ENSC 427
Communication Networks
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Analysis of VoIP
(Voice over Internet Protocol)

Group 11
King Fai Chung kfchung@sfu.ca
Yue Pan ypa11@sfu.ca
Ziyue Zhang zza15@sfu.ca

http://www.sfu.ca/~ypa11/Ensc%20427/427.html

Overview

- Introduction
- Scenario cases
- Results analysis

Voice over Internet Protocol

- Start 1970s
- Transmit voice and multimedia over packet switched network
- Operate Over Internet Protocol
- Alternative to public switched telephone network (PSTN)
- Allows call to be make over non phone device

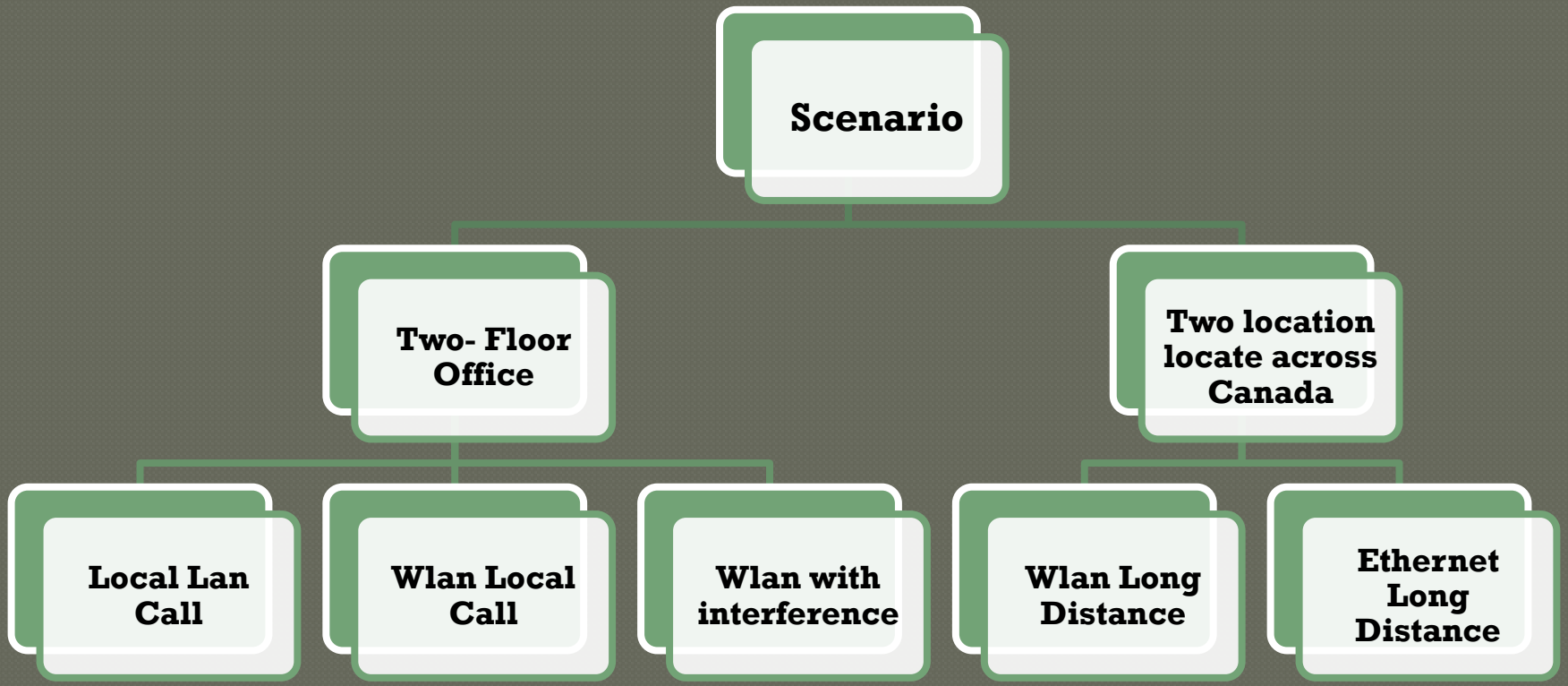
VoIP vs. Tradition Calls

- Cost
- Quality
- Reliability

Introduction

- Project motivation
  - Increasing popularity of VoIP
- Project overview
  - Performance of VoIP between wire and wireless connection
  - Compare and analysis the QoS parameter between scenarios

Scenario Cases



Analysis Parameters

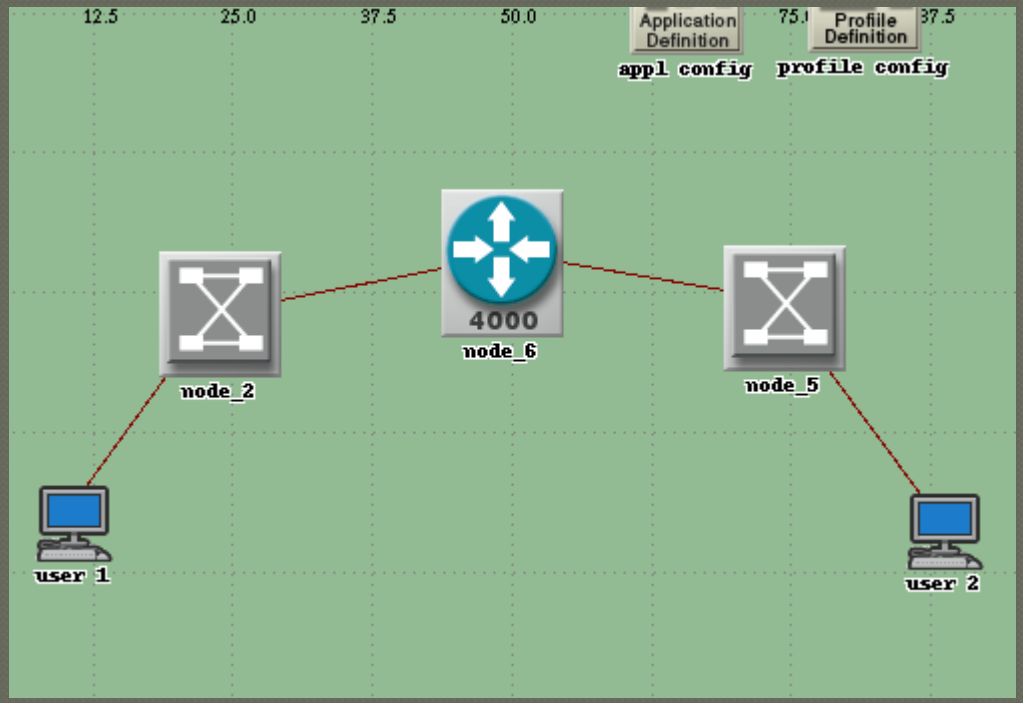
- Jitter
- Mean Opinion Score Value (MOS Value)
- End to End Delay
- Delay Variation

