IEEE P802.11  
Wireless LANs

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| Comment Resolution for Subclauses 9.32n.3 | | | | |
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Abstract

This document provides comment resolution for TGah Draft 0.1 Comment Collection 9 with these CIDs:

56, 57, 60, 261, 262, 263, 519, 705, 706, 707, 709, 710, 711, 712, 713,749, 750, 751, 981, 982, 983, 984.

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 “Instruction to 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.***

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| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **SC** | **Comment** | **Proposed Change** | **Resolution** |
| 56 | 160 | 9.32n.3 | The description in the draft does not specify where the relayed frame bit is located, e.g., acknowledgement procedure does not specify what type of ACK frames are used | Specify that the Relayed frame bit is located in the FC of the short mac header and NDP ACK frames as defined in clause 8. Describe protocol using these frames and specify that relayed frame bit is set to 0 unless otherwise specified throughout the section. | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |
| 57 | 160.58 | 9.32n.3.1 | Sentence is not correct. It should be " The relay STA shall transmit the received frame addressed to the AP with an ACK Indication field set to ACK, SIFS time after sending the NDP ACK frame to the non-AP STA." The response frame transmitted to the non-AP STA had not ACK, BA or CTS indication. Similar observation for sentence in page 161 line 8. Also in line 5 pg 161 non-AP STA should be AP STA. | as in comment. | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |
| 261 | 160.27 | 9.32n.3 | "The statement ""A Relay STA may set Relayed  Frame field to 1 only if the More Data field was set to 0 in the frame most recently received from the non-AP STA."" is not completely correct since Relay can also share TXOP from AP. And it's better to explain the conception of Relay sharing TXOP at the beginning of this sub-clause." | Delete "A Relay STA may set Relayed  Frame field to 1 only if the More Data field was set to 0 in the frame most recently received from the non-AP STA."  And insert following sentence at the beginning of this sub-clause:  "A Relay may share TXOP by setting Relayed Frame field to 1 only if the More Data field was set to 0 in the frame most recently received from the non-AP STA or AP" | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |
| 262 | 160.58 | 9.32n.3.1 | The first sentence of the paragraph is totally confusing. | "Change to ""The Relay STA shall transmit the received frame addressed to the AP SIFS after sending the response frame transmission that included an ACK Indication field value of ACK.Not ACK, BlockAck or CTS"", or  ""The Relay STA shall transmit the received frame addressed to the AP that included an ACK Indication field value of ACK, SIFS after sending the response frame transmission that included an ACK Indication field value of ACK""" | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |
| 263 | 161.9 | 9.32n.3.2 | The first sentence of the paragraph is totally confusing. | "Change to ""The Relay STA hall transmit the received frame addressed to the non-AP STA SIFS after sending the response frame transmission that included an ACK Indication field value of ACK.Not ACK, BlockAck or CTS"", or  ""The Relay STA shall transmit the received frame addressed to the non-AP STA that included an ACK Indication field value of ACK, SIFS after sending the response frame transmission that included an ACK Indication field value of ACK""" | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |
| 519 | 160.16 | 9.32n.3 | "(If Relay function is not removed)  TXOP sharing may cause hidden node problem. If a non-AP STA which is associated with a Relay AP inside a Relay is located outside the coverage of a Root AP, relayed frames may cause hidden node problem." | "If non-AP STA is located outside the coverage of a Root AP, TXOP sharing shall not be used.  TXOP sharing shall be enabled after a non-AP STA and a Relay AP inside a Relay have agreed to use it. The mechanism to negotiate availability of TXOP sharing is needed.  Details are TBD." | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |
| 518 | 158.56 | 9.32n.1 | Addressing and forwarding rules described in subclause 9.32n.1 and 9.32n.2 are applicable only to Regular frame format. As TXOP sharing assumes use of Short frame format, rules for Short frame format (use AID instead of MAC address) are needed. | Add support of Short frame format. | Revised –  It is considered in the text. Please look at Discussion for more detail. TGah editor to make changes shown in 11-13-0891-05-00ah |
