IEEE P802.11
Wireless LANs

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| TGah D0.1 Comment Resolutions on MAC |
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|  |  |  |  |  |

Abstract: **MAC Comment Resolution for CID 163, Clauses 8.4.2.170s**

##### CIDs for Clause 24.1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 163 | Bo Sun | 8.4.2.170s | 97.31 | Detailed function description of Relay Discovery IE has been accepted in the spec framework. Corresponding text should be provided for the spec draft. | Specify the detailed design of Relay Discovery IE as the spec framework described. | **Revise**Modify the specification to include the detailed relay discovery information element as proposed in this document. |
|  |  |  |  |  |  |  |

*TGah Editor: Pls replace the current text in 8.4.2.170s Relay Discovery element with following text:*

A station can optionally include a Relay Discovery IE in the Probe Request sending to a relay station to provide the information of direct path to the AP if the information is available.

Upon receiving the Probe Request, the relay station may send a Probe Response with specific information related to the relay station and to its backhaul link to AP

The relay station may autonomously include the Relay Discovery IE optionally in beacon frames to provide additional information specific to the relay station.

A Relay Discovery IE includes the common fields for Probe Request, Response and Beacon as shown in FIG 8-xxxa.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Element | Length | Relay Discovery Info | UL Min Data Rate | UL Mean Data rate | UL Max Data Rate | DL Min Data Rate | DL Mean Data Rate | DL Max Data Rate |
| Octets | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

**Figure 8-xxxa Relay Discovery IE common fields**

In Probe Request frame, those fields respectively denote the UL and DL minimum data rates, UL and DL mean data rates, and UL and DL maximum data rates of the direct path between the station and AP in the unit of 100 kbps if they are included.

In Probe Response frame or Beacon frame, those fields respectively denote the UL and DL minimum data rates, UL and DL mean data rates, and UL and DL maximum data rates of relay link between the relay station and AP in the unit of 100 kbps if they are included.

* “UL Min Data Rate” field and “DL Min Data Rate” field: these two fields shall be included if the bit of “Min Data Rate Included” in the Relay Discovery Info sub-field is set to “1”.
* “UL Mean Data Rate” field and “DL Mean Data Rate” field: these two fields shall be included if the bit of “Mean Data Rate Included” in the Relay Discovery Info sub-field is set to “1”.
* “UL Max Data Rate” frield and “DL Max Data Rate” field: these two fields shall be included if the bit of “Max Data Rate Included” in the Relay Discovery Info sub-field is set to “1”.

The Relay Discovery Info sub-field is shown as in the Figure 8-xxxb.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Relay Station Indication | Min Data Rate Included | Mean Data Rate Included | Max Data Rate Included | Delay and Rate Requirement Included/ Utilization and Count Included | Information Not Available | Optional Information Not Available | Reserved |
| Bits | B0 | B1 | B2 | B3 | B4 | B5 | B6  | B7 |

**Figure 8-xxxb Relay Discovery Information sub-field**

The “Relay Discovery Info” field contains information indicating whether or not subfields are included in the Relay Discovery IE, and their availabilities.

* Relay Station Indication bit: the relay station shall set this field to “1”. Otherwise, this bit shall be set to “0”.
* Min Data Rate Included bit: if UL and DL min data rate fields are included in the Relay Discovery IE, this bit shall be set to “1”. Otherwise, this bit shall be set to “0”.
* Mean Data Rate Included bit: if UL and DL mean data rate fields are included in the Relay Discovery IE, this bit shall be set to “1”. Otherwise, this bit shall be set to “0”.
* Max Data Rate Included bit: if UL and DL max data rate fields are included in the Relay Discovery IE, this bit shall be set to “1”. Otherwise, it shall be set to “0”.
* Delay and Rate Requirement Included / Utilization and Count Included bit :

This field has different meaning in different message. In Probe Request, this bit means “Delay and Rate Requirement Included”. If the “Delay Bound Requirement” and “Min PHY Rate Requirement” fields are included in Relay Discovery IE, this bit shall be set to “1”. Otherwise, this bit shall be set to “0”.

In the Probe Response or Beacon, this bit means “Utilization and Count Included”. If the “Channel Utilization” and “Relay Station Count” fields are included in the Relay Discovery IE, this field shall be set to “1”. Otherwise, this bit shall be set to “0”.

* Information Not Available bit: this bit shall be set to “1” if the relay station cannot provide requested information in the fixed fields of Relay Discovery IE. Otherwise, this bit shall be set to “0”.
* Optional Info Not Available bit: this bit shall be set to “1” if the relay station cannot provide the requested information of the optional fields. Otherwise, this bit shall be set to “0”.

A Relay Discovery IE may contain optional sub-fields of in Probe Request as shown in FIG 8-xxxc.

|  |  |  |
| --- | --- | --- |
|  | Delay Bound Requirement | Min PHY Rate Requirement |
| Octets | 1 | 1 |

 **Figure 8-xxxc Optional sub-field in the Relay Discovery for Probe Request**

A station may attach the option sub-fields at the end of common fields of the Relay Discovery IE in Probe Request frames.

* Min PHY Rate Requirement: this field indicates the minimum PHY data rate set required by the requesting station, and is included only in Probe Request if the bit of “Delay and Rate Requirement Included” in the “Relay Discovery Info” sub-field is set to “1”.
* Delay Bound Requirement sub-field: this field indicates the delay bound requirement of the connetion through the relay station, and is included only in Probe Request if the bit of “Delay and Rate Requirement Included” in the “Relay Discovery Info” sub-field is set to “1”.

Responding relay stations determine whether or not to respond the Probe Request according to received information such as UL and DL Minimum Data Rates, UL and DL Mean Data Rates, UL and DL Maximum Data Rates, Delay Bound Requirement and/or Min PHY Rate Requirement, which depends on the implantation of relay stations.

A Relay Discovery IE may contain optional sub-fields in Probe Response or Beacon frames as shown in FIG 8-xxxd.

|  |  |  |
| --- | --- | --- |
|  | Channel Utilization | Relay Station Count |
| Octets | 1 | 1 |

**Figure 8-xxxd Optional sub-fields in Relay Discovery IE for Probe Response and Beacon**

A relay station may attach the option sub-fields shown in Figure 8-xxxd at the end of common fields of Relay Discovery IE in Probe Response and Beacon frames.

* Channel Utilization: this field denotes the ratio of time that relay statoin observes the busy level on the relay link between the relay station and AP. “255” means 100% busy level and “0” means idle. This field is included only in the Probe Response or Beacon if the bit of “Utilization and Count Included” in “Relay Discovery Info” sub-field is set to “1”.
* Relay Station Count: this field denotes the number of stations currently associated with the relay station and is included only in the Probe Response or Beacon if the bit of “Utilization and Count Included” in “Relay Discovery Info” sub-field is set to “1”.