Simulation Setup

- WLAN 802.11g connection using 56Mbps
- G.711 encode scheme
- 1 voice frame / packet
- Best effort
- One minute /call and total simulation of 5 calls in total

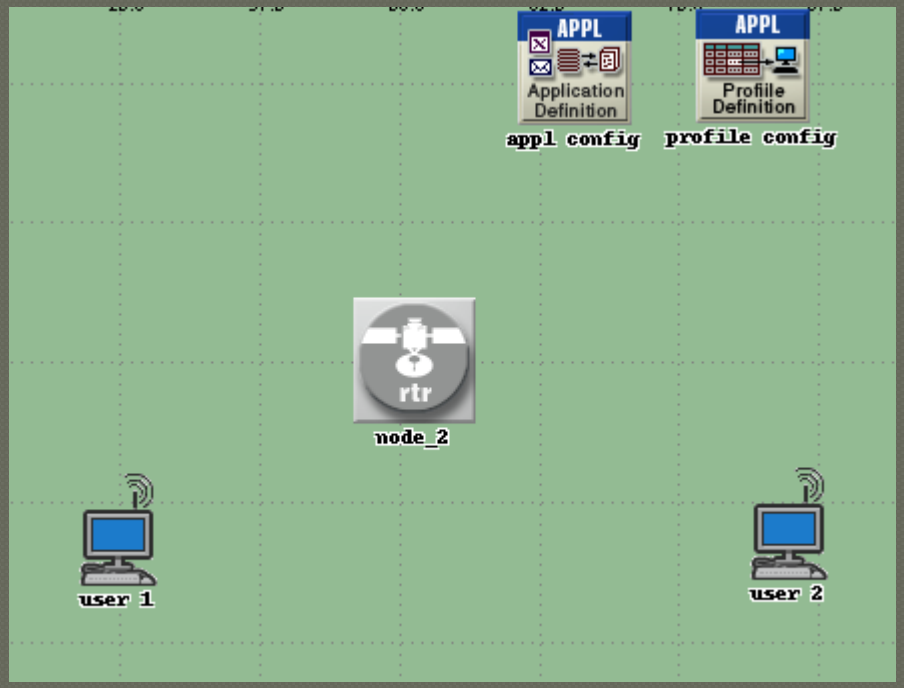
Scenario

- LAN Local call



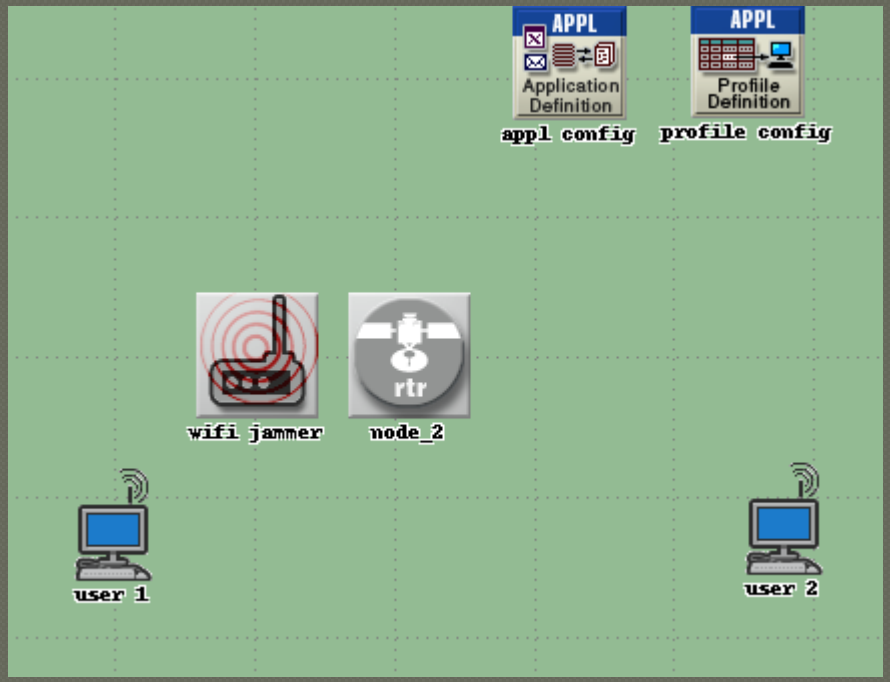
Scenario

- WLAN Local Call



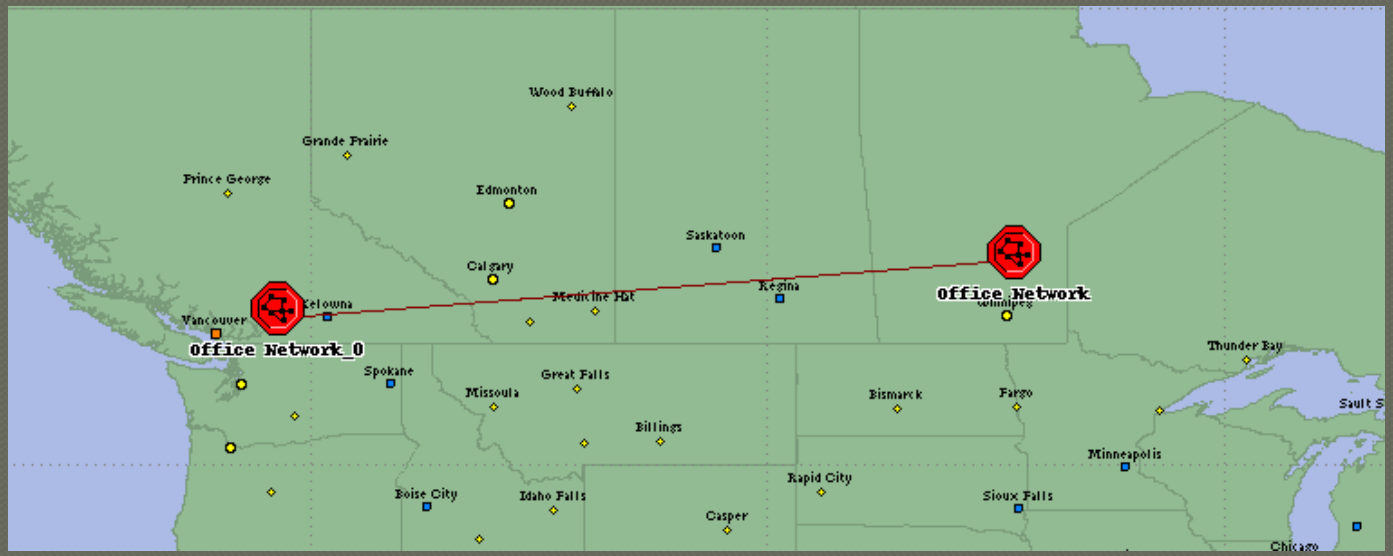
Scenario

