ENSC 427: COMMUNICATION NETWORKS
SPRING 2014 FINAL PROJECT PRESENTATION

# Analysis of the Evolved Multimedia Broadcast Multicast Service (eMBMS) in LTE Networks

www.sfu.ca/~atian/ensc427.html

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TEAM #13

# Roadmap

- Introduction
- Implementation
- Results & Analysis
- Conclusion & Discussion
- Future Work
- Reference
- Q & A

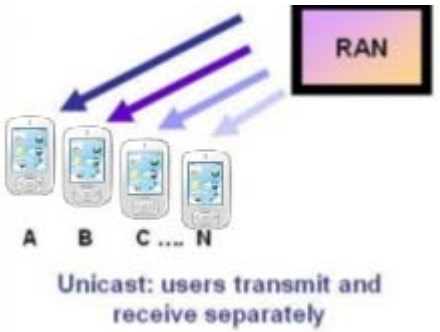
# Introduction

- Long Term Evolution (LTE)
- Evolved Multimedia Broadcast Multicast service (eMBMS)
- Enables Single Frequency Network (SFN) broadcast capability within LTE
- Broadcasting Delivery same content efficiently to a large Number of user

# Unicast VS Multicast/broadcast

- Unicast –users transmit and receive separately

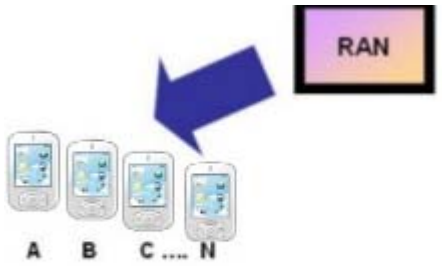
  one to one transmission



Unicast: users transmit and receive separately

- Multicast/Broadcast–all users receive simultaneously

  one to many transmission



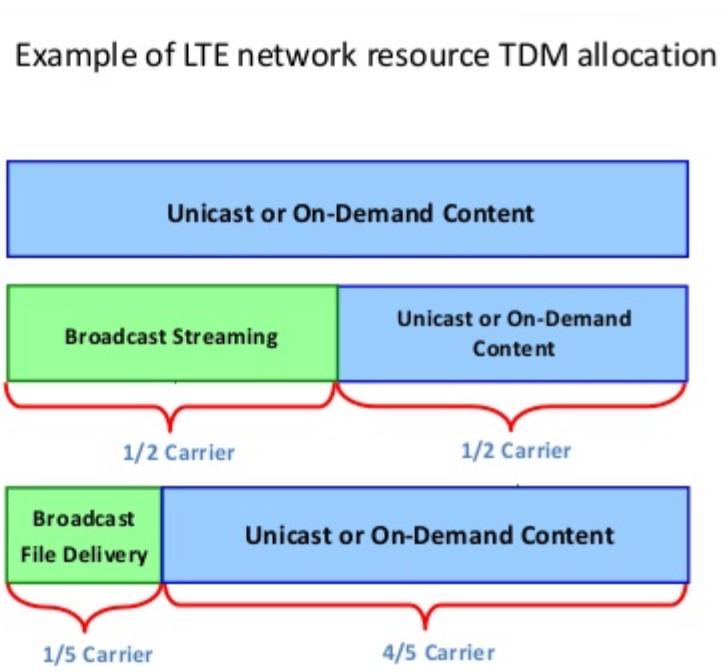
Multicast: all users receive simultaneously

# Functionality

Flexibility to dimension unicast and broadcast.

Identifying the right mix of services to keep sub-scribers interested.

