IEEE P802.11
Wireless LANs

|  |
| --- |
| 2.3.3 Measurement Request element |
| Date: 2016-12-11 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Kyungtae Jo | LG Electronics | Yangjae-daero 11gil, Seocho-gu, Suoul, 137-893, Korea | +82-10-8421-7010 | kyungtae.jo@lge.com |
| Lei Huang | Pannasonic |  |  | lei.huang@sg.panasonic.com |

Abstract

This document proposes specification text for subcaluse 2.3.3 of the SFD describing Measurement Request element.

* + 1. Measurement Request element
			1. Directional Channel Quality request

Channel Number field indicates the channel number for which the measurement request applies if either of the Requesting STA and the Target STA is a non-EDMG STA. Otherwise this field is reserved. Channel Number is defined within an Operating Class as shown in Annex E.

The AID field indicates the Target STA.

The Measurement Configuration field indicates measurement configuration information for which the measurement request applies. The Measurement Configuration field format contains a 6-bit Measurement Channel Bitmap subfield and 2 bit Measurement Report Method subfield. Whether the Measurement Configuration field uses the reserved bits or is put into the optional subelement is TBD

|  |  |  |  |
| --- | --- | --- | --- |
|  | Measurement Channel Bitmap | Channel Measurement Report Method | Antenna Measurement Report Method |
| Bits: | 6 | 1 | 1 |
| 1. — Measurement Configuration field format (11ad)
 |

The Measurement Channel Bitmap subfield indicates one or multiple 2.16GHz channels for which the measurement request applies. Starting with the MSB, the *i*-th bit of the Measurement Channel Bitmap subfield sets to 1 to indicate the 2.16GHz channel with channel number *i* for which the measurement request applies. The *i*-th bit of the Measurement Channel Bitmap subfield sets to 0 to indicate the 2.16GHz channel with channel number *i* for which the measurement request does not apply. Notice that the Measurement Channel Bitmap subfield also indicates the number of requested 2.16GHz channels, *Nch*.

The Channel Measurement Report Method subfield indicates the method that is to be used by the Requested STA to report the results of measurements over multiple 2.16GHz channels in the measurement report. The Channel Measurement Report Method subfield sets to 0 to indicate the results of measurements over all the requested 2.16GHz channels during each measurement time block are reported per 2.16GHz channel. The Channel Measurement Report Method subfield sets to 1 to indicate the averaged results of concurrent measurements over all the requested 2.16GHz channels during each measurement time block are reported.

The Antenna Measurement Report Method subfield indicates the method that is to be used by the Requested STA to report the results of concurrent measurements using multiple Rx antennas in the measurement report. The Antenna Measurement Report Method subfield sets to 0 to indicate the results of concurrent measurements over each requested 2.16GHz channel using multiple Rx antennas during a measurement time block are reported per Rx antenna. The Antenna Measurement Report Method subfield sets to 1 to indicate the averaged results of concurrent measurements over each requested 2.16GHz channel using multiple Rx antennas during a measurement time block are reported.

The Extended Measurement Configuration subelement contains measurement timing information for the requested 2.16GHz channels excluding the first 2.16GHz channel. When the Extended Measurement Configuration subelement is present, the measurement timing information for the first requested 2.16GHz channel is indicated in the Measurement Start Time field, the Measurement Duration field and Number of Time Blocks field. When the Extended Measurement Configuration subelement is not present, the measurement timing information for all the requested 2.16GHz channels is the same and indicated in the Measurement Start Time field, the Measurement Duration field and Number of Time Blocks field. The Extended Measurement Configuration subelement shall be put into the optional subelement. The Extended Measurement Configuration subelement data field format is shown in Figure 14 (Extended Measurement Configuration data field format).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Measurement Start Time for 2nd Requested Channel | Measurement Duration for 2nd Requested Channel | Number of Time Blocks for 2nd Requested Channel (N2) | … | Measurement Start Time for *Nch*-th Requested Channel | Measurement Duration for *Nch*-th Requested Channel | Number ofTime Blocks for *Nch*-th Requested Channel (NNch) |
| Octets: | 8 | 2 | 1 |  | 8 | 2 | 1 |

1. - Extended Measurement Configuration data field format (11ad)
 |

* + - 1. Directional Channel Quality report

Channel Number field indicates the channel number for which the measurement report applies if either of the Reporting STA and the Target STA is a non-EDMG STA. Otherwise this field is reserved. Channel Number is defined within an Operating(#6739) Class as shown in Annex E.

The AID field indicates the Target STA.

The Measurement Configuration field indicates measurement configuration information for which the measurement report applies. The Measurement Configuration field(#2041) format contains a 6-bit Measurement Channel Bitmap subfield and 2‑bit Measurement Report Method subfield.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Measurement Channel Bitmap | Channel Measurement Report Method | Antenna Measurement Report Method |
| Bits: | 6 | 1 | 1 |
| 1. — Measurement Configuration field format (11ad)
 |

The Measurement Channel Bitmap subfield indicates one or multiple 2.16GHz channels for which the measurement report applies. Starting with the MSB, the *i*-th bit of the Measurement Channel Bitmap subfield sets to 1 to indicate the 2.16GHz channel with channel number *i* for which the measurement report applies. The *i*-th bit of the Measurement Channel Bitmap subfield sets to 0 to indicate the 2.16GHz channel with channel number *i* for which the measurement report does not apply. Notice that the Measurement Channel Bitmap subfield also indicates the number of the reported 2.16GHz channels, *Nch*.

