IEEE P802.11  
Wireless LANs

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| Minutes of the Nov 2019 meeting of the IEEE 802.11be MAC ad hoc group | | | | |
| Date: 2019-11-11 | | | | |
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Abstract

Meeting minutes of the IEEE 802.11be MAC ad hoc group

**11/11/2019 – AM1 session**

Chairman: Jeongki Kim

Secretary: Liwen Chu

At 08:00am the chairman calls the meeting to order.

The Chairman informs the ad hoc group about the IEEE patent policy.

The chairman calls for essential patents. Nobody speaks up.

The chairman asks for approval of the meeting agenda in 11-19/2001r0.

Q: if the deferred Straw polls can’t be finished in this session, what should be done the unfinished straw polls?

A: complete all the backlogged documents, then continues with the new submissions

The agenda is approved by unanimous consent.

1. **11-19/0773r7 “Multi-link Operation Framework” (Po-kai Huang)**

Straw Poll 4: Do you support that a multi-link logical entity can indicate capability to support exchanging frames simultaneously on a set of affiliated STAs?

C: Multi-link logical entity is not agreed, it should be first agreed of multi-link logical entity.

A: multiple contributions have entity concept. It is not good to delay the straw polls per undefined multi-link logical entity.

C: what is the meaning of exchange: exchange is between two logical entity, exchange is between STAs afflicicated with multi-link entity.

A: announce the capability indication.

C: clarify the straw poll to add to another multi-link logical entity at the end of straw poll.

A: agree to add the text.

C: add the note that the name of multi-link logical entity can be changed.

A: agree to add the note.

C: which one is preferred: do frame work discussion first then do the other straw polls or add the note for each straw poll?

A: the group agreed to change the agenda to discuss the framework first.

1. **11-19/1855r0 “802.1AX Overview” (Osama Aboul-Magd)**

The document is about 802.1ax overview. No specific 11be architecture is proposed. Recommend to use as many of 802.1ax compoents for modelling 802.11be multi-link related work.

C: .1ax can be used since it for ethernet. Define entity to present to DS. It seems there is no conflict with multi-link entity.

A: generally agreed. Just to make to reuse .1ax as many as possible.

C: gree to reuse the existing one. However we should look at what we want to achieve: throughput, latency. .1ax archetexture assumes that BA is in MAC of each STA. But we may want some BA functionality to be in higher layer MAC of multiple STAs.

A: 802.11 defines many higher layer MAC e.g. HCCA, mesh.

C: .1ax allows one link 802.11 and another link ethernet.

A: propose to reuse .1ax as many as possible.

C: for packet level operation, we need to change both lower MAC and higher MAC.

A: this presentation is just for discussion.

C: more links may have different IP interfaces which is not covered by .1ax.

Straw Poll: Do you agree to make use of relevant 802.1AX components for 11be MLA discussion**?**

C: not clear about .1ax components. Look detail before agreeing the straw poll.

A: the straw poll just talks about .1ax.

C: similar comment. Not clear about relevant 802.1AX components.

A: not take .1ax as it is. Just look at whether and which .1ax components are relavent to .11be.

C: the straw poll assume that we have to aware of what .1ax is done. Shouldn’t do anything before knowing .1ax.

A:

C: two more presentations about architecture.

C: the straw poll is useful. Some components can be resued.

C: replace components with concepts.

A: agreed to change to straw poll to “Do you agree to make use of relevant 802.1AX concepts for 11be MLA discussion”.

Straw Poll result:

Y:22 N:1 A: many.

C: ask Ming to present the related documents and make progress.

A: the group agree to change the agenda to present 11-19/1940

1. **11-19/1940r1 “Multi-link Framework” (Ming Gang)**

Claim that One STA does not belong to multi-link, Try to reuse the existing architectures, do not touch any related operation.

C: slide 8, comment about transparent option. The difference with multi-lin entity: 1, more than one 2, name.

A: agreed.

C: question about more than one. One STA can’t switch between links?

A: it can operate in multiple bands at same time.

