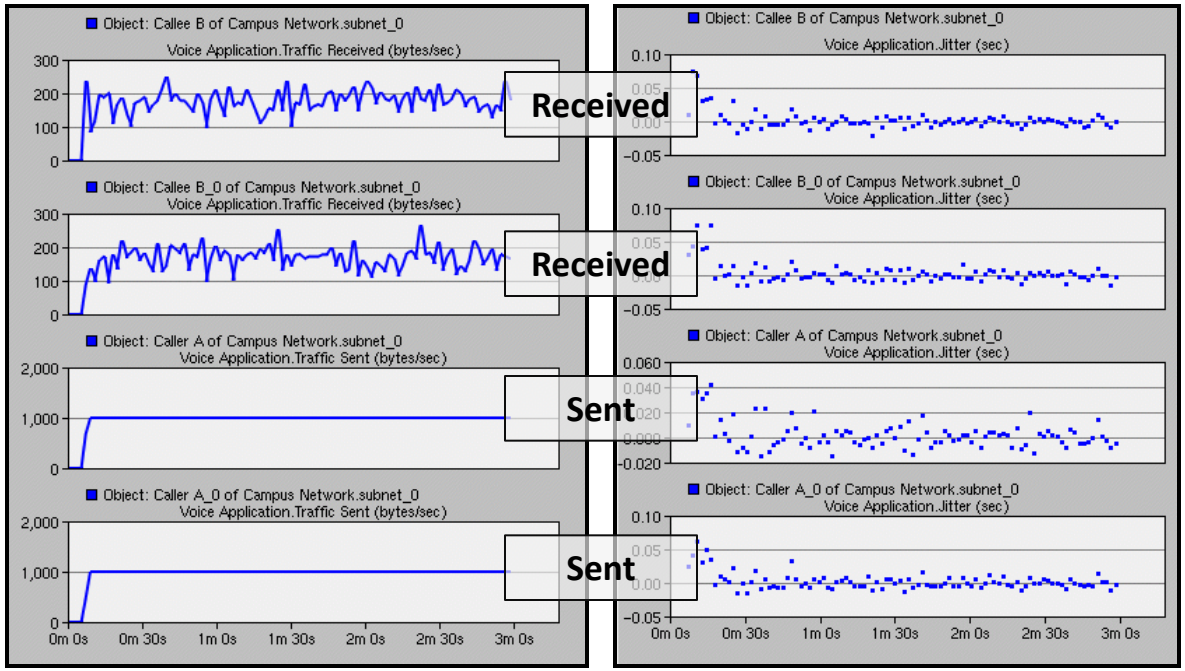
- Set-up 1
  - Two calling pairs within **100m** of the access point
- Results
  - No packet loss
  - Low jitter



STATIONARY CALLING PAIRS

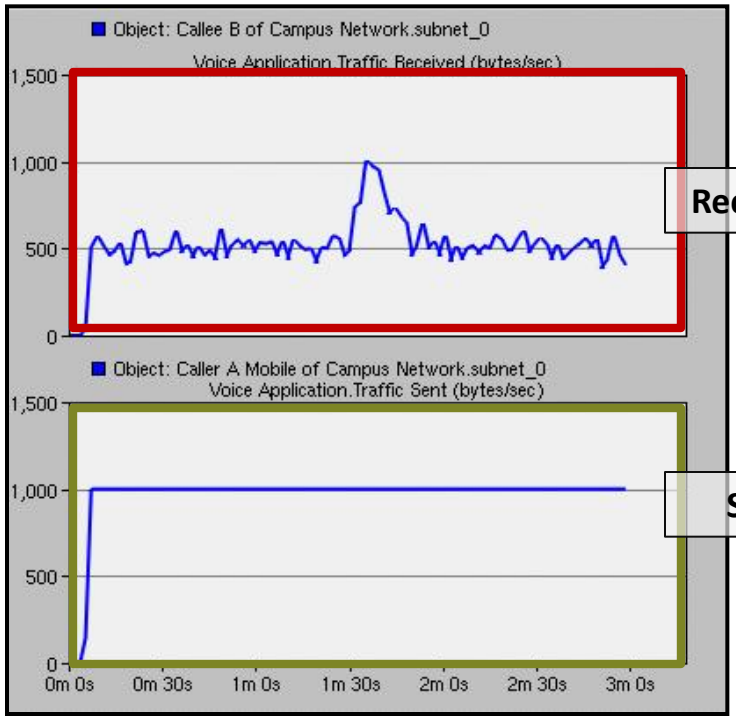


- Set-up 2
  - Two calling pairs within **400m** of the access point
- Results
  - Packet loss
  - Increase in jitter



