IEEE P802.11
Wireless LANs

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| ARC SC Meeting Minutes May 2018 |
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Abstract

This document contains the minutes of the IEEE 802.11 ARC SC meeting sessions held on 8 May 2018 at 10:30 CET, 8 May 2018 at 16:00 CET, and 9 May 2018 at 08:00 CET in Warsaw, Poland. The minutes for the joint ARC and TGba meeting session May 10 2018 at 16:00 CET in Warsaw, Poland are provided in the TGba meeting minutes (11-18/999).

Note: Highlighted text are action items.

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# Tuesday, 8 May 2018, at 10:30 CET

**Administration:**

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

**Vice Chair/Secretary Joseph Levy, InterDigital**

**Meeting call to order in ARC meeting room by Chair 10:33 CET,**

Agenda slide deck: [11-18/0644r2](https://mentor.ieee.org/802.11/dcn/18/11-18-0644-02-0arc-arc-sc-agenda-may-2018.pptx), proposed agenda copied here for reference:

**Tuesday, May 8, AM2**

* **Administrative: Minutes, Chair and VChair elections**
	+ **IEEE 1588 mapping to IEEE 802.11/802.1ASrev use of FTM update -** [11-17/1086r4](https://mentor.ieee.org/802.11/dcn/17/11-17-1086-04-0arc-ieee-802-1as-d5-0-review-comments.pptx)
	+ **802 (and 802.1) activities: 802c, 802.1CQ**
	+ **IETF/802 coordination**
	+ **Continued review of TGax approach to subclause 10.2 and Figure 10-1:** [11-18/0362r1](https://mentor.ieee.org/802.11/dcn/18/11-18-0362-01-00ax-cr-for-cids-in-10-2-6.docx)
	+ **YANG/NETCONF modeling discussions – TIG formation discussion**
	+ **“What is an ESS?”**
	+ **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)**
* **MLME-RESET, versus MLME-JOIN and MLME-START**

**Tuesday, May 8, PM2**

* **Continue the above, as needed**

**Wednesday, May 9, AM1**

* + **Continue the above**
	+ **Future sessions / SC activities**

**Joint session with TGba – Thursday, May 10, PM2**

* + **Investigation of WUR architecture topics; eventually may lead into “split” PHYs (LC, 28 GHz (Phazr)):** [11-17/1025r0](https://mentor.ieee.org/802.11/dcn/17/11-17-1025-00-0arc-11ba-arch-discussion.pptx)**,** [11-18/0533r2](https://mentor.ieee.org/802.11/dcn/18/11-18-0533-02-0arc-802-11ba-topics-related-to-arc.pptx)

**Administration:**

The Chair reviewed the Administrative information in slides 5-10 in Agenda document,

**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

The proposed agenda was approved by unanimous consent.

**ARC Minutes:**

* **March face-to-face minutes:** [11-18/0544r0](https://mentor.ieee.org/802.11/dcn/18/11-18-0544-00-0arc-arc-sc-meeting-minutes-march-2018.docx)

Minutes approved by unanimous consent.

**Chair Support, Vice Chair Election**

**Chair:**

The Chair called for any volunteers – none were forthcoming

Hence Mark Hamilton, Ruckus/Arris is the only volunteer for Chair of the ARC SC.

The Chair called for support for continuing – there was unanimous consent.

**Vice Chair:**

The Chair called for any nominations – no attritional nominations – hence Joseph Levy, InterDigital is the only candidate for Vice Chair of the ARC SC.

Motion to elect Joseph Levy as the ARC Vice Chair – the motion passes by unanimous consent.

**IEEE 1588 mapping to IEEE 802.11/802.1ASrev use of FTM update -** [11-17/1086r4](https://mentor.ieee.org/802.11/dcn/17/11-17-1086-04-0arc-ieee-802-1as-d5-0-review-comments.pptx)

Chair was informed prior to the meeting by Ganesh Venkatesan (Intel) that there was nothing new to report, as things are basically static – 802.1AS is in sponsor ballot process.

**802 (and 802.1) activities: 802c, 802.1CQ**

*Chair:* 802.1Q revision was approved by REVCOM. So, this is done.

Called for additional inputs and comments, none were forth coming.

*Chair:* 802.1CQ, was PAR approved a few months ago, reviewed status.

Steven McCann reported additional information on 802.1CQ, indicating that he has have joined the 802.1CQ activity, the activity has been moved to OMNIRAN (due to Pat retiring.) – The CQ project is ongoing and he indicated he will be attending that meeting as much as possible. Steven McCann agreed to provide updates to the ACR SC.

Chair – called for addition inputs – none were forthcoming.

**IETF/802 coordination**

Peter Yee – is the new IETF Liaison – Peter is not present - will have update later in the week.

