IEEE P802.11  
Wireless LANs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ARC SC and joint meetings Minutes March 2016 | | | | | |
| Date: 2016-03-23 | | | | | |
| Author(s): | | | | | |
| Name | Affiliation | Address | | Phone | email |
| Joseph Levy | InterDigital Communications, Inc. | | 2 Huntington Quadrangle  4th floor, South Wing Melville, NY 11747 | +1.631.622.4139 | joseph.levy@interdigital.com |
| Mark Hamilton | Ruckus Wireless | 350 W Java Dr.  Sunnyvale, CA 94089 | | +1-303-818-8472 | [mark.hamilton@ruckuswireless.com](mailto:mark.hamilton@ruckuswireless.com) |

Abstract

Minutes of the IEEE 802.11 ARC Standing Committee meeting held on 14h, 16th, and 17th of March 2016, in Macau. Note: this document also includes the minutes of the ARC SC joint meetings with 802.11 TGak and 802.1, which was held on 17th of March during the AM1 time slot.

**Contents:**

[Monday, March 14th, PM2, 16:00 (CT) ARC SC Meeting 3](#_Toc447019228)

[Wednesday, March 16th, AM2, 8:00 (CT) ARC SC Meeting 5](#_Toc447019229)

[Wednesday, March 16th, PM1, 13:30 (CT) ARC SC Meeting 7](#_Toc447019230)

[Thursday, March 17th, AM1, 8:00 (CT) Joint 802.11 ARC SC, 802.11 TGak, 802.1 session 8](#_Toc447019231)

# Monday, March 14th, PM2, 16:00 (CT) ARC SC Meeting

**Administration:**

**Chair: Mark Hamilton, Ruckus**

**Vice Chair Joseph Levy, InterDigital**

**Meeting call to order by Chair 16:01, 14 March 2016**

**Proposed Agenda slide deck:** [**11-16-0236-00-0arc-arc-sc-agenda-mar-2016.ppt**](https://mentor.ieee.org/802.11/dcn/16/11-16-0236-00-0arc-arc-sc-agenda-mar-2016.ppt) **, updated during the meeting to r1**

Monday, Mar 14, PM2

* Administrative: Minutes
* 802.11 as a component in a (larger) system/5G/IMT-2020: 11-15/0757r1, 11-15/0593r2, 11-15/0842r1, 11-15/1133r0, 11-15/1266r1, 11-15/1376r2

Wednesday, Mar 16, AM1

* 802.11 as a component in a (larger) system/5G/IMT-2020: 11-15/0757r1, 11-15/0593r2, 11-15/0842r1, 11-15/1133r0, 11-15/1266r1, 11-15/1376r2

Wednesday, Mar 16, PM1

* Updates, no action expected: IEEE 1588 mapping to IEEE 802.11
* IETF/802 coordination: update on multicast over 802.11: 11-15/1261r2
* 802.1AC status update
* AP/DS/Portal architecture and 802 concepts - 11-15/0454r0,   
  11-14/1213r1 (slides 9-11)
* MIB attributes Design Pattern - 11-15/0355r3, 11-15/0891r0
* Future sessions / SC activities

Joint session with TGak and 802.1, Thursday, Mar 17, AM1

**Administration:**

The Chair reviewed the Administrative information in slides 5-9 in the Agenda document (11-16/0236r0)

**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 proposed Agenda slide 10 of the Agenda document (11-16/0236r0) - copied above was reviewed, no comments or changes were proposed, the proposed agenda was approved by unanimous consent.

