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| **Comment** | **Text in PAR/CSD** | **Remarks / Answers to the Comments** |
| **In response to the comments from IEEE 802.11:** | | |
| **PAR 5.2.a and 5.2.b The scope is not bounded sufficiently.**  **PAR 5.2a and 5.2b Stakeholders will not be able to determine if this is a project if of interest with the scope as written.**  **PAR 5.2a and 5.2b It would seem that this project may overlap other projects**  **PAR 5.2.b – The scope is not defined to a range that is definitive. Remove “or more” as a start, but the scope would need to be defined more crisply.**  **General: The CSD includes a suggested range of “up to several 100m”** | **5.2.a. Scope of the complete standard:** This project will define the PHY and MAC specifications for high data rate wireless connectivity with fixed, portable and moving devices. Data rates will be high enough to satisfy a set of consumer multimedia industry needs, and to support emerging wireless switched point-to-point applications.  **5.2.b. Scope of the project:** This amendment defines a wireless switched point-to-point physical layer to IEEE Std. 802.15.3 operating at PHY data rates typically in the range of 1 Gbps at the low end, and up to 100 Gbps at the high end. Operation is considered in bands from 60 GHz up to and including optical wireless at ranges as short as a few centimeters and up to several 100m. Additionally, modifications to the Medium Access Control (MAC) layer, needed to support this new physical layer, are defined.  **8.1 Additional Explanatory Notes (Item Number and Explanation):** 5.2b: In this context the term switching is used to describe the reconfiguration of a set of elsewise fixed wireless links. This means that the physical beams of a device at one end of the wireless links are switched between stationary devices at the other end of the links resulting in an different configuration. | **5.2.a, various comments**: This is the general scope of 802.15.3, which was cleaned up a bit to remove language and references that might have been helpful 11 years ago, but are just irrelevant or confusing today.. Our Proposal is to leave it as is for now and address it in more detail in the next revision of 15.3  **5.2.b, various comments**: In response to your comments we have made edits to 5.2b and in 8.1 to clarify the differentiation with other existing standards or projects. These are shown to the left.  **General comment:** For the backhauling/fronthauling application ranges of several 100m are suitable. We have also added this range to the scope 5.2b of the PAR. |
| **PAR 5.5 The last sentence is not true. (i.e. 802.11ad)**  **PAR 5.5 “guaranteed” is not possible when using unlicensed wireless bands.** | **5.5 Need for the Project:** In data centers wireless links will make frequent reconfiguration easier and more cost-effective. In the case of backhaul and fronthaul, wireless solutions will reduce costs for the case when installing a fiber network is not cost-effective. In the cases of close-proximity kiosk-downloading and intra-device communication, a minimum data rate achievable with high probability is required, which should be possible because of the operation in a controlled environment. No wireless standard with all these properties within the whole range of targeted data rates from 1 to 100 Gbps suitable for operation in a switched point-to-point-configuration exists today.  Adding a sentence to 8.1: In close proximity kiosk-downloading the link distance is at the order of a few centimeters. | **5.5, various comments:** In response to your comments, we have made the edits to 5.5 and 8.1 shown to the left |
| **PAR 5.1 Would you check the number that is actively involved? 100 seems high (only 20 people from 11 organizations attended the Study Group in January)** | **5.1 Approximate number of people expected to be actively involved in the development of this project:** 100 | 802.15 has typically used the average number of WG voting members in the response to this question. |
| **PAR 7.1 – There would seem to be some projects of similar scope – i.e. 802.15.3c, 802.11ad, Transferjet, etc.** | **7.1 Are there other standards or projects with a similar scope?:** No  5.2.b. Scope of the project: This amendment defines a wireless switched point-to-point physical layer to IEEE Std. 802.15.3 operating at PHY data rates typically in the range of 1 Gbps at the low end, and up to 100 Gbps at the high end. Operation is considered in bands from 60 GHz up to and including optical wireless at ranges as short as a few centimeters and up to several 100m. Additionally, modifications to the Medium Access Control (MAC) layer, needed to support this new physical layer, are defined.  8.1 Additional Explanatory Notes (Item Number and Explanation): 5.2b: In this context the term switching is used to describe the reconfiguration of a set of elsewise fixed wireless links. This means that the physical beams of a device at one end of the wireless links are switched between stationary devices at the other end of the links resulting in an different configuration. | We do not agree that these projects are of similar overall scope. As explained in the modified 5.2b. and 8.1 (see changes that have been repeated to the left), the mentioned standards neither have the data rate range nor do they specifically address the needs of switched point-to-point links, like wireless backhauling/fronthauling or intra-device communication. We feel that these edits help to clarify the differentiation. |
| **General Question – Is this the project that is getting the .1AC MAC address space correction?** |  | Yes |
| **CSD 1.2.1 a) The use cases seem too broad to be believable.**  **CSD 1.2.1 a) “guaranteed” – this is not possible – reword sentence.** | *There is a need for increased wireless data rates to service aggregated data streams in switched point-to-point applications in data center, wireless backhaul/fronthaul, intra-device communication and kiosk downloading. In this context the term switching is used to describe the switching reconfiguration of a set of elsewise fixed wireless links. This means that of the physical beams of a device at one end of the wireless links are switched from one antenna between stationary devices at the other end of the links resulting in an different configuration. This feature is common to all these various use cases. The different use cases differ mainly in terms of transmission ranges and transmission data rates. Fronthaul is the link between the PHY control unit of a base station and a remote radio unit. The wireless communication links can have a coverage range of up to several 100m.*  *A literature study has revealed that data centers need to be reconfigured frequently. In data centers wireless links will make frequent reconfiguration easier and more cost-effective compared to e. g. fibre and copper twin/ax deployments. In the case of backhaul and fronthaul, wireless solutions will reduce costs for the case when installing a fiber network is not cost-effective. In the cases of close-proximity kiosk-downloading and intra-device communication, a minimum data rate achievable with high probability is required, which should be possible because of the operation in a controlled environment.* | **Comment 1.2.1a (“broad scope”)**: In response to your comment we have modified the paragraph in the CSD for clarification of the commonalities of the use cases as shown to the left.  **Comment 1.2.1a (“guaranteed”)** In response to your comment on the term “guaranteed” we have reworded the sentence, see result to the left. |
