**IEEE P802.15**

**Wireless Personal Area Networks**

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| Re: | TG8 draft text for peering related 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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# [This is draft text for subclause of Peering related command for TG8]

# MAC Layer

**5.3 MAC command frames**

The command frames defined by the MAC sublayer are listed in Table 5. A PD shall be capable of transmitting and receiving all command frame types. MAC commands shall not be transmitted in the CFP.

MAC command reception shall abide by the procedure described in 5.1.2.2.

**Table 5—MAC command frames**

|  |  |  |
| --- | --- | --- |
| **Command frame****identifier** | **Command name** | **Subclaus** |
| 0x01 | One-to-one peering request | 5.3.1 |
| 0x02 | One-to-one peering response | 5.3.2 |
| 0x03 | One-to-one re-peering request | 5.3.3 |
| 0x04 | One-to-one re-peering response | 5.3.4 |
| 0x05 | One-to-one de-peering request | 5.3.5 |
| 0x06 | One-to-one de-peering response | 5.5.6 |
|  |  |  |
|  |  |  |
| 0x0a-0xff | Reserved |  |

**5.3.1 One-to-one peering request command**

The one-to-one peering request command allows a PD to request peering with another PD.

This command shall only be sent by a PD that wishes to peer with another PD. A PD shall only peer with another PD through the one-to-one peering procedure.

All PDs shall be capable of transmitting and receiving this command.

The one-to-one peering request command shall be formatted as illustrated in Figure 49.

|  |  |  |
| --- | --- | --- |
| **Octets: variable** | **1** | **1** |
| MHR fields | Command Frame Identifier | Capability Information |

**Figure 49—One-to-one peering request command format**

**5.3.1.1 MHR fields**

The Source Addressing Mode field shall be set to indicate 48-bit addressing and the Destination Addressing Mode field shall be set to indicate the 2-byte multicast addressing and the 6-byte unicast addressing.

The Frame Pending field shall be set to zero and ignored upon reception, and the AR field shall be set to one.

The Destination Device ID field shall contain the device ID of the PD to which to peer with. The Destination Address field shall contain the address of the PD to which the peering request command is being sent. The Source Device ID field shall contain the PD’s own device ID. The Source Address field shall contain the value of *48-bit Device Address*.

**5.3.1.2 Capability Information field**

The Capability Information field shall be formatted as illustrated in Figure 50.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Bits 0** | **1** | **2** | **3** | **4-5** | **6** | **7** |
| Reserved | Device Type | Power Source | Receiver On When Idle | Reserved | Security Capability | Reserved |

**Figure 50—Capability Information field format**

The Device Type field shall be set to one if the PD is used at a fixed location. Otherwise, the Device Type field shall be set to zero to indicate a moving PD.

The Power Source field shall be set to one if the PD is receiving power from the alternating current mains. Otherwise, the Power Source field shall be set to zero.

The Receiver On When Idle field shall be set to one if the device does not disable its receiver to conserve power during idle periods. Otherwise, the Receiver On When Idle field shall be set to zero.

The Security Capability field shall be set to one if the device is capable of sending and receiving cryptographically protected MAC frames as specified in 7.2; it shall be set to zero otherwise.

**5.3.2 One-to-one peering response command**

The one-to-one peering response command allows a PD to communicate the results of a one-to-one peering attempt back to the PD requesting peering.

This command shall only be sent by a PD that receives a peering request, to a PD that is currently sending the peering request.

All PDs shall be capable of receiving this command.

The peering response command shall be formatted as illustrated in Figure 51.

|  |  |  |  |
| --- | --- | --- | --- |
| **Octets: variable** | **1** | **2/6** | **1** |
| MHR fields | Command Frame Identifier | multicast address/unicast address | Peering Status |

**Figure 51—One-to-one peering response command format**

**5.3.2.1 MHR fields**

The Destination Addressing Mode field shall be set to indicate 2-byte multicast addressing and 6-byte unicast addressing. The Source Addressing Mode field shall be set to indicate 48-bit device addressing.

The Frame Pending field shall be set to zero and ignored upon reception, and the AR field shall be set to one.

The Destination Device ID field shall contain the value of *device ID*, while the Source Device ID field shall contain the PD’s own device ID. The Destination Address field shall contain the 2-byte multicast address and/or 6-byte unicast address of the PD requesting peering. The Source Address field shall contain the value of *48-bit Device Address*.

**5.3.2.3 Peering Status field**

Valid values of the Peering Status field are defined in Table 6.

|  |  |
| --- | --- |
| **Peering Status** | **Description** |
| 0x00 | Peering successful |
| 0x01 | Peering failed |
| 0x02 | Peering denied |
| 0x03-0x7f | Reserved |
| 0x80-0xff | Reserved for MAC primitive enumeration values |

**Table 6—Valid values of the Peering Status field**

**5.3.3 One-to-one Re-peering request command**

The one-to-one re-peering request command allows a PD to request re-peering with a previously peered PD.