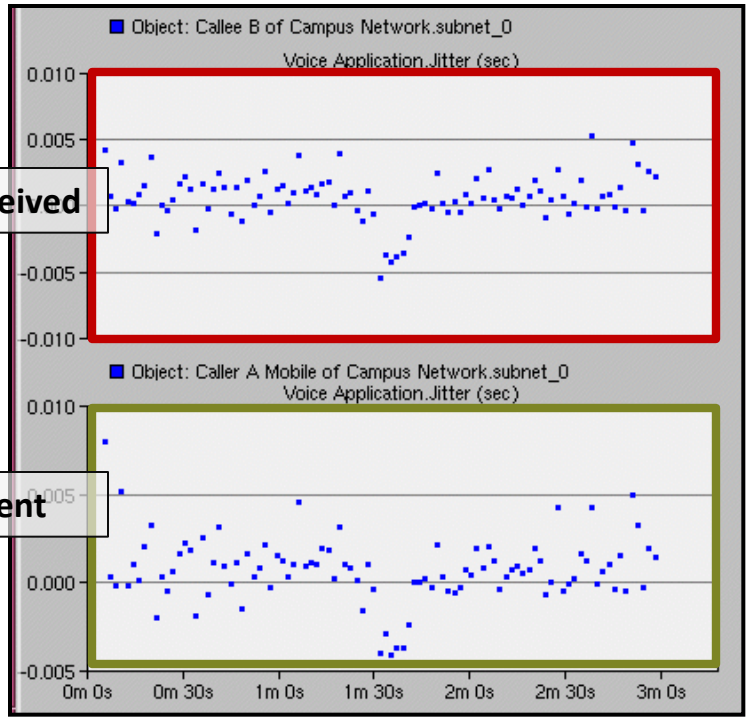
MOBILE CALLING PAIRS

- Set-up 1
  - One mobile pair
- Results
  - Increased data when closer to router

