



Private LTE Based on CBRS

A reliable alternative to Wi-Fi and public networks in the 3.5 GHz band

Wireless communication has become a necessity in modern life. But when public LTE and Wi-Fi networks aren't available due to coverage limitations or aren't working well because of capacity issues, organizations in the U.S. are increasingly looking at the option of private LTE networks based on Citizens Broadband Radio Service (CBRS) to meet their business connectivity needs.

What is Private LTE?

Private LTE networks are non-public wireless networks based on cellular LTE technology. They are based on the same protocols and technology that public LTE networks use today. Small cells – similar to Wi-Fi access points – are installed on site and then operated by a managed service provider (MSP), the site owner (such as a shopping mall owner) or by the enterprise customer. Users can then use their Band 48-capable cellular devices with a private SIM to connect to the private LTE network.

A private LTE network offers performance and reliability that public LTE or Wi-Fi alone can't match, and usually at a much lower cost. It offers uninterrupted connectivity along with the ability to handle heavy traffic loads, such as data coming from thousands of IoT devices. And it offers excellent penetration, with the ability to reach through building walls and other obstacles that might block a Wi-Fi signal.

Private LTE and CBRS

Citizens Broadband Radio Service (CBRS) is a new private LTE network option now available in the U.S. It occupies 150MHz of shared spectrum in the 3.5 GHz C-band, also known as Band 48 (B48). Traditionally, this band had been reserved for

Product Highlights

Digi TX54

Rugged and secure cellular router for mission critical industrial transportation applications, including models for public safety networks.



Digi WR54

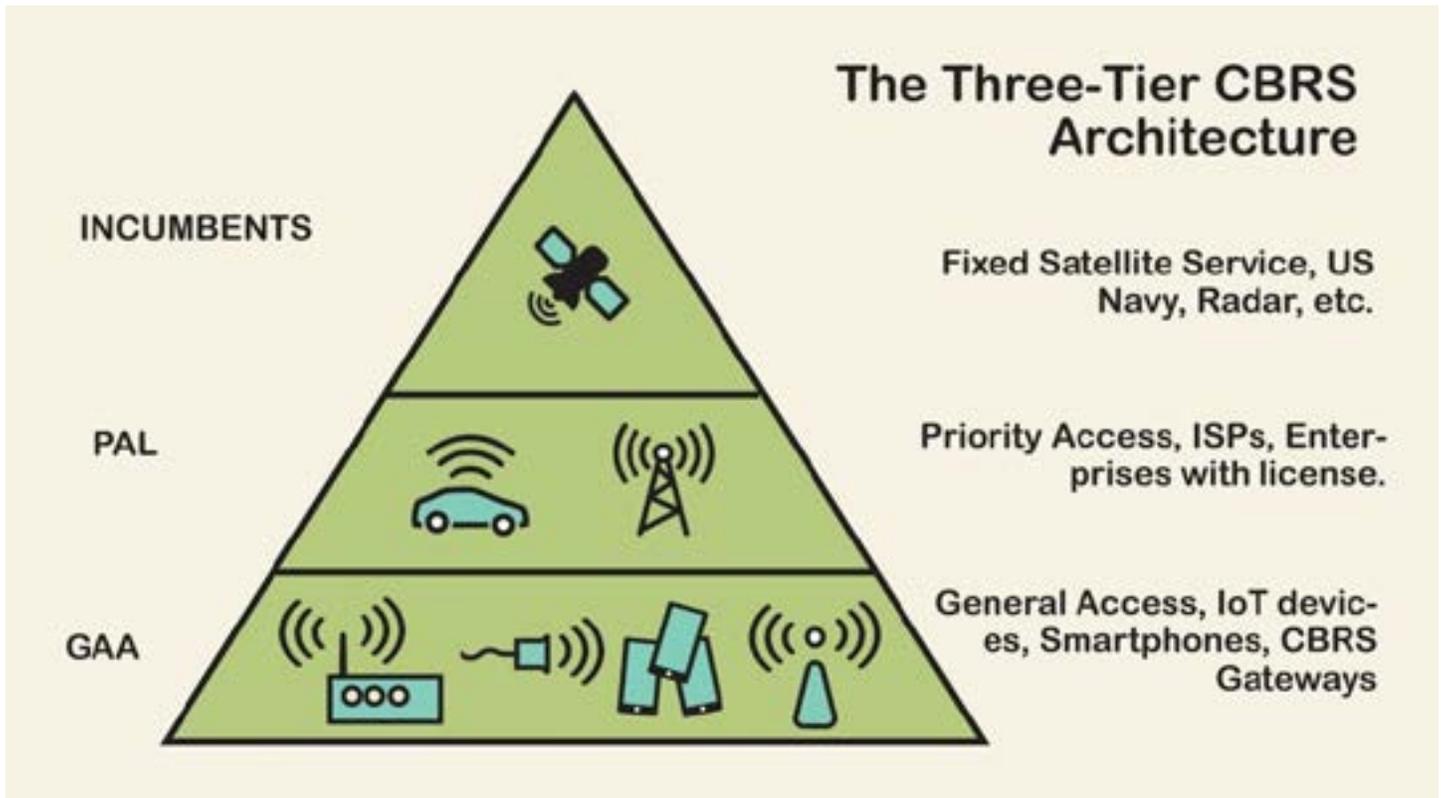
Rugged and secure cellular router for mission critical industrial transportation applications, including FirstNet Ready™ models for public safety networks



users in the U.S. military and fixed satellite service. But this spectrum has recently been approved for broader use by the FCC, opening up opportunities for a range of new applications. Industry observers have said that “CBRS will put enormous wireless networking power into the hands of organizations that have never had such a promising and affordable option before.”¹

