The WiMAX/LTE Project: We See You

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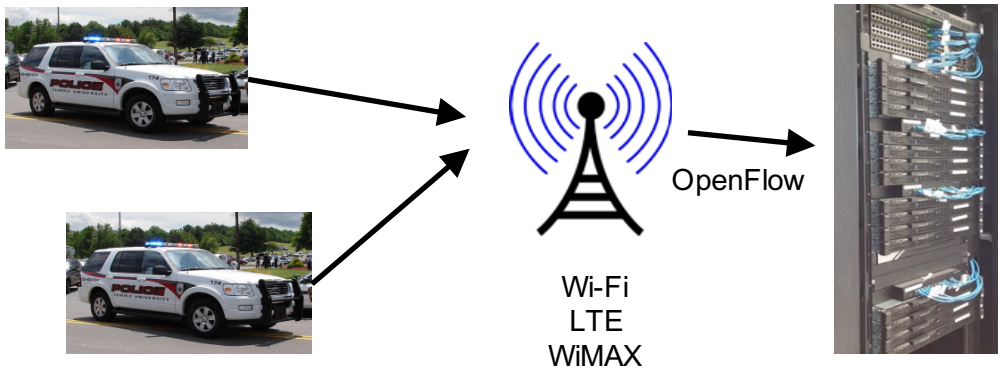
Project Overview

- Cameras will be mounted on police cars
- Video streams from cameras will be broadcast using wireless networks, including Wi-Fi, LTE, and/or WiMAX, to a central location for instant analysis storage
- Switches between WAN and host server will be managed using OpenFlow

Objectives

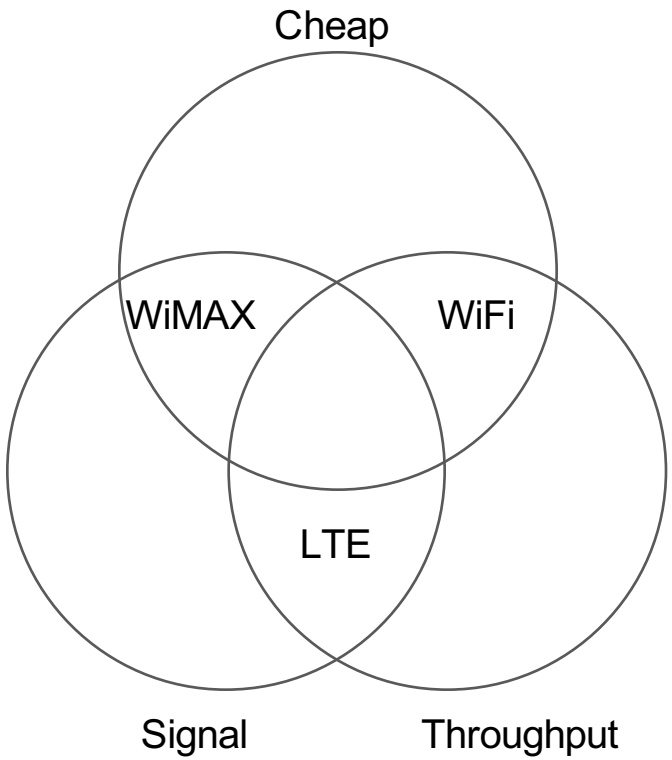
- Send multiple video streams to server
- Be able to prioritize one video stream over others and allocate more network resources to it in real time



