IEEE P802.11
Wireless LANs

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| LB 203 MAC Comment Resolution on Short Probe Response (Clause 8.4.2.170s, 8.8.5.3, 10.1.4.1, and 10.1.4.3) |
| Date: 2014-09-07 |
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Abstract

This submission proposes comment resolutions on Short Probe Response (Clause 8.4.2.170s, 8.8.5.3, 10.1.4.1 and 10.1.4.3).

* CIDs: 3276, 4012, 3169, 3170, 3054, 3582, *3851*, *4027,* and 3171 (9 CIDs)

Changes in the text refer to: Draft P802.11ah/D2.1 and P802.11REVmc D3.1

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGah Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGah Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGah Editor: Editing instructions preceded by “TGah Editor” are instructions to the TGah editor to modify existing material in the TGah draft. As a result of adopting the changes, the TGah editor will execute the instructions rather than copy them to the TGah Draft.***

**CID 3276**

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| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed****Resolution** |
| 3276 | 8.4.2.170s | 167 | 27 | It seems that some of these paragraphs are either redundant, partial or in the wrong locaiton. See suggested changes to improve the description. | Move paragraph in P167L27 to P161L32 nut only after adding this sentence at the end of it " The bit is set to 0 to indicate that the information is not requested". Remove paragraph in P167L32 because this is already described in the first table. Move the last two paragraphs of the subclause immediately before the paragraph in P161L38. | Accepted -Agree with the commenter. |

**CID 4012**

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| **CID** | **Clause** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed****Resolution** |
| 4012 | 8.8.5.3 | 200 | 54 | In order to facilitate faster TSF synchronization, the S1G Beacon Compatibility element shall be the first optional element in Short Probe Response frames if the "Request S1G Beacon Compatibility" field in the received Probe Request frame was set to 1. This will allow the receiving STA to extract the TSF completion field in a more predictable fashion. | Add the following sentence to the end of the paragraph:If the S1G Beacon Compatibility element is included in the Short Probe Response frame, it shall be included as the first optional element. | Revised -Agree with the commenter in principle.TGah Editor to make changes shown in 14/1154r2  |

**Proposed Remedy:**

***Instructions to TGah Editor: Add the following sentence at the end of Line 54 Page 203 in Subclause 8.8.5.3***

**8.8.5.3** Short Probe Response frame format

……

***Line 54 Page 203***

The Optional Elements field contains optional elements requested to be included in the Short Probe Response frame such as S1G Beacon Compatibility element. If the S1G Beacon Compatibility element is requested to be included, the Short Probe Response frame includes it as the first optional element.

