IoT and Machine Type Communications


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The broadband service of 5G is already here and progressively the major Internet of Things (IoT) use cases are being addressed. Due to the diversity of the IoT application requirements, in addition to 5G, LTE-M (Long Term Evolution for Machines) and NB-IoT (Narrowband-IoT), two inherited 3GPP technologies based on 4G LTE, will continue to play a role in addressing the wide range of requirements.

NB-IoT and LTE-M networks will coexist with 4G and 5G mobile networks and will benefit from all the security and privacy features of mobile networks, such as support for user identity confidentiality, entity authentication, data integrity and identification of mobile equipment.

Despite commercial launches of LTE-M and NB-IoT networks that are available in several countries and reached more than 1.5 billion connections early in 2020, NB-IoT and LTE-M continue to evolve in terms of capabilities to address the massive aspect of IoT. Furthermore, 5G networks will be able to support the enormous amount of data that smart cities will generate, and will address many of the most promising IoT use cases, such as industrial automation and remote surgery that require ultra-low latency.

Finally, it is worth highlighting that although cellular 3GPP based technologies are expected to play a bigger role in the IoT space, other standards, such as IEEE, ETSI, oneM2M and IETF, will have their own share. In this series we analyze the current state of the 3GPP, ETSI and IETF standards with regard to the evolution of mobile IoT technologies.

The first article, "IETF Protocol Suite for the Internet of Things: Overview and Recent Advancements", gives a comprehensive survey of the IETF's efforts in IoT. Further, it discusses mainstream standardization and research activities, as well as other IETF-connected support initiatives provided in the context of IoT.

The second article, "3GPP Release-16 Preconfigured Uplink Resources for LTE-M and NB-IoT", shows that UEs in Release-16 can save more power thanks to Preconfigured Uplink Resources (PUR), which introduces the possibility to assign radio resources to an UE in advance for transmission of uplink data without the need of connection setup. For example, with periodicity of 30 s, 50 bytes payload, and 43 min extended discontinuous reception (eDRX) cycle, the gain for PUR compared to early data transmission (EDT) ranges from 50 percent in good coverage to 7 percent in deep coverage.

The third article, "On extending ETSI MEC to Support LoRa for Efficient IoT Application Deployment at the Edge", proposes a new framework that leverages the ETSI multi-access edge computing (MEC) model to deploy LoRa-based IoT applications at the edge. In particular, the proposed model allows running an IoT application as a 5G network slice at the edge, and takes advantage of the ETSI MEC features, such as dynamic deployment of an IoT application at the edge and application life cycle management.

We hope the readers will enjoy this issue and find the articles useful. We also like to express our thanks to the Communications Society staff and reviewers for their continuous support in the preparation of this issue.

Biographies

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