IEEE P802.11  
Wireless LANs

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| LB203 DLS/TDLS comment resolution for 8.6.13.3, 10.7 and 10.23 | | | | |
| Date: 2014-09-10 | | | | |
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Abstract

This submission proposes resolutions for following DLS/TDLS relevant comments in LB203 to P802.11ah Draft 2.0:

* 3739 (for 8.6.13.3)
* 3969 (for 10.7)
* 3966 (for 10.23)

Revisions:

* Rev 0: Initial version of the document.

### Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGah Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGah Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGah Editor: Editing instructions preceded by “TGah Editor” are instructions to the TGah editor to modify existing material in the TGah draft. As a result of adopting the changes, the TGah editor will execute the instructions rather than copy them to the TGah Draft.***

### Comments Resolutions

| **CID** | **Clause** | **Page** | **Line** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
| 3739 | 8.6.13.3 | 181 | 43 | From 11ac, TDLS setup allows two TDLS peer STAs to establish a TDLS link which is wider than BSS operation channel. This doesn't require off channel operation. Why does 11ah disallow this? | Add the related changes as 11ac. | Revised.  11ac added a VHT Operation element to the TDLS Setup Confirm Action field. It is necessary to add An S1G Operation element for S1G STA.  In addition, 11ac added an AID element to DLS / TDLS Request / Response and it is not present in S1G STA. Thus, it is necessary to change 8.6.4.2, 8.6.4.3, 8.6.13.2, and 8.6.13.3 to make the AID element present in S1G STA.  TGah editor to make changes shown in 11-14/ 1127r0 under the heading for CID 3739. |
| 3969 | 10.7 |  |  | As an S1G STA may support DLS, it is necessary to amend the subclause 10.7 (DLS operation) of P802.11mc D2.5. | Insert a following text as the 2nd paragraph of the subclause 10.7.1 (General);  ---  For an S1G STA, the same DLS operation is applied, with "HT STA" is replaced by "S1G STA" and "HT Capabilities" replaced by "S1G Capabilities" across the whole subclause 10.7 (DLS operation). | Revised-  Agree in principle.  However, it is better to change draft text directly.  TGah editor to make changes shown in 11-14/ 1127r0 under the heading for CID 3969. |
| 3966 | 10.23 |  |  | As an S1G STA may support TDLS, it is necessary to amend the subclause 10.23 (Tunneled direct-link setup) of P802.11mc D2.5.  Including amendments to support TDLS channel switching from/to the 1MHz bandwidth. | 1) Insert a following text as the 4th paragraph of the subclause 10.23.1 (General);  ---  For an S1G STA, the same TDLS setup procedure is applied, with "VHT" is replaced by "S1G" and "HT Operations" replaced by "S1G Operations" across the subclause 10.23.1 (General) to the subclause 10.23.5 (TDLS direct-link teardown).  2) Modify the subclause 10.23.6.4 (Setting up a wide bandwidth off-channel direct link) to support the S1G STA. Details are TBD. | Revised-  Agree in principle.  However, it is better to change the draft text directly.  In addition, it is necessary to replace “80 MHz” by “8 MHz” and “160 MHz” by “16 MHz”.  TGah editor to make changes shown in 11-14/1127r0 under the heading for CID 3966. |

**Proposed Remedy for CID 3739:**

* + - 1. **DLS Request frame format**

***TGah Editor: Insert the following text at the beginning of this subclause:***

***Change the following row in Table 8-285 as follows:***

Table 8-285—DLS Request frame Action field format

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 10 | AID | The AID element containing the AID of the STA sending the frame is present if dot11VHTOptionImplemented or dot11S1GOptionImplemented is true. |

* + - 1. **DLS Response frame format**

***TGah Editor: Insert the following text at the beginning of this subclause:***

***Change the following row in Table 8-286 as follows:***

Table 8-286—DLS Response frame Action field format

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 10 | AID | The AID element containing the AID of the STA sending the frame is present if dot11VHTOptionImplemented or dot11S1GOptionImplemented is true. |

* + - 1. **TDLS Setup Request Action field format**

***TGah Editor: Insert the following text at the beginning of this subclause:***

***Change the following row in Table 8-327 as follows:***

Table 8-327— Information for TDLS Setup Request Action field

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 19 | AID | The AID element containing the AID of the STA sending the frame is present if dot11VHTOptionImplemented or dot11S1GOptionImplemented is true. |

