

Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [DF04 Beamforming Related Comment Resolutions]

Date Submitted: [Jan. 19, 2009]

Source: [Junyi Wang, Zhou Lan, Chang woo Pyo, Chin-Sean Sum, Tuncer Baykas, Azizur Rahman, Ryuhei Funada, Fumihide Kojima, Hiroshi Harada, Shuzo Kato, Su-Khiong Yong*, Huai Rong Shao*, Jisung Oh*, Ismail Lakkis⁺]

Company [National Institute of Information and Communications Technology (NICT), Tensorcom, Samsung]

Address¹[3-4 Hikari-no-oka, Yokosuka-shi, Kanagawa 239-0847, Japan;
416 Maetan-3Dong Yeongtong-Gu Suwon-shi Kyunggi-Do 443-742, Korea*;
10875 Rancho Bernardo Rd, #108, San Diego, CA 92127⁺]

Voice¹:[+81-46-847-5074] , FAX¹: [+81-46-847-5440]

E-Mail[junyi.wang@nict.go.jp]

Re: []

Abstract: [Comment Resolutions related to Beamforming in DF04]

Purpose: [To be considered in TG3C baseline document.]

Notice: This document has been prepared to assist the IEEE P802.15. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.

Release: The contributors acknowledge and accept that this contribution becomes the property of IEEE and may be made publicly available by P802.15.

D04 Beamforming Related Comment Resolutions

Junyi Wang
junyi.wang@nict.go.jp
NICT

Comments on IE definitions (1/8)

- Comment 12: It is better to add a figure in the introduction of BF to show the relation between BF operation and directional association. The figure shall contain two cases, (1) Omni-antenna: association follows 802.15.3, (2) directional antenna: directional association, the part shall be further divided into 2 subpart: proactive and on-demand BF.
- Subclause 13, Page 157
- Resolution: Withdraw the comment, but add the following text in directional association related IE in subclause 7.4 .
 - All directional association related IEs shall be supported by all 802.15.3c compliant PNC and non-PNC capable DEVs.
- Replace
 - “The pro-active beam forming shall take place in the beacon and CTAP ” in L19 of Page 157
- by
 - “As for the pro-active beam forming, the sector level training from PNC to DEV shall take place in the beacon; The sector level training from DEV to PNC and the beam level training of both directions, shall take place in the CTAP”

Comments on IE definitions (2/8)

- Comment 13: We think the cluster encoding is only used in PET, if it is true please clarify it L23, "The following cluster encoding scheme is only used in PET."
- Subclause 13.3, Page 160, Line 23
- Resolution: Add following sentences to clarify the fact in L23
 - The following cluster encoding scheme is only used in PET.

Comments on IE definitions (3/8)

- Comment 14: There is no clear reason why the cases that $K < M$ and $K \neq M/2$ are not of interest.
- Subclause 13.3.1, Page 162, Line 53
- Resolution: Remove the sentences.

Comments on IE definitions (4/8)

- Comment 16: It is better to remove SAS sector level and beam level training, since they are the special cases of AAS, and for a DEV, it is hard to decide whether the system is AAS or SAS, because AAS or SAS is not only depends on Antenna configuration but also depends on channel. Since the channel may not reciprocal for uplink and downlink in NLOS channel, it may result different optimal patterns for transmission and reception even for the same antenna configuration.
- Subclause 13.5.1.1.2, Page 169
- Resolution: Withdraw. Although the SAS is a special case of AAS, it is the most possible case that would be considered in the practical scenario. So it is better to keep them for implementation. The editorial change for AAS shall be applied to the corresponding part of SAS in order to keep them consistence to each other.

Comments on IE definitions (5/8)

- Comment 17: There is no definition of "phase vector" and "amplitude vector"
- Subclause 13.5.1.2.1, Page 174, Line 1-5
- Resolution:
 - Change "phase vector" into "phase vector, i.e. phase for each antenna element".
 - Change "amplitude vector" into amplitude vector, i.e. amplitude for each antenna element.

Comments on IE definitions (6/8)

- Comment 18: It is said there that "phase resolution" and "amplitude resolution" are greater than one, which are conflict with what defined in L49 and L53 of page 39. Furthermore there is no mapping table for these two fields.
- Subclause 13.5.1.2.1, Page 174, Line 2/7
- Resolution: "greater than one" in Line 2/7 of Page 174 shall be taken place by "greater than zero". The mapping is just from $N \rightarrow 2^N$.

Comments on IE definitions (7/8)

- Comment 19: It is said here that "When beam switching criterion is used, pattern tracking reduces to beam tracking", Is it true? And what is beam switching criterion, what is pattern tracking, what is the difference from beam tracking?
- Subclause 13.5.2, Page 178, Line 45-46
- Resolution: Suggest to remove the sentence.

Comments on IE definitions (8/8)

- Comment 20: There is no definition of "beam grouping method"
- Subclause 13.5.2, Page 178, Line 48
- Resolution: Replace following sentence
 - “Tracking is enabled by clustering which is a beam grouping method as describe in 13.2.4”
- with
 - “Tracking is enabled by clustering as described in 13.2.4. The best beam and its adjacent beams that requires to be tracked shall be grouped as the best cluster; Accordingly the second best beam and its adjacent beams shall be grouped into the second best cluster.”