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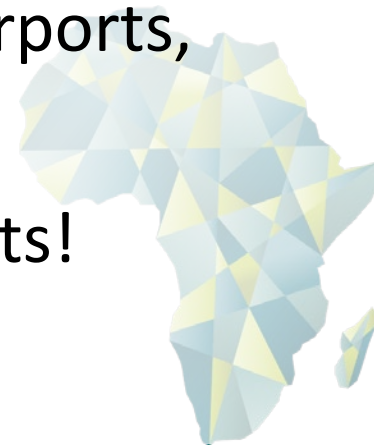


Enabling the Internet of Things through CBRS

ROBERT KRUMM - RUCKUS

Internet of Things Applications

- Critical Communications, Streaming Data, Telemetry, Automation & Control.
- Application design requirements / concerns
 - Medium to High data throughput (1 to 100 Mbps)
 - Latency, Jitter, QoS
- Healthcare, Mining, Transport, Factories, Oil Platforms, Ports, Airports, Conference Centers, Stadiums, Smart Cities etc.
- Present day solutions may require proprietary radio tech & clients!
- Unlicensed Bands don't always work for the application.



Citizens Broadband Radio Service

- April 21, 2015 – FCC Announced [Report & Order for Citizens Broadband Radio Service](#)
- Allows commercial, coordinated use of the 3550 to 3700 MHz band (3GPP - Band 48)
- The technology covers 3GPP Band 42 & 43 (3400 – 3800MHz)
- Rules allow licensed and unlicensed use for a wide variety of services.
- Three-tiered model protects incumbent users whilst allowing shared, coordinated access to the 3.5GHz band.
- ***NO INTERFERENCE*** on your assigned channel!
- Low barrier to entry for potential service providers & private enterprise.
- Ideal for Indoor / Outdoor TD-LTE & LTE-A services.



- **EXPENSIVE & OUT OF REACH**

- Limited uptake remote / rural, industrial installations
- LTE capable IMS / EPC Core is massive CAPEX / OPEX
- Requires spectrum leasing from licensed operator / regulatory intervention

- **UNTIL NOW**

- Spectrum now available for *Free* via CBRS
- Virtualised IMS / EPC core products becoming available for Enterprise!
- Standardised Client devices / technology enables wide adoption.



CBRS BENEFITS

- **NEW SPECTRUM**

- 3.5GHz frequency band adds to available capacity!

- **CARRIER CLASS CONNECTIVITY & QoS**

- LTE / LTE-A radio interface highly suited to life/mission critical & delay sensitive applications.

- **NO INTERFERENCE**

- Co-ordinated spectrum removes issues of interference.
- No co-existence issues with unlicensed bands & WLAN (eg. LTE-U / LAA).

- **LOW COST OF DEPLOYMENT**

- No costly licensing.
- Neutral Host architectures allow consolidation, interconnectivity & cost savings.
- Ability to augment existing Wi-Fi installs saves on infrastructure costs.

- **NEW BUSINESS / SERVICE MODELS**

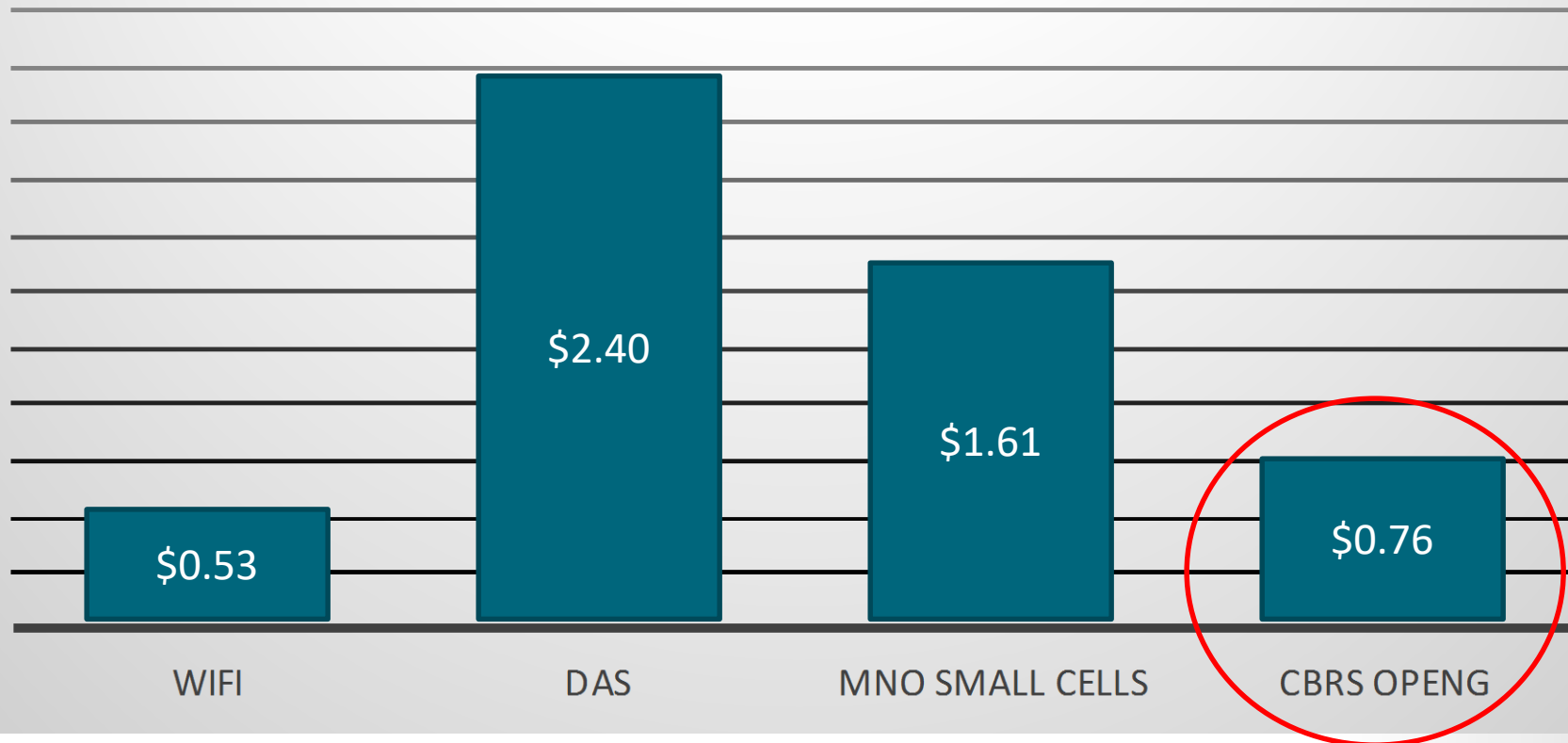
- Enables private LTE networks for enterprise applications.
- Opportunity for managed services & interconnection to mobile operators.



WHAT DOES IT COST?

5-Year TCO Comparison

\$/sqft for a 200K sqft Building





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Thank you!