Venue-specific Broadcast
Region-specific Broadcast
Nation-wide Broadcast



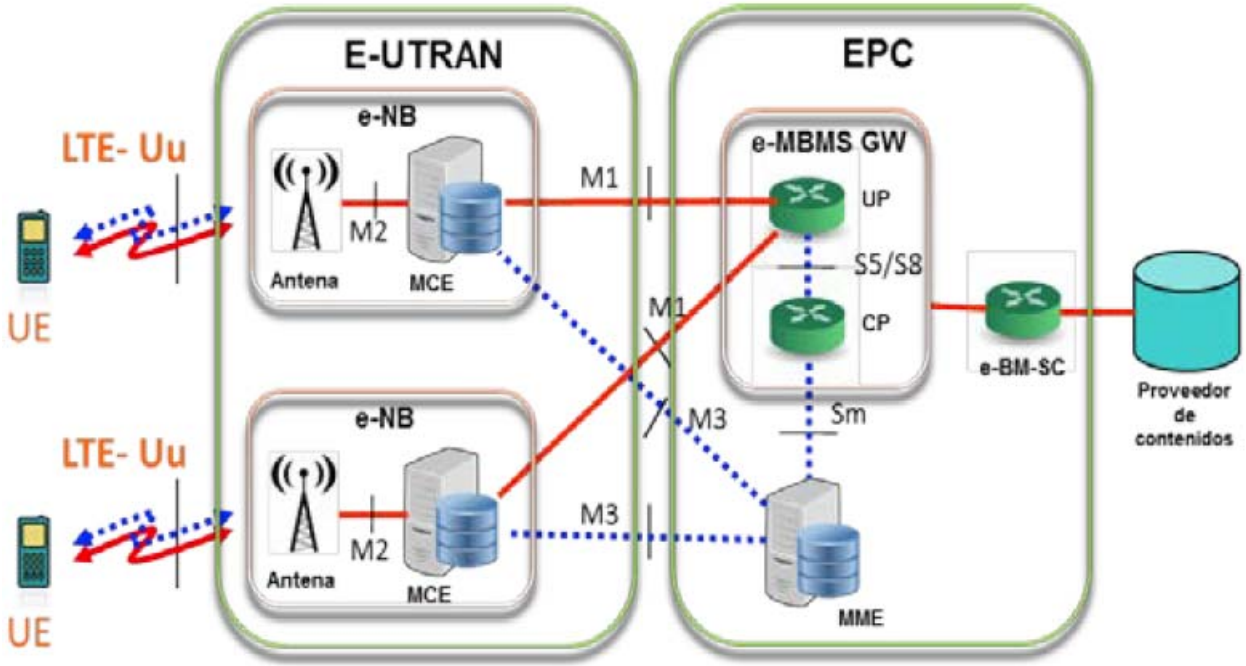
# eMBMs allows operators to control the service area to match audience

- Live event streaming
- Real-time TV streaming
- News, stock market report, weather, and sports updates
- Broadcast music and radio
- Off-peak media Delivery

# eMBMS leverages

- Reuses LTE network infrastructures
- Upto 60% of subframes can be allocated to eMBMS traffic
- Broadcast over a single frequency network (MBSFN)
- Efficiently broadcast delivery to a large Number of users
- Cost Effective Upgrade of LTE Networks and Devices
- Enable superior performance of high throughput and excellent coverage

