IEEE P802.11  
Wireless LANs

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| ARC SC Meeting Minutes January 2019 | | | | |
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Abstract

This document contains the minutes of the IEEE 802.11 ARC SC meeting sessions held on 15 January 2019 at 16:00 CT, 16 January 2019 at 8:00 CT, and 17 January 2019 at 10:30 CT in St. Louis, Missouri, USA.

Note: Highlighted text are action items.

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# Tuesday, 15 January 2019, PM2

**Administration:**

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

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

**Meeting call to order in ARC meeting room by Chair 16:01 ICT,**

Agenda slide deck: [11-18/2115r1](https://mentor.ieee.org/802.11/dcn/18/11-18-2115-01-0arc-arc-sc-agenda-jan-2019.pptx), proposed agenda copied here for reference:

**Tuesday, January 15, PM2**

* **Administrative: Minutes**
  + **IEEE 1588 mapping to IEEE 802.11/802.1ASrev and use of FTM**
  + **WBA liaison on MAC randomization – follow-ups for 802.11?**
  + **802 (and 802.1) activities:** 
    - **802.11aq, 802.1CQ and LAAP:** [11-18/1934r0](https://mentor.ieee.org/802.11/dcn/18/11-18-1934-00-0arc-mac-address-assignment-in-ieee-802-11.pptx)
    - **Local Administrator Advertisements:** [11-18/2022r0](https://mentor.ieee.org/802.11/dcn/18/11-18-2022-00-0arc-local-administrator-advertisements.ppt)
    - **Proxy IPv6 Neighbor Discovery:** [11-18/1920r2](https://mentor.ieee.org/802.11/dcn/18/11-18-1920-02-0wng-proxy-nd-discovery-in-802-11.pptx)

**Wednesday, January 16, AM1**

* + **TGba (WUR) continued discussion:** [11-18/1017r0](https://mentor.ieee.org/802.11/dcn/18/11-18-1017-00-0arc-wur-multi-ap-reference-model.vsd)**,** [11-18/1020r5](https://mentor.ieee.org/802.11/dcn/18/11-18-1020-05-0arc-discussion-on-wur-802-11ba-states.pptx)**,** [11-18/1494r2](https://mentor.ieee.org/802.11/dcn/18/11-18-1494-02-00ba-overview-of-802-11-ba-power-management-in-d0-4.pptx)**,** [11-18/1641r0](https://mentor.ieee.org/802.11/dcn/18/11-18-1641-00-0arc-discussion-on-wur-802-11ba-nomenclature.pptx)
    - **11ba is a “capability” of a STA**
    - **11ba is a separate entity on the same device as the STA**
  + **Continue the other items (previous slide), as needed**

**Thursday, January 17, AM2**

* + **Future sessions / SC activities**
  + **IETF/802 coordination**
  + **Multiple MAC Addresses (and IPv6), “Multiple radios” (any contributions?)**
  + **System architecture views for common use scenarios (any contributions?)**
  + **“What is an ESS?”:** [11-18/1051r3](https://mentor.ieee.org/802.11/dcn/18/11-18-1051-03-0arc-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)**)**
  + **Consider IETF DetNet/time-sensitive networking input (potential relationship to RTA TIG?)**
  + **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 (and MLME-SCAN?)**
* **Does TGba discussion lead into other “split” PHYs (LC, 28 GHz (Phazr))?**
* **Continue the other items (above/previous slide), as needed**

**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:**

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

Minutes approved by unanimous consent.

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

Update (Ganesh Venkatesan, Intel) - Nothing new here.