Access to CBRS spectrum is shared and actively managed among three groups:

- ✓ Tier 1. Incumbent users, primarily the U.S. Navy and satellite ground stations
- ✓ Tier 2. Users with priority access licenses (PALs)
- ✓ Tier 3. General authorized users (GAA)



CBRS technology is being developed and promoted by the CBRS Alliance, a non-profit industry organization of which Digi is a member. The CBRS Alliance has developed detailed specifications along with a certification program to ensure seamless interoperability for all network components.

Business benefits: Why use Private LTE?

Private LTE has several advantages over public LTE or Wi-Fi. Within the confines of the network, it provides an exclusive LTE network in uncrowded spectrum. It is deployed with dedicated equipment that increases device and data capacity and includes built-in security and controls not possible in public networks. It is tailored to put the enterprise customer in control.

Here are some additional benefits:

- ✓ **Privacy:**
With private LTE, data never leaves the enterprise customers' network. This is especially important for highly regulated industries, such as healthcare or finance.
- ✓ **Security:**
SIM-level device security ensures that devices have a unique identifier and are properly authenticated. This gives network administrators tight control over what devices are allowed on the network.
- ✓ **Flexibility:**
Private LTE networks can be customized to meet an organization's unique application needs.
- ✓ **Capacity:**
Private LTE networks can use either dedicated or shared spectrum. This puts the enterprise customer in control of bandwidth and infrastructure density, based on their individual needs.
- ✓ **Quality of service (QoS):**
Cellular technology provides a better quality of service than Wi-Fi and gives the customer control of how data traffic is prioritized, end to end.
- ✓ **Latency:**
Deterministic latency, that is, the ability to set a fixed length of time for the transfer of data, is available with private LTE, thanks again to full end-to-end control. Deterministic latency can be very important in factory settings where devices need to be tightly synchronized.
- ✓ **Resiliency:**
With private LTE, enterprise customers can deploy additional small cells for increased resiliency and uptime. They can also allow fallback to public LTE (if desired) using the same cellular device.
- ✓ **Mobility:**
With private LTE, mobility, that is, the hand-over between the individual small cells, is seamless and comparable to what users experience with public LTE. There's no connection loss with private LTE as there can be with Wi-Fi.
- ✓ **Cost:**
Enterprise customers enjoy lower data transfer costs with private LTE than with public LTE, an especially important consideration when there are high data volumes. In addition, while the cost of an individual high-powered small cell is higher than an enterprise-grade Wi-Fi access point, fewer small cells are needed to provide coverage over the same area. (The total cost of ownership (TCO) for private LTE is outlined in a white paper available from the CBRS Alliance.)

Use cases: Where should Private LTE be deployed?

Private LTE is an attractive wireless option for any number of geographically defined areas, such as a seaport, mine or college campus, or inside a facility such as a hospital, factory, shopping mall or sports stadium. It can also provide low-cost "last mile" connectivity in rural areas.

Here are just a few promising use cases for private LTE:

- ✓ **Mine sites:**
Mining operations typically cover large, but clearly defined geographical areas, where high-power base stations can be deployed cost-effectively. Private LTE enables reliable, uninterrupted communication with personnel and mining equipment.

✓ **Seaports:**

With seaports implementing automation on a growing scale and containerized freight systems increasingly using RF identification, private LTE makes it possible to continuously monitor equipment and track the flow of freight, improving efficiency and security.

✓ **Hospitals:**

Private LTE provides secure, high-performance connectivity, enabling medical staff and administrators to share sensitive medical files while keeping data secure.

✓ **College or corporate campuses:**

Private LTE can provide secure, low cost coverage and address coverage gaps over distances that are too great for Wi-Fi.

✓ **Factories:**

Expanded use of robotics and automation in manufacturing is driving the need for low-latency connectivity between machines on the factory floor. Private LTE networks can connect robots and IoT devices, and facilitate better process monitoring and predictive maintenance.

Digi is ready to help you deploy Private LTE based on CBRS

We are still in the very early days of private LTE. Industry experts, however, believe it has the potential to dramatically expand the uses of wireless communication and reach previously untapped markets and unserved or underserved populations. No wonder it's being called the "innovation band."

1 Paul Pishal, "Soon, Reachable for All," ISE Magazine, November 1, 2019

<https://www.isemag.com/2019/11/telecom-citizens-broadband-radio-service-cbrs-spectrum/>