**CIDs 3169, 3170, 3054, 3582, 3851, 4027, and 3171**

|  |  |  |  |  |  |  |
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| **CID** | **Clause** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed****Resolution** |
| 3169 | 10.1.4.1 | 318 | 18 | There is a lot of redundancy (e.g., the second paragraph is basically a duplicate of the first one and in addition the same behavior is described in 10.1.4.3) and what is not a duplicate is nconsistencies. | Keep one paragraph (it could simply be one sentence: "An S1G STA can transmit Short Probe Response frame as a response to a Probe Request frame that includes a Short Probe Response element as described in 10.1.4.3.1"). Move some of the text that describes the contents of the Short Probe Response element content to 10.1.4.3.1. | Revised -Agree with the commenter in principle.TGah Editor to make changes shown in 14/1154r2 |
| 3170 | 10.1.4.3.1 | 318 | 50 | This paragraph has become too long. It is best to split and adapt it into multiple paragraphs to improve its readability. | As in comment. | Revised -Agree with the commenter in principle.TGah Editor to make changes shown in 14/1154r2 |
| 3054 | 10.1.4.3.1 | 318 | 52 | This is indended to be an introductory para, but .11ah adds lots of detailed rules about S1G probe operation. | By all means add a sentence describing the existence of an S1G short probe, but move the detail to an existing detailed subclause, or (better) a new subclause specific to S1G.Also you might want to consider which of the criteria in 10.1.4.3.4 (REVmc D3) need to be changed for .11ah. | Revised -Agree with the commenter in principle.TGah Editor to make changes shown in 14/1154r2 |
| 3582 | 10.1.4.3.1 | 318 | 54 | If an S1G STA and if it receives a Probe Request frame with Short Probe Response Option element, then Short Probe Response frame may be transmitted by the responding STA as a probe response. | Not sure what this sentence is saying. Remove "and if it" or otherwise fix the grammar of the if/then phrasing | Revised -The sentence has been removed because the sentence is redundant with other sentences (by the resolution to CID 3171).TGah Editor to make changes shown in 14/1154r2 |
| 3851 | 10.1.4.3.1 | 318 | 54 | Change to "If an S1G STA receives a Probe Request frame with Short Probe Response Option element," | As in comment. | Revised -The sentence has been removed because the sentence is redundant with other sentences (by the resolution to CID 3171).TGah Editor to make changes shown in 14/1154r2 |
| 4027 | 10.1.4.3.1 | 318 | 54 | Check grammar "If an S1G STA and if it receives a Probe Request frame..." | As in comment | Revised -The sentence has been removed because the sentence is redundant with other sentences (by the resolution to CID 3171).TGah Editor to make changes shown in 14/1154r2 |
| 3171 | 10.1.4.3.4 | 319 | 1 | This subclause has changed in D3.0 of REVmc. Make the appropriate changes to update to REVmc D3.0. And this subclause should be the one to describe how to set the last bit of the FC field of the Short Probe Response. In general, please make sure that the description in 10.1.4 is consistent (i.e., avoid multiple description of the same normative behavior, remove redundant text etc.) | As in comment. | Revised -Agree with the commenter in principle.Changed the text accordingly.TGah Editor to make changes shown in 14/1154r2 |

**Discussion:**

**CID 3169, 3170, 3054, 3582, and 3171**

**Proposed Remedy:**

***Instructions to TGah Editor: Change the subclause 10.1.4.1 as follows (Line 56 Page 251)***

* Acquiring synchronization, scanning
* ~~General~~

***~~Insert the following paragraphs~~***~~(#3130)~~ ***~~after the 2nd paragraph of the sub-clause 10.1.4.1:~~***

~~An S1G STA may use Short Probe Response frames as defined in 8.8.5.3 (Short Probe Response frame format) instead of Probe Response frames as defined in 8.3.3.10 (Probe Response frame format). Short Probe Response frame is used for reducing overhead of using long Probe Response frame in active scanning by optimizing the frame format and by allowing STA to request minimum information that is required for association with the responding STA to be included in the Short Probe Response frame. A STA may include ShortProbeResponseOption in the MLME-SCAN.request primitive to include the Short Probe Response Option element in the Probe Request frame.(#3671) The requesting STA indicates the optional information to the responding STA by setting one or more bits in the Probe Response Option bitmaps in the Short Probe Response Option element transmitted in Probe Request frame as defined in 8.4.2.170t (Short Probe Response Option element)(#3672, Ed).~~

~~Short Probe Response Option element defined in 8.4.2.170t (Short Probe Response Option element) is used by the requesting STA to indicate which optional information is requested to be included in the Short Probe Response frame that is transmitted by the responding STAs. A STA may include ShortProbeResponseOption in the MLME-SCAN.request primitive to include the Short Probe Response Option element in the Probe Request frame. The requesting STA indicates the optional information to the responding STA by setting one or more bits in the Probe Response Option bitmaps in the Short Probe Response Option element transmitted in Probe Request frame as defined in 8.4.2.170t (Short Probe Response Option element).~~

* Active scanning
* Introduction

***Change the following paragraph of the sub-clause 10.1.4.3.1 as follows:***

Active scanning involves the generation of Probe Request frames and the subsequent processing of received probe responses. ~~Probe Response frames.~~ . The details of the active scanning procedures are as specified in the following subclauses.(#3583)

* Criteria for sending a probe response

***Change the 2nd paragraph of subcluase 10.1.4.3.4 as follows, and insert the followings after the 2nd*** (#3130) ***paragraph of the sub-clause 10.1.4.3.4 in REVmc D3.1 :***

A~~n~~ non-S1G AP shall remain in the Awake state, and shall respond to probe requests, subject to the criteria above.

