IEEE P802.11
Wireless LANs

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| ARC SC Meeting Minutes July 2017  |
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| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Joseph Levy | InterDigital Communications, Inc. | 2 Huntington Quadrangle 4th floor, South WingMelville, NY 11747 | +1.631.622.4139 | joseph.levy@interdigital.com |

Abstract

This document contains the minutes of the IEEE 802.11 ARC SC meeting sessions held on 11 July 2017 at 16:00 CET, and 12 July 2017 at 8:00 CET in Berlin, Germany. Notes are also provided for the 10 July 2017, at 8:00 CET, TGab ARC related discussion held during the TGba ad hoc session.

Note: Highlighted text are action items.

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# TGba Ad Hoc meeting, Monday, 10 July 2017, at 8:00 CET

**ARC presentation/discussion in 802.11 TGba –** [**11-17/1025r0**](https://mentor.ieee.org/802.11/dcn/17/11-17-1025-00-0arc-11ba-arch-discussion.pptx) **“802.11ba Architecture Discussion” Presented by: Mark Hamilton, Ruckus/Brocade (ARC SC Chair)**

**Official minutes:** [**11-17/1197r0**](https://mentor.ieee.org/802.11/dcn/17/11-17-1197-00-00ba-meeting-minutes-july-2017.docx)

**Some additional notes from the meeting, as taken by Joseph Levy, ARC SC Vice Chair/Secretary:**

The discussion started with Mark Hamilton (Ruckus/Brocade) the ARC SC Chair presenting [11-17/1025r0](https://mentor.ieee.org/802.11/dcn/17/11-17-1025-00-0arc-11ba-arch-discussion.pptx). After the presentation the following discussion took place:

* Statement: for the STA we have specific operation. There is a separate PHY, the MAC needs to work with the main radio MAC. But, we are trying not to touch the main radio MAC. I haven’t looked at the architecture in detail.
* Response: What is the feedback, is it a separate stack with a main .11 MAC/PHY in sleep mode and a wake up radio with a separate MAC/PHY which wakes up the main radio?
* Statement: there is a signal to wake up the main radio, but we haven’t really addressed this yet.
* Statement: 802.11 TGba haven’t looked at the system architecture, but the PAR says we are developing an PHY and a simple MAC to pass the packet structure to the main radio MAC. But, this has yet to be defined. So we should work on answering these questions.
* Response: I tend to think about things from a top down approach. How do you talk about the WUR?
* Statement: 802.11 TGba is trying to use as much as possible the current .11 MAC – but we will not use the current 48-byte address, as it is too long – we intend to reuse, but there are differences
* Statement: WUR will have an ID, this will not be the MAC Address – but what it will be is TBD.
* Statement: These are good questions – the WUR is a totally new MAC/PHY – independent of the legacy MAC/PHY. But, the WUR is a companion radio, so it doesn’t operate by itself, it needs the main radio to operate. The WUR is configured using the Main Radio.
* Response: The main radio has a MAC address; how does this relate to the WUR?
* Statement: The WUR does not have its own MAC address just an ID.
* Response: I think I’m hearing some agreement in the group that the WUR is an independent radio, but its characteristics are negotiated by the main radio.
* Statement: The main radio associates, so it will be part of the BSS – transmission of the WUR will have legacy preamble, 802.11ba has been considering it to be p2p.
* Statement: About question 3 (On slide 8: Does the WUR work with all 802.11 PHYs e.g. a, b, g, n, ac, ad, ah, ax, ay?) WUR will be in 2.4 and 5GHz bands, but ad, ay, ah may not be included. But, if you look at the PAR all PHYs are included.
* Statement: To clarify the WUR will be in the 2.4/5 GHz band – but the main radio can operate on a different band. 802.11 TGba needs to look at all the signaling and where it can be put in the main radio types.
* Statement: On question 4 (On slide 8: Does the WUR work with mesh STAs? IBSS? OCB?) 802.11 TGba has a single device that can wake up another device. Hence there is a hierarchy, so a flat architecture does not apply. So Mesh/IBSS/OCB which all have a flat architecture will probably not be supported.
* Statement: 802.11 TGba’s focus is on the AP/STA model.
* Statement: WUR does not use the MAC SAP interface.
* Response: So the WUR does not deliver “Data”