**IEEE 1588/802.1AS**

Results from first Sponsor Ballot of IEEE 1588 revision, Sept 17 – Oct 28

**802.1ASrev use of 802.11 FTM:**

Results of D7.3 WG recirculation, 11/30- 12/15 ([802-1AS-rev-d7-3.pdf](http://www.ieee802.org/1/files/private/as-rev-drafts/d7/802-1AS-rev-d7-3.pdf), [802-1AS-rev-d7-3-dis-v01.pdf](http://www.ieee802.org/1/files/private/as-rev-drafts/d7/802-1AS-rev-d7-3-dis-v01.pdf) )

**WBA liaison on MAC Address randomization**

Incoming liaison is here: [11-18/1579r1](https://mentor.ieee.org/802.11/dcn/18/11-18-1579-01-0000-2018-09-liaison-from-wba-re-mac-randomization-impacts.docx)

Discussion notes for 802.11 (ARC) discussion so far, are here: [11-18/1671r0](https://mentor.ieee.org/802.11/dcn/18/11-18-1671-00-0arc-notes-for-response-to-wba-liaison-on-mac-address-randomization.docx)

Initial draft of response: [11-18/1988r0](https://mentor.ieee.org/802.11/dcn/18/11-18-1988-00-0arc-proposed-response-to-liaison-from-wba-on-mac-address-randomization-impcats.docx)

802.11 response: [11-18/1988r2](https://mentor.ieee.org/802.11/dcn/18/11-18-1988-02-0arc-proposed-response-to-liaison-from-wba-on-mac-address-randomization-impcats.docx)

Chair reviewed status of the above documents

**Comment**: The 802.1 Chair asked for views on this, to be generated by the OmniRAN TG.

Chair then reviewed[11-18/1988r2](https://mentor.ieee.org/802.11/dcn/18/11-18-1988-02-0arc-proposed-response-to-liaison-from-wba-on-mac-address-randomization-impcats.docx)

**Question**: Do we have access to the final sent LS,

**Answer**: The 802.11 Chair is in process of setting up a repository of sent LSs – should be available soon.

**Comment**: MAC randomization seems to be being deployed more widely.

Chair discussed possible recommended deployment guidance for: MAC address stability for band steering between bands and for mobility.

**Comment**: For steering beacon reports are used, so if the standard is followed there is no issue with MAC address. We shouldn’t say this will fail for reassociation.

**Chair**: Beacon reports can be used to steer but there are implementations which use probes to steer and the use of probes may break the ability to steer.

**Question**: Why are “operators” assigning two different SSIDs in different bands in an ESS?

**Comment**: If you can reach the same place from the BSS, it should use the same SSID.

**Comment**: But people don’t do this – xx2.4 and xx5 are typical SSIDs in the same “ESS”.

**Comment**:We could make a shall to define the process to insure this behavior, but I don’t think we should do this. We should provide the means and recommendations to do things. I don’t want many shall statements which would restrict me from finding better solutions.

**Comment**: Suggesting a recommended practice to describe how things are supposed to work.

**Comment**: 802.11f – but this was not successful – but 802.11 is more theory and WFA is more practice. Maybe we should just let WFA take care of this.

**Comment**: We should act and recommend to the WFA that they provide guidelines for band steering, devices moving in the same ESS should use the same MAC address.

**Comment**: My company did a survey of this – there is no standardization – everyone does what they think works best. Any solution would have to be very fluid – as people will choose different ways of doing this and we should try not break too much.

**Comment**: We could ask WFA what they are doing in this area – we should let WFA try to clean this up.

**Comment**: Windows 10 has options that MAC addresses are or are not random, it also maintains a list of random MAC address per SSID, there is a setting for maintaining a MAC address for 24 hours. But all this is dependent on the 802.11 hardware in the device, which may or may not support various Windows 10 features.

**Chair**: A 24-hour MAC address reset may cause problems, resetting all links when the address changes at the 24-hour mark.

**Comment**: More should be done to implement MCO

Comment: There an IETF recommendation to provide some guidance for the DHCP server. Implementation: hardware is one, but software drivers/firmware you are using can change behavior. Guidelines to clarify this would be helpful.

**Comment**: The WBA is facing consumers and customers – if we know about something we should say something, we shouldn’t ignore this. It doesn’t help them for us to just say it’s not us look elsewhere. This may be best supplied by WFA.

**Comment**: These are all in the recommendations for random MAC addresses in the IETF documentation.

Comment: We should ask WFA to do this and inform WBA we have asked them. It should be clarified that an operator should not assume that a MAC address used in a probe request is stable. As a significant number of implementations do not keep a stable MAC address for probes.

