IEEE P802.11
Wireless LANs

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| Combined Text for Active Scanning |
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| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Jarkko Kneckt | Nokia Corporation | Otaniementie 19, 02150 Espoo Finland | +358504821550 | Jarkko.Kneckt@Nokia.com |
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Abstract

The submission clarufues the changes that the changes needed to active scanning clauses of the 802.11ai D0.4 to make compatible with the 802.11mc D1.0. These changes shown here are response to the 802.11ai Editor’s comments related to several active scanning clauses.

The clause 10.1.4.3.2 shows the changes to the clause in 802.11mc D1.0.

The content clause 10.1.4.3.3 of the 802.11mc D1.0 is deleted and new material is added to the clause. The text in clause 10.1.4.3.3 is the same as in 802.11ai D0.4.

For clauses 10.1.4.3.5 and 10.1.4.3.7 the submission changes the Instructions for the editor and all text in the clauses is written as new text. No text changes to these clauses are proposed.

References:

802.11ai D0.4

802.11mcD1.0

**10.1.4.3.2 Active scanning procedure**

*Instructions to Editor: Change the clause as shown below.*

*Delete the existing figure 10-3. Add two new figures. Number the captions of the figures accordingly.*

Upon receipt of the MLME-SCAN.request primitive with ScanType indicating an active scan, a STA shall use the following procedure:

For each channel to be scanned:

a) Wait until the ProbeDelay time has expired or a PHYRxStart.indication primitive has been received;

b) Perform the Basic Access procedure as defined in 9.3.4.2

c) When the criteria defined in the 10.1.4.3.3 are met, send a probe request to the broadcast or individual destination address. When the SSID List is present in the MLME-SCAN.request primitive, send one or more Probe Request frames, each with an SSID indicated in the SSID List and the BSSID from the MLME-SCAN.request primitive.

d) Set a ProbeTimer to 0 and start the ProbeTimer.

e) If PHY-CCA.indication (busy) primitive has not been detected before the Probe Timer reaches MinChannelTime, then ~~set NAV to 0 and scan the next channel~~ go to step f), else ~~when ProbeTimer reaches MaxChannelTime, process all received probe responses.~~ while the Probe Timer is less than the MaxChannelTime:

 1. Process any received probe responses;

 2. Process any received beacons, measurement pilots and FILS Discovery frames if dot11FILSActivated is true in the STA; and

 3. If dot11FILSActivated is true in the STA, ReportingOption is IMMEDIATE, and new AP or new information of the AP is detected, issue MLME-SCAN.confirm primitive with the ResultCode equal to IMMEDIATE\_SCAN\_RESULT and the BSSDescriptionSet containing information of the detected AP.

If dot11FILSActivated is true and the ReportingOption is CHANNEL\_SPECIFIC, issue at the time when the Probe Timer reaches the MaxChannelTime an MLME-SCAN.confirm primitive, with the ResultCode equal to SUCCESS and the BSSDescriptionSet containing information of all APs that have been discovered from the scanned channel.

f) Set NAV to 0 and scan the next channel.

See Figures ~~10-3 (Probe Response)~~ 10-3c and 10-3d.



**Figure 10-3c—Example of active scanning process when Probe Request frame is addressed to individual address.**



**Figure 10-3d—Example of active scanning process when Probe Request frame is addressed to broadcast address.**

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**~~Figure 10-3 – Probe response~~**

When all channels in the ChannelList have been scanned, the MLME shall issue an MLME-SCAN.confirm primitive with Resultcode set to SCAN\_SUCCESS and the BSSDescriptionSet containing all of the information gathered during the scan.

If the MLME receives an MLME-SCAN-STOP.request primitive, the STA shall complete the ongoing active scanning process at the scanned channel, and shall not initiate scanning at any new channel. The MLME shall issue an MLME-SCAN.confirm primitive with the ResultCode set to SCAN\_SUCCESS and BSSDescriptionSet containing all of the information gathered during the scan.

