

Cellular LPWA vs. Proprietary LPWA — Myths and Reality

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With the IoT now enabling practically any asset to be connected to the internet, the need for wide-area, low-power, low-cost connectivity for IoT applications has grown. With this type of connectivity, utilities, Original Equipment Manufacturers (OEMs), transportation and logistics firms, construction firms and other organizations can deploy smart energy and resource monitoring, smart city infrastructure monitoring, predictive maintenance, mobile asset tracking, and similar IoT applications that allow them to collect, analyze and use asset data to lower costs, offer new services, increase customer engagement, and otherwise transform the way they operate.

At first, proprietary Low Power Wide Area (LPWA) technologies like LoRa and Sigfox emerged to meet some of these organizations need for wide area, low power IoT connectivity. Then, over the past decade, the 3rd Generation Partnership Project (3GPP) introduced standards for two cellular LPWA technologies – Narrowband IoT (NB-IoT) and LTE-Machine Type Communication (LTE-M). Meanwhile, Mobile Network Operators (MNOs) have built out NB-IoT and LTE-M networks, with at least 156 such networks now in operation around the world today.

While shipments of proprietary and cellular LPWA IoT devices are roughly equal today, over the next decade industry experts expect growth of cellular LPWA devices to outpace propriety LPWA devices. BERG Insight [forecasts](#) that annual shipments of 3GPP LPWA (NB-IoT and LTE-M) IoT devices will exceed 300 million units by 2025, while annual shipments of non-3GPP LPWA IoT devices will grow more slowly over this period, to less than 250 million units.

Why will Cellular LPWA Grow Faster than Proprietary LPWA?

The reason why shipments of cellular LPWA device shipments are expected to be higher than propriety LPWA over the coming years is that cellular LPWA offers several advantages over propriety LPWA. These advantages are leading organizations to increasingly choose cellular LPWA for their monitoring, tracking and other IoT applications.

Cellular LPWA, unlike propriety LPWA, offers organizations:

- **Ubiquitous Global Coverage:** As [this map](#) from the GSMA shows, cellular LPWA network coverage is global, with MNOs operating LTE-M, NB-IoT or both types of networks in most of North American, South American, Europe, Asia and Australia.
- **Best-in-Class Security:** With more than three decades of security experience in the field, 128 bit encryption, and physical SIM cards inserted or embedded in IoT devices, cellular LPWA offers industry-leading network security.

- **Firmware Over the Air (FOTA) Upgrades:** Firmware and other software updates can be remotely sent over the air to cellular LPWA devices, enabling organizations to quickly and easily update the security and other functionality of their devices, reducing their total cost of ownership.
- **Guaranteed Service Over Time:** With both NB-IoT and LTE-M specifications included in the new 5G wireless standard, organizations can be confident that MNOs will continue to build out and maintain their cellular LPWA networks over the next decade and beyond, while a large ecosystem of cellular LPWA solution vendors and service providers will be available to support their cellular LPWA-based IoT applications for years down the road.

Separating Cellular LPWA Fact from Fiction

Despite these and other advantages associated with cellular LPWA, some business leaders still think cellular LPWA's power consumption, data throughput, and coverage or signal penetration capabilities are significantly weaker than proprietary LPWA's.

However, upon further examination, the facts show that many of these cellular LPWA drawback drawbacks are fiction. For example:

Cellular LPWA Power Consumption is Comparable to Proprietary LPWA: While broadband LTE and 5G NR cellular chipsets do consume more battery power than proprietary LPWA chipsets, cellular LPWA chipsets deliver power performance on par with proprietary LPWA chipsets. Designed for IoT applications, these NB-IoT and LTE-M chipsets have been designed to use very little power when they are in sleep or standby mode. And because cellular LPWA data rates are higher than proprietary LPWA data rates, they can connect and then disconnect from the network faster than proprietary LPWA chipsets, allowing them to save additional power by spending more time in sleep or standup mode

LoRa's Coverage and Signal Penetration Are Not Significantly Better Than Cellular LPWA:

LoRa, a proprietary LPWA technology, is perceived as having better coverage and signal penetration than NB-IoT and LTE-M. Yet, the difference in maximum coupling loss (the amount of the wireless channel that can be lost before device is no longer able to connect to network infrastructure's antenna) between Lora (165db) and cellular LPWA (164db) is only one decibel. In addition, public cellular LPWA networks are denser than LoRa networks – which means, for a given area, cellular LPWA is likely to provide better coverage and signal penetration than LoRa.

Data Throughput Rates for Cellular LPWA Are Higher Than Proprietary LPWA: The latest version of NB-IoT, NB2, offers downlink (DL) speeds of 127 Kilobits Per Second (kbps) and uplink (UL) speeds of 158 kbps, while the latest version of LTE-M, M1, provides DL speeds of 588 kbps and UL speeds of 1119 kbps. These rates and real-world field tests of cellular LPWA and proprietary LPWA devices show cellular LPWA data speeds are higher than proprietary LPWA technologies. Thanks to these higher data rates, in the field FOTA updates that are not possible

with proprietary LPWA devices can be completed with cellular LPWA devices. Moreover, because cellular LPWA uses licensed spectrum, quality of service and non-interference is guaranteed both today and tomorrow, further improving performance.

Cellular LPWA Delivers the IoT Connectivity Organizations Need in a Connected Economy

As organizations of all types seek to digitally transform their operations, being able to extract, orchestrate and act on data from widely distributed, battery powered, low-cost IoT sensors and other devices is becoming more important than ever.

Cellular LPWA's ubiquitous global coverage, robust security, support for FOTA upgrades and guaranteed service meet this need, providing organizations with wide area, inexpensive, low-power connectivity for a wide range of IoT applications. In addition, with power consumption, data throughput rates and coverage that is comparable to or better than proprietary LPWA, and a technology standard supported by MNOs and other wireless industry leaders, these organizations can be confident that cellular LPWA will offer them the connectivity their IoT applications need not just today, but tomorrow as well.

Author Bio:

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To view the original blog at Sierra Wireless, go here: https://www.sierrawireless.com/iot-blog/cellular-lpwa-vs-proprietary-lpwa/?lsc=db_internal-eblast_eblast_eblast-cell-lpwa-vs-prop-lpwa-bl-210719-wkly-bl&cid=7011M0000016aOwQAI&campaigntype=database-marketing-lead-nurture&utm_source=internal-eblast&utm_medium=eblast&utm_campaign=eblast-cell-lpwa-vs-prop-lpwa-bl-210719-wkly-bl



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