**Administrative: Minutes**

Minutes approved by unanimous consent for:

The ARC SC, January 2016, Atlanta, GA Meeting ([11-16/0157r0](https://mentor.ieee.org/802.11/dcn/16/11-16-0157-00-0arc-arc-sc-and-joint-meetings-minutes-january-2016.docx))

**802.11 as a component in a (larger) system/5G/IMT-2020**

Joseph Levy (InterDigital) presented – 11-16/0376r0 and it was discussed

Three main use cases in IMT document:

* + Enhanced Mobile Broadband
    - Wide-area coverage – seamless mobility, etc.
    - Hotspot (high density, high traffic capacity, high-speed)
  + Ultra-reliable and low latency
  + Massive machine type communications

Discussion:

* This does the right thing, breaking down their use case/scenarios and showing how 802.11 can map to it.
* Consider 11ad as an Ultra-reliable mapping, because it allows quickly/easily using multiple bands. Also, 11ai, 11aq as mechanisms to help with that.
* But, their meaning of “ultra-reliable/low latency” could be different than our thoughts about multi-radio reliability and speed of switching.
* We don’t (necessarily) meet all the requirements as envisioned by IMT-2020, because we are a “low layer” standard only. Show how we meet the underlying structure/foundation to build up to those requirements.
* Have heard that IMT-2020 is meant to be a longer-lived system (than previous G’s), lasting from 2020 to 2035. This implies technology probably has to be upgradable over-the-air.
* Do we really understand the whole landscape of how this is evolving at ITU? IMT has seemed to be based on “what happens at the end of a fibre?” There is spectrum allocation coming with this discussion. Do we focus on self-preservation? From comments coming from IMT/5G leaders, it seems 802.11 has virtually no mind-share.
* Back to the Ultra-reliable/low-latency item, and what do we say about that from 802.11? Tried to understand what IMT means by this – it seems to be safety of life, necessary utilities, etc. The requirements (and their vagueness) is often driven by the cellular-centric view. Do we try to zoom out to the real application, and approach it as how 802.11 could (in some circumstances) support the applications, even if not the way the requirements are being expressed?
* We need to be careful with terms, this is “safety related” not “safety of life”. There are specific meanings to those terms.
* It is probably too late (or would take a lot of effort) to change the perspective of how the requirements are viewed – e.g., to take out assumptions that result in favour to synchronous systems.
* We could focus on the hotspot niche, where we likely fit more easily into their current way of thinking/describing the requirements.
* We are okay with 802.11p shown as mapping to “Ultra-reliable/Low-latency”, because it is one part (but only one part – not a standalone complete solution) for vehicle safety communications.
* We could (should we?) show 802 on the “spider web” drawing? On the “triangle” drawing?
* We are back to the question of are we only trying to protect our (existing or envisioned) spectrum, or are we trying to make a place for ourselves in IMT-2020 (with a side-effect of protecting our spectrum)?
* What is needed for the basis of our argument (if we make one) to make 802.11 a technology in IMT-2020? Is that really the right question, or are we only at the point of providing information into the EC SC, to help the discussion there, and IFF that progresses, then we worry about “selling” IMT? The mapping drawing Joe has presented is probably a good starting point for the 802 discussion.
* We would like to split the capabilities that add/enhance the MAC/PHY (11az, 11aq, 11ak, etc.) from the MAC/PHY. It’s easier to show the MAC/PHYs mapping to the ITU/IMT categories, and then the enhancing items mapping to the MAC/PHYs.

The Chair recessed the meeting at 18:00.

# Wednesday, March 16th, AM2, 8:00 (CT) ARC SC Meeting

**Administration:**

**Chair: Mark Hamilton, Ruckus**

**Vice Chair Joseph Levy, InterDigital**

**Meeting call to order by Chair 8:05, 16 March 2016**

**Administration:**

The Chair reviewed the Administrative information in slides 5-9 in the Agenda document (11-16/0236r1)

**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 proposed Agenda slide 10 of the Agenda document (11-16/0236r2), copied below - was reviewed, no comments or changes were proposed, and the proposed agenda was approved by unanimous consent.

