**IEEE P802.15**

**Wireless Personal Area Networks**

|  |  |
| --- | --- |
| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | Suggested Primitive descriptions for Peering and de-peering |
| Date Submitted | September 2016 |
| Source | Huan-Bang Li (NICT)Marco Hernandez (NICT)Fumihide Kojima (NICT) |  |
| Re: | TG8 draft text for comment resolution 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 |
| Notice | This document does not represent the agreed views of the IEEE 802.15 Working Group or IEEE 802.15.8 Task Group. It represents only the views of the participants listed in the “Source(s)” field above. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein. |
| Release | The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15. |
| 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>. |

# [This is draft text to resolve comment submitted to TG8]

6.1.3 Peering primitives

These primitives are used when a PD is peering or is being peered with another PD.

6.1.3.1 MLME-PEERING.request

This primitive requests peering with a given PD. The properties of this primitive are:

MLME-PEERING.request{

ChannelNumber;

ChannelPage;

GroupMode

GroupID

MulticastGroupID;

DestinationAddress;

CyclicSuperframeStructure;

PhySecuritySupport;

}

The primitive parameters are defined in Table 35.

Table —MLME-PEERING.request parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Property** | **Type** | **Valid range** | **Description** |
|  ChannelNumber | Integer  | Any valid channel number as defined in Table 76 |  The channel number on which to attempt peering. |
| ChannelPage  | Integer  | Any valid channel page as defined in Table 76 | The channel page on which to attempt peering. |
| GroupMode | Integer | As defined in Table 20 | Group mode determines the type of peering procedure |
|  GroupID | Integer | 0 to 216 −1  | Group ID provided by the application layer. |
| MulticastGroupID | Integer | Implementation specific | Multicast address of a PAC group |
|  DestinationAddress | MAC address | IEEE 48 bit address | Address of the PD with which to peer for one-to-one peering. |
| CyclicSuperframeStructure | Cyclic-superframe structure descriptor | As defined in Table 31 | Indicates the structure of cyclic-superframe |
| PhySecuritySupport | Enumeration | TRUE, FALSE | Indicates whether the PD is using PHY layer security mode |

6.1.3.1.1 When generated

This primitive is generated by the next higher layer to request that the MLME to initiate a peering procedure.

6.1.3.1.2 Effect on receipt

When receiving the MLME-PEERING.request primitive with the CyclicSuperfreamStructure parameter, the MAC sublayer sets the PIB with the value of the cyclic-superframe structure descriptor and selects the start time of a cyclic-superframe. After starting a cyclic-superframe, the MAC sublayer inserts the Cyclic-superframe descriptor IE to the MAC header of the Peering Request command frame. The MAC sublayer schedules to access a period of a superframe of a cyclic-superframe.

6.1.3.2 MLME-PEERING.indication

The primitive is used to indicate the reception of a Peering Request command. The properties of this primitive are:

MLME-PEERING.indication{

SourceID;

GroupMode

MulticastGroupID

PHYcapability;

CyclicSuperfameStructure;

PhySecuritySupport;

}

The primitive parameters are defined in Table 36.

Table —MLME-PEERING.indication parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Property** | **Type** | **Valid range** | **Description** |
|  SourceID | MAC address | PD specific | Address of the PD requesting peering. |
| GroupMode | Integer | As defined in Table 20 | Group mode determines the type of peering procedure |
| MulticastGroupID | Integer | 0 to 216 −1  | Group ID of the requested group. |
| PHYcapability  | Enumeration  | LOW\_MOBILITY, HIGH\_MOBILITY, GFSK, UWB\_BPM\_BPSK, UWB\_OOK | Operational capability of the PD requesting peering. |
| CyclicSuperframeStructure | Cyclic-superframe structure descriptor | As defined in Table 31 | Indicates the structure of cyclic-superframe |
| PhySecuritySupport | Enumeration | TRUE, FALSE | Indicates whether the PD is using PHY layer security mode |

6.1.3.2.1 When generated

This primitive is generated when the MAC layer of a PD receives a Peering Request command from another PD, to indicate the reception of the Peering Request command to the next higher layer.

