IEEE P802.11
Wireless LANs

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| 802.11 TGaq Meeting Minutes – July 2013 (Geneva) |
| Date: 2013-07-15 |
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Abstract

This document comprises the Minutes for the IEEE 802.11 Task Group aq (TGaq) meeting (3 sessions – Tuesday (PM1), Wednesday (AM1) and Thursday (PM1) held in July 2013 in Geneva, Switzerland.

Chair: Stephen McCann (RIM)
Vice Chair: Yunsong Yang (Huawei Technologies)

Secretary: [position open]

Technical Editor: Dan Gal (Alcatel-Lucent)

**Tuesday, July 16th, 2013, 13:30 to 15:30 (PM1)**

**Call to order and agenda**

Meeting called to order on Tuesday, July 16th, 2013 by TGaq Chair, Stephen McCann, at 13:31 pm.

The chair reviewed the meeting guidelines including the IEEE patent policy and call for patents. No such claims were made. He reminded participants to record their attendance.

The chair reviewed and updated the working version of the agenda (doc 13/0682r1) which was an updated version of the agenda on the server. He organized the order of presentations for the three sessions in this week. The agenda (doc 13/0682r1) was approved by unanimous consent.

**Secretary Position**

* The Chair reviewed the situation and asked if there is any nomination for Secretary position. There was none.
* Yunsong Yang (Vice Chair) volunteered to take the meeting minutes for this week.
* The call for nomination of Secretary position remains open. Interested candidates can inform the Chair.

**Approval of previous meeting minutes**

May 2013 Plenary minutes

Minutes from May 2013 meeting of the TGaq (doc 13/0636r1) were approved by unanimous consent.

July 1st Teleconference minutes
Minutes from July 1st 2013 teleconference of the TGaq (doc 13/0710r0) were approved by unanimous consent.

**Re-present closing report from May meeting**

The Chair presented the status of the group’s activities as covered in the May interim meeting closing report (doc 13/0618r0).

* Press release officially published.
* Had Teleconference call on July 1st.

There were no comments or discussion.

**Documentation Recap**

**11-13-0118r2 Use Case**

There was no change.

**Terminology Document**

**11-13-0299r0 [Yunsong]**

Previously, Lee Armstrong made the comment to check TGaq terminology with the IEEE Standard 100-1996 ("The IEEE Standard Dictionary of Electrical and Electronics Terms Sixth Edition”). It turns out that IEEE Std. 100 needs to be purchased. Subsequently, the Chair secured the access to this Std. for him and Dan Gal (editor).

The Chair projected the IEEE Standard Dictionary on-line for the task group. The group searched the word “Service”, found two definitions in the first page useful, but there are 192 search results not shown yet. The group also searched the word “Service Discovery”, found one definition useful.

Joe Kwak (InterDigital) suggested that the editor go through the other definitions and give the group an update later this week. The Chair asked Dan to take an action item to check these definition offline and report back to the group later in the week. Dan accepted the action item.

**Framework Document**

**11-13-0300r0 [Yunsong]**

There were no updates to the document at this point.

The Chair reminded the group that this document is just a skeleton right now. He looked forward to inputs to fill the document so that we can turn it into amendment spec later.

**Presentations**

**11-13-0125r5 Use Case Analysis document update**

Mike Lin (ITRI) presented the changes made in use case analysis document 11-13-0125r5.

* Added two new subsections for use cases #24-25
	+ Use case #24 for traffic/ road information service
	+ Use case #25 for indoor parking service discovery
* Added new requirements #70-71

Questions and Discussions:

* Question: In requirement #70, what do you mean by dominates?
* Response: Meant that the AP controls the WLAN or provides coverage.
* Question: Is the service advertisement for the STA or provided by the AP.
* Response: by the AP.
* Santosh: suggest changing “service advertisements in the WLAN that it dominates” to “services accessible through the AP”.
* The Chair: suggest removing the word “Phase” in requirement #70.
* Santosh (Qualcomm): In requirement #71, are service probe request and service probe response two new messages? Suggest deleting the word “service” in service probe request and service probe response.
* There was a question about if probe request and probe response are the exact frames that TGaq will use for PAM. The resolution is to add a note under Section 2 title that says “this set of requirements is intended to be used as a guideline only for the development of work within TGaq. It is not a mandatory set of requirements.”
* With these changes, the use case document was updated to 0125r6.