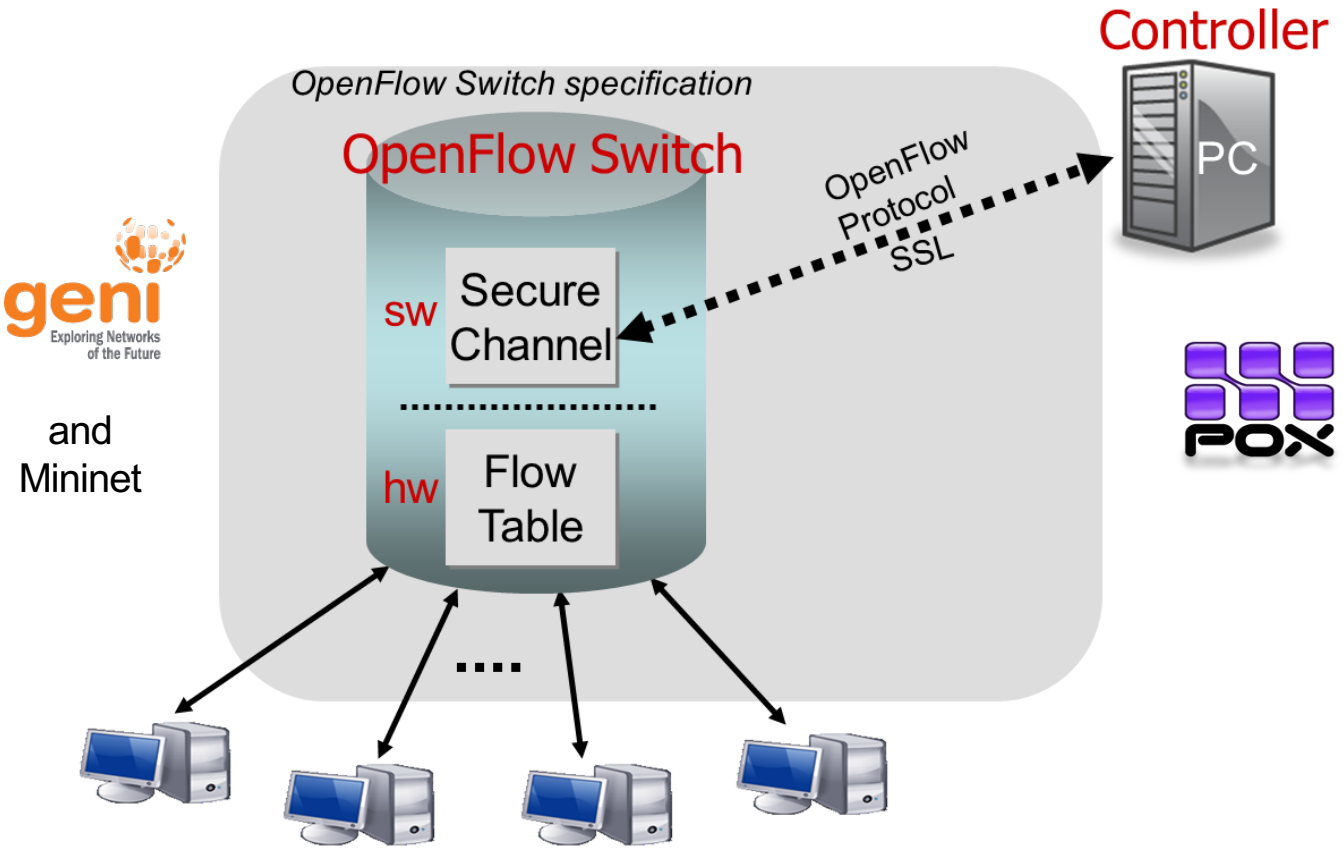
Wireless Network Tests

Wireless Network Tests

- Assisted with conducting stationary and walking tests of Wi-Fi, LTE, and WiMAX around campus
- Each had its own drawback at any given time
- Use all three



