**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | TG 8 MAC Draft Text for Peering and De-peering | |
| Date Submitted | July 14, 2015 | |
| Source | Qing Li (InterDigital Inc.) | Email: Qing.Li@InterDigital.com |
| Re: | Draft text of MAC data request command for 802.15.8 | |
| Abstract | This is the work in progress text of the MAC component for IEEE 802.15.8 group for PAC. | |
| Purpose | This document provides the details of draft text to IEEE 802.15.8 | |
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| Patent Policy | The contributor is familiar with the IEEE-SA Patent Policy and Procedures:  <http://standards.ieee.org/guides/bylaws/sect6-7.html#6> and  <http://standards.ieee.org/guides/opman/sect6.html#6.3>.  Further information is located at <http://standards.ieee.org/board/pat/pat-material.html> and  <http://standards.ieee.org/board/pat>. | |

1. MAC protocol
   1. MPDU formats

----------------------------- Beginning of Text ------------------------------------

(Copied from IEEE 802.15.4 2011 release, clause 5.1.3, and then modified for PAC)

**5.1.3 Peering and de-peering**

This subclause specifies the procedures for peering and de-peering.

* + - 1. **Peering**

The next higher layer shall attempt to peer only after having first performed discovering PD(s) successfully, as defined in [5.1.2.](file:///C:\\Users\\liqx\\Desktop\\!QPAC\\_201503Berline\\802.15.4-2011.docx" \l "_bookmark56) The results of the discovery would have then been used to peer with PD(s).

Following the decision of peering with a PD, the next higher layers shall request through the MLME-PEER.request primitive, as described in [TBD,](file:///C:\\Users\\liqx\\Desktop\\!QPAC\\_201503Berline\\802.15.4-2011.docx" \l "_bookmark211) that the MLME configures the following PHY and MAC PIB attributes to the values necessary for peering:

* *phyCurrentChannel* shall be set equal to the ChannelNumber parameter of the MLME- PEER.request primitive.
* *phyCurrentPage(??)* shall be set equal to the ChannelPage parameter of the MLME- PEER.request primitive.
* *macGroupId (Application Id??)* shall be set equal to the GroupId parameter of the MLME-PEER.request primitive.

A PD shall allow peering only if *macPeerPermit* is set to TRUE. Similarly, a PD should attempt to peer only with a PD that is currently allowing peering, as indicated in the results of the discovery procedure. If a PD with *macPeerPermit* set to FALSE receives apeering request command from a device, the command shall be ignored.

A PD that is instructed to peer with a PD, through the MLME-PEER.request primitive.

The MAC sublayer of a PD (i.e. the peering initiator) shall initiate the peering procedure by sending apeering request command, as described in [TBD,](file:///C:\\Users\\liqx\\Desktop\\!QPAC\\_201503Berline\\802.15.4-2011.docx" \l "_bookmark163) to the PD (i.e. the peering responder); if the peering request command cannot be sent due to a channel access failure, the MAC sublayer shall notify the next higher layer.

The acknowledgment to apeering request command does not mean that the peering has been accepted.. The next higher layer should make this peering decision within *macResponseWaitTime*. If the next higher layer of the peering responder finds that the peering requestor was previously, all previously obtained device-specific information should be replaced. If sufficient resources are available, short address the MAC sublayer shall generate apeering response command, as described in [TBD,](file:///C:\\Users\\liqx\\Desktop\\!QPAC\\_201503Berline\\802.15.4-2011.docx" \l "_bookmark171) to indicate a successful peering. If sufficient resources are not available, the next higher layer of the peering responder should inform the MAC sublayer, and the MLME shall generate apeering response command containing a status indicating a failure, as defined in [Table TBD](file:///C:\\Users\\liqx\\Desktop\\!QPAC\\_201503Berline\\802.15.4-2011.docx" \l "_bookmark175).

On receipt of the acknowledgment to the peering request command, the peering requestor shall wait for at most *macResponseWaitTime* for the PD to make its peering decision. The peering requewstor shall attempt to extract the peering response command from the peering responder after *macResponseWaitTime*. If the peering requestor does not receive apeering response command frame from the peering responder within *macResponseWaitTime*, the MLME shall issue the MLME-PEER.confirm primitive, as described in [TBD,](file:///C:\\Users\\liqx\\Desktop\\!QPAC\\_201503Berline\\802.15.4-2011.docx" \l "_bookmark219) with a status of FAILURE, and the peering attempt shall be deemed a failure.

If the Peering Status field of the peering response command indicates that the peering was successful, the peering requestor shall store the address contained in the Address field of the command in *macAddress*; communication on the PAC uses this address*.*



If the value of the Peering Status field of the command is not “Peering successful,” if there were a communication failure during the peering process due to a missed acknowledgment, or if the peering response command frame were not received, the peering requestor shall set *macGroupId* to the default value (0xffff).

A message sequence chart for peering is illustrated in [Figure TBD](file:///C:\\Users\\liqx\\Desktop\\!QPAC\\_201503Berline\\802.15.4-2011.docx" \l "_bookmark78).

[Figure TBD](file:///C:\\Users\\liqx\\Desktop\\!QPAC\\_201503Berline\\802.15.4-2011.docx" \l "_bookmark79) illustrates a sequence of messages that may be used by a first PD to successfully peer with a second PD.

**Figure TBD—Peering message sequence chart**

* + - 1. **De-peering**

The de-peering procedure is initiated by the next higher layer by issuing the MLME- DEPEER.request primitive, as described in TBD, to the MLME.

When a PD (i.e. the de-peering requestor) wants to leave from the peered PD or one of its peered PDs (i.e. de-peering responder) to leave , the MLME of the de-peering requestor shall send the de-peering request command to the peering responder.

**Figure 18—Message sequence chart for peering**

If the depeering request command cannot be sent due to a channel access failure, the MAC sublayer shall notify the next higher layer.

If the transmission fails, the de-peering requestor should consider the second PD de-peered.

The de-peering responder receiving the de-peering request command shall verify that the source address corresponds to one of its peered PDs; if so, the de-peering responder should consider the de-peering requestor is valid. If this condition is not satisfied, the de-peering request command shall be ignored.

A peered PD shall de-peer itself by removing all references to the PAC; the MLME shall set *macGroupId*, *macLinkId*,. The next higher layer of a de-peering requestor shall de-peer a de-peering responder by removing all references to that PD.

The next higher layer of the requesting PD shall be notified of the result of the de-peering procedure through the MLME-DEPEER.confirm primitive, as described in [TBD.](file:///C:\\Users\\liqx\\Desktop\\!QPAC\\_201503Berline\\802.15.4-2011.docx" \l "_bookmark229)

[Figure TBD](file:///C:\\Users\\liqx\\Desktop\\!QPAC\\_201503Berline\\802.15.4-2011.docx" \l "_bookmark80) illustrates the sequence of messages for a first PD to de-peer itself from a second PD.

1st PD

MLME

1st PD

high layer

Device next higher layer

Device MLME

Coordinator MLME

MLME-DISASSOCIATE.request

*de-peering notification*

*Acknowledgment*

MLME-DISASSOCIATE.confirm

(SUCCESS)

MLME-DEPEER.indication

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| 2nd PD next higher layer | |
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**Figure TBD—Message sequence chart for de-peering initiated by a PD**