IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Minutes of the IEEE 802.11ax Spatial Reuse ad hoc group meeting – Dallas, November 2015 | | | | |
| Date: 2015-09-18 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Laurent Cariou | Intel | 2111 NE 21st avenue, hilsboro, USA | 5033294020 | laurent.cariou@intel.com |
| Guido R. Hiertz | Ericsson | Ericsson Allee 1 52314 Herzogenrath Germany | +49-2407-575-5575 | hiertz@ieee.org |
| Jae Seung Lee | ETRI | 161 Gajeong-dong, Yuseong-gu, Daejeon, Korea | +82-42-860-1326 | jasonlee@etri.re.kr |

Abstract

This document contains the minutes of the November 2015 meeting of the IEEE 802.11ax Spatial Reuse ad hoc group held in Dallas.

**PM1 - Tuesday 13:30 November 10, 2015**

PM1 Session was chaired by Guido Hiertz (Ericsson).

Chair called the meeting to order at 13:30.

Chair went through the agenda.

Chair reviewed agenda, asked for objection. None noted.

There were 82 attendees including 3 co-chairmen during PM1 SR ad hoc session (checked at 14:40)

**15/1348r0, Multiple NAVs for spatial reuse**

Presenter: Sigurd Schelstraete (Quantenna)

Sigurd reviewed document 15/1069r1

Comment: Need to consider complexity for the gain of multiple OBSS NAVs

Response: slide 5 shows the benefits with 2 OBSSs

Question: Complexity on the STA side

Response: Ways to reduce complexity in the presentation. But complexity is not a worry for such a feature.

Question: Another presentation on this topic. Not so easy to draw the line between intra-BSS and inter-BSS. And not sure we need more than 2 NAVs.

Question: Simpler solution is possible. Especially as it is a corner case (piggy in the middle)

Question: once we have SR, shouldn’t we not use NAV at all, to desynchronize the different BSSs.

Response: depends also on the level of RSSI from the received OBSS packet. You may ignore the NAV or respect the NAV

Straw Poll 1 –

* **Do you agree to add the following text in SFD:** 
  + An HE STA should have a mechanism to remember and distinguish NAVs set by intra-BSS frame and OBSS frame. A CF-end frame that comes from intra-BSS (OBSS) should not reset NAV that was set by a frame from OBSS (intra-BSS). To determine which BSS is the origin of a frame, the HE STA may use BSS color.

Question: can we delay strawpoll 1 after another presentation.

* 1. Yes: 30
  2. No: 0
  3. Abstain 14

-🡪 passes

Propose to rewrite the text of the motion.

Strawpoll 2

* **Do you agree to add the following text in SFD:**
* An HE STA should have a mechanism to remember and distinguish NAV values set by frames from different BSSs. A CF-end frame that comes from one BSS should not reset NAV that was set by a frame from another BSS. To determine which BSS is the origin of a frame, the HE STA may use BSS color.

Clarification: this contains the other strawpoll

* 1. Yes: 12
  2. No: 16
  3. Abstain: 18

-🡪 fails

**15/1259r1, Use of TG ax Scenarios for Spatial Reuse**

Presenter: Graham Smith (SR Technologies)

Comment: missing point is the presence of mobile AP

Comment: depending on the load, fixed bandwidth can be dynamicly changed

Straw Poll 1 –

* **Do you agree that when evaluating Spatial Reuse technologies the channel allocations should be allowed to be varied along the lines indicated in this document, rather than only use the fixed assignments as specified in the Simulation Document?**
  + Yes: 20
  + No: 0
  + Abstain: 30

**15/1284r0, Simulation results for spatial reuse in 11ax**

Presenter: Jinmin Kim(LG)

Question: can you explain the choice of your CCA levels?

Question: how would that behave when there are more traffic in UL?

**15/1316r3, DSC calibration results with NS-3**

Presenter: Eduard Garcia-Villegas (UPC)

Question: do you reduce by 5dB?

Response: somehow (for the effect of shadowing).

**15/1336r1, BSS Color Field Size Measurements**

Presenter: Chuck Lukaszewski (Aruba, a HP Enterprise Company)

Question: in a managed network, how to assign colors?

Response: in a managed environment, the colors would be assigned intelligently. Overlapping collision domain

Question: problem of cooperation between management systems in the same place

Response: signalling between APs, or threshold above which we can reuse the colors could be defined

Question: if it’s managed, there could be ways to deal with that.

Question: wonder about the complexity of dealing with such a high number of BSS colors.

Strawpoll

* **Do you support to assign 8 bits for BSS Color?**
  + Yes: 11
  + No: 16
  + Abstain: 28

**PM1 - Wednesday 13:30 November 11, 2015 – Plenary Meeting**

PM1 Session was chaired by Guido (Ericsson).

Chair called the meeting to order at 13:32.