**10.1.4.3.3 Sending a probe request**

*Instructions to Editor: Delete the existing clause 10.1.4.3.3. Add the text to the new Clause 10.1.4.3.3 as shown.*

~~STAs, subject to the criteria below, receiving Probe Request frames shall respond with a probe response only if:~~

~~a) The Address 1 field in the probe request is the broadcast address or the specific MAC address of the STA, and either item b) or item c) below.~~

~~b) The STA is a mesh STA and the Mesh ID in the probe request is the wildcard Mesh ID or the specific Mesh ID of the STA.~~

~~c) The STA is not a mesh STA and~~

~~1) The SSID in the probe request is the wildcard SSID, the SSID in the probe request is the specific SSID of the STA, or the specific SSID of the STA is included in the SSID List element, and~~

~~2) The Address 3 field in the probe request is the wildcard BSSID or the BSSID of the STA.~~

~~Additionally, STAs with dot11InterworkingServiceActivated equal to true, receiving Probe Request frames~~

~~containing an Interworking field in the Extended Capabilities element set to 1 shall examine the~~

~~Interworking element in the received Probe Request frame and respond with a probe response only if~~

~~— The HESSID field, if present in the Interworking element, is the wildcard HESSID or the HESSID of the STA, and~~

~~— The Access Network Type field in the Interworking element is the wildcard Access Network Type or the Access Network Type of the STA.~~

~~Only APs and STAs in an IBSS or in an MBSS respond to probe requests. A result of the procedures defined in this subclause is that in each infrastructure BSS and IBSS there is at least one STA that is awake at any given time to receive and respond to probe requests. In an MBSS, STAs might not be awake at any given time to respond to probe requests. In an infrastructure BSS or in an IBSS, a STA that sent a Beacon frame shall remain in the Awake state and shall respond to probe requests, subject to criteria in the next paragraph, until a Beacon frame with the current BSSID is received. If the STA is contained within an AP, it shall remain in the Awake state and always respond to probe requests, subject to criteria in the next paragraph.~~

~~There may be more than one STA in an IBSS that responds to any given probe request, particularly in cases where more than one STA transmitted a Beacon frame following the most recent TBTT, either due to not receiving successfully a previous Beacon frame or due to collisions between beacon transmissions.~~

~~In an infrastructure BSS or in an IBSS, STAs receiving Probe Request frames shall respond with a proberesponse when the SSID in the probe request is the wildcard SSID or matches the specific SSID of the STA or when the specific SSID of the STA is included in the SSID List element. Furthermore, a STA with dot11RadioMeasurementActivated true receiving a probe request with a DSSS Parameter Set element containing a Current Channel field value that is not the same as the value of dot11CurrentChannel shall not respond with a probe response. An AP shall respond to all probe requests meeting the above criteria. In an IBSS a STA that transmitted a Beacon frame since the last TBTT shall respond to group addressed Probe Request frames. A STA in an IBSS shall respond to Probe Request frames sent to the individual address of the STA.~~

~~An associated mesh STA that receives a Probe Request frame shall not respond with a Probe Response frame when dot11RadioMeasurementActivated is true and the Probe Request frame contains a DSSS Parameter Set element with its Current Channel field value different from the value ofdot11CurrentChannelNumber.~~

~~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.~~

~~Requested Element IDs in the Request element shall be included in the Probe Response if the responding 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.~~

When an MLME receives an MLME-SCAN.request primitive with ScanType indicating an active scan, a STA may not transmit a Probe Request frame to a channel at which the STA has received:

* A broadcast addressed Probe Request frame to which the clause 10.1.4.3.5(Criteria to respond to probe request) allows at least the same responses as the information indicated in the received MLME-SCAN.request primitive.
* A broadcast addressed Probe Response or a Beacon frame containing at least the same information as indicated in the received MLME-SCAN.request primitive.

A Probe Request frame may contain Probe Response Reception Time element. When present, the Max Channel Time field of the Probe Response Reception Time element of the Probe Request frame is set to the Max Channel Time of the MLME-SCAN.request.

The SSID List element shall not be included in a Probe Request frame in an IBSS.

**10.1.4.3.5 Criteria to respond to probe request**

*Instructions to Editor: Add the new subclause 10.1.4.3.5. Please note that all text in the clause is new and no text is moved from some other clause.*

**10.1.4.3.7 Sending a response to probe request**

*Instructions to Editor: Add the new Clause 10.1.4.3.7. Please note that all text in the clause is new and no text is moved from some other clause.*