IEEE P802.11
Wireless LANs

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| ANQP updates for Venue, Advice of Charge and Local Content information |
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Abstract

This document proposes to update ANQP with new elements for Venue, Advice of Charge and Local Content information.

This uses Draft P802.11REVmc\_D4.0.pdf as a baseline together with proposed changes from the technical editor Adrian Stephens.

***Add the following reference to Annex A***

[B56] ISO 4217 currency codes, <http://www.currency-iso.org/en/home/tables/table-a1.html>

***Modify the table in the following clause as shown:***

* + 1. Access Network Query Protocol (ANQP) elements(11u)

|  |
| --- |
| Table 8-257 ANQP-element definitions(11u) |
| ANQP-element name | Info ID | ANQP- (Ed)element (clause) |
| Reserved | 0 – 255 | n/a |
| Query List | 256 | 8.4.5.2 (Query List ANQP-element) |
| Capability List | 257 | 8.4.5.3 (Capability List ANQP-element) |
| Venue Name | 258 | 8.4.5.4 (Venue Name ANQP-element) |
| Emergency Call Number | 259 | 8.4.5.5 (Emergency Call Number ANQP-element) |
| Network Authentication Type | 260 | 8.4.5.6 (Network Authentication Type ANQP-element) |
| Roaming Consortium | 261 | 8.4.5.7 (Roaming Consortium ANQP-element) |
| IP Address Type Availability | 262 | 8.4.5.9 (IP Address Type Availability ANQP-element) |
| NAI Realm | 263 | 8.4.5.10 (NAI Realm ANQP-element) |
| 3GPP Cellular Network | 264 | 8.4.5.11 (3GPP Cellular Network ANQP-element) |
| AP Geospatial Location | 265 | 8.4.5.12 (AP Geospatial Location ANQP-element) |
| AP Civic Location | 266 |  8.4.5.13 (AP Civic Location ANQP-element) |
| AP Location Public Identifier URI/FQDN | 267 |  8.4.5.14 (AP Location Public Identifier URI/FQDN ANQP-element) |
| Domain Name | 268 | 8.4.5.15 (Domain Name ANQP-element) |
| Emergency Alert Identifier URI | 269 | 8.4.5.16 (Emergency Alert URI ANQP-element) |
| TDLS Capability(#13018) | 270 | 8.4.5.18 (TDLS Capability ANQP-element) |
| Emergency NAI | 271 | 8.4.5.17 (Emergency NAI ANQP-element) |
| Neighbor Report | 272 | 8.4.5.19 (Neighbor Report ANQP-element) |
| Venue URL | 273 | 8.4.5.20 (Venue URL ANQP-element) |
| Advice of Charge | 274 | 8.4.5.21 (Advice of Charge ANQP-element) |
| Local Content | 275 | 8.4.5.22 (Local Content ANQP-element) |
| Reserved | 276 – 56796 | n/a |
| Vendor Specific | 56797 | 8.4.5.8 (Vendor Specific ANQP-element) |
| Reserved | 56798 – 65535 | n/a |

**8.4.4.4 Venue Name ANQP-element**

***Insert the following paragraph after the last paragraph***

A URL associated with the Venue can be specified by the Venue URL ANQP-element defined in 8.4.5.20

***Insert the following new subclauses***

**8.4.5.20 Venue URL ANQP-element**

The Venue URL ANQP-element provides a list of one or more URLs which can be used for webpage advertising services or providing information, particular to a venue’s BSS, to a STA. The format of the Venue URL ANQP-element is defined in Figure 8-607a.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Info ID | Length | Venue URL Duples |
| Octets: | 2 | 2 | variable |

**Figure 8-607a – Venue URL ANQP-element format**

The Info ID and Length fields are defined in 8.4.5.1 (General).

The format of the Venue URL Duple field is shown in Figure 8-607b

|  |  |  |  |
| --- | --- | --- | --- |
|  | Length | Venue Number | Venue URL |
| Octets: | 1 | 1 | variable |

**Figure 8-607b – Venue URL Duple field**

The Length is a 1-octet field whose value is set to 1 plus the number of octets in the Venue URL field.

The Venue Number is a 1-octet field whose value corresponds to the implicit returned order value of the corresponding Venue Name Duple returned in a Venue Name ANQP-element, as defined in 8.4.5.4. If no Venue Name Duples were returned in the Venue Name ANQP-element then this value is 0.