Summary: WUR is independent MAC/PHY, it does not have its own MAC address as it is associated with the main radio, but it does have a ID which is negotiated over the main radio. Also the WUR does not send data and has no MAC SAP. The WUR does have a link to the main radio MAC to wake the main radio up.

# Tuesday, 11 July 2017, at 16:00 CET

**Administration:**

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

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

Note: 802.11 ARC SC joined the 802.1 Trk 1: TSN meeting at 16:00 CET to discuss comments on IEEE 802.1AS Rev D5.0 as provided by Ganesh Venkatesan (Intel) in [11-17/1086r1](https://mentor.ieee.org/802.11/dcn/17/11-17-1086-01-0arc-ieee-802-1as-d5-0-review-comments.pptx). The following are some notes from the 802.1 Trk 1: TSN meeting while members of the ARC SC were present (these notes are not the official minutes for the 802.1 Trk 1: TSN meeting.

The 802.1AS Chair provided a summary of the status of 802.1AS – which is still in open ballot. So additional comments maybe still posted.

Ganesh Venkatesan (Intel Corporation) presented [11-17/1086r1](https://mentor.ieee.org/802.11/dcn/17/11-17-1086-01-0arc-ieee-802-1as-d5-0-review-comments.pptx) which discusses 15 comments, 4 are editorial and were not discussed. The remaining 11 comments are broken down to 3 sets: 2 need additional discussion in ARC, 8 need discussion with 802.1AS, and 1 Needs discussion with 802.11md and 802.11az.

Started the discussion on slide 6 [11-17/1086r1](https://mentor.ieee.org/802.11/dcn/17/11-17-1086-01-0arc-ieee-802-1as-d5-0-review-comments.pptx), to address the 8 comments that need discussion with 802.1AS.

802.1AS – have a burst duration - discussion on what is meant by infinite – discussion of number of frames per burst, and periodicity of the burst. The original concept of burst was to increase the accuracy in a period of time. The current maximum # of measurements in the burst is 31. A burst is short exchange between Master and Slave – what are the period of the burst frames. On Slide 8 the burst signaling flow is shown.

Concern was raised regarding existing sessions being terminated by an additional location request.

Also concern – about the UE always being on for timing.

Well we would also be sending audio frames at the same time, while keeping timing going.

802.1AS is concerned with timing drift and accuracy. Can’t location and timing both be done at the same time?

802.11 FTM can only run one session at any given time. It is expected that location will probably use different frequency channels. Concern about running things in parallel – so proposal to use TM for timing and reserving FTM for location accuracy.

Ganesh will add option C and D.

Note: current version of the document is [11-17/1086r4](https://mentor.ieee.org/802.11/dcn/17/11-17-1086-04-0arc-ieee-802-1as-d5-0-review-comments.pptx)

802.11 ARC SC members left 802.1AS room.

**Administration:**

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

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

**Meeting call to order in ARC meeting room by Chair 17:47 CET, 11 July 2017**

Proposed Agenda slide deck: [11-17/0886r1](https://mentor.ieee.org/802.11/dcn/17/11-17-0886-01-0arc-arc-sc-agenda-july-2017.pptx) , proposed agenda copied here for reference:

