5G CBRS Proof-of-Concept for Scientific Applications

Introduction

IOT Sensors

CBRS Spectrum

Characteristics

Bandwidth

Latency

Video Overview

- EMBED Video into the presentation
- Concept background
- Robot building at MHS
- Testing at MCSD
- Saintcon footage
- Big Finish

Citizens Band Radio Service (CBRS)

FCC Spectrum Allocation

- 3.5 gHz Naval Radar
- Used historically to land planes on aircraft carriers
- Mid decade opened up for Fixed Wireless application

New Rules

- Shared Spectrum Allocation
- GPS requirements
- Specific types of signaling – LTE standard, Cambium Networks proprietary
- Central standards organization CBRS Alliance
  - https://www.cbrsalliance.org/about-the-cbrs-alliance/

Shared Access Spectrum

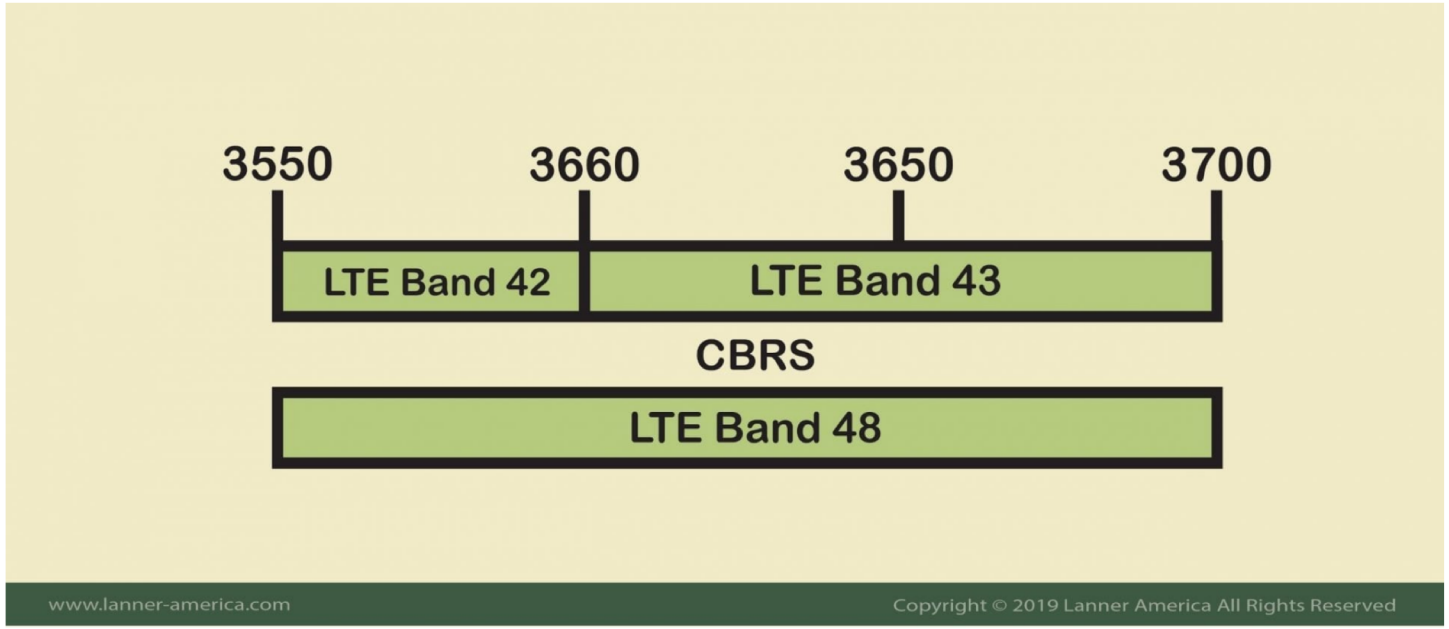
FCC controlled database

Subscription required

- Google
- Commscope