**11-13-0796r0 Two Step Service Discovery from Huawei**

Ping Fang (Huawei) presented this document.

* Slide 4: Based on 11u, a STA discovers the network first, and then sends GAS to query services. Then, based on the response, the STA decides to associate or not.
* Slide 5: Design option diagram with 11u approach.
* Slide 6: One issue for 11u approach is that if the service can’t be found in the end, the AP/network discovery is wasted. Also needs to prevent multiple responses.
* Slide 7: The proposal is that, in step 1, STA discovers the AP/network + service indication via Beacon or Probe. If the service is there, in step 2, the STA sends out GAS based detailed service query.
* Slide 8: Proposed diagram.
* Slide 9: Service indication is the hash of service name and/or a service bitmap.
* Slide 10: Summary.

Questions and Discussions:

* Santosh (Cisco): How many octets are there in this service bitmap?
* Response: The final detailed length is not decided yet. Here is only an example.
* Santosh (Cisco): The WFDS only has tens of services. For an AP, the number of services may be on the order of hundreds. So, the bitmap may not scale well.
* Santosh (Cisco): Suggest to discover what higher layer service is supported first, before using GAS to query the details. Service indication should be service protocol discovery.
* Joe Kwak (InterDigital): I have similar reaction. What we advertise is not the network, but the proxy server. Therefore, we should advertise what protocol the proxy server supports. So, it might be a 3-step approach, with the first step being to find out the existence of a proxy server and what protocol it supports.
* The Chair: Regarding WFA service hash, Paul has proposed something like that one year ago during the SG stage. The GAS message has comeback feature, which fits in this two-step approach. The advantage of GAS is that if the AP caches the service information, then the AP can respond immediately.
* Cheol Ryu (ETRI): It is a good idea to provide some service indication. But putting it in the Beacon may be cause too much overhead.
* The Chair: People may not like it if more than 3 or 4 bits are broadcasted via the Beacon.
* Mike Lin (ITRI): Step 2 may not be needed for some simple services.
* The Chair: we started to talk about a hierachical approach. First, finding out if the AP supports 11aq, then what protocols the AP supports, then what services are supported.
* The Chair: Can we consider WFDS as a service here?
* Jing (HTC): GAS comeback message only holds off the response, but it doesn’t achieve what Ping proposes here.

The Chair encouraged the members to have offline discussion and generate joint contributions on this topic.

**Recess**

The chair recessed the meeting at 3:11 pm.

**Wednesday, July 17th, 2013, 8:00 to 10:00 (AM1)**

**Reconvene and agenda**

Meeting reconvened on Wednesday, July 17th, 2013 by Stephen McCann at 8:01 am.

Chair reminded participants to record their attendance.

The chair reviewed an update of the agenda (doc 11-13-0682r2) which covers the activities of the current session (Wed AM1)

* The chair reviewed the plans for today.
* The revised agenda (doc 11-13-0682r2) was approved by unanimous consent.

**Presentations**

**11-13-0874r0 Huawei AP-Assisted Service Discovery**

Betty Zhao (Huawei) presented this document.

* Slide 3: The assumption is that the STA that provides the service is not always associated with the AP. However, the APs know its existence (through previous association).
* Slide 4: Currently the Authentication and Association procedure is always triggered by the STA.
* Slide 5: Proposal is to allow the AP to trigger the STA to proceed with the Authentication and Association procedure.

Questions and Discussions:

* Andrew (Cisco): What is the use case? It is not for the power save since the STA needs to stay awake to listen to the trigger according to the proposal. The STA can actually save more power by becoming associated and entering the PS mode.
* Betty: another motivation is that the STA can only be associated with one AP. But the STA looking for services may be near another AP.
* Andrew: why can’t the STA provide the service, via one AP, the network, and the other AP? I would assume that all these APs are inter-connected.
* Edward Reuss (Clair Global): I don’t see the problem that this solution is trying to solve. Need a better use case.
* Mike Lin (ITRI): Is this STA associated with each AP sequentially at the beginning?
* Betty: That is the assumption.
* Mike: On slide 5, what modification is needed on the modified Authentication Request and Response?
* Betty: I haven’t thought about the details yet.
* Dan Gal (Alcatel-Lucent): Question on the architecture, our previous design option architecture shows multiple STAs and one AP. If we are looking at multiple APs, I haven’t seen any picture showing multiple APs.
* Santosh (Qualcomm): I can think of a few scenarios of multiple APs. A printer can be shared among multiple APs.
* Dan: If a device is deployed and powered off later, I would reword the use case to waking up a STA, instead of asking the STA to associate.
* The Chair: About the service provisioning aspect, one way is the original vision (in the design option presentation), the other is what Betty proposed here. I would like to ask members to think of this aspect. Tomorrow, we may consider a SP on this as a direction that the group will take.