When receiving the Peering Request command frame with the Cyclic-superframe descriptor IE, the MAC sublayer sets the PIB with the value of Cyclic-superframe Duration field, Primary superframe Number field, Primary superframe Type field, and Secondary superframe Type field. The MAC sublayer notifies the receiving the cyclic-superframe structure to the higher layer with MLME-PEERING.indication primitive. The MAC sublayer calculates the next start of a cyclic-superframe structure with the value of Sequence Number field and of Cyclic-superframe Duration field, and starts to schedule to access a period of a superframe of a cyclic-superframe.

6.1.3.2.2 Effect on receipt

When the next higher layer receives the MLME-PEERING.indication primitive, it shall make a decision of accepting the peering request or not and generate a response primitive based on its decision.

6.1.3.3 MLME-PEERING.response

The primitive is used to initiate a response to an MLME-PEERING.indication primitive. The properties of this primitive are:

MLME-PEERING.response{

SourceID;

GroupMode;

MulticastGroupID;

Status;

PhySecuritySupport;

}

The primitive parameters are defined in Table 37.

Table —MLME-PEERING.response parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Property** | **Type** | **Valid range** | **Description** |
|  SourceID | MAC address | PD specific | Address of the PD requesting peering. |
| GroupMode | Integer | As defined in Table 20 | Group mode determines the type of peering procedure |
| MulticastGroupID | Integer | 0 to 216 −1 | ID of the MulticastGroup  |
| Status | Enumeration | SUCCESFUL, OUT\_OF\_CAPACITY, ACCESS\_DENIED,  | Status of the peering attempt. |
| PhySecuritySupport | Enumeration | TRUE, FALSE | Indicates whether the PD is using PHY layer security mode |

6.1.3.3.1 When generated

This primitive is generated by the next higher layer to request that the MLME to initiate a response to an MLME-PEERING.indication primitive, that it received from its MAC layer.

**6.1.3.3.2 Effect on receipt**

When receiving this primitive, a PD’s MAC layer shall initiate a Peering Reponse commond in accordance to this primitive and send it to the initiator PD that request for peering.

6.1.3.4 MLME-PEERING.confirm

The primitive reports the result requested by MLME-PEERING.request of the initiating PD. The properties of this primitive are:

MLME-PEERING.confirm{

DestinationAddress;

GroupMode;

MulticastGroupID;

Status;

PhySecuritySupport;

}

The primitive parameters are defined in Table 38.

Table —MLME-PEERING.confirm parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Property** | **Type** | **Valid range** | **Description** |
|  DestinationAddress | MAC address | PD specific | Address of the peered PD. |
| GroupMode | Integer | As defined in Table 20 | Group mode determines the type of peering procedure |
| MulticastGroupID | Integer | 0 to 216 −1  | Group ID of the established group. |
| Status | Enumeration | SUCCESS, CHANNEL\_ACCESS\_FAILURE, NO\_ACK, ACCESS\_DENIED,  | The status of the peering attempt. |
| PhySecuritySupport | Enumeration | TRUE, FALSE | Indicates whether the PD is using PHY layer security mode |

6.1.3.4.1 When generated

This primitive is generated when that a Peering Reponse commond from a responder PD is received by the MAC layer of the peering initiator PD.

**6.1.3.4.2 Effect on receipt**

When receiving this primitive, the next higher layer shall register the related information of the responder PD if the status is success. The next higher layer shall decide if re-send a peering request if the status is channel access failure or no ack. The next higher layer shall terminate the peering procedure if the status is access denied.

If the peering request was successful, then the Status parameter will be set to SUCCESS. Otherwise, the Status parameter will be set to indicate the type of failure.

6.1.4 De-peering primitives

These primitives are used when a PD wishes to de-peer with another PD or to be de-peered from another PD.