An S1G AP that is awake shall respond to probe requests, subject to the criteria above. The response to the probe requests shall have the same CH\_BANDWIDTH as the preceding probe request. The S1G AP may send a Short Probe Response frame instead of a Probe Response frame as specified in subclause 10.1.4.3.4x (Active scanning using Short Probe Response).

NOTE- This rule does not allow ~~that~~ an S1G AP to respond~~s~~ with a ~~P~~probe ~~R~~response ~~frame~~ in 1 MHz channel width after receiving a ~~P~~probe ~~R~~request ~~frame~~ in 2 MHz channel width.

~~Active scanning involves the generation of Probe Request frames and the subsequent processing of received probe responses. Probe Response frames. An S1G STA may include Short Probe Response Option element in the Probe Request frame to indicate which optional information is requested to be included in the Short Probe Response frame. If an S1G STA and if it receives a Probe Request frame with Short Probe Response Option element, then Short Probe Response frame may be transmitted by the responding STA as a probe response. Otherwise, a Probe Response frame shall be transmitted by the responding STA as a probe response~~..~~Upon reception of a Short Probe Response frame that includes an S1G Beacon Compatibility element the S1G STA that included the Short Probe Response Option element in a previously transmitted Probe Request frame or that set the Requested Probe Response Type to 0 in a previously transmitted NDP Probe Request frame, may update its TSF timer using the same TSF timer update procedure described in 10.1.3.10.3 (TSF timer accuracy with S1G Beacon) for S1G Beacon frames.~~ ~~The details of the active scanning procedures are as specified in the following subclauses.(#3583)~~

* ~~Criteria for sending a probe response~~
* ~~This subclause has changed significantly since REVmc D2.5. I believe the correct location to insert this paragraph is after the first paragraph of this subclause in REVmc D3.0. Reviewers please check carefully.~~

***~~Insert the following paragraph after the 1st~~***~~(#3130)~~ ***~~paragraph of the sub-clause 10.1.4.3.4:~~***

~~If the requesting STA is an S1G STA and a Short Probe Response Option element (see Clause 8.4.2.170t (Short Probe Response Option element)) is included in the Probe Request frame, and if the responding STA is an S1G STA with dot11ShortProbeResponseOptionImplemented equal to true, then the responding S1G STA shall respond with a Short Probe Response frame. Otherwise, the S1G STA that responds to a Probe Request shall transmit a Probe Response frame. If a bit in a Probe Response Option bitmap in the Short Probe Response Option element is equal to 1, it means that corresponding optional information is requested by the requesting S1G STA, and the responding S1G STA with dot11ShortProbeResponseOptionImplemented equal to true shall include the corresponding information in the Short Probe Response frame. If the Request Full(#3584) SSID bit in the Short Probe Response Option element is equal to 1, then the responding S1G STA shall include its full SSID in the Short Probe Response frame. If it is equal to 0, then it shall include its compressed SSID instead of the full SSID. In S1G BSS, the (Short) Probe Response frame shall have the same CH\_BANDWIDTH as the preceding Probe Request frame. An S1G STA with dot11ShortProbeResponseOptionImplemented equal to true, scheduled to transmit a Short Probe Response frame that includes the S1G Beacon Compatibility element shall generate this element no later than the Timestamp field of the Short Probe Response frame that carries the element.~~

~~NOTE- This rule does not allow that an S1G AP responds with a Probe Response frame in 1 MHz channel width after receiving a Probe Request frame in 2 MHz channel width.~~

