IEEE P802.11
Wireless LANs

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| Broadcast Probe Response including Normative Text |
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Abstract

This document provides normative text for a technical proposal for TGai. In this proposal, a method of broadcasting the probe response frame is provided to share BSS information between STAs for FILS stage.

**Problem:**

As previously discussed in [IEEE 11-11-1500-00-00ai](https://mentor.ieee.org/802.11/dcn/11/11-11-1500-00-00ai-broadcast-probe-response.pptx), and as illustrated by the results provided in [IEEE 11-11-1413-02-00ai-real-air-time-occupation-by-beacon-and-probe](https://mentor.ieee.org/802.11/dcn/11/11-11-1413-02-00ai-real-air-time-occupation-by-beacon-and-probe.ppt), in certain TGai revelenat use case scenarios current initial lik setup performance is impaired by excessive, redundant ACK and Probe Response retransmissions.

Multiple concurrent STA Probe Requests from a number of STA elicit multiple concurrent Probe Responses, though the content of the Probe Response is common to requests from different STAs.

Retransmition of duplicate Probe Responses, possibly numerous, to the same STA in the absense of acknowledging ACKs, even though the STA may already have terminated network discovery and entry attempt at the AP, or STA has otherwise become unavailable to respond.

**Remedy:**

Transmit the Probe Response to the Broadcast Address.

A single broadcast Probe Response informs listening STA in the same way that Beacon would, while preserving independent Beacon and Probe state machines.

Probe Response to multiple listening STA pre-/post-Probe Request can both preempt pending Probe Requests and respond to multiple pending Probe Requests, reducing the number of duplicate Probe Responses as a linear function of the number of contemporary pre-/post-Probe Request transactions.

Probe Response to the Broadcast Address does not elicit corresponding ACK; reduces non-productive unicast Probe Response retransmissions to unresponsive STAs; but may incur some re-Probe Request/Response transaction events when true STA does not acquire broadcast Probe Response.

Either use generic TGai support indicator in Probe Request for STA to indicate ability and interest to accept broadcast Probe Response, or provide a specialized indicator in Probe Request.

Adopt the proposed text as:

**10.1.4.3 Active scanning**

**10.1.4.3.1 Introduction**

***[Change subclause 10.1.4.3.1 as:]***

Active scanning involves the generation of Probe Request frames and the subsequent processing of received responses to Probe Request frames. The details of the active scanning procedures are as specified in the following subclauses.

**10.1.4.3.2 Sending a probe response**

***[Change subclause 10.1.4.3.2 as:]***

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

**10.1.4.3.3 Active scanning procedure**

*[Change Figure 10-3 as:]*



**Figure 10-3—Probe response**

**References:**

[P802.11REVmb/D12.0](http://www.ieee802.org/11/private/Draft_Standards/11mb/Draft%20P802.11REVmb_D12.0.pdf)

With grateful acknowledgment, incorporated one text change to ‘10.1.4.3.1 Introduction’ per [IEEE 11-11-1619-00-00ai](https://mentor.ieee.org/802.11/dcn/11/11-11-1619-00-00ai-active-scanning.docx), Jarkko Knect et al