**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title |  |
| Date Submitted | January 16, 2013 (r1) |
| Source | 802.15.8 Technical Editor:Seung-Hoon Park (Samsung) | E-Mail: [shannon.park@samsung.com] |
| Re: | Technical Guidance for 802.15.8 Proposals |
| Abstract | Merged comments to revise TGD draft document (based on DCN385-08) and TGD clean document (based on DCN568-01)] |
| Purpose | To summary and compare comments to TGD draft and clean document |
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**[Technical comments]**

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| Sub-clause | 4.2. States of the PD |
| Eldad | Remove this section.*[Comment] As discussed in the CC the contents of this section can only be determined after technical proposals are presented and agreed. Therefore it is inappropriate for TGD, I would suggest removal.* |
| Marco et. al. | delete clause 4.2.*[Comment] States of the PD is implementation (proposal) dependant. It is not part of requirements.* |

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| Sub-clause | 4.4. Reference model |
| Eldad | On reception, the PHY layer passes MAC frames to the MAC sublayer via the PHY SAP, and the MAC sublayer passes MSDUs to the higher layer via the MAC SAP.MAC and PHY SAPs also pass control information between the layers.*[Comment] The current description focuses on user plane PDU’s. For completeness it is appropriate to mention that control information is also passed between the layers.* |

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| Sub-clause | 5.2. Duplex |
| Eldad | Remove this section.*[Comment] Duplexing schemes are either TDD or FDD. By saying that duplexing may be either we are making no new requirements. Therefore I would suggest removal of section.* |

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| Sub-clause | 6.2. Synchronization |
| Eldad | ~~Synchronization shall / may be used to reduce discovery listening time and battery consumption.~~*[Comment] This section is needed to define minimum requirements for synchronization. Further requirements may depend on modulation etc. and are out of scope for TGD.* |
| Shannon, Kwak | IEEE802.15.8 may operate in synchronous or asynchronous mode. 1. When IEEE802.15.8 is operating in synchronous mode, a PD shall maintain synchronization among synchronized PDs.
2. *~~IEEE802.15.8 shall support mechanisms to synchronize PDs in synchronous mode.~~*

*Straw poll for accepting 2: yes:no:abstain = 4:9:0**Straw poll for accepting updated 1: yes:no:abstain = 11:0:1**[Comment] Synchronous mode can support of low duty cycling of discovery and high throughput of data transmission, but with more protocol overheads due to network dynamics. Asynchronous mode can support more simple system with low protocol overheads, but the supportable type of PD may be restricted due to high power consumption.* |

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| Sub-clause | 6.3. Discovery |
| Eldad | Discovery is defined as uni-directional. Mutual discovery is therefore two concurrent uni-directional discoveries. Straw poll: unanimousPossibly with higher layer support, An IEEE 802.15.8 device shall support peer discovery, service discovery, and group discovery.Straw poll for the comment from Eldad: yes:no:abstain = 7:4:0Peer discovery ~~includes~~ implies device discovery.* Efficient spectrum utilization
* Prioritized access to discovery

Note that it is up to ~~higher layers or~~ the implementer how to use and implement these IDs or to use part of them.[Comment] *The reason for the change in the next paragraph is the inability to define which applications are the same. For example, are revisions of the same application “same”? How about two different applications which use the same data base?*IEEE 802.15.8 may support that a peer ID is discovered to only other peers who is in the same~~samemappable~~ application-specific ID/application-specific user ID/group ID or the designated application-specific ID/application-specific user ID/group ID ). [Comment] *Note that support by PAC only means we have a MAC mechanism for that, not necessarily that all PDs will support it. This isn’t a compliance spec.*IEEE 802.15.8 ~~may~~shall support mechanisms to ensure privacy that a PD is not tracked.802.15.8-PAC shall support protection of identity from impersonation.IEEE 802.15.8 may provide support proximity-based presence functionality that a PD shall recognizes another peer entering in the proximity as well as the peer going out of the proximity.~~IEEE 802.15.8 may support that a user recognizes the activation status of peers~~ [Comment] *redundant.* |

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| Sub-clause | 6.4. Peering |
| Eldad | 802.15.8-PAC shall support re-peering.  |