# Implementations



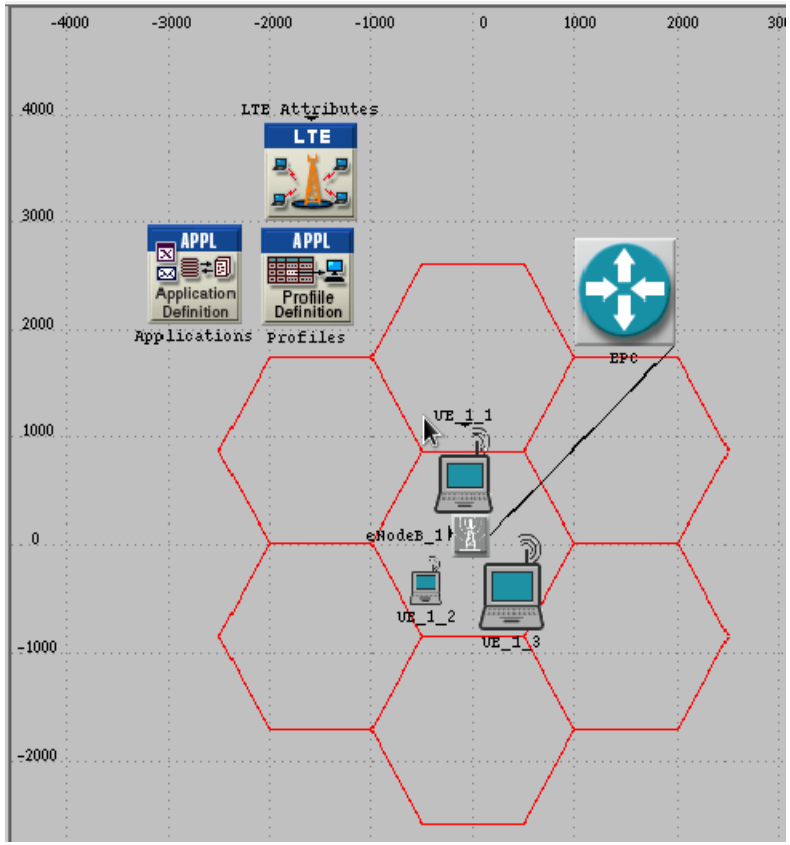

eMBMS architecture

UE: User Equipment
MCE: Multicell/Multicast Coordination Entity
MME: Mobility Management Entity
e-BM-SC: evolved Broadcast Multicast Service Center

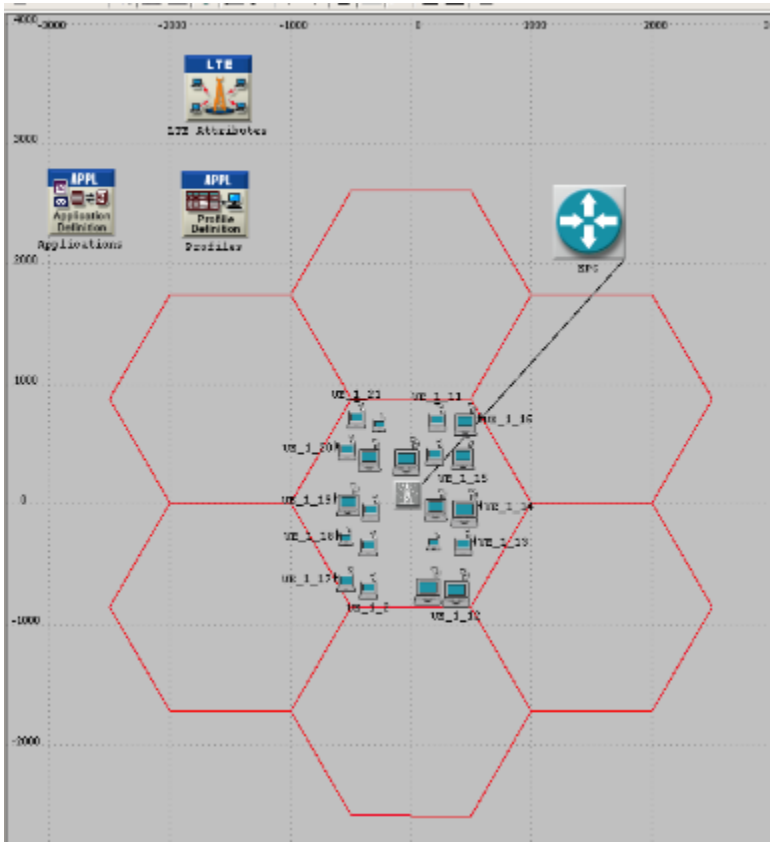
http://www.researchgate.net/publication/257518275_Performance_Analysis_of_eMBMS_in_LTE_Dynamic_MBSFN_Areas

