IEEE P802.11  
Wireless LANs

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| D0.1 Comment Resolution – CIDs on RTS/CTS | | | | |
| Date: 2011-04-08 | | | | |
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##### Baseline is 11ac D0.3 document.

##### This document proposes resolution for the following CIDs:

##### COEX: 6, 7, 713, 714, 715, 716, 717, 719, 777, 1052, 1533.

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| 7 | Aboul-Magd, Osama | 9.2.ob.7 | 45 | 64-65 | TR | the statement "non-primary channels indicated by the RTS frame", I am not sure in which part of the RTS frame this information is carried. Is their a new RTS format that is mission from the draft? | Clarify | COEX |

**Proposed resolution:** Disagree. A new format for RTS has been defined in 11ac amendment where in the scrambler seed the requested bandwidth and dynamic/static capability are indicated.

**Discussion:** A new format for RTS has been defined in 11ac amendment where in the scrambler seed the requested bandwidth and dynamic/static capability are indicated. The details of these formats are defined in clauses 8.3.2.1 and 17.3. With RTS carrying such information, and considering the unique definition of 20MHz, 40MHz, 80 MHz transmission, once primary-20MHz channel is known, it becomes clear what non-primary channels is used by RTS.

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| 713 | Kneckt, Jarkko | 9.2.0b.7 | 46 | 4 | TR | Why the CCA measurement in CTS frame transmission is not performed at the primary channel?  The CCA measurement is performed a PIFS before RTS transmission, so it could be busy. Also the busy channel is not setting the NAV, rather AIFS delay is used after the busy period.  Is the assumption that the RTS frame cannot be received if the channel quality is too poor and no other protection is needed for the primary channel? | Please clarify. | COEX |

**Proposed resolution:** Disagree. The RTS/CTS frame exchange stated here and the assessment of RTS receiver based on primary channel is based on the same principle stated throughout 802.11 history. In this regard, no additional clarification is needed.

##### Discussion: In the history of 802.11, the RTS/CTS exchange has been based on assessment of clear channel by an RTS sender and as long as RTS receiver decode RTS successfully it can assume clear primary channel and within SIFS to transmit CTS. This means that CTS sender assumes implicitly that the channel is available. In fact if the channel were busy at the RTS receiver side, very likely it would not been able to decode RTS at the first place.

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| 1533 | SOHN, ILLSOO | 9.2.0b.7 | 46 | 9 | TR | The behavior of STA for CTS  over non-primary channels is described as "may". However, this makes the behavior ambiguous. | Change "may" to "should". | COEX |

**Proposed resolution:** Disagree. It is up to the RTS receiver whether to respond with CTS on non-primary channels depending on its capabilities.

##### Discussion: Sending CTS on non-primary channels depends on other capabilities of RTS receiver as well and that’s why it is up to RTS receiver whether to respond on other non-primary channels.

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| 777 | Liu, Yong | 9.2.0b.7 | 46 | 10 | TR | Clarify that the channels used to transmit CTS shall be a valid channel combination | as comment | COEX |

**Proposed resolution:** Counter. Section 10.24.1 in D0.3 defines that all transmissions, including CTS, shall use a valid channel combination. To clarify further the proposed resolution is to clarify that some or all of the non-primary channels are used.

**9.3.2.7 CTS procedure**

If the DYN\_BANDWIDTH\_IN\_NON\_HT RXVECTOR parameter for a RTS frame is valid and set to Dynamic, the VHT STA that is addressed by the RTS frame shall respond with a CTS frame over the primary channel and may respond with a CTS frame only over some or all the non-primary channels that are specified in the CH\_BANDWIDTH\_IN\_NON\_HT RXVECTOR parameter for the RTS frame and have been indicated idle in the PHY-CCA.indication primitive during an interval of PIFS before the RTS frame is received.

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| 1052 | Seok, Yongho | 9.2.0b.7 | 46 | 6~11 | TR | When INDICATED\_DYN\_BANDWIDTH RXVECTOR is set to Dynamic, it is not clear whether a CTS frame is non-HT or non-HT duplicate. | Clarify the transmitted form of a CTS frame considering tx BW. | COEX |

**Proposed resolution:** Disagree. The section 9.7.5.1 (baseline) and 9.7.5.6 defines the format and channel bandwidth used by control response frames such as the CTS frame.

