BEC TECHNOLOGIES

WHITEPAPER

High Performance CBRS Private LTE Solutions for In-Building Applications

The advantages of utilizing CBRS spectrum to provide secure, cost-effective LTE indoor coverages and the vertical markets could benefit from it

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Summary

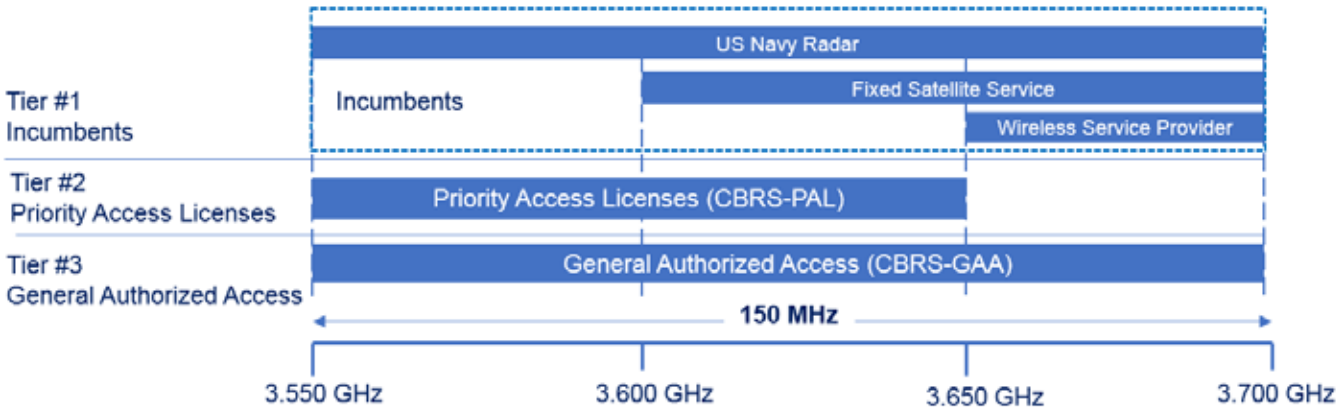
CBRS shared spectrum creates many opportunities to supporting new Private LTE and IoT applications

This paper discusses the advantages of delivering secure and cost-effective network with high capacity over CBRS shared spectrum in indoor environments, and the vertical markets could benefit from utilizing LTE-based technologies in shared spectrum to run their own local network with dedicated equipment and settings.

Quick Overview

CBRS – Citizen Broadband Radio Service

To make more spectrum available for wireless broadband use, in 2015 the FCC established Citizen Broadband Radio Service (CBRS), an initiative that broadly opens the use of the 3.5 GHz spectrum band for shared public and private use. Under the initiative, the FCC redefined dynamic sharing rules to make 150 MHz of spectrum available for flexible wireless broadband for general U.S. consumers, while at the same time ensuring interference protection and uninterrupted use by federal incumbent users already utilizing this spectrum. The plan incorporates a three-tier sharing model comprised respectively of federal incumbents (1) at the top, (2) priority access license (PAL) in the middle, and (3) general authorized access (GAA) -users at the bottom. The model is aimed at securely coordinating spectrum access between the incumbent military radars and satellite ground stations that are guaranteed access, and the new commercial users who can take advantage of underutilized spectrum.



Why and Who?

The needs of Private LTE network

Today, Wi-Fi networks have a role in virtually every architecture. However, in some circumstances, Wi-Fi and public LTE are not ideal. For those cases, private LTE has emerged, providing dedicated, fixed-cost networks for businesses and IoT devices. Organizations that can generate the greatest benefit from private LTE have use cases that are not readily supported on public or Wi-Fi networks. With LTE spectrum now being made available to non-traditional network operators, businesses, and entrepreneurs will be able to pursue new and exciting network applications across multiple industries, including manufacturing, shipping, health care, and transportation.

The primary reasons to deploy a private LTE network are:

Cost

The infrastructure needed for private LTE network is far less expensive than a widespread Wi-Fi deployment. Moreover, there are dozens of Wi-Fi access points would be required in a sprawling area, a LAN based on private LTE would call for just a few specially designed cellular access points.

Better connection, coverage, and capacity

Enterprises can guarantee coverage at their facility or location by installing their own private network. This is most necessary where the public or Wi-Fi networks do not exist or are not ideal but can often also apply to indoor and campus locations. Without connection with other network users, enterprises can make full and exclusive use of available capacity, for example, to support video surveillance and analysis of a security application.

Security

Network architecture with Private LTE usually includes on-site servers, enabling organizations to keep traffic between CPE devices and corporate servers on the wireless LAN instead of the public Internet. LTE deployments include SIM cards and edge networking devices, providing additional layers of security that aren't possible with Wi-Fi networks. Altogether, these factors give private LTE network security advantages over Wi-Fi and help protect an organization's most critical information from malicious attacks.

Advantages of CBRS Spectrum

Utilizing LTE-based technologies in CBRS shared spectrum to establish private LTE network

Besides all the benefits from private LTE networks addressed previously, CBRS enables LTE-based solutions for both in-building wireless and outdoor coverage and capacity expansion. The 150MHz of CBRS shared spectrum, at low spectrum cost, opens a wide variety of market opportunities for both traditional mobile operators and non-traditional players. Compared to Wi-Fi, private LTE offers higher bandwidth capacity, more predictability, and better security with built-in over-the-air encryption. Additionally, devices connected to a Wi-Fi network need to stay within 300 feet of a wireless router to maintain a reliable connection, which necessitates the use of numerous routers and extenders to achieve a somewhat stable network. With LTE small cells, only a few antennas would be required to create a reliable and fast network since they possess a range of approximately 10,000 square feet and are designed with scalability in mind. In addition to this, LTE-enabled devices, like the smartphones in our pockets, don't need to be set up to work on an LTE network: they can simply connect and start functioning as soon as they're turned on.

