IEEE P802.11
Wireless LANs

|  |
| --- |
| Inclusion of Multi-band element in GAS frames |
| Date: 2012-06-06 |
| Author(s): |
| Name | Company | Address | Phone | Email |
| Carlos Cordeiro | Intel |  |  |  |
| Solomon Trainin | Intel |  |  |  |

Abstract

Proposes to include the Multi-band element in GAS frames.

**Discussion**: The GAS provides functionality that enables STAs to discover the availability of information related to desired network services. For example, GAS is used to implement service discovery, thus enabling a STA to discover the protocols (e.g., Wi-Fi Display, UPnP, Bonjour, WiGig protocol adaptation layers over 60 GHz, etc.) available in another STA *on the same band over which they are transmitted*. If, on the other hand, a STA wants to send GAS frames over 2.4 GHz to discover whether the peer device supports, say, Display Port over 60 GHz, such support is not available through GAS. That is, the STA would have to power 60 GHz radio before it can discover the capabilities over that band. In this example, it would be beneficial to perform service discovery relative to the 60 GHz band beforehand, so that the 60 GHz radio does not have to be powered on.

**6.3.71 Network discovery and selection support**

*For all the GAS primitives, include a* “Multi-band” *parameter, with type of* “Multi-band element” *and define it as “*Specifies the frequency band and channel number to which the GAS transaction applies. The parameter is absent if the GAS transaction applies to the same frequency band and channel where the frame is transmitted.*”*

**8.5.8.12 GAS Initial Request frame format**

*Change Table 8-216 as follows*

|  |  |
| --- | --- |
| **Order** | **Information** |
| 0 | Category |
| 1 | Action |
| 2 | Dialog Token |
| 3 | Advertisement Protocol element |
| 4 | Query Request Length |
| 5 | Query Request |
| 6 | Multi-band (optional) |

*Insert at the end of the subclause*

When present in a GAS Initial Request frame, the Multi-band element indicates the frequency band, operating class and channel number to which the GAS Initial Request frame applies.

**8.5.8.13 GAS Initial Response frame format**

*Change Table 8-217 as follows*

|  |  |
| --- | --- |
| **Order** | **Information** |
| 0 | Category |
| 1 | Action |
| 2 | Dialog Token |
| 3 | Status Code |
| 4 | GAS Comeback Delay |
| 5 | Advertisement Protocol element |
| 6 | Query Response Length |
| 7 | Query Response (optional) |
| 8 | Multi-band (optional) |

*Insert at the end of the subclause*

When present in a GAS Initial Response frame, the Multi-band element indicates the frequency band, operating class and channel number to which the GAS Initial Response frame applies.

**8.5.8.14 GAS Comeback Request frame format**

*Change Table 8-218 as follows*

|  |  |
| --- | --- |
| **Order** | **Information** |
| 0 | Category |
| 1 | Action |
| 2 | Dialog Token |
| 3 | Multi-band (optional) |

*Insert at the end of the subclause*

When present in a GAS Comeback Request frame, the Multi-band element indicates the frequency band, operating class and channel number to which the GAS Comeback Request frame applies.

**8.5.8.15 GAS Comeback Response frame format**

*Change Table 8-219 as follows*

|  |  |
| --- | --- |
| **Order** | **Information** |
| 0 | Category |
| 1 | Action |
| 2 | Dialog Token |
| 3 | Status Code |
| 4 | GAS Query Response Fragment ID |
| 5 | GAS Comeback Delay |
| 6 | Advertisement Protocol element |
| 7 | Query Response Length |
| 8 | Query Response (optional) |
| 9 | Multi-band (optional) |

*Insert at the end of the subclause*

When present in a GAS Comeback Response frame, the Multi-band element indicates the frequency band, operating class and channel number to which the GAS Comeback Response frame applies.

**10.24.3.1.2 STA procedures to transmit a GAS Query**

***Change item (a) in the first paragraph as follows***

1. The requesting STA sends a GAS Query by transmitting a GAS Initial Request frame containing a Dialog Token, an Advertisement Protocol element containing an Advertisement Protocol ID and the GAS Query in the Query Request field. If the GAS Initial Request frame requests information relative to a frequency band different than the frequency band where the frame is transmitted, the STA shall include a Multi-band element in the GAS Initial Request frame with the Band ID, Operating Class and Channel Number fields set to indicate to which frequency band the GAS Initial Request frame applies, with other fields within the Multi-band element being reserved. Otherwise, a Multi-band element shall not be included in the frame.

**10.24.3.1.4 STA procedures for transmitting the GAS Query Response**

***Insert the following paragraph below the second paragraph***

If the GAS Initial Request frame that initiated the GAS transaction contains a Multi-band element, but the GAS Initial Response frame transmitted as a response does not contain a copy of the same Multi-band element, the Status Code in the GAS Initial Response frame shall be set to “The request has been declined”. Otherwise, the requesting and responding STAs shall include a copy of the same Multi-band element in all subsequent GAS Initial Response, GAS Comeback Request and GAS Comeback Response frames transmitted as part of the GAS transaction. Inclusion of the Multi-band element indicates to which frequency band the GAS transaction applies. If the GAS Initial Request frame that initiated the GAS transaction does not contain a Multi-band element, then none of the subsequent GAS Initial Response, GAS Comeback Request and GAS Comeback Response frames transmitted as part of the GAS transaction shall include a Multi-band element.