# Implementations

- Scenarios: single cell, multi-users



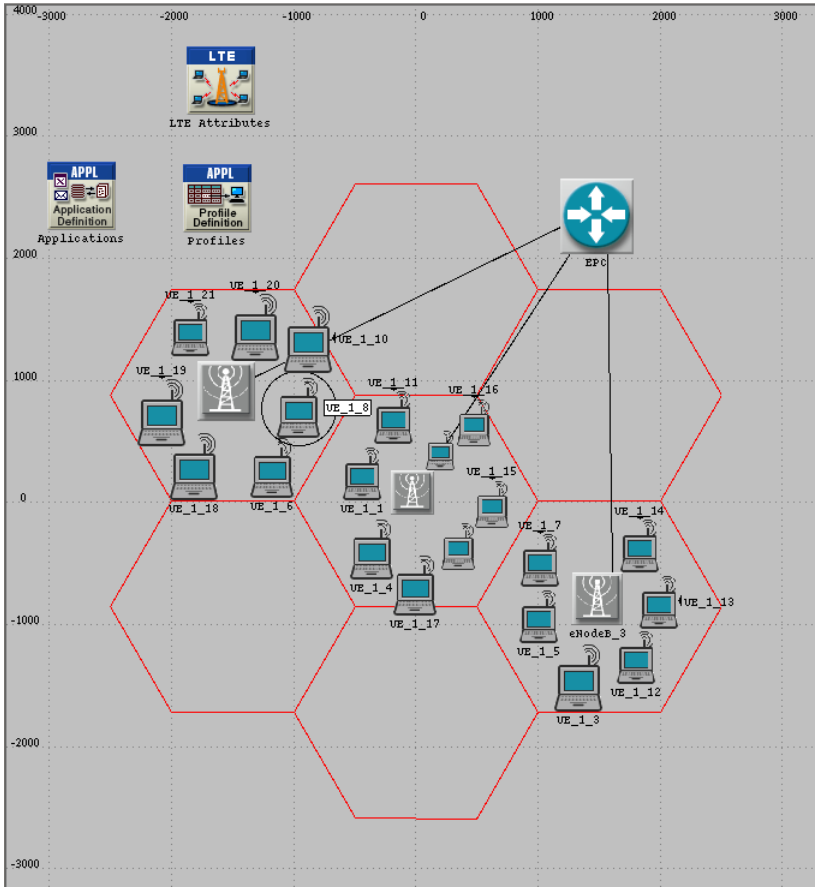

2 UEs, Single Cell




20 UEs, Single Cell

# Implementations

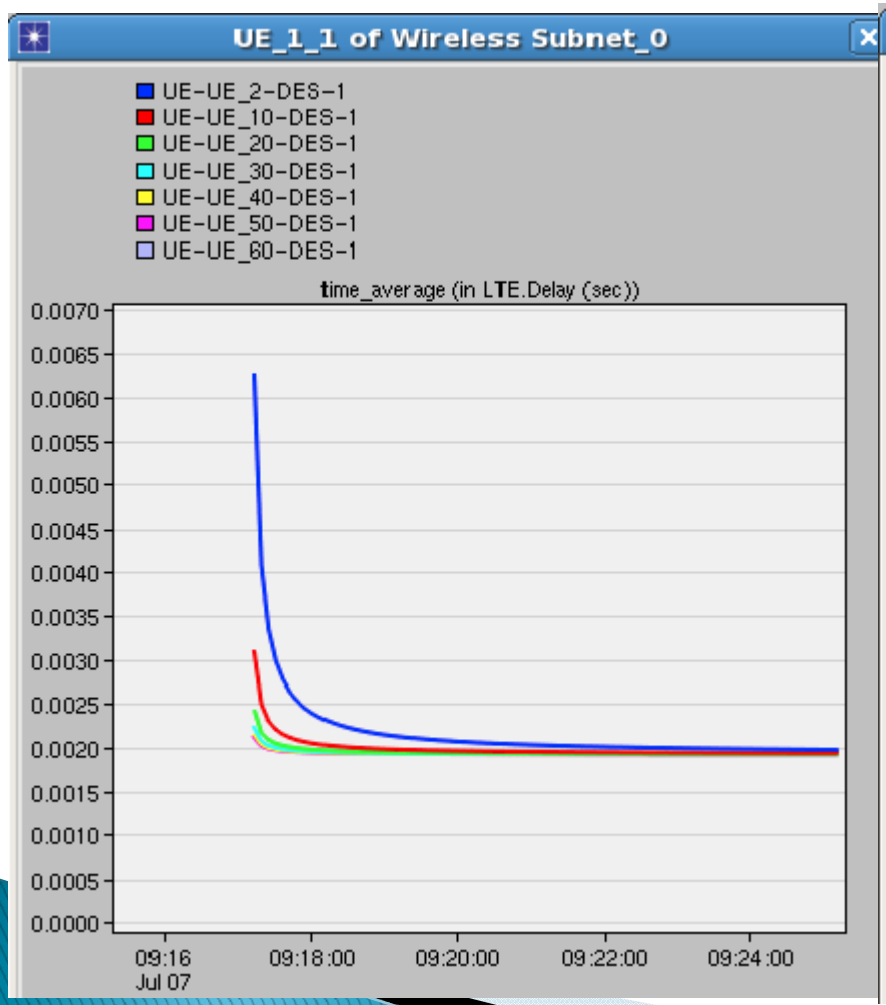
- Scenarios: multi-cell, with same number of users

