**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | Minutes of IEEE 802.15.8 TG Interim Meeting on January 2015 in Atlanta, GA, USA |
| Date Submitted | January 20th , 2015 |
| Source | Marco Hernandez (NICT) |
| Response |  |
| Abstract |  |
| Purpose | For reference in TG8 |
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**Content**

1. TG8 sessions 3

2. Minutes 3

1. TG8 sessions

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| --- | --- | --- | --- | --- |
| Session | Monday | Tuesday | Wednesday | Thursday |
| AM1 |  |  | **TG8** | **TG8** |
| AM2 |  | **TG8** |  | **TG8** |
| PM1 | **TG8** | **TG8** | **TG8** |  |
| PM2 | **TG8** |  |  |  |

1. Minutes

Chair: Prof. Myung Lee (CUNY) USA.

Secretary: Marco Hernandez (NICT) Japan.

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Monday January 12th, PM1 session

−Chair calls the meeting to order.

**Chair:** We have 8 sessions in the revised agenda. Do you have comments on the agenda?

**BJ:** We need to change the format in the timeline to Month-Year.

**Chair:** Ok, I will figure it out.

**Marco:** I have 1 presentation.

**BJ:** I have 2 presentations and another one in preparation.

**BJ:** Let's discuss the email sent by HB Li about the Draft changes.

−Marco moves the proposed agenda in DCN 15-01r2.

Second: BJ.

Discussion: none.

The agenda is approved unanimously.

−Marco moves a motion to approve the minutes of the previous meeting in DCN 14-0696r2.

Second: BJ.

Discussion: none.

The minutes are approved unanimously.

**Chair:** Marco, please report the teleconference.

−Marco reads the minutes of the teleconference in DCN 14-723r1.

Comments:

**Qing:** I hope to discuss with BJ and to propose harmonized text for peering, power control, etc.

**Chair:** The working items assigned to champions are in DCN 14-657r2:

Sync (BJ and Shannon)—By Jan 2015

Discovery (Shannon—TBD: presentation & disc Jan. 2015)

PHY interface with MAC: Marco and BJ

Peering (March 2015)

MAC: Qing and Nov. 2014 (BJ)

PHY interface with MAC: Marco and BJ

Communication period

CAP: BJ (Nov 2014)

Channel Selection (Nov. 2014: HB Li)

CAP: BJ (By Jan 2015)

CFP: Shannon (By Jan 2015)

Transmit power control

CFP done (Marco)

CAP: Qing (Presentation and discussion on Jan 15)

Power management (BJ and Qing: Presentation and discussions on Jan 15)

Relative positioning: UWB by Igor presentation and discussion on Jan 15)

Security (interface to KMP: PHY security BJ March 2015)

**Chair:** BJ, what about synchronization?

**BJ:** Network synchronization consists of initial, maintaining and re-synchronization. Shannon and I have had some discussions. We have agreements, but still some disagreements. I made some extra simulations to proof the 180 degrees rule is better than the concave curve, but Shannon insists to use such concave curve.

Maintaining synchronization is a problem when 2 different groups meet. How to maintain synchronization is not easy. I expect to propose something during this meeting.

About re-synchronization, Shannon and I have different concepts, but at least we agree that the same concept for initial synchronization should be used when PDs lose synchronization.

**Chair:** If the TG agrees on something during this meeting that is it.

**Chair:** About peering, BJ and Qing?

**BJ:** I am working on a proposal of random access for peering, but it is different than the one for the communication period. Such contribution is not ready yet.

**Chair:** Channel selection: We have CAP by BJ and CFP by Shannon. I do not remember what they were about?

−Nobody recalled why channel selection was divided for CAP and CFP, just that it is managed by higher layers.

**Chair:** About power control and power management, hope that Qing and BJ discuss about it.

**Chair:** For relative positioning, Igor?

**Igor:** I will present something on Wednesday.

**Chair:** Ok, we have now 3 presentations:

1st presenter is Marco (NICT) DCN 15-17r0 "Motion for reference signals in the high mobility PHY"

Comments: none.

−Marco moves a motion to replace the text in clause 9.2.40 (Reference signals) of Draft Standard v0.6 by the text in DCN 15-16r0.

