**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **Proposed comment resolution for IE related comments of LB104** |
| Date Submitted | 6 July 2015 |
| Source | \*[Verotiana Rabarijaona, Fumihide Kojima], †[Hiroshi Harada]\*[NICT], †[Kyoto University]\*[3-4, Hikarino-oka, Yokosuka, 239-0847 Japan], †[36-1 Yoshida-Honmachi, Sakyo-ku, Kyoto 606-8501 Japan] | Voice: [+81-46-847-5075]Fax: [+81-46-847-5089]E-mail: [rverotiana@nict.go.jp] |
| Re: | 802.15.10 Consolidated Comment Entry Form, IE related comments |
| Abstract | Provides a proposed resolution to IE related comments |
| Purpose | To be used by the technical editor to apply the necessary changes to the draft to resolve IE related comments |
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1. **Comment CID #342, 345**

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| **CID** | **Commenter** | **Page** | **Clause** | **Line** | **Comment** | **Proposed change** |
| 342 | Verotiana Rabarijaona | 55 | 6.2.2.1 | 25 | The MCO, PAN Coord Connection and DS Route Required flags are already present in the L2R-D IE. Are they also needed in the TC IE? | Consider deleting |
| 345 | Tero Kivinen | 55 | 6.2.2.1 | 51 | The DS Route Required field is not described at all. What is the meaning of it? |  |

If a device wants to join a L2R mesh, it should discover the appropriate PAN upon which the L2R mesh is deployed first and associate with the PAN found. The L2R-D IE is sent in an EBR where the Destination PAN Identifier and the Destination Address fields are set to 0xffff to discover the all the possible L2R meshes.

If a device is already associated with a PAN and wishes to join an L2R mesh, the device first discovers the appropriate L2R mesh. The L2R-D IE is sent in an EBR where the Destination PAN Identifier and the Destination Address fields are set to 0xffff to discover the all the possible L2R meshes. If a desired L2R mesh is already on the current PAN, the devices just joins the L2R mesh. Otherwise, the devices associates with the appropriate PAN first.

If a device needs to rejoin a L2R mesh, it may

* Discover all the L2R meshes available, by sending the L2R-D IE in an EBR with the Destination PAN Identifier and the Destination Address fields to 0xffff.
* Or rediscover the previous L2R mesh, if the device is still associated with the same PAN by sending an L2R-D IE in an EBR with the Destination PAN Identifier field set to the PAN ID of its current PAN and with the Destination Address field set to 0xffff.

In every case, all the settings are conveyed in the L2R-D IE and the flags can be deleted from the TC IE.

**Resolution:**

* ***Modify the title of clause 5.1.2.1and the first 2 paragraphs as follows:***

**5.1.2.1 Procedure to discover an L2R mesh**

If a device wishes to join a L2R mesh tree and is not associated to any PAN, it should perform an enhanced scan to find a PAN upon which the L2R mesh tree is built and associate with this PAN beforehand. The association procedure to a PAN is described in IEEE 802.15.4TM-2011.

The next higher layer of a joining device invokes the L2RLME-SCAN.request primitive to request the broadcast of an EBR with an empty L2R Discovery (L2R-D) IE, i.e. the fields after the Type field are omitted. The L2R-D IE is defined in 6.2.1. The scan procedure is done on the channels indicated in L2RLME-SCAN.request. The L2R-D IE is sent in an EBR with the Destination PAN Identifier and the Destination Address fields to 0xffff to discover all the existing L2R meshes.

* ***Replace Figure 7 with:***



* ***Insert the following text after Figure 7***

If a device is already associated with a PAN and wishes to join an L2R mesh, it may discover all the existing L2R meshes according to the procedure illustrated in the Discovery dashed box in Figure 7. If a desired L2R mesh is deployed over the PAN the device is currently associated with, it may join the L2R mesh according to the procedure described in 5.1.2.2.

If the desired L2R mesh is not deployed over the PAN which the device is currently associated with, the device associates with the appropriate PAN before joining the L2R mesh.

If a device is already associated with a PAN, it may also discover the potential L2R mesh(es) deployed within its PAN. In this case, the device sends the L2R-D IE on the channel of the current PAN within an EBR where the Destination PAN Identifier field is set to the current PAN ID and the Destination Address field is set 0xffff to allow a response from all potential neighbors. This procedure is illustrated in Figure 8.



Figure 8 – Procedure to discover a L2R mesh within the associated PAN

* ***Modify the first paragraph of clause 5.1.2.3 as follows:***

If a device does not have any neighbor left in its NT, it has been disconnected from the L2R mesh tree. Upon detection of the disconnection, the L2R sublayer issues a L2RLME-DISCONNECT-TREE.indication primitive to the next higher layer.

The device may rediscover all the existing L2R meshes according to the procedure illustrated in Figure 7 and associate with the appropriate PAN before joining or rejoining a L2R mesh.

