CHICAGO
MARCH 4-7

INTERNET2
2024
COMMUNITY
exchange

R&E Deployments of CBRS-based NHN

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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

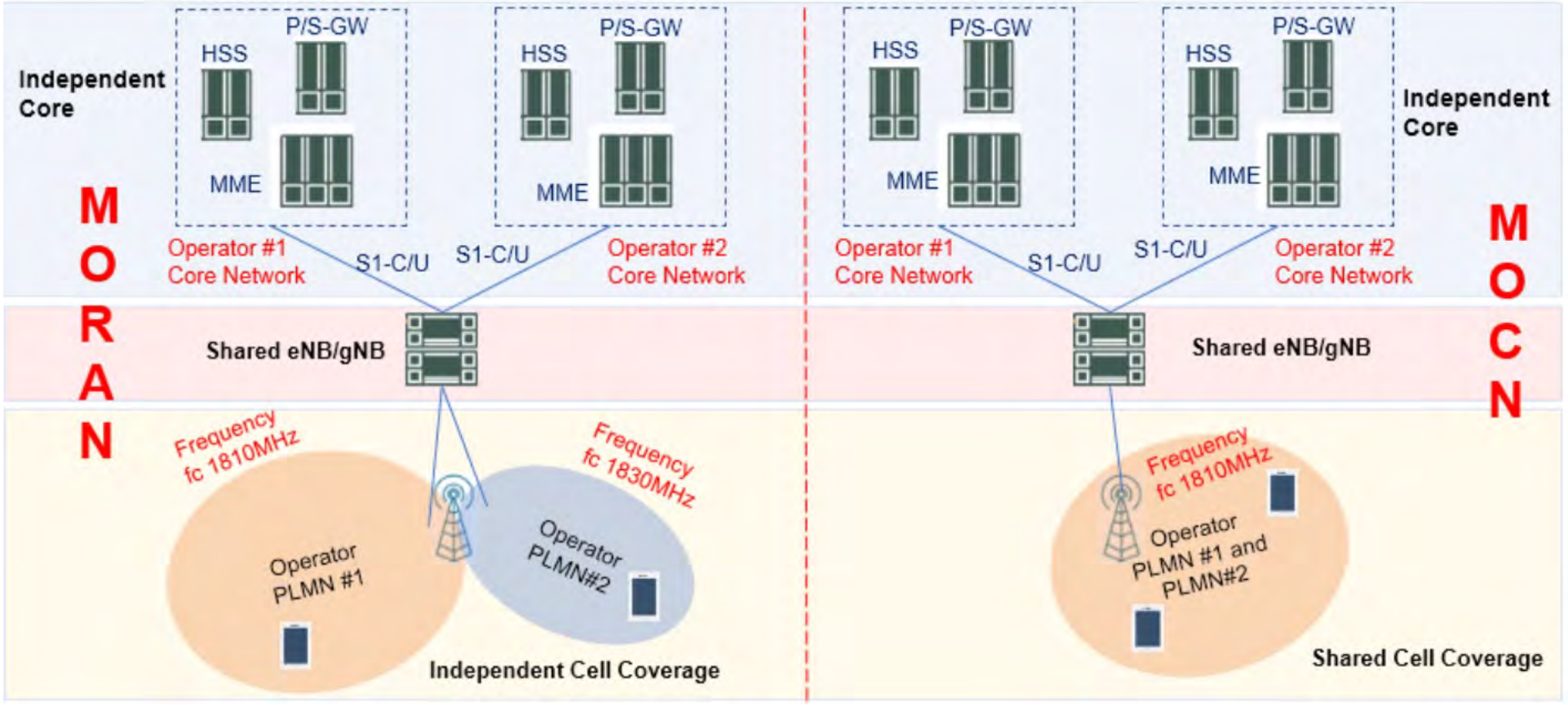
Business Drivers: Private LTE/5G

- 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)

IoT

IoT

IoT

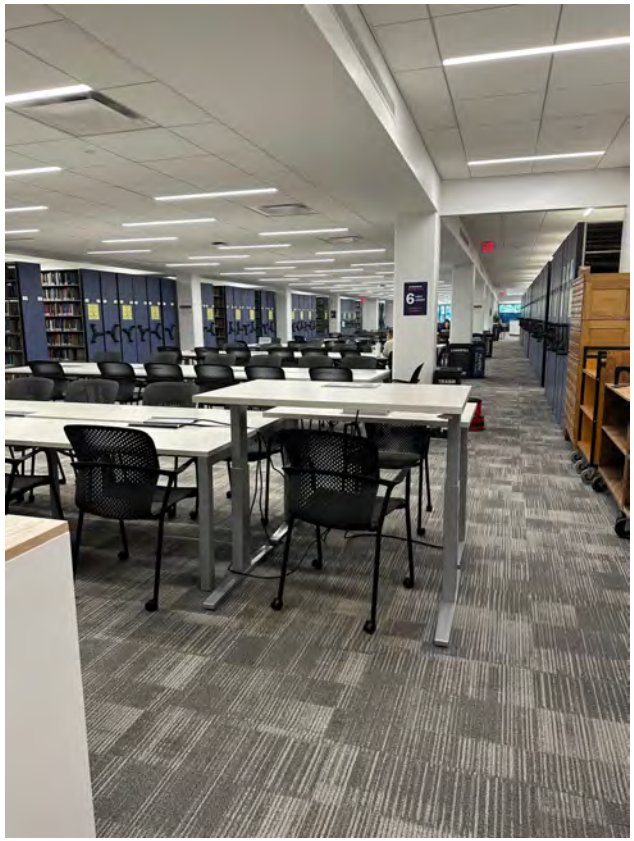


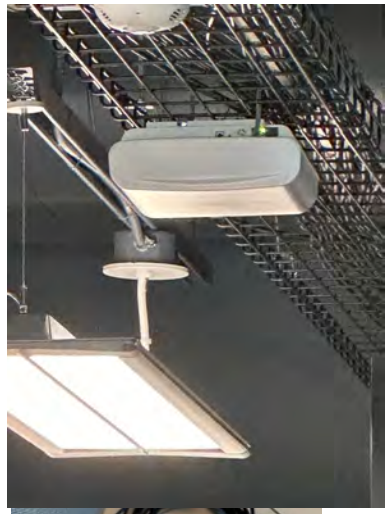
Multi-Operator Radio Access Network

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.