The Channel Measurement Report Method subfield indicates the method that is used by the Reporting STA to report the results of measurements over multiple 2.16GHz channels in the measurement report. The Channel Measurement Report Method subfield sets to 0 to indicate the results of measurements over multiple 2.16GHz channels during each measurement time block are reported per 2.16GHz channel. The Channel Measurement Report Method subfield sets to 1 to indicate the averaged results of concurrent measurements over multiple 2.16GHz channels during each measurement time block are reported.

The Antenna Measurement Report Method subfield indicates the method that is used by the Reporting STA to report the results of concurrent measurements over each 2.16GHz channel using multiple Rx antennas in the measurement report. The Antenna Measurement Report Method subfield sets to 0 to indicate the results of concurrent measurements over each 2.16GHz channel using multiple Rx antennas during a measurement time block are reported per Rx antenna. The Antenna Measurement Report Method subfield sets to 1 to indicate the average results of concurrent measurements over each 2.16GHz channel using multiple Rx antennas during a measurement time block are reported.

The Extended Measurement Report(#2041) subelement is defined in Optional Subelements. The Extended Measurement Report(#2041) subelement contains supplementary results of measurements over multiple 2.16GHz channels using multiple Rx antennas. The format of the Extended Measurement Report data field depends on the values of the Channel Measurement Report Method subfield and the Antenna Measurement Report Method subfield. When both the Channel Measurement Report Method subfield and the Antenna Measurement Report Method subfield set to 0, the results of measurements over the first 2.16GHz channel using the first Rx antenna are carried in the Measurement for Time Blocks fields and the remaining results of measurements are carried in the Extended Measurement Report subelement. The Extended Measurement Report(#2041) subelement data field format when both the Channel Measurement Report Method subfield and the Antenna Measurement Report Method subfield set to 0 is shown in Figure 9-245b (Extended Measurement Report data field format when both the Channel Measurement Report Method subfield and the Antenna Measurement Report Method subfield set to 0). The Measurement Results for 1st Requested Channel field consists of *N*1 Measurement for Time Block subfields for each of *NRX,*1 Rx antennas excluding the first Rx antenna. The Measurement Results for *j*-th Requested Channel field (*j*=2,3,…,*Nch*) consists of *Nj* Measurement for Time Block subfields for each of *NRX,j* Rx antennas.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Number of Rx Antennas for 1st Requested Channel (NRX,1) | Measurement Results for 1st Requested Channel | Number of Rx Antennas for 2nd Requested Channel (NRX,2) | Measurement Results for 2nd Requested channel | … | Number of Rx Antennas for Nch-th Requested Channel (NRX,Nch) | Measurement Results for Nch-th Requested channel |
| Octets: | 1 | *N1*\*(*N*RX,*1*-1) | 1 |  *N2*\**N*RX,*2* |  | 1 | *NNch*\**N*RX,Nch |
| 1. Extended Measurement Report data field format when both the Channel Measurement Report Method subfield and the Antenna Measurement Report Method subfield set to 0 (11ad)
 |

When the Channel Measurement Report Method subfield sets to 0 and the Antenna Measurement Report Method subfield sets to 1, the results of measurements over the first 2.16GHz channel using multiple Rx antennas are carried in the Measurement for Time Blocks fields and the remaining results of measurements are carried in the Extended Measurement Report subelement. The Extended Measurement Report(#2041) subelement data field format when the Channel Measurement Report Method subfield sets to 0 and the Antenna Measurement Report Method subfield sets to 1is shown in Figure 9-245c (Extended Measurement Report data field format when the Channel Measurement Report Method subfield sets to 0 and the Antenna Measurement Report Method subfield sets to 1). The Measurement Results for *j*-th Requested Channel field (*j*=2,3,…,*Nch*) consists of *Nj* Measurement for Time Block subfields.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Measurement Results for 2nd Reported Channel | Measurement Results for 3rd Reported Channel | … | Measurement Results for *Nch*-th Reported Channel |
| Octets: | *N2* | *N3* |  | *NNch* |
| 1. Extended Measurement Report data field format when the Channel Measurement Report Method subfield sets to 0 and the Antenna Measurement Report Method subfield sets to 1 (11ad)
 |

When the Channel Measurement Report Method subfield sets to 1 and the Antenna Measurement Report Method subfield sets to 0, the results of measurements over multiple 2.16GHz antennas using the first Rx antenna are carried in the Measurement for Time Blocks fields and the remaining results of measurements are carried in the Extended Measurement Report subelement. The Extended Measurement Report(#2041) subelement data field format when the Channel Measurement Report Method subfield sets to 1 and the Antenna Measurement Report Method subfield sets to 0 is shown in Figure 9-245d (Extended Measurement Report data field format when the Channel Measurement Report Method subfield sets to 1 and the Antenna Measurement Report Method subfield sets to 0).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Number of Rx Antennas (NRX) | Measurement Results for1st Rx Antenna | Measurement Results for2nd Rx Antenna | … | Measurement Results forNRX Rx Antenna |
| Octets: | 1 | *N* | *N* |  | *N* |
| 1. Extended Measurement Report data field format when the Channel Measurement Report Method subfield sets to 1 and the Antenna Measurement Report Method subfield sets to 0 (11ad)
 |

When the Channel Measurement Report Method subfield sets to 1 and the Antenna Measurement Report Method subfield sets to 1, the results of measurements over multiple 2.16GHz channels using multiple Rx antennas are completely carried in the Measurement for Time Blocks fields.