IEEE P802.11  
Wireless LANs

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| ARC SC Meeting Minutes July 2019 | | | | |
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Abstract

This document contains the minutes of the IEEE 802.11 ARC SC meeting sessions held on 16 July 2019 at 16:00 CET, 17 July 2019 at 8:00 CET, and 17 July 2019 at 16:00 CET in Vienna, Austria.

Note: Highlighted text are action items.

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# Tuesday, 16 July 2019, PM2

**Administration:**

**Chair: Mark Hamilton, Ruckus/CommScope**

**Vice Chair: Joseph Levy, InterDigital**

**Secretary: Joseph Levy, InterDigital**

**Meeting called to order in ARC meeting room by Chair 16:03 CET,**

Agenda slide deck: [11-19/0984r0](https://mentor.ieee.org/802.11/dcn/19/11-19-0984-00-0arc-arc-sc-agenda-july-2019.pptx) , proposed agenda copied here for reference (will be r1 out of the meeting):

**Tuesday, July 16, PM2**

* Administrative: Minutes
  + IEEE 1588 mapping to IEEE 802.11/802.1ASrev and use of FTM
  + IETF/802 coordination
  + Consider IETF DetNet/time-sensitive networking input (potential relationship to RTA TIG?)
  + IETF SAVI draft: <https://datatracker.ietf.org/doc/draft-bi-savi-wlan>
  + “What is an ESS?”: [11-18/1051r6](https://mentor.ieee.org/802.11/dcn/18/11-18-1051-06-0arc-what-is-an-ess.pptx)
  + ~~New topic (from REVmd)?: “What is a STA?” (See:~~ [~~11-19/0106r0~~](https://mentor.ieee.org/802.11/dcn/19/11-19-0106-00-000m-sta-and-ap.docx)~~)~~ – deferred

**Wednesday, July 17, AM1**

* MLME-RESET, versus MLME-JOIN and MLME-START (and MLME-SCAN?)
* “What is an ESS?” (continued)
* ~~“What is a STA?” (continued)~~

**Wednesday, July 17, PM2**

* + Future sessions / SC activities
  + Above items continued, as needed
  + TGbe (EHT) multi-band operation architecture ([11-08/0949r4](https://mentor.ieee.org/802.11/dcn/08/11-08-0949-04-0arc-mac-component-breakdown-wip.ppt))
  + TGbc (Broadcast) unassociated broadcast, broadcast reception
  + AP/DS/Portal architecture and 802 and GLK concepts - [11-17/0136r2](https://mentor.ieee.org/802.11/dcn/17/11-17-0136-02-0arc-bridging-architecture-considerations.docx), [11-16/1512r0](https://mentor.ieee.org/802.11/dcn/16/11-16-1512-00-0arc-glk-802-1q-bridge.pptx), [11-16/0720r0](https://mentor.ieee.org/802.11/dcn/16/11-16-0720-00-0arc-stacked-architecture-discussion.pptx), [11-15/0454r0](https://mentor.ieee.org/802.11/dcn/15/11-15-0454-00-0arc-some-more-ds-architecture-concepts.pptx), [11-14/1213r1](https://mentor.ieee.org/802.11/dcn/14/11-14-1213-01-0arc-ap-arch-concepts-and-distribution-system-access.pptx) (slides 9-11)
  + Continue the other items (above, and previous slide), as needed

**Administration:**

The Chair reviewed the Administrative information in the agenda document, 11-19/0984r0

**Call for Patents:**

The Chair reviewed the Patent policy and called for potentially essential patents – there was no response to the call.

**Participation:**

The chair reviewed the participation policy

**Approval of the Agenda:**

The Chair reviewed the agenda and called for comments or amendments to the agenda - there was no response to the call.

Agenda discussion:

Comment: ICVF over OCB should be discussed.

The Chair noted that 802.11 (ARC SC) submitted comments but heard no feedback, also be some work related to 1609 and ability to request a MAC address change will be discussed.

The proposed agenda was approved by unanimous consent.

**March 2019 face-to-face minutes:** [11-19/0914r0](https://mentor.ieee.org/802.11/dcn/19/11-19-0914-00-0arc-arc-sc-meeting-minutes-may-2019.docx)

Approved by unanimous consent.

**IEEE 1588 mapping to IEEE 802.11/802.1ASrev and use of FTM**

No updates – from anyone present.

**IETF/802 coordination**

IETF Liaison - Peter Yee – not present – no updates from anyone.

IPv6 ND Proxy – 11-18/1920r2 – was Pascal a while ago – but no problem has been brought back to us. Peter will check with Pascal. Also 11-18/1919r5.

