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5G and Massive IoT: legacy technologies will bridge the gap for now

Table of Figures:

6111051	2
6111052	2
christiankimihsmarkitcom_2019_3_14_12_46_35_massive-iot-roadmapjpg3.....	2

Overview

The term “Massive IoT” is an apt description of the enormous number of IoT sensors and devices that will be communicating with one another. The minimum requirements documentation for the IMT-2020 standard - the standard that is associated with 5G - requires minimum connection density of 1 million devices for every square kilometer (roughly 0.38 square miles). In comparison, the 4G LPWA standard supports 60,680 devices at the same size of coverage—a far cry from what 5G can deliver.

To achieve a vision in which millions of devices are connected, two requirements must first be satisfied. On the technical side, the IoT standard must offer both scalability and versatility, offering enough capacity and network efficiency to connect millions of devices while also providing advanced features—such as longer battery life and a wider coverage area—to facilitate the expansion of new use cases. On the application side, many more new use cases need to be developed and tested.

Below is a chart that shows the 3GPP’s specification roadmap for Massive IoT. The industry body’s specifications in release 14,15, and 16 are all designed to gradually evolve IoT to better meet technical and application requirements alike. The specs achieve this by supporting scalability while also adding new features to enable wider use cases.

Release 15, which includes the first 5G specifications for Massive IoT, was completed in June of 2018. Considering that a standard lead time for a first-module launch is 12-18 months after the specification is completed, we will see the launch of the first 5G massive IoT module in late 2019 or in early 2020. Until the 5G modules for Massive IoT enter the market, 4G based LTE-M and NB-IoT standard will be the most advanced standards for massive IoT applications.

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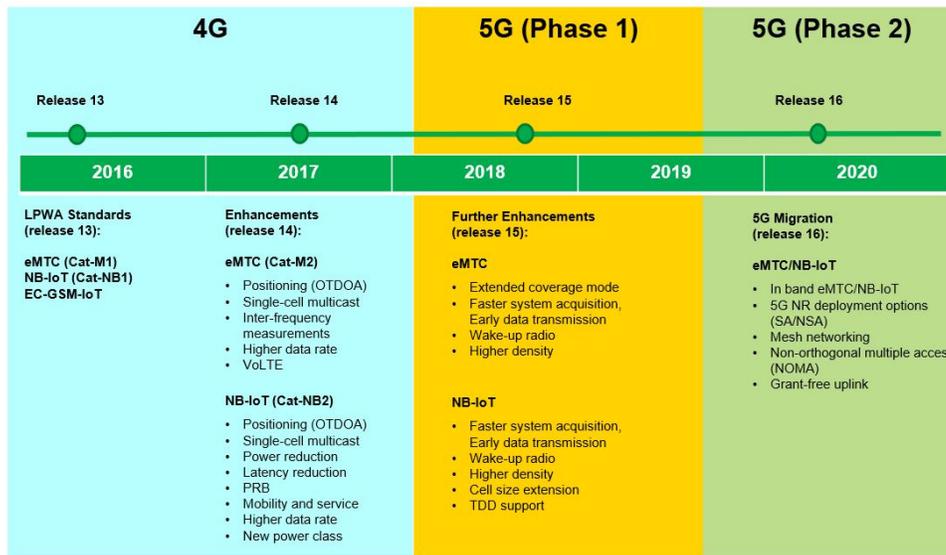


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5G – Massive IoT Roadmap



Analysis

Both parts of 4G-based LPWAN wireless technology, the first LTE-M, and NB-IoT modules were launched in early 2017, receiving a great deal of attention. But even though more than 50 mobile operators had announced network deployments of LTE-M, NB-IoT, or both by the end of 2018, market adoption of the two technologies has been slow.

Despite sluggish adoption of LTE-M and NB-IoT, two major recent developments show a positive turn in events. First, pricing for low-power IoT modules has been falling rapidly. In China, 2G modules are now selling for under \$2 while NB-IoT modules are selling for \$3. The lower 2G and NB-IoT module pricing have been the main contributor to growth and acceleration in the number of IoT connections in China.

Secondly, smart cities and utilities projects in metropolitan cities across the world are starting to drive the growth of IoT connections. For example, Tianjin Utilities in China, is currently adding 4 million smart gas meters.

Overall, the substantial reduction in module pricing has lowered entry barriers to Massive IoT while also offering a better return on investment. But to achieve the eventual goal of connecting one million devices for each city block, more compelling use cases should be developed to carry current momentum forward. Meanwhile, 4G and the legacy 2G and 3G standards—all of them proven technologies—will bridge the gap until 5G networks for Massive IoT are widely deployed.

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