If the device wishes to remain within the same PAN, it may try to rediscover the L2R meshes within its PAN according to the procedure illustrated in Figure 8. The next higher layer may request an orphan scan process ([15.4], 6.3.1.3) in order to reestablish the connection to the PAN if it has lost connection with its coordinator before trying to rejoin the L2R mesh. The procedure is illustrated in Figure 9.

* ***Replace Figure 9 with:***



* ***Modify clause 6.2.2.1 as follows:***

The descriptor field is formatted as illustrated in Figure 33.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Bits:**  | **0** | **1** |  |  | **2-7** |  |  |  |
|  | Metrics Present  | Mesh Root Address Mode |  |  | Reserved  |  |  |  |

When the Metrics Present field is set to 1, the PQM List field is present. Otherwise, it is omitted.

When the Mesh Root Address Mode field is set to 1, the Mesh Root Address field contains an extended address, if set to 0, it contains a short address.

* ***Modify the last paragraph of clause 6.2.1.1 as follows:***

When the MCO field is set to 1, the L2R mesh spans more than one PAN operating on different channels and the MCO Descriptor field is present in the TC IEs sent within the L2R mesh. Otherwise, the L2R mesh tree is contained within a single PAN and the MCO Descriptor field is omitted from the TC IEs.

* ***Modify Figure 32 as follows:***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Bits:0-7** | **8-14** | **15** | **Octets: 0/1** | **0/2/8** | **0/Variable** | **0/1** | **0/1** | **0/1** | **0/10** | **0/1** | **0/1** | **0/Variable** | **0/Variable** |
| Length | Sub-ID | Type = 0 | Descriptor | Mesh Root Address | Entity ID List | Depth | Sequence Number | TC IE Interval | MCO Descriptor | DAgg Buffering Time | Security Level | PQM List | Path to Root |

1. **Comment CID #344, R178, 390**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Page** | **Clause** | **Line** | **Comment** | **Proposed change** |
| 344 | Verotiana Rabarijaona | 55 | 6.2.2.1 | 48 | The Depth field should not be deleted since the definition of the depth is not based on hops | Delete the end of the sentence from "and the" |
| R178 | Charlie Perkins | 55 | 6.2.2 | 7 | How many links are in "Path to Root" | Isn't the next hop sufficient? |
| 390 | Tero Kivinen | 59 | 6.2.2.11 | 31 | How does one know whether short addresses or extended addresses are used in the list? The list says each item can either be 2 octets or 8 octets, but nothing specifies which size each element in the list is. |  |

**Resolution**

The next hop upstream can be found in the neighbor table so the Path to Root field is not needed.

* ***Modify Figure 32 as follows:***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Bits:0-7** | **8-14** | **15** | **Octets: 0/1/2** | **0/2/8** | **0/Variable** | **0/1** | **0/1** | **0/1** | **0/10** | **0/1** | **0/1** | **0/Variable** |  |
| Length | Sub-ID | Type = 0 | Descriptor | Mesh Root Address | Entity ID List | Depth | Sequence Number | TC IE Interval | MCO Descriptor | DAgg Buffering Time | Security Level | PQM List |  |

* ***Modify Figure 33 as follows:***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Bits: 0** | **1** | **2** | **3** | **4** | **5-7** |  | **8** | **9-15** |
| Short Descriptor | Metrics Present  | Mesh Root Address Mode | MCO | PAN Coord Connection  | Reserved  |  | DS Route Required | Reserved |

* ***Delete the last paragraph of clause 6.2.2.1***
* ***Delete clause 6.2.2.11***
1. **Comment CID #346**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Commenter** | **Page** | **Clause** | **Line** | **Comment** | **Proposed change** |
| Tero Kivinen | 55 | 6.2.2.2 | 52 | There is Entity ID field described, here bu the TC IE contains Entity ID List field, which then contains Entity ID fields. Perhaps it would be just enough to say that Entity ID List field is formatted as specified in the 6.2.1.2? |  |

**Resolution**

* ***Modify clause 6.2.2.2 as follows***

6.2.2.2 Entity ID List field

The Entity ID List field is formatted as described in 6.2.1.2.

1. **Comment CID #395, R204**

|  |  |  |  |  |  |  |
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| **CID** | **Commenter** | **Page** | **Clause** | **Line** | **Comment** | **Proposed change** |
| 395 | Tero Kivinen | 60 | 6.2.5.1 | 45 | What is the point of having “Address Mode Present” field here, and then we have one bit in the Neighbor Metric Container, which still cannot be omitted, as it is inside the octet that is transmitted. As written here, it would mean that one bit of first octet of the Neighbor Metric Container 1 is omitted, i.e. it would only be 7 bits long, thus rest of the IE would not be octet aligned. | Remove the Address Mode Present field completely. |
| R204 | Charlie Perkins | 60 | 6.2.5.1 | 49 | Bit is always there, but described as omitted sometimes | Change "omitted" to be "set to zero" |

**Resolution**

* ***Modify Figure 43 as follows:***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Bits: 0-10** | **11-14** | **15** |  | **16-23** | **Octets: 1** | **Variable** | **…** | **0/Variable** |
| Length | Sub-ID | Type = 1 |  | Number of Neighbors | NLM IE Interval | Neighbor Metric Container 1 | … | Neighbor Metric Container N |