Chair called for potentially essential patent claims. There was no response.

There was a problem with the microphones so that our voice was heard in the neighboring room. Thus, we were in recess from around 13:33 until 13:37.

Chair went through the agenda.

Chair reviewed agenda, asked for objection. None noted.

There were 81 attendees including 2 co-chairmen during PM1 SR ad hoc session (checked at 14:25)

**15/1313r1, Considerations for Spatial Reuse**

Presented by Reza Hedayat (Newracom)

Reza reviewed document 15/1313r1

Graham: You are just looking at two overlapping BSS. No STA in the middle concept. You talk about fixed CCA or threshold levels.

Reza: There is some misunderstainding. This is not opposing DSC. This SR topic is from different angle.

Reza: RSSI and CCA are used to determine wheter medium is idle. Victim is always the recipient of the frame. This does not contradict with the previous work.

Graham: You listen to every traffic and remember everyone’s MAC and signal level.

Answer: You just listen to one frame and the response frame. Current CCA is based on the RSSI of one frame, but this proposal is based on the RSSI of the frame and the response frame.

**Straw Poll (amended)**

* Do you agree that the following be added to 11ax SFD?

**Add to the end of**

**“5.1: Features for operation in dense environments**

The specification to consider a procedure that may revise the NAV depending on TBD conditions at the recipient of the ongoing OBSS frame.”

**The following:**

* *A STA that receives an OBSS RTS frame and its CTS response frame may avoid updating the NAV if the measured RSSI of the RTS and CTS frames are less than TBD threshold values or additional conditions are met.*

Y: 13

N: 11

A: 30

George: Have you considered RTS/CTS reporting SNR?

Reza: That might be valuable. This is just one solution. If you propose something, than I would be happy to work with you.

Simone: Genenral idea is reasonable. Question on the specific criteria. It also depends on the TX power of RTS/CTS frame.

Reza: That should be addressed. This proposal does not contributing any further.

Simone: Suggest to make the straw poll more generic.

**15/1337r1 Secondary Channel CCA of HE STA**

Presented by John Son (WILUS)

John reviewed document 15/1337r1

**Straw Poll 1**

* Do you agree to add the following text into 11ax SFD ?
* **5.x HE STA shall have the same Energy Detection capability as VHT STA in secondary channels.**
  + Y/N/A

Y: 16

N: 15

A: 33

Graham: Question on “shall”

John: Since we have additional PPDU detection of legacy and HE PPDU, we should fix the Energy Detection threshold.

Simone: Specs are defining new ways to deal with set of rules.

John: This is only related to Energy Detection, not related to OBSS PD related things since they detect PPDU. This is detecting any signal.

YoungHoon: We have not decided anything on ED, even in the primary channel. Is it reasonable to discuss ED in the secondary channel?

**Straw Poll 2**

* Do you agree to add the following text into 11ax SFD ?
* **5.x HE STA shall detect Legacy PPDU in secondary channels at or above TBD thresholds within PIFS before transmission.**
  + Note: Legacy PPDU is NON\_HT, HT\_MF, HT\_GF or VHT PPDU.
  + Y/N/A

Y: 10

N: 11

A: 35

Matt: Listen before transmission, does it include control response transmission?

John: It does not cover control response frame.

Matt: TBD is not saying anything. In the baseline, this is what we do.

Passing the straw poll does not do anything.

John: We need more discussion on the threshold. Legacy detection is not decided in the HE STA.

George: There are new scenarios that are being added. MU case, and OBSS PD threshold. We need to understand those features first. Too early to run the straw poll.

Straw Poll 3 was not run.

**1338r1 Improving Spatial Reuse During OBSS UL MU Procedure**

Presented by Geonjung (WILUS)

Geonjung reviewed document 15/1338r1

**Strw Poll**

* Do you agree to add the following text into sub-clause 5.1 in 11ax SFD ?

**To the end of**

**“5.1 Features for operation in dense environments**

The specification to consider a procedure that may revise the NAV depending on TBD conditions at the recipient of the ongoing OBSS frame.”

**add the following:**

* + OBSS UL MU PPDU is detected and RSSI of the frame that triggered the UL MU PPDU was below OBSS PD level.
  + Y: 9
  + N: 10
  + A: 29

Simone: The same comments as the previous comment.

Matt: You drop the NAV not based on the receiver’s location but on the transmitter’s location.

John: MU is differentiated from other types of sequences.

**1427r0 Drivers of the dynamic CCA adaptation**

Presented by Eduard (UPC)

Eduard reviewed document 15/1427r0

Graham: Question on the 15dB capture threshold.

Eduard: I am referencing the reference [5]. 15 dB is for fast modulation.

Guido: Did you use one of the TGax scenario?

Eduard: Yes.TGax Residential building scenario.

The chairman adjourned the meeting at 15:25.