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| Sub-clause | 6.5. Scheduling |
| Eldad | IEEE 802.15.8 shall provide a fully distributed scheduling ~~scheduling coordination~~ mechanism. [Comment] *Coordination is a more generic expression that doesn’t imply a specific solution.* |

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| Sub-clause | 6.8. Multicast |
| Eldad | IEEE 802.15.8 may support a reliable multicast transmission including both one-hop and multi-hop cases. |

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| Sub-clause | 6.11. Relative positioning |
| J.Kim | IEEE 802.15.8 shall support relative positioning. Relative positioning parameters shall include presence or distance, and may include orientation as well.  *[Comment] The PAR for P802.15.8 mandates “relative positioning” as a required feature of IEEE 802.15.8 PAC standard.* |

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| Sub-clause | 6.13. Security |
| Eldad |  [Comment] *In many cases applications for smart phones are created by a third party and sold by a mobile phone vendor. Neither vendor nor mobile operator vets the application for security. On the other hand, 802.15 cannot specify applications, which puts the burden of 802.15 (with the aid of higher layers as necessary) to provide whatever security is required and cannot depend on the good behavior of applications. Therefore I would suggest the following requirement:*IEEE 802.15.8 shall make no assumption regarding security protection offered by applications. |
| Junbeom et. al. | “The IEEE 802.15.8 may include * + security functions that provide necessary means to achieve authentication, authorization, and encryption against passive and active attacks.
	+ a key management protocol that provides efficient means to derive secret keys by a user, or establish private keys or group keys among the devices.
	+ multiple levels of security modes depending on security requirements of services.
	+ Support of various security algorithms on the basis of the security and efficiency requirements of the services.”
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| Sub-clause | 6.14.2 Data rate scalability |
| Eldad | * PAC shall support scalable data rate to accommodate many applications such as listed in the Application Matrix (DCN15-12-0350). -.
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| Sub-clause | 6.16. Requirements for high layer and infrastructure interaction |
| Eldad | *[Comment] Note that we have reporting but forgot triggering of the action – a missing piece* |
| Marco et. al. |  *[Comment] The last paragraph is incorrect. PAC systems shall be infrastructure-less based.* |

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| Sub-clause | 7.1. Transmission range |
| Marco et. al. | delete clause 7.1.*[Comment] In the last meeting in San Antonio, it was decided not to include transmission range.* |

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| Sub-clause | 7.4. Error rate |
| Eldad | *~~Remove this section~~**[Comment] What is the requirement here? Without a specific SNR there’s no requirement, while a specific SNR would make it depend on the modulation scheme which is out of scope for TGD. Suggest remove or else move the evaluation section.*The packet error rate (PER) without retransmission shall be less than or equal to 10% for a 256 octet packet size with a link success probability of 95% over all channel conditions as specified in the channel model document per frequency band. |

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| Sub-clause | 7.6. Fairness |
| Eldad | *~~Remove this section~~**[Comment] Suggest removal, no requirement here* |

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| Sub-clause | 8. Regulation |
| H.B.Li et. al. | Add text for UWB regulation. (refer DCN15-13-0007-00-0008) |

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| Sub-clause | 9.2. Channel model |
| Shannon | Add “Propagation between terminals located below roof-top height at UHF” from ITU-R P.1411-6 for 300MHz-3000MHz.[Comment] Current path-loss in TG8 channel models doc. (DCN12-459-r3) assumes the model within street canyons or over roof-tops for cellular model, for the case of that transmitter is base station and receiver is mobile station.These models are not applicable to PD-to-PD scenario with low antenna height. |

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| Sub-clause | 9.4. Link-level simulation (PHY) |
| Marco et. al. | Change the number of clause 9.4 to 9.3 and number clause 9.3 to 9.3.2 and place it (text included) after clause number 9.3.1.Create title of clause 9.3.1 as “Link budget analysis” with the following text:Parameter:Average transmitter power  x [dB]Distance  [m]1. Transmitter antenna gain x [dBi]
	1. Receiver antenna gain x [dBi]
		1. Central frequency\* x [Hz]
			1. Average received power  [dB]

