IEEE P802.11
Wireless LANs

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| ARC SC Teleconferences Minutes January 2022 - Interim |
| Date: 2022-01-19 |
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Abstract

This document contains the minutes of the IEEE 802.11 ARC SC teleconferences held on 17 January 13:30-15:30 h ET, 19 January 11:15-1:15 h ET.

Note: Highlighted text are action items. A- precedes comments from the document’s author, C- precedes comments, R- precedes responses to comments.

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# Monday 17 January 2022 at 13:30-15:30 h ET

## Administration:

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

**Vice Chair: Joseph Levy, InterDigital**

**Secretary: Joseph Levy, InterDigital**

**Meeting called to order by the Chair 13:30 ET**

Agenda slide deck: [11-21/1994r1](https://mentor.ieee.org/802.11/dcn/21/11-21-1994-01-0arc-arc-sc-agenda-jan-2022.pptx)

**Agenda Slides 4-15:**

**Registration Reminder**

**Reminders to Attendees**

**Call for Patents:**

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

**IEEE SA Copyright Policy:**

The chair reviewed the Copyright policy.

**Participation:**

The chair reviewed the participation policy.

**Approval of the Agenda**

**17 Jan 2022, 13:30 ET:**

* Reminder: 2 meetings this week: Monday 13:30 ET, Wednesday 11:15 ET
* Attendance, noises/recording, meeting protocol reminders
* Policies, duty to inform, participation rules
* Prior meeting minutes
* Contribution/discussion topics:
	+ Annex G way forward
	+ Clause 6
	+ IEEE Std 802 project(s) update/discussion
	+ TGbe informative annex
	+ Other topics?

**19 Jan 2022, 11:15 ET:**

* Attendance, noises/recording, meeting protocol reminders
* Policies, duty to inform, participation rules
* Contribution/discussion topics:
	+ Annex G way forward
	+ Clause 6
	+ IEEE Std 802 project(s) update/discussion
	+ TGbe informative annex
	+ Other topics?
* Next steps

The Chair reviewed the agenda and called for comments or amendments to the agenda.

None were forthcoming.

Approved by unanimous consent.

**Approval of Minutes (slide 19)**

**Move to approve the minutes of:**

Nov plenary: 11-21/1794

Dec telecons:

* + Dec 2: 11-21/1950

Moved: Joseph Levy

Second: Harry Bims

**These minutes were approved by unanimous consent**

## Clause 6

Graham – presenting 11-21/1822r1

C – Clause 6 is to provide the SAP definitions. Clause 11 provides the operations, but the SAP interface is about the service. If the SAP interface definition is useful is a different question. People have been sloppy with the content in Clause 6 – all variables should be defined where they cross the SAP. The behavior across the SAP should be clearly specify.

A – Agree, that is what Clause 6 should be doing. But currently it is basically boilerplate – people are sticking things in there with out thinking. When I provided Clause 6 inputs, I was adding the boiler plate.

C – The MLME associate – there are two for request and two for response – so it makes sense to me.

The OUI are useful. OUIs are valuable for implementation, they provide guidance as to what needs to be done. I would like to see sending action frames. From a standards description view – Clause 6 is full of errors and maintaining it is difficult, a huge amount of work. We can provide some generic guidance, so it makes sense to slim it down. If we slim it down, maintenance will be easier.

C – Clause 6.2 has been slimed down. – the whole idea of clause 6 is: our standard defines a box containing the services, we have upper layers and a SME, both interact with the closed box (via the MIB). Clause 6.2 provides a way of setting the MIB attributes, but it was done so using generic primitives – so it is more of a template, than specification of the actual parameters.