The Venue URL field is a variable-length field that indicates the URL at which information relevant to the corresponding Venue Name Duple, indicated by the Venue Number, might be retrieved. This is further described in 10.25.3.2.11. If no Venue URL is provided this field is left empty. The Venue URL field is formatted in accordance with IETF RFC 3986.

**8.4.5.21 Advice of Charge ANQP-element**

The Advice of Charge ANQP-element provides a list of one or more financial advice of charges to a STA associated with access to the BSS. The format of the Advice of Charge ANQP-element is defined in Figure 8-607c.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Info ID | Length | Advice of Charge Duples |
| Octets: | 2 | 2 | variable |

**Figure 8-607c – Advice of Charge ANQP-element format**

The Info ID and Length fields are defined in 8.4.5.1 (General).

The format of the Advice of Charge Duple field is shown in Figure 8-607d

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Length | Advice of Charge Type | Language | Currency Code | Plan Information |
| Octets: | 1 | 1 | 3 | 3 | variable |

**Figure 8-607d – Advice of Charge Duple field**

The Length field is a 1-octet field whose value is set to 7 plus the number of octets in the Plan Information field.

The Advice of Charge Type is a 1-octet field with the following values:

**Table 8-260a Advice of Charge Type field values**

|  |  |
| --- | --- |
| **Advice of Charge Type Value** | **Description** |
| 0 | Time-based |
| 1 | Data-volume-based |
| 2 | Time-and-data-volume-based |
| 3 | Unlimited |
| 4 | Unspecified |
| 5-255 | Reserved |

The Language Code is a 3-octet ISO-14962-1997 [B45] encoded string field that defines the

language used in the Cost Information field. The Language Code field is a two or three character

language code selected from ISO-639 [B44]. A two character language code has 0 (“null” in ISO-

14962-1997) appended to make it 3 octets in length.

The Currency Code is a 3-octet string (e.g. “USD”) representing an ISO 4217 currency numeric code [B56]

The Plan Information is a variable length UTF-8 formatted field that carries an XML description of an Advice of Charge plan. The UTF-8 format is defined in IETF RFC 3629. The schema and semantics of this description are outside the scope of this standard.

As ANQP-elements are transmitted in the clear, prior to STA association, protected dual of public action frame should be used after association to verify this information.

**8.4.5.22 Local Content ANQP-element**

The Local Content ANQP-element provides a list of one or more URLs which can be used to display local content associated with the BSS, to a STA. The format of the Local Content ANQP-element is defined in Figure 8-607e

|  |  |  |  |
| --- | --- | --- | --- |
|  | Info ID | Length | Local ContentDuples |
| Octets: | 2 | 2 | variable |

**Figure 8-607e – Local Content ANQP-element format**

The Info ID and Length fields are defined in 8.4.5.1 (General).

The format of the Local Content Duple field is shown in Figure 8-607f

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Length | State | Local Content URL | Label Length(optional) | Label(optional) |
| Octets: | 1 | 1 | variable | 1 | variable |

**Figure 8-607f – Local Content Duple field**

The Length is a 1-octet field whose value is set to 1 plus the number of octets in the Local Content URL, Label Length and Label fields.

The State is a 1-octet field whose value is defined as follows:

**Table 8-260b Local Content State values**

|  |  |
| --- | --- |
| **State** | **Description** |
| 0 | Not authenticated |
| 1 | authenticated |
| 2 | Failure during authentication |
| 3  | Incorrect credentials |
| 4 | Credentials expired |

The Local Content URL is a variable length field of a URL that is used for directing the device to local content.

The Label Length is a 1 octet field that contains the value of the length of the Label field in octets. If the Label is not used, this field is also not used.

The Label field is a variable length field containing a description of the URL. This is formatted as a free form string. It will assist the device in knowing the type and potential usage of the URL.