**TGax approach to subclause 10.2 and Figure 10-1:** [11-18/0362r1](https://mentor.ieee.org/802.11/dcn/18/11-18-0362-01-00ax-cr-for-cids-in-10-2-6.docx)

* + Concepts initially discussed in Sep, 2017 (see [11-17/1220r2](https://mentor.ieee.org/802.11/dcn/17/11-17-1220-02-00ax-clause-10-2-comment-resolution.docx) and [11-17/1396r1](https://mentor.ieee.org/802.11/dcn/17/11-17-1396-01-0arc-comments-on-11ax-clause-10-2.docx))
	+ In March, reviewed 11ax D2.0 comments received, and resolutions first proposed (11-18/0362r0 and [11-18/0362r1](https://mentor.ieee.org/802.11/dcn/18/11-18-0362-01-00ax-cr-for-cids-in-10-2-6.docx))
	+ Review/discuss updates, formulate response

Chair call for comments – none were forthcoming.

**Discussion on YANG/NETCONF models**

Chair provided a review of status – that there are people interested in doing this work, but so far no one has volunteered to take leadership of this activity, but offline discussions are ongoing.

Discussion:

A participant – Have we established that companies want this.

A participant – I don’t think we need this, we don’t implement the MIB or would we implement the YANG?

A participant – we have to decide if we are going to maintain the MIB model or are we going to move to the YANG model – the 802 YANG library is set up – and is waiting to be filled in for .11 – if we are going to be consistent 802 – we should probably move to YANG models.

Chair – we had a discussion on what we should do in March – but we are now at the point of trying to begin.

A participant – the scenario of taking small bites – my long-term goal would we to replace the MIB in its entirety. To do that amount of work it has to be of significant value.

Chair – I haven’t seen any one proposing to get rid of the MIB (not in 802.1 or 802).

Showed an example of what 802.1 has been doing. How they are doing small pieces.

Suggestion to starting from UML and then up to YANG.

But, this all comes down to – if we don’t have leadership and volunteers to do the work nothing will happen. So, we are still looking for people to do this work.

A participant - I don’t think there is any glory in doing this work?

Chair – this will be a TG.

**What is an ESS?**

Chair reviewed – Slides 19-25

Chair asked what we do from here?

A participant – we agreed to define this thing from scratch – as arguing about what is there is unproductive. We have been discussing this for 4 meetings. So, let’s try to complete defining it.

At this point, there is no relevance to .21.

Chair asked for any issue in removing .21 from this work.

A participant – I am trying to understand homogeneous and what is meant by the term.

Chair – the word may have come from .21, but the meaning has changed and is no longer related to the .21 concept. Therefore – looking at slide 25.

A participant – why are we doing this work.

Chair- we established that these terms are broken and should be fixed.

A participant – what is our exit criteria

A participant – there are real benefits from this work – I want to know if I need to change my IP address when I switch from one AP to another.

Chair – agrees to organize the work and generate a list of goals.

A participant – I think we should set what an ESS is. HESS is a new concept.

Chair – that is where we started – but things unraveled to where we are now. We determined that we can’t even ask the question without sorting out what are the concepts we want to capture. So, we are trying to define the concepts.

Chair – as an attempt to solve this problem – what does the STA need to know regarding mobility?

Discussion defining useful groups of BSSs, versions A-E were proposed:

Version A:

* + Same subnet
	+ IP address doesn’t change with mobility within a Version A
	+ “802.1Q Bridged Network”
	+ One DS
	+ Can Reassociate
	+ Can’t necessarily FT between all APs (more than one “mobility domain”) (not just because equipment is not capable/configured)
	+ Examples: 2 buildings far enough apart to not support FT (each building has its own “mobility domain”); groups of APs where there is too much latency between the groups to handle FT; <x>ESS subsetted to limit number of clients within each subset that can FT (each mobility domain has limited resource requirements)

Version B:

* + Access to the same authentication domain (RADIUS) – same database
	+ Not necessarily same subnet, etc.
	+ “Roaming Consortium”, etc. “Visited network”, “NAI Realm”

Version C:

* + Same accounting for use

Version D:

* + Same subnet
	+ IP address doesn’t change with mobility within a Version D
	+ “802.1Q Bridged Network”
	+ More than one DS
	+ Can’t reassociate across the DSs

Version E:

* + Same subnet
	+ IP address doesn’t change with mobility within a Version E
	+ “802.1Q Bridged Network”
	+ One DS
	+ Can reassociate
	+ Can FT

Version F:

* + Same/consistent security parameters

No agreement on the necessity of Versions A-F or how they are named.

Recessed 12:32 CET

# Tuesday, 8 May 2018, at 16:00 CET

**Call to order 16:03 CET.**

**Agenda document:** [11-18/0644r3](https://mentor.ieee.org/802.11/dcn/18/11-18-0644-03-0arc-arc-sc-agenda-may-2018.pptx)

**Administration:**

The Chair reviewed the Administrative information in slides 5-10 in Agenda document,

**Call for Patents:**

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

**Agenda Items:**

* + **“What is an ESS?”**
	+ **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)**
	+ **MLME-RESET, versus MLME-JOIN and MLME-START**

**Approval of the Agenda:**

The Chair asked which item we should talk about. – there was no response to the question

Chair indicated we would continue to discuss “What is an ESS?”

