**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **Additional instructions for discovery related comments**  |
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| Re: | Document 542r2 |
| Abstract | This document provides a proposed comment resolutions for the comments which are related to CID i-75, i-76 and i-121 of SB1 of 802.15.10 |
| Purpose | To propose |
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**CID i-75**

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| i-75 | Kivinen, Tero | INSIDE Secure | 29 | 5.2.1 | 26 | Here the text says that MT is filled based on the TC IEs but lots of the information the table 3 is not in the TC IE, but are only on the L2R-D IE. i.e., to fill in the Table 3 we need to receive L2R-D not TC IE. The text then says we only store the MT Entries for as many MTs as the number of L2R meshes it has joined, but to be able to join the mesh, it needs to store all the MTs during the discovery phase so that joining phase can use that to find out the MT entries. It seems that Discovery phase returns the information to the higher layer, but how does the higher layer then fill in the MT so that joining process can know that mesh with mesh root address of xxxx has Mesh Id of "Mesh1"? | I think there is something missing here, i.e. how is the information from the discovery phase (L2R-D IE) passed to the joining phase (TC IE). Where is this explained and how is supposed to work.The joining phase (page 19 line 47, and page 21 line 46) do say we fill in or update the table 3, but information to fill in the table 3 is not available in the TC IE, thus it cannot be filled at that point, it can only be filled during the discovery phase, where we receive L2R-D IE. |

**AiP**

*Modify the text in section 5.1.2.1.1 and 5.1.2.1.2 as follow in order to add a creation of MT at the mesh discovery phase.*

**5.1.2.1.1 Discovery of a specific L2R mesh**

If MeshId is a string with a nonzero length, the L2R sublayer should attempt to discover the L2R mesh identified by MeshId.

If the *macAutoRequest* MAC PIB attribute is set to FALSE, the L2R sublayer is notified with an MLME-BEACON-NOTIFY.indication primitive upon receiving each EB frame. If the L2R-D IE is received from a device belonging to the mesh corresponding to MeshId, the L2R sublayer creates a MT if it has not created yet and the L2RLME-PAN-SCAN.confirm is returned with a Status SUCCESS and with one entry in the ScanResultList corresponding to the mesh of interest, and the scan is interrupted. Otherwise, the L2R-D IE is discarded.

If an L2R mesh identified by MeshId is not found at the end of the scan, the L2RLME-PAN-SCAN.confirm is returned with a Status MESH\_NOT\_FOUND and with an empty ScanResultList.

If *macAutoRequest* is set to TRUE, the L2R sublayer is notified of all the scan results with the MLMESCAN.confirm primitive from the MAC layer at the end of the scan. If at least one received EB contains a L2R-D IE from a device belonging to the L2R mesh identified by MeshId, the L2R sublayer creates MTs and the L2RLME-PANSCAN.confirm is returned with a Status SUCCESS and with one entry in the ScanResultList corresponding to the mesh of interest. Otherwise, the L2RLME-PAN-SCAN.confirm is returned with a Status MESH\_NOT\_FOUND and with an empty ScanResultList.

**5.1.2.1.2 Discovery of all existing meshes**

If MeshId is a string with a length of zero, the L2R sublayer discovers all the existing meshes in the device's vicinity.

If the *macAutoRequest* MAC PIB attribute is set to FALSE, the L2R sublayer is notified with an MLMEBEACON-NOTIFY.indication primitive upon receiving each EB frame. In this case, the L2R sublayer creates a MT if it has not created yet and issues an L2RLME-PAN-SCAN.indication primitive to the next higher layer after receiving each MLME-BEACON-NOTIFY.indication primitive from the MAC layer. After the scan is completed the L2R sublayer issues the L2RLME-PAN-SCAN.confirm primitive with an empty ScanResultList.

If *macAutoRequest* is set to TRUE, the L2R sublayer is notified of all the scan results with the MLMESCAN.confirm primitive from the MAC layer at the end of the scan. The L2R sublayer creates MTs if at least one EB received EB contains a L2R-D IE and submits the L2RLME-PAN-SCAN.confirm primitive with the available coordinator candidates in the ScanResultList parameter. After the discovery, the device associates with a PAN containing at least one L2R mesh providing the desired service. This procedure is illustrated in Figure 5. The L2RLME-PAN-SCAN.confirm and the L2RLME-PAN-SCAN.indication are described in 7.1.1.2 and 7.1.1.3 respectively.

*Modify the text in the section 5.1.2.2.1 and 5.1.2.2.2 as follow in order to correct the operation of MT and global NT.*

