IEEE P802.11
Wireless LANs

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| Over the Air (OTA) RAD Access for Enabling STAs |
| Date: 2010-10-29 |
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Abstract

Submission for candidate P802.11af draft text. In TVWS, inorder for an STA to operate as an enabling STA (Mode 2 operation according to FCC 10-174), the STA needs to have access to a Regulatory Administered Database (RAD) providing information on available channels at the location of the STA and to also verify the device identifiers of devices it intends to enable. Such RAD access may be performed through a separate MAC/PHY entity at the STA, however, the requirement of a separate MAC/PHY entity only for RAD access may pose unnecessary costs to the STA. In this submission we present an extension to RLQP (that uses GAS frames ) to provide RAD access to an enabling STA via an auxillary enabling STA.

This submission addresses comments CID 4&5 by using RLQP GAS to carry security encapsulated frames to and from an enabling capable STA to a data base.

**Introduction**

## Interpretation of a Motion to Adopt

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

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

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

***Submission Note: Notes to the reader of this submission are not part of the motion to adopt. These notes are there to clarify or provide context***.

**Discussion:**

In recent rulings from the FCC (10-174), enabling STAs shall operate as Mode 2 STAs. Mode 2 STAs are required to monitor their respective geolocation at least once every 60s and access the RAD at least once every 24 hours or if they have moved more than a 100 meters to obtain the latest information on the available channels at the STAs current location. In addition enabling STAs require RAD access to The requirement of RAD access may impose the burden of an additional MAC/PHY entity at the enabling STA only for the purpose of RAD access unless provisions are made for enabling STAs to obtain data base access through alternate STAs. This submission proposes additional information elements for RLQP (that is carried in GAS frames) to provide RAD access to enabling STAs. Note that the use of GAS frames between two enabling STAs for the purpose of RAD access precludes the need for association betweent the two entities.

This submission addresses comments CID 4&5 by using RLQP GAS to carry security encapsulated frames to and from an enabling capable STA to a data base.

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| --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | Stephen McCann | 10.3 | 5 | 36 | T | If the GAS & ANQP from TGu are re-used, then the changes to clause 10 are not required. TGu has already done the hard work of how a protocol can communicate messages between a STA and an external network database. | Re-structure the frames in clause 7.3.2. to fit ANQP as defined in Tgu, which then use GAS as a transport protocol. One advantage of the GAS mechanism, is that data can be retrieved from a TVWS Database whilst the STA is non-associated, although data security issues may need to be addressed. |
| 5 | Stephen McCann | General |   |   | T | Consider extending ANQP from TGu to provide a series of frames exchanges to a TVWS database external to the WLAN. In addition to the current frames suggested in clause 7, the use of ANQP also allows discovery of various TVWS databases in the network and their characterisitics. | Re-write clause 7 and 11 to extend ANQP with the suggested TVWS database access frames. |

***Note: This document’s baselines are P802.11af-D0.06.***

# **3. Definitions**

## 3.1 Definitions

***Insert new definition retaining alphabetic order:***

**Regulatory Administered Database (RAD):** A database provided by a Regulatory Body or vendors permitted by a Regulatory Body that supplies information on available channels, operating power limits, permitted devices for a geographical area.

**Direct RAD Access Capable (DRAC):** An STA is DRAC if it has a connection to the RAD that does not use 802.11af as the first hop.

**Direct RAD Access Provider (DRAP) enabling STA:** An DRAC enabling STA that is capable of providing access to the RAD using RLQP RAD Query/Response messages.

# 8. Frame Formats

### 8.4.5 Registered Location Query Protocol elements

***TGaf Editor: Insert values into Table 8-45af1 as follows***

**Table 8-45af1—Registered Location Query Protocol info ID definitions**

|  |  |  |
| --- | --- | --- |
| Info Name | Info ID | RLQP Info Element (clause) |
| RAD Query/Response | <ANA> |  |

#### 8.4.5. ota1 DSE RAD Access Query/Response Element

The DSE RAD Query Element of RLQP is used by an enabling STA to send a RAD query message to a TVWS RAD



**Figure 8-45af4— DSE RAD Access Query Element**



**Figure 8-45af5— DSE RAD Access Response Element**

The Info ID field is set to the value for RAD Access Query/Response defined in Table 8-45af1

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The Length field indicates the length of the remaining element fields in octets

The Reason Result Code is set as given in Table 8.4.5.ota1l

Table 8.4.5.ota1

|  |  |
| --- | --- |
| Reason Result Code field value | Description |
| 0 | Reserved |
| 1 | RAD query message |
| 2 | RAD response with with security encapsulated response |
| 3 | No response from RAD |
| 4 | RAD access rejected. |
| 5-255 | Reserved |

The Enablement Identifier is set to Enablement Identifier received during enablement and is optionally present when the Reason Result Code is 1

The RAD identifier element is used to identify the RAD that access is required to and is always present with the Reason Result Code is 1.

The encapsulated RAD query message is forwarded to the identified data base.

# 10. MLME

## 10.12 DSE procedures

### 10.12.6 DSE Registered Location Query Protocol procedures

#### 10.12.6.2 Extended DSE Enablement Procedures

***TGaf Editor: At the end of 10.12.6.2, insert following text, as shown:***

##### **10.12.6.2..ota1 RAD Query/Response**

In some regulatory domains enabling STAs require access to a Regulatory Administrated Database (RAD) to obtain information on available channels and also check permissions of operation for dependent STAs. In such domains enabling STAs that are capable of providing forwarding database queries and responses from their dependent STAs are defined as DRAP enabling STAs.

A dependent STA that is capable of performing the function of an non-DRAP enabling STA may obtain access to a RAD if its enabling STA is an DRAP enabling STA

A non-DRAC dependent STA first obtains enablement as a dependent STA using the DSE enablement protocol. Once it is enabled, the non-DRAC STA may send/receive messages to/from the RAD through its DRAP enabling STA using the RLQP RAD Query/Response frames.

 To transfer of data between the dependent STA and the RAD, the dependent STA sends a security encapuslated RAD query message in an RLQP information element as shown in section 8.4.5.ota1(Figure 8-45af4) to the DRAP enabling STA. The DRAP enabling STA should forward the security encapsulated query message to the RAD identified in RAD identifier field. The content and format of the message placed in security encapsuated query message are beyond the scope of this standard. The protocols used for communication between a DRAP enabling STA and the RAD are beyond the scope of this standard.

If the RAD responds with a security encapsulated response message, the encapsulated response is sent to the querying dependent STA using RAD RLQP IE as shown in section 8.4.5.ota1 (Figure 8-45af5).

On receiving the information and permissions required by the regulatory domain, the non-DRAC dependent STA that is capable of operating as an enabling STA may transit to operation as an enabling STA.

The RLQP RAD query and response frames may be used may be used whenever RAD access is required, for example to obtain moniton any change in the current channels at the location of the dependent STA or transmitting a query to check if a device is permitted to operate in a certain region based on the device ID.