C: two carification questions: one MAC one MAC SAP. Do you allow two MAC addresses as AP side.?

A: we don’t touch address issue. Open to discuss.

C: one SAP MAC address (to LLC), multiple link MAC addresses are possible. Differentiate SAP address and link address.

A: open to further discussion.

C: Do you allow multiple-link dvice to have one working link.

A: we can discuss further ofr this case. But for definition we want to idisallow single link device to be named as multiple link device.

C: non-transparent case.

A: to the uplayer have multiple MAC addresses.

C: MAC address usage should belong to architecture.

A: depend on the architecture definition.

C: what is tunable single band STA.

A: for product, these two types of devices exist.

C: there may be some single link STA to have some functionality of multi-link device.

C: expct to have single link STA to be multi-link device for enhancement.

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1. **11-19/0773r7 “Multi-link Operation Framework” (Po-kai Huang)**

Straw Poll 4: Do you support that a multi-link logical entity\* can indicate capability to support exchanging frames simultaneously on a set of affiliated STAs to another multi-link logical entity\*?

NOTE\* – the name and definition of terminology is TBD

Straw Poll result:

Y:32, N: 4, A: 29

Chair asks if there are any other business. No requests.

The meeting is adjurn.

**11/11/2019 – Evening session**

Chairman: Jeongki Kim

Secretary: Liwen Chu

At 07:30pm the chairman calls the meeting to order.

The Chairman informs the ad hoc group about the IEEE patent policy.

The chairman calls for essential patents. Nobody speaks up.

The chairman asks for approval of the meeting agenda in 11-19/2001r1.

c: propose to continue with the architecture straw polls?

A: No objection to it.

The agenda is approved by unanimous consent.

1. **11-19/0822r6 “Extremely Efficient Multi-band Operation” (Po-kai Huang)**

Straw Poll 1:

* **Do you support to add the followings to the 11be SFD :**
  + **Multi-link device (MLD):** A device that has more than one affiliated STA and has one MAC data service to the LLC
  + NOTE – It is TBD for a MLD to have only one STA.
  + NOTE – The WM MAC address of each STA affiliated with the MLD is TBD

C: in second note change TBD to same

A: different people have different view. Change it to “Whether the WM MAC address of each STA affiliated with the MLD is same or different is TBD”.

C: clarify that device means virtual device. Logical device is also ok.

A: to be move forward, don’t want to change the definition.

C: add note that the the device can be logical.

A: agree to add the note.

C: no MAC SAP in the straw poll

A: MAC SAP is in different straw poll.

C: should be MAC SAP.

C: Each STA has one MAC SAP. Mutlple STAs and one MAC SAP contradict with each other. Change to “one MAC SAP to the LLC, which includes one MAC data service”

A: agree and made the changes.

Per the discussion the straw poll is changed to

* **Do you support to add the followings to the 11be SFD :**
  + **Multi-link device (MLD):** A device that has more than one affiliated STA and has one MAC SAP to LLC, which includes  one MAC data service.
  + NOTE – The device can be logical
  + NOTE – It is TBD for a MLD to have only one STA.
  + NOTE – Whether the WM MAC address of each STA affiliated with the MLD is the same or different is TBD

Straw Poll result:

Y:50, N:0 A:14

Straw Poll 2:

* **Do you support to add the followings to the 11be SFD :**
  + **AP multi-link device (AP MLD):** A multi-link device, where each STA affiliated with the multi-link device is an AP.
  + **Non-AP multi-link device (non-AP MLD):** A multi-link device, where each STA affiliated with the multi-link device is a non-AP STA.

No objection. approved by unanimous consent

Straw poll 3:

* **Do you support that a multi-link device has a single MAC-SAP address associated with the MAC data service?**

C: don’t know what it means.

A: to identify the multi-link device.

C: if this is not defined, how to differtiate entitys in a device.

C: MAC address which is different from link address. MLD has one address related to it.

Debating whether a single MAC address is required to identify a MLD is necessary.

Defer the straw poll for offline discussion.