* ~~This subclause has changed significantly since REVmc D2.5. The cited sentence below cannot be found under any subclause of REVmc D3.0. Further input from the task group is needed to incorporate the change below. Currently the instruction below is incompatible with REVmc D3.0.~~

***Insert the following subclause immediately after the subclause 10.1.4.3.4***

10.1.4.3.4x Active scanning using Short Probe Response

An S1G STA may use Short Probe Response frames as defined in 8.8.5.3 (Short Probe Response frame format) instead of Probe Response frames as defined in 8.3.3.10 (Probe Response frame format). Short Probe Response frame is used for reducing overhead of using long Probe Response frame in active scanning by optimizing the frame format and by allowing STA to request minimum information that is required for association with the responding STA to be included in the Short Probe Response frame.

~~A STA may include ShortProbeResponseOption in the MLME-SCAN.request primitive to include the Short Probe Response Option element in the Probe Request frame.(#3671) The requesting STA indicates the optional information to the responding STA by setting one or more bits in the Probe Response Option bitmaps in the Short Probe Response Option element transmitted in Probe Request frame as defined in 8.4.2.170t (Short Probe Response Option element)(#3672, Ed).~~

An S1G STA may solicit Short Probe Response frames by including the Short Probe Response Option element defined in 8.4.2.170t (Short Probe Response Option element) in the Probe Request frames it transmits or by setting the Requested Probe Response Type field in the NDP Probe Request frame it transmits to 0. ~~is used by the requesting STA to indicate which optional information is requested to be included in the Short Probe Response frame that is transmitted by the responding STAs. A~~

The STA may include ShortProbeResponseOption in the MLME-SCAN.request primitive to include the Short Probe Response Option element in the Probe Request frames. (#3671) The requesting STA indicates which~~the~~ optional information is requested to be included in the Short Probe Response frame to the responding STA by setting one or more bits in the Probe Response Option bitmaps in the Short Probe Response Option element. ~~transmitted in Probe Request frame as defined in 8.4.2.170t (Short Probe Response Option element) )~~(#3672, Ed).

An S1G STA responds to the probe request subject to the criteria defined in 10.1.4.3.4 (Criteria for sending a probe response). The response to the probe request shall be a Short Probe Response if all the criteria below are satisfied:

* dot11ShortProbeResponseOptionImplemented is true at the responding STA
* A Short Probe Response Option element is included in the received Probe Request frame

If any of the criteria above is not satisfied, then the response to the probe request shall be a Probe Response frame.

When an NDP Probe request frame is used instead of a Probe Request frame, the response shall be a Short Probe Response if all the criteria below are satisfied:

* dot11ShortProbeResponseOptionImplemented is true at the responding STA
* the Requested Probe Response Type field in the NDP Probe Request frame is set to 0

If any of the criteria above is not satisfied, then the response to the NDP Probe Request shall be a Probe Response frame.

~~If the requesting STA is an S1G STA and a Short Probe Response Option element (see Clause 8.4.2.170t (Short Probe Response Option element)) is included in the Probe Request frame, and if the responding STA is an S1G STA with dot11ShortProbeResponseOptionImplemented equal to true, then the responding S1G STA shall respond with a Short Probe Response frame. Otherwise, the S1G STA that responds to a Probe Request shall transmit a Probe Response frame.~~

The S1G STA that responds with a Short Probe Response frame shall include the following information in the frame:

* The elements that are requested by the requesting STA as indicated in the Short Probe Response Option element contained in the received Probe Request frame.

. If a bit in a Probe Response Option bitmap in the Short Probe Response Option element is equal to 1, then the corresponding information element is requested and it shall be included in the Short Probe Response frame (See 8.4.2.170t Short Probe Response Option element)).

. If the S1G Beacon Compatibility element is included in the Short Probe Response frame, then it shall be included as the first optional element and shall be generated no later than the Timestamp field of the frame and not earlier than 231 -1 microseconds.

* Either the SSID element or the compressed SSID field.