| **CSD 1.2.2 – Is 48-bit addressing required to be conformant with 802.1AC, if so, is this PAR proposing to use 48-bit addressing?** | **a)Will the proposed standard comply with IEEE Std 802, IEEE Std 802.1AC and IEEE Std 802.1Q?**  **b)If the answer to a) is no, supply the response from the IEEE 802.1 WG.**  Yes. | **Comment 1.2.2:** Yes. A solution will be proposed in the amendment to enable the use of 48-bit addressing. |
| **CSD 1.2.5 Is the proposed application consistent with modern data centers? Does this apply more to older deployed data centers for retro upgrade? If the data center is wired up, the change of configuration is typically done via software. So does this wireless technology provide a benefit given the wired connectivity?** | Wireless installations typically substantially simplify configuration. This particular wireless technology at 100 Gbps is expected to provide substantial cost savings in comparison to wire or fibre installations. This is particularly true in situations requiring frequent changes in configuration. | **Comment 1.2.5:** We think what we have said here is adequate. The target is to have wireless links complementing fibers, rather than a complete replacement of fibre. An extensive literature study has been done revealing the need for wireless links in data centers. Even, if software reconfiguration is possible, latency requirements may induce manual change of physical link connectivity. Apart from easier reconfiguration also cooling is less problematic. These are points that have already been made elsewhere in the CSD. We did not feel we needed to repeat them here in the financial section. |
| In response to John d’Ambrosio’s comments: | | |
| **PAR Title may not be reflective of the proposed scope, which states two data ranges: a) 1 to 10 Gb/s and b) up to 100 Gb/s. This is a very significant range difference, and are for very different application spaces inside a data center, which is the cited need.  Please clarify if the scope is intended to do both frequency ranges, and if so choose a title that is more exact.**  **PAR 5.2b Scope of the project points to the ranges noted in comment above. Will a single phy layer be sufficient or will different Physical layers targeting the specific ranges be done?** | Title: Standard for Information technology-- Local and metropolitan area networks-- Specific requirements-- Part 15.3: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for High Rate Wireless Personal Area Networks (WPAN) Amendment for a 100Gbps wireless switched point-to-point physical layer  Scope: This amendment defines a wireless switched point-to-point physical layer to IEEE Std. 802.15.3 operating at PHY data rates typically in the range of 1 Gbps at the low end, and up to 100 Gbps at the high end. Operation is considered in bands from 60 GHz up to and including optical wireless at ranges as short as a few centimeters and up to several 100m. Additionally, modifications to the Medium Access Control (MAC) layer, needed to support this new physical layer, are defined. | **Comment to the title**: According to the changes we made in the scope 5.2b (see changes to the left), we believe this resolves the issue with the title.  **Comment 5.2b**: The study group evolved from the IG THz looking at the PHY in the THz frequency range. For some of the use cases also 60 GHz or optical wireless communications may be appropriate. Hence, the project is open to proposals of different PHY layers. A definite answer to your question is part of the work of the task group |
| **PAR 5.6 Stakeholders for the Standard Given the frequency range and the citation of data center in 5.5. it would seem that server vendors should be noted.** | **5.5 Need for the Project:** In data centers wireless links will make frequent reconfiguration easier and more cost-effective. In the case of backhaul and fronthaul, wireless solutions will reduce costs for the case when installing a fiber network is not cost-effective. In the cases of kiosk-downloading and intra-device communication, a guaranteed minimum data rate is required. No wireless standard fulfilling these requirements exists today.  **5.6 Stakeholders for the Standard:** Chip vendors, server vendors radio frequency (RF) and optical component manufacturers, equipment manufacturers, enterprise infrastructure providers and wireless operators. | **Comment 5.6:** In response to your comment “Server vendors are added as stakeholders in 5.6 |
| **Distinct Identity  The PAR Scope states This amendment defines a wireless switched point-to-point physical layer to IEEE Std. 802.15.3 operating at PHY data rates typically in the range of 1 Gbps to 10 Gbps at the low end, and up to 100 Gbps or more at the high end.  Yet in CSD Distinct Identity it states that *There are currently no wireless standards servicing switched point-to-point applications beyond 10 Gbps.* Will a distinct identity problem be created?** | **Par 7.1** Are there other standards or projects with a similar scope?: No  **CSD 1.2.3 :** There are currently no wireless standards servicing switched point-to-point applications beyond 10 Gbps. Standards addressing wireless links with data rates < 10 Gbps operating at 60 GHz IEEE 802.15.3c, IEEE 802.11ad, ECMA-387 and WirelessHD. At the low end there is some fuzziness, but we need a seamless scalable solution over the entire data rate range keeping the functional simplicity for low-cost solutions for switched point-to-point applications..The low end is there to enable a minimum data rate achievable with high probability, which should be possible because of the operation in a controlled environment in the related use cases.  Wireless connections at 100 Gbps complements 100 Gbps IEEE 802.3 links in data centers to increase reconfigurability. | **Comment to PAR 7.1, CSD 1.2.3**: In response to your comments we have clarified the situation by changing CSD 1.2.3 to the left. |