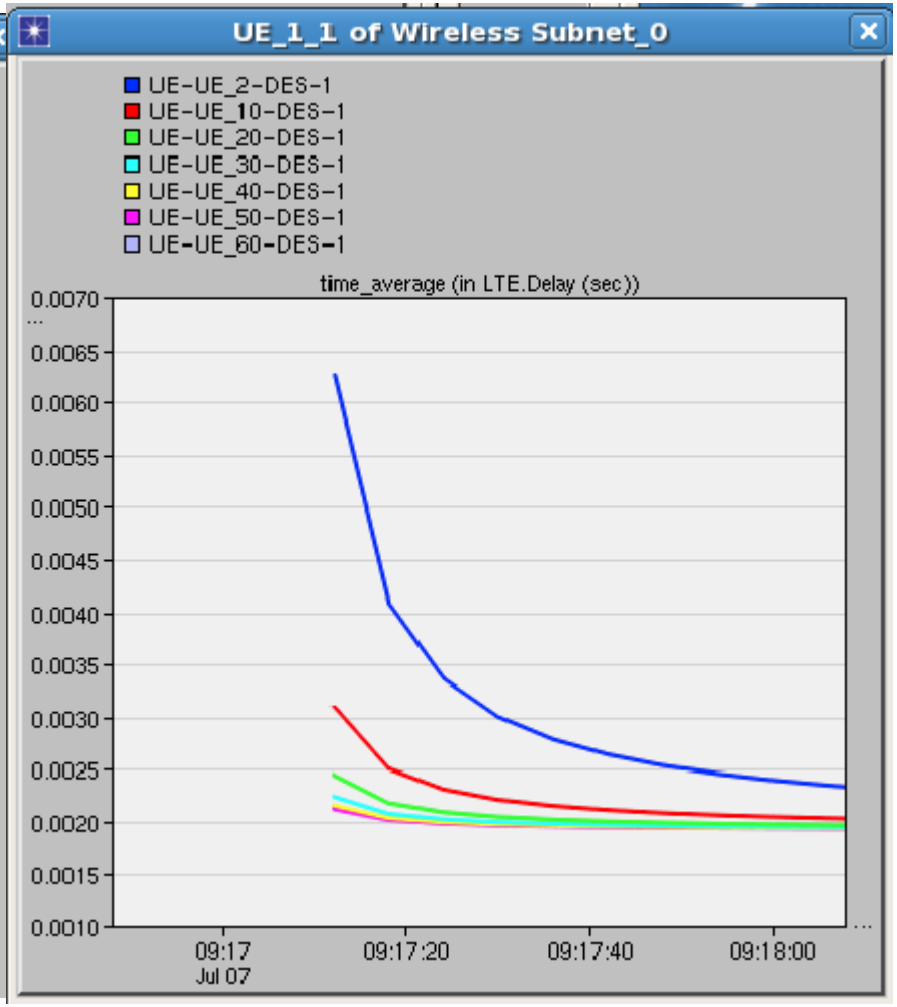



20 UEs, 3 Cell

# Results & Analysis