- WLAN call with interference from same frequency devices



Scenario – Long Distance Call

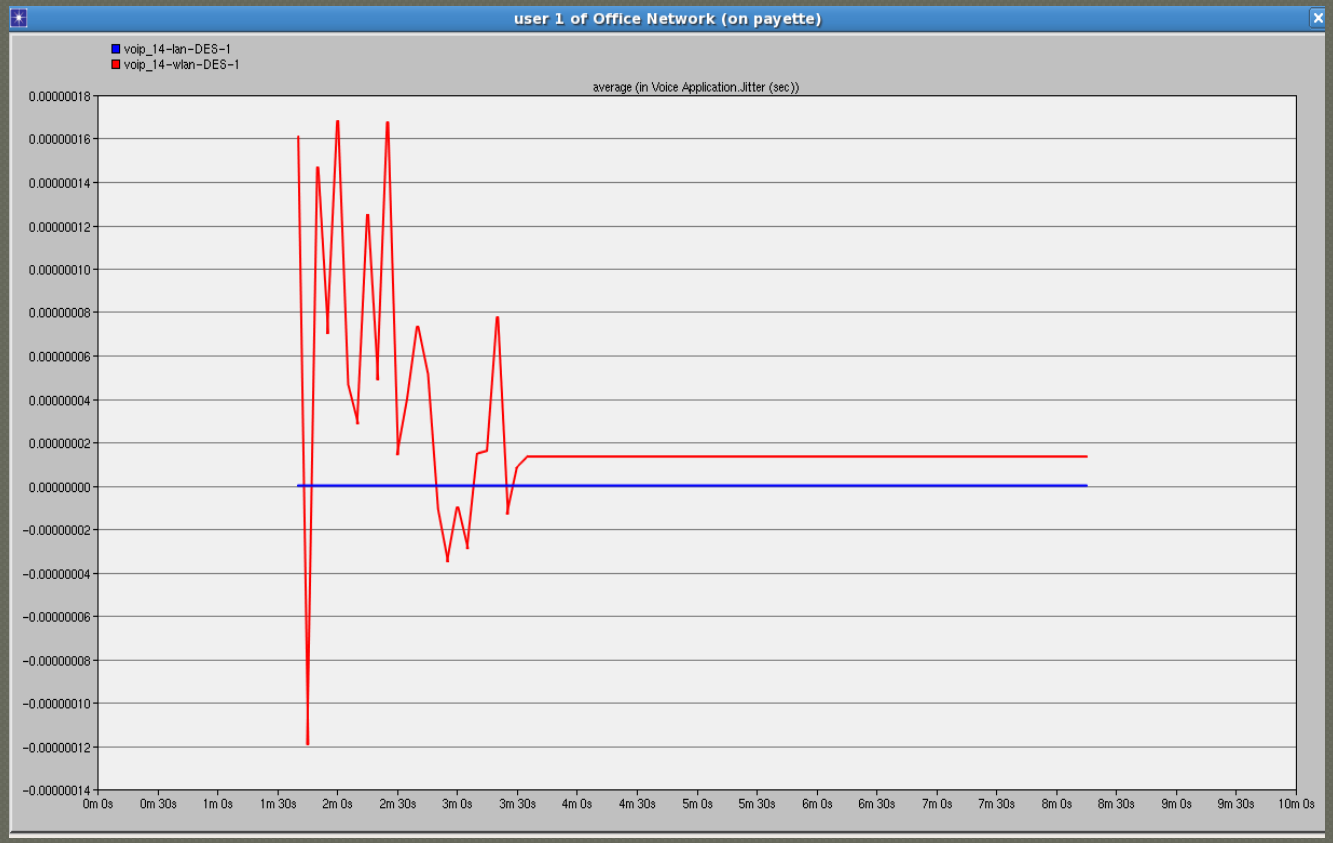
- Long distance call for LAN and WLAN Continental Size



Future Work

- Multiple access of switch (FTP, Printer server, Http server and Email Server)
- G.729 comparison
- WiMax over WiFi
- Conference Call across the Globe

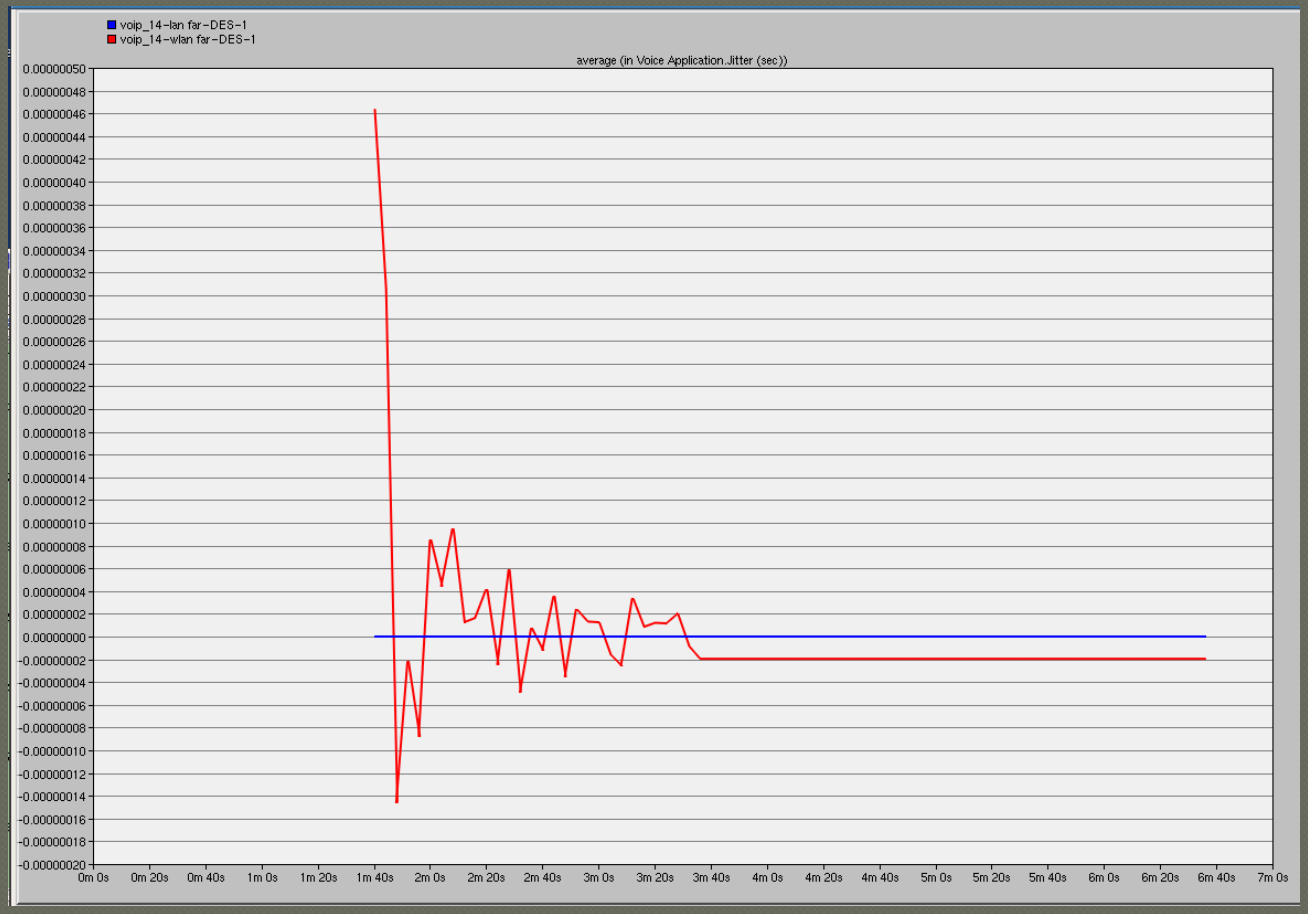
Results – Jitter (Local Call)