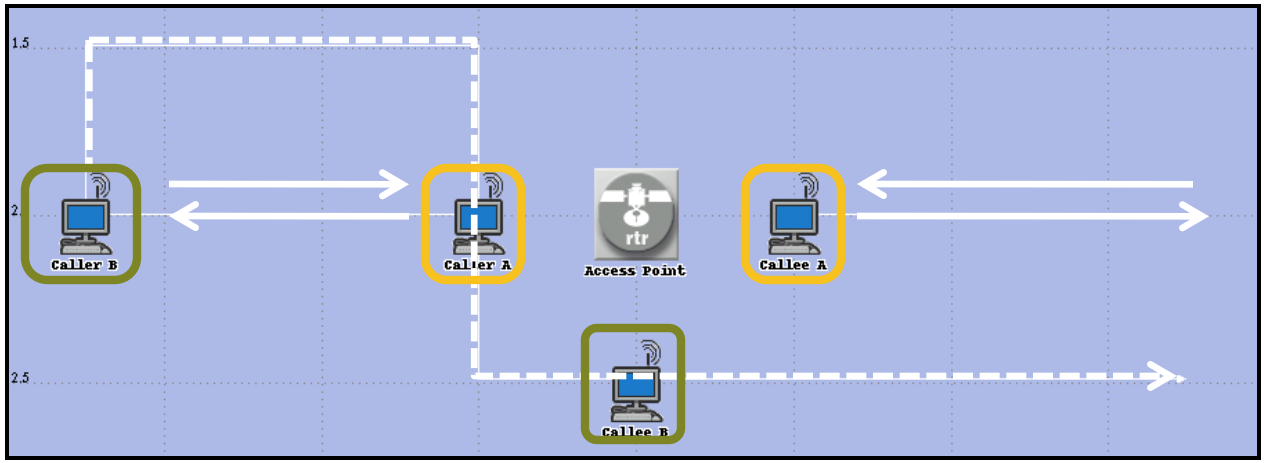


Received

Sent

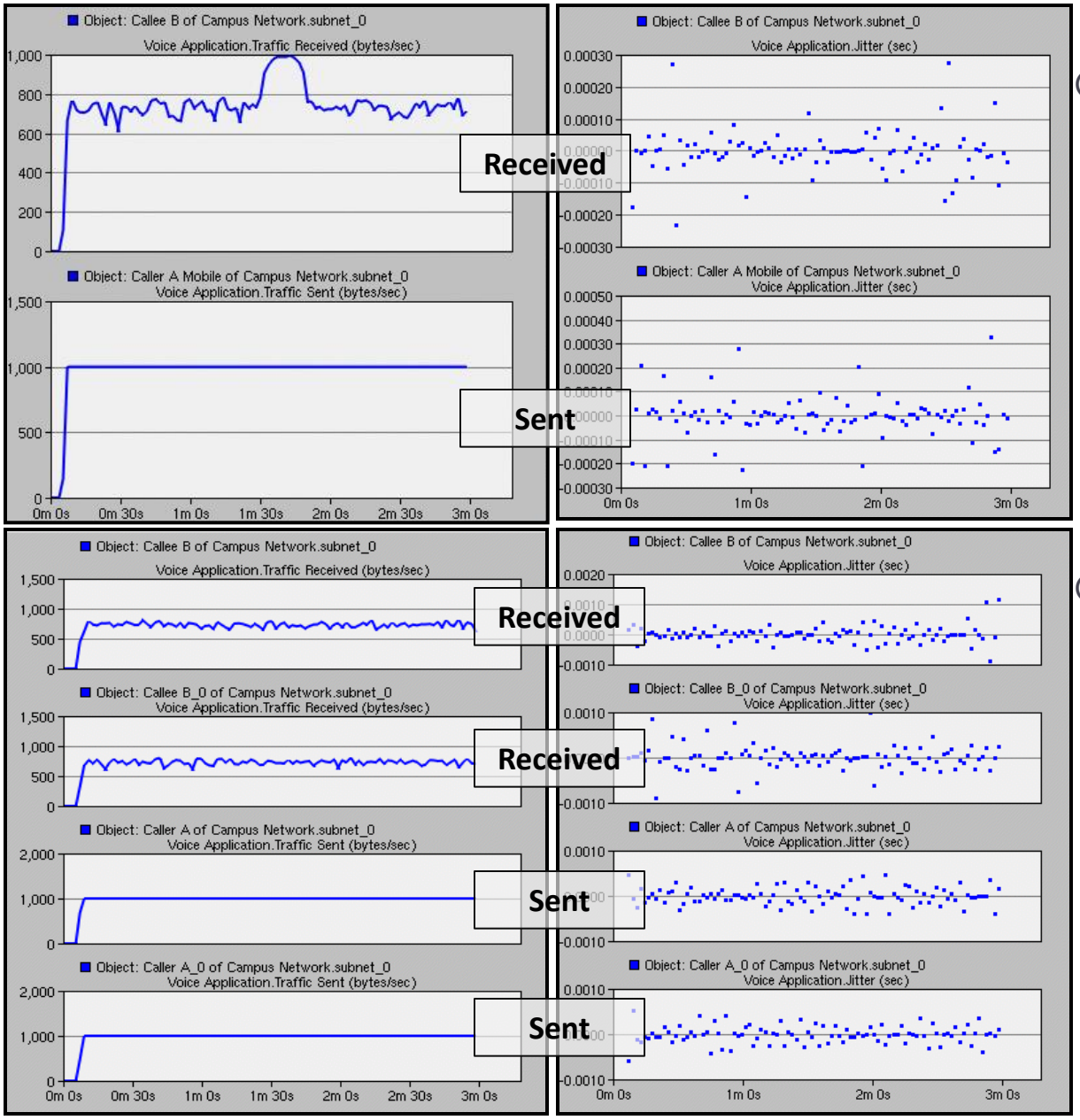


MOBILE CALLING PAIRS



- Set-up 2
  - Two mobile pairs
- Results
  - Spike in data/jitter

POWER MODIFICATION



- Set-up
  - 1-2 pairs
  - Fixed and mobile nodes
  - 10mW change
- Results
  - Better performance
  - Lower jitter
  - Higher data transfer

ORGANIZATION & TIME MANAGEMENT

- Divided work
  - Stationary Simulations
  - Mobile Simulations
  - Power Simulations

- Shared work
  - Documentation and research

- Weekly meetings
  - deadlines
  - goals

RELATED WORK

- Seamless Wireless Handoff
- Power Throttling States

CONCLUSION

- VoIP is over Wi-Fi is a good choice for stationary nodes
- Increased power profiles will help maintain high QoS
- Cost-effective while providing greater clarity
- Feasible in fixed environments

References

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