* + - 1. **TDLS Setup Response Action field format**

***TGah Editor: Insert the following text at the beginning of this subclause:***

***Change the following row in Table 8-328 as follows:***

Table 8-328— Information for TDLS Setup Response Action field

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 20 | AID | The AID element containing the AID of the STA sending the frame is present if dot11VHTOptionImplemented or dot11S1GOptionImplemented is true. |

***TGah Editor: Insert the following text as subclause 8.6.13.4:***

* + - 1. **TDLS Setup Confirm Action field format**

***Inseert a new row (ignoring the header row) in Table 8-329 as follows:***

Table 8-329— Information for TDLS Setup Confirm Action field

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 13 | S1G Operation | The S1G Operation element is present if dot11S1GOptionImplemented is true and the status code is 0 (Successful). The S1G Operation element is  defined in 8.4.2.170w (S1G Operation element). |

**Proposed Remedy for CID 3969:**

***TGah Editor: Insert the following text as subclause 10.7:***

### 10.7 DLS Operation

### 10.7.1 General

***Change the item a) of the sixth paragraph of the subclause as follows:***

1. A STA, STA-1, that intends to exchange frames directly with another non-AP STA and dot11DLSAllowed is true, STA-2, invokes DLS and sends a DLS Request frame to the AP (step 1a in Figure 10-24 (The four steps involved in direct-link handshake)). This request contains the rate set, capabilities of STA-1, and the MAC addresses of STA-1 and STA-2. If STA-1 is an HT STA, this request also contains the HT capabilities of STA-1. If STA-1 is an S1G STA, this request also contains the S1G capabilities of STA-1.

***Change the item c) of the sixth paragraph of the subclause as follows:***

1. If STA-2 has dot11DLSAllowed true and accepts the direct stream, it sends a DLS Response frame to the AP (step 2a in Figure 10-24 (The four steps involved in direct-link handshake)), which contains the rate set, (extended) capabilities of STA-2, and the MAC addresses of STA-1 and STA- 2. If STA-2 is an HT STA, this response also contains an HT Capabilities element representing the HT capabilities of STA-2. If STA-2 is an S1G STA, this response also contains an S1G Capabilities element representing the capabilities of STA-2.

### 10.7.3 Data transfer after setup

***Change the first paragraph of the subclause as follows:***

For each active direct link, a STA shall record the MAC and PHY features, rates, and MCSs that are supported by the other STA participating in the direct link, according to the Supported Rates, Extended Supported Rates, Capability Information, ~~and~~ HT Capabilities, and S1G Capabilities fields within the DLS Request and DLS Response frames that were used to establish the direct link.

**Proposed Remedy for CID 3966:**

***TGah Editor: Insert the following text as subclause 10.23:***

### 10.23 Tunneled direct-link setup

### 10.23.1 General

***Insert a following text after the eleventh paragraph of this subclause:***

An S1G STA with a TDLS link that is not an off-channel direct link shall use as its primary channel the channel indicated by the Primary Channel Number field in the S1G Operation element. The channel width of a S1G TDLS link shall not be wider than the maximum channel width supported by either the TDLS initiator STA or the TDLS responder STA.

An S1G STA shall not participate in a TDLS direct link with the same primary 8 MHz channel as the infrastructure BSS or another TDLS direct link of the STA but with a different secondary 8 MHz channel.

***Insert a following text as the last paragraph of this subclause:***

The S1G Operation element shall be present in a TDLS Setup Confirm frame for S1G STA.

### 10.23.6.4 Setting up a wide bandwidth off-channel direct link

### 10.23.6.4.1 General

***Change the following pragraphs in the subclause 10.23.6.4 .1 as follows:***

A wideband TDLS off-channel TDLS direct link is a 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz offchannel TDLS direct link for VHT STAs, or 2 MHz, 4 MHz, 8 MHz, or 16 MHz offchannel TDLS direct link for S1G STAs.

A wideband off-channel TDLS direct link may be started if both TDLS peer STAs indicated wideband support in the Supported Channel Width Set subfield of the VHT Capabilities element VHT Capabilities Info field or S1G Capabilities element in S1G Capabilities info field included in the TDLS Setup Request frame or the TDLS Setup Response frame.