**IETF SAVI draft:**<https://datatracker.ietf.org/doc/draft-bi-savi-wlan>

We spoke about this in March – but “the expert”, Juan Carlos, was not available in May, and he is not present today.

The Chair will talk to the 802 Chair to determine if work needs to be done.

**Consider IETF DetNet/time-sensitive networking input**(potential relationship to RTA TIG?)

C - The physics of the wave guide – it is up to them to decide what delay they can support.

C - If there are few devices it is very deterministic, but with lots of users it is not deterministic.

C - If it is probabilistic – It is not a good fit for deterministic. Note there was a presentation of a “managed LAN model” - in the managed LAN – that could be applied to TSN principles, so one could plan and be deterministic – this may have been followed up this week in TGbe discussions.

C – The original issue that launched this discussion was: “If 15.4 can support it, why can’t 802.11”.

C - In a controlled environment – by license.

C - The issues is: what is the load and what is the tolerable delay. In a factory the environment is quasi-licensed, as the devices present are controlled and defined.

C – Need to consider changes as we shift from software ACKs to hardware ACKs.

Chair – I don’t think we are at the ranging response level – but it isn’t clear what the requirement is.

**“What is an ESS?”:** [11-18/1051r6](https://mentor.ieee.org/802.11/dcn/18/11-18-1051-06-0arc-what-is-an-ess.pptx)

Note: header is wrong in r6 – still says r5.

The Chair reviewed the document – running through the identified types A-G.

The Chair reviewed the new slides describing type A

The Chair reviewed the new slide 19 describing type E – saying there is nothing to be done.

Open items:

* Type B: needs details
* Type C: it is not agreed what to do with it or if it is interesting. (see slide 20)
* Open Concepts that need to be address are listed on slide 20.

**Recessed:** 17:59 CET.

# Wednesday, 17 July 2019, AM1

**Chair: Mark Hamilton, Ruckus/CommScope**

**Vice Chair: Joseph Levy, InterDigital**

**Secretary: Joseph Levy, InterDigital**

**Meeting call to order in ARC meeting room by Chair 8:03 am**

Agenda slide deck: 11-19/0984r1, proposed agenda copied here for reference:

**Wednesday, May 15, AM1**

* Continued discussion on IPv6 over OCB/IPWave, or other IEEE 1609 input/requests to 802.11 – deferred (follow TGmd activities)
* Annex G – review of mid-week plenary information.
* MLME-RESET, versus MLME-JOIN and MLME-START (and MLME-SCAN?)
* “What is an ESS?” (continued)

**Administration:**

The Chair reviewed the Administrative information in slides 5-10 in Agenda document, 11-19/0984r1.

**Call for Patents:**

The Chair reviewed the Patent policy and called for potentially essential patents – there was no response to the call.

**Approval of the Agenda:**

The Chair reviewed the agenda and called for comments or amendments to the agenda – there was no response to the call.

Short discussion on “IEEE 1588 mapping to IEEE 802.11/802.1ASrev and use of FTM” with Ganesh – to discuss if there was anything to discuss, answer was there is really nothing new since March – ballot comment resolution is still on going.

Also discussed 1609.4 ability to change the station’s MAC address without resetting the entire MAC. from 11-19/1031 slide 3. But, without Michael Fisher or Michael Montemurro this discussion is premature, so we will discuss this in the future and interested members should probably follow this activity in TGbd. So, no agenda item for this meeting.

Proposed Agenda:

* Annex G – review of mid-week plenary information.
* MLME-RESET, versus MLME-JOIN and MLME-START (and MLME-SCAN?)
* “What is an ESS?” (continued)

The proposed agenda was approved by unanimous consent.

**Annex G – review of mid-week plenary information.**

Dorothy Stanley (WG Chair) reported “ongoing discussions on Annex G at the mid-week plenary”. She is considering tasking the ARC SC to generate recommendations similar to what was done for the MIB (Annex C). But, this will be discussed at the WG level first. It has been proposed to remove Annex G – but there has not yet been a submission that is complete enough to allow the removal.

C – First we need the analysis to see what we lose if we delete it. We need to know its value first and the impact of removal.

C – I view it similar to what we did with the SDL code, which was reduced to being informative, before we removed it. We need to look at what has been done in the spec and if it is in conflict with what is in Annex G.

C – When we removed the SDL code we did an analysis to make sure we weren’t losing anything before we made it informative and then eventually removed it. This is the same process we should follow for the removal of Annex G. But it will be work to remove Annex G, but it is also work have new amendments update Annex G.