**Chair**: This is being done today and is breaking things and should be recommended against.

**Comment**: I don’t think we should be mandating any preassociation behavior.

**Chair**: I agree we should not be mandating behavior, but we could do a recommended practice. We should think about ways to have preassociation privacy with a constant MAC address or a way to do so.

**Comment**: 802.11 is the best place to define 802.11 protocols, we provide the means of doing this. We may provide rules to establish a random mac address. We should coordinate with WFA on this.

**Chair**: There seems to be general agreement on this way forward.

**Analytics:**

**Chair:** We know that there are implementations that use the MAC address to generate analytics – but the use of random MAC address will break the ability of these implementations to track a device.

**Comment**: Flapping between switch ports. When you have a random MAC address you would have trouble identifying this type of behavior. There are issues for both the analytics and management side.

**Comment**: These type of management issues are a problem. I don’t want the network to be in control – If I walk by a hotspot every day I don’t want to the AP to know I walk by every day.

Propose to start a TIG to look into these issues and generate the 802.11 position – on MAC randomization impacts on:

* Client steering and band steering methods rooted in 802.11 features, and further developed or enhanced by IEEE 802 and Wi-Fi Alliance specifications should be investigated.
* Network analytics and troubleshooting
* Device manufacturer identification

**Chair**: We should have a good idea as to the scope before we request a group. We should also look at 802e and we should contact some of the non-802.11, 802 experts on this: Mick Seaman, Amelia Andersdotter, Juan Carlos Zuniga and Roger Marks.

**IEEE 802.11aq, 802.1CQ and LAAP:**

**Report from Steven McCann:** LAAP has been returned to MAC address policy targeted for REVmd.

**Report from Roger Marks**: They met last night ST Louis time. The contribution suggested there are attacks based on layer 2 addresses. But no new attacks were found, but if there are additional entities in an area there are additional attack points. There was a discussion on overflowing of the bridge routing table with multiple MAC addresses will cause flooding.

**Chair**: Reminder that we will meet AM1 tomorrow and will discuss TGba.

**Recessed:** 18:03 ICT.

# Wednesday, 16 January 2019, AM1

**Call to order 8:06 CT**

**Agenda document:** [11-18/2115r2](https://mentor.ieee.org/802.11/dcn/18/11-18-2115-02-0arc-arc-sc-agenda-jan-2019.pptx)

**Agenda:**

* TGba (WUR) continued discussion: [11-18/1017r0](https://mentor.ieee.org/802.11/dcn/18/11-18-1017-00-0arc-wur-multi-ap-reference-model.vsd), [11-18/1020r5](https://mentor.ieee.org/802.11/dcn/18/11-18-1020-05-0arc-discussion-on-wur-802-11ba-states.pptx), [11-18/1494r2](https://mentor.ieee.org/802.11/dcn/18/11-18-1494-02-00ba-overview-of-802-11-ba-power-management-in-d0-4.pptx), [11-18/1641r0](https://mentor.ieee.org/802.11/dcn/18/11-18-1641-00-0arc-discussion-on-wur-802-11ba-nomenclature.pptx), [11-19/0081r1](https://mentor.ieee.org/802.11/dcn/19/11-19-0081-01-0arc-11ba-architecture-considerations.docx), [11-19/0173r0](https://mentor.ieee.org/802.11/dcn/19/11-19-0173-00-0arc-continued-discussion-on-wur-802-11ba-nomenclature.pptx)
* MAC randomization: [11-19/0179r0](https://mentor.ieee.org/802.11/dcn/19/11-19-0179-00-0arc-idquery-query-message-proposal.pptx)
* Continue the other items (previous slide), as needed

**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.

**TGba (WUR) continued discussion**

Chair provided a top-level overview of the status of TGba architecture. That we were moving towards a new view of WUR as mode.

Look at where TGba is now at:

29r1: this document removes the concepts of WURx and PCR – so the spec now talks of a WUR AP and WUR non-AP STA with modes and capabilities.

The Chair reviewed the document from a high level and then pointed out the rest of the document is the details on the removal.

The Chair reviewed [11-19/0021r2](https://mentor.ieee.org/802.11/dcn/19/11-19-0021-02-00ba-cr-clause-4.docx) – which provides the changes to clause 4.

