**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | **– comments on 15-14-0348-00** | |
| Date Submitted | June 3, 2014 | |
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| Re: | [Subclause 7.1 of 802.15 TG10 TGD and [TGD Scenario Parameters #319r0](https://mentor.ieee.org/802.15/dcn/14/15-14-0319-00-0010-tgd-scenario-parameters.docx)] | |
| Abstract | [Comments on 15-14-0348-00, Scenario Parameters for CfFP] | |
| Purpose | [Define the parameters to consider in the scenario for final proposals] | |
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**Introduction**

This document has been prepared to suggest some comments on 15-14-0348-00 regarding the operational scenarios which will be included in the TG10 TGD so that the TG10 scenarios **meet all requirements and fit better to real situations, by which proposals can be fairly compared.**

**Comments on 15-14-0348-00**

**The comments are as shown in green in the following:**

1. **Use of device to device communication**

The TGD does not mention any use case using device to device communication such as M2M applications in the Use cases clause (Clause 5) [1]. We suggest to

* + 1. either amend the TGD with use cases requiring device to device communication and create a corresponding new scenario
    2. or delete the device to device type of communication from the scenarios

**Although use cases are not included in the TGD, this type of communication has been considered in this group. Therefore to broaden the use of the algorithms to be specified in this TG10 practice, we had better include this type of communication in the TGD with a simple description.**

1. **Linear topology**

The description "For Linear Topology M = 999 (33x33), where the middle row or column has M =100"[1] is unclear. We propose the following modification:

“For linear topology M = 10000 (100 x 100), where the communication between 100 nodes of only one row or one column is considered.”

**Only one case of M=121 (11x11) can be considered for linear topology as shown in 15-14-0350-00 to clearly define this linear topology for the scenarios.**

1. **Subnet merging**

We should agree on what is meant in Clause 6 of the TGD [2]:

"It should be possible to merge an independent subnet into a larger network when connectivity between them becomes available, providing both are using similar operating parameters. The merge operation should ideally take place without outside intervention. It should be possible for a network to operate as a number of independent subnets in the event of failure of parts of the network."

There are two essential parts to this paragraph:

"It should be possible to merge an independent subnet into a larger network when connectivity between them becomes available, providing both are using similar operating parameters.”

Our understanding of this statement is as depicted below:

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| C:\Users\Verotiana\Documents\NICT\Standardization\15.10\TGD\Module parameters\SmallPANBigPAN.png | C:\Users\Verotiana\Documents\NICT\Standardization\15.10\TGD\Module parameters\2PANs merging.png |

**Our understanding from this statement is to consider a couple of reasons. The first is to extend ranges and expand coverage areas, so that in the above figure the leftmost node can communicate with the rightmost node.**

“It should be possible for a network to operate as a number of independent subnets in the event of failure of parts of the network.”

Here are two possible meanings of this statement:

* + 1. Several nodes in the network are able to act as the PAN coordinator. Only one of them is the PAN coordinator. In the event that that PAN coordinator (here, A) is turned off due to some reason (power failure, maintenance…), nodes that have PAN coordinator capability (here B and C) start new PANs to maintain the connectivity of network.

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| C:\Users\Verotiana\Documents\NICT\Standardization\15.10\TGD\Module parameters\Original3PANCoordTopology.png | C:\Users\Verotiana\Documents\NICT\Standardization\15.10\TGD\Module parameters\2backupPANCooord.png |

* + 1. There are several PANs in a network with their respective PAN coordinators. If one of the PAN coordinators (here, A) is turned off, the nodes that were associated with A are able to join one of the other PANs left (here, coordinated by B or C).

|  |  |
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| C:\Users\Verotiana\Documents\NICT\Standardization\15.10\TGD\Module parameters\3actingPANCoord.png | C:\Users\Verotiana\Documents\NICT\Standardization\15.10\TGD\Module parameters\2backupPANCooord.png |

* + 1. **As the second reason, additionally and more importantly, a node (which is not a PAN coordinator) has a broken link to a PAN and can set up a link to another PAN to continue communications. In the figure below, Node E lost a link to Node D and established a new link to another PAN (blue link). This is why the TGD mentions a requirement for the case of loss of a node and addition of a new node.**

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| C:\Users\Verotiana\Documents\NICT\Standardization\15.10\TGD\Module parameters\3actingPANCoord.png |  |

Accordingly, we suggest including in the TGD at the end of Clause 6.1:

“The proposal should include a mechanism to enable routing after a PAN reconstruction”

1. **Multiple entry/exit point**

We should agree on the meaning of clause 6.18 and on the definition of entry and exit point :

"Devices shall implement a method to select the most appropriate **entry/exit point** for their communications **with entities outside the network**"

Here is our understanding of those terms based on the uses cases described in clause 5 of the TGD:

Smart Metering



**Entity outside the network**

**Entry/Exit point**

Smart city



**Entity outside the network**

**Entry/Exit points**

Accordingly, Clause 6.18 addresses the selection of the entry/exit point selection and not communication from an entry point to an exit point.

“It **may** be possible for the protocol to use connections external to the network between ingress and egress points as part of the route between devices within the network (backbone routing).”

As described in the last paragrah of Clause 6.18 above, communication between devices through entry(ingress) point and exit(egress) points **may** be possible through backbone routing, however this is not the primary scope of this group. If communication between devices through a backbone of entry/exit points is to be addressed in the scenarios, we recommend that it be an optional requirement as suggested by the use of “**may**” in the clause. Otherwise we suggest considering the scenarios with only a single entry/exit point.

Further, the number of entry/exit points for the upstream and downstrean scenarios of “M-1” should be replaced with “1” in document #338r4 [1].

**A different interpretation can be made. As shown in the above figures, multiple entry/exit points which are able to be connected to the external entity may exist. Therefore one best node can be selected from multiple entry points or exit points. It means routing algorithms from multiple entry/exit points should be considered and the best route can be chosen if needed.**

1. **Multiple PAN communication**

There is no mention in the TGD that the routing protocol should provide routing between devices from different PANs. If this is an issue desired to be addressed, we suggest amending Clause 6.1 of the TGD after the second paragraph with:

“If the network is composed of several subnets, the proposal **should** (**may**?) provide routing between devices of different subnets”

**Subclause 6.1 of the TGD mentions about subnet merger into a large network and splitting of a large network into multiple subnets as follows:**

## Deployment architecture

**……..**

***It should be possible to merge an independent subnet into a larger network when connectivity between them becomes available, providing both are using similar operating parameters. The merge operation should ideally take place without outside intervention. It should be possible for a network to operate as a number of independent subnets in the event of failure of parts of the network.***

**Some of these cases are explained in the above Comment 3. They include the case which needs routing between devices from different PANs.**

1. **Mandatory and optional parameters**

We propose that scenario parameters in document #338r4 based on “**shall**” statements be made **mandatory** and parameters based on “**should**” and “**may**” statements be made **optional**.

**No comments on this section.**