Unrelated to the Annex G discussion, but occurring at the end of the Annex G discussion, the following action was requested: That the ARC Chair provide two slides to the WG Chair for presentation to the WG summarizing the current MIB pattern guidelines (11-18/0052r2 slides 12, 13 should be cleaned up to address this request).

**MLME-RESET, versus MLME-JOIN and MLME-START**

Chair went thru the agenda slide 21 reproduced here:

Topic out of REVmd:

* No apparent requirement for an “initial” MLME-RESET, in 802.11. So, what is the initial state?
* Many MIB attributes describe taking effect at next MLME-JOIN or MLME-START.
  + MLME-JOIN occurs at each BSS transition
  + MLME-START occurs at less well-defined points, seems to require an MLME-RESET first
  + Do these attributes really take effect at these points, or at the MLME-RESET?
* How about other state information, such as security association, block ack agreements, etc., etc.?
* Maybe need to consider MLME-SCAN, too?
* Is correct information provided at these primitives (and not more than needed information, and to the right primitive)?

C – does this impact the changing of the MAC address.

Chair – As we talk about how the MAC address change without resetting the whole MAC.

Q – How does this impact security? Security is done at a higher layer, you need to do a new set keys, without having to run though the whole security procedure.

Chair – Resetting the MAC must be dealt with.

C – But, resetting the MAC is not defined in MLME primitives

Chair recorded the following MLME issues:

* Need either MLME-RESET required, or something else about initial state.
* Recognize there is state in the SME (security association, for example) that is outside “the MAC/MLME”, not reset by MLME-RESET.
* Does MLME-RESET “cause” MLME-DEAUTHENTICATE/DISASSOCIATE.indications?
* Are there some MIB attributes which, when changed, should trigger a “RESET.indication” to higher entities? (SNMP traps?)
  + Or other .indication (MLME-SET.indication?) when some attributes are changed – this may provide the function of an SNMP trap.
* Reassociation to same AP, (probably?) doesn’t do MLME\_JOIN, does that break anything with “take affect at the next JOIN”?
* MLME-START and MLME-JOIN should say the MLME shall actually do the attributes” “taking effect” stuff.
* Add an MLME-DATA-READY.indication, when “everything is ready to go” (State 4, …) (OCB, too)
  + Is there one of these on the AP side?
  + Consider 11ak behavior/events, too?

Discussion on the last bullet related to scope and what should be done in the .11 spec. Discussed the possibility of adding SNMP traps. But, the SNMP trap should be similar to how we deal with the MIB, it is used as a way to describe things that must be done, but as long as implementations performs the tasks they need not actually use the SNMP trap.

To know the impacts of no MLME\_JOIN on reassociation, we need to way review all the “take affect at the next JOIN” locations in the specification.

C – Why certain things are hidden in the MIB – e.g. there is no default Table for EDCA parameters of AP in the spec, it is only in the MIB.

C – There are lots of defaults in the MIB, it is the place for the defaults.

C – There should have an MLME indication that means the STA is good to go for data frames. e.g. MLME-DATA-READY. Indication.

**Recessed:** 10:00 CET.

# Wednesday, 17 July 2019, PM2

**Call to order:** 16:04 CET

**Administration:**

**Chair: Mark Hamilton, Ruckus/CommScope**

**Vice Chair/Secretary: Joseph Levy, InterDigital (absent)**

**Secretary: Stephen McCann, BlackBerry**

The Chair reviewed the Administrative information in slides 5-10 in Agenda document, 11-19/0984r2.

**Call for Patents:**

The Chair reviewed the Patent policy and called for potentially essential patents – there was no response to the call.

**Approval of the Agenda: 11-19/0984r2**

The Chair reviewed the agenda and called for comments or amendments to the agenda – there was no response to the call (slide 12 – copied here for reference).

* **Future sessions / SC activities.**
* **TGbe (EHT) multi-band operation architecture (**[11-08/0949r4](https://mentor.ieee.org/802.11/dcn/08/11-08-0949-04-0arc-mac-component-breakdown-wip.ppt)**)**
* **TGbc (Broadcast) unassociated broadcast, broadcast reception**
* **AP/DS/Portal architecture and 802 and GLK concepts -** [11-17/0136r2](https://mentor.ieee.org/802.11/dcn/17/11-17-0136-02-0arc-bridging-architecture-considerations.docx), [11-16/1512r0](https://mentor.ieee.org/802.11/dcn/16/11-16-1512-00-0arc-glk-802-1q-bridge.pptx), [11-16/0720r0](https://mentor.ieee.org/802.11/dcn/16/11-16-0720-00-0arc-stacked-architecture-discussion.pptx)**,** [11-15/0454r0](https://mentor.ieee.org/802.11/dcn/15/11-15-0454-00-0arc-some-more-ds-architecture-concepts.pptx)**,** [11-14/1213r1](https://mentor.ieee.org/802.11/dcn/14/11-14-1213-01-0arc-ap-arch-concepts-and-distribution-system-access.pptx) **(slides 9-11)**
* **Continue the other items (previous slide), as needed**

The proposed agenda was approved by unanimous consent.

