IEEE P802.11  
Wireless LANs

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| --- | --- | --- | --- | --- |
| Fixes to multi-band operations | | | | |
| Date: 2018-07-12 | | | | |
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Abstract

Among other things, this contribution fixes the OCT figure and primitives, which were correct in 802.11ad-2012, but were incorrectly modified in 11mc. There are no CIDs related to this contribution.

All the changes are related to 11md D1.2.

**Discussion**:

* Somewhere along the 11mc development, there were several erroneous changes to the OCT figure, name of primitives, and parameters compared to 802.11ad-2012. In this contribution, the proposal is to revert back to the original 802.11ad-2012 text.
* In addition, also propose:
  + Instead of keeping it implicit, to explicitly specify how to identify an MLME
  + That some fields in the Multi-band element are reserved if FST is not supported
  + To delete an outdated restriction on which types of primitives can be used with OCT
  + To allow passing the RXVECTOR in the OCTunnel.indication primitive. This will enable the NT-MLME to make an informed decision if/how to respond to received frames as, for example, is allowed by 11ai (e.g., based on RSSI)

**Proposed changes**:

**6.3.7.5.2 Semantics of the service primitive**

*Change the primitive as follows*

The primitive parameters are as follows:

MLME-ASSOCIATE.response(  
PeerSTAAddress,  
ResultCode,  
AssociationID,  
RCPI,  
RSNI,  
RMEnabledCapabilities,  
Content of FT Authentication elements,  
SupportedOperatingClasses,  
TimeoutInterval,  
BSSMaxIdlePeriod,  
TIMBroadcastResponse,  
QoSMapSet,

Multi-band local,  
Multi-band peer,  
FILSHLPContainer,(11ai)  
FILSIPAddressAssignment,(11ai)  
KeyDelivery,(11ai)  
S1G Sector Operation,(11ah)  
S1G Capabilities,(11ah)  
AID Response,(11ah)  
TSF Timer Accuracy,(11ah)  
TWT,(11ah)  
Sectorized Group ID List,(11ah)  
MaxAwayDuration,(11ah)  
S1GRelay,(11ah)  
S1GRelayActivation,(11ah)  
S1GOperation,(11ah)  
HeaderCompression,(11ah)  
SSTOperation,(11ah)  
CDMG Capabilities,(11aj)  
CMMG Capabilities,(11aj)

VendorSpecificInfo  
)

*In the table below the primitive, insert the following row above the Multiband peer parameter*

|  |  |  |  |
| --- | --- | --- | --- |
| Multi-band local | Multi-band element | As defined in 9.4.2.138 (Multi-band element) | Specifies the parameters within the Multi-band element that are supported by the local MAC entity. The parameter is present if dot11MultibandImplemented is true and is absent otherwise. |

**6.3.8.5.2 Semantics of the service primitive**

*Change the primitive as follows*

The primitive parameters are as follows:

MLME-REASSOCIATE.response(  
PeerSTAAddress,  
ResultCode,  
AssociationID,  
RCPI,  
RSNI,  
RMEnabledCapabilities,  
Content of FT Authentication elements,  
SupportedOperatingClasses,  
TimeoutInterval,  
BSSMaxIdlePeriod,  
TIMBroadcastResponse,  
FMSResponse,  
DMSResponse,  
QoSMapSet,

Multi-band local,  
Multi-band peer,  
FILSHLPContainer,(11ai)  
FILSIPAddressAssignment,(11ai)  
KeyDelivery,(11ai)  
S1G Sector Operation,(11ah)  
S1G Capabilities,(11ah)  
AID Response,(11ah)  
TSF Timer Accuracy,(11ah)  
TWT,(11ah)  
Sectorized Group ID List,(11ah)  
MaxAwayDuration,(11ah)  
S1GRelay,(11ah)  
S1GRelayActivation,(11ah)  
S1GOperation,(11ah)  
HeaderCompression,(11ah)  
SSTOperation,(11ah)  
CDMG Capabilities,(11aj)  
CMMG Capabilities,(11aj)

VendorSpecificInfo  
)

*In the table below the primitive, insert the following row above the Multiband peer parameter*

|  |  |  |  |
| --- | --- | --- | --- |
| Multi-band local | Multi-band element | As defined in 9.4.2.138 (Multi-band element) | Specifies the parameters within the Multi-band element that are supported by the local MAC entity. The parameter is present if dot11MultibandImplemented is true and is absent otherwise. |

**6.3.89.3.2 Semantics of the service primitive**

*Change the primitive as follows*

The primitive parameters are as follows:

MLME-OCTunnel.indication(

PeerSTAAddress,

OCT MMPDU,

Multi-band local,

Tunneled RXVECTOR

)