**Wednesday, Mar 16, AM1**

* + **TGaq architecture discussion update 11-16/0239r3**
  + **802.11 as a component in a (larger) system/5G/IMT-2020:** [11-15/0757r1](https://mentor.ieee.org/802.11/dcn/15/11-15-0757-01-0000-802-11-as-a-component-tutorial.pptx), [11-15/0593r2](https://mentor.ieee.org/802.11/dcn/15/11-15-0593-02-0arc-802-11-as-a-component.ppt), [11-15/0842r1](https://mentor.ieee.org/802.11/dcn/15/11-15-0842-01-0arc-ieee-802-11-in-5g.pptx), [11-15/1133r0](https://mentor.ieee.org/802.11/dcn/15/11-15-1133-00-0arc-existing-oam-interface-specifications.pptx), [11-15/1266r1](https://mentor.ieee.org/802.11/dcn/15/11-15-1266-01-0000-tutorial-panel-discussion-perspectives-on-ieee-802-11-in-5g.ppt), [11-15/1376r2](https://mentor.ieee.org/802.11/dcn/15/11-15-1376-02-0arc-update-on-3gpp-ran3-multi-rat-joint-coordination.pptx)

**TGaq architecture discussion update 11-16/0239r3 – Stephen McCann (BlackBerry)**

Stephen presented 11-16/0239r3 for comment and review by the ARC SC.

There was some discussion for clarification. The proposed architecture for TGaq was basically agreed as the preferred way forward.

**802.11 as a component in a (larger) system/5G/IMT-2020**

* EC SC on 5G and IMT-2020 has met twice since our Monday slot: Monday night and Tuesday night.
* Reviewed Glenn Parson’s slides ([ec-16/0017r2](https://mentor.ieee.org/802-ec/dcn/16/ec-16-0017-02-5GSG-5g-sc-agenda-march-2016.pdf) )
  + Standing Committee (SC) formed by EC in January
  + Scope is to consider: IEEE 5G specification; or a proposal to IMT-2020 for a single technology, multiple technologies, or one or more technologies via some other body (e.g., 3GPP)
* Talked to the “simplified architecture” drawing, on slide 12. Noted that the natural thought from “IMT/cellular” community, is that the right hand side of this architecture drawing (the “Core”) needs to be a complicated and sophisticated service(s) provision. Not sure that IEEE 802 agrees or needs to agree to this. We (802) provide a lot of connectivity today, without a lot of centralized and sophisticated “back-end”.
* Noted that discussion last night involved a concern that IEEE 802 doesn’t have a lot of solution to offer for “mobility”, which is the “M” in IMT. But, 802 does offer a lot for IoT, Hotspots, etc., which is all a big part of what 5G wants to address. Much of this is because we (IEEE 802) are experts in, and scoped by, Layers 1 and 2. But, we have expertise on how to include these technologies into a bigger structure, and 5G is probably an example of that – so we should try to steer the discussion to include that expertise and discussion.
* We do need to consider how to (or how much to) address the management of network components, even at our layers. We are more than just a PHY/MAC, or perhaps need to do a more complete job so that we are more than just the PHY/MAC.
* This leads into the discussion of whether we should be defining an IEEE 5G. This could be our own complete system and solution, which might be “a 5G” if we get IMT to agree, or just keep as our own equivalent system.
* One big difference in philosophy/thinking between the communities, is the use of unlicensed spectrum and individual users’ deployment (getting the service you get as a result), versus licensed spectrum and centralized deployment and management to deliver required services like emergency services.
* We should start by carefully defining what the different approaches are, before we try to decide which (or more than one) to do.
* Do we (IEEE 802, in the “IEEE 5G”) deliver to the same requirements/features of a 3GPP system (including mobility, centralized tracking/control, etc.)?
* We all agree that 802 can deliver a lot of the items in the “triangle” view (slide 5 of [ec-16/0041r1](https://mentor.ieee.org/802-ec/dcn/16/ec-16-0041-01-5GSG-802-11-5g-technologies-for-5g-sc.pptx))
* IMT-2020 has a set of customers, the ~300 providers, and is trying to figure out how to deliver services to their customers, that IEEE 802 delivers today (other items on the triangle). Right now, IMT delivers 6% of the internet traffic, using quite a lot of spectrum. They are looking for more spectrum to deliver these additional use cases/triangle items. We could (should?) go to the ITU and say that we are \_not\_ IMT, and don’t want to be. We deliver our own solutions, and deserve our spectrum to do it, alongside IMT. This gets to a question about how/where spectrum discussions happen. IMT is (mostly) looking at above 24 GHz. But, WRC is working on allocation within 5GHz (up to 6.4 GHz). These are related, but somewhat separate discussions.
* There will be another meeting of the EC SC today, 12:30 to 1:00 pm. This is (partly) driven by a desire to discuss further how we can preserve our spectrum, or even get more, and perhaps change the scope of the EC SC to discuss this, even if it goes beyond the scope of addressing the IMT-2020 topic, per se. This would be other work under Study Group 5.
* Another angle on thinking here is that we generally rely on the WFA to do “marketing” of 802.11, but these ‘governmental’ sorts of activities would like to also hear from the IEEE with advocacy for our spectrum.
* Does 802.11 want to have a position, to take into the EC on Friday, on the question about modifying the scope of the EC SC to talk about any activities with ITU-R beyond 5G/IMT-2020? This could be (we think): engage with WP 5A for spectrum discussions beyond 5G/IMT-2020; and/or engage with Task Group 1 (?) that is looking at 26.45 GHz of “co-primary” spectrum that is being considered to get the IMT stamp and also the spectrum sharing options needed to allow technologies in these bands.
* Reviewed the conference call and face-to-face meeting planning for the EC SC. Conference calls are likely to alternate times, to be equally challenging for Europe and Asia. The face-to-face meetings are still TBD, from the options of April 22 Tokyo, May 20 Waikoloa, May 25 Budapest, June 15 Ottawa, and July 25 San Diego.
* When we look at “IEEE 5G” are we thinking about the same “~300 customers” (the operators) as IMT thinks about with their 5G?