Chair reviewed slide 25 – the list of ARC Future Activities and sessions (copied below for reference).

* **ARC SC meets when a specific focused task is requested of the SC for which the is sufficient volunteer interest.**
* **Continue work on architectural models, and liaison with TGs in development of their architecture as appropriate (e.g. TGbc, TGbe) - Perhaps updates on “STA” definition to handle TGbe concepts? Might have multiple radio/MAC address implications, too?**
* **Investigation of 802.11 as part of a Deterministic Network – Joint session w/802.1 & TGbe in July (TBC)**
* **Will also follow 802.1/802.11 activities on links, bridging, and MAC Service definition – “What is an ESS?”, for example**
* **“What is a STA?” (11-19/0106) Related: What is the (“STA(s)”) architecture of off-channel TDLS?**
* **MLME-RESET, versus MLME-JOIN and MLME-START (and MLME-SCAN?)**
* **Monitor/report on IETF/802 activities, as needed**
* **Monitor/report on IEEE 1588 activities and 802.1ASrev use of FTM, as needed**

C – ARC should consider further discussion on: **802.11 as a deterministic network.**

**Planning:**

Future sessions / SC activities

* Plan for three individual meeting slots
* Teleconferences: None planned.

**TGbe (EHT) multi-band operation architecture (**[11-08/0949r4](https://mentor.ieee.org/802.11/dcn/08/11-08-0949-04-0arc-mac-component-breakdown-wip.ppt)**)**

* **“Lower MAC” discussions in ARC, back in 2008**
  + [11-08/0949r4](https://mentor.ieee.org/802.11/dcn/08/11-08-0949-04-0arc-mac-component-breakdown-wip.ppt) MAC-Component-Breakdown-WIP (Darwin Engwer)
* **TGbe some docs related to multi-link/band ARC concepts:**
  + [11-19/0823r0](https://mentor.ieee.org/802.11/dcn/19/11-19-0823-00-00be-multi-link-aggregation.pptx) Multi-Link Aggregation (Abhishek Patil)
  + [11-19/0822r2](https://mentor.ieee.org/802.11/documents?is_dcn=822https://mentor.ieee.org/802.11/dcn/19/11-19-0822-00-00be-extremely-efficient-multi-band-operation.pptx) Extremely Efficient Multi-band Operation (Po-Kai Huang)
  + [11-19/0760r1](https://mentor.ieee.org/802.11/documents?is_dcn=760https://mentor.ieee.org/802.11/dcn/19/11-19-0760-01-00be-multi-band-opinion.pptx) Multi-Band Opinion (Alan Jauh)
* **TGbe a doc related to multi-AP ACR concepts:**
  + [11-19/0804r0](https://mentor.ieee.org/802.11/dcn/19/11-19-0804-00-00be-multi-ap-transmission-procedure.pptx) **Multi-AP Transmission Procedure (Sungjin Park)**

Aspects of multiple “links” may change some of the current ARC understanding.

The multi-AP concept could be considered as a single AP with a phased array antenna? TGbb may also be looking at the same concept for multiple light sources. RFC 4118 (CAPWAP) may also be relevant for this discussion.

The chair will discuss with the TGbe chair to see if a suitable meeting can be assigned in the future.

**TGbc (Broadcast) unassociated broadcast, broadcast reception**

* [**11-19/0268r5**](https://mentor.ieee.org/802.11/dcn/19/11-19-0268-05-00bc-tgbc-use-case-document.pptx) **IEEE 802.11bc Use Case Document:** 
  + Transmit from AP to multiple receive only STAs   
    (Multi-Lingual/ Emergency Broadcast/Broadcast Services)
  + Sensor STA transmits to any/multiple APs (no association)
  + ITC all devices transmit / all devices receive (no associations)
* [**11-19/0151r3**](https://mentor.ieee.org/802.11/dcn/19/11-19-0151-03-00bc-802-11bc-functional-requirements-document.doc) **802.11bc Functional Requirements Document**

For receive only devices, some words will need to be changed in the specification, possibly in clause 4. Apparently, OCB can be received only according to the specification, as it’s not explicitly disallowed.