The Chair asked for additional comments or inputs. There were none.

The Chair reviewed [11-19/0081r1](https://mentor.ieee.org/802.11/dcn/19/11-19-0081-01-0arc-11ba-architecture-considerations.docx) – it was noted that the WUR mode may disable the other PHYs, it was stated that these details should not be included in the specification to limit the STA.

The Chair pointed out that WUR is different and it should be clear that only the WUR PPDU can be received.

The TGba Chair stated that imposing these requirements impact implementation.

The Chair asked if there is a restriction that the AP only send WUR PPDU?

**Discussion on the PHY transmission.**

There was some discussion on what is the restriction on WUR AP sending PPDUs to the WUR non-AP STA. Some agreement regarding the need for stating that only WUR PPDUs can be sent to a WUR non-AP STA when it is in WUR awake state. Other types of PPDUs should not be sent.

There is need for this statement because WUR is now a mode.

The TGba Chair suggests that if it is felt that it is necessary to make such a statement it should be done as a comment on 802.11ba D2.

There was some discussion on the effective removal of the possibility of having a WUR only receiver or WUR only transmitter.

**Comment**: We have discussed this and have agreement in the TG.

**TGba Chair**: This has been discussed in the TG, and the new draft has been accepted. So, this has been agreed.

**Chair**: Pointed out these restrictions tend to be complex, when the restrictions are in the MAC as the MAC supports all the PHYs.

**Chair**: the wording on what the PHY can receive may need to be cleaned up so that it matches the other PHYs betters. In particular, the restriction to clause 17 may need review.

[11-19/0173r0](https://mentor.ieee.org/802.11/dcn/19/11-19-0173-00-0arc-continued-discussion-on-wur-802-11ba-nomenclature.pptx) - was reviewed by Joseph Levy (InterDigital)

Very little discussion, just a review.

**MAC randomization:**

[11-19/0179r0r](https://mentor.ieee.org/802.11/dcn/19/11-19-0179-00-0arc-idquery-query-message-proposal.pptx) a proposal to add a new action frame to query a unique identity was presented by Carol Ansley (ARRIS). This is only available after association.

**Comment**: All of this information can be sent during association.

**Comment**: Association frames are not encrypted.

**Comment**: There may be no penalty of putting a false ID.

**Comment**: Other approaches to provide a unique identity may be preferred.

**Comment**: There seems to be no central mechanism, so what is the benefit.

**Answer**: The main benefit to the STA is to take advantages features of the AP. E.g. I want my parental controls to work. Right now, the AP can’t even ask.

The Chair suggest the discussion on this topic should continue – tomorrow/offline.

**Recessed:** 10:00 CT.

# Thursday, 17 January 2019, AM2

**Call to order:** 10:32 AM CT

Thursday, January 17, AM2

* + Future sessions / SC activities
  + IETF/802 coordination
  + Consider IETF DetNet/time-sensitive networking input (potential relationship to RTA TIG?)
  + Multiple MAC Addresses (and IPv6), “Multiple radios”
  + System architecture views for common use scenarios (any contributions?)
  + “What is an ESS?”: [11-18/1051r3](https://mentor.ieee.org/802.11/dcn/18/11-18-1051-03-0arc-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))
  + 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 (and MLME-SCAN?)
* Does TGba discussion lead into other “split” PHYs (LC, 28 GHz (Phazr))?
* Continue the other items (above/previous slide), as needed

**Approval of the Agenda:**

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

The proposed agenda was approved by unanimous consent. [11-18/2115r3](https://mentor.ieee.org/802.11/dcn/18/11-18-2115-03-0arc-arc-sc-agenda-jan-2019.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.

**Future sessions / SC activities**

* 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
* Investigation of WUR architecture topics; may lead into “split” PHYs (LC, 28 GHz (Phazr))
* Investigation of 802.11 as part of a Deterministic Network
* Multiple MAC Address discussion (IPv6) – perhaps “multiple radios” too
* System architecture(s) for common use scenarios
* Will also follow 802.1/802.11 activities on links, bridging, and MAC Service definition – “What is an ESS?”, for example
* 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

If you have ANY other topic that you would like ARC SC to consider, contact the SC chair.

