

Performance Evaluation of IEEE 802.11ah standard in Internet of Things Applications

Project type: Individual project (Master Thesis)

Duration: 180 Hours

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Introduction

The idea of the Internet of Things (IoT) is to create a network of objects which are available anytime, anywhere for anything. According to the Cisco Internet Business Solutions Group (IBSG), the number of devices on the Internet will reach 50 billion by 2020. Wireless technologies are playing key roles in the IoT. However, the technologies such as Bluetooth Low energy, ZigBee, or Wi-Fi are only designed for short range communication. On the other hand, the technologies such as LTE and WiMAX are required to have large energy resource. The IEEE 802.11ah is the latest Wi-Fi standard which has a combination of Wi-Fi and low power wireless technology features. The main idea of the design is to extend the coverage to achieve longer distance communication with low power nodes.

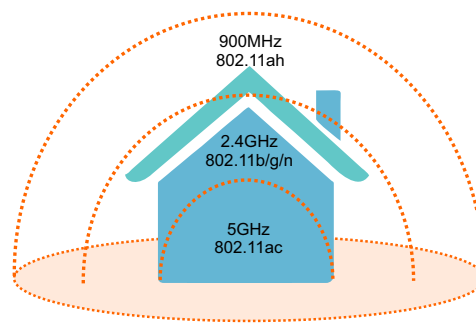


Fig 1. Coverage comparison among IEEE 802.11 standards

Fig 1 depicts the IEEE 802.11ah standard is operating in Sub-1 GHz frequency range and this allows better obstacle penetration, longer range, and lower power consumption while it maintain the 802.11 features such as natively support of IPv6. However, the technology is novel and there are many research challenges in this area.

Objectives

- Implementation of the 802.11ah standard in the OMNeT++ simulation environment
- Performance evaluation in power consumption and coverage for IEEE 802.11ah compared with other technologies

Pre-requirements

- C++ programming Language
- Basic Knowledge about wireless networking

References

1. Ahmed, N., Rahman, H., & Hussain, M. I. (2016). A comparison of 802.11 AH and 802.15. 4 for IoT. *ICT Express*, 2(3), 100-102.
2. Khorov, E., Lyakhov, A., Krotov, A., & Guschin, A. (2015). A survey on IEEE 802.11 ah: An enabling networking technology for smart cities. *Computer Communications*, 58, 53-69. Chicago