Regarding the 27 primitive parameters and 45 fields in the Association Request frame. The external stuff is only 27 things, and the other stuff is already known by the “box” - this is an interesting and critical distinction. It is important to define what is provided by the “higher layers” and what is know to the box. The receive and sending of frames needs to be clarified. Looking at the measurement report: Why does it not have request and return – there is no interface for the measurement report because it is contained in the box. We could streamline this information and make it more manageable by making some tables. But interesting things like scan or setkeys – which are not a protocol exchange – there is considerable mapping and activity is going on inside our box (for scan and setkeys) – but the rest could be a few tables and a template.

A – Thank you. There are a few services defined in Clause 6.3 that are important and are useful, but the other services could be dealt with in a manner similar what is done in clause 6.2.

C – The history of these primitives is from the ISO world: where there is always a request from the higher layer, which is confirmed by the lower layer and going the other way there are responses from the lower layers that are acknowledged by the higher layer. Some of this is probably being used and should be written somewhere.

C – Introducing generic primitives in Clause 6.3 will take some work, but it will be useful work and it should reduce the number of pages and help clarify the standard.

C – It is clear we need this interface – but it could simply be implementation dependent – streamlining would be good – and some of these things being defined allows a lot of external control, do we need to allow all this control – The DME opens the interface – but is this necessary. There are a lot of primitives that are simply set – which can be done with the MIB – so maybe some of these could simply be done by the MIB. Maybe limiting the MLME primitives to only where they are necessary.

R – What is the DME?

R – the DME is the device management entity – it is out of scope of the standard – it manages the device through the MLME interface – similar to our SME. (Secretarial Note: DME is a term used in 802.15 standards and related IETF documents)

R – concurred.

C – Agree with what has been said - the reason to have this Clause is to define what this external interface looks like – the specification defines frame formats and behavior is also defined (in the MAC/MLME) but we push SME to manage this. It is critical to see what the behavior/control is and how it functions.

Chair – It seems to be a good idea to capture things that are important, and it makes sense to make this more succinct. Defining what is in our box and what have we pushed into higher layers and how these map into management and protocol. So, what do we want to capture in clause 6? Once we know then we should decide how to move forward. Graham would you be willing to work on this?

Graham – Agree, to begin work on a set of rules for what should be specified in clause 6.3 and look in to doing something similar to 6.2.

Mark H. and Graham S. volunteer to continue this work and to support a discussion on the ARC reflector.

AI – Mark to announce this work on the WG reflector and note that the discussion will be on the ARC reflector.

## Annex G way forward

Consider scope/purpose for (new) Annex G – informative or normative, etc.

Replace Annex G with some other notation/style –[11-21/1797r2](https://mentor.ieee.org/802.11/dcn/21/11-21-1797-02-0arc-proposal-for-new-annex-g-frame-exchange-sequence-descriptions.docx) – Harry Bims

<https://mentor.ieee.org/802.11/dcn/22/11-22-0101-00-0arc-the-need-for-frame-exchange-sequences.pptx> - presented by Harry.

This is an overview of the FES and provides motivation and propose a way forward.

C – Thank you for focusing us. For clarification: an FES is always between two peer STAs. So, a STA may have more than one FES at the same time, e.g., an AP with MU STAs with BA, may have overlapping FES one for each AP/STA pair.

C – This is uncovering some new normative behavior that needs to be specified differently.

R – Different STAs will see different FES (especially for legacy devices)

C – How do these things overlap and what is the purpose and how do we define things better.

C – TXOPs are not FES – in a TXOP you can have more than one FESs. Also, FES sequences are different than frame exchanges. Just calling it a FES give the idea of what the peer STAs are trying to do. If you want to explain how a FES keeps the medium – there should be other mechanisms like NAVs and things that are controlling the medium – if there are particular things going on. General things like don’t change state during a FES, this may not be said hard enough.

C – Should this be submitted as a comment to an amendment? Generating such a buy in would make the effort worthwhile. Using the term to define a relationship. Where you are seeing the issues in the normative text – once it is acknowledged we can fix it.