. If the Request Full(#3584) SSID bit in the Short Probe Response Option element is equal to 1, then the SSID element shall be present in the Short Probe Response frame and the Compressed SSID shall not be present. If it is equal to 0, then the Compressed SSID shall be present and the SSID element shall not be present.

* The 1 MHz Channel Primary Location field in the Frame Control field shall indicate the location of the 1 MHz primary channel within the 2 MHz primary channel.

~~If a bit in a Probe Response Option bitmap in the Short Probe Response Option element is equal to 1, it means that corresponding optional information is requested by the requesting S1G STA, and the responding S1G STA with dot11ShortProbeResponseOptionImplemented equal to true shall include the corresponding information in the Short Probe Response frame~~. ~~If the Request Full(#3584) SSID bit in the Short Probe Response Option element is equal to 1, then the responding S1G STA shall include its full SSID in the Short Probe Response frame. If it is equal to 0, then it shall include its compressed SSID instead of the full SSID.~~

~~An S1G STA with dot11ShortProbeResponseOptionImplemented equal to true, scheduled to transmit a Short Probe Response frame that includes the S1G Beacon Compatibility element shall generate this element no later than the Timestamp field of the Short Probe Response frame that carries the element.~~

***~~Change the 7-th paragraph of the sub-clause 10.1.4.3.4 as follows:~~***

~~Probe Response frames and~~ Short Probe Response frames shall be sent as directed frames to the address of the STA that generated the probe request.

Upon reception of a Short Probe Response frame that includes an S1G Beacon Compatibility element the S1G STA that included the Short Probe Response Option element in a previously transmitted Probe Request frame or that set the Requested Probe Response Type to 0 in a previously transmitted NDP Probe Request frame, may update its TSF timer using the same TSF timer update procedure described in 10.1.3.10.3 (TSF timer accuracy with S1G Beacon) for S1G Beacon frames.

***Update the reference related to the short probe response in the PICS***

Annex B

Protocol Implementation Conformance Statement (PICS) proforma

B.4.26a Sub 1 GHz (S1G) features

B.4.26a.1 S1G MAC features

* S1G MAC features

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| --- | --- | --- | --- | --- |
| Item | Protocol capability | References | Status | Support |
|  |  |  |  |  |
|  |  |  |  |  |
| S1GM4 | Timing synchronization function (TSF) |  | CF32:M | Yes  No  N/A  |
| S1GM4.1 | Generation of S1G Beacon | 10.1.3.10.2 (Generation of S1G Beacon) | (CF1 & CF32): M | Yes  No  N/A  |
| S1GM4.1.1 | S1G Beacon generation at TBTT |  | (CF1 & CF32): M |  |
| S1GM4.1.2 | S1G Beacon generation at TSBTT |  | (CF1 & CF32): O | Yes  No  N/A  |
| S1GM4.1.3 | S1G Beacon reception at TBTT |  | (CF2 & CF32): M | Yes  No  N/A  |
| S1GM4.1.4 | S1G Beacon reception at TSBTT |  | (CF2 & CF32): M | Yes  No  N/A  |
| S1GM4.2 | TSF timer accuracy with S1G Beacon | 10.1.3.10.3 (TSF timer accuracy with S1G Beacon) | CF32: M | Yes  No  N/A  |
| S1GM4.3 | TSF timer accuracy with TACK, STACK, BAT, Short Probe Response frames |  | CF32: O | Yes  No  N/A  |
| S1GM4.4 | Signaling Probe Response Option element in Probe Request frame |  | CF32: O | Yes  No  N/A  |
| S1GM4.5 | Active scanning using NDP Probe Request frame | 10.1.4.3.3b (NDP Probing) | CF32: O | Yes  No  N/A  |
| S1GM4.6 | Sending Short Probe Response frame | 10.1.4.3.4x (Active scanning using Short Probe Response), 10.1.4.3.4b (NDP Probing) | (CF1 & CF32): O | Yes  No  N/A  |
|  |  |  |  |  |