IEEE P802.11
Wireless LANs

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| Proposed Resolution for CID 1036, 1104, 1177, 1416, 1211, 1241, 1263 and 1459 on GAS Configuration Sequence Number |
| Date: 2013-07-10 |
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Abstract

This submission proposes a resolution for CIDs 1036, 1104, 1177, 1263, 1416, 1211, 1241, 1459 to allow an AP to notify a STA of the current ANQP Configuration Sequence Number and corresponding Configuration set.

## 1 Introduction

In TGai CC8 comment database, 13/0495r10 [Ref-3], Comments for CIDs 1036, 1104, 1177, 1211, 1263, 1241, 1416,1459 are assigned to author of this contribution. The comments are related to the GAS configuration sequence number feature.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause Number(C)** | **Page(C)** | **Line(C)** | **Type of Comment** | **Comment** | **Proposed Change** |
| 1036 | Graham Smith | 8.4.2.175 | 30 | 36 | E | "It indicates the version number of AP's GAS configuration information set." I do not understand this wording. Does it not indicate a change to the AP's GAS configuration information set? | Replace "It indicates the version number of AP's GAS configuration information set." with "It indicates a change to the AP's GAS configuartion information set." |
| 1104 | Jarkko Kneckt | 8.4.2.175 | 30 | 45 | T | The GAS parameters are likely contents of the ANQP-elements and they are likely introduced in other standard. However, it is important for the devices that use the GAS Configuration Sequence Number need to know the parameters that are considered as static or dynamic. | If possible add a reference to a document or a foot note that defines the dynamic GAS parameters and static GAS parameters. |
| 1177 | Juho Pirskanen | 8.4.2.175 | 30 | 37 |  | GAS Configuration Sequence Number element is not defined properly. The baseline specification does not define GAS configuration thus and this section either. Therefore it is impossible to say what "The AP's GAS configuration information set refers to part or whole network services' information over the IEEE 802.11 network, which can be acquired by GAS query." means. | Define what GAS configuration is with much more explicitely |
| 1211 | Lei Wang | 8.4.2.175 | 30 | 45 | T | There seem an issue with leaving the identificaiton of dynamic operational reporting metric to implementation specific in the use of GAS configuration sequence number: if a STA does not know what items are dynamic items, how can the STA know which items may changed and no longer valid (i.e., dynamic items) with the same GAS sequence number. | identify those dynamic items in GAS response data, and list them in the standard. |
| 1263 | Lin Cai | 8.3.3.3 | 24 | 14 | T | add 'and dot11FILSActivated is true' after 'dot11InterworkingServiceActivated is true' | add 'and dot11FILSActivated is true' after 'dot11InterworkingServiceActivated is true' |
| 1241 | Lei Wang | 10.24.3 | 70 | 28 | T | How the newly introduced GAS Configuration Sequence Number is is communicated in the GAS message exchange? Or, more generally, how does a STA know the connection between a sequence number and its configuration info set? | Introduce GAS Configuration Sequence Number in GAS response message. |
| 1416 | Santosh Ghanshyam Pandey | 8.4.2.175 | 30 | 34 | T | Length field description missing | Add a paragraph, before the second paragraph of the clause 8.4.2.175, "The Length field is a 1-octet field whose value is equal to 1." |
| 1459 | Santosh Ghanshyam Pandey | 10.24.3 | 70 | 34 | T | The sentence (which is 7 lines long!) seems to indicate that if the STA shall not intiate GAS query if the GAS Configuration Sequence Number is the same as it has in the cache. However, the GAS Configuration Sequence number does not capture dynamic information which may be required by the STA to decide if it wants to assocaite to a particular AP. | Change " ... then the STA attempting associationshall not initiate a GAS query request to the ... " to "... then the STA attempting associationmay not initiate a GAS query request to the ..." |

## 2 Conventions

In this contribution, the proposed 802.11ai Specification Document text will be presented as changes to the current TGai draft specification, 11ai/D0.5 [Ref-2]. The following format conventions are used:

1. The new added text is marked as underline text;
2. The deleted text is marked as ~~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*; and
5. Any other text, e.g., discussions, proposed motions, etc., is in black text, but not in the context of proposed TGai specification text.

## 3 Discussions

In CID 1177, the author asks for a better definition of the GAS Configuration, while in CID 1211 the author asks for the identification of the dynamic items in the GAS response IN CID 1241 the author asks how does the STA knows the maping between the sequence number and the configuration set. In order to address all the above comments, we found that the GAS Configuration covers too many possibilities and protocols as pecified in [Ref-1], while the main network discovery and selection, which responsible for the latency during firts initial link setup, uses the ANQP protocol. For this reason, we propose to address the above comments by proposing instead of GAS Configuration Sequence number feature the ANQP Configuration Sequence number which is better defined and addresses the network selection as specified in the 802.11u amendment.