**Comment**: Is there anything that relates to md? If so we should prioritize it.

**Question**: Does the ARC SC need to address the what is a “STA” question?

**Chair**: We call a STA a non-AP STA – so there was a question in REVmd – which was suggested by the TGm chair? But, ARC has not been assigned by the WG chair to do this work.

Added item:

“What is a STA?” ([11-19/0106r0](https://mentor.ieee.org/802.11/dcn/19/11-19-0106-00-000m-sta-and-ap.docx))

Related: What is the (“STA(s)”) architecture of off-Channel TDLS?

**Planning March 2019:**

* Plan for three individual meeting slots
  + Usual slot on Wed AM1
  + Another 2 slots for standalone ARC work (Monday/Tuesday?)
  + Plus, Joint sessions: Another with TGba?
* Teleconferences:
  + None planned.

**IETF/802 coordination**

Nothing new as IETF has not met.

**DetNet and other Time -sensitive networking (IETF, RTA TIG, etc.)**

RTA TIG is completed their work and is handing off to EHT. This topic is mentioned in the current EHT PAR document.

**Question**: Why is 802.15.4 is appropriate and 802.11 inappropriate?

**Answer**: 802.15.4 is synchronous and is managed, which is why it is appropriate.

**Comment**: When .11 drops a packet, we just retransmit, which effects the deterministic nature of these signals.

**Comment**: HCCA – is scheduled access – may be this should be improved.

**Comment**: If there is only one AP in an area then it is ACVO.

**Comment**: I have reviewed this with some people and they agree with this assessment – 15.4 is deterministic and .11 does not support deterministic behavior.

The Chair called for an evaluation of why 15.4 works and .11 does not work.

**Comment**: I think Wi-Fi is just as good.

**Chair**: We can continue to discuss this or we can evaluate it and then discuss it.

**Question**: Why is this ARCs job?

**Chair**: Historically this was assigned to ARC, but maybe this should be just dealt with in EHT.

**Comment**: Maybe ARC should provide input to EHT. A fast look it seems that 15.4 THCS seems to be equivalent to .11 HCCA.

**Chair** asked: So, what are the metrics and how do we deal with this stuff.

**Comment**: HCCA is out there in various implementations.

**Comment**: We should probably bring HCCA to IETF’s attention.

**Comment**: The physic of the wave guide gets in the way.

**Chair** – asked Menzo Wentink (Qualcomm) if he would provide a contribution on this topic. He agreed to consider providing a contribution, but didn’t commit to doing so.

**MAC randomization:**

[11-19/0179r0r](https://mentor.ieee.org/802.11/dcn/19/11-19-0179-00-0arc-idquery-query-message-proposal.pptx)– Carol Ansley (ARRIS)

This proposal is limited as it is only helping APs with associated STAs – it could help an AP know that a random MAC address STA is a known STA and it can do this in a way the STA can maintain its over the air privacy as this information would be sent encrypted.

**Carol** provided a detailed overview of slide 6.

**Chair:** 2 bytes of seconds in not enough to handle once a day.

**Comment**: on slide 5 – I don’t think we need either of these items – as they are provided during association. on slide 6 - Regarding the vendor specific one – I don’t think that this is useful.

**Question**: Regarding the scope for the UI to be used, can it be used for all BSSs or all ESSs?

**Answer**: It is most useful for an AP if it is valid and the same for multiple BSSs. This may be the same identifies – as a “Starbucks” may want to know it’s me anywhere in the world. But, as a STA I may not what to share a single ID to all “Starbucks” everywhere.

**Comment**: I don’t see a reason to do this as it seems to be undermining the whole purpose of random MAC addresses. So, I don’t think you will get what you want, hence I don’t see a benefit to doing this.

**Chair**: Would you like to see what this benefit is?

**Comment**: Well the home use case may have some benefit.

**Answer**: One might want to move a device which is using lots of data to a particular AP to provide a service. Most STAs use their real MAC address now, but this may change going forward with randomization. The motivation for a user would get better performance and faster log in.