Mike M – Chair of rev-me – TGme has made some progress in cleaning up annex G – Graham’s contribution cleans up the normative text allowing annex G to be made informative. Are there current outstanding comments that are being addressed. If there are other comments on this, I am not aware of them, and this work is on the REVme general issues list. TGme has received many comments, so we have a lot of work ahead of us.

R – I understand – if everyone is so busy that this isn’t viewed as important – we need to know what problem we are solving.

R – If someone brings in a contribution to TGme, TGme is open to discussion.

Chair – This provides a possible way forward. Harry, will you define the interop problem and a solution.

Harry – Getting the group to agree that this is a problem, is interesting – but having a clause specific definition may be the way forward.

R – If it is clause specific, it maybe be the best solution at this point.

C – There may be a condition that a frame exchange can overlap. Doesn’t the sequence number space and duplicate and recovery capabilities address this, so if the overlap happens, are there knobs there to fix this.

C – In 11ax – there is MU – with multiple STA with over lapping FES – the trigger frame is going out to multiple STAs – each of these STAs would have a different FES.

C – Different regarding the start and end than that they are duplicates.

C – What are we talking about when we talk about FES? Aren’t we trying to define this so that all STAs can play together?

C – In full agreement. For FES we don’t set a bit – there is nothing there to designate it – the third party looking in can’t really tell. There is nothing wrong with defining MU TXOP – it is constrained, and the protection is provided by other mechanisms to hold the media.

Chair – We need to be careful and write down our language here.

C – The potential issue is that the reality of what is happening (or what transactions are ongoing) is different for each device – there is no global reality. Each device has a different understanding of what is happening. (due to capability differences, etc.). Also, the understanding may be different within the context of each sub-clause. So, before we move ahead, we must first see if the group thinks that a single definition or understanding of frame exchange sequence is useful. The definition becomes so complex that it may defeat the very purpose of what we are trying to solve.

C – The FES is nothing but a set of transmission times – any type of protection / NAV that is the job of the entire spec. 802.11 created a way to protect FES – but the concept of FES stands clear and independent of frame protection. An FES is an exchange of frames which two STAs have agreed to complete.

C – The FES has a specific timing or provided in the transmission. It is clear upfront.

C – The timing is clear and defined by the standards.

C – It is either pre-determined or defined by the preceding frame. The standard also allows for the timing to be defined on the fly.

C – All that matters is that the timing is defined by the standard.

Chair – I think we need to understand the concepts and then we can word them.

C - FES aren’t used to protect anything. Especially, since our PHYs are operating in unlicensed spectrum. So, expecting the medium will be available can be problematic. There are a ton of ways of doing a DOS attack. On a more acceptable level – NAV modification/spoofing can be an issue – but I’ve never seen it in the market. The devices all seem to be well behaved. The other aspect – the timing is important – the sequence can’t protect that.

C – In the standard there are burst transmission, and it will transmit even if there is interference as it is in burst mode. It is one thing to jam the network with your microwave oven – if you send a DOS that is smart you jam better with more efficiency.

Chair – The way forward:

1. pull out of the presentation the “real” interop issues – to validate we are working on something useful.
2. in parallel is to work the issues we have discussed – and name these concepts so we can decide what to define and how to progress the work.

Chair reviewed the agenda for Wednesday.

## Recessed: 15:26 h ET

# Wednesday 19 January 2022 at 11:15-13:15 h ET

## Administration:

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

**Vice Chair: Joseph Levy, InterDigital**

**Secretary: Joseph Levy, InterDigital**

**Meeting called to order by the Chair 11:16 h ET**

Agenda slide deck: <https://mentor.ieee.org/802.11/dcn/21/11-21-1994-04-0arc-arc-sc-agenda-jan-2022.pptx>

**Agenda Slides 4-15:**

**Registration Reminder**

**Reminders to Attendees**

**Call for Patents:**

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

**IEEE SA Copyright Policy:**

The chair reviewed the Copyright policy.

**Participation:**

The chair reviewed the participation policy.

