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## Attributes for Access Network Location and Ownership Information

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### Abstract

This document describes RADIUS Authentication, Authorization, Accounting (AAA) attributes that are used to convey the Access Network's operational ownership and Location Information to a Home Service Network.

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Access Network Location Information

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[1. Introduction](#)

Wireless LAN (WLAN) Access Networks (AN) are being deployed in public places such as airports, hotels, shopping malls, and coffee shops by a diverse set of incumbent operators such as cellular carriers (GSM and CDMA), Wireless Internet Service Providers (WISP), and fixed broadband operators.

When a Public Wireless Local Area Network (PWLAN) client connects to a PWLAN AN, the information pertaining to the PWLAN AN location and operational ownership needs to be conveyed to the PWLAN client's Home Service Network (HSN). The intent of PWLAN AN location-related information is to enable use case scenarios for location aware billing (e.g., determine the appropriate tariff and taxation), location aware subscriber authentication / authorization in roaming, and location aware services.

Standard bodies / forums (such as 3GPP, 3GPP2, GSMA) and WiFi Alliance public access III have already defined Vendor Specific Attributes (VSA) with different format/syntax and content for indicating location-related information. However, common understanding and Standardization of these attributes is essential to enable improved interoperability and hence successful deployments of PWLANs.

This document describes AAA attributes that are used by an AAA client or a local AAA server/proxy in an AN for conveying location-related information to the HSN AAA server. The attributes are described for RADIUS [\[1\]](#).

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## [1.2](#) Applicability

Although proposed attributes in this draft are intended for PWLAN deployments, they can also be used in other networks (e.g., wired networks) where location-aware services are required.

## [1.3](#) Requirements language

In this document, several words are used to signify the requirements of the specification. These words are often capitalized. The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [\[RFC2119\]](#).

## [1.4](#) Terminology

### Access Network (AN)

The PWLAN hotspot network that provides wireless connectivity to the Internet for WLAN clients (or stations) present in the local access area. This MAY be in a separate security and routing domain with respect to the Home Service Network or a Mediating Network.

### Home Service Network (HSN)

The network providing the service and therefore maintaining the direct relationship to the user/subscriber of the WLAN service. All AAA functions are ultimately performed by the

HSN.

#### Access Point (AP)

A station that provides access to the distribution services via the wireless medium for associated Stations.

#### RADIUS server

This is a server which provides for authentication/authorization via the protocol described in [1], and for accounting as described in [6]. It is deployed in the PWLAN AN, MN, and HSN.

## [2. Overview](#)

The AN location and operational ownership information is conveyed in three AAA attributes which are: Operator-Name, Location-Name, and Location-Information. The description of these attributes is as follows.

### [2.1 Operator-Name Attribute](#)

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This attribute contains an operator name which uniquely identifies the ownership of an AN. The Attribute value is a non-NULL terminated string whose Length MUST NOT exceed xxxx. The attribute value is comprised of the prefix and the Identity, separated by a colon. The prefix identifies the operator type; example: GSM, CDMA. And, the Identity uniquely identifies the operator name within the scope of the operator type. Examples: GSM:TADIC where GSM is a prefix indicating an operator type and TADIC is a unique globally known GSM operator ID.

This document defines three prefixes which are: GSM, CDMA, and REALM.

### [2.2 Location-Name Attribute](#)

This attribute contains country name, telephone area code, city name where an AN is located, and location type of the AN such as airport, hotel, coffee shop, bookstore, and etc. E.164 [3] format is used for identifying country name and telephone area code. A city name is a non-NULL terminated string whose length MUST NOT exceed 64 octets. This document defines the following integer codes for AN location type:

- 0 Reserved
- 1 Coffee Shop
- 2 Hotel
- 3 Airport
- 4 Shopping Mall
- 5 Restaurant
- 9 Library
- 10 Convention Center
- 11 School
- 12 Enterprise
- 13 Airplane
- 14 Train

### [2.3](#) Location-Information Attribute

This attribute contains a descriptive information in English language about the AN's Location that can be printed into subscriber's detailed bill. The information is presented as a non-NULL terminated string whose length MUST NOT exceed 64 octets.

## [3.](#) Operation

Operation is identical to that defined in RADIUS AAA specifications [\[1\]](#)[\[2\]](#).

### [3.1](#) Attributes

This section defines attributes for AN operational ownership and location Information.

#### [3.1.1](#) Operator-Name Attribute

Operator-Name Attribute SHOULD be sent in Access-Request, and Accounting-Request records where the Acc-Status-Type is set to Start, Interim, or Stop.

A summary of the Operator-Name Attribute is shown below.

0		1		2
0 1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1		

```

+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|      Type      |      Length      |      Text...      |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+

```

Type:

To Be Assigned by IANA - Operator-Name

Length:

>= 3

Text:

The text field contains an Access Network Operator Name in prefix-based format as describe above. Example:

REALM:anyisp.com

### [3.1.1.2](#) Location-Name Attribute

Location-Name Attribute SHOULD be sent in Access-Request, and Accounting-Request records where the Acc-Status-Type is set to Start, Interim, or Stop if available.

A summary of the Location-Name Attribute is shown below.

```

0                               1                               2                               3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
| TYPE      | LENGTH      | text      |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+

```

Type:

To Be Assigned by IANA - Location-Name

LENGTH:

>= 3

Text:

The text is a string which should be of the form:

cc=<E.164\_Country\_Code, ac=<E.164\_Area\_Code>,cn=<city name in English>,lt= <Location Type>

Example:

cc=1,ac=503,cn=Portland,lt=1

### [3.1.1.3](#) Location-Information Attribute

Location-Information attribute SHOULD be sent in Access-Request, and Accounting-Request records where the Acc-Status-Type is set to Start, Interim or Stop if available.

A summary of the Location Information Attribute is shown below.

```

      0                      1                      2
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+---+---+---+---+---+---+---+---+---+---+---+---+
|      Type      |      Length      |      Text ...
+---+---+---+---+---+---+---+---+---+---+---+---+
```

Type :

To Be Assigned by IANA - Location-Information

Length:

>= 3

Text:

The text field contains descriptive information about PWLAN AN Location. Its length MUST NOT exceed 64 octets.

## [4.](#) Table of Attributes

The following table provides a guide to which attributes may be found in which kinds of packets, and in what quantity.

Request	Accept	Reject	Challenge	Accounting	#	Attribute
				Request		
0-1	0	0	0	0-1	TBD	Operator-Name
0-1	0	0	0	0-1	TBD	Location-Name
0-1	0	0	0	0-1	TBD	Location-Information

## [5.](#) IANA Considerations

This document requires the assignment of three new RADIUS attribute numbers for the following attributes:

Operator-Name

Location-Name  
Location-Information

See [section 4](#) for the registered list of numbers.

## [6](#). Security Considerations

The attributes in this document have no additional security considerations beyond those already identified in [\[1\]](#).

## [7](#). Acknowledgements

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## [8](#). References

- [1] Rigney, C., Rubens, A., Simpson, W. and S. Willens, "Remote Authentication Dial In User Server (RADIUS)", [RFC 2865](#), June 2000.
- [2] Rigney, C., "RADIUS Accounting", [RFC 2866](#), June 2000.

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