IEEE P802.11
Wireless LANs

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| Proposed802.11TGai Specification Text for enhanced active scanning procedure for FILS |
| Date:2012-09-17 |
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Abstract

The submission contains normative text for enhanced active scanning procedure for FILS.

The detailed description of the enhancements, performance analysis results, and proposed text changes to the 802.11ai Specification Framework Document (SFD) have been provided in [Ref-1].

# Background

To facilitate a fast initial link setup, a method for reducing signaling overhead during active scanning has been provided [Ref-1]. Some performance analysis results and proposed text changes to the 802.11ai Specification Framework Document (SFD) have also been provided in [Ref-1].

As a response to the TGai Call-for-Contributions, this document proposes detailed text for TGaiSpecifiction Document, for the proposed enhancement to active scanning.

# Conventions

In this contribution, the proposed 802.11ai Sepcification Document text will be presented as an amendment text based on the baseline 802.11 standard, 802.11-2012 [Ref-2]. The following format conventions are used:

1. The new added text is marked asblue underline text;
2. The deleted text is marked as~~red strikethrough text~~;
3. The unchanged baseline standard text stays in black text in the context of proposed TGai specification text;
4. The editorial instruction is marked as*italic text highlighted by Yellow*;
5. The quoted TGai SFD text is marked as *green italic text*; and
6. Any other text, e.g., discussions, proposed motions, etc., is in black text, but not in the context of proposed TGai specification text.

# Proposed 802.11ai Specification Text

**6.3.3 Scan**

**6.3.3.2 MLME-SCAN.request**

**6.3.3.2.2 Semantics of the service primitive**

*Instructions to Editor: Change the clause as shown with track changes:*

The primitive parameters are as follows:

MLME-SCAN.request(

 BSSType,

 BSSID,

 SSID,

 ScanType,

 ProbeDelay,

 ChannelList,

 MinChannelTime,

 MaxChannelTime,

 RequestInformation,

 SSID List,

 ChannelUsage,

 AccessNetworkType,

 HESSID,

 MeshID,

 APConfigurationChangeCount,

 VendorSpecificInfo

)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Valid range** | **Description** |
| APConfigurationChangeCount | As defined in 8.4.2.ai2 | As defined in 8.4.2.ai2 | The parameters define the responding STAs.  |

* + - 1. Probe Request frame format

*Instructions to Editor: Add new element to Table 8-26 as shown with track changes.*

The frame body of a management frame of subtype Probe Request contains the information shown in Table 8–26 Probe Request frame body  (#33)

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| --- |
| Table 8–26 Probe Request frame body   |
| Order | Information | Notes |
| 15 | AP Configuration Change Count | The AP Configuration Change Count is optionally present if dot11FILSActivated is true. |
|  Last | Vendor Specific | One or more vendor-specific (#1684)elements are optionally present(#29). These (#1684)elements follow all other (#1684)elements(#1221). |

* + - 1. Probe Response frame format

*Instructions to Editor: Add new element to Table 8-27 as shown with track changes.*

The frame body of a management frame of subtype Probe Response contains the information shown in Table 8–27.  See additional details and procedures in 9.18.3 and 10.1.4. (#33)

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| --- |
| Table 8–27 Probe Response frame body   |
| Order | Information | Notes |
| 55 | AP Configuration Change Count | The AP Configuration Change Count is optionally present if dot11FILSActivated is true. |
|  Last-l | Vendor Specific | One or more vendor-specific (#1684)elements are optionally present(#29). These (#1684)elements follow all other (#1684)elements(#1221). |
| Last-n | Requested Elements | Elements requested by the Request element of the Probe Requestframe are present if dot11MultiDomainCapabilityActivated is true.See 10.1.4.3.2. |

**8.4.2.ai2 AP Configuration Change Count element**

*Instructions to Editor: Add new element type to the element type list.*

|  |  |  |
| --- | --- | --- |
| Element Id | Length | BSS Change Count  |
| Octets: 1 | 1 | 1 |

**4 B5 B7e 8-ai2 CILS Cri refer to the same parameter defined in TSPEC.Figure 8-ai2—AP Configuration Change Count element**

The Element Id is equal to the AP Configuration Change Count element value in Table 8-ai.

The value of the Length field is the length of the element and set to 1.

The BSS Change Count field is 1 octet in length and is defined as an unsigned integer initialized to 0, that increments when an update to any of BSS system parameters carried in beacon frame or probe response frame has occurred; see 10.1.4.3.8.

**10.1.4.3.8 FILS active scanning procedure to preferred AP**

*Instructions to Editor: Add the new Clause 10.1.4.3.5*

A non-AP STA with dot11FILSActivated equals to ture may retain BSS system parameters sets of the preferred APs which the STA was associated with previously. BSS system parameters set indicates the system information elements of the AP carried by beacon frame or probe response frame.

The AP with dot11FILSActivated equals to ture shall increase the value (modulo 256) of the BSS Change Count field of AP Configuration Change Count element in the next transmitted FILS Discovery frame (s) when a update occurs to any of the elements inside the Beacon frame or Probe response frame.

The AP with dot11FILSActivated equals to ture may retain a changed BSS system parameter set list which consists of old BSS Change Count fields and identifiers of the changed system information elements corresponding to old BSS Change Count fields. In this case, whenever an update occurs to any of the elements inside the Beacon frame or Probe response frame, the AP shall add the the previous BSS Change Count field and the updated element’s ID(s) into the changed BSS system parameter set list.

When a non-AP STA with dot11FILSActivated equals to ture sends the unicast probe request to a preferred AP, if the STA has the BSS system parameter set of the preferred AP, the STA shall include the AP Configuration Change Count element of the AP in the probe request frame and send the probe request.

When receiving the probe request including the AP Configuration Change Count element from a STA, an AP compares the received BSS Change Count with the BSS Change Count which the AP has. If the values of both change count fields are same, the AP shall send the probe response frame including only mandatory fields and the AP Configuration Change Count element. If the received change count value is different from the value of the change count which the AP has and changed system parameters need to be updated by the STA, the AP shall send the probe response frame including mandatory fields and only the optional elements which need to be updated by the STA. Although the received BSS change count value is different from the value of the BSS change count which the AP has, if changed system parameters don’t need to be updated by the STA, the AP shall send the probe response frame only including mandatory fields and the AP Configuration Change Count element.

# References:

1. IEEE 802.11-12/1034r2 Enhanced scanning procedure for FILS
2. IEEE Std 802.11 – 2012