**The Chair recessed the meeting at 10:05.**

# Wednesday, March 16th, PM1, 13:30 (CT) ARC SC Meeting

**Administration:**

**Chair: Mark Hamilton, Ruckus**

**Vice Chair Joseph Levy, InterDigital**

**Meeting call to order by Chair 13:30, 16 March 2016**

**Administration:**

The Chair reviewed the Administrative information in slides 5-9 in the Agenda document (11-16/0236r3)

**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 proposed Agenda slide 10 of the Agenda document (11-16/0236r3), copied below - was reviewed, agenda was approved by unanimous consent.

**Wednesday, Mar 16, PM1**

* **Updates, no action expected:** IEEE 1588 mapping to IEEE 802.11
* **IETF/802 coordination:** update on multicast over 802.11: [11-15/1261r2](https://mentor.ieee.org/802.11/dcn/15/11-15-1261-02-0arc-mulicast-performance-optimization-features-overview-for-ietf-nov-2015.ppt)
* **802.1AC status update**
* **AP/DS/Portal architecture and 802 concepts -** [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)
  + **TGak joint topics on architecture –** [**11-16/0457r0**](https://mentor.ieee.org/802.11/dcn/16/11-16-0457-00-0arc-802-11ak-802-1ac-stas-aps-dses-and-convergence-functions.pptx)
* **MIB attributes Design Pattern -** [11-15/0355r3](https://mentor.ieee.org/802.11/dcn/15/11-15-0355-03-0arc-mib-truthvalue-usage-patterns.docx), [11-15/0891r0](https://mentor.ieee.org/802.11/dcn/15/11-15-0891-00-0arc-delta-r2r3-of-mib-truthvalue-usage-patterns.docx)
* **Future sessions / SC activities**

**Updates, no action expected:** IEEE 1588 mapping to IEEE 802.11

Agreed no actions at this point.

