**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **<IEEE802.15 SCMan and SCWNG minutes>** |
| Date Submitted | [14 Nov 2013] |
| Source | [][][Chicago, IL] | Voice: [+1.847.960.3715]Fax: []E-mail: [pat.kinney@ieee.org] |
| Re: | [802.15 Main and WNG Meeting in Dallas] |
| Abstract | [IEEE 802.15 Man and WNG Standing Committee Minutes] |
| Purpose | [Official minutes of the Working Group Session] |
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**IEEE 802.15 Plenary Meeting – Session #87**

**Hyatt Regency, Dallas, Texas, USA**

**November 10-14, 2013**

**SC Maintenance**

**Wednesday 13 November 2013**

**08:12** SC Maintenance called to order by Pat Kinney (Kinney Consulting)

* Consideration of changes to Operation Manual (15-10-235-10)
* Technical Expert Group (TEG)
	+ Significant discussion on the concept
	+ Add paragraph showing typical/preferred activities/use of TEG such as TEG presenting a tutorial on the standard at the start of the TG, guidance along the TG’s development, etc.
	+ Combine background and function sub-clauses into Function
* Ballot Resolution Committee (BRC) changes
	+ Consensus is to not change duration of BRC, rather have the TG request re-affirmation at the opening plenary.
* ANA number assignment
	+ Significant discussion on various aspects
		- Explicit limitation is too narrow
		- Limitation to SDO is to restricting, add industrial standards group/consortium/alliances

**10:00** SC Maintenance meeting recessed

**Thursday 14 November 2013**

**08:00** SC Maintenance called to order

discussed maintenance request from Daniel Popa

Significant discussion on a number of issues:

* Proper sequence of operations for incoming secured frames
* Intention of IE operation in the stated usage case
* Discovery that the “Get802” version of 802.15.4-2011 was incorrect

In conclusion there was a consensus to accept Popa’s edited request as included in Annex B.

**09:25** Operations Manual Changes

Discussion ensued as to the wording of the Technical Expert Group changes. The resolutions to the discussions are included in 15-10-235-11.

**10:10** recess

**10:40** call back to order

Discussion ensued as to the ANA changes for external SDOs and Industry Standards Groups. Agreed upon changes are included in 15-10-235-11.

**11:45** meeting adjourned

**SC WNG meetings**

13 November 2013

**11:08** SC WNG called to order by WNG chair, Pat Kinney

Four presentations, three in AM2, and one PM1 using SC maintenance slot

1. Two innovative energy efficient IEEE 802.15.4 MAC sub-layer protocols with packet concatenation: employing RTS/CTS and multi-channel scheduled channel polling by Noberto Barroca (15-13-0627-02)
	1. Which 802.15.4 version are you referring? 2011, then there’s another CCA mechanism - Aloha
	2. Consider any interference? Smaller packets have a decreased probability of interference, but tweaking the protocol essentially on a case-by-case basis could be done
	3. Modeling included probability of collision with different protocol devices? Changes can be done on a packet by packet basis
	4. PER?
	5. What would you have 802.15 do with your presentation? Consider these mechanisms in future amendments. SRU will consider this presentation
2. Proposal for a Study Group focusing on ranging support for WPAN’s by Dietmar Eggert (15-13-0693-00)
	1. Vote on moving this concept to a Study Group: 32 for , 0 against, and 10 with no opinion
3. European Low Rate PHY by Larry Taylor (15-13-0690-00)
	1. Does the European Regulatory specify this is General or smart grid usage? No, agnostic. Then should it be put in the SUN PHY? Yes But why should it be limited to the SUN PHY? SG will decide.
	2. Vote on moving this concept to a Study Group: 31 for , 1 against, and 5 with no opinion

**12:30** meeting recessed until PM1

**13:30** SC WNG called back to order

1. 6TiSCH + 802.1 for a new IPv6 MultiLink subnet by Pascal Thubert (15-13-0685-01)
	1. trickle multicast? Yes
	2. slide 10 – doesn’t make a difference if connected to router or wireless
	3. slide 17 – what makes 6tisch specific for TSCH mac? Time slot allocations, etc.
	4. what if TSCH is not used? Although many macs can be used the .4e TSCH is mature and well understood by industrial protocols, deterministic behavior is required by the applications
	5. RPL is framework for routing? Configuration function or set of configurations (time and freq)? 6tisch will provide one
	6. Trickle multicast msgs – do you process all messages in domain? Comment made that this messes up link layer security
	7. Slide 20 – assuming RFC6775? Don’t propagate RPL over the backbone
	8. Timing accuracy, especially toward large networks? precise crystals are getting cheaper. Some analysis has been done, but use of backbone to sync is probable
	9. 6top – include mechanism to communicate time sync? No MAC is responsible
	10. 802.15 WG topics
		1. time sync distribution
		2. nothing else specific

Significant interest in participating in an IG 6TiSCH. IG would seek out areas of 802.15.4 that would benefit 6TiSCH such as new IEs. 802 EC coordination call with IETF occur frequently. Chair solicited volunteers for the IG chair position by asking potential volunteers to email pat.kinney@kinneyconsultingllc.com.