| 749 | 160.51 | 9.32n.3.1 | Speed frame change using NDP frames is accepted in SFD and 2-bit ACK Indication is redefined. NDP ACK can be used for TXOP sharing for two-hop relay. Need to modify the text of 9.32n.3.1. | Change to "A non-AP STA starts a frame exchange by sending a frame addressed to the relay STA with ACK Indication field set to Normal Response or NDP Response and Aggregation field set to 0. The relay STA shall set the equivalent ACK Indication to Long Response if the response frame that is transmitted to the non-AP STA is NDP ACK. Otherwise, the relay STA shall set the ACK Indication field of the response frame that is transmitted to the non-AP STA to Long Response. " | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |
| 750 | 160.25 | 9.32n.3.1 | Need to consider NDP ACK as the response frame in TXOP sharing procedure | change "STA shall set the Relayed Frame field to 1 in the immediate ACK frame." to "STA shall set the Relayed Frame field to 1 in the immediate ACK frame or NDP ACK frame." | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |
| 751 | 160.30 | 9.32n.3.1 | Need to consider NDP ACK as the response frame in TXOP sharing procedure | change "A non-AP STA that receives the ACK frame that matches its address shall not initiate any further frame" to "A non-AP STA that receives the ACK frame that matches its address or the NDP ACK frame with a matching ACK ID shall not initiate any further frame" | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |
| 981 | 160.1 | 9.32n.3.1 | Speed frame change using NDP frames is accepted in SFD and 2-bit ACK Indication is redefined. NDP ACK can be used for TXOP sharing for two-hop relay. Need to modify the text of 9.32n.3.1. | Change to "When the direction of the frame is from the AP to the non-AP the AP STA starts a frame exchange by sending a frame addressed to the relay STA with ACK Indication field set to Normal Response or NDP Response and Aggregation field set to 0. The relay STA shall set the equivalent ACK Indication in the response frame that is transmitted to the AP STA to Long Response if the response frame is NDP ACK. Otherwise, the relay STA shall set the ACK Indication field of the response frame that is transmitted to the AP STA to Long Response." | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |
| 982 | 160.7 | 9.32n.3.1 | Speed frame change using NDP frames is accepted in SFD and 2-bit ACK Indication is redefined. NDP ACK can be used for TXOP sharing for two-hop relay. Need to modify the text of 9.32n.3.1. | Change to "The relay STA shall transmit the received frame addressed to the non-AP STA SIFS after sending the response frame transmission that included an ACK Indication field value of Normal Response or NDP Response and Aggregation field value of 0. Upon the successful receipt of the relayed frame, the non-AP STA shall set the ACK Indication field or the equivalent ACK Indication value in the response frame to No Response. " | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |
| 983 | 160.51 | 9.32n.3.1 | Speed frame change using NDP frames is accepted in SFD and 2  -bit ACK Indication is redefined. NDP ACK can be used for TXOP sharing for two-hop relay. Need to modify the text of 9.32n.3.1. | Change to "A non-AP STA starts a frame exchange by sending a frame addressed to the relay STA with ACK Indication field set to Normal Response to 0 or set to NDP Response and Aggregation field to 0. The relay STA shall set the equivalent ACK Indication to Long Response if the response frame that is transmitted to the non-AP STA is NDP ACK. Otherwise, the relay STA shall set the ACK Indication field of the response frame that is transmitted to the non-AP STA to Long Response. " | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |
| 984 | 160.57 | 9.32n.3.1 | Speed frame change using NDP frames is accepted in SFD and 2-bit ACK Indication is redefined. NDP ACK can be used for TXOP sharing for two-hop relay. Need to modify the text of 9.32n.3.1. | Change to "The relay STA shall transmit the received frame addressed to the AP SIFS after sending the response frame transmission that included an ACK Indication field value of Normal Response or NDP Response and Aggregation field value of 0. Upon the successful receipt of the relayed frame, the AP shall set the ACK Indication field or the equivalent ACK Indication value of the response frame to No Response. " | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |
| 516 | 158. 27 | 9.32n | "(If Relay function is not removed)  A Relay is defined as a logical entity that consists of a Relay AP and a Relay STA. With this definition, the Relay AP and the Relay STA in the Relay may use different primary channels. TXOP sharing and Implicit ACK will not work if Relay AP and Relay STA in the Relay use different primary channels." | "If the Relay AP and the Relay STA in the Relay use different primary channels. TXOP sharing and Implicit ACK shall not be used. The mechanism to negotiate availability of TXOP sharing and Implicit ACK is needed.  Details are TBD." | Revised –  TGah editor to make changes shown in 11-13-0891-05-00ah under the heading for CID 56, 57, … |