**11-13-0799r0 11aq Design Framework for P2P Discovery**

Joe Kwak (InterDigital) presented this contribution. This is the second presentation for the case where there isn’t any AP nearby.

Slide 2: Summary. In the use cases document, we have some P2P use cases.

Slide 3: Outline. Two modes: independent mode and server mode.

Slide 4: Review of P2P use cases.

Slide 5: Highlighted the difference between service discovery in BSS and IBSS. Peer service information is needed: service information, user info, user address (MAC address)

Side 6: requirements for P2P SD

* Low power
* Scalability
* Fairness
* Local

Slide 7: design framework

* Need new IE to advertise services to peers
* Advertisement include service description, user info, user address
* This IE may be included in any beacon, probe request/response, and GAS.

Slide 8: Terminology

* Directory: a collection of PSAd.
* Summary: a shorten Directory by aggregating the service descriptions found in the directory without the user info.
* Server: STA designated to collect PSAds and to provide
* Window: scheduled window to allow query and advertisement for all

Slide 9: for low density deployment (independent mode)

* Share service info through the beacons.

Slide 10: for high density deployment (server mode)

* Individual transmission of beacon to advertise service is not an efficient means in this case.
* Proposal is to include a server (STA) which broadcasts directory for peers, saving power and channel time for all.

Slide 11: Timeline with synchronized Discovery Window

Slide 12: Functions of the peer discovery Server.

Slide 13: Discovery transactions during discovery windows.

Slide 14: Server role transition.

Slide 15: Procedures to establish the connection after the discovery in both modes.

Slide 16: Summary.
Slide 17: Open issues: Service description format should be flexible and extensible to describe current and future services; possibly reuse already standardized service description; message/IE format needs to be flexible.

Slide 18: Conclusion.

Questions and Discussions:

Yunsong (Huawei): how to decide when to start to collect the directory information.

Joe: It is decided in a distributed manner.

Yunsong: During Server role transitioning, the directory information is passed on. How to prevent the unlimited expansion of the directory?

Joe: There is an aging process to take out the STAs that are no long within the range.

Ed Reuss (Clair Global): This sounds like Bluetooth. Like the idea of server mode. For the concert use case (presented yesterday in WNG, 11-13-0792r1), there are thousands of peers. Individual advertisement would clot the channel. The question is how to trust other STAs to advertise your info truthfully.

Joe: 1) There is no authentication in pre-association. 2) you can check by listening if your advertisement has been included.

Mike Lin (ITRI): What is the difference between your proposal and software AP?

Joe: Software AP is not described in the standard. The AP is usually connected to the BSS.

Mike: Software AP is more successful in the market than the ad-hoc mode.

Andrew (Cisco): IBSS is not universally used. The market is going the way of Wi-Fi Direct. What is actually a service? The concept of having a Server seems to against the IBSS.

Joe: I am aware of the service discovery programs in the WFA. But it is not done yet. I would like to do, in the long run, something to align with the WFA. A service is an application. Server vs. IBSS is a little bit odd. The goal here is for scalability.

The Chair: We want to be compatible with Wi-Fi Direct.

Santosh (Qualcomm): In the AP case, we know that both STAs are within the coverage of the AP. But in the case of P2P, two STAs may be within the coverage of the Server STA, but the two STAs may not be within the radio with each other.

Paul Lambert (Marvell): Not sure if there is an urgent need for IBSS based cases. IBSS has been a market failure. There are not many applications running on IBSS. Had a doubt if the server model is workable (need to be session-oriented). There should be a much simpler model. Question: how to differentiate with the WFA programs?

Joe: The WFA is a vendor specific group. We need a standardized approach.