* ***Delete clause 6.2.5.1***
1. **Comment CID #407**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Commenter** | **Page** | **Clause** | **Line** | **Comment** | **Proposed change** |
| Verotiana Rabarijaona | 62 | 6.2.6.2 | 47 | A device might belong to a mesh tree connected to more than Entity so the Entity ID should be the Entity ID List field formatted as in clause 6.2.1.2 | Fix Figure 46 and correct this clause |

**Resolution**

* ***Modify Figure 46 as follows:***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Bits: 0-10** | **11-14** | **15** | **Octets:1** | **Variable** | **2/8** | **1** | **1** | **1** | **2/8** | **0/10** | **0/Variable** | **1** | **0/Variable** |
| Length | Sub-ID | Type = 1 | Descriptor | Entity ID List | Mesh Root Address | Depth | Sequence Number | RA IE Interval | Source Address | MCO Fields | Multicast Subscription | Number of Intermediate Addresses | Intermediate Address List |

* ***Modify clause 6.2.6.2 as follows:***

**6.2.6.2 Entity ID List**

The Entity ID List field is formatted as described in 6.2.1.2.

1. **Comment CID #453**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Commenter** | **Page** | **Clause** | **Line** | **Comment** | **Proposed change** |
| Tero Kivinen | 70 | 6.2.10.4 | 3 | The header line in figure does not specify bits or octets. | Add Octes in the header line |

**Resolution**

* ***Modify Figure 58 as follows:***

|  |  |  |  |
| --- | --- | --- | --- |
| **Octets: 0/1** | **2/8** | **0/1** | **2/8** |
| Source Address PAN ID | Source Address | Destination Address PAN ID | Destination Address |

1. **Comment CID R215**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Commenter** | **Page** | **Clause** | **Line** | **Comment** | **Proposed change** |
| Charlie Perkins | 63 | 6.2.6.9 | 33 | Number of Multicast Addresses should not have value of zero | Insert clarifying text |

**Resolution**

* ***Modify the second paragraph of 6.2.6.9 as follows:***

The Number of Multicast Addresses indicates the number of addresses present in the Multicast Subscription field and should be greater than or equal to 1.

1. **Comment CID R218, 423**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Page** | **Clause** | **Line** | **Comment** | **Proposed change** |
| R218 | Charlie Perkins | 64 | 6.2.6.11 | 4 | Suggest bit vector format for Intermediate Hop Descriptor | 7 bits for Addresses, 1 bit for "continuation" |
| 423 | Tero Kivinen | 64 | 6.2.6.11 | 19 | I assume the idea for the Intermediate Address Mode Present field in the Descriptor field is that if it is set to 0, then Intermediate Hop Descriptor field (one octet) is omitted completely. This is not reflected in the figure 49, nor in the text on lines 19-20. | Add text saying that if the Intermediate Address Mode Present field is set to 0, then the format does not have Intermediate Hop Descriptor at all, i.e. the Intermediate Address List contains only Intermediate Hop Address as 2 octet long field.  |
| 433 | Verotiana Rabarijaona | 65 | 6.2.8.1 | 51 | The Address Mode s/b "Intermediate hop address mode". However, it is the only field of the Intermediate hop Descriptor so the entire descriptor should be omitted. Same thing in 6.2.9.1. 6.2.10.1 | Replace the second "Address mode" with "Intermediate Hop Descriptor field" |

**Resolution**

The size of the address mode bitmap can be derived from the Number of Intermediate Addresses field. The Intermediate Hop Descriptors field can be replaced with a bitmap without requiring a “continuation bit”

* ***Modify clause 6.2.6.11 as follows:***

The Intermediate Address List field is formatted as illustrated in Figure 49.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Octets: 1/Variable** | **2/8** | **…** |  | **0/2/8** |
| Address Mode Bitmap | Intermediate Hop Address 1 | … |  | Intermediate Hop Address N |

Figure 49—Format of the Intermediate Address List in the RA IE

|  |  |
| --- | --- |
|  |  |
|  |  |

Each bit b\_i (i=0,…,7) in the Address Mode Bitmap field indicates the address mode of the Intermediate Hop Address *(i+1)*. A value of 0 indicates a short address, and a value of 1 indicates a long address.

The size of the Address Mode Bitmap field is set according to the Number of Intermediate Addresses. If there are less intermediate hops than the number of bits available in the Address Mode Bitmap field, the remaining bits are set to 0 and are ignored by the receiver.

* ***Modify the last paragraph of clause 6.2.8.1, 6.2.9.1, and the 10th paragraph in clause 6.2.10.1 as follows:***

When the Intermediate Address Mode Present field is set to 1, the Address Mode Bitmap field is present in the Intermediate Address List field. Otherwise, the Address Mode Bitmap field is omitted and only short addresses are used. If MCO is set to 1, the Intermediate Address Mode Present field is set to 1. When the L2R mesh tree is in storing mode, the Intermediate Address Mode Present field is ignored.