**Comment**: The use cases should be documented.

**Comment**: If nobody does it and it is not private – I may want to do a UUID – for peer to peer devices it may be beneficial. We wind up discovering a device multiple times once and this may simplify this.

**Comment**: If you are looking for privacy – the STA would respond zero – what stops the STA from providing a random ID every time. If the goal is privacy and the STA is trying to avoid any tracking.

**Answer**: That is why we put in a decline – as we don’t want a STA just put in another random ID.

**Comment**: I’m not convinced of the value or if this would be used.

**Comment**: I would make the time to live a fixed value. If you are sending this often you are doing something wrong.

**Comment**: Many installed internet applications yield large numbers of super cookies (e.g. 4000). So is the effort of adding this feature worthwhile, since we all have cookies.

**Comment**: I can see this use in a home network, where you would not be tracked by your MAC address, but by this UID, that would allow a home network to be able to learn and provide better service if it know the user ID. “Private tracking”

**Comment**: All of these require a table of authority. We don’t communicate this over the air – but it then needs to be defined in the MAC.

**Comment**: I see an extra user intervention step.

**Answer**: Using parental controls – if the devices are not identifying themselves - e.g. if you’re not on the white list – you get nothing. The users, want a simple way to do this – while providing some privacy.

**Comment**: It is a bad idea to use MAC address to provide parental control – using authenticated ID is the only way to do this securely. If you have Hotspot capability this is taken care of. If you are using authentication it is already taken care of. It is fine for trusted networks. But, this configured by the user. So, I don’t think we should be giving users ways to give up privacy.

**Chair**: You would be opposed to allowing a user to give up privacy?

**Comment**: When you reassociate to a preferred AP – you use the same random MAC address. So, it is quite simple to do this on the STA. Some STAs currently do this. It could be a STA setting, under the control of the user.

**Answer**: This would give you one layer of additional privacy – as if you keep the same MAC address then you can be tracked by that particular address.

**Comment**: We should protect people from themselves.

**Comment**: This is significantly better that using a fixed random MAC address. What are our next steps?

**Answer**: My next step is to present this in TGmd.

**Comment**: Asking how the user will experience this? I can currently move though Copenhagen Airport and maintain connectivity, will this break this experience?

**Chair:** How much privacy do you have to give up to enable getting through Copenhagen Airport while maintaining connectivity?

**Comment**: There was an earlier discussion/proposal to start a TIG to discuss random MAC addresses and related topics, this topic may fit in that activity.

**Comment**: If the TIG is going to be formed, when will it be discussed.

**Chair**: I will talk to the .11 WG chair and discuss this at the CAC.

**What is an “ESS”** (slide 28) – [11.18/1051r4](https://mentor.ieee.org/802.11/dcn/18/11-18-1051-04-0arc-what-is-an-ess.pptx) – Chair reviewed status and what has changed.

Content has been reordered.

Is the standard correct. We’ve identified 7 things – on slide 4.

Goal of <x>SS discussion on slide 5:

Slide 6: Long discussion on the Can’t reassociate across the DSs – bottom line this needs to be looked at in the spec.

Slide 9 – this one seems to be well defined in the specification.

Slide 10 – added Same SSID and not same 802.1Q Bridged network.

Slide 11 – reviewed

Slide 12 – reviewed and updated the Summary/status – (see r5)

Discussion on the need to distinguish between F and D.

Slide 13 – call for volunteers –

Andrew suggested to look at the RTA document: 11-18/1918.

Document draft out of the meeting: [11-18/1051r5](https://mentor.ieee.org/802.11/dcn/18/11-18-1051-05-0arc-what-is-an-ess.pptx)

Please notify the Chair if you would to work on this or participate in drafting of specification text changes or additions.

**Adjourned 12:32 CT**

Note: final agenda slide deck is: [11-18/2115r3](https://mentor.ieee.org/802.11/dcn/18/11-18-2115-03-0arc-arc-sc-agenda-jan-2019.pptx) and closing report is: [11-19/0207r0](https://mentor.ieee.org/802.11/dcn/19/11-19-0207-00-0arc-arc-closing-report-jan-2019.pptx)