Second: HB Li.

Official vote on the mentioned motion:

~~In favor: 9. Oppose: 0. Abstain: 0. Motion carries.~~

In favor: 8. Oppose: 0. Abstain: 0. Motion carries. (One vote was subtracted due to Qing does not have voting rights).

2nd presenter is BJ (ETRI) DCN 15-10r0 "Proposed change of terminology: frame to superframe"

Comments:

**Marco:** I will rename “super frame” to “PHY super frame” in clause 9.2.

**Response:** That is ok with me.

**Paul:** I think superframe is a collection of frames.

**Response:** The superframe consists of synchronization, discovery, peering, CAP and CFP. Frame is used for the communication period.

**Igor:** I suggests you check the terminology used in 15.4.

**Response:** The issue is that the term superframe is used for different things in the Draft.

I will check it with the 15 Editor James.

**Chair:** We can follow our own terminology as we are not an amendment Group, but BJ will check it with the 15 editor and come back to us later.

3rd presenter is BJ (ETRI) DCN 15-12r0 "Proposed Structure of Contention Free Period in PAC Superframe"

Comments:

**Qing:** I do not agree. However, if a motion was passed, I respect it, but we will receive comments on it.

**Billy:** We can call it “scheduled period” rather than CFP to avoid problems.

**Paul:** However, we should follow 15 terminologies and keep CFP.

**Chair:** Let's stick to the passed motion during the last meeting.

**Qing:** I object the current proposed motion as superframe has not been accepted yet.

**Response:** Let me check. No, there is not any reference to superframe here.

**Qing:** I am fine then.

−BJ moves a motion to approve the text changes in Draft Standard v0.6 by the text embedded in DCN 15-12r1.

Second: Marco.

Discussion: none.

Official vote on the mentioned motion:

~~In favor: 7. Oppose: 2. Abstain: 0. Motion carries.~~

In favor: 7. Oppose: 1. Abstain: 0. Motion carries. (One vote was subtracted due to Qing does not have voting rights).

**Chair:** Let's take a recess until PM2.

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Monday January 12th, PM2 session.

−Chair calls the meeting to order.

**Chair:** The network is down, again. Let's make a list for assistance.

**Chair:** I changed the format for the timeline to month/year in the agenda.

**BJ:** The timeline should be enforced. We need to make technical decisions and to resolve TBDs.

**Chair:** All major items are compiled in DCN 14-657r2.

**BJ:** This document summarizes the high level harmonization, but still details are needed and these will take time.

**Chair:** Shall we go over the Draft Standard v0.6 and compared it with IEEE802.15.4 2011?

**Chair:** Let's divide the work with Qing and Marco to go over 15.4 and our Draft and see which parts are missing.

**Chair:** The meeting is in recess until AM2 tomorrow.

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Tuesday January 13th, AM2 session

−Chair calls the meeting to order.

**Chair:** We have 2 presentations:

4th presenter is HB Li (NICT) DCN 15-46r0 "Frequency channel selection text to put into draft"

Comments: none.

−HB Li moves a motion to approve the text for frequency channel selection in DCN 15-46r1 into the Draft Standard v0.6

Second: Igor.

Discussion: none.

Official vote on the mentioned motion:

~~In favor: 8. Oppose: 0. Abstain: 0. Motion carries.~~

In favor: 7. Oppose: 0. Abstain: 0. Motion carries. (One vote was subtracted due to Qing does not have voting rights)

**BJ:** I talked with the 15 Editor James and he said the term superframe is perfectly right. So I want to resolve the pending motion of yesterday. Basically there is one definition of superframe and other contributions must rename it.

−BJ moves a motion to accept the terminology proposed in DCN 15-10r1, and to rename the term "superframe" referred by motion 2 in DCN 14-689r2, slide 4.

Second: Qing.

Discussion: none.

Official vote on the mentioned motion:

~~In favor: 9. Oppose: 0. Abstain: 0. Motion carries.~~

The voting result is invalid as Qing does not have voting rights. This motion was voted later on Wednesday PM1 session.

5th presenter is Qing (Interdigital) Draft Standard v0.6 "Comparison with IEEE802.15.4: clauses 4 and 5 " sent to the email reflector.

