IEEE P802.11
Wireless LANs

|  |
| --- |
| Minutes of the Nov 2019 meeting of the IEEE 802.11be MAC ad hoc group |
| Date: 2019-11-11 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Liwen Chu | Marvell |  |  | liwenchu@marvell.com |

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

**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.

.

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 adjourned.

**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” (Abhishek Patil)**

**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 recessed.

**11/12/2019 – PM session 1**

Chairman: Jeongki Kim

Secretary: Liwen Chu

At 01:30pm 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 11-19/2001r2.

The chair announces that he is grouping preentations to different topics. This session will first try to finish the remaining straw polls.

c: propose to continue with the architecture straw polls?

A: No objection to it.

The agenda is approved by unanimous consent.

1. **11-19/1405r5 “Multi-link Channel Access Discussion” (**Sharan Naribole**)**

 Go over the slides related to the straw polls.

 Straw Poll 1:

* **Do you support 802.11be have a mode of multi-link operation for multi-link logical entities\* which can’t support simultaneous transmit and receive capability?**
	+ Both non-AP STAs and APs multi-link logical entities\* included
	+ Signaling of this capability is TBD

 \*exact name can be changed

 C: don’t want to have impression of separate mode.

 A: mode is per device capability.

 C: by mode you should allow Tx + Rx and Tx+ Tx

 A: allow multi-link device

 C: can or can’t support simultaneous support this.

 C: For Tx and Rx, leakage may disallow it.

 More discussion is needed. No straw poll running.

1. **11-19/1509r3 “Discussion on Multi-link Setup” (**Insun Jang**)**

 Go over the slides related to the straw polls.

 Straw Poll 1:

* **Do you support a mechanism that**
	+ **An AP multi-link device\* indicates the information of its multi-link capabilities and operation for all APs belonging to the AP multi-link device\***
	+ **A non-AP STA multi-link device\* indicates the information of its multi-link capabilities for all STAs belonging to the non-AP multi-link device\***
	+ **Specific information of multi-link capabilities and operation of multi-link device\* is TBD**
	+ **NOTE\*: The exact name can be changed**

 C: 2nd bullet. Don’t provide all the information.

 A: for non-AP side change “all STAs” to “one or more STAs”.

 C: capability of the STA and AP?

 C: operation to one AP or all AP?

 A: one parameter per AP.

 C: change the straw poll to each AP.

 A: agreed.

 C: propose to change the straw poll to a STA can announce its capabilities.

 C: clarify to who or what entity.

 The updated straw poll:

* **Do you support a mechanism that**
	+ A STA affiliated with multi-link device\* can indicate the capabilities and operational parameters for one or more STAs of the multi-link device\*
		- Specific information of multi-link capabilities and operational parameters of multi-link device\* is TBD
		- NOTE\*: The exact name can be changed

 Straw poll result:

 Y: 31 N: 4 A: 30

1. **11-19/1512r4 “Multi-link acknowledgment” (**Rojan Chitrakar**)**

 Go over the slides related to the straw polls.

 Straw Poll 1:

* + **Do you support that a single block ack agreement is negotiated between two Multi-link devices (MLDs) for a TID that may be transmitted over multiple links?**
	+ **Note: The format of the setup frames is TBD.**

 Straw poll result:

Y: 27 N: 1 A: 11

Straw Poll2:

* **Do you support that the same sequence number space is used for transmission of MPDUs of a TID transmitted over multiple links?**

After the discussion, the straw poll is changed to:

* **Do you support assigning sequence numbers from a common sequence number space shared across multiple links of a Multi-link device (MLD) for a TID transmitted to peer Multi-link device.**

Straw poll result:

Y:29 N: 1 A: 15

Straw Poll3:

* **Do you support that a single BlockAck frame may indicate the receipt status of MPDUs of a TID received over multiple links?**
	+ **Note: The format of the BlockAck frame is TBD.**

C: is it possible to prepare block ack for mmultiple links?

A: it is possible, e.g. when BA is transmitted later.

C: link budget can be different. EDCA operation is based on the acknowledgement. This straw poll may create some issue of EDCA operation.

A: this straw poll doesn’t avoid per link BA.

C: the information is still there.

A: the question is what is done per link.

More discussion is needed.