**15:50** WGN adjourned

**Annex A**

# IEEE 802.15 WG Assigned Numbers Authority

The objective of the Assigned Numbers Authority (ANA) is to conserve and allocate identifier values in the IEEE 802.15 standards and approved amendments. Such identifiers are called Managed Resources.

## WG ANA Lead

The WG ANA Lead shall be appointed by the WG Chair. The WG ANA Lead shall be responsible for approving and maintaining a central repository of Managed Resource values in a document as defined in subclause 0.

## ANA Document

A document containing the Managed Resource values shall be made available on the server during Interim Sessions and Plenary Sessions and posted on the IEEE 802.15 WG website. Any updates shall be posted on the IEEE 802.15 WG website within 15 days following the close of the 802.15 WG Interim Session or Plenary Session.

## ANA Request Procedure

A request for a Managed Resource for new identifier values shall be made by using the following procedure:

1. A draft amendment or standard that has been approved by the WG or a TG and that requires allocation of values from the ANA shall contain placeholders for such numbers using the sequence <ANA>, and should not presume any particular value will be assigned.
2. The TG chair or technical editor shall prepare requests for each such <ANA> flag using the forms provided by the ANA and documented in the ANA database document.
3. The ANA shall circulate the requests and tentative assignments to the 802.15 editor's reflector and ask TG editors to check for any conflict.  Typically the requests are generated following a session.  The ANA should respond to the request within one week.  The ANA shall reject any request that is not properly formed, i.e., does not supply all information required by the ANA form.  The last item of any resource will never be assigned and will always automatically be designated as “escape bit/number”.
4. After a period of 1 week has elapsed and no conflict has been reported, the assignments are confirmed and the ANA shall upload an updated database document and notify the WG reflector.

### ANA Revocation Procedure

The TG that has previously requested a Managed Resource may request revocation of that Managed Resource value, however the request must be approved by a motion in the TG or WG.

### ANA Appeals Procedure

An appeal of an assignment of a Managed Resource value may be made by a Voter by following the appeal procedure described in the WG P&P **Error! Reference source not found.**.

### ANA Managed Resource Addition Procedure

A TG or the SC maintenance that defines a new resource enumeration in the development of its draft standard shall inform the ANA Lead of the new resource which may be added to the set of Managed Resources. The TEG shall ensure there is no conflict or duplication of the new resource enumeration with any existing Managed Resource.

The TEG will recommend to the 802.15 WG whether a new resource enumeration should be added to the set of Managed Resources.

## ANA Request Procedure for other standards development organizations (SDOs)

An SDO which has a current MoU or collaboration agreement with IEEE may request the WG Chair to allocate a Managed Resource identifier to allow the SDO to extend the use of IEEE 802.15 standards.

Industry Standard Groups or other organizations recognized by the WG (ISGs) may also request reservation of Managed Resource values at the discretion of the WG Chair.

A limited number of resource identifiers may be assigned to such SDOs or ISGs. Currently, this is only allowed for IEEE Std 802.15.4, but it may be applied to other IEEE 802.15 standards in the future at the discretion of the WG Chair.

The set of Managed Resource identifiers includes:

1. Frame Extension ID
2. Header Information Element (IE) Element ID
3. Payload IE Group ID
4. Other resource enumerations as per 2.3.3

Only one value shall be assigned to an SDO or ISG from any Managed Resource.

To request a Managed Resource value, the SDO or ISG shall send an official request to the IEEE 802.15 WG Chair that includes, at a minimum, the following information:

1. The name of the SDO or ISG and its accreditation
2. The reason for the request
3. The Managed Resource(s) that is/are requested

If the request from the SDO or ISG contains the required information, the IEEE 802.15 WG Chair shall assign the review of the request to the TEG. The WG ANA lead and the WG 802.15 Chair are ex-officio members of the review committee. The TEG may request further information from the SDO or ISG if necessary for the evaluation of the request for a Managed Resource. The TEG shall determine whether the assignment of the resource may impact other resource identifiers within 802.15 standard(s) and reserve values for any such associated resources.

The committee should decide on the request within three months of the request. This is to allow the consideration of the request at an interim or plenary session.

The committee shall refuse the request if:

1. The SDO is not an accredited SDO or recognized ISG
2. The SDO or ISG has already been assigned a number in a requested Managed Resource category.
3. There is a technical reason why a value cannot be allocated.

