THE LAST MILE

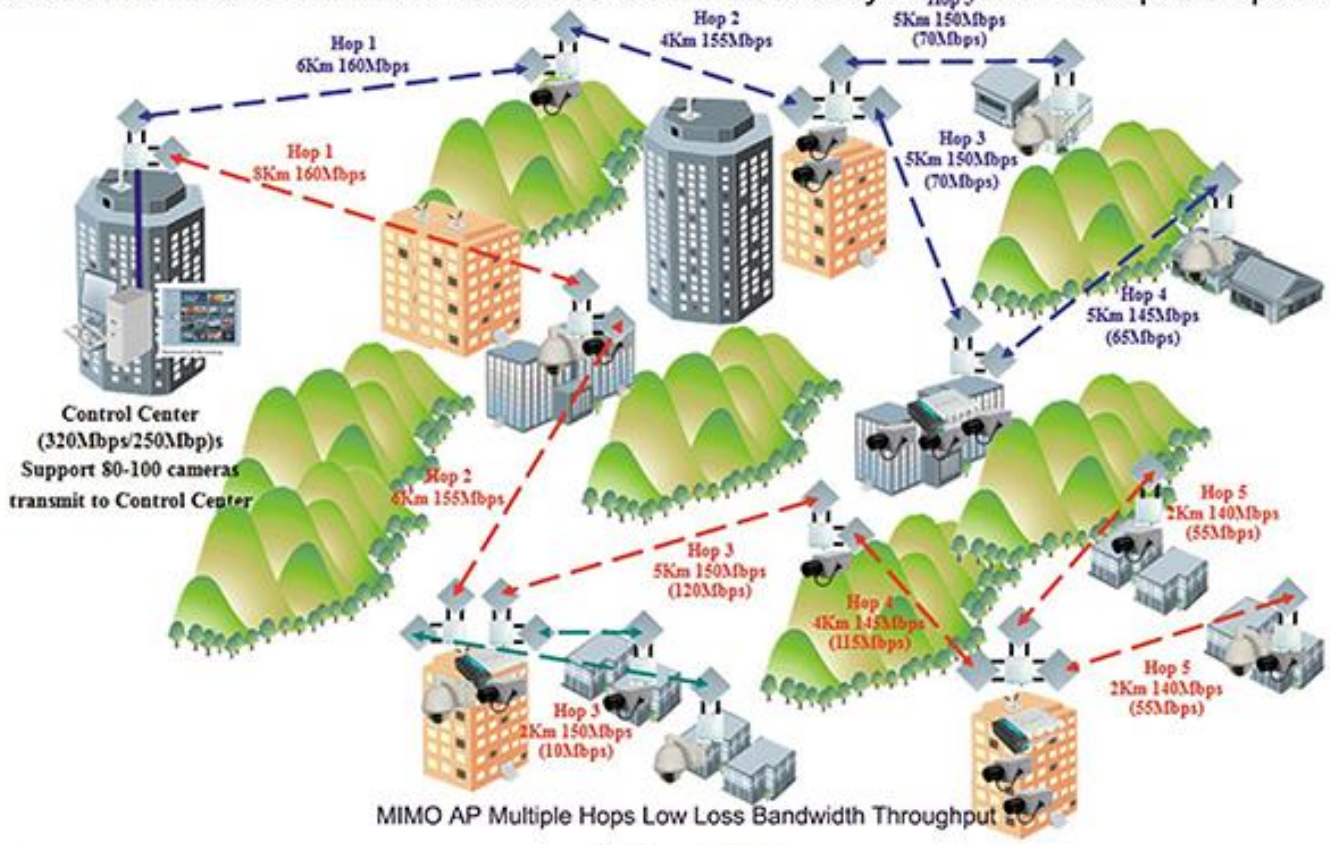
Mike McPherson, KQ9P

29 October 2016


Base Station
Line of Sight
Subscriber

SENTRY US Outdoor WiFi MIMO Wireless Surveillance System

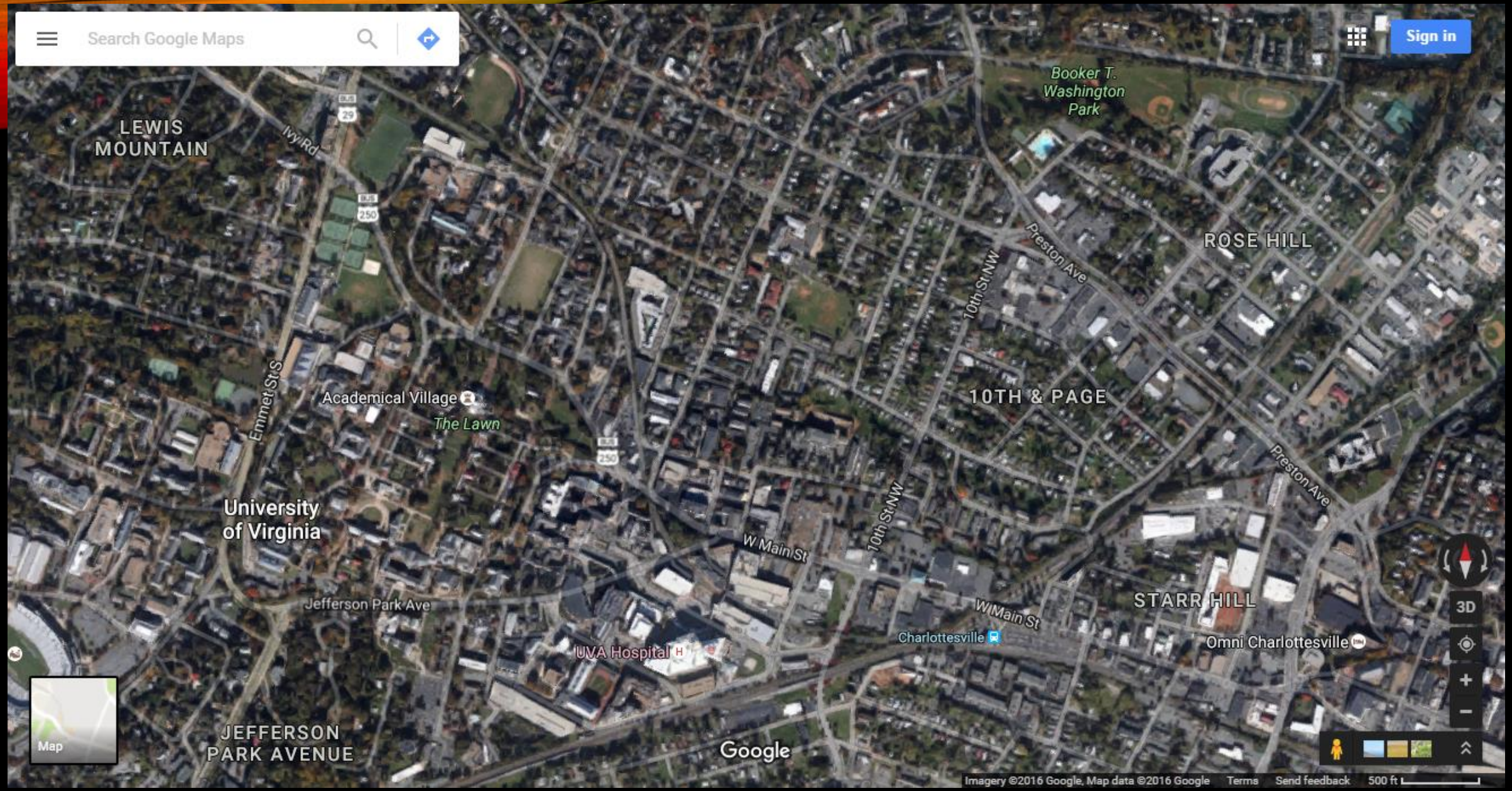
Outdoor WiFi 802.11n MIMO Wireless Surveillance System with Multiple Hops Features



MIMO AP Multiple Hops Low Loss Bandwidth Throughput

Hop 1 160Mbps
Hop 2 152-154Mbps
Hop 3 144-150Mbps
Hop 4 136-145Mbps
Hop 5 128-136Mbps

Hops 6th after, the bandwidth throughput will not reduce again, less than 10ms response time delay.


Search Google Maps
Sign in
LEWIS MOUNTAIN
Ivy Rd
Booker T. Washington Park
ROSE HILL
Preston Ave
10th St NW
Emmet St S
Academical Village
The Lawn
10TH & PAGE
University of Virginia
W Main St
Jefferson Park Ave
STARR HILL
Charlottesville
Omni Charlottesville
UVA Hospital
JEFFERSON PARK AVENUE
Google
Map
3D
Imagery ©2016 Google, Map data ©2016 Google
Terms
Send feedback
500 ft

BGCCC 2013 - 100 Miler

CVADN LAST MILE EXPERIMENTS

- Need to deploy whenever, wherever
- What we need is
  1. “Instant backbone node, just add water"
  2. End nodes designed to take full advantage of #1

CVADN LAST MILE EXPERIMENTS

- Lots of components to address different use cases
  - "Instant backbone nodes"
    - Kitoons – helium balloon shaped as an airfoil to counteract wind
    - RC drones – long wingspan fixed wing aircraft designed for extended time aloft