**5.1.2.2.1 Mesh selection by the L2R sublayer**

If *l2rMeshSelection* is TRUE, mesh selection is handled by the L2R sublayer. When a device wishes to join a mesh, the next higher layer issues the L2RLME-JOIN-MESH.request primitive to request the L2R sublayer to join a mesh managed by one of the mesh roots found in the MeshRootList indicated in the primitive. Upon reception of this primitive, the L2R sublayer initiates an enhanced active scan and broadcasts an EBR with a TC IE with an empty Content field. The TC IE is defined in 6.1.2. When an L2R router receives the EBR with an empty TC IE, it immediately replies with an EB containing a non-empty TC IE, and then resumes its regular periodic TC IE transmissions. When the joining device receives the response TC IE and if the TC IE is belonged to the stored MT, it computes its own depth and PQM as described in 5.2.1 and ~~creates (regardless of the condition to record the parameters indicated in Table 3) or~~ updates an MT entry related to the L2R mesh advertised in the TC IE. The device also creates ~~(regardless of the condition to record the element indicated in Table 7)~~ or updates a global NT entry for the neighbor transmitting the TC IE. ~~If the device receives multiple TC IEs from different meshes within the same PAN, and if these TC IEs are not encrypted or are encrypted with a known key, the device creates as many MTs as meshes.~~ At the end of the scan, the L2R sublayer selects the L2R mesh providing the best PQM value among the L2R meshes whose mesh root are found in the MeshRootList. If multiple meshes with the same mesh ID are discovered during to the procedure described in 5.1.2.1, and have different PQM IDs, the algorithm to select the L2R mesh is out of the scope of this document. The L2R sublayer adds a new L2R mesh descriptor to *l2rMeshDescriptorList* for the L2R mesh the device is joining. The elements of the L2R mesh descriptor that are not set from the content of the TC IE are set to default values. At the end of the joining procedure the L2R mesh, the next higher layer may set these elements to different values. The device is allowed to join an L2R mesh if its depth does not exceed the value in the L2R Max Depth field of the TC IE. The device deletes unnecessary MTs, MT entries or MT entry elements and global NT entries or elements according to the condition to record each element as described in 5.2.1. The device then transmits its own TC IE. The L2R sublayer sends an L2RLME-JOIN-MESH.confirm primitive with a SUCCESS Status to the next higher layer. This procedure is illustrated in Figure 7.

**5.1.2.2.2 Mesh selection by the next higher layer**

If *l2rMeshSelection* is FALSE, when a device wishes to join a mesh, the next higher layer issues the L2RLME-MESH-DISCOVERY.request primitive to request the L2R sublayer to discover the L2R meshes around the joining device. Upon reception of this primitive, the joining device initiates an enhanced active scan and broadcasts an EBR with a TC IE with an empty Content field. When an L2R router receives the EBR with a TC IE with an empty Content field, it replies with an EB containing a non-empty TC IE. When the joining device receives the response TC IE and if the TC IE is belonged to the stored MT, it computes its own depth and PQM as described in 5.2.1. The device ~~creates (regardless of the condition to record the parameters indicated in Table 3) or~~ updates an MT entry related to the L2R mesh advertised in the TC IE. The device also creates ~~(regardless of the condition to record the parameters indicated in Table 7)~~ or updates a global NT entry for the neighbor transmitting the TC IE. ~~If the device receives multiple TC IEs from different meshes that are not encrypted or that are encrypted with a known key, the device creates as many MTs as meshes.~~ At the end of the scan, the L2R sublayer sends an L2RLME-MESH-DISCOVERY.confirm primitive with a SUCCESS Status to the next higher layer. The next higher layer selects the L2R mesh to join based on the information in the MT stored in the L2R sublayer and informs the L2R sublayer by issuing the L2RLME-MESH-SELECT.request primitive. The device deletes unnecessary MTs, MT entries or MT entry elements, and global NT entries or elements according to the condition to record each element as described in 5.2.1. The L2R sublayer adds a new L2R mesh descriptor to *l2rMeshDescriptorList* for the L2R mesh to join. The elements of the L2R mesh descriptor that are not set from the content of the TC IE are set to default values. At the end of the procedure to join the L2R mesh, the next higher layer may set these elements to different values. The device then transmits its own TC IE. The L2R sublayer sends an L2RLME-MESH-SELECT.confirm primitive with a SUCCESS Status to the next higher layer. This procedure is illustrated in Figure 8.

**CID i-76, i-121**

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| i-76 | Kivinen, Tero | INSIDE Secure | 104 | 7.1.1.11 | 50 | This text says that MT has been created or updated from the information retrieved from a TC IE. The TC IE does not have information which can be used to fill in the MT entry. It can only update some pieces of the MT table, i.e., L2R Max Depth, PQM, Dcat buffering time etc, but it cannot filling the MeshID, SSPAN, Storing Mode etc fields. | Change the text to say that it will only update the MT entries filled in the table during the PAN scan phase, and will not create any new entries. |
| i-121 | Sato, Noriyuki | OKI | 19 | 5.1.2.2.1 |  | This clause describes that selection of mesh with same mesh ID. However, the device gather mesh ID only at discovery phase. After joined, there is no chance to find new mesh with mesh ID started. | Provide some solution for itEx.Periodical announcement of Mesh IDLight scan when unknown mesh root is found |

**AiP**

*Add the following text at P.32 l.3.*

If the device receives a TC IE that is belonged to a new L2R mesh whose MT needs to be stored but has not been created yet, it creates its MT. Then the L2R sublayer notifies the next higher layer with L2RLME-NOTIFICATION.indication with the code NEW\_MESH\_FOUND. When the next higher layer receive this notification, it may search the MTs and scan L2R-D IE by issuing the L2RLME-PAN-SCAN.request with the mesh root address set base on the Mesh Root Address field retrieved from which the TC IE of the new mesh was received. . When the device receives the response L2R-D IE, it updates the MT entry. When *l2rMeshSelection* is TRUE and *l2rSwitchMesh* is TRUE, the device adds the mesh root address of the new L2R mesh to the mesh root address list if this L2R mesh has a same mesh ID as the desired mesh ID.

*Modify the table 37 and add the text as follow.*

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| **Name** | **Type** | **Valid Range** | **Description** |
| Notification | ENUMERATION | ROOT\_CONFLICT, BETTER\_MESH\_DETECT, TC\_IE\_MISMATCH, MISSING\_NT\_DATA,NEW\_MESH\_FOUND | Notifies the next higherlayer of an event at theL2R sublayer |

If a device finds an unknown mesh, the Notification is set to NEW\_MESH\_FOUND.

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