Comparison Between WiFi and WiMAX
On OPNET

http://www.sfu.ca/~luodil/427project.html

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Roadmap

- Introduction
- OPNET simulation setup
- Simulation results
- Conclusion and discussion
- Future work
- References
Goal of this project:
Performance evaluation of Wireless Fidelity (WiFi) and Worldwide Interoperability for Microwave Access (WiMAX) networks through streaming video and browsing. We will compare the quality of services on two wireless networks respectively, such as delay, data-drop rate and throughput.
WiFi Overview

- IEEE 802.11 standard
- Describes only narrow range of connectivity ensuring Wireless Local Area Network
- Speed up to 50 Mbps
- Range up to 30 Meters
WiFi Network Architecture

- **Access Point**: Acts like a transceiver of wireless signal
- **Server**: Provide network services upon network users’ requests
- **Gateway**: Transfer data packets between networks on different layers
- **Workstation**: Wireless devices that can receive and transmit data packets of requested service
WiMAX Overview

- IEEE 802.16 standard
- IP based, wireless broadband access technology
- Speed up to 70 Mbps
- Range is about 50 Kilometers
- Protocol that provide fixed & mobile Internet Access
WiMAX Network Architecture

- **Access Service Network (ASN):** It is a transition part in order to connect those mobile stations or wireless devices to internet service provider.
- **Connectivity Service Network (CSN):** Provide management and control for those WiMAX subscribers with services.
- **IP Backbone:** Interconnect network and core routers on the internet.
WiFi Topology on OPNET

- **Access Point**: WLAN_ethernet_slip4_adv
- **Gateway**: Ethernet4_Slip8_gtwy
- **Server**: Ethernet_server
- **Workstation**: WLAN_skstn_adv
- **Link Model**: 100BaseT
WiFi Topology on OPNET
WiMAX Topology on OPNET

- **WiMAX Base Station**: Wimax_bs_ethernet4_slip4_router
- **Gateway**: Ethernet4_Slip8_gtwy
- **Server**: Ethernet_server
- **IP backbone**: Rounter_slip64_dc
- **Workstation**: Wlan_skstn_adv
- **Link Model**: 100BaseT
WiMAX Topology on OPNET
Simulation Result (Streaming Video)

WiFi

- WiMAX has a significant lower data drop rate than WiFi due to QoS
Simulation Result (Streaming Video)

WiFi
- WiMAX has a better performance on Delay than WiFi due to the QoS.
Simulation Result (Streaming Video)

- Unstable throughput on every MS due to the multipath effect and range
- WiMAX has a higher throughput than WiFi
Simulation Result (Heavy Browsing)

- Similar data drop rate for WiFi and WiMAX due to low transmission rate.
Simulation Result (Heavy Browsing)

- Similar throughput for WiFi and WiMAX due to low transmission rate

**WiFi**

**WiMAX**

16
Simulation Result (Heavy Browsing)

- WiMAX has a larger delay than WiFi due to the absence of QoS.
Conclusion and Discussion

WiMAX outperforms WiFi

- WiMAX provides Quality of Service (QoS) to ensure better performance such as data dropped rate, delay and throughput
- Cost of building WiMAX network is expensive
- Most wireless devices are compatible with WiFi technology, but incompatible with WiMAX technology.
Future Work

Integration of WiFi and WiMAX in order to achieve better performance by connecting WLAN router to WiMAX base station

Comparison of WiFi and WiMAX with a large number of network users
Question?
References