

Anterix Issue Brief

An Overview and Reference Guide for Utility Private LTE

Summary

Anterix is focused on modernizing infrastructure and critical communications by enabling private broadband connectivity for electric, gas, and water utilities. Anterix Private LTE spectrum helps utilities securely integrate and manage distributed resources, automate processes, monitor conditions, use artificial intelligence, and drive worker productivity to improve service and reduce operational costs. With Anterix's 900 MHz licensed broadband spectrum, utility customers can deploy robust cybersecure Private LTE Networks they control on a standards-based platform that provides future scalability, while offering deep coverage, ample capacity, and cost efficiency.

Anterix delivers the foundation for more secure, flexible, private networks designed to help support the market forces facing the industry as further described below. The following highlights how utilities can benefit from adopting Private LTE networks using Anterix technology:

CYBER SECURITY

As cyber attackers grow more sophisticated, utilities will benefit from developing effective mechanisms to help discover, prevent, and recover from security incidents. LTE is a worldwide standard and enjoys highly advanced security features. A utility that deploys LTE in a private network, supported by licensed spectrum, has fewer points of entry compared to commercial wireless networks. Ultimately, a utility managing a Private LTE network for their operations and communications needs has the option to completely disconnect from the public internet (either permanently or temporarily) providing a high level of protection from cyberattacks and enabling the utility to scrutinize all traffic moving between its systems and end points.

"We think the 900 MHz band can be a source of innovation for electric utilities. The reason is that technology has progressed to the point where, and the needs of utilities have progressed to the point where, this band in particular can help them accomplish their goals, which are to modernize their operations, improve the resiliency of the power grid, and otherwise use the airwaves to set up private networks that can help them do what they do best. And that's to deliver power in an efficient, effective way across the country."

- FCC Chairman, Ajit Pai



IMPROVED RELIABILITY, RESILIENCY AND CUSTOMER SATISFACTION

A Private LTE network is preferred over other types of utility wireless networks during major disruptions, leading to better, faster and more accurate grid information. Private LTE networks can provide utilities with enhanced visibility and improved control across the electric grid, thereby helping the utility to react far more quickly to line outages, downed poles, and tripping of inverters or transformers. They can also help to increase the ability of the grid to both consistently deliver electricity to customers, and withstand, survive, and recover from weather-related outages, natural disasters, cyberattacks and other disruptive events. Improved reliability and resiliency can, in turn, directly impact customer satisfaction and help to reduce the impact of disruptive events.

INTEGRATION OF DISTRIBUTED RESOURCES

Management of solar, wind, hydropower, fuel cells, and other distributed energy resources (DER) is one of the emerging challenges to the modern electric grid. Private LTE networks can help utilities to view and adjust the grid transmission and distribution systems when integrating individual consumer generation resources. Additionally, the higher speed, more secure two-way communication capabilities of a Private LTE network allow development of next-generation utility applications to better control DERs and help a utility to better manage the integration and energy flow from these resources.

LOWER TOTAL COST OF OWNERSHIP

Anterix licensed spectrum for Private LTE deployments can help provide utilities with more cost-effective and forward-compatible solutions, and lower Total Cost of Ownership (TCO) through reduced infrastructure and operating requirements benefitting consumers by helping to lower the consumers burden of these investments. TCO can also be lower with the Anterix spectrum because of the global LTE device ecosystem, which helps to ensure continued support of devices and reduced chance of stranded investments.

ROBUST DEVICE ECOSYSTEM WILL ENSURE FLEXIBILITY AND FUTURE-PROOF IT/OT INVESTMENTS

Because Anterix's 900 MHz spectrum is already within a globally defined LTE standard band, utilities should be able to enjoy all of the benefits of 4G technology and equipment when deploying a Private LTE network with Anterix spectrum. The FCC has also included Anterix's 900 MHz spectrum in its 5G FAST Plan, indicating the US government backs the company's spectrum as ideal for 5G, which is an evolution of the LTE standard technology to accommodate a diverse set of mission critical use cases and applications, both now and into the future.

