**IEEE P802.19**

**Wireless Coexistence**

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| Project | IEEE P802.19 Wireless Coexistence WG | |
| Title | Recommended Practice for Local and Metropolitan Area Networks - Part 19: Coexistence Methods for 802.11 and 802.15.4 based systems operating in the Sub-1 GHz Frequency Bands | |
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| Source | Jianlin Guo (MERL)  Philip Orlik (MERL)  Yukimasa Nagai (MERL)  Benjamin A. Rolfe (MERL/BCA)  Takenori Sumi (Mitsubishi Electric)  Takahisa Yamauchi (Mitsubishi Electric)  Yuichi Tokunaga (Mitsubishi Electric) | E-mail: [guo@merl.com](mailto:guo@merl.com)  [porlik@merl.com](mailto:porlik@merl.com)  [nagai@merl.com](mailto:nagai@merl.com)  [ben@blindcreek.com](mailto:ben@blindcreek.com)  [Sumi.Takenori@dc.MitsubishiElectric.co.jp](mailto:Sumi.Takenori@dc.MitsubishiElectric.co.jp)  [Yamauchi.Takahisa@cw.MitsubishiElectric.co.jp](mailto:Yamauchi.Takahisa@cw.MitsubishiElectric.co.jp)  [Tokunaga.Yuichi@ds.MitsubishiElectric.co.jp](mailto:Tokunaga.Yuichi@ds.MitsubishiElectric.co.jp) |
| Abstract | This document is the initial discussion of P802.19.3: Coexistence Methods for 802.11 and 802.15.4 based systems operating in the Sub-1 GHz Frequency Bands | |
| Purpose | To start discussion of the Recommended Practice | |
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1. **Overview**
   1. Scope

This recommended practice provides guidance on the implementation, configuration and commissioning of systems sharing spectrum between IEEE Std 802.11ah-2016 and IEEE Std 802.15.4 Smart Utility Networking (SUN) Frequency Shift Keying (FSK) Physical Layer (PHY) operating in Sub-1 GHz frequency bands.

* 1. Need for the Project

Many millions of devices based on IEEE Std 802.15.4 are currently operating in Sub-1 GHz frequency bands, and the field is expanding rapidly. Critical applications, such as grid modernization (smart grid) and internet of things (IoT) are using the low to moderate data rate capabilities of IEEE Std 802.15.4. IEEE Std 802.11ah-2016 may operate in the same Sub-1 GHz frequency bands and provides higher data rate capabilities than IEEE Std 802.15.4. In consideration of the current usage, as well as anticipation of yet unforeseen usage models enabled by the standards within the scope of this recommended practice, and to fully realize the opportunity for successful deployment of products sharing the spectrum, strategies and tactics to achieve good coexistence performance are critical. This recommended practice enables IEEE Std 802.15.4 and IEEE Std 802.11ah-2016 to most effectively operate in license exempt Sub-1 GHz frequency bands, by providing best practices and coexistence methods. This recommended practice uses existing features of the referenced standards and provides guidance to implementers and users of IEEE 802(R) wireless standards.

1. **Normative reference**
2. **Definitions, acronyms and abbreviations**
   1. Definitions
   2. Acronyms and abbreviations
3. **Overview of Sub-1 GHz band systems considered**

4.1 802.11ah

4.2 802.15.4

4.3 LoRa

4.4 SigFox

4.5 ???

1. **Use cases of the IEEE 802 Sub-1 GHz technologies**

5.1 Smart utility

5.2 Smart city

5.3 Field monitoring

5.4 Power grid

5.5 Parking

5.6 Infrastructure monitoring

5.7 Industrial cases?

5.8 ???

1. **Sub-1 GHz spectrum allocation (informative, could be annex)**

6.1 Japan

6.2 US

6.3 Europe

6.4 xxx

**7. Necessity of spectrum sharing**

7.1 Spectrum allocation constraint

7.2 Potential multiple co-located applications

7.3 xxx

1. **802.11ah and 802.15.4g coexistence study (informative)**

8.1 802.11ah coexistence mechanisms

8.2 802.15.4g coexistence mechanisms

8.3 Coexistence performance of 802.11ah and 802.15.4g

Simulation results

8.4 Need of coexistence management

8.5 Potential coexistence improvement

Simulation results

1. **Recommendations examples**
   1. CSMA/CA recommendations
   2. CCA recommendations
   3. Transmission duration recommendation
   4. Duty cycle recommendation
   5. PHY parameter recommendation
   6. MAC parameter recommendation
   7. Network topology recommendation
   8. App based recommendation
   9. Frequency coordination
   10. ???

**Annex**

**Evaluation and simulation practice**

Simulation model

Simulation parameters

Propagation model