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| 705 | 160.00 | 9.32n.3 | The sentences below conflicts with each other: "When Relay STA uses the Explicit ACK procedure to acknowledge the reception of a valid frame, the Relay STA shall set the Relayed Frame field to 1 in the immediate ACK frame. A Relay STA may set Relayed Frame field to 1 only if the More Data field was set to 0 in the frame most recently received from the non-AP STA.A non-AP STA that receives the ACK frame that matches its address shall not initiate any further frame transmissions within the current TXOP."Line 24-28 implies that the More Data field in the frame sent from the source node will impact the Relayed Frame field setting in the ACK frame. However, lines 30-31 states that no matter how Relayed Frame field is set (0 or 1) in the ACK frame, the source node will not perform any SF exchange in the current TXOP. | Clarify whether the SF exchange is done under Relay operation. Clarify whether the Relayed Frame field setting (driven by More Data field setting) has any impact on SF exchange. | Revised-  TGah editor to make changes shown in 11-13-0891-05-00ah |
| 706 | 160.00 | 9.32n.3.1 | non AP STA sends information to the wrong entity : "addressed to the relay STA" | use "addressed to the relay AP" | Revised-  TGah editor to make changes shown in 11-13-0891-05-00ah |
| 707 | 160.00 | 9.32n.3.1 | response from the wrong entity to non AP STA: "The relay STA shall" | "The relay AP shall" | Revised-  TGah editor to make changes shown in 11-13-0891-05-00ah |
| 711 | 160.00 | 9.32n.3.1 | The description in the paragraph in line 50 page 160 is very confusing. Let's use the Relay structure diagram in Figure 4-23a on page 3 as a reference, the Non-AP STA is communicating with the Relay, or more specfically, the Relay AP in the Relay. However, the description in the paragraph in line 50 page 160 says Non-AP STA communicating wthe the relay STA. | Make the following changes:1) In the paragraph in line 50 page 160, change the two occurences of "relay STA" to "Relay".2) in line 57 page 160, change "relay STA" to "Relay".3). Line 7 page 161, change "Relay STA" to "Relay" | Revised-  TGah editor to make changes shown in 11-13-0891-05-00ah |
| 712 | 161.00 | 9.32n.3.1 | wrong entities used in text | when the direction of the frame is from the AP to the non-AP "STA", the AP starts a | Revised-  TGah editor to make changes shown in 11-13-0891-05-00ah |
| 713 | 161.00 | 9.32n.3.1 | wrong entities used in text | "The relay AP shall" | Revised-  TGah editor to make changes shown in 11-13-0891-05-00ah |
| 709 | 160.00 | 9.32n.3 | what are "S1G frames"?Searched entire 11ah/D0.1; only one occurrence in line 36 page 160, but no definition. | Provide clarification to "S1G frames" in line 36 page 160. | Revised-  TGah editor to make changes shown in 11-13-0891-05-00ah |
| 710 | 160.00 | 9.32n.3 | The sentence in line 34 page 160 needs clarification. How could "the choice" beceom optional? Does it mean a Relay may not make a choice? If so, does it mean no ack? | Change the sentence in line 34 page 160 to the following text:The Relay STA decides which acknowledgement procedure is used, Explicit ACK procedure or Implicit ACK procedure. | Revised-  TGah editor to make changes shown in 11-13-0891-05-00ah |

**Discussion**

TXOP sharing for Explict ACK and implicit ACK can be used only with Short Data frame, which includes a Relayed Frame subfield in Frame Control field.