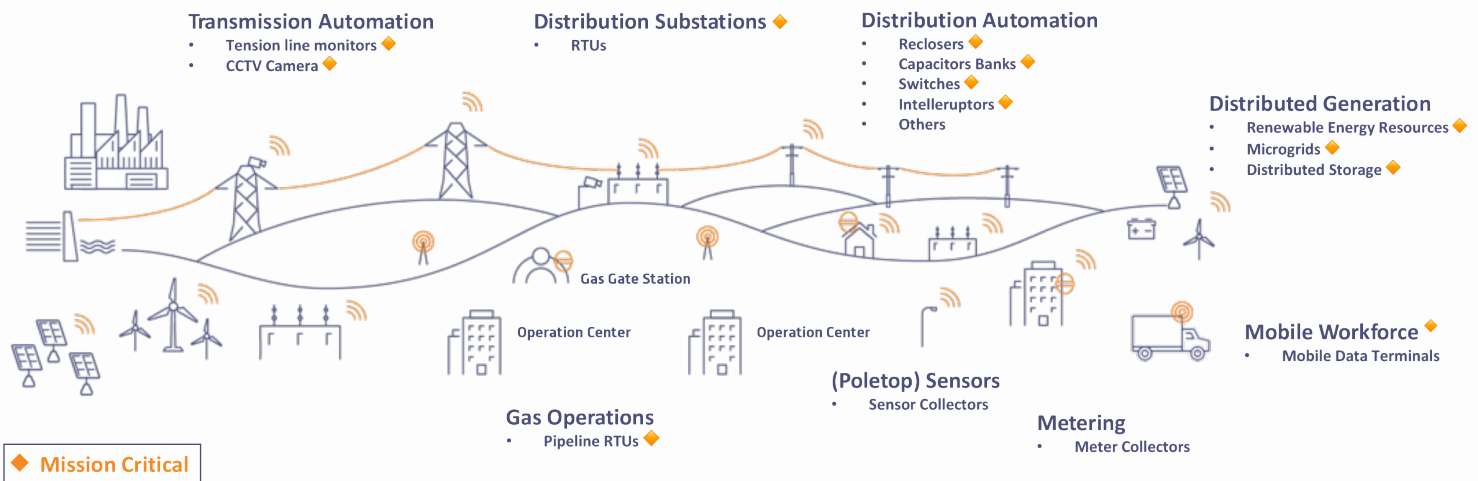
COMMUNITY IMPROVEMENTS

Since utilities investing in Private LTE networks are building the infrastructure needed for community broadband deployment, these efforts can also help support rural broadband expansion.

SMART COMMUNITY/SMART CITY/IoT

Smart Community/Smart City technologies include applications such as monitoring of parking space availability, urban noise mapping, gunshot detection, smart lighting, and traffic congestion monitoring. All of these applications ultimately require connection of a device that uses data and technology to improve the lives and experiences of the people and businesses within that community. This smart device technology is also referred to as the Internet of Things (IoT).





Grid automation places more stringent requirements on network performance and reliability

IMPROVED SAFETY OF UTILITY PERSONNEL

Improved communications between utility stations, equipment and personnel can help to increase operations safety, and lower personnel exposure to potential risks. With Private LTE Networks, when a failure occurs on the grid, Internet of Things (IOT) technology can reliably relay data about the issue enabling the utility to properly respond.

INTEROPERABILITY

As the complexity and interconnectedness of modern critical infrastructure increases, and the threat landscape evolves, it becomes paramount for utilities to be able to cooperate across networks. Private LTE networks supported by Anterix's spectrum can provide an ideal platform for utilities to control and protect their own systems, while allowing greater collaboration without increasing vulnerabilities.

SMART GRID APPLICATIONS/SMART METERS

Smart meters and smart grid technologies such as fault protection, dynamic voltage control, automated reclosers, and advanced sensing and measurement can only be optimized if the utility has the ability to see, manage, and collect data from these devices. Private LTE networks help to provide that transparency and functionality necessary to maximize these smart investments.

RURAL BROADBAND DEPLOYMENT

Utilities that invest in Private LTE networks are building the same physical infrastructure—poles, wires, towers, backhaul fiber—used to deploy broadband into communities lacking adequate broadband access. This allows the physical infrastructure to also help support rural broadband deployment initiatives.

Conclusion

CONSUMERS BENEFIT FROM UTILITY INVESTMENT IN PRIVATE LTE NETWORKS

Utility investment in private broadband networks benefit consumers by helping to provide a more secure grid in an era of increasing cybersecurity concerns, improving the reliability and resiliency of utility infrastructure, enabling the integration of distributed resources and artificial intelligence that make utility operations safer and more efficient, and improving the interoperability of utilities during times of disruption.

Utilities can start down the path towards a Private LTE network with confidence, utilizing the Anterix pilot deployment program to help prove out the capabilities of a 900 MHz Private LTE network against critical use cases. The experienced Anterix team will work with the utility evaluation team every step of the way to help ensure the process is thorough and adequately covers all necessary exercises and scenarios. Ultimately, the pilot deployment program provides a lower risk opportunity to start down the path towards a fully controllable full-scale Private LTE network deployment.