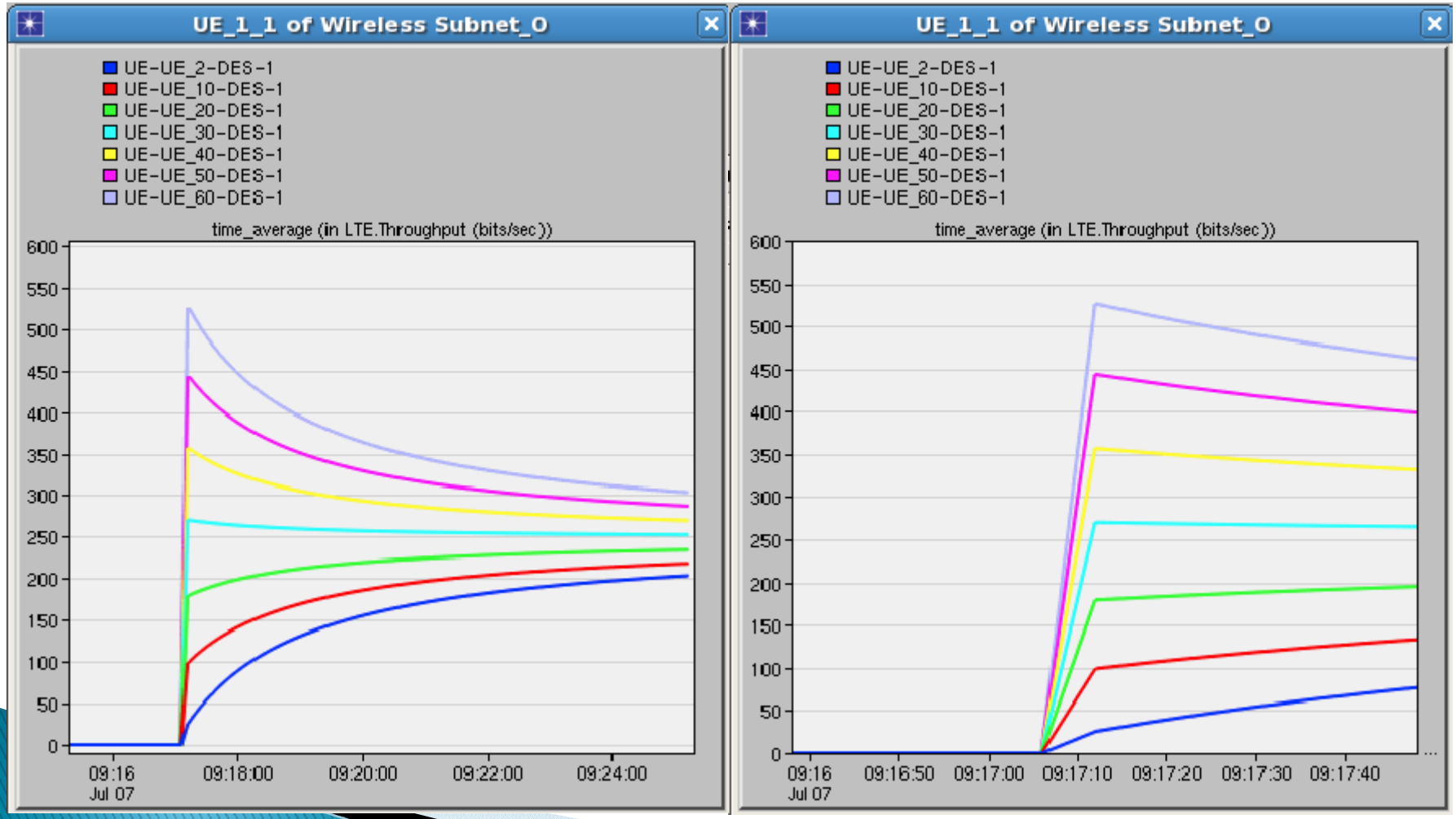
1. Single Cell, different # of users (Delay)