Comments:

**Li:** Some items in red have already been addressed in the framework document.

6th presenter is Marco (NICT) Draft Standard v0.6 "Comparison with IEEE802.15.4: clauses 8 and 9" sent to the email reflector.

Comments:

**Billy:** Why the UWB operational bands need to be moved to another clause.

**Response:** In order to be consistent with IEEE802.14 style format, but it is up for discussion.

7th presenter is BJ (ETRI) Draft Standard v0.6 "Comparison with IEEE802.15.4: clauses 6 and 7"

Comments:

**Chair:** The issue with security is that the Std 15.4 has security embedded in the standard, while we aim to define an interface. Recall TG9 is key management; there is nothing about encryption, etc. We need to see how to integrate security of 15.4 and key management into our draft.

**Chair:** This afternoon we go over the comparison to IEEE802.4 2011 and to define champions for missing parts.

8th presenter is BJ (ETRI) DCN 15-53r0 "Updated Proposal on Fully Distributed Synchronization Scheme for PAC"

Comments:

**Marco:** Can we discuss further the 180 rule?

**Response:** Yes, I am willing to delay a motion on this. What you do you need to know?

**Marco:** A theoretical proof that this rule converges.

**Response:** I do not have a theoretical proof, just my simulations scenarios.

**Marco:** That is the thing, the concave rule is well known, while we do not have a concrete proof of your proposed rule.

**Response:** I got it because besides of offering good results, also it has consistency when 2 different PAC groups meet.

**Chair:** For 2 groups you achieve global synchronization?

**BJ:** Yes.

**Chair:** We are in overtime; let's take a recess until PM1.

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Tuesday January 13th, PM1 session

−Chair calls the meeting to order.

**Chair:** Let's continue the comments for BJ.

**Li:** Please go through the text changes.

**Marco:** Other than the 180 rule, the rest is fine with me.

**BJ:** What do you need to discuss?

**Marco:** If the 180 rule is mandatory and the concave curve is optional, then it is fine with me.

**BJ:** Ok, let me change typos and mandatory and optional rules by tomorrow.

**Chair:** How are we going to continue? By March 2015, all technical contributions should be done.

**Chair:** Based on the list of items in DCN 14-657r2, let's check:

We have superframe consists of synchronization, discovery, peering, CAP, CFP.

What is the length of the synchronization period?

**BJ:** It depends on the performance metric, currently 34 back-off slots (32 slots + 2 synch slots)

90% of the time PDs receive the synchronization signal.

**Paul:** Is it for best of worst channel condition?

**BJ:** I think we used the fading channel.

**Paul:** We need to define channel conditions: AWGN, fading, mobility, etc. and then we aim 90% successful synchronization reception for those channel conditions.

**Qing:** Also, distance between PDs and receivers parameters can affect these synchronization parameters.

**BJ:** We took simple Wi-Fi-like receiver parameters.

**Qing:** The transmit power changes the parameters as well.

**BJ:** I am ok with introducing power control. So, these parameters do not change much.

**BJ:** Also, changing the channel model, it will affect the numbers slightly. I prefer to skip it.

**Qing:** What about mobility?

**BJ:** The convergence of the network is faster than mobility.

**Chair:** We need to specify the number of slots for synchronization period.

**BJ:** I wanted to test if 34 slots are enough to avoid Wi-Fi interference, but I do not have results.

**Marco:** Let's take these numbers and if somebody else comes up with better parameters we will revise them.

−After discussion, TG8 defined synchronization parameters and partially for the discovery period. Those are captured in DCN 14-657r3.

**Chair:** Ok, let's continue tomorrow. The meeting is in recess.

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Wednesday January 14th, AM1 session

−Chair calls the meeting to order.

**Chair:** Let's continue the discussion on superframe period parameters.

−After discussion, TG8 decided some (but not all) parameters for peering period. Qing is the champion for looking at content of peering, re-peering messages, and comparison with traditional association process.

−During the discussion, the potential reconfigurable structure of the superframe was mentioned, which includes: solution to avoid interference, BO, SO, MO, (15.4e) to configure, active & inactive period, and superframe interval. However, TG8 found out that the frame structure was already decided to be fixed. The potential reconfigurable structure of the superframe was removed from working items in DCN 14-657r3.