**Approval of the Agenda:**

* Attendance, noises/recording, meeting protocol reminders
* Policies, duty to inform, participation rules
* Prior meeting minutes (Dec 13)
* Contribution/discussion topics:
	+ IEEE Std 802 project(s) update/discussion
	+ Annex G way forward
	+ Clause 6
	+ TGbe informative annex
	+ Other topics?
* Next steps

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 accepted without comment.

## Approval of Minutes (slide 20)

Move to approve the minutes of:

* Dec 13 telecon: <https://mentor.ieee.org/802.11/dcn/21/11-21-2005-01-0arc-arc-sc-teleconference-minutes-13-december-2021.docx>

Moved: Joseph Levy

Second: Rajat Pushkarna

These minutes were approved by unanimous consent

## IEEE Std 802 project(s) update/discussion (slide 22)

The Chair reviewed the status of the IEEE Std 802 activities.

The Chair provided a quick review of the ELLA report (802.1-21-0076r8)

(Note the dependance on other standards – may be incorrect)

The Chair also pointed to 802.11 discussion that may relate to the 2nd PAR project.

## Annex G way forward (slide 21)

* Consider scope/purpose for (new) Annex G – informative or normative, etc.
* Replace Annex G with some other notation/style –[11-21/1797r2](https://mentor.ieee.org/802.11/dcn/21/11-21-1797-02-0arc-proposal-for-new-annex-g-frame-exchange-sequence-descriptions.docx) – Harry Bims
* The need for Frame Exchange Sequences: [11-22/0101r0](https://mentor.ieee.org/802.11/dcn/22/11-22-0101-00-0arc-the-need-for-frame-exchange-sequences.pptx) – Harry Bims

The Chair gave the status and reviewed the discussion had on Monday (2022-01-17)

The Chair called for contributions and suggested providing input to Harry Bims.

## Clause 6 (slide 23)

**Clause 6 purpose and value?**

* + [11-21/1774r0](https://mentor.ieee.org/802.11/dcn/21/11-21-1774-00-0arc-clause-6-discussion.pptx) – Graham Smith
	+ [11-21/1822r1](https://mentor.ieee.org/802.11/dcn/21/11-21-1822-01-0arc-clause-6-discussion.docx) – Graham Smith

The Chair provided status and reviewed the discussion had on Monday (2022-01-17)

Graham – Thanking Mark for his suggestion to remove the boiler plate items – use simple rules to reduce the content of Clause 6, summarized in an email posted to the 802.11 reflector: ([[STDS-802-11] ARC discussion on what is valuable within clause 6 (of Std 802.11)](https://grouper.ieee.org/groups/802/11/email/stds-802-11/msg05797.html)). The Chair reviewed the content of this email.

Graham – I only found 8 different references in IEEE Std 802.11REVme to clause 6. Otherwise, the MLME objects are not referred to. So, the 480 pages of clause 6 does not contain much material that is referenced in other clauses of the specification.

C – Regarding the references in spec, did you look at how 6 references other sections?

A – I searched for 6.3 finding the references listed in [11-21/1822r1](https://mentor.ieee.org/802.11/dcn/21/11-21-1822-01-0arc-clause-6-discussion.docx) – reviewed the references.

C – In 6.3 you may have references going the other way, showing you where it was used.

## TGbe informative annex

Gave an update on why, the desire, focus – but have not progressed the work – will attempt to do so for March.

Called for volunteers – Rakesh stepped forward.

## Next Steps:

**Contributions requested/expected:**

* Annex G
* Clause 6
* IEEE Std 802 projects
* TGbe/MLO informative annex

**March plenary planning**

* 2 slots
* Topics:

**Next Teleconference(s):**

* Jan to Mar teleconference plan… How many telecons? 2
* Conflicts to avoid: TGbe, REVme, TGbd, TGbh
* Monday 1PM ET? Thursday 7PM ET?
* Dates to avoid??
* Will be coordinated with other TG chairs, and announced later

## Adjourned: 12:17 h EDT