# IEEE P802.15
## Wireless Personal Area Networks

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **Response to 802.1 Comments on PAR and 5C** |
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| Re: | 802 PAR and 5C Review |
| Abstract | Responses to 802.1 Comments |
| Purpose | PAR and 5C |
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# Response to Comments Received from the Chair of 802.1

802.1 has studied the 802.15.10 draft PAR and 5C, and need further clarification in order to understand the intent behind this project.

The PAR scope states that the object of the recommended practice is to "route packets dynamically". While there is no fundamental difference between "bridging frames" and "routing packets" (As per the description of bridging in 802.1Q, bridge relays only forward user data. This project will also forward frames other than data.), in the context of IEEE 802, this statement seems to say that 802.15.10 will do something different to 802.1 bridging. However, this appears to be a bridging PAR, and that being the case, there should be opportunities for 802.15 to leverage the existing Bridging work, rather than creating something new and potentially incompatible with Bridging.

It is not the intention of the project, nor does the PAR state that it intends to do bridging as defined in 802.1Q-2011 Section 8.1, and shown in Figure 8-1, nor bridge relays as defined in 8.1.1. Rather, the intent is to enable frame forwarding at the 802.15.4 MAC sub-layer.

The responses to the compatibility aspects of the 5 Criteria indicate that the recommended practice will not mandate compliance with IEEE Std. 802, IEEE Std. 802.1D or IEEE Std. 802.1Q. However, the base standard and this amendment are compliant with the draft D1.5 IEEE 802, which says "... traffic between EUI-64 and EUI-48 addressed networks needs to be routed at a layer above the DLL." Hence, the current IEEE Std. 802.1DÂ and IEEE Std. 802.1Q are not applicable as they only support EUI-48.

This recommended practice will not address the routing of traffic between EUI-64 and EUI-48 addressed networks.

The quoted statement in IEEE Std. 802 points out that you have to go above the Data Link Layer; however, reading the draft PAR, 802.15.10 is staying within the Data Link Layer. The addresses being used are 64-bit MAC addresses, not IP addresses.

The 5C response goes on to say that in the case where the 64-bit address space is effectively used as a 48-bit address space, then 802.1 Bridging would be fully supported. However, in this case, there is no work to be done other than the need to specify text for inclusion in IEEE Std. 802.1AC to specify how an 802.15 device supports the Internal Sublayer Service and thereby supports 802.1 Bridging.

Yes, that is confusing. We have changed the response to Compliance in Section 2 of the 5C to be: 802.15.10 will schedule joint meetings with 802.1 to facilitate review of the draft.

It seems that there are at least the following possibilities:

- It is the intent of this project to provide a means of bridging between 802.15 devices that support 64-bit addresses. If that is the case, then the re-use of existing 802.1 Bridging technology would make a great deal of sense, rather than inventing something new and potentially incompatible. Going in this direction would probably result in changes to existing 802.1 standards (802.1AC and/or 802.1Q) in order to accommodate different MAC address lengths in the Bridging standards.

<span style="color:red">The intent is to enable frame forwarding at the 802.15.4 MAC sub-layer utilizing advanced signaling and table management algorithms. This includes frames other than user data.</span>

- It is the intent of this project to provide a means of bridging between 802.15 devices and other 802 MAC technologies that use 48-bit addresses. If that is the case, then the only way this can be achieved is by encoding a 48-bit address in the 64-bit address fields of the 802.15 MAC, and this would require PARs for (a) changes to 802.1AC to specify how the 802.15 MAC supports the ISS, and (b) potentially, changes to the 802.15 standard to specify how 48-bit addresses are encoded in the address fields of 802.15 frames.

<span style="color:red">This project will not address bridging between 802.15 devices and other 802 MAC technologies that use 48-bit addresses.</span>

- It is the intent to provide a means of bridging between 802.15 devices that use 64-bit addresses and other 802 MAC technologies that use 48-bit addresses. If that is the case, then bridging is not an option (for the reasons stated in IEEE Std. 802) and the only option is to perform routing at layer 3, which is technology that already exists in IETF specifications.

<span style="color:red">This project will not address bridging between 802.15 that use 64-bit addresses devices and other 802 MAC technologies that use 48-bit addresses.</span>

- It is the intent of this project to reinvent bridging, among 802.15 end stations, in a manner different than that specified by 802.1Q. This would be a violation of the intent of the 802.1Q compatibility criterion.

<span style="color:red">The intent is to enable frame forwarding at the 802.15.4 MAC sub-layer utilizing advanced signaling and table management algorithms. This includes frames other than user data.</span>

802.1 would like to engage in discussion with 802.15 in order to clarify the intent of this draft PAR before it is submitted to the EC for approval, per the existing Compatibility criteria, and in the spirit both of the changes to the P&P regarding PAR submission that are under discussion this week. Some initial discussion took place in 2012, and resulted in Norm Finn giving the following presentation in an 802.15 interim in September 2012:
https://mentor.ieee.org/802.15/dcn/12/15-12-0510-02-0l2r-802-1-cooperative-standards-efforts.pdf

It is unfortunate that his suggestion of collaboration with 802.1 was not taken up; however, it is not too late for that to be rectified.

We currently have a project under way in 802.1 that was the result of a highly successful collaborative activity with 802.11 in order to properly specify 802.11 Bridging, both between wired and wireless media, and among wireless stations (this will be documented in 802.11ak and 802.1Qbz).

IEEE 802.1 has also recently worked very well with 802.16 to support their specification of bridging.

All of these media, 802.16, 802.11, and 802.3, can look forward to full interoperability with each other in a bridged network. We see no reason why 802.15 cannot be a part of this joint effort.

802.15 looks forward to continuing to work with 802.1 in the development of this project and will schedule joint mtgs. with 802.1 to facilitate this effort.