
IEEE P802.15
Wireless Personal Area Networks

Project IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Title **Random vs Carrier Sense Media Access**

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Submitted

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Re:

Abstract

Purpose

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**This contribution is a result of discussion between Sridhar, Praveen and Rick.
Thanks to all for the comments!**

During the resolution of T-CID 175, discussion arose as to what is mandatory and optional in regards to the support of channel access mechanisms. After discussion via email, the following opinion has formed.

- The standard should not mandate that all devices must implement all mechanisms. It can mandate that all devices shall support random access, and slotted random access, but not CSMA or CSMA-slotted.
- The standard need not even mandate coordinator must implement all mechanisms since it is not clear what specific purpose this serves.
- At a later time, an industry forum, can decide on a use case basis (profiles) that devices or coordinators trying to operate in certain profiles must implement specific modes and so on. It is not clear why this needs to be mandated in the standard.

What needs to be done?

The document needs to be structured to indicate that random access is mandatory and that CSMA is optional. The impact on the document would be:

1. Clause 5:

- Introduction indicates CSMA is optional and random access is mandatory

2. Clause 6:

- Indicate that CCA is optional

3. Clause 7:

- Add to the capabilities IE a bit that indicates CCA is supported in the receiver
- Indicate that random access is mandatory and that CSMA is optional

Side effects to clause 7?

I suppose the side effect of this is that device discovery is always done using random access and that CSMA is only used once a device has joined the network.

Some things we can do:

- Before starting a new superframe, devices should listen for an existing beacon using its native PHY type. This is about all we can do to prevent interference; but it is a weak requirement, especially given mobility of devices and different beacon modulation formats.
- The fact that with the proper optics VLC can be highly directional allows a significant amount of spatial reuse, which implies a degree of immunity to interference.
- Also, if the implementation leverages the modulation domain spectral separation inherent between the PHY types then there is another degree of coexistence.

The way forward

In a future revision of this document, I'll propose text that can be added to the document that accomplishes the required task.