6.1.4.1 MLME-DE-PEERING.request

This primitive requests de-peering of given PD. The properties of this primitive are:

MLME-DE-PEERING.request{

DestinationAddress;

SourceAddress;

GroupMode;

MulticastGroup\_ID;

Reason;

}

The primitive parameters are defined in Table 39.

Table —MLME-DE-PEERING.request parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Property** | **Type** | **Valid range** | **Description** |
| DestinationAddress | MAC address | PD specific | Address of the PD with which to peer. |
| SourceAddresss  | MAC address  | PD specific | The address of the PD requesting peering. |
| GroupMode | Integer | As defined in Table 20 | Group mode determines the type of peering procedure |
| MulticastGroup\_ID | Integer | 0 to 216 −1  | Group ID of destination PD. |
| Reason | Integer | 0 to 1  | Reasons for de-peering: 0 - Source wants to leave. 1 - Source requests destination to leave.  |

6.1.4.1.1 When generated

This primitive is generated by the next higher layer to request that the MLME to initiate a de-peering procedure.

**6.1.4.1.2 Effect on receipt**

When receiving this primitive, the MAC layer of the de-peering requestor PD shall initiate a De-Peering Notification commond in accordance to this primitive and send it to de-peering responder PD.

6.1.4.2 MLME-DE-PEERING.indication

The primitive is used to indicate the reception of a De-peering request command.

MLME-DE-PEERING.indication{

SourceID;

GroupMode;

MulticastGroup ID

Reason;

}

The primitive parameters are defined in Table 40.

Table —MLME-DE-PEERING.indication

|  |  |  |  |
| --- | --- | --- | --- |
| **Property** | **Type** | **Valid range** | **Description** |
| SourceID | MAC address | PD specific | The address of the PD requesting de-peering. |
| GroupMode | Integer | As defined in Table 20 | Group mode determines the type of peering procedure |
| MulticastGroup\_ID | Integer | 0 to 216 −1 | ID of MulticastGroup  |
| Reason | Integer | 0 − 1 | 0 – source wants to leave1 – source requests destination to leave  |

6.1.4.2.1 When generated

This primitive is generated when the MAC layer of a PD receives a De-Peering Request command from another PD, to indicate the reception of the De-Peering Request command to the next higher layer..

**6.1.4.2.2 Effect on receipt**

When the next higher layer receives the MLME-De-PEERING.indication primitive, it shall terminate peering with the de-peering requestor PD.

6.1.4.3 MLME-DE-PEERING.confirm

This primitive reports the result requested by MLME-DE-PEERING.request. The properties of this primitive are:

MLME-DE-PEERING.confirm{

DestinationAddress;

 SourceAddress;

 GroupMode;

MulticastGroup\_ID;

 Status;

}

The primitive parameters are defined in Table 41.

Table —MLME-DE-PEERING.confirm parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Property** | **Type** | **Valid range** | **Description** |
| DestinationAddresss | MAC address | PD specific | Address of the PD with which to de-peer. |
| SourceAddresss  | MAC address  | PD specific | The address of the PD requesting de-peering. |
| GroupMode | Integer | As defined in Table 20 | Group mode determines the type of peering procedure |
| MulticastGroup\_ID | Integer | 0 to 216 −1 | MulticastGroup ID of destination PD. |
| Status | Enumeration | SUCCESS, NO\_ACK, CHANNEL\_ACCESS\_FAILURE,  | The status of the de-peering attempt. |

6.1.4.3.1 When generated

This primitive is generated when that a De-Peering Reponse commond from a responder PD is received by the MAC layer of the de-peering initiator PD.

**6.1.4.3.2 Effect on receipt**

When the next higher layer receives the MLME-De-PEERING.indication primitive, it shall terminate peering with the de-peering requestor PD. If the de-peering request was successful, then the Status parameter will be set to SUCCESS. Otherwise, the Status parameter will be set to indicate the type of failure.

1.