1. **11-19/1159r4 “Multilink operation capability announcement” (**Liwen Chu**)**

 Straw poll:

* **Do you support that**
	+ **A MLD that supports multiple links at any time can announce the following capabilities for each pair of links:**
		- **To support transmission on one link concurrent with reception on the other link**
			* **Support can be advertised only if the 2 links are on different channels**
		- **To support transmission on one link concurrent with transmission on the other link**
		- **To support reception on one link concurrent with reception on the other link**

 Straw poll result:

 Y:16 N: 6 A: 32

1. **11-19/1510r2 “EHT Power saving considering multi-link” (**Rojan Chitrakar**)**

Straw poll 3:

* **Do you agree to add the following into the TGbe SFD?**
	+ A non-AP STA within a multi-link logical entity can set up the TWT Service Periods for one or more links within the same multi-link logical entity through its link

C: it is not clear whther it is doable from synchronization point of view.

C: TSF synchronization may be an issue.

**C: ask to defer the straw poll**

The straw poll is deferred.

1. **11-19/1525r1 “EHT Power saving considering multi-link” (**Abhishek Patil**)**

Straw Poll

* **Do you support that the 802.11be amendment shall define mechanism(s) for multi-link operation that enables the following:**
	+ Indication of capabilities and operating parameters for multiple links of a multi-link logical AP entity
	+ Negotiation of capabilities and operating parameters for multiple links during a single setup signaling exchange.

No objection, Approve with unanimous consent

1. **11-19/1358r1 “Multi-Link Operation Management” (**Yongho Seok**)**

C: granularity of TID is not reasonable.

A: it is ok to decide later.

C: agree with the previous comment.

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

The meeting is recessed.

**11/12/2019 – 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.

 11-19/1622 is deferred

1. **11-19/1851r1 “Latency enhancement in multi-link” (Suhwook Kim)**

The slide addresses how to give priority to the low latency traffic over other traffic via additional EDCAF and queue, and discusses additional advantages in multi-link when we define EDCAF for low latency queues

C: who define the low latency.

A: interface to up layer to get the latency requirement.

C: add another queue may make things worse, e.g. abuse it.

C: is it defined by AP or user? Additional queue doesn’t help.

C: it is not clear about how the mapping is done.

A: interface to up layer carries the information. Assume the uplayer can clarfisfy it.

C: did you run the simulation to show the improvement.

A: will provide the simulation result

 Straw Poll 1:

* **Do you agree to add the following into the TGbe SFD?**
	+ **TGbe shall define a mechanism that differentiates and prioritizes the traffic requiring low latency from other traffic which doesn’t require low latency**

 C: is there any idea about how to do it? Would like to see the result before voting.

 A: will provide the detail later.

 C: agree with the previous commenter. It is not clear how to use it. What is the real reason for this? It is good to see the simulation result for the voting.

 C: the straw poll is not clear.

 The author agreed to defer the straw poll.

1. **11-19/1613r1 “Multi-link TXOP Sharing for Delay Reduction” (**Sunghyun Hwang**)**

.

C: slide 5, is this sharing scheme within single BSS. Why is DL OFDMA efficent?

A: DL OFDMA shares the frequency within the single BSS.

C: Why do you need another method since UL OFDMA provides ul sharing.

A: with this, AP can share STA’s TXOP.

C: Does this work for asynchronized method? Some simulation results show asynchronized method is better.

A: can’t to jarge since the simulation is not available.

C: clarification question. Slide 6, How AP knows that STA2 has something to transmit?

A: based on the previous information.

C: how does the AP know STA2 can transmit.

A: basically AP knows the STA’s situation.

C: slide 6. How can a MLD do simultaneous transmission? The concern for this scheme is the fairness issue.

A: assume synchronized transmission is allowed.

C: the STA shouldn’t reserve more time than it requires.

Straw Poll

* **Do you support the following definition?**
	+ **Multi-link TXOP Sharing:** In multi-link transmission, one or more links shall be shared to other ACs or STAs while at least one link is utilized by the primary AC or TXOP holder
	+ NOTE – The frames from the other ACs or STAs may be included when at least one frame from the primary AC or TXOP holder has been transmitted

Y:2 N:26 A: many

1. **11-19/1884r1 “Discussion on RTA retransmission” (**Liangxiao Xin**)**

.

C: You mentioned several possible solutions.

A: plan to show simlution results in the future. This presentation discusses potential solutions.

C: Is there any reason to use 11g? Use 11ax may give different results.

A: just set up 11g network.

C: which aggretation is disabled?

A: both A-MPDU and A-MSDU are disabled.

C: IS it fair to say that your conclusion is that collsion creates retransmission and retransmission increases latency?

A: Yes

C: the result may not be from the retransmission.

C: per 802.11 baseline, retransmissmion can be in same TXOP.

A: STA may lose medium control because of transmission failue.