This command shall only be sent by a PD that wishes to re-peer with a previously peered PD. A PD shall only re-peer with a previously peered PD through the one-to-one re-peering procedure.

All PDs shall be capable of transmitting and receiving this command.

The one-to-one re-peering request command shall be formatted as illustrated in Figure 52.

|  |  |  |
| --- | --- | --- |
| **Octets: variable** | **1** | **1** |
| MHR fields | Command Frame Identifier | Capability Information |

**Figure 52—One-to-one re-peering request command format**

**5.3.3.1 MHR fields**

The Source Addressing Mode field and the Destination Addressing Mode field shall be set to indicate 48-bit addressing.

The Frame Pending field shall be set to zero and ignored upon reception, and the AR field shall be set to one.

The Destination Device ID field shall contain the device ID of the PD to which to re-peer with. The Destination Address field shall contain the 2-byte multicast address and/or 6-byte unicast address of the PD to which the re-peering request command is being sent. The Source Device ID field shall contain PD’s own device ID. The Source Address field shall contain the value of *48-bit device address*.

**5.3.4 One-to-one re-peering response command**

The one-to-one re-peering response command allows a PD to communicate the results of a one-to-one re-peering attempt back to the PD requesting re-peering.

This command shall only be sent by a PD that receives a re-peering request, to a PD that is currently sending the re-peering request.

All PDs shall be capable of receiving this command.

The re-peering response command shall be formatted as illustrated in Figure 53.

|  |  |  |  |
| --- | --- | --- | --- |
| **Octets: variable** | **1** | **2/6** | **1** |
| MHR fields | Command Frame Identifier | multicast address/unicast address | Peering Status |

**Figure 53—One-to-one re-peering response command format**

**5.3.4.1 MHR fields**

The Destination Addressing Mode and Source Addressing Mode fields shall each be set to indicate 48-bit addressing.

The Frame Pending field shall be set to zero and ignored upon reception, and the AR field shall be set to one.

The Destination Device ID field shall contain the value of *device ID*, while the Source Device ID field shall contain the PD’s own device ID. The Destination Address field shall contain the 2-byte multicast address and/or 6-byte unicast address of the PD requesting re-peering. The Source Address field shall contain the value of *48-bit device address*.

**5.3.5 One-to-one de-peering request**

A peered PD may send the one-to-one de-peering request.

All PDs shall implement this command.

The one-to-one de-peering request shall be formatted as illustrated in Figure 54.

|  |  |  |
| --- | --- | --- |
| **Octets: variable** | **1** | **1** |
| MHR fields | Command Frame Identifier | De-peering reason |

**Figure 54—One-to-one de-peering request command format**

**5.3.5.1 MHR fields**

The Source Addressing Mode field shall be set to indicate 48-bit addressing.

The Frame Pending field shall be set to zero and ignored upon reception, and the AR field shall be set to one.

The Destination Device ID field shall contain the value of *device ID*, while the Source Device ID field shall contain the PD’s own device ID. If a PD wants a peered PD to be de-peered, then the Destination Address field shall contain the address of the PD being de-peered. If a peered PD wants to de-peer, then the Destination Address field shall contain the value of either *macCoordShortAddress*, if the Destination Addressing Mode field is equal to two, or *macCoordExtendedAddress*, if the Destination Addressing Mode field is equal to three. The Source Address field shall contain the value of *48-bit device address*.

**5.3.5.2 De-peering Reason field**

Valid values of the One-to-one De-peering Reason field are defined in Table 7.

**Table 7—Valid de-peering reason codes**

|  |  |
| --- | --- |
| **De-peering reason** | **Description** |
| 0x00 | Reserved |
| 0x01 | The PD is de-peered |
| 0x02 | The PD wishes to de-peer |
| 0x03-0x7f | Reserved |
| 0x80-0xff | Reserved for MAC primitive enumeration valves |

**5.3.6 One-to-one De-peering response command**

The one-to-one de-peering response command allows a PD to communicate the results of a one-to-one de-peering attempt back to the PD requesting de-peering.

This command shall only be sent by a PD that receives a de-peering request, to a PD that is currently sending the de-peering request.

All PDs shall be capable of receiving this command.

The de-peering response command shall be formatted as illustrated in Figure 55.

|  |  |  |  |
| --- | --- | --- | --- |
| **Octets: variable** | **1** | **2/6** | **1** |
| MHR fields | Command Frame Identifier | multicast address/unicast address | Peering Status |

**Figure 55—One-to-one de-peering response command format**

**5.3.6.1 MHR fields**

The Destination Addressing Mode and Source Addressing Mode fields shall each be set to indicate 48-bit addressing.

The Frame Pending field shall be set to zero and ignored upon reception, and the AR field shall be set to one.

The Destination Device ID field shall contain the value of *device ID*, while the Source Device ID field shall contain the PD’s own device ID. The Destination Address field shall contain the 2-byte multicast address and/or 6-byte unicast address of the PD requesting de-peering. The Source Address field shall contain the value of *48-bit device address*.