*Insert the following row in the table below the primitive*

|  |  |  |  |
| --- | --- | --- | --- |
| Tunneled RXVECTOR | RXVECTOR | As defined in 17.2.3 if the TR-MLME is part of a non-HT STA  As defined in 19.2.2 if the TR-MLME is part of an HT STA  As defined in 20.2.2 if the TR-MLME is part of a DMG STA  As defined in 21.2.2 if the TR-MLME is part of a VHT STA | Contains a copy of the RXVECTOR that the PHY passes to the MAC upon reception of the On-channel Tunnel Request frame. |

*Insert the following subclause*

**6.3.89.4 MLME-OCTunnel.confirm**

**6.3.89.4.1 Function**

This primitive reports the results of a request to transmit an On-channel Tunnel Request frame.

**6.3.89.4.2 Semantics of the service primitive**

The primitive parameters are as follows:

MLME-OCTunnel.confirm(

ResultCode

)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Valid range** | **Description** |
| ResultCode | Enumeration | SUCCESS, FAILURE | Indicates the result of the OCTunnel.request primitive |

**6.3.89.4.3 When generated**

This primitive is generated by the MLME as a result of an MLME-OCTunnel.request primitive to transmit an On-channel Tunnel Request frame.

**6.3.89.4.4 Effect of receipt**

The MLME is notified of the results of the frame transmission.

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**9.4.2.138 Multi-band element**

*Change the indicated paragraph as follows*

The FSTSessionTimeout field is used in the FST Setup Request frame to indicate the timeout value for FST session setup protocol as defined in 11.31.1 (General). The FSTSessionTimeout field contains the duration, in TUs, after which the FST setup is terminated. This field is reserved if the FST Not Supported subfield is 1.

**9.6.20.7 On-channel Tunnel Request frame format**

*Change the last paragraph as follows*

The Multi-band field contains the Multi-band element (see 9.4.2.138 (Multi-band element)) of the peer MLME to which the OCT MMPDU is destined to. The values of the Band ID, Channel Number and BSSID fields ~~channel, frequency band and MAC address~~ contained in this element are used to deliver the OCT MMPDU to the correct MLME within the peer STA.

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**11.31.4 On-channel Tunneling (OCT) operation**

*Delete the following bullet in the third paragraph*

* ~~Defines request, indication, response, and confirm primitives, or just request and indication  
  primitives.~~

*Insert the following paragraph after the third paragraph*

An NT-MLME is identified by the values of the Band ID, Channel Number and BSSID fields in a Multi-band element.

*Replace figure 11-48 with the following*



*Change the 8th paragraph as follows*

A TR-MLME receiving an MLME-OCTunnel.request primitive shall transmit an On-channel Tunnel Request frame addressed to the peer TR-MLME(s) and which includes the tunneled MMPDU. The peer TR-MLME(s) is identified by the PeerSTAAddress parameter of the MLME-OCTunnel.request primitive. Once the On-channel Tunnel Request frame is acknowledged or attempts to transmit the frame are abandoned, the TR-MLME shall issue an MLME-OCTunnel.confirm primitive, with the appropriate result code, to inform the NT-MLME of the frame transmission.

*Change the 10th paragraph as follows*

A NT-MLME receiving an MLME-OCTunnel.indication primitive shall

* As defined in this standard, process the OCT MMPDU parameter of the primitive as if the MMPDU had been received over the air, with the exception that an Ack frame, if any, shall not be sent as a response to the reception of the MMPDU.
* Generate an OCT MLME indication primitive, if one is defined, corresponding to the frame type of tunnelled MMPDU. This primitive is generated to the SME of the STA, which processes the MMPDU as defined in this standard.

*Change the first line of the 13th and 14th paragraphs as follows*

A NT-MLME receiving an OCT MLME response primitive, if one is defined, or generating a response by itself, if no OCT MLME response primitive is defined, shall

* As defined in this standard, process the response and construct an OCT MMPDU corresponding to the primitive in question. The NT-MLME shall not transmit any frame as a result of this primitive.
* Generate an MLME-OCTunnel.request primitive with parameters including the OCT MMPDU and the peer Multi-band element. The MLME-OCTunnel.request primitive shall be generated to the TR-MLME identified by the local Multi-band element which is contained within the OCT MMPDU

A TR-MLME receiving an MLME-OCTunnel.request primitive transmits an On-channel Tunnel Request frame addressed to the peer TR-MLME that includes the tunneled MMPDU. The peer TR-MLME(s) is identified by the PeerSTAAddress parameter of the MLME-OCTunnel.request primitive. Once the On-channel Tunnel Request frame is acknowledged or attempts to transmit the frame are abandoned, the TR-MLME issues an MLME-OCTunnel.confirm primitive, with the appropriate result code, to inform the NT-MLME of the frame transmission.