Tuesday, July 11, PM2

* Administrative: Minutes
	+ IEEE 1588 mapping to IEEE 802.11
	+ 802 activities
	+ IETF/802 coordination
* 802.1ASrev use of FTM
* Investigation of WUR architecture topics; 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)
	+ MIB attributes Design Pattern - [11-14/1281r4](https://mentor.ieee.org/802.11/dcn/14/11-14-1281-04-0arc-mib-attributes-analysis.docx), [11-15/0355r4](https://mentor.ieee.org/802.11/dcn/15/11-15-0355-04-0arc-mib-truthvalue-usage-patterns.docx), [11-17/0475r3](https://mentor.ieee.org/802.11/dcn/17/11-17-0475-03-0arc-mib-pattern-analysis.xlsx), [11-09/0533r1](https://mentor.ieee.org/802.11/dcn/09/11-09-0533-01-0arc-recomendation-re-mib-types-and-usage.ppt)
	+ YANG/NETCONF modeling discussions – [11-16/1436r1](https://mentor.ieee.org/802.11/dcn/16/11-16-1436-01-0arc-yang-modelling-and-netconf-protocol-discussion.pptx)
	+ 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), [11-16/0720r0](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)
	+ “What is an ESS?”

Wednesday, July 12, AM1

* + MIB attributes Design Pattern (cont.)
	+ AP/DS/Portal architecture and 802 and GLK concepts (cont.)
	+ “What is an ESS?” (cont.)

Future sessions / SC activities

**Administration:**

The Chair reviewed the Administrative information in slides 5-10 in Agenda document, [11-17/0886r1](https://mentor.ieee.org/802.11/dcn/17/11-17-0886-01-0arc-arc-sc-agenda-july-2017.pptx)

**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 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:**

* **May face-to-face minutes:** [**11-17/0864r0**](https://mentor.ieee.org/802.11/dcn/17/11-17-0864-00-0arc-arc-sc-meeting-minutes-may-2017.docx) **-** approved by unanimous consent.
* **May 30 teleconference minutes:** [**11-17/1039r0**](https://mentor.ieee.org/802.11/dcn/17/11-17-1039-00-0arc-arc-sc-teleconference-meeting-minutes-30-may-2017.docx) **-** approved by unanimous consent.
* **June 27 teleconference minutes:** [**11-17/1125r0**](https://mentor.ieee.org/802.11/dcn/17/11-17-1125-00-0arc-arc-sc-teleconference-meeting-minutes-27-june-2017.docx) **-** approved by unanimous consent.

**IEEE 1588 mapping to IEEE 802.11**

The Chair reported:

* Still tracking this activity
* The Chair is not aware of any issues related to 802.11

**IEEE 802 Activity**

The Chair reported:

* 802.1Q revision is underway, 2017, to roll in:
	+ IEEE Std Qcd-2015,
	+ IEEE Std 802.1Qca-2015,
	+ IEEE Std 802.1Q-2014 Cor 1-2015,
	+ IEEE Std 802.1Qbv-2015,
	+ IEEE Std 802.1 Qbu-2016,
	+ IEEE Std 802.1Qbz-2016
* 802.1AC-2016 published

**IETF/802 coordination:**

The Chair called for any input on IEFT activity – none was provided.

**TGba architecture comments (from Mon AM1):**

The Chair reviewed the discussion with 802.11 TGba on Monday AM1 (see Slide 18 from [11-17/0886r2](https://mentor.ieee.org/802.11/dcn/17/11-17-0886-02-0arc-arc-sc-agenda-july-2017.pptx), and notes above which were not available during this meeting.)

**Recessed 18:04 CET**

# Wednesday, 12 July 2017, at 8:00 CET

**Administration:**

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

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

**Meeting call to order by Chair 8:09 CET, 12 July 2017**

**Proposed Agenda slide deck:** [11-17/0886r2](https://mentor.ieee.org/802.11/dcn/17/11-17-0886-02-0arc-arc-sc-agenda-july-2017.pptx) (note: [11-17/0886r3](https://mentor.ieee.org/802.11/dcn/17/11-17-0886-03-0arc-arc-sc-agenda-july-2017.pptx) was created in this session)**,** proposed agenda copied here for reference:

Wednesday, July 12, AM1

* + MIB attributes Design Pattern (cont.)
	+ AP/DS/Portal architecture and 802 and GLK concepts (cont.)
	+ “What is an ESS?” (cont.)
	+ Future sessions / SC activities

The Chair reviewed the Administrative information in slides 5-10 in the 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 called for comments or amendments to the agenda, the agenda was discussed, modified, and approved by unanimous consent.