Paul: We need to differentiate from the WFA programs.

The Chair: From regulatory PoV, you may not be able to do beaconing in 2.4GHz in EU.

The Chair asked how many people would like to work with Joe to come back in September. There are six members raised hand (out 23 people in the room).

The Chair reminded the members that the original Session III has been cancelled. The next and final session of TGaq is Thursday PM1 session.

The Chair asked Cheol if he would like to move his presentation to Thursday PM1 session. The response was yes.

**Recess**

The chair recessed the meeting at 9:54 am.

**Thursday, July 18th, 2013, 13:30 to 15:30 (PM1)**

**Reconvene and agenda**

Meeting reconvened on Thursday, July 18th, 2013 by Stephen McCann at 13:31 pm.

Chair reminded participants to record their attendance.

The chair reviewed an update of the agenda (doc 11-13-0682r3) which covers the activities of the current session (Thursday PM1)

* The chair reviewed the plans for today
* The revised agenda (doc 11-13-0682r3) was approved by unanimous consent.

**Presentation**

**11-13-0700r1 Discovery Modes and Discovery Proxy of Web Services Discovery**

Cheol Ryu (ETRI) presented this contribution. This is an update of the presentation previously made during teleconference call.

Slide 7: PAM is a broadcast or multicast Public action frame to reduce service discovery traffic. The frequency of PAM can be controlled.

Slide 8: Web Service Discovery and Bonjour support one-way service announcement.

Joe Kwak (InterDigital): I am not sure about the benefit of cache. In managed mode, why hello is unicast? Certain protocol uses multicast. If caching that, does the proxy only respond according to what is cached or does it still need to query the network again? Is the cached information adequate?

Response: This is generally based on OASIS.

Ping (Huawei): What frame is used for PAM?

Response: PAM can be a public action frame.
Ping: how frequently do you expect PAM will be sent?

Response: Not as frequent as the beacon.

Ping: In slide 4, if the probe is multicast, all APs can hear it and come back with multiple responses.

Response: The Probe frame is unicast. The content in the Probe is multicast UDP.

Jing (HTC): In slide 5, for the Hello message, when the AP relays it, does the AP multicast the data to all associated STAs and then use PAM to all unassociated STAs?

Response: Yes, there are two steps.

Jing: for unassociated STAs, if PAM (Hello) is not sent frequently, the delay for the unassociated STAs may be long.

**11-13-0788r0 TGaq Transaction Protocol**

Mike Montemurro (BlackBerry) presented this contribution. This is a strawmen of 11aq MAC protocol.

Slide 4: Transaction protocol

* Need a new protocol ID for Service TP.
* Different from ANQP.

Slide 5: TPX handles the query. TPX can be collocated with the AP.

Slide 6: An example.

Slide 7: The STP encapsulation message carries the ULP message to TPX. TPX passes the ULP message to the co-located service discovery ULP entity.

Slide 8: A diagram.

Slide 9: The STP encapsulation message also carries the ULP response message back to STA.

Slide 10: The message is signed to protect data integrity.

Slide 11: Possible IE format.

Questions and Discussions:

Yunsong (Huawei): in slide 11, why is the Token field located before the Length field?

Response: No particular reasons. It can be after the Length field.

Yunsong: Do you assume that the STA has the knowledge of the TPX before hand?

Response: Yes.

Santosh (Qualcomm): How to do push?

Response: We create a new protocol so that we don’t have to do ANQP.

Joe Kwak (InterDigital): In slide 6, after the first step, doesn’t the STA need to first find out the AP that supports the protocol or is connected to a proxy, before the second step can take place?

Response: one way we can advertise the protocol capabilities in the beacon. The other way is that we can include the protocol information in the encapsulation.

Juho (Renesas Mobile): How do you see ULP? Are you requiring certain standardization of ULP?

Response: No, we deliberately hide the details of the ULP so that we can focus on MAC design.

George (Qualcomm): you said that STP is not ANQP. How are they different?

Response: ANQP is a network oriented protocol. STP is not for network discovery. Separate rules are needed.

George: Agree on these philosophical points. But practically, how are they different from each other?

Response: For example, STP can use broadcast.

Ping (Huawei): ULP can be large. Do you need other step to find out the AP first?

Response: we need nice way to reduce the ULP size.