- Federated Wireless

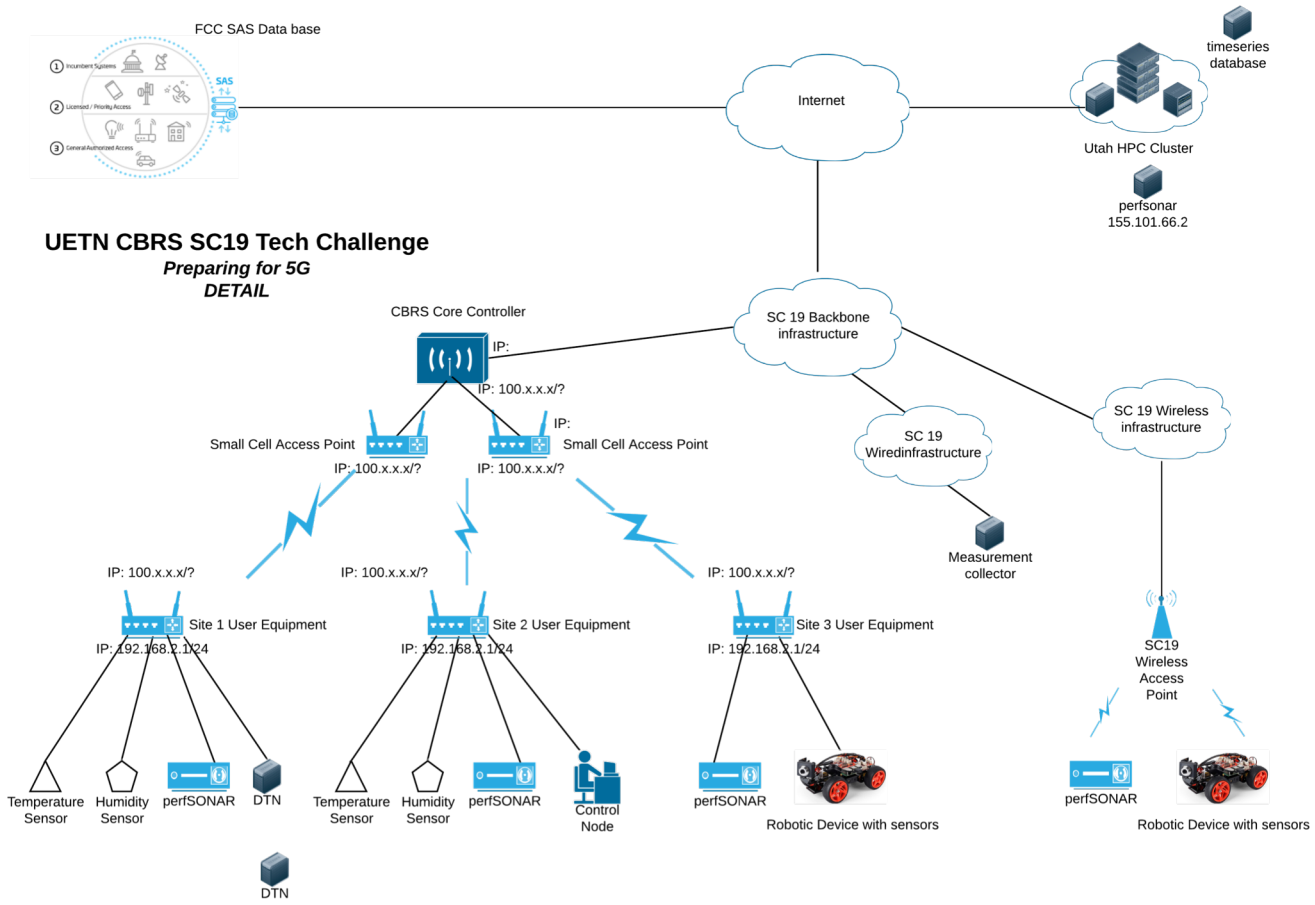
Prioritization

- Incumbent
- Priority Access
- Generally Available Access



LTE Bands used by CBRS

Network Diagram



CBRS LTE-A Network at SC19

EPC Core – Athonet

Hybrid Core

- Data Traffic Local Drop-off
- Control Traffic goes to AWS

eNodeB – 4 Ruckus Wireless Radios

1 Model 410 indoor

2 Model 710 indoor

1 Model 910 Outdoor

Shared Access Spectrum

Google (managed by Ruckus)

Station 1 –

- U of U Booth

Station 2 –

- U of U Booth

Station 3 -

- Demo Booth

IOT Sensors

- SCNET NOC
- SCNET Suite
- Ciena

Live View

- View of Data from HPC Node in SLC

Scientific Applications

IOT Sensors

Temperature

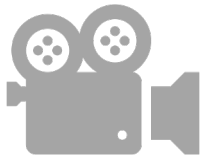
Humidity

Pressure

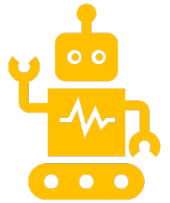
Gyroscope

Accelerometer

Magnometer



Video



Remote control

Drone

Robot