CVADN LAST MILE EXPERIMENTS

- End nodes
  - APRS, Winlink, and other amateur packet technologies
  - 2m/70cm AFSK, 70cm/33cm LoRa, 5.8GHz mesh (modified to be very light weight)
  - Portable AREDN mesh nodes
  - Directional antennas with tracking capability

EXAMPLE USE CASE
PUBLIC SERVICE CYCLING EVENT

- Multiple sources of data
  - APRS on SAG/MEDIC/Support vehicles; 2m AFSK uplink
  - Cyclist/runner detection devices at checkpoints, turns, on SAG/MEDIC vehicles; 70cm/33cm LoRa uplink
  - Race HQ registration and timing data; 5.8GHz mesh uplink

EXAMPLE USE CASE
PUBLIC SERVICE CYCLING EVENT

- Backbone network
  - One or more RC aircraft loitering over the course carrying digipeaters, LoRa radios, 5.8GHz mesh nodes
  - Fixed 2m digipeaters
  - Fixed CVADN mesh backbone nodes
- Software to integrate and present information useful to hams and race organizers

CVADN LAST MILE EXPERIMENTS

- Lots of questions to be answered through analysis and experimentation
  - How many aircraft/balloons are required to cover a given area?
  - What power levels and antennas are required for reliable communications?
  - What are the regulatory and public relations issues to be managed?
- Big payoff – potential to solve last mile problem *and* could yield immediate operational capabilities

THANKS!

Mike McPherson, KQ9P
mike@kq9p.us