

VolP over Wi-Fi using Riverbed Simulation

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Road Map

Introduction (motivation of this project, wifi and riverbed details)

- Voice over WiFi implemented in Riverbed
- Discuss and analyze MOS factors
- Performance of G.711 and G.729a
- Summary

Introduction

WiFi- Wireless Fidelity

Local area wireless technology, support electronic devices to participate in computer networking

- Riverbed Technology
- Popular tool, lots companies(Ericsson) => benefit students



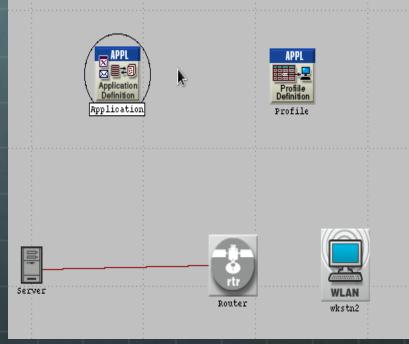
Important app, expected to carry more and more voice traffic over TCP/IP network, Viber, Skype....

In this project, we simulate them in an office environment

VolP over WiFi- Setup

Application, 1 Profile, 1 Ethernet Server, 1 Router, 1000BaseX

users at different distances



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-Print	off	0	-Number of Rows	1
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VoIP over WiFi – MOS Values

- MOS stands for mean opinion score
- Obtains the user's view of the audio quality of the network
- The score range is 1 to 5, 1 being the lowest quality
- MOS > 4.3 (Very Good) Range: 30- 250 meters
- 3.5< MOS < 4.3 (Good) Range: 250 260 meters</p>
- 3 < MOS < 3.5 (Mediocre) Range: 260-270 meters</p>
- MOS < 2 (Bad) Range : more than 270 meters

Factors Affecting MOS

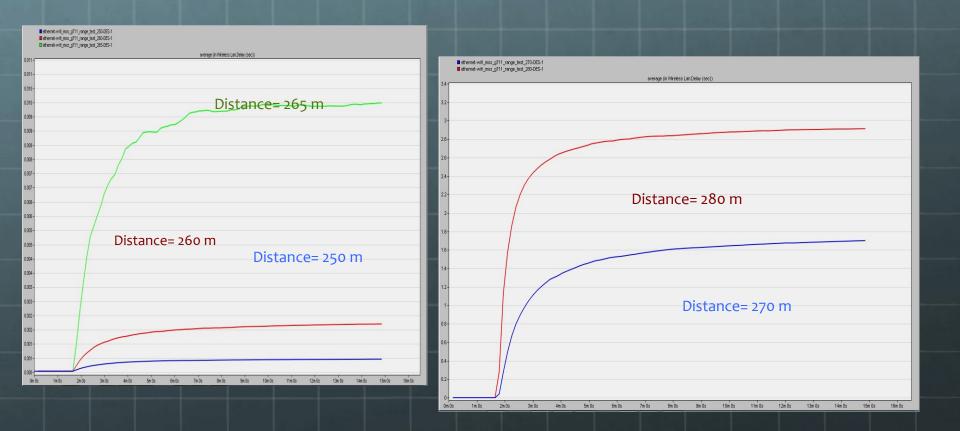




Packet Loss

Delay results for different distances

Five distances: 250m,260m,265m,270m and 280m



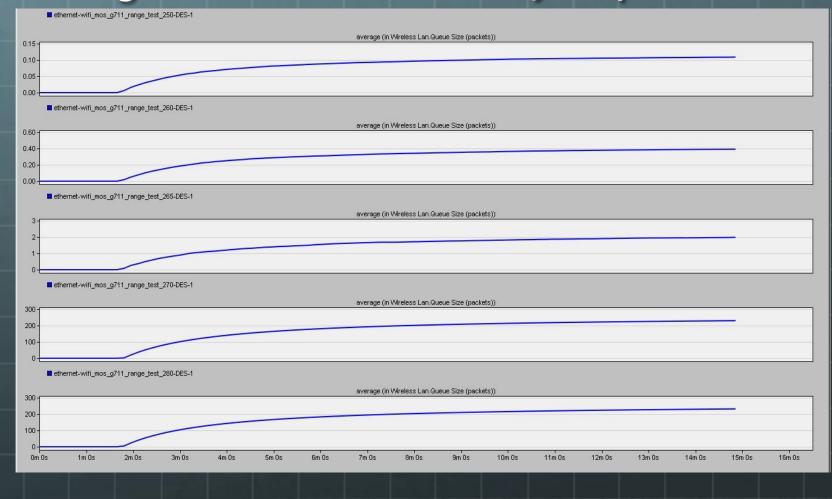
Jitter results for different distances

• Jitter is variance of times between packets arriving

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Jitter- Queue size relationship

Jitter is directly related to how severe the traffic congestion which is determined by the queue size



Voice Packet Loss results for different distances

Traffic received is reduced as distance increases and more and more packets are dropped

ethernet-wifi_mos_g711_range_test_250-DES-1
 ethernet-wifi_mos_g711_range_test_260-DES-1
 ethernet-wifi_mos_g711_range_test_265-DES-1
 ethernet-wifi_mos_g711_range_test_270-DES-1
 ethernet-wifi_mos_g711_range_test_280-DES-1



