IEEE P802.11
Wireless LANs

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| Text for Probe Response frame transmission interval |
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Abstract

This document proposes normative text for FILS Scanning – Probe Response frame transmission interval.

Changes in the text refer to: Draft P802.11-REVmb/D12

This proposal provides normative text to make active scanning more efficiently by using Probe Response frame transmission timeout interval.

* In active scanning, STA sends a probe request to the broadcast destination address, and receives the Probe Response during MaxChannelTime. If the MaxChannelTime has elapsed, then the STA scans the next channel, so the STA cannot receive the Probe Response in the previous channel after the MaxChannelTime.
* But the remaining responding STAs may send the probe response frame after the MaxChannelTime because they do not know the status of the STA that has transmitted the probe request, and since the probe response frame cannot be received by the requesting STA and cannot be acknowledged, the remaining STAs keep sending the probe response frame. It will cause Probe Response frame flooding, severely increase the network traffic and reduce the initial link setup time.
* In this proposal, Probe Response deadline interval is included in the Probe Request frame. The responding STAs do not transmit or retransmit Probe Response frame to the transmitter of the Probe Request after the time limit specified in the Probe Response deadline interval, since the transmitter will not listen to the Probe Response frame any more. It will help to prevent the Probe Response flooding.

**8.3.3.9 Probe Request frame format**

**Table 8-26—Probe Request frame body**

|  |  |  |
| --- | --- | --- |
|  **Order** | **Information** | **Notes** |
| xx | Timeout Interval (ProbeResponse deadline interval) | The Timeout Interval element (TIE) containing the ProbeResponse deadline interval is present only if dot11FILSActivated is true |

**8.4.2.51 Timeout Interval element (TIE)**

The Timeout Interval Type field contains one of the values from Table 8-122.

|  |  |  |
| --- | --- | --- |
| **Timeout Interval Type** | **Meaning** | **Units** |
| 0 | Reserved |  |
| 1 | Reassociation deadline interval | Time units (TUs) |
| 2 | Key lifetime interval | Seconds |
| 3 | Association Comeback time | Time units (TUs) |
| 4 | Time-to-Start (see 10.32.2.1)  | Time units (TUs) |
| 5 | ProbeResponse deadline interval | Time units (TUs) |
| 6-255 | Reserved |  |

ProbeResponse deadline interval is determined by the transmitter of the Probe Request and the interval shall be greater than or equal to MinChannelTime and shall be less than or equal to MaxChannelTime.It shall be included in the Probe Request frame if the dot11FILSActivated is true.

**10.1.4.3 Active scanning**

**10.1.4.3.x Sending a probe request**

When sending a probe request, Timeout Interval element containing a ProbeResponse deadline interval (See 8.4.2.51) shall be included in the Probe Request frame if the dot11FILSActivated is true. It is determined by the transmitter of the Probe Request and the interval shall be greater than or equal to MinChannelTime and shall be less than or equal to MaxChannelTime.

It notifies the responder of the Probe Request of the deadline interval to send the Probe Response frame.

**10.1.4.3.x Sending a probe response**

Probe Response frames shall be sent as directed frames to the address of the STA that generated the probe request. The SSID List element shall not be included in a Probe Request frame in an IBSS.

STA supports it. In an improperly formed Request element, a STA may ignore the first element requested that is not ordered properly and all subsequent elements requested. In the probe response frame, the STA shall return the requested elements in the same order as requested in the Request element.

If dot11RadioMeasurementActivated is true and if the Request element of the Probe Request includes the RCPI element ID, the STA shall include in the Probe Response an RCPI element containing the measured RCPI value of the received Probe Request frame. If no measurement result is available, the RCPI value shall be set to indicate that a measurement is not available.

The responder of the Probe Request frame shall check ProbeResponse deadline interval in the Probe Request frame if dot11FILSActivated is true and the ProbeResponse deadline interval is present in the Probe Request frame. The responder of the Probe Request frame shall not transmit or retransmit the Probe Response frame if the time specified in the ProbeResponse deadline interval has been elapsed since it has received the Probe Request frame to prevent unnecessary transmission of the Probe Response frame.