##### Discussion: Depending on CTS sender capability and whether it transmits on primary only or on other non-primary channels (which have met the listed conditions), the CTS frame is non-HT or non-HT duplicated.

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| 714 | | Kneckt, Jarkko | | 9.2.0b.7 | | 46 | | 14 | | TR | | How the saved TXOP holder is maintained, if during the NAV a other frame that has TA or RA not set to TXOPholder. Is the saved TXOPholder updated, or is the STA maintaining the same TXOP holder for the NAV duration? | | Please clarify. | | COEX | |
| 715 | | Kneckt, Jarkko | | 9.2.0b.7 | | 46 | | 14 | | TR | | What happens if a STA receives a frame that extends the NAV duraiton from the saved TXOP holder? Is the saved TXOP holder maintained and just the duration of the NAV extended? | | Please clarify. | | COEX |

**Proposed resolution:** Disagree. Please refer to the 802.11 base standard for clarification.

##### Discussion: The TXOP holder and NAV duration are updated every time when a STA receives a packet that indicates a longer NAV than its current NAV. This is the essence of the design.

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| 719 | Kneckt, Jarkko | 9.2.0b.7 | 46 | 14 | TR | Is there any restriction how many RTS messages may be transmitted within a TXOP? | Please clarify and justify. | COEX |

**Proposed resolution:** Disagree.This paragraph only describes the actions that a STA needs to perform when receiving RTS from stations other than the TXOP holder. The 11ac amendment is silent in this regard and does not intend to change what the baseline draft defines.

**Discussion:** Above referenced paragraph only specifies the action that a STA needs to take when an RTS is received which does not belong to the TXOP holder. It does not limits the number of RTS sent by the TXOP holder during a TXOP. The 11ac amendment is silent in this regard and does not intend to change what the baseline draft defines.

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| 716 | Kneckt, Jarkko | 9.2.0b.7 | 46 | 14 | TR | When Reverse Direction Grant is used, is he saved TXOP holder updated when the reverse direction TXOP is taken into use? | Please clarify. | COEX |

**Proposed resolution:** Disagree. The 11ac amendment does not intend to change actions that a STA that receives RDG need to take. Hence no change or clarification is required.

##### Discussion: Above comment is regarding behaviour that a STA has during RDG which TGac does not intend to change. The behaviour and actions of a STA receiving RDG does not change compared to what has been stated in the latest REVmb release.

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| 717 | Kneckt, Jarkko | 9.2.0b.7 | 46 | 14 | TR | Does the saved TXOP holder have to be from the same BSS? May any TXOP holder be the saved TXOP holder? | Please clarify | COEX |

**Proposed resolution:** Disagree. Please refer to the 802.11 base standard for clarification.

##### Discussion: Above comment is regarding general behaviour of an 802.11 STA in updating its NAV and updating TXOP holder. The 11ac amendment does not intend to change the behaviour and decisions that a VHT STA perform in these situations compared to legacy devices.

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| 6 | Aboul-Magd, Osama | 7.2.0b.7 | 46 | 1-3 | TR | How a STA can anticipate the reception of an RTS and check that all non-primary channel ate IDLE for a period of PIFS in advance? This rule seems to be non-implementable, or at least difficult to implement. | discuss | COEX |

**Proposed resolution:** Disagree. The discussion here is mostly implementation-related and it is outside of the purpose of the 11ac amendment to discuss such details (although the feasibility of such implementations have been discussed in 07/3001r2, 10/0012r0, 10/0744r1). Therefore no change or discussion is required.

**Discussion:**One potential implementation is that the RTS receiver evaluates all non-primary channels continuously and stores the CCA state upon packet reception. However, a receiver can devise more simple and efficient algorithms for early-packet or mid-packet detection for non-primary channels. Please see algorithms and discussions on early- and mid-packet detection in 07/3001r2, 10/0012r0, 10/0744r1.