Voice Packet Loss results for different distances

Reason for Packet Loss? MOS Network Loss Rate

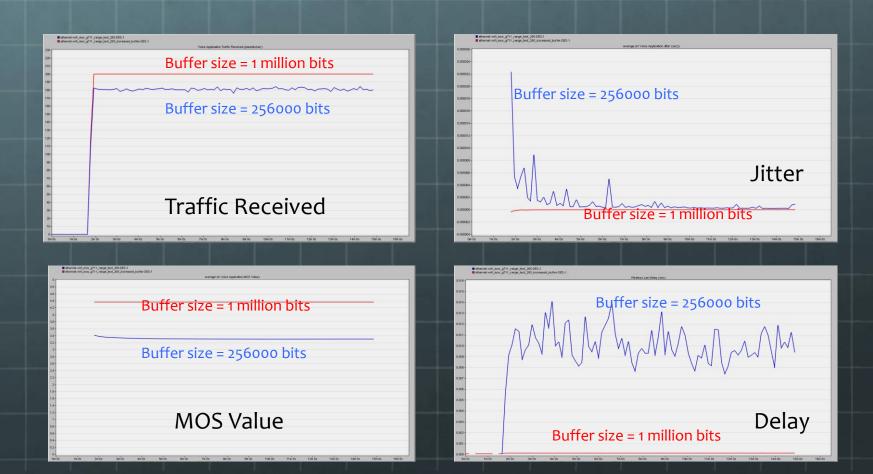
MOS Network Loss Rate = ratio of packets lost due to network factors to the total number of packets

ethernet-wifi_mos_g711_range_test_250-DES-1 ethernet-wifi_mos_g711_range_test_260-DES-1 ethernet-wifi_mos_g711_range_test_265-DES-1 ethernet-wifi_mos_g711_range_test_270-DES-1 ethernet-wifi_mos_g711_range_test_280-DES-1

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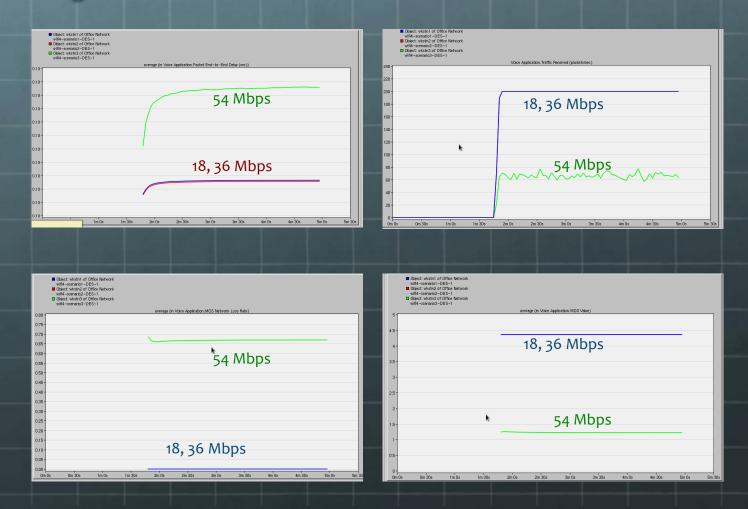
Packet loss due to buffer size

- As buffer size increases, lower packet loss and less congestion
- However too large of a buffer will introduce queuing delay



Packet loss due to Data Rate

- fixed distance 265 meters, user data rate = 24Mbps
- A high LAN router data rate will overrun the receiver buffer



MOS values over different distances

A high MOS score requires low jitter, low delay, and minimal packet loss

ethernet-wifi_mos_g711_range_test_250-DES-1
 ethernet-wifi_mos_g711_range_test_260-DES-1
 ethernet-wifi_mos_g711_range_test_265-DES-1
 ethernet-wifi_mos_g711_range_test_270-DES-1
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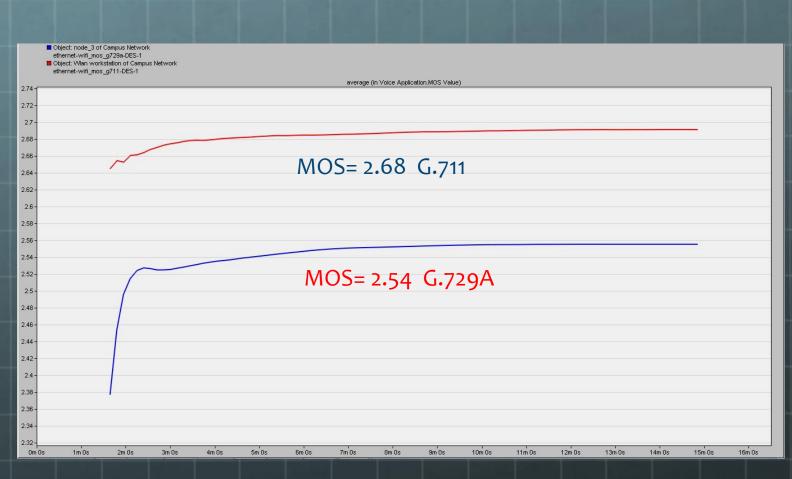
WiFi MOS for G.711 and G.729A

Fixed distance = 200 meters

Our MOS Result is similar to PSQM testing result 4.03 for
 G.729A and 4.45 for G.711 under ideal condition

	ethernet-wifi_mos_g711-DES-1 ethernet-wifi_mos_g729a-DES-1														
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G.711 vs. G.729A



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