If the committee approves the request, the WG ANA lead will assign a value for the requested Managed Resource categories and update the ANA database document. The assigned values should also be submitted for inclusion in the next revision of the standard.

### ANA Appeals Procedure

An appeal of a request refusal for a Managed Resource value may be made by an SDO or ISG via its official communications channel with the 802.15 chair.

**Annex B**

## Maintenance Request Form

Date: 12 November 2013

Name: Daniel Popa

Affiliation: Itron, Inc.

E-Mail: daniel.popa@itron.com

Document's title (include revision/year): IEEE 802.15.4e-2012 & IEEE 802.15.4-2011

Clause number: Clause 5.2.4.22 *IE List Termination IE*

Page: 94-95

### Issue, concern, or question

IEEE Std. 802.15.4e-2012 defines the following structure for the Information Elements: a Header Information Element (HIE) and a Payload Information Element (PIE). Header IEs are used by the MAC to process the frame. Header IEs cover security, addressing, etc., and are part of the MHR. Payload IEs are destined for another layer or SAP and are part of the MAC payload.

Format of the HIE is depicted bellow (copy-pasted from 802.15.4e-2012 spec):



HIE Element ID field is used – among other functionalities - to signal if the HIE is followed or not by PIEs, as illustrated in the following figure



Format of the PIE is depicted bellow (copy-pasted from 802.15.4e-2012 spec):



PIE Group ID is used – among other functionalities - to signal if the PIE is followed or not by a MAC payload, as illustrated in the following figure



**Section 5.2.4.22** states:

*The Header IE list is terminated with an IE List Termination IE (ID = 0x7e or 0x7f) that has a content length*

*of zero. Explicit termination is required after a Header IE if there is one or more Payload IEs (0x7e), or*

*MAC payload (0x7f), following the Header IE list. If an unformatted payload follows the Payload IE list, then the payload IE list is terminated with a list termination IE (ID = 0xf) that has a content length of zero.*

*Otherwise the terminator may be omitted.*

## Use case: MAC has Header Information Elements and no payload (Information Element Payload, or upper Layer data)

We consider the following use case. The transmitter has a to send a MAC frame that has the following characteristics

* MAC frame contains one Header Information Element or several Header Information Elements (i.e., a list of Header Information Elements), and
* MAC frame does not include a MAC payload (i.e., no upper layer payload, and no Payload Information Elements).

1st Requested Clarification – MAC frame is not secured

For the aforementioned use case, the transmitter has to send the MAC frame without security.

Since the MAC frame has not payload (i.e., no upper layer payload, and no Payload Information Element) is it required to insert an IE List Termination (i.e., an additional Header IE with length zero and Element ID of *0x7f*) to signal the end of (the list of) Header Information Elements?

2nd Requested Clarification – MAC frame requires security

For the aforementioned use case, the transmitter has to send the MAC frame with a level of security that requires MAC frame authentication (i.e., MIC field is present).

In this context, is MIC considered as a MAC payload? Therefore, is it required to insert an IE List Termination (i.e., an additional Header IE with length zero and Element ID of *0x7f*), between the end of (the list of) Header Information Elements and the MIC, to signal the Header IEs termination?

### Proposed change

In Clause 5.2.4.22, change text

*The Header IE list is terminated with an IE List Termination IE (ID = 0x7e or 0x7f) that has a content length of zero. Explicit termination is required after a Header IE if there is one or more Payload IEs (0x7e), or MAC payload (0x7f), following the Header IE list. If an unformatted payload follows the Payload IE list, then the payload IE list is terminated with a list termination IE (ID = 0xf) that has a content length of zero. Otherwise the terminator may be omitted.*

As follows

*When determining if a Termination IE is required, the authentication or encryption procedures are not taken into account.*

*The Header IE list is terminated with a List Termination IE, which has a content length of zero, as follows:*

* *Insertion of the List Termination IE with ID = 0x7e (<Insert here reference to Table 4b>) is required after the last Header IE, if there is one or more Payload IEs following the Header IE list.*
* *Insertion of the List Termination IE with ID = 0x7f (<Insert here reference to Table 4b>)  is required after the last Header IE, if there is there is a MAC payload (upper layer data) following the Header IE list.*
* *Otherwise the List Termination IE may be omitted.*

*The Payload IE list is terminated with a List Termination IE, which has a content length of zero, as follows:*

* *Insertion of the List Termination IE with ID = 0xf (<Insert here reference to Table 4c>) is required after the last Payload IE, if there is a MAC payload (upper layer data) following the Payload IE list.*
* *Otherwise the list Termination IE may be omitted.*

### Impact on existing equipment

None identified.