**IETF/802 coordination:** update on multicast over 802.11: [11-15/1261r2](https://mentor.ieee.org/802.11/dcn/15/11-15-1261-02-0arc-mulicast-performance-optimization-features-overview-for-ietf-nov-2015.ppt)

Dorothy Stanley (HPE) – reported that:

1. The Multi-cast draft is not yet available – though it is being worked by Charlie Perkins (Huawei) and Dorothy Stanley (HPE).
2. 802.11/.15 Tutorial is also not yet available – though it is being worked by Charlie Perkins (Huawei), Dorothy Stanley (HPE)
3. There will be an ITS BOF at the April IETF meeting, and announcement e-mail was sent. A request was made that a report of the BOF activities be provided at the next 802.11 meeting. Dorothy Stanley (HPE) agreed to this request.

**802.1AC status update**

No new information available – 802.1AC status is still waiting for an either-type assignment.

**AP/DS/Portal architecture and 802 concepts -** [11-15/0454r0](https://mentor.ieee.org/802.11/dcn/15/11-15-0454-00-0arc-some-more-ds-architecture-concepts.pptx), **TGak joint topics on architecture**[11-16/0457r0](https://mentor.ieee.org/802.11/dcn/16/11-16-0457-00-0arc-802-11ak-802-1ac-stas-aps-dses-and-convergence-functions.pptx)

Dick Roy presented (via Skype link) 11-16/0457r0 – which contains a new view of the architecture. No agreements were made.

**MIB attributes Design Pattern -** [11-15/0355r3](https://mentor.ieee.org/802.11/dcn/15/11-15-0355-03-0arc-mib-truthvalue-usage-patterns.docx), [11-15/0891r0](https://mentor.ieee.org/802.11/dcn/15/11-15-0891-00-0arc-delta-r2r3-of-mib-truthvalue-usage-patterns.docx)

The goal is to complete what we have so that it can be used as guidance to the TGs. Chair of 802.11 requests that we finish the document and send it on. The ARC SC Chair stated that the work load in the ARC SC is getting lighter, as the work related to TGak and 802.1 is finishing up, also 802 EC 5G SC work will probably be moving outside of the ARC SC. Hence we should have time to complete the MIB attributes work. The 802.11 Chair agreed to circulate a list of applicable documents to aid in the completion of this work.

**Future sessions / SC activities**

Plan for two individual meeting slots: the usual slot on Wed AM1, and another slot for standalone ARC work (Monday/Tuesday?); a slot for a joint session with 802.11ak and 802.1 (Thru AM1)

No scheduled teleconferences – will schedule with 10 days’ notice if necessary.

Individuals interesting in ARC should consider participating in TGak and/or TGaq sessions and monitoring 5G/IMT-2020 discussions.

**The Chair recessed the meeting at 15:30.**

# Thursday, March 17th, AM1, 8:00 (CT) Joint 802.11 ARC SC, 802.11 TGak, 802.1 session

**Administration:**

**802.11 ARC SC Chair: Mark Hamilton, Ruckus**

**802.11 TGak Chair: Donald Eastlake, Huawei**

**802.1 Vice Chair: John Messenger**

**Secretary/802.11 ARC Vice-Chair Joseph Levy, InterDigital**

**Meeting call to order by Chair 8:10, 17 March 2016**

Status – 802.11TGak

First recirculation Letter Ballot completed 84% approval increased to 91% approval. Currently resolving comment from the recirculation ballot, anticipate next recirculation ballot in September.

Status – 802.1Qbz

First sponsor ballot recirculation ballot was clean (no comments), therefore the draft is going to RevCom for unconditional approval. The draft fixes tag stacking and references to AC.

Status – 802.1AC

Still waiting for the RAC to issue an either-type (LLC encapsulation either-type) before going into recirc. Anticipate a ballot before July.

802.11 TGak/802.1Qbz conference calls:

Agreed 3/28, 4/18, 4/25, 5/2 at 10:00 EDT by unanimous consent.

**The Chair adjourned the meeting at 8:32 CT**