The procedure of TXOP sharing was described in different terminology than the general description of the Relay operation. So, a Relay STA shall be changed to either a Relay AP or a Relay STA. Also, ACK Indication was changed to the Response Indication. Accordingly, the procedure of TXOP sharing shall be updated.

* **Procedures TXOP sharing**

A non-S1G STA shall not perform TXOP sharing as described in this subclause.

[CID 516]

A Relay entity shall not perform TXOP sharing if the Relay STA and Relay AP are operating in different primary channels for the duration of the TXOP.

The sequence of frames exchanged over the first hop and second hop depends on the acknowledgement procedure used ~~at~~ by the Relay. ~~Frames~~A Relay can use either:

* Explicit ACK procedure
* Implicit ACK procedure

[CID 56]

When a Relay (Relay STA or Relay AP) receives a valid Short Data frame with the Relayed Frame field in the Frame Control field set to 1, the Relay may acknowledge the received Short Data frame using the Implicit or Explicit ACK procedure.

A Relay shall not acknowledge the received valid Short Data frame using either Implicit or Explicit ACK procedure if the Relayed Frame field in the Frame Confrol field is set to 0 in the received short Data frame. ~~When a Relay receives a valid frame with Relayed Frame field set to 1, Relay shall not acknowledge the received frame using the Implicit ACK procedure.~~

~~When Relay STA receives a valid frame with Relayed Frame field set to 0, Relay STA shall not acknowledge the received frame using the Implicit ACK procedure.~~

~~When Relay STA uses the Explicit ACK procedure to acknowledge the reception of a valid frame, the Relay~~

~~STA shall set the Relayed Frame field to 1 in the immediate ACK frame. A Relay STA may set Relayed~~

~~Frame field to 1 only if the More Data field was set to 0 in the frame most recently received from the non-AP~~

~~STA.~~

[CID 751, 261]

~~A non-AP STA that receives the ACK frame that matches its address shall not initiate any further frame~~

~~transmissions within the current TXOP.~~

~~The choice of acknowledgement procedure is optional to the Relay STA.~~

~~The operation of TXOP sharing is supported only for S1G frames.~~

NOTE- The frames transmitted over the first hop and second hop can be sent at two different MCSs.

* **Explicit ACK procedure**

**Instruction to Editor: *Please make the following changes in subclause 9.32n.1:***

[CID 749, 983, 750, 981, 57]

~~A non-AP STA is the source of the frame to be relayed when the direction of the frame is from the non-AP~~

~~STA to the AP.~~

~~An AP is the final destination of the frame to be relayed when the direction of the frame is from the non-AP STA to the AP.~~

A non-AP STA (AP) starts a frame exchange by sending a Short Data frame addressed to the Relay AP (Relay STA) by setting the Relayed frame field set to 1.

The Relay ~~STA~~AP (Relay STA), that intends to use Explicit ACK procedure, shall set the Duration Indication field to 1 and Duration field to 0 in ~~ACK Indication field of~~ the NDP ACK ~~response~~ frame that is transmitted to the non-AP STA (AP) to indicate Long Response ~~to Not ACK, BlockAck or CTS,~~. In addition it~~and~~ shall set the Relayed Frame field of the ~~response~~ the NDP ACK frame ~~that is transmitted to the non-AP STA~~ to 1. Otherwise, it shall set the Duration Indication field to 0 and the Duration field to 0 in the NDP ACK to indicate No Response and the Relayed Frame field to 0.