Blue – Ethernet Connection

Red – Wireless Connection

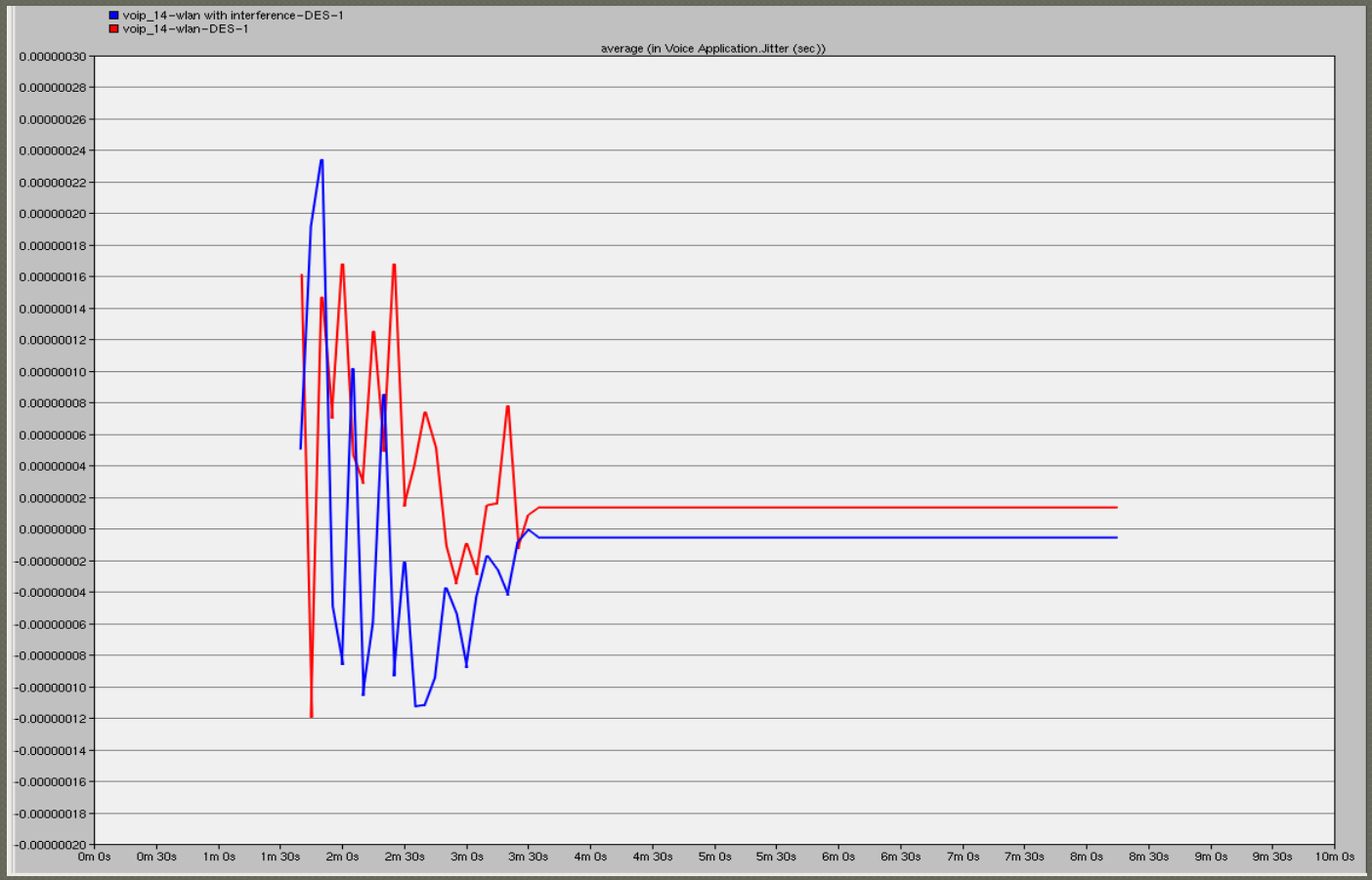
Results – Jitter (Long Distance Call)



