Project Demo: Comparison between LTE and Rival Wireless Technologies (using Opnet 16)

Team 10:
Josh Ancill   jja48@sfu.ca
Kim Izmaylov   kvi@sfu.ca
Anton Khomutskiy   aka78@sfu.ca

URL: http://www.mempf.com/427project/

- Long Term Evolution
- 100 Mbit/s DL and 50 Mbit/s UL (1x1)
- Up to 300 Mbit/s DL and 70 Mbit/s UL (4x4 MIMO)
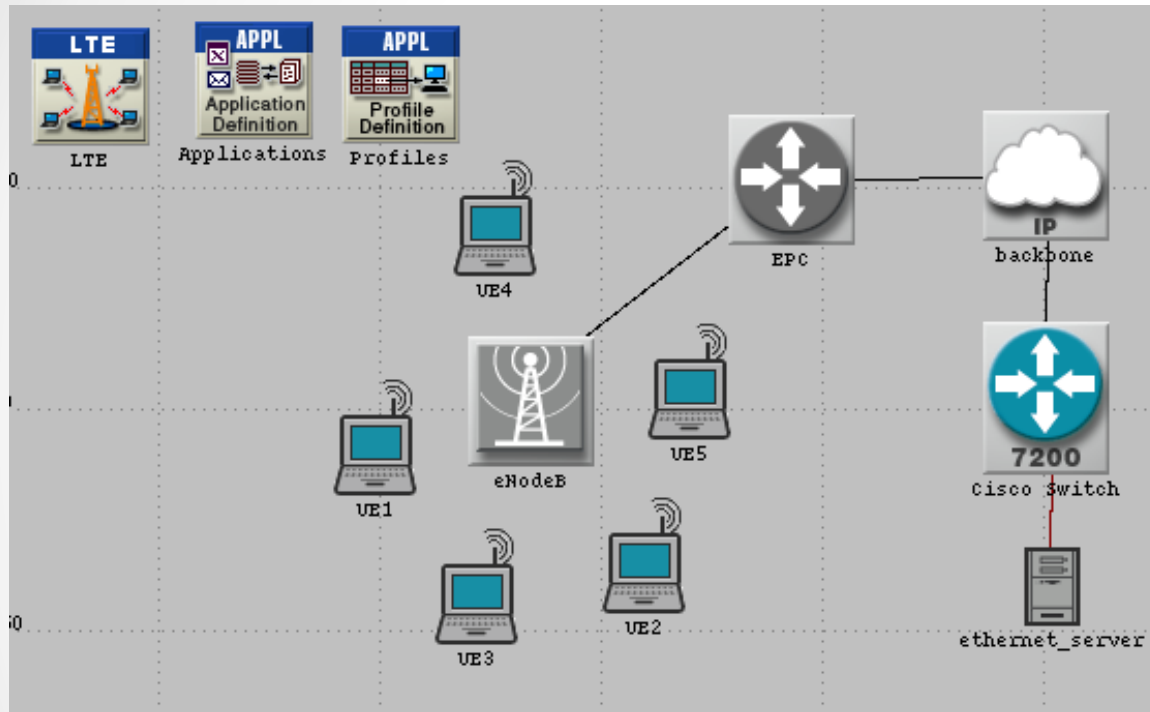
…versus

- Worldwide Interoperability for Microwave Access (WiMAX)
- 802.16-2009: Up to 80 Mbit/s DL and 40 Mbit/s UL (1x1)

