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 the active scanning mechanism. More requirements will be added later.

The requirements are grouped according to enhancement.

The submissions that are covered with these choises are:

11-1414r4 Probe Request and Response in TGai

11-1521r2 AP and Network Discovery Enhancements

11-1523r3 Access Delay Reduction for FILS

11-1619r3 Active Scanning

12-50r0 Broadcast Probe Response including Normative Text

12-56r0 FILS enabled active scanning

12-59r0 Selection of the AP for Scanning

12-60r0 Text for Selection of the AP for scanning

12-61r0 Probe Response frame transmission interval

12-62r0 Text for Probe Response frame transmission interval

12-67r0 Active Scanning Time Notification

12-124r0 Text for access delay reduction for FILS

Normative text to implement the choices is provided in 11-1619r3.

# MLME

* The MLME-SCAN.confirm primitive shall be invoked to report every found BSS during the scan procedure.

# Probe Request

* When the transmitter of the Probe.Request is FILS capable, the FILS capability shall be indicated in Probe Request
* Probe Requests may be sent to an individual address [11-12/13r0]
  + When sent to individual address, the addressed STA shall acknowledge the received Probe Request
* The probe request may include information specifying which Aps [11-12/59r1 & 11-12/124r0 & 11-12/56r0]
  + A) shall respond to the probe request
  + B) shall NOT respond to the probe request
* The same criteria may be used to define the responding and not responding devices. The criteria shall include at least the following information elements:
  + MAC address of the responding STA (BSSID)
  + SSID
  + Mesh Id
  + HESSID
  + Network ID / Roaming ID (TBD)
* The transmitter of the Probe Request frame may indicate the time that it is available to receive Probe Response frames.
  + The indicated time is similar to Min and Max channel time
  + When the time expires, the Probe Response transmitters may transmit the Probe Response once, but shall not retransmit the Probe Response

# Canceling Probe Responses transmission

* A transmitted Association Request or a Probe End frame from the transmitter of Probe Request shall indicate to the transmitters of Probe Response frame that the Requesting STA is no longer receiving the transmitted Probe Responses.
  + The Probe Response transmitters should cancel the transmission of the Probe Responses.
  + The Probe Response transmitters may transmit the Probe Response once, but shall not retransmit the Probe Response
* Requesting STA may set more response criteria to all its pending Probe Requests with a frame
  + The new criteria may cancel responses transmission from one or multiple:
    - BSSID (MAC Address)
    - SSID
    - Mesh ID
    - HESSID
    - Network ID / Roaming ID (TBD)
    - Network type (BSS / IBSS / MBSS)

# Probe Response

* The Probe Response shall include a field set to specific value to indicate that the responder is FILS capable.
* The Probe Response frame may be transmitted to an individual or broadcast address.
* The Probe Response may contain information of other than responding AP (Comprehensive response). All responded information shall be subject to the response criteria of the probe request.
  + A field shall indicate if the response contains information of multiple APs
  + The information of other APs may contain information of APs having the same or other primary channel as the channel in which the request was transmitted
  + The information of other APs shall contain at least the same information as specified in NeighborList information element
  + The Probe Request shall contain a field that is set to specific value, when the Probe.Request transmitter requests Probe Response frame(s) with comprehensive response

# Probe Response collision avoidance

* If other AP transmits a response to Probe Request including the information of other AP, the other AP shall cancel its Probe Response transmission.
* AP may response to multiple Probe Requests with a single response frame
  + The response frame shall have indication when AP responds to multiple Probe Requests with a single Probe Response
  + The all requested parameters, as specified in all requests shall be included to the response frame
* AP may transmit a Beacon frame instead of Probe Response frame if the TBTT occurs within short time interval (dot11BeaconResponseDuration)
  + No additional Beacon shall be generated to respond to Probe Request, only one Beacon is transmitted at a TBTT

**References:**

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