SDN and OpenFlow



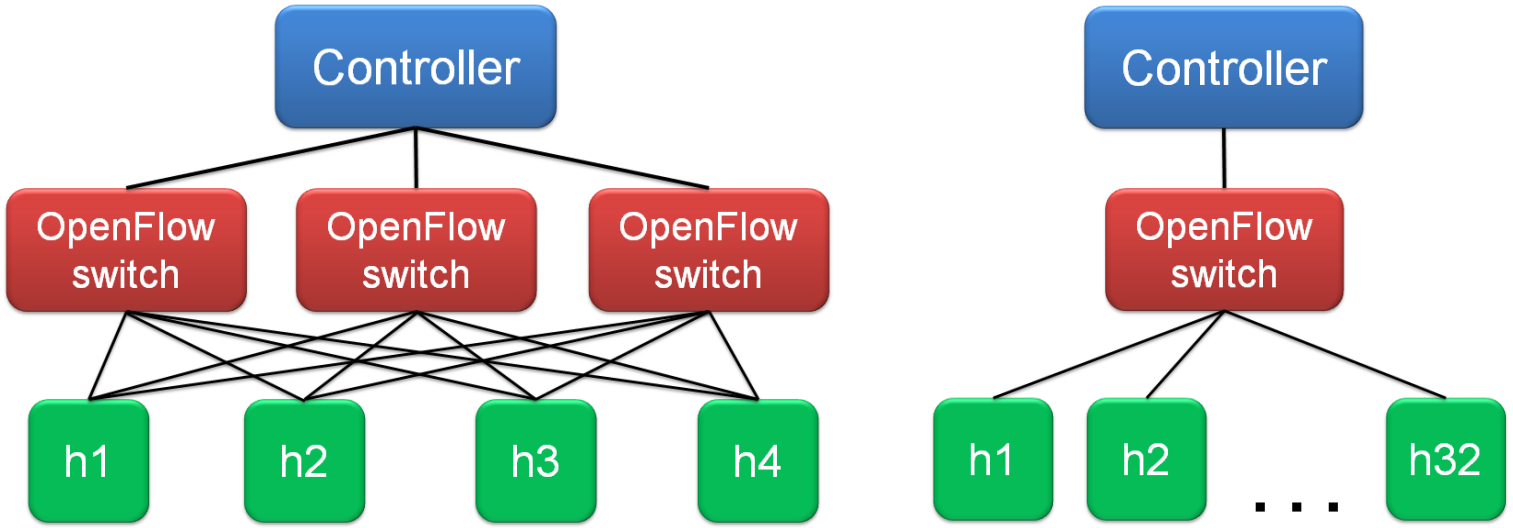
SDN and OpenFlow

- Software-Defined Networking (SDN) separates the control plane from the forwarding data plane, allowing the network to be directly programmed and centrally managed
- OpenFlow is a protocol to enable SDN
- Can be simulated using GENI and Mininet

POX OpenFlow Controller

- POX is a Python-based OpenFlow controller
- Wrote a custom POX application that learns port numbers from incoming packets and drops packets from specified IP addresses
- Mininet supports OpenFlow 1.0.0, which allows for packet dropping but not direct bandwidth management

Mininet



- Tested controller using Mininet with custom topologies to mimic possible physical equipment configurations

Continuing This Research

- Test POX controller application using new OpenFlow-enabled switches and server
- Update POX controller application to manage bandwidth, not just drop packets

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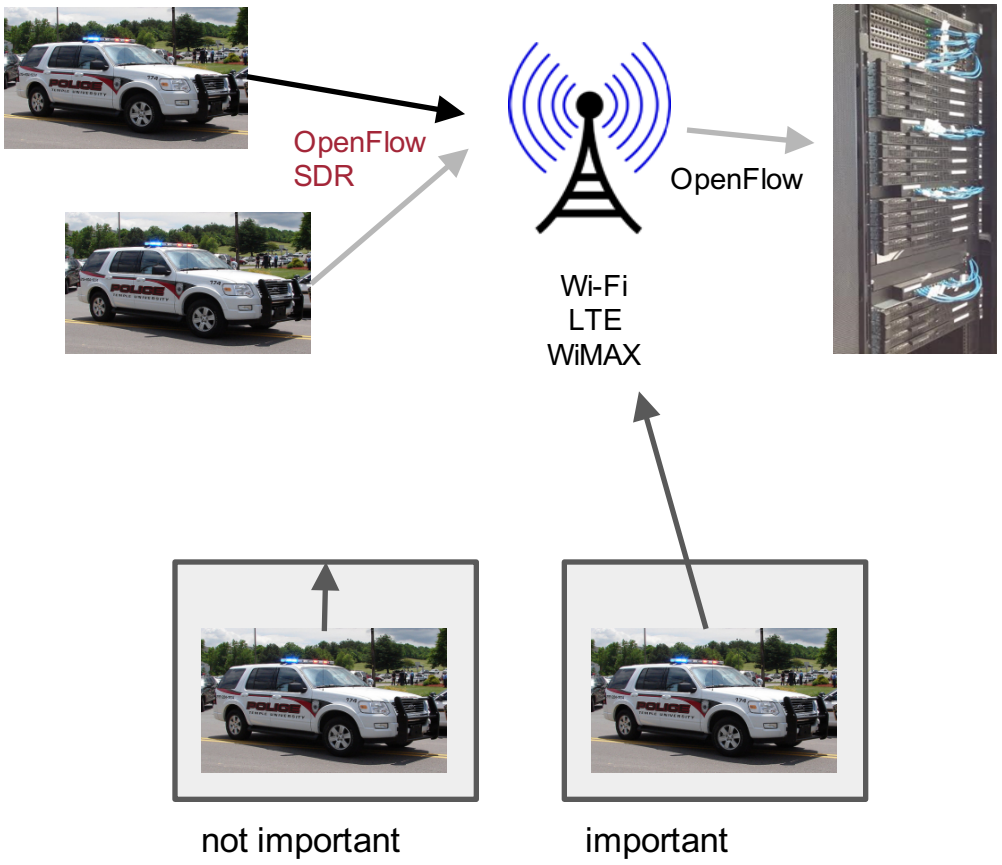
WHITE BOX SDN

Further Research

- Use OpenFlow SDR like OpenRadio to implement our program closer to the source of data
- Combine our solution with data limiting on source itself



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