Straw Poll

* **Do you think the retransmission delay has a critical impact on worst case latency?**

Straw poll result:

Y: 18 N: 3 A: 40

* **Should we solve the problem of worst case latency caused by retransmission time and consider new retransmission procedures for RTA traffic?**

C: we need to see what to do to use resource efficiently. It is too early to address the retransmission in this stage.

The author deferred the straw poll.

1. **11-19/1888r0 “Performance evaluation of deterministic service for EHT - Follow up” (**Suhwook Kim**)**

C: 11ax allows STA to report TSPEC to AP for scheduling.

A: The report information is different as shown in slide 17.

C: propose to use TSPEC.

C: even if info in slide 17 is not known, AP can still do optimizated schedule per TSPEC etc.

C: raise similar concern. Frequent feedback seems unnecessary. The issue could be solved through TSPEC.

Straw poll:

**Do you agree to add the following into the TGbe SFD?**

* An EHT non-AP STA can report traffic stream information for supporting the traffic requiring low latency to the associated AP
	+ Detail of traffic stream information and signaling are TBD (e.g. frame arrival time, remaining time until frame drop, etc …)

The straw poll is deferred.

1. **11-19/1933r1 “Capabilities to support Time-Aware Scheduling in 802.11be” (**Dave Cavalcanti**)**

 The author presented the slides but couldn’t finish.

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

The meeting is recessed.

**11/13/2019 – PM2 session**

Chairman: Jeongki Kim

Secretary: Liwen Chu

At 04:00pm 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 with several added straw polls.

1. **11-19/1933r1 “Capabilities to support Time-Aware Scheduling in 802.11be” (**Dave Cavalcanti**)**

C: how to deal with interference?

A: control the time duration to open the high priority queue and close the other queues

No straw poll running.

1. **11-19/1780r0 “AR/VR on EHT: Design Considerations” (**Sam Alex**).**
2. 11-19/1358r1 “**Multi-Link Operation Management**” (Yongho Seok)

**Straw poll1:**

* **Do you support the following multi-link operation?**
	+ **The TID to link mapping can be updated after multi-link setup through a negotiation, which can be initiated by any MLLE**
		- **Format TBD**
			* **Note: When the responding MLLE can not accept the update, it can reject the TID link mapping update.**

C: concern about TID to Link mapping. May not be good for STA implementation.

 A: agree to use link enable/disable.

The strw poll is deferred.

1. 11-19/822r8 “**Extremely Efficient Multi-band Operation**”(Po-kai Huang)

**Straw poll1:**

* **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.**

The strw poll is accepted with unanimous consent

1. 11-19/1159/r5 “**Multilink operation capability announcement**”. (Liwen Chu)
* Do you support that
	+ A MLD that supports multiple links can announce whether it can support transmission on one link concurrent with reception on the other link for each pair of links.

 Note----the 2 links are on different channels

 Note----Whether to define a capability of announcing the support transmission on one link concurrent with transmission on the other link is TBD.

The strw poll is accepted with unanimous consent

1. 11-19/1505r2 “**Multi-link TXOP Aggregation Considerations**” (Sharan Naribole)

Straw Poll 1

* **Do you agree that 802.11be shall allow a multi-link device\* that has constraints to simultaneously transmit and receive on a pair of links to operate over this pair of links?**
	+ Signaling of this constraints is TBD

 The strw poll is accepted with unanimous consent

1. 11-19/1526r1 “**Multi-Link Operation: Anchor Channel**” (Abhishek Patil).

C: it seems the mechanism is similar to 11ba’s wake up radio.

A: it can avoid power burning in multiple links. In anchor link, STA can still get frames.

C: do we need such mechanism that the STA parking in one link. Power save can be used to get such result.

A: Do you want multiple awake RFs in multiple links?

C: How to do the synchronization if only anchor link is monitored?

A: Beacon in one link carries the TSF time of other links.

No straw poll running.

1. 11-19/1536r2 “**Power Consideration for Multi-link Transmissions**” (Rojan Chitrakar).

C: similarity with previous one. After disabling links and only one link awake, then it is ok.

C: be careful about what is special link doing. The benefit and the usage of the link are also important.

A: no restriction as slide 5 being shown.

C: simulation result doesn’t consider the power save.

C: how to maintait the synchronization when one link’s beacon is monitered.

A: Ahbi mentioned some solution.

C: do you need link specific buffers?

A: don’t consider that scenario.

No straw poll running.

1. 11-19/1542r1 “**Multi-link Broadcast Addressed frame Reception**” (Po-kai Huang).

 C: doesn’t need to indicate specific link.

 A: open to it.

No straw poll running.

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

The meeting is adjourned.

.