Blue – Ethernet Connection

Red – Wireless Connection

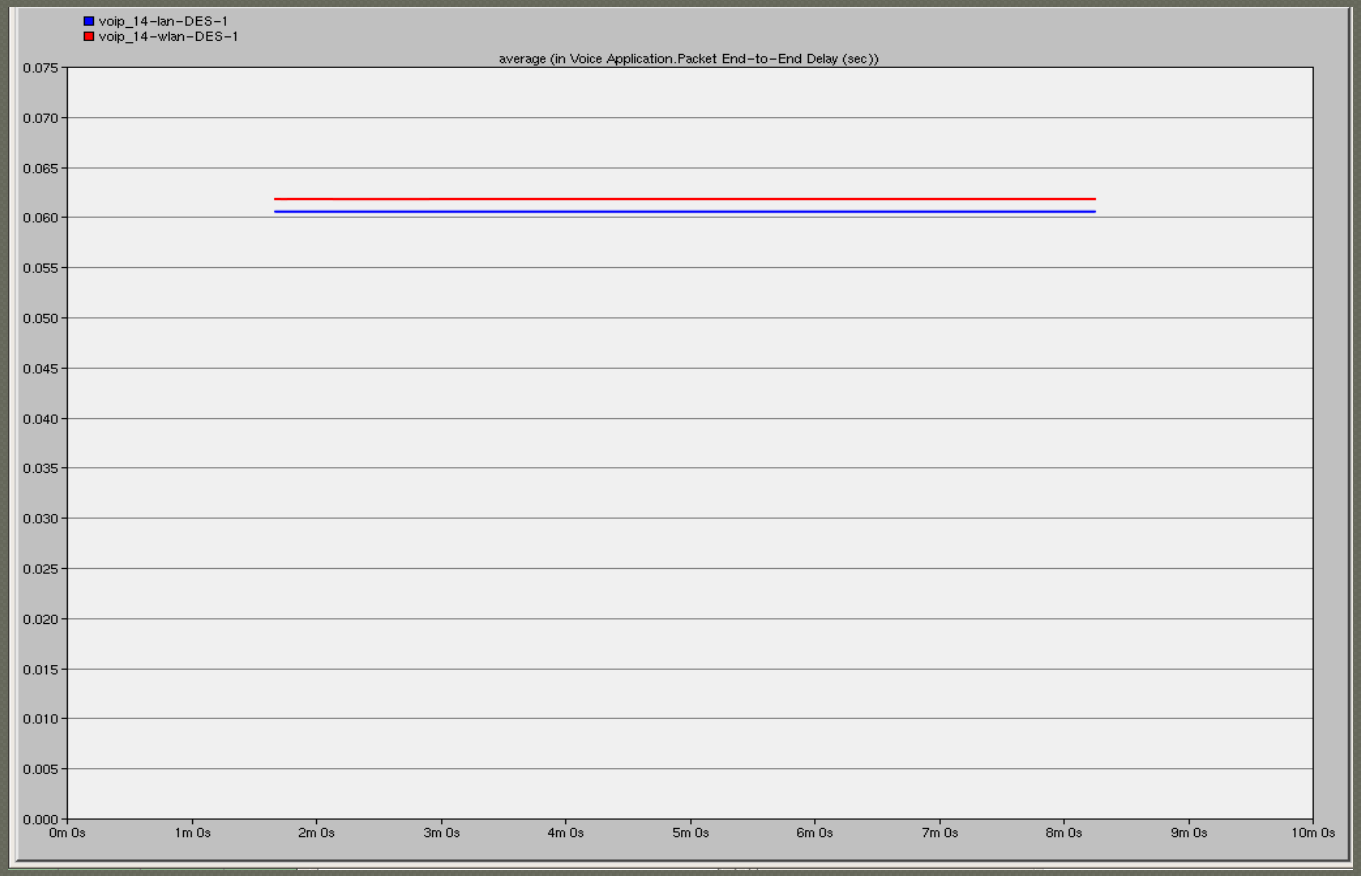
Results – Jitter (Wifi connection with interference)



Blue – Wireless Connection with interference

Red – Wireless Connection

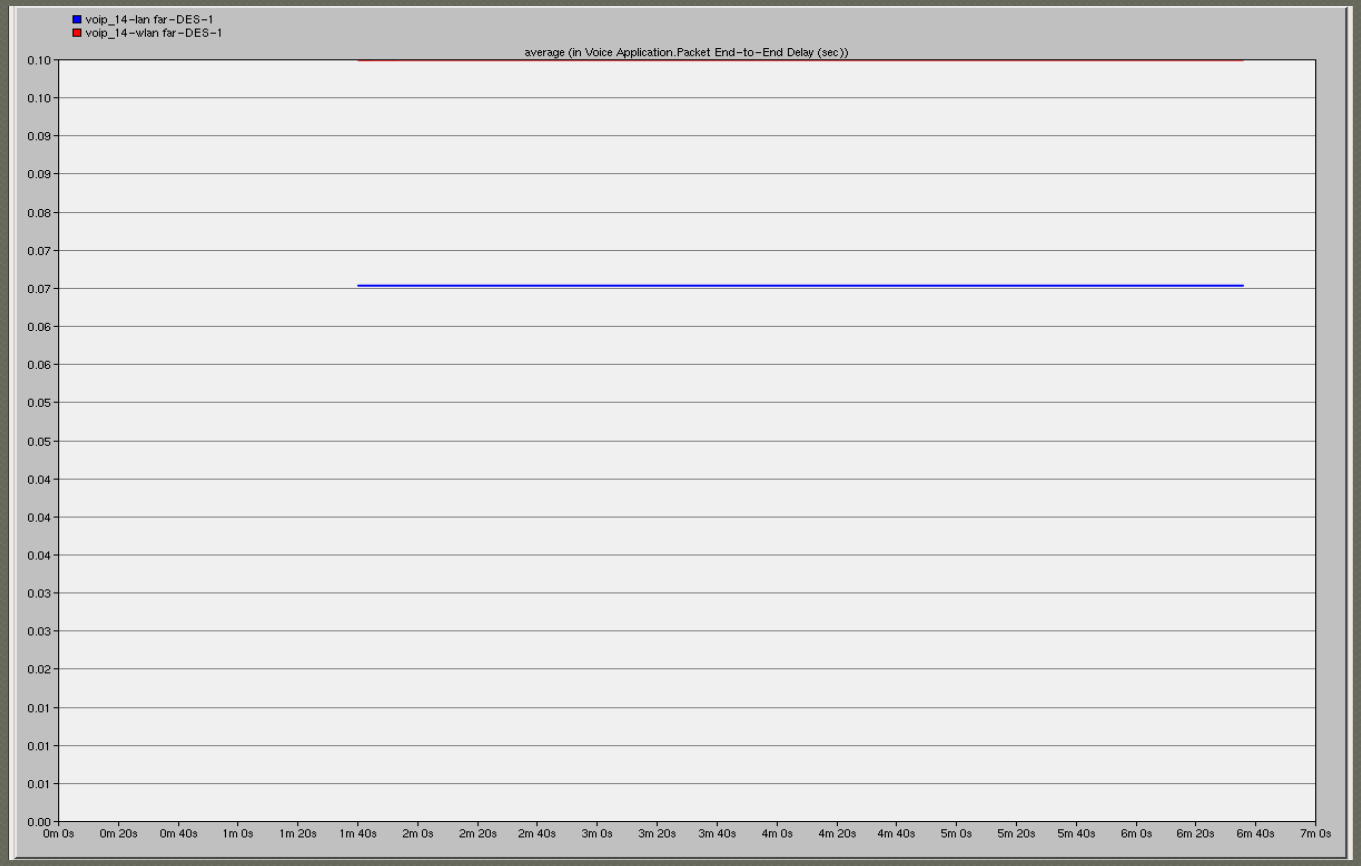
Results – ETE Delay (Local Call)



