IEEE P802.11
Wireless LANs

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| Active Scanning related requirements for Specification Frame Work Document  |
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Abstract

The document contains minimal set of requirements to achieve faster, more precise and less overhead creating active scanning mechanism. More requirements will be added later.

The requirements are grouped according to enhancement. The need for each requirement is explained with motivation clause, then the concept is explained and finally a strawpoll questions 802.11ai opinion.

The motions to add the requirement text to the specification framework document are not provided. It is assumed that the motion text asks to add the text in requirement paragraph to the specification framework document.

# Information elements

***5.2.1 Motivation***

The Neighbor Report element contains comprehensive set of AP parameters. The use of existing information element avoids creation of similar information elements.

* ***Requirement***

One or more Neighbor Report elements may be added to Beacon, Probe Response or Measurement Pilot frames.

# 5.3 Probe Request

***5.3.1 Motivation***

The MAC address, SSID, Mesh ID, and HESSID set clear rules who should respond or not. These information elements are well defined and widely used in the 802.11.

* ***Requirement***

The responding and not responding devices may be indicated at least with the following information elements:

* + MAC address of the responding STA (BSSID)
	+ SSID
	+ Mesh Id
	+ HESSID

***5.3.2 Motivation***

The be interested to only assess the link quality toward the AP, for instance, the AP has stored to its memory the AP parameters, or received them from other frame. To assess the link quality from the AP, the STA may:

1. Transmit a probe request. The information of the responded Probe Response is unnecessarily transmitted and creates overhead.
2. Wait until it receives a frame from the AP. The duration of the waiting time is not known before hand.
* ***Requirement***

The scanning STA may request in Probe Request frame, the APs to respond with short Probe Response (TBD). When FILS capable APs receive Probe Request frame requesting short response, they shall respond with short Probe Response (TBD) frame.

# 5.4 Canceling Probe Responses transmission

***5.4.1Motivation***

The operation solves three separate challenges:

1. The Probe Request transmitter may have done its selection of the AP it desires to associate, thus it may not need to receive more Probe Responses.
2. The scanning STA may not have indicated scanning time (Max channel time). In this case, the responding APs do not know when the receiving STA has stopped the channel scanning.
3. The scanning STA has indicated long scanning time (Max Channel Time) to idle channel. In these cases, the remaining to receive at the channel creates delay and wastes energy.
* ***Requirement***

The Probe End or Association Request frame transmitted by Probe Request transmitter shall indicate that the transmitter of Probe Request is no longer available to receive Probe Response frames.

* + 1. ***Motivation***

The scanning device may transmit multiple Probe Requests with different request parameters. Managing each request separately may lead to unnecessary overhead and slow down the scanning operation.

* ***Requirement***

A Probe End frame shall have means to set new criteria to all ongoing requests at the channel.

# Probe Response

***5.5.1 Motivation***

The Probe Request frames may request different parameter values to be responded in Probe Response. The Requested Parameters are important for the requesting STA and the information needs to be provided.

* ***Requirement***

When a Beacon or Probe Response frame is a response to multiple Probe Requests, the response frame shall include all the requested parameters, as requested by the responded Probe Requests.

# Probe Response collision avoidance

***5.6.1 Motivation***

The APs should have means to reduce the amount of transmitted Probe Response frames. Sometimes it is more important to reduce congestion in the media than providing responses to every Probe Request.

As shown in 11-12-279r0 Scanning Simulations.docx the reduction of the amount of the transmitted Probe Responses saves network resources and the discovery speed is at least at the same level.

* ***Requirement***

The AP may not transmit a response to Probe Request frame if the AP has received its operation parameters in successfully transmitted Probe Response, Measurement Pilot or Beacon frame after the transmission of Probe Request.