1. **11-19/1940r3 “Multi-link Framework” (Ming Gan)**

Straw Poll

* **Do you support to add the following sentence to the 11be SFD？**
* **Multiple MAC SAPs Multi-Link device (MMLD):** A device that has more than one affiliated STA and more than one MAC SAP to the LLC
* Note-The device can be logic

C: what is the difference between this and transparent case

A: all them are devices. People may have different view of device.

C: more than one MAC-SAP to the LLC. One LLC can have multiple MAC SAP?

A: any suggestion about ir?

C: just questioning it.

C: multiple IP interfaces for a single device. Addressable through multiple interfaces.

A: the device has more than one MAC SAP.

C: how to use MMLD

A: MMLD can be one STA and one MLD.

Straw poll result:

Y: 15 N: 8 A: many

1. **11-19/1082r4 “Multi-Link Operation: Dynamic TID Transfer” (Abhi)**

**Straw Poll:**

* **Do you support that the 802.11be amendment shall define mechanism(s) for multi-link operation that enables the following:**
  + **Dynamically change the mapping of MPDUs of one or more TID(s) from one set of links to another set of links**

C: Why this is needed

A: both sides need to agree such operation

C: this is related to straw poll of TID to link mapping which fails. Should first vote about TID to link mapping

C: what does dynamic mean?

A: should done through negotiation for dynamic link mapping.

C: don’t need such operation

A: client may have some restriction, e.g. not be able to work at 5GHz and 6GHz band at same time.

C: link disabling is enough

A: In 1904, TID to link mapping implicates link disabling.

C: propose to group TID to link mapping related presentations together.

A: offline discussuion first and harmonize them.

C: general suggestion: group the related topics together.

Defer the straw poll.

1. **11-19/1116r3 “Channel Access in Multi-band operation” (Yunbo Li)**

**Straw Poll 1:**

* **Do you agree the PPDU bandwidths on multiple links between two multi-link capable devices below rules?**
  + **The PPDU bandwidth on each link could be different;**
  + **The PPDU bandwidth on each link is only depends on the CCA results of its own link;**
  + **The PPDU bandwidth selection rules in each link keep the same as in single link.**

C: use the name of MLD

A: agreed

C: 2nd one may be too early

A: the straw poll is natural

C: fron English point of view, the straw poll may require rewoding.

C: 2nd one, PPDU BW may depends on many things. Suggests to change to “PPDU BW in each link is indepent from the CCA of other links”.

C: the straw polls assume multiple PPDUs. Sometimes one PPDU in multiple links may be required.

A: agree to defer the straw poll

**The author showed straw poll 2a and 2b which he assumed same from rechnical point of view**

**Straw Poll 2a:**

* **Do you agree that the channel access mechanism in each link of asynchronous multiple links follows EDCA mechanism in current specification?**

Straw Poll 2b:

* **Do you agree that the channel access mechanism in each link for a multiple link capable device that support simultaneous transmit and receive on different links follows EDCA mechanism in current specification?**

C: prefer 2a with some changes. What is the meaning of “**each link of asynchronous multiple links**”. Propose to change to “**asynchronous multiple link operation**”

C: no trigger based operation? Assume the straw poll is about EDCA access.

A: even Trigger based access should follow the current specification.

C: add “non-trigger based channel access”

A: agree to add the change.

C: proposed the following straw poll: the channel access mechanism of each link of asynchronous multiple links is independent from the channel access mechanism of the other links.

C: the definition of “asynchronous multiple links” is not clear.

C: Propose the following wording: when the STAs are operating in the simultaneous transmission and reception mode.

Straw Poll result of straw poll 2a

Y: 20 N: 4 A: 20

**Straw Poll 3a:**

* **Do you agree that synchronous multiple links need a different channel access mechanism from asynchronous multiple links?**
  + **Exact designs are TBD**

C: first we need to decide whether we need synchronous mode or not.

C: ask to defer it.

C: 3a and 3b are different.

There is no time to run the straw poll

Chair asks if there are any other business. No requests.

The meeting is adjurn.