***Modify the text and table in the following clause:***

* + - 1. ANQP procedures(11u)
				1. General(Ed)

…

|  |
| --- |
| Table 10-16 ANQP usage (11u) |
|  |  | BSS | IBSS |
| ANQP-element Name | ANQP-element (subclause)(Ed) | ANQP-element Type | AP | Non-AP STA | STA |
| Query List | 8.4.5.2 (Query List ANQP-element) | Q | T, R | T, R | T, R |
| Capability List | 8.4.5.3 (Capability List ANQP-element) | S | T, R | T, R | T, R |
| Venue Name | 8.4.5.4 (Venue Name ANQP-element) | S | T | R | — |
| Emergency Call Number | 8.4.5.5 (Emergency Call Number ANQP-element) | S | T | R | — |
| Network Authentication Type | 8.4.5.6 (Network Authentication Type ANQP-element) | S | T | R | — |
| Roaming Consortium | 8.4.5.7 (Roaming Consortium ANQP- element) | S | T | R | — |
| Vendor Specific | 8.4.5.8 (Vendor Specific ANQP-element) | Q, S | T, R | T, R | T, R |
| IP Address Type Availability | 8.4.5.9 (IP Address Type Availability ANQP-element) | S | T, R | T, R | T, R |
| NAI Realm | 8.4.5.10 (NAI Realm ANQP-element) | S | T | R | T, R |
| 3GPP Cellular Network | 8.4.5.11 (3GPP Cellular Network ANQP-element) | S | T | R | — |
| AP Geospatial Location | 8.4.5.12 (AP Geospatial Location ANQP-element) | S | T | R | T, R |
| AP Civic Location | 8.4.5.13 (AP Civic Location ANQP-element)  | S | T | R | T, R |
| (#13006)AP Location Public Identifier URI/FQDN | 8.4.5.14 (AP Location Public Identifier URI/FQDN ANQP-element)  | S | T | R | T, R |
| Domain Name | 8.4.5.15 (Domain Name ANQP-element) | S | T | R | — |
| Emergency Alert Identifier URI | 8.4.5.16 (Emergency Alert URI ANQP-element) | S | T | R | T, R |
| TDLS Capability (#13018) | 8.4.5.18 (TDLS Capability ANQP-element) | Q, S | T,R | T,R | T, R |
| Emergency NAI | 8.4.5.17 (Emergency NAI ANQP-element) | S | T | R | — |
| Neighbor Report | 8.4.5.19 (Neighbor Report ANQP-element) | S | T | R | - |
| Venue URL | 8.4.5.20 (Venue URL ANQP-element) | S | T | R | - |
| Advice of Charge | 8.4.5.21 (Advice of Charge ANQP-element) | S | T | R | - |
| Local Content | 8.4.5.22 (Local Content ANQP-element) | S | T | R | - |
| **Symbols**Q element is an ANQP queryS element is an ANQP responseT ANQP-element may be transmitted by MAC entityR ANQP-element may be received by MAC entity— ANQP-element is neither transmitted nor received by MAC entity |

***Insert the following new subclauses***

**10.25.3.2.11 Venue URL procedure**

The Venue URL ANQP-element is used to transmit webpage advertising services or information particular to the venue between STAs.

This ANQP-element is to be used in conjunction with the Venue Name ANQP-element, to provide extra information about the venue. Typical operation would be to use the Venue Name ANQP-element to determine the list of available venues advertised by a STA, and then the Venue URL ANQP-element is used, if required, to determine a list of venue URLs, each entry corresponding to the Venue Name entry in the list returned by the Venue Name ANQP-element.

**10.25.3.2.12 Advice of Charge procedure**

The Advice of Charge ANQP-element is used to transmit financial cost advertisements between STAs in the form of Advice of Charge plan information. This information may be of benefit to a receiving STA, or user of a receiving STA, in assisting with a financial decision about proceeding with access.

The use and operation of the Plan information schema are outside the scope of this standard.

As ANQP-elements are transmitted in the clear, prior to STA association, protected dual of public action frame should be used after association to verify this information.

**10.25.3.2.13 Local Content procedure**

The Local Content ANQP-element is used to transmit local content URLs between STAs. Each URL may point to local content information that may be of interest to a receiving STA, or user of a receiving STA, for example in providing information about terms and conditions for BSS access, when automated login procedures are being used.

Several URLs can be transmitted with the Local Content ANQP-element, each belonging to a separate state value. This allows the STA to display differing local content, associated with the BSS (e.g. terms and conditions, failure warning information, help page), through the STA association procedure. The number of provided states is optional.

For example, the Local Content ANQP-element may return two URLs with State values 0 and 2. The requesting STA may display the contents of the local web-page indicated by the first URL (State 0) showing terms and conditions of BSS access. If a subsequenet association fails, then the requesting STA may the contents of the local web-page indicated by the second URL (State 2) showing a help page.