R&E Deployments of CBRS-based NHN

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March 6, 2024
University of Michigan

• Began initial CBRS R&D in 2020 – pandemic paused that
• Restarted work in 2023, joined the I2 Future Wireless Working Group
• Focused on market analysis/deployment business models, and handling the prerequisites
  • Precision time distribution with minimum necessary network awareness (unicast!) – which vendors support which ITU profiles (G.8265.1? G.8275.2?)
  • 802.3bt - planning for higher power budgets in the access layer without breaking the bank (interesting findings on LLDP/negotiation)
  • To consider: management platform for linking SIM identities to campus IDP
  • To explore: eSIM (if needed) and Wi-Fi access provisioning via in-app OSU
  • To worry about: U-M did not acquire PALs – what does the interference/noise floor situation look like with multiple competing GAA users in a geography?
• Coinciding work on Passpoint – open questions on how to implement the two technologies in the same spaces, the limits of vendor implementations of the HS 2.0 standard, variability in E911 support over Wi-Fi, and optimization of Wi-Fi Calling using ALG – future work needed
Utah Education Network

- Spectrum - In our experience, spectrum is the limiting factor - we need to address this and secure spectrum
- 50,000 Utah students without network connectivity
- Develop strategic 5G capabilities - Campus focus with ability to go beyond when necessary
- IoT - Growing sensor networks, security, and ability to explore best practices that assist in developing the operational technology models
- Research, mainly field, and ability to reach remote locations
University of Virginia

Business Drivers: Private LTE/5G

- Campus applications in locations where wired or Wi-Fi network connections are difficult to implement.

- Interconnection with cellular carriers for neutral host network (DAS / ODAS)
Multi-Operator Radio Access Network

Multi-Operator Core Network
Kajeet MOCN Technical Trial

- Locations
  - Clemons Library
  - IT office areas

- Collaborators
  - Kajeet / Internet2
  - AT&T
  - T-Mobile
  - Airspan Radios
Full Carrier Interoperability

• Services
  • Cellular broadband data
  • Cellular voice
  • E-911 and emergency services

• Interesting
  • Handoff to/from macro network
  • MNO accepted radio types
  • 4G vs. 5G and MOCN
  • Campus network plumbing
  • Scalability and campus network growth
Comcast MOCN Technical Trial

• Locations
  • Lawn / Amphitheater
  • Indoor test locations
  • IT office areas
  • via UVA CBRS PALs

• Collaborators
  • Comcast core
  • UVA core (Athonet)
  • Airspan Radios
  • Mosolabs Radios
  • Next, add Cellular to MOCN GW
Summary

• MOCN Technical Trials
  • The technology works
  • Full cellular carrier interconnections worked well, E-911, etc.

• Is private cellular most cost-effective for DAS / ODAS?
  • Including campus niche applications, supported on margins

• Time will tell
  • Carrier acceptance
  • Business models
  • Software and equipment maturity
  • Alignment of technology and business models?
Internet2

• **Future Wireless Working Group**
  • All three of these organizations are part of the 25+ R&E Internet2 members discussing and collaborating on emerging wireless technologies
  • Come join us!

• **Neutral Host Network Platform RFP**
  • Created by the Working Group. Responses due March 8th
  • Seeks a Provider with
    1) Carrier relations, 2) MOCN Gateway Service and 3) RAN design expertise to enter into the NET+ Service Evaluation Process

• **NET+ Service Evaluation Process**
  • Member driven evaluation of cloud services to ensure needs of the R&E community
Thank you!

Question?

A link to the slides will be available with the session abstract.