*Instructions to Editor: Replace the text in the GAS Configuartion Sequence Number with ANQP Configuration Sequence Number as following:*

**6.3.3.3 MLME-SCAN.confirm**

**6.3.3.3.2 Semantics of the service primitive**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name**  | **Type** | **Valid Range** | **Description** | **IBSAS Adoption** |
| ~~GAS Configuration~~~~Sequence Number~~ANQP ConfigurationSequence Number | Integer | 0-255 | ~~The GAS Configuration~~~~Sequence Number of the~~~~found BSS.~~The ANQP ConfigurationSequence Number of the found BSS. |  |

**8.3.3.2 Beacon frame format**

*Instructions to Editor: Replace the text corresponding to GAS Configuration Sequence Number in the Table 8-20 as following*

The frame body of a management frame of subtype Beacon contains the information shown in Table 8-20.

**Table 8-20—Beacon frame body**

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| 203 | ANQP Configuration Sequence Number (8.4.2.175) | ANQP Configuration Sequence Number element is optionally present when dot11FILSActivated is true. |

* + - 1. **Probe Response frame format**

*Instructions to Editor: Replaec the element of GAS Configuration Sequence number in Table 8-27 as following:*

The frame body of a management frame of subtype Probe Response contains the information shown in Table 8-27.

**Table 8-27—Probe Response frame body**

|  |  |  |
| --- | --- | --- |
| Order | **Information** | **Notes** |
| 70 | ANQP Configuration Sequence Number (8.4.2.ai1) | ANQP Configuration Sequence Number element is optionally present when dot11FILSActivated is true. |

**8.4.2 Information elements**

**8.4.2.1 General**

*Instructions to Editor: Replace the GAS Configuration Sequence element in Table 8-54 as shown as follows.*

Table 8-54 Element IDs

|  |  |  |  |
| --- | --- | --- | --- |
| Element  | Element ID | Length of Indicated element | Extensible |
| ANQP Configuration Sequence Number (8.4.2.175) | ANA | 4 |  |
|  |  |  |  |

*Instructions to Editor: replace the clause of 8.4.2.175 with the following text:*

8.4.2.175 ANQP Configuration Sequence Number element[CIDs 1241,1211,1104, 1177]

ANQP Configuration Sequence Number element provides the current version number of the ANQP configuration set which indicates a change in the ANQP configuration set. The ANQP Configuration Sequence Number element may be included in Beacon or Probe Response frame to reduce ANQP exchanges when dot11InterworkingServiceActivated is true and dot11FILSActivated is true[CID 1263].

|  |  |  |  |
| --- | --- | --- | --- |
| Element ID | Length | ANQP Configuration sequence number  | Scope |

Octects: 1 1 1 1

The element ID for this element is set to the value specified in Table 8-54.

The Length of the element is 1-octet whose value is equal to 2[CID 1416]. The ANQP configuration sequence number is 1-octet and indicates the current version number that represents a change to the ANQP configuration set[CID 1036]. The ANQP configuration sequence number changes when the ANQP Configuration set element changes or any value of the ANQP configuration set represented ANQP information changes.

The Scope is a 1-octet field that indicates the valid scope of the ANQP configuration sequence number represented ANQP information. A field value of 0 indicates the ANQP configuration sequence number represented ANQP information only valid in the BSSID, a field value of 1indicates the ANQP configuration sequence number represented ANQP information valid in HESSID, and a field value of 2 indicates the ANQP configuration sequence number represented ANQP information valid in SSID. Field value of 3-255 are reserved.

**8.4.4** Access Network Query Protocol (ANQP) elements

*Instructions to Editor: Add new element to Table 8-184 as shown as follows.*

Table 8-184 - ANQP-element definitions

|  |  |  |
| --- | --- | --- |
| ANQP-element name | InfoID | ANQP-element (subclause) |
| Configuration Set  | ANA | 8.4.4.ai2 |

8.4.4.ai2 Configuration Set

*Instructions to Editor: Add new clause of 8.4.4.ai2 as shown as follows.*

The Configuration Set element provides the ANQP configuration sequence number represented ANQP Configuration Set.