Blue – Ethernet Connection

Red – Wireless Connection

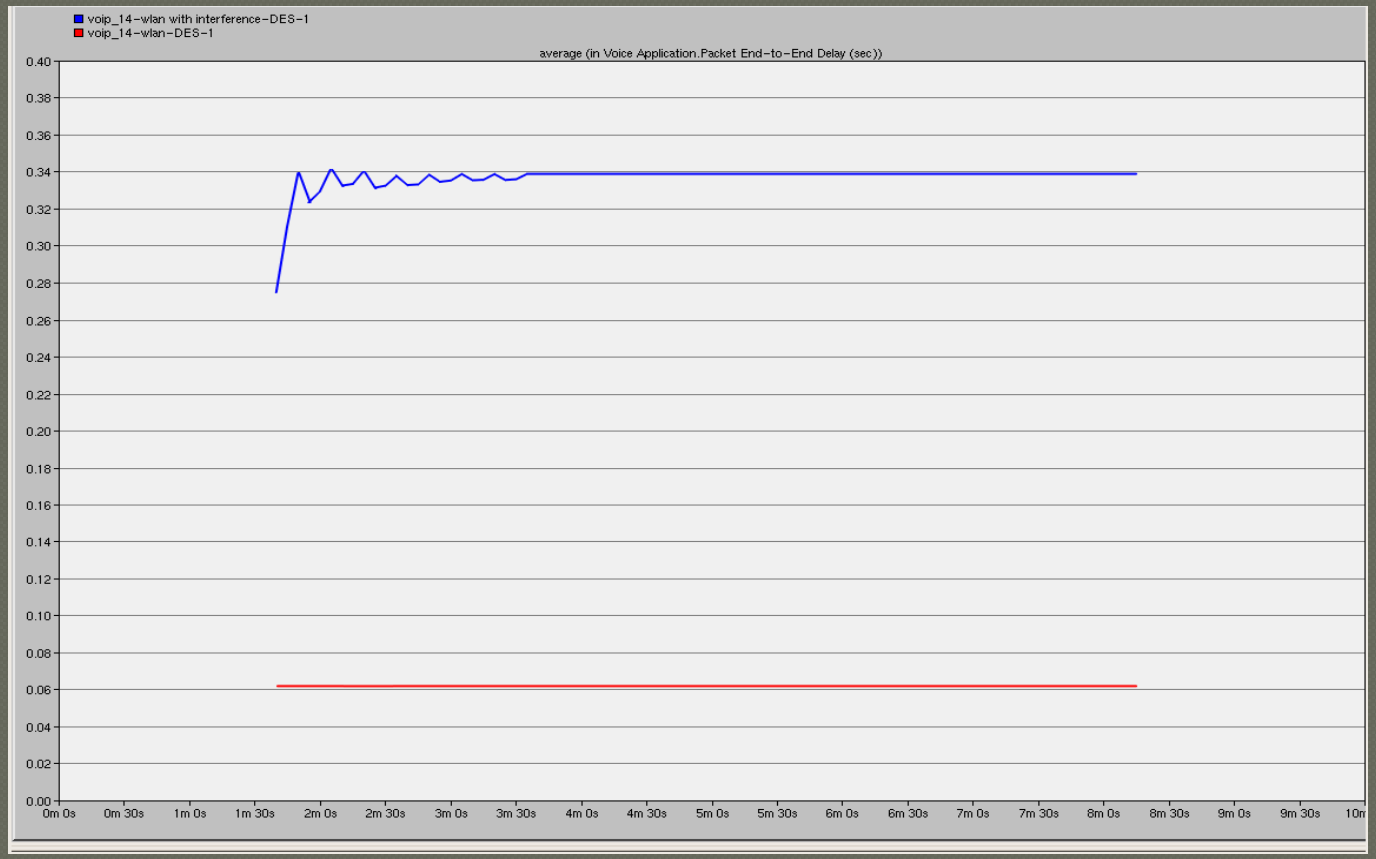
Results – ETE Delay (Long Distance Call)



Blue – Ethernet Connection

Red – Wireless Connection

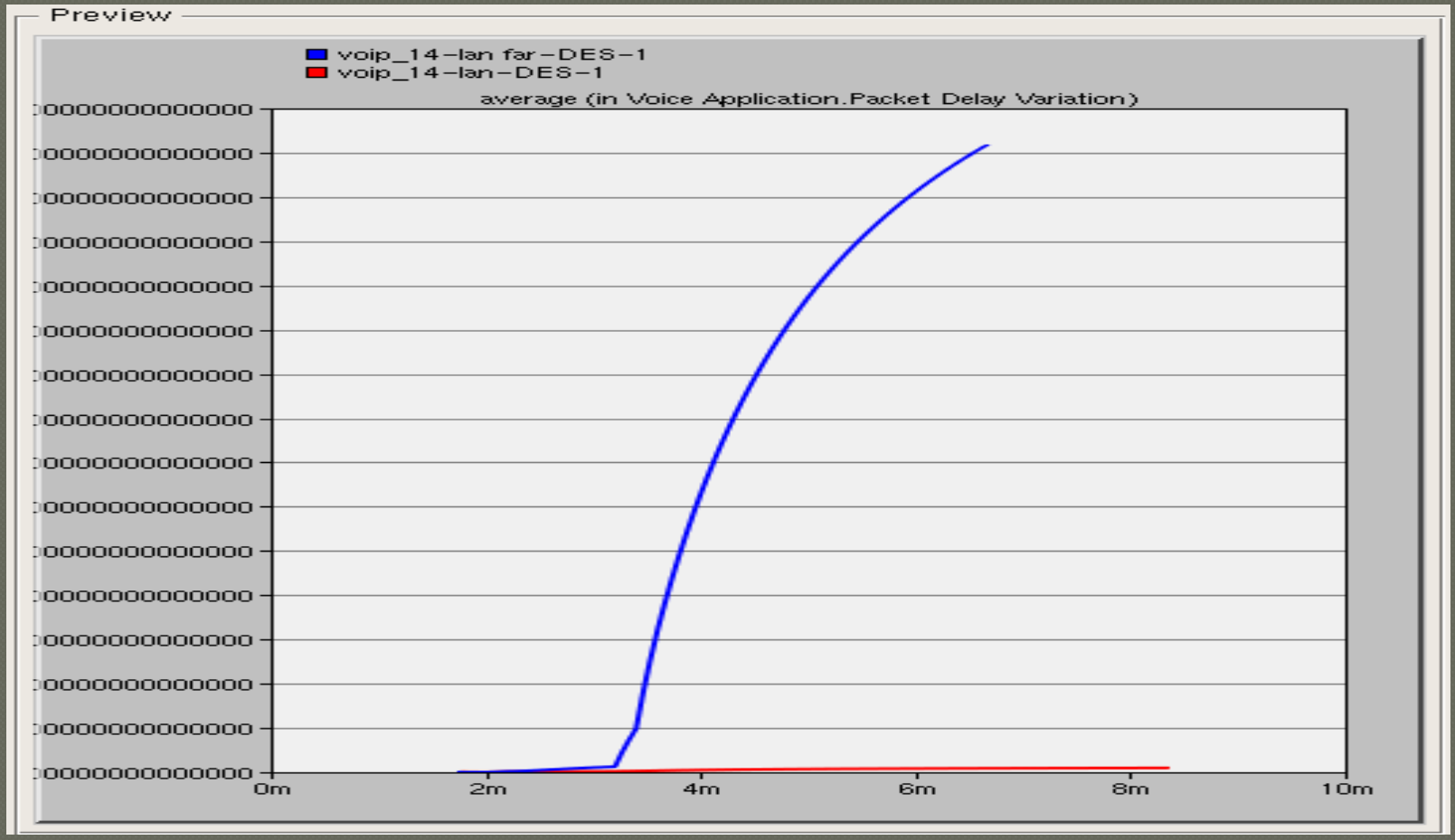
Results – ETE Delay (Interference)