Parameter:Data rate  x [bps] Receiver’s noise figure x [dB] Receiver’s implementation losses  x [dB]  x [dB] required for a PER10% over a random packet of 256 bytes. Thermal noise 174 dBm/Hz for room temperature 293 OK. Receiver sensitivity  [dBm] Parameter: Fade margin x [dB]  Link margin  [dB]  The amount by which the received signal level can be reduced without causing the PER is larger than 10%. \*Central frequency between the 10 dB upper and lower cut-off frequencies of a bandpass filter. Such filter is not necessarily symmetric, but treated on a liner frequency scale. |

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| Sub-clause | Common communication mode |
| PAC C.C. | According to discussion on the call, it is preferred to define a common mode on each frequency band individually.A common communication mode in each frequency band shall be supported.Straw poll: yes:no:abstain = 8:0:1 |

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| Sub-clause | New |
| H.B.Li et. al. | [QoS sub-clause]IEEE 802.15.8 shall support prioritized services including emergency services with highest priority, various QoS classes, enabling an optimal matching of service, application and protocol requirements to resources and radio characteristics. |

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| Sub-clause | New |
| Shannon |  |

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| Sub-clause | New |
| Kwak et. al. | Add new sub-clause “Transmit power control”.IEEE 802.15.8 shall support the functionality for PDs to control the transmit power to minimize interference and power consumption.*[Comment]** *IEEE 802.15.8 PAC is a standard for fully distributed communication networks with a distributed scheduling mechanism. The interference will be one of the major challenges.*
* *Different transmit power is required for different operations; Ex: device discovery, texting, gaming, etc.*
* *Power consumption (a.k.a. battery life) is directly related to user experience.*
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**[Editorial comments]**

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| Sub-clause | 2.2. Specific definitions to this standard |
| Marco et. al. | Delete “Facebook, Twitter” and replace it with “social network”. Replace “account@facebook” with “account@SocialNetwork”.*[Comment]**The examples Facebook and Twitter are infrastructure based applications. As TG8 targets infrastructure-less applications as mandatory in the PAR, the examples give a wrong message and in fact are misleading.* |
| TGD | Device ID: e.g. MAC address . This is a unique identifier for a compliant PD.Device group ID:  . This is a unique identifier for a group of compliant PDs.Application type ID: . This identifies a class of specific applications enabled in a PD. . e.g. SNS, gaming, etc.Application-specific ID: . This identifies a specific application enabled in a PD. . e.g. PACsocialnetwork, PACinvaders, etc.Application-specific user ID: . This is the user account ID linked to a specific application. . e.g. account@PACsocialnetworkApplication-specific group ID: . This identifies a group of selected Application-specific users.Peer: this is equal to Application-specific user ID. |

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| Sub-clause | 3. Abbreviations and acronyms |
| Kwak | ~~PD (PAC Device)~~PD: PAC Device |

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| Sub-clause | 4. General description |
| Kwak | This clause provides the basic framework of PDs. The framework serves as a guideline in developing the ~~functions~~ functionalities of PDs and their interactions specified ~~later~~ in detail in the subsequent clauses. |

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| Sub-clause | 6.15. Coexistence |
| Kwak | IEEE 802.15.8 shall support the coexistence of PDs used for different applications as well as ~~non-PDs~~devices compliant with other specifications in the same spectrum. |

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| Sub-clause | 6.16. Requirements for high layer and infrastructure interaction |
| Kwak | IEEE 802.15.8 shall perform measurements at the request of, and report the results to higher layers. |

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| Sub-clause | 9.2. Channel models (Refer to DCN #15-12-0459r3 or the latest) |
| Marco et. al. | Leave the title of clause 9.2 as “Channel models”The rest of the title (Refer to DCN…) place it as a text of this clause and delete “or the latest”.Channel models* Refer to DCN #15-12-0459rx
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| Sub-clause | 9.5. System-level simulation (MAC) |
| Kwak | 9.5.1. ~~scenarios~~ Scenarios & parameters for just PDs9.5.2. ~~scenarios~~ Scenarios & parameters for PD links |

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| Sub-clause | 10. References |
| Marco et. al. | delete clause 10.*[Comment] This is an empty clause.* |