Reviewed version A-F – Slides 27-32 [11-18/0644r3](https://mentor.ieee.org/802.11/dcn/18/11-18-0644-03-0arc-arc-sc-agenda-may-2018.pptx)

Continued discussion on <x>ESS and refined slides.

In recess – 17:59 CET.

# Wednesday, 9 May 2018, at 8:00 CET

**Call to order 8:03 CET**

**Agenda document:** [11-18/0644r3](https://mentor.ieee.org/802.11/dcn/18/11-18-0644-03-0arc-arc-sc-agenda-may-2018.pptx)

**Agenda:**

**Administration**

**TGba joint meeting preparation:**

**802.11ba Architecture Discussion** [11-18/0884r0](https://mentor.ieee.org/802.11/dcn/18/11-18-0884-00-0arc-802-11ba-architecture-discussion.pptx) **– Ganesh Venkatesan (Intel)**

**Future sessions / SC activities**

**Administration:**

The Chair reviewed the Administrative information in slides 5-10 in Agenda document,

**Call for Patents:**

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

Proposed agenda:

**Approval of the Agenda:**

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

The proposed agenda was approved by unanimous consent.

**802.11ba Architecture Discussion** [11-18/0884r0](https://mentor.ieee.org/802.11/dcn/18/11-18-0884-00-0arc-802-11ba-architecture-discussion.pptx) **– Ganesh Venkatesan (Intel)**

The discussion raised the following points and questions:

1. WUR is basically an overlay to existing power save modes.
2. On Slide 4- suggest adding legacy PS mode “configuration”
3. Also on Slide 4 Unassociated is a state, Associated is a state, but WUR-mode parameter exchange is not a state. Update to states WUR configured, WUR Sleep.
4. Slide 5 –
5. Does the non-AP STA when it wakes up via WUR and is in PCR state – what is the PCR timing on wake – how is this maintained?
6. Roger – noted the WUR discovery frame provides a low power means of discovering APs.
7. Do we want to add a slide about this mode?
8. Is the non-AP STA after WUR wake, fully awake and immediately asking for its data frames?

Or

Is the non-AP STA after WUR wake, wakes in legacy PS mode?

1. Are the AP sending WU frames and the associated AP required to be collocated and in communication?
2. If no what information needs to be shared between the APs?
3. Are WU frames protected frames? If so, how are security parameters shared between the AP sending WU frames and the associated AP?
4. What bands can the associated AP be in: 2.4, 5, 60, others?
5. What bands can the WU AP be in: 2.4, 5, 60, others?
6. Is WUR band agnostic?
7. Is the PCR band agnostic?
8. Mobility:
Can the non-AP STA roam to a new WU AP? A new associated AP?
9. Is the WUR used to do scanning? Does the non-AP STA maintain DL data connectivity when the non-AP STA is mobile?
10. Discovery frame – is it sent by the AP?
11. Is WUR limited to infrastructure only?
12. Should the “legacy PS mode” be limited PS poll mode and U-APSD?
13. On wake up – should the non-AP STA send a data null, trigger frame, or PS poll?
14. How are security keys maintained?
15. There are now two radios in a non-AP STA, this needs to be captured somewhere.

These questions will be shared with TGba and be discussed in the joint TGba/ARC SC session Thursday, 10 May 2018, at 16:00 CET. Ganesh Venkatesan agreed to update the document with these questions: [11-18/0884r1](https://mentor.ieee.org/802.11/dcn/18/11-18-0884-01-0arc-802-11ba-architecture-discussion.pptx)

**Future sessions / SC activities**

**Planning for July**, slide 39: [11-18/0644r3](https://mentor.ieee.org/802.11/dcn/18/11-18-0644-03-0arc-arc-sc-agenda-may-2018.pptx)

Planning – July 2018 – 3 Slots plus Joint session with TGba? – The Chair will discuss with TGba.

**Teleconferences:**

Joint with TGba: Thursday May 24 @ 1200 (noon) ET and Thursday June 21 @ 12:00 (noon) ET.

Any additional teleconferences will be announced with 10 days’ notice.

**Adjourned: 10:03 CET**

# Thursday, 10 May 2018, at 16:00 CET

Joint meeting TGba and ARC SC session Minutes are captured in the 80211 TGba minutes: [11-18/0999r0](https://mentor.ieee.org/802.11/dcn/18/11-18-0999-00-00ba-meeting-minutes-may-2018)

Note: final agenda slide deck is: [11-18/0644r3](https://mentor.ieee.org/802.11/dcn/18/11-18-0644-03-0arc-arc-sc-agenda-may-2018.pptx) and closing report is: [11-18/0981r2](https://mentor.ieee.org/802.11/dcn/18/11-18-0981-02-0arc-arc-closing-report-may-2018.pptx)