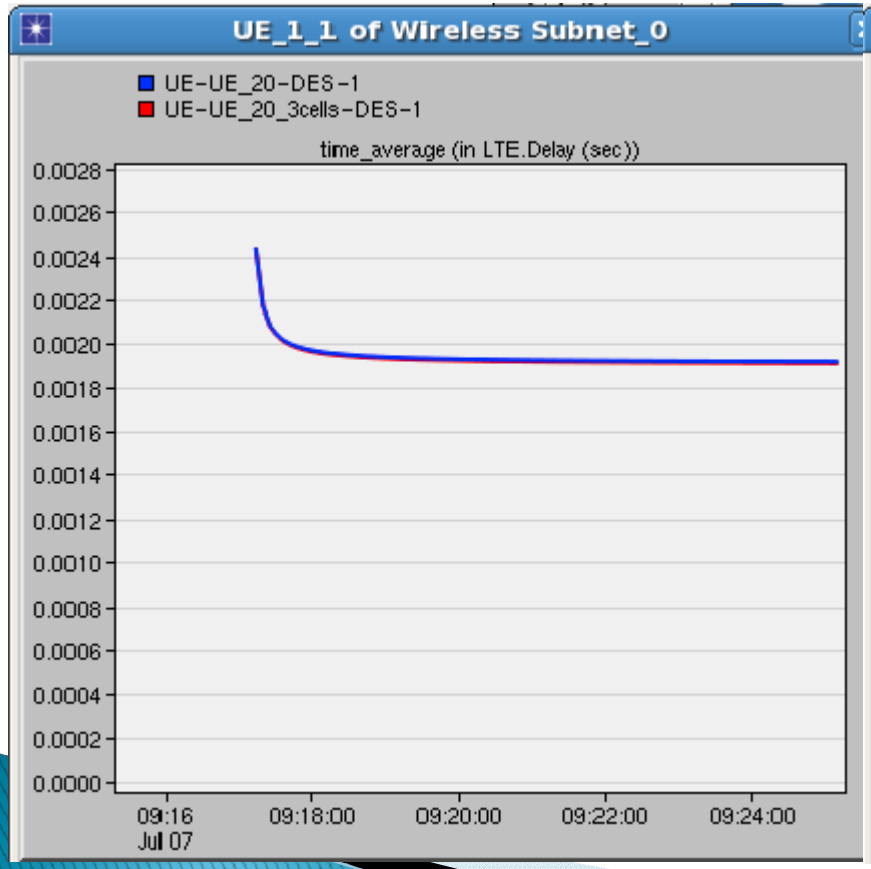
# Results & Analysis

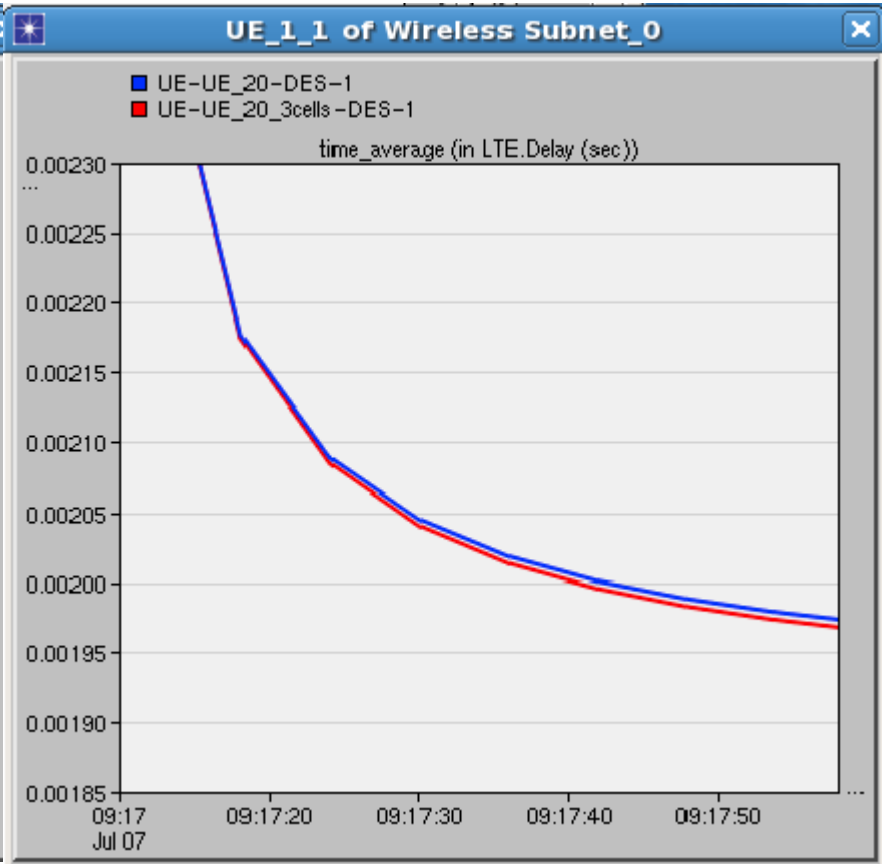
1. Single Cell, different # of users(Throughput)