In-Building Applications

Vertical Markets could benefit from utilizing private LTE network in shared spectrum

1. Enterprise Business: Warehouse and Manufacturing

Most modern-day warehouses and manufacturing plants that utilize automated systems like robotics rely on hard-wired connections, Wi-Fi, or Bluetooth to perform their day to day functions, which isn't ideal since these network systems can be unreliable. Because of this unreliability, the rollout of these technologies in our manufacturing plants has been slower than expected; however, with wireless industrial networks based on LTE, businesses will be able to create an advanced "digital nervous system" for all IoT devices to operate on, bringing unparalleled connectivity, reliability, speed, and safety. With private LTE networks, manufacturing plants will be able to truly embrace all that the IoT has to offer, which includes full autonomous functionality, a wider range of internet-ready devices, and energy efficiency as LTE networks are low-powered by design.

2. Healthcare: Hospital and Hospice

This market has a significant number of high-tech devices that are used throughout both clinics and hospitals. In the past, they have only been offered Wi-Fi because it has been the lowest common denominator. Just like we saw with manufacturing, private LTE networks can also greatly benefit hospitals and various other healthcare facilities where the number of internet-ready devices being deployed is growing every year. With a stable and reliable private LTE network in place, medical professionals will be able to receive an up-to-date and real-time analysis of their patient's wellbeing without delay from anywhere within the facility. From digital thermometers to ventilation machines, nearly every piece of equipment in a hospital can be networked to provide aggregate data, which should help improve the quality of healthcare received by Americans.

3. Education: Campus

Most commonly used access technologies do not meet enterprise connectivity requirements. While campuses often do have sufficient throughput in their existing LAN, the access technologies are either too costly (wireline) or too low range (Wi-Fi) or are not suitable for mobile use cases. For example, remotely operating a factory with smart robots across a large campus such as an airport will not be feasible within a Wi-Fi network, as there is poor handover functionality. On the other hand, public cellular networks cannot be used due to a lack of throughput, latency, and security. With Private Networks, many of the current challenges can be solved. Homogeneous indoor and outdoor coverage, multi-technology integration and increased control and security are paving the way for digitalization from a networking perspective.

What does BEC offer ?

Comprehensive product solutions for CBRS shared Spectrum

To take advantages of private LTE, organizations must have edge solutions that support certain bands, including CBRS. BEC's LTE solutions are certified and support licensed, unlicensed, and shared spectrum.

BEC's high-performance portfolio of CBRS gateways and routers all support LTE Bands 42, 43 and 48 with 4x4 MIMO Antenna Technology Operators can select models designed for indoor and outdoor applications, LTE Category 6 or 12 and Carrier Aggregation up to 3CA DL with 2CA UL.

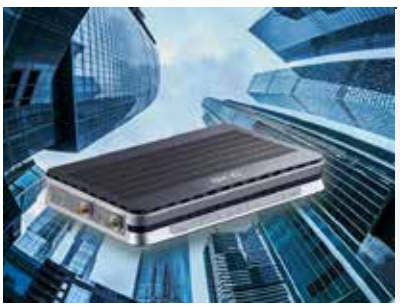
All devices are managed by BECentral®, BEC's cloud-based remote device management platform. It allows operators to remotely provision, monitor, upgrade and troubleshoot devices from a single centralized location.

MX-100UE – Industrial CBRS M2M Modem
Compact IP -50 Hardened enclosure with industrial-grade components, dual SIM and active GPS, plug and play, alternatively it can be used with the MX-1200 Multi-Service Router.

Applications: Industrial IoT, Kiosk/Vending, Digital Signage, Telehealth, Embedded System/OEM

MX-240 Series – Enterprise CBRS Gateway
Compatible with major edge routers, supporting IP passthrough, managed failover with two Gigabit Ethernet, ultra-compact, designed for industrial environments.

Applications: In-Building, Private LTE, Industrial IoT, Business-critical operations



6500AEL – CBRS Multi-Service Router
Dual WAN interface, can serve as primary all in one connection or drop-in secondary WAN failover for existing networks. 802.11AC Wave 2 Wireless LAN with advanced networking.

Applications: In-Building Connectivity, Private LTE

6900RUL – Series CBRS Outdoor Router
High gain antenna technology ensures faster and efficient bi-directional transmission for maximum bandwidth and coverage. Built to last, designed to survive the harshest environment.

Applications: Fixed Wireless for Last Mile Access

About BEC Technologies

BEC Technologies is a leading developer and manufacturer of next-generation wired & wireless IP networking solutions for mobile operators, residential, enterprise, and Industrial markets. BEC's comprehensive product portfolio of solutions incorporate xDSL, FTTH, 3G, 4G/LTE, Fixed Data Routers, VoIP/VoLTE Gateways, Rugged Outdoor, Industrial/M2M Connectivity, Public Safety, Fleet/Telematics and Cloud-based remote device management. Our solutions are designed for high availability, reliability and secure connectivity all backed up with class-leading technical service and support.

Contact us for a No-risk Product Evaluation

Talk to us about customized solutions for your opportunities!

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