[CID 984, 262, 263, 57]

The Relay STA (Relay AP), that uses Explicit ACK procedure, shall forward to the AP ~~transmit~~ the previously received Short Data frame ~~addressed to the AP~~ SIFS time after the Relay AP send~~ing~~s the ~~response~~ NDP ACK frame to the non-AP STA (AP). ~~transmission that included an ACK Indication field value of ACK.~~ Upon ~~the~~ successful receipt of the relayed Short Data frame, the AP (non-AP STA) shall transmit an NDP ACK frame to the Relay STA (Relay AP), which shall have both the Duration Indication field and the Duration field set to 0 to indicate ~~set the ACK Indication field of the response frame to~~ No ~~ACK~~Response.

~~When the direction of the frame is from the AP to the non-AP, the AP STA starts a frame exchange by~~

~~sending a frame addressed to the relay STA with ACK Indication field set to ACK. The relay STA shall set~~

~~the ACK Indication field of the response frame that is transmitted to the AP STA to Not ACK, BlockAck or~~

~~CTS, and shall set the Relayed Frame field of the response frame that is transmitted to the non-AP STA to 1.~~

~~The Relay STA shall transmit the received frame addressed to the non-AP STA SIFS after sending the~~

~~response frame transmission that included an ACK Indication field value of ACK. Upon the successful~~

~~receipt of the relayed frame, the non-AP STA shall set the ACK Indication field of the response frame to No~~

~~ACK.~~

The AP uses a new TXOP for a new frame transmission.

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| **CID** | **P.L** | **SC** | **Comment** | **Proposed Change** | **Resolution** |
| 60 | 160 | 9.32n.3 | Add a capability indication for the TXOP sharing operation for relays | As in comment. | Revised –  TGah editor to make changes shown in 11-13-0891-00-00ah under the heading for CID 60 |

* **Procedures TXOP sharing**

**Instruction to Editor: *Please add the following paragraphs at the beginning of this subclause:***

A S1G STA indicates support of Implicit ACK in TXOP Sharing feature using the TXOP Sharing Implicit ACK Support subfield of the S1G Capabilities Info field in the S1G Capabilities element. A S1G STA shall set the TXOP Sharing Implicit ACK Support subfield to 1 in frames that it transmits containing the S1G Capabilities element if the dot11TXOPSharingImplicitACKSupportImplemented is true. Otherwise, the S1G STA shall set the TXOP Sharing Implicit ACK Support subfield to 0.

A S1G STA that does not support TXOP Sharing procedures as described in this subclause shall set the Relayed Frame field in the Frame Control field of Short Data frames and in NDP ACK frames to 0 unless the NDP ACK frame is used for flow control as described in 9.32n.3.3.

* **S1G Capabilities info field**

**Instruction to Editor: *Please change the following subclause as follows:***

The structure of the S1G Capabilities Info field is defined in Figure 8-401dg (S1G Capabilities Info field).

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|  | B0 | B1 | B2 | B3 | B4 | B5 | B6 B7 | B8 |
|  | Uplink  Synch  Capable | Dynamic  AID | BAT  Support | TIM ADE  Support | Non-TIM  Support | TWT  Support | STA  Type  Support | TXOP Sharing Implicit ACK Support |
| Bits: | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| **S1G Capabilities Info field** | | | | | | | | |

The subfields of the S1G Capabilities Info field are defined in Table 8-191d (Subfields of the S1G Capabilities Info field).

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| * **Subfields of the S1G Capabilities Info field** | | |
| Subfield | Definition | Encoding |
| … |  |  |
| TXOP Sharing Implicit ACK Support | This bit indicates support of TXOP Sharing | Set to 1 if dot11TXOPSharingImplicitACKSupport is true.  Set to 0 otherwise. |