# Results & Analysis

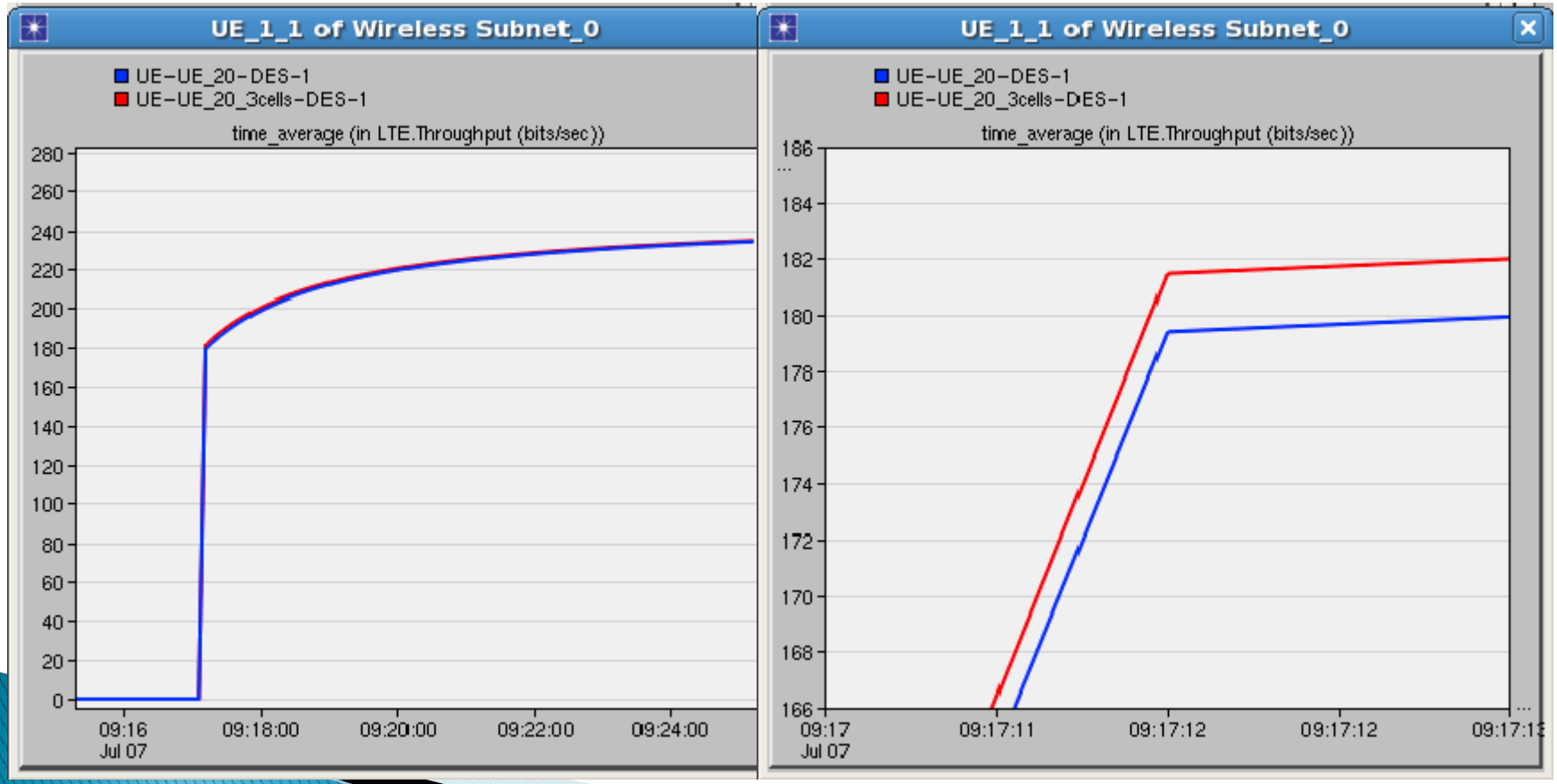
2. Compare single and multi cells with 20 UEs (Delay)



# Results & Analysis

2. Compare single and multi cells with 20 UEs (Throughput)



# Conclusions & Discussion

- 1. At the same time point, the throughput increase as the number of UEs increase
- 2. With the same number of UEs, multi-cell improves the network performance

# Problems & Difficulties

- 1. No “Wireless Network Deployment wizard”
- 2. The cell radius does not effect the network performance in OPNET LTE modeller
- 3. Need more determinable parameters to determine the throughput

# Future Work

- 1. Study the throughput under different SNR
- 2. Study the effect of channel bandwidth to the throughput

# References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# Q & A

- Thank You