- 802.11g (highest supported in Opnet 16.0): up to 54 Mbit/s
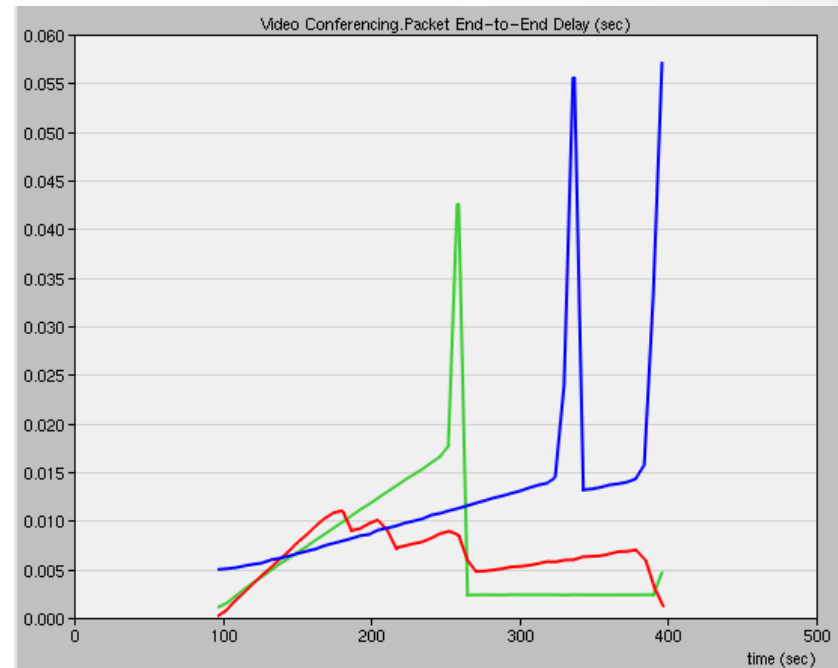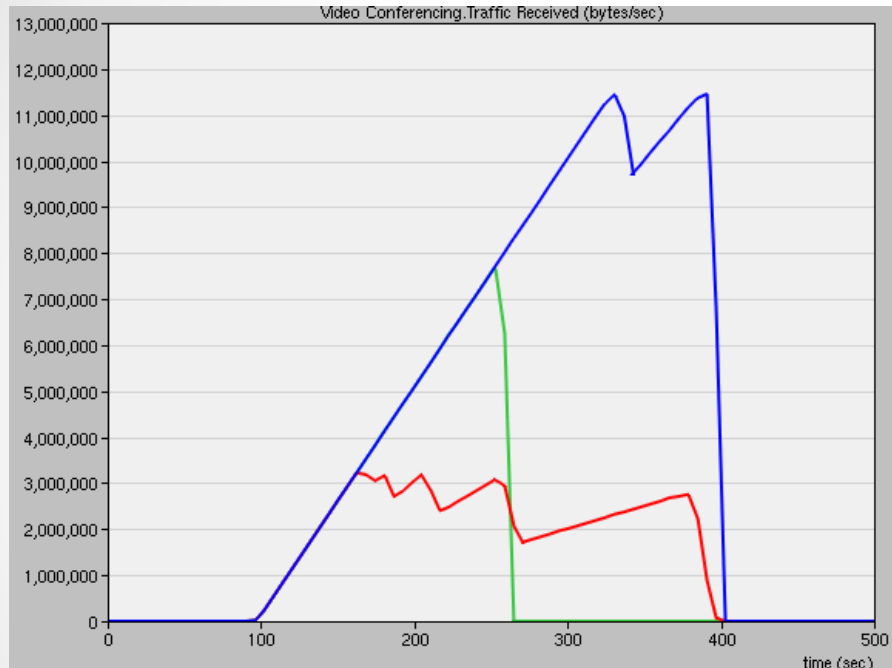- 802.11n (current version): up to 150 Mbit/s (1x1)

LTE Network Setup

- UE: User Equipment
- eNodeB: Evolved Node B (base station)
- EPC: Evolved Packet Core

- Wi-Fi and WiMAX networks are set up in an overall similar fashion

Comparison of Cross Technology Results

Results produced using 0 - 25 Mbit/s

Technology:	
Blue: LTE	
Red: Wi-Fi	
Green: WiMAX	

- LTE maintains its throughput for much longer than the other technologies
- WiMAX video throughput drops to ~0 Kbit/s
- Wi-Fi has the smallest delay throughout the simulation until WiMAX throughput drops to ~0

4

Conclusions

- LTE's maximum throughput seen in simulation is 92 Mbit/s DL, which is near theoretical values (100 Mbit/s)
- Given that all technologies in our simulation use 20 MHz channels, LTE has the highest spectrum efficiency based on the simulation results showing higher sustained data rates
- LTE has lower latency than WiMAX, comparable to WiFi (shown in project report and project presentation)
- Based on the above LTE is superior to other technologies