Frequently Asked Questions

WHAT ARE PRIVATE WIRELESS NETWORKS?

Private wireless utility communication networks carry information and data through wireless Long Term Evolution (LTE) technology on a network not accessible to the public. "LTE" means these networks meet the global standards for this technology, which are also referred to as "4G," and soon "5G". The "Private" component means the network is not accessible to the public or anyone outside of the utility, providing maximum control and security.

WHAT IS SPECTRUM?

Spectrum refers to the invisible radio waves on which wireless signals travel. The Federal Communications Commission (FCC) regulates state, local government, commercial, private internal business, and personal use of spectrum. The FCC designates spectrum for use by approved users under specified conditions. Lower spectrum bandwidth travels farther but can carry less data. Higher spectrum bandwidth can't travel as far and does not penetrate buildings or foliage as well but can carry more data.

WHAT ARE WIRELESS ALTERNATIVES TO PRIVATE LTE NETWORKS?

Reliance on Commercial Carriers - Utility networks that rely on commercial carriers face several challenges. During storm events and other outages, the utility is completely dependent on the carrier to restore its network before the utility can fully "see" its electric grid. The commercial carrier—not the utility—determines prioritization of network traffic, so the utility's data may be subordinated to other users such as carrier traffic and first responders. This can cause enormous delays in storm response and outage restoration.

Utility networks that rely on commercial carriers or technologies other than Private LTE are also subject to more network traffic congestion and interference. All commercial communication networks run on shared platforms, meaning that there is traffic from other users that can overwhelm the network or create digital "static" that can disrupt the utility's network. Because a shared network platform is not entirely under the control of a utility, it is also more vulnerable to 'bad actors' accessing the network, hacking, ransomware, and other cybersecurity threats.



Unlicensed spectrum or other licensed spectrum – Unlicensed spectrum faces a higher risk of interference from other users, and also presents higher security risks from unknown actors. Anterix dedicates their 900 MHz spectrum for customer's private networks, greatly reducing the risk of interference from other unrelated users and enabling the sharing of information and applications with other utilities while maintaining a high level of control and security for the local utility.

IS ANTERIX SPECTRUM EXPENSIVE?

Spectrum pricing should be viewed in the context of the overall cost of the utility's communication infrastructure. Utilities are increasing their investments by necessity for the reasons discussed above. Spectrum is a key enabler for Private LTE but not the major driver of the costs. An analogy would be a smart phone: a customer has to pay a fee for the wireless service, but the phone itself is the piece of equipment that must be purchased to use the service, and it typically costs much more than the service itself. Similarly, a utility building a Private LTE network – or any communication network – is making long-term investments in the physical infrastructure (i.e., the equipment) that can be quite significant. The spectrum, however, is generally a relatively low percentage of the overall spend.

IF A STATE DEREGULATED TELECOM YEARS AGO AND DOESN'T HAVE ANY TELECOM STAFF, HOW CAN ITS REGULATORS UNDERSTAND THIS TELECOM STUFF?

A utility's investment in communication networks is squarely within the purview of the electric service it provides. These networks are now considered part of, not apart from, the electric grid. These investments are part of the necessary technology to [1] help protect and secure the electric grid from hostile actors, storms, and other forces that can threaten the grid; and [2] help modernize the grid and accommodate public policy goals, including integration of renewables, voltage control, grid automation, and other next-generation services. This is, therefore, not a departure into telephone or cable regulation, but rather an assessment of a utility's capability in the traditional context of electric generation, transmission, and distribution.

SHOULDN'T UTILITIES JUST WAIT FOR 5G?

Anterix spectrum is fundamentally supportive of both 4G and 5G. 5G is the next generation in wireless technology and may well bring exciting new applications and use cases to the utility field. It is noteworthy that the 5G technology will be additive to the current LTE/4G technology and will use the same infrastructure. In past advances in wireless deployment, such as the shift from the generation of devices that used 3G technology to those that used 4G/LTE, there were fundamental changes in the architecture used in the evolution of the technology. With 5G, however, there is more of an extension of the existing 4G/LTE architecture. This means that private wireless networks based on 4G LTE technology provide a path to 5G and represent utilities' best option to address current and future needs and maximize their return on investment.

ANTERIX INC.

Anterix delivers game-changing connectivity for critical infrastructure, including next-generation communications platforms to support utilities' grid modernization and cybersecurity strategies. We partner with utilities and ecosystem vendors to build secure, reliable, cost effective, and customized LTE solutions on our 900 MHz licensed nationwide spectrum.

