

UNIFYING INFRASTRUCTURE FOR 5G WITH CITIZENS BROADBAND RADIO SERVICE PRIVATE LTE NETWORKS



Healthcare, transport and logistics, manufacturing, smart venues, smart cities, and oil and gas sectors will be major spenders in private Long-Term Evolution (LTE) from 2020 to 2025, [according to ABI Research](#). Main drivers of private LTE are a new understanding of spectrum usage spearheaded by Citizens Broadband Radio Service (CBRS) activities.

Unlike cellular spectrum, CBRS is not owned by mobile operators but it allows enterprises and [a new wave of managed service providers](#) (MSPs) to deploy in-building cellular coverage solutions at a fraction of the cost of today's alternatives. Major smartphone chip vendors already support CBRS capability and handsets are in the pipeline.

SPECTRUM

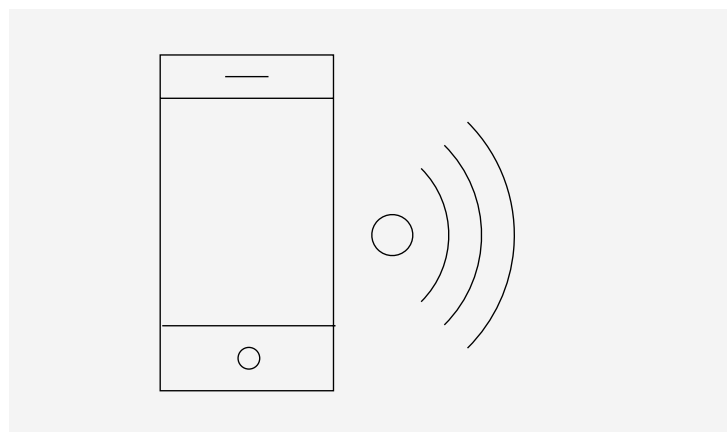
The CBRS system provides 150 MHz (3550 to 3700 MHz) of spectrum and offers the ability for companies to easily acquire spectrum in a local area at nominal cost. This has traditionally been one of the roadblocks to private LTE expansion.

With this ability, enterprises can leverage on solutions, such as the [CommScope Ruckus CBRS portfolio](#) that combines dedicated spectrum to allow enterprises to build a local private LTE network in-building or outdoors. Private LTE networks enable cellular-like reliability, mobility, security and quality of service but are managed like Wi-Fi and more cost-effective than traditional cellular/ LTE networks.

CBRS AND 5G

With CBRS, enterprises now have access to secure, cost-effective LTE coverage as well as support for IoT connectivity. This brings both commercial mobile operator services and emerging CBRS private LTE networks into an efficient, unified infrastructure that paves the way for 5G in the building.

CBRS creates a framework for 4G and 5G deployments in the 3.5 GHz band. In many countries, the 3.5 GHz band is reserved for 5G deployments. The technology allows building owners and property managers to run in-building networks using standard 4G LTE cellular technology. Even as mobile operators across Asia-Pacific gear up to roll out 5G networks, 4G availability in the region has reached near ubiquity, particularly in South Korea, Japan, Hong Kong, Taiwan, Singapore and India.



Private LTE networks bring maximum mobile coverage and ubiquitous connectivity inside buildings, in high-traffic venues (i.e., [stadiums](#), theatres) and in high radio frequency environments, such as hospitals and corporate and educational campus facilities. Asia-Pacific is expected to be the fastest-growing private LTE market over the coming years due to government initiatives to boost Smart City programmes and rapid investments from domestic vendors to integrate 5G with private LTE networks.

Successful private LTE deployments will show the reliability of cellular technology and its ecosystem. These networks enable enterprises to enhance operational efficiency and provide innovative network solutions to the end user while paving the way for 5G in industrial markets.

CBRS COMMERCIAL DEPLOYMENTS AND PORTFOLIO

In 2019, the US Federal Communication Commission [certified CommScope's spectrum access system](#) (SAS) to support CBRS for initial commercial deployment. CommScope's Environmental Sensing Capability (ESC) sensor also passed the Institute for Telecommunication Sciences' testing.