Fig. 8.ai 01 Configuration Set

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Info ID | Length | ANQP Configuration sequence number | ANQP element ID 1 | … | ANQP element ID n |

Octets: 2 2 1 2 2

The Info ID value is equal to the value in Table 8-184.

The Length field is 2 octets whose value is set to the length in octets of remaining fields.

The ANQP Configuration Sequence Number is a 1-octet field and it indicates the current ANQP configuration sequence number. The ANQP configuration sequence number changes when the ANQP Configuration set element changes or any value of the ANQP configuration set represented ANQP information changes.

The ANQP element ID is 2 octets.

*Instructions to Editor: In the clause of 10.1.4.3.8, page 65, lines 22-26 replace the text as follwos:*

**10.1.4.3.8 Sending a response to probe request**

~~If dot11InterworkingServiceActivated is true, the STA may include in the Probe Response frame a GAS Configuration Sequence Number element containing the current sequence number of the AP’s GAS configuration information. The current AP’s GAS configuration information can be acquired by GAS query mechanism as described in 10.24.3.~~

If dot11InterworkingServiceActivated is true, the STA may include in the Probe Response frame a ANQP Configuration Sequence Number element containing the current sequence number of the AP’s GAS configuration information. The current AP’s ANQP Configuration information can be acquired by GAS query mechanism as described in 10.24.3.

*Instructions to Editor: In the clause of 10.1.4.3.8 , page 70, lines 28-35 replace the text as follows:*

**10.24 WLAN interworking with external networks procedures**

**10.24.3 Interworking procedures: generic advertisement service (GAS)**

~~If a STA acquires a GAS Configuration Sequence Number from a current beacon or probe response, and if the STA retains GAS information previously acquired from a STA through a previous association attempt GAS message exchange including GAS configuration information and GAS Configuration Sequence Number, and if the GAS Configuration Sequence Number transmitted in the current beacon or probe response equals the value stored by the STA from the previous association attempt, then the STA attempting association shall not initiate a GAS query request to the discovered STA and instead shall use the previously acquired GAS information values as current values.~~

**10.24.3.2 ANQP procedures**

*Instructions to Editor: Insert the following text in the Table 10-10 ANQP Usage:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | BSS | IBSS |
| **ANQP-element name** | **ANQP-element (subclause)** | **ANQP element type** | **AP** | **Non-AP STA** | **STA** |
| Configuration Set | 8.4.4.ai2 | Q,S | T,R | T,R | - |

**10.24.3.2.1**

*Instructions to Editor: Insert the following text at the beginning of 10.24.3.2.1:*

A STA should check an ANQP configuration sequence number element from an AP to decide whether it should initiate an ANQP query. If the current received ANQP configuration sequence number equals to the stored value of ANQP configuration sequence number associated with the corresponding BSSID, HESSID, or SSID of the AP, the STA may not initiate an ANQP query request to the AP and should use the stored ANQP information instead[1459]. How the ANQP server maintains a configuration set sequence number for each BSSID, HESSID, or SSID is out of the scope of this document.

**10.24.3.2.ai1 ANQP Configuration Set Procedure**

*Instructions to Editor: Insert the following clause 10.24.3.2.ai1 as follows:*

The Configuration Set ANQP-element is used by a requesting STA to perform an ANQP Query for the Configuration Set corresponding to a Configuration sequence number using the ANQP Query procedure defined in 10.24.3.2.1. The requesting STA shall include Info ID of Configuration Set element as shown in Table 10-10. When an AP receives the ANQP Query List that contains the Info ID of Configuration Set, the ANQP server and the AP shall include the ANQP Configuration Sequence Number and the IDs of the ANQP elements that are specified in the Configuration Set in the increasing order of ID values in the response frame. The response frame should also include the ANQP elements that a STA requested in the ANQP query list in the increasing order of the element ID values.

The ANQP Configuration Sequence number increases by 1 when there is any change in the ANQP Configuration Set, including a change in the set of elements of the Configruation Set or a change in the values of the elements.

# References:

1. IEEE Std 802.11 – 2012
2. IEEE Std 802.11ai/D0.5
3. 11-13-0495-10-00ai-tgai-d0-5-call-for-comments-responses-resolutions-cc08
4. 11-11-0745-05-00ai-tgai-functional-requirements

**Motion-1:** Move to authorize the Editor to incorporate the text changes proposed in contribution 11-13-0725-01-00ai to the draft TGai Specification Document.

Yes: \_\_\_\_\_\_\_\_\_\_\_\_;  No: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_;  Abstain: \_\_\_\_\_\_\_\_\_\_\_\_\_

[Result of Motion]