 Wednesday, July 12, AM1

* + Investigation of WUR architecture topics; 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)
	+ MIB attributes Design Pattern (cont.)
	+ AP/DS/Portal architecture and 802 and GLK concepts (cont.)
	+ “What is an ESS?” (cont.)
	+ Future sessions / SC activities

**Investigation of WUR architecture topics:**

* Reviewed and discussed the TGba slides ([**11-17/1025r0**](https://mentor.ieee.org/802.11/dcn/17/11-17-1025-00-0arc-11ba-arch-discussion.pptx)) and slide 18 of [11-17/0886r2](https://mentor.ieee.org/802.11/dcn/17/11-17-0886-02-0arc-arc-sc-agenda-july-2017.pptx), the Chairman’s notes from TGba Ad Hoc meeting, Monday, 10 July 2017, at 8:00 CET, generating some additional questions/comments:
	+ Yes, fully independent PHY
	+ Probably independent MAC?
	+ Always co-located with AP or non-AP STA
	+ No MAC Address (?)
	+ WUR MAC (assuming it is independent) does need to coordinate with the main MAC. Main MAC negotiates a WUR ID on WUR’s behalf, for example. And, power on/off needs to be coordinated between them – might be through higher layer entity, though (?)
	+ WUR does not associate to the BSS (it doesn’t have a MAC Address)
	+ WUR only runs in 2.4/5 GHz. But, can work with all PHYs (maybe?)
	+ Mesh, IBSS, OCB uses are TBD in the future, not now
* Is the WUR receive mode exclusive of WUR transmit mode?
* Does each WUR receiver connects to only one main radio?
* It was suggesting that [11-17/972r1](https://mentor.ieee.org/802.11/dcn/17/11-17-0972-01-00ba-definition-of-wur-mode.pptx) be look at for a definition of WUR mode.
note [11-17/972r2](https://mentor.ieee.org/802.11/dcn/17/11-17-0972-02-00ba-definition-of-wur-mode.pptx) is now available.
* Note that the agenda deck was updated to capture the additional questions/comments: [11-17/0886r3](https://mentor.ieee.org/802.11/dcn/17/11-17-0886-03-0arc-arc-sc-agenda-july-2017.pptx)

**MIB attributes Design Pattern**

MIB pattern document has been update to [11-15/0355r5](https://mentor.ieee.org/802.11/dcn/15/11-15-0355-05-0arc-mib-truthvalue-usage-patterns.docx), needs review and discussion.

**Future sessions / SC activities**

Future sessions were discussed and it was decided that:

* **Plan for three individual meeting slots**
	+ Usual slot on Wed AM1
	+ Another slot for standalone ARC work (Monday/Tuesday?)
	+ Another slot (Thursday’s slot)?
	+ Joint sessions: TGba
* **Individuals interested in ARC work are encouraged to also attend AANI SC sessions**
* **Teleconferences:**
	+ Schedule discussion of TGba, try to get to a block diagram
	+ Schedule discussion of MIB
	+ Schedule with 10 days’ notice

**Adjourn 10:03 CET, 12 July 2017**

Note final agenda slide deck is: [11-17/0886r4](https://mentor.ieee.org/802.11/dcn/17/11-17-0886-04-0arc-arc-sc-agenda-july-2017.pptx) and closing report is: [11-17/1149r0](https://mentor.ieee.org/802.11/dcn/17/11-17-1149-00-0arc-arc-closing-report-july-2017.pptx)