For transmit only devices, this is new, although it may also be covered by OCB or a broadcast public action frame (e.g. diagnostic frame). The behavior is possibly defined in Clause 11.

IEEE 1609.4 states that a WAVE device can be transmit only, receive only or both. This implies that the use of the OCB bearer can be receive or transmit only.

Using public actions frames not a good idea, use protected action frames instead. This would be basically a new type of public action frame operating in a broadcast mode. Possibly similar to GAS, but with a new number. This would be better for the sensor uplink case, as an AP (STA) needs to manipulate the raw broadcast frame into a TCP frame over the network. Therefore, a new unique frame (as opposed to OCB) would be a better implementation, as the AP can determine what this new frame is. The AP can forward the TGbc frame and forward it to an encapsulation entity (collocated with the AP).

Security should be within the payload and therefore outside the scope of IEEE 802.11. This again parallels the OCB/WAVE solution.

There are examples of multiple-APs receiving a location update on the same channel, as a broadcast public action frame.

**AP/DS/Portal architecture and 802 and GLK concepts -** [11-17/0136r2](https://mentor.ieee.org/802.11/dcn/17/11-17-0136-02-0arc-bridging-architecture-considerations.docx), [11-16/1512r0](https://mentor.ieee.org/802.11/dcn/16/11-16-1512-00-0arc-glk-802-1q-bridge.pptx), [11-16/0720r0](https://mentor.ieee.org/802.11/dcn/16/11-16-0720-00-0arc-stacked-architecture-discussion.pptx)**,** [11-15/0454r0](https://mentor.ieee.org/802.11/dcn/15/11-15-0454-00-0arc-some-more-ds-architecture-concepts.pptx)**,** [11-14/1213r1](https://mentor.ieee.org/802.11/dcn/14/11-14-1213-01-0arc-ap-arch-concepts-and-distribution-system-access.pptx) **(slides 9-11)**

* **Presentations on architectural description(s)**
  + [11-17-0136-02-0arc-bridging-architecture-considerations.docx](https://mentor.ieee.org/802.11/dcn/17/11-17-0136-02-0arc-bridging-architecture-considerations.docx)
  + [11-16-1512-00-0arc-glk-802-1q-bridge.pptx](https://mentor.ieee.org/802.11/dcn/16/11-16-1512-00-0arc-glk-802-1q-bridge.pptx)
* **Reference presentations (previously reviewed, current status of thinking):**
  + [11-14-1213-01-0arc-ap-arch-concepts-and-distribution-system-access.pptx](https://mentor.ieee.org/802.11/dcn/13/11-13-0115-15-0arc-considerations-on-ap-architectural-models.doc)
  + [11-13-0115-15-0arc-considerations-on-ap-architectural-models.doc](https://mentor.ieee.org/802.11/dcn/13/11-13-0115-15-0arc-considerations-on-ap-architectural-models.doc)
  + [11-14-0497-03-0arc-802-11-portal-and-802-1ac-convergence-function.pptx](https://mentor.ieee.org/802.11/dcn/14/11-14-0497-03-0arc-802-11-portal-and-802-1ac-convergence-function.pptx)
  + [11-14-0562-05-00ak-802-11ak-and-802-1ac-convergence-function.pptx](https://mentor.ieee.org/802.11/dcn/14/11-14-0562-05-00ak-802-11ak-and-802-1ac-convergence-function.pptx)
  + [11-15-0454-00-0arc-some-more-ds-architecture-concepts.pptx](https://mentor.ieee.org/802.11/dcn/15/11-15-0454-00-0arc-some-more-ds-architecture-concepts.pptx)
  + [11-16-0720-00-0arc-stacked-architecture-discussion.pptx](https://mentor.ieee.org/802.11/dcn/16/11-16-0720-00-0arc-stacked-architecture-discussion.pptx)

No comments about this topic

**Future Joint Meetings**

No decision at the moment, until the ARC chair talks to the TGbc and the TGbe chairs.

**Adjourned 17:05 CET**

Note: final agenda slide deck is: [11-19/0984r4](https://mentor.ieee.org/802.11/dcn/19/11-19-0984-04-0arc-arc-sc-agenda-july-2019.pptx) and closing report is: [11-19/1345r0](https://mentor.ieee.org/802.11/dcn/19/11-19-1345-00-0arc-arc-closing-report-july-2019.pptx)