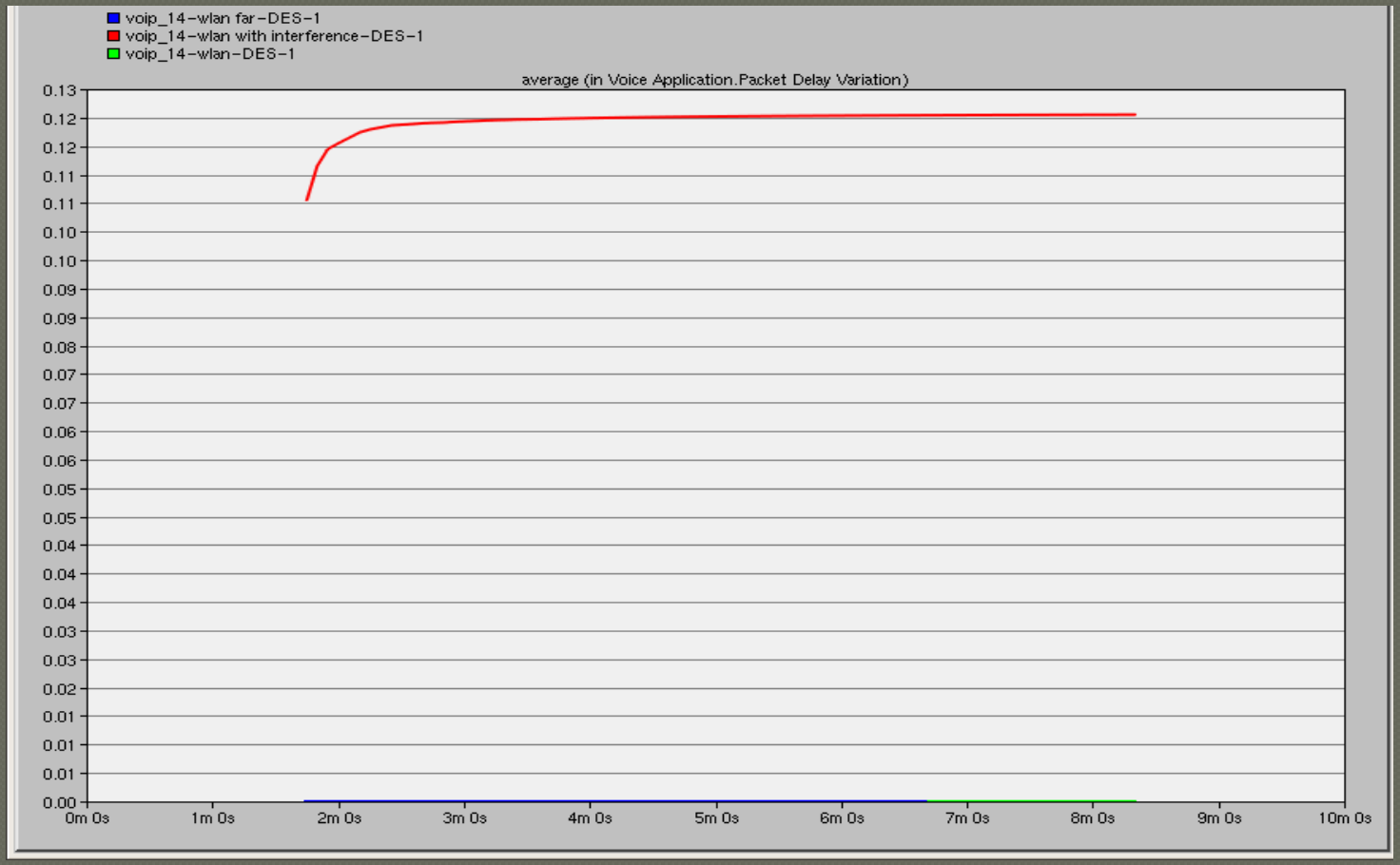
Blue – Wireless Connection with Interference