Switching to a wideband off-channel direct link is achieved by including any of the following information in the TDLS Channel Switch Request frame:

* + An Operating Class element indicating 40 MHz Channel Spacing
  + A Secondary Channel Offset element indicating SCA or SCB
  + A Wide Bandwidth Channel Switch element indicating 80 MHz, 160 MHz, or 80+80 MHz channel width for VHT STAs
  + A Wide Bandwidth Channel Switch element indicating 2 MHz, 4 MHz, 8 MHz, or 16 MHz channel width for S1G STAs

For VHT STAs, t~~T~~he operating class in TDLS Channel Switch Request frame shall have a value representing 5 GHz for the channel starting frequency.

***Change the 6th pragraph in the subclause 10.23.6.4 .1 as follows:***

When announcing new operating classes or both a new operating class table index and new operating classes that come into effect at the same time as the switch to the direct link and that express new regulatory requirements, the TDLS peer VHT or S1G STA initiating the switch shall include a Country element in a transmitted TDLS Channel Switch Request frame. The Country element shall contain all the Operating Classes for the off-channel direct link in Operating Triplet fields and zero Subband Triplet fields. The Country element shall include one Operating Triplet field that contains the same Operating Class as the Operating Class field in the same frame. The country indicated by the Country string in the TDLS Channel Switch Request frame shall be equal to the country indicated by the Country string of the BSS. The recipient TDLS peer VHT or S1G STA that has dot11MultiDomainCapabilityActivated, dot11SpectrumManagementRequired, or dot11RadioMeasurementActivated equal to true shall use the parameters in the received Country element in the TDLS Channel Switch Request frame in order to maintain regulatory compliance.

### 10.23.6.4.2 Basic wideband functionality

***Insert the following pragraphs at the end of the subclause 10.23.6.4 .2 as follows:***

TDLS peer S1G STAs may transmit up to 2 MHz, 4 MHz, 8 MHz, or 16 MHz PPDUs on a 2 MHz, 4 MHz, 8 MHz, or 16 MHz direct link, respectively. A TDLS peer S1G STA shall not transmit a 2 MHz PPDU in the nonprimary channel of its 4MHz, 8 MHz or 16 MHz direct link.

A TDLS peer S1G STA shall not transmit a 4 MHz PPDU that does not use the primary 4 MHz channel of its 8 MHz or 16 MHz direct link. A TDLS peer S1G STA shall not transmit an 8 MHz PPDU that does not use the primary 8 MHz channel of its 16 MHz direct link.

### 10.23.6.4.3 Channel selection for a wideband off-channel direct link

***Change the first pragraph in the subclause 10.23.6.4 .3 as follows:***

If a TDLS peer STA chooses to start a wideband direct link, the TDLS peer STA shall follow the primary channel selection rules defined in 10.40.2 (Channel selection methods for a VHT BSS), 10.44c.2 (Channel selection methods for an S1G BSS) and 10.24.15 (Channel usage procedures) and the secondary 80 MHz / 8 MHz channel rule defined in 10.23.1 (General).

***Change the title of the subclauses 10.23.6.4.4 as follows:***

### 10.23.6.4.4 Switching from a wideband to a 20 MHz or 1 MHz direct link

***Change the first pragraph in the subclause 10.23.6.4 .4 as follows:***

Switching from a wideband off-channel direct link to a 20 MHz or 1 MHz off-channel direct link is established through a TDLS channel switch. A STA operating on a wideband off-channel direct link shall accept a requested switch to a 20 MHz or 1 MHz direct link.

***Change the title of the subclauses 10.23.6.4.5 as follows:***

### 10.23.6.4.5 CCA sensing and NAV assertion in a 20 MHz, 40 MHz, 80 MHz, 160 MHz, ~~or~~ 80+80 MHz, 2 MHz, 4 MHz, 8 MHz, or 16 MHz direct link

***Change the first pragraph in the subclause 10.23.6.4 .5 as follows:***

TDLS peer VHT or S1G STAs shall follow the CCA rules defined in 9.3.2.6 (VHT and S1G RTS procedure), 9.22.2.7 (Multiple frame transmission in an EDCA TXOP), and 9.22.3 (HCCA) and the NAV rules defined in 10.40.5 (NAV assertion in a VHT BSS) and 10.44c.5 (NAV and RID assertion in an S1G BSS).