While the CBRS opens the coveted 3.5 GHz band to wireless networks, neutral hosts, broadband providers and other networks, all operators need to access an SAS to tap into this new spectrum. SAS allows efficient frequency sharing, interference reduction and the prioritization of the traffic from incumbent users, such as government radar installations.

At CommScope's manufacturing facility in the US, CBRS devices managed by the CommScope SAS provide high-bandwidth, low-latency connections to remote video equipment monitoring the facility while select IoT devices are also connected to the CommScope private LTE CBRS network.

With the addition of [CommScope Ruckus CBRS-band LTE access points \(APs\) and associated cloud services](#), CommScope's end-to-end solution consisting of SAS and ESC gives organisations the ability to deploy LTE-based wireless solutions quickly and confidently. A Ruckus private LTE network can be deployed as easily as Wi-Fi in a matter of hours or days and managed from the cloud.

Ruckus is a founding member of the CBRS Alliance and Ruckus has offered the industry's [first FCC-certified CBRS-band LTE APs](#). Ruckus equipment has been deployed in nearly 50 trials across a wide variety of enterprise verticals as well as with network operators.

With CBRS alleviating dead spots in wireless connectivity, enterprises minimise dropped connections, outages or gaps in service. Ultimately, the CBRS-driven private LTE networks will facilitate higher customer satisfaction and streamlined facilities management.

SIGNATURE SHOWCASE:

COMMSCOPE/RUCKUS DEMONSTRATES CBRS FOR PRIVATE LTE

In 2019, CommScope [demonstrated the Ruckus Citizens Broadband Radio Service \(CBRS\) portfolio](#) and Attabotics' 3D robotic supply chain automation system as part of Microsoft Azure capabilities for private LTE networks. The demo also highlighted how IoT applications can take advantage of the security, latency and bitrates provided.

Integration of CommScope-Ruckus portfolio with Microsoft Azure's networking and edge connectivity solutions paves the way for dedicated, secure, ultra-high-quality private LTE networks that feature end-to-end encryption.

Ruckus also showcased a CBRS-based private LTE network in partnership with Amazon Web Services, Athonet, and Federated Wireless in late 2018. The CBRS networks enabled the rapid deployment of industrial IoT applications, such as real-time surveillance devices, smart meters, and worker safety monitoring.

More than 120 programmable Amazon DeepLens video cameras were configured and set up in a matter of hours. Previously, LTE networks would have taken weeks – or even months – to plan and deploy. DeepLens runs deep learning analyses locally on the camera to take action on what it sees.

The FCC-certified Ruckus Q710 3.5 GHz indoor APs and the Federated Wireless Spectrum Controller enabled access to CBRS shared spectrum for private 4G and 5G applications with Athonet BubbleCloud as a mobile core. The network delivered a plug-and-play experience that made it easy to connect, monitor and manage IoT assets at scale.

Typically, network congestion can be an issue with many devices trying to share the wireless bandwidth simultaneously. However, the LTE network was able to do this seamlessly with no impact on performance to the user.



SIGNATURE SHOWCASE:

Such demos inspire possibilities of other applications using DeepLens and similar devices leveraging AWS applications running locally and in the cloud.

REAL-WORLD IMPACT

CBRS capabilities are poised to allow office and industrial building owners to improve cellular signal strength at dramatically lower costs. This advantage alone addresses deployment challenges related to distributed antenna systems.

Similarly, hotels seeking to solve indoor cellular coverage issues can leverage technologies, such as OnGo, to provide interference-free spectrum. OnGo is a brand of the CBRS Alliance, which promises high-quality wireless connectivity enabled by spectrum sharing in the 3.5 GHz band.

Not all organisations have to design, install or manage their own LTE networks. Managed Service Providers provide networks for private LTE and as a neutral host network. As a neutral host, organisations enter a business agreement with mobile operators to provide service to mobile customers while they are on the OnGo network on premises.