Red – Wireless Connection

Delay Variation

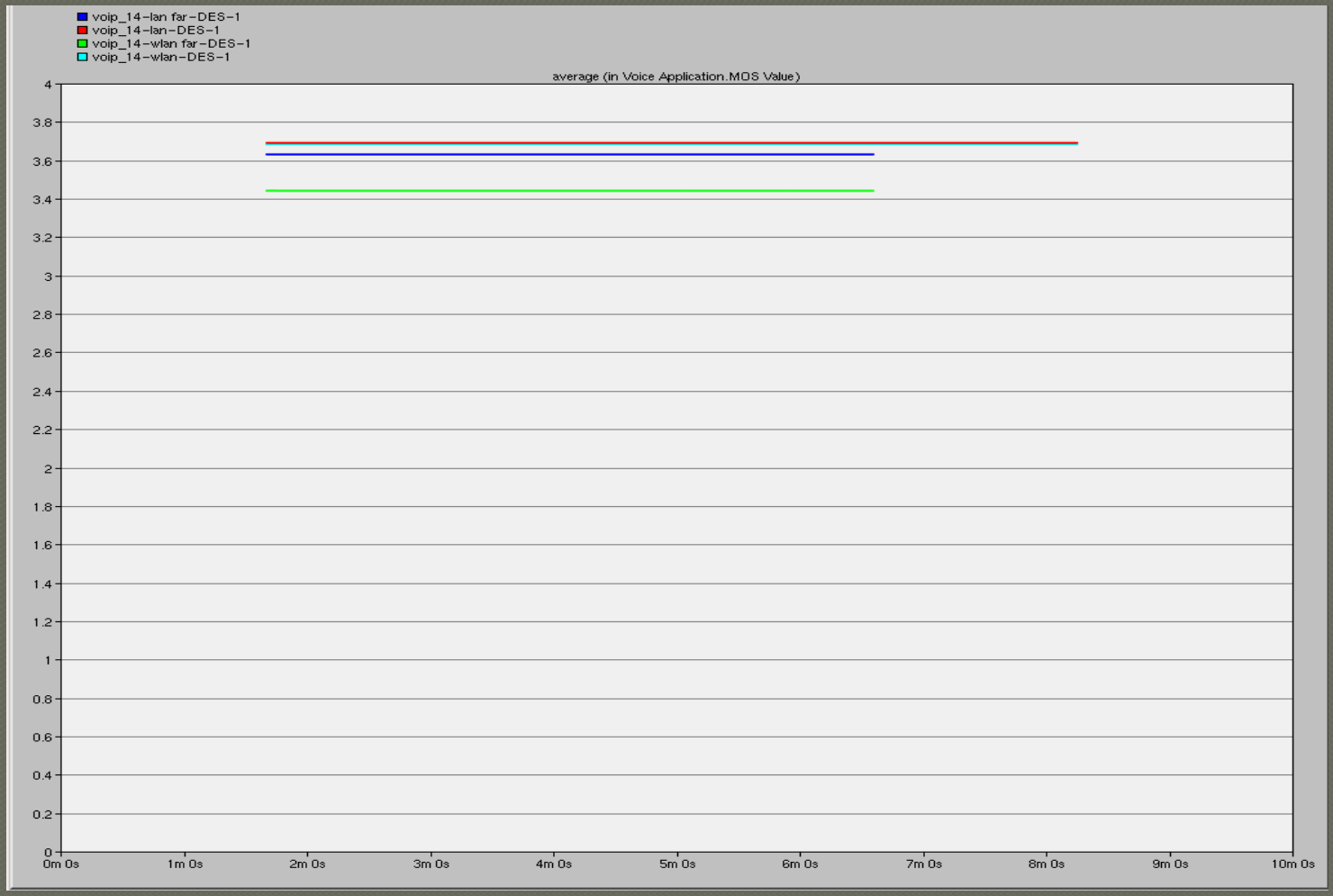


Delay Variation

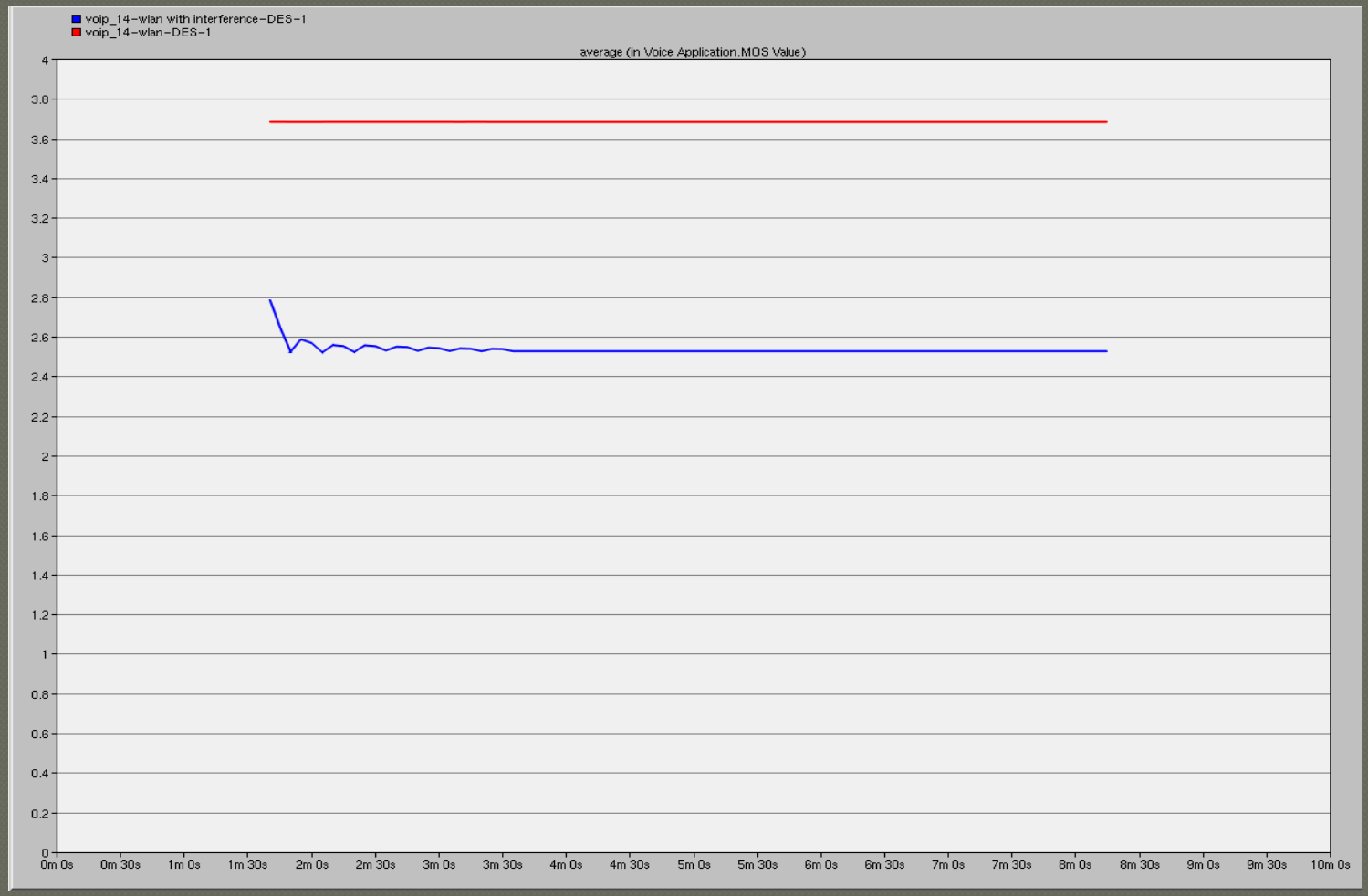


Red – Wireless Connection with Interference

RESULTS – MOS VALUE



RESULTS – MOS VALUE



Conclusion

- Ethernet has a more stable and less delay connection than wireless connection
- Interference near wireless router greatly reduce QoS
- Distance VoIP introduce greater jitter, ETE and lower MOS

Reference

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