Paul Lambert (Marvell): had a question on the signature field in last slide.

Response: It is not necessarily for the security, but it is for the data integrity.

Santosh (Qualcomm): will IEEE need to define or register the IDs for ULP protocols?

Response: Not necessarily through registration. We need some IDs of ULP protocols and associate it with the encapsulation. But not sure how to do it in details right now.

Dan Gal (Alcatel-Lucent): what happens when the transaction actually goes on between STA and proxy?

Response: it is between the ULP entities in the STA and the TPX.

Dan: why can’t it be transparent?

Response: then we will be back to tunneling of ULP. You don’t want proxy the multicast DNS.

**11-13-0893r0 Service Discovery Proposal**

Paul Lambert (Marvell) presented this contribution. It is an update of a presentation given to the SG about 1year ago. Added four new slides.

Slide 5: Alternative ways to identify a service.

Slide 7: Min recommendation for Key size is 80bits. The possibility of collision is a function of the number of bits.

Slide 9: is where we left from last year.

Slide 10: definitions

Slide 11: collision issue is addressed by multiple service IDs.

Slide 12: reducing collision probability and enhance security benefits.

Slide 13: diagram of privacy protection with group key

Questions and Discussions:

Cheol Ryu (ETRI): If you use service ID as a multicast address, will it conflict with an existing multicast address?

Response: The responded service ID will help to reduce false match.

George (Qualcomm): Replay is still possible in this approach.

Response: The group key can help to further protect the privacy.

George: That will be post association, right?

Response: The group key can be set up before association.

George: Just want to make sure the scope is to protect the privacy.

Dan Gal (Alcatel-Lucent): A printer may come with pre-defined names. How do you deal with that?

Response: This approach is meant for the case where application developers come with a way to name their service uniquely.

**11-13-0299r1 Terminology document update**

Dan Gal (Editor) has updated the document with alternative definitions he found. The Chair led the group to review the alternatives.

Application

The result of group discussion is to replace the original text with the Wikipedia definition with the exception of replace the word “computer” with “device” and deleting the virus phrase.

Joe Kwak (InterDigital): Suggest deleting the second sentence as well. So deleted.

Bonjour

Santosh (Qualcomm): are we constructing a terminology for Bonjour?

The Chair: to make the amendment self consistent.

Paul (Marvell): Bonjour can be very chatty. May not be a good example.

Dan Gal (Alcatel-Lucent): prefer to keep the definition.

The Chair: suggest taking Apple’s definition.

Juho (Renesas Mobile): I agree with Santosh. Don’t like to take marketing language in the amendment text.

The group agreed that the intention here is to educate people and there is no intention to include this definition in the amendment text.

With this understanding, the final resolution is to choose the first choice, and to replace the word “Apple’s” with “A popular”.

Proximity

Joe Kwak: Suggest “Nearness in space, within the reception range of a radio frequency (RF) signal.”

Service

The group agreed to combine 2) and 3).

The group stopped on this topic after “service” due to limited time left. The updated document is saved as 11-13-0299r2.

**Timeline Update**

The group reviewed our current timeline and changes were made as highlighted:

* **Approval of PAR & 5C: November 2012**
* **Initial TG meeting: July 2013**
* **Initial Working Group Letter Ballot: July 2014**
* **Re-circulation Working Group Letter Ballot: July 2014**
* **Form Sponsor Ballot Pool: September 2014**
* **Mandatory Editorial Check: September 2014**
* **Initial Sponsor Ballot: November 2014**
* **Sponsor Ballot Recirculation: July 2015**
* **Final WG/EC Approval: July 2015**
* **RevCom/Standards Board Approval: July 2015**

There was no objection to the change.

**Teleconference Schedule**

One before September interim: Tuesday, August 27th, 2013 at 10:00 am ET.

**Preparation for September meeting**

The chair will requires 4 slots with a room for 50 people.

Call for proposals / Presentations.

With the agreed teleconference schedule, the Chair updated the agenda document to 11-13-0682r4.

**AOB**

The Chair reminded group that the call for nomination for TG Secretary remains open and interested member can contact the Chair (no prior experience is needed).

The Chair reminded participants to record their attendance.

**Adjourn**

Hearing no objection, 802.11aq is adjourned for the week at 15:29 local time.