**Chair:** The meeting is in recess until PM1.

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Wednesday January 14th, PM1 session

−Chair calls the meeting to order.

9th presenter is BJ (ETRI) DCN 15-53r1 "Updated Proposal on Fully Distributed Synchronization Scheme for PAC"

Comments:

**Li:** Why the number 180 in the 180 rule? Why no other number?

**BJ:** I understand your concern, results will be shown later. Anyhow, I will move a motion.

−BJ moves a motion to accept the text proposed in DCN 15-53r1 for network synchronization in the Draft Standard v0.6.

Second: Chang.

Discussion:

**Li:** I cannot accept it without evidence that other numbers are not good.

**Qing:** I agree with HB Li.

Official vote on the mentioned motion:

**BJ:** Qing does not have voting rights.

**Chair:** Then, you cannot vote Qing.

In favor: 3. Oppose: 2. Abstain: 1. Motion fails.

**Qing:** In order to be consistent, you must subtract my vote from previous motions.

−Marco goes through the previous motions to subtract 1 vote (Qing). There are no changes in the voting results. However, Qing seconded one motion. Thus, that motion is voted again:

−BJ moves a motion to accept the terminology proposed in DCN 15-10r1, and to rename the term “superframe" referred by motion 2 in DCN 14-689r2, slide 4.

Second: Chang.

Discussion: none.

Official vote on the mentioned motion:

In favor: 6. Oppose: 0. Abstain: 0. Motion carries.

**Chair:** Let's continue with the work items.

−TG8 decided champions on work items in DCN 14-657r5 to be reported during the teleconferences.

Teleconferences are scheduled as:

January 28th at 7:00 AM ET, 9:00 PM Japan and Korea

February 11th at 8:00 PM ET; February 12th at 10 AM Japan and Korea

March 4th at 7:00 AM ET, 9:00 PM Japan and Korea

**Chair:** BJ, as soon as we have numbers for the superframe, please make a figure of the superframe with those.

10th presenter is Igor (NICT) DCN 15-65r0 "Text for Relative Positioning"

Comments:

**BJ:** What is the resolution?

**Response:** approximate 1 foot.

**BJ:** Does it require LOS?

**Response:** For better resolution, yes.

**Li:** What about other methods?

**Response:** The ranging method depends on the PHY parameters, but other methods we can be added later.

**BJ:** Is it allowed to have figures in color in the specification?

**Response:** We can change that.

**Chair:** Let's continue with the comparison with IEEE802.15.4 2011 and to define champions for bringing text for the next meeting.

−Qing goes through General description and TG8 decided champions, who will take care of specification text. The discussion is summarized in an email sent to the reflector.

**Chair:** The meeting is in recess until tomorrow PM1.

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Thursday January 15th, AM1 session

−Chair calls the meeting to order.

**Chair:** Let's continue with the comparison with IEEE802.15.4.

−Qing goes through MAC clause 5 of IEEE802.15.4 and champions were assigned to items. The discussion is summarized in DCN 15-74r0.

−Marco goes through PHY clauses 8 and 9 of IEEE802.15.4 and champions were assigned to items.

It was decided that the term "frame" in the PHY can remain, while deleting "ultra-frame" and replacing "super frame" by “multi-frame”. The discussion is summarized in an email sent to the reflector.

**Chair:** Clauses 6 and 7 of IEEE802.15.4, MAC services and security, will be addressed after other clauses of the Draft Specification are completed.

−BJ moves a motion to approve the Draft Specification v0.71 to v0.8 (agreed version).

Second: Marco.

Discussion: none.

Official vote on the mentioned motion:

In favor: 7. Oppose: 0. Abstain: 0. Motion carries.

**Chair:** The meeting is in recess until AM2.

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Thursday January 15th, AM2 session

−Chair calls the meeting to order.

−Qing goes through the PAC framework document. Some missing items were identified.

**Marco:** I uploaded the document with the so far approved motions to Mentor as DCN 14-689r3.

**Chair:** Thank you everybody for your hard work. Talk to you in the next teleconference. The meeting is adjourned.