Attachment 4-2-7

WiMAX Forum® Network Architecture

Architecture, detailed Protocols and Procedures

Over-The-Air Provisioning & Activation Protocol based on TR-069

WMF-T33-105-R015v01

WiMAX Forum® Network Architecture

Architecture, detailed Protocols and Procedures

Over-The-Air Provisioning & Activation Protocol
based on TR-069 Specification

WMF-T33-105-R015v01

WiMAX Forum® Approved

(2009-11-21)

WiMAX Forum Proprietary

Copyright Notice, Use Restrictions, Disclaimer, and Limitation of Liability.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. Revision History

November 6, 2009	V01	

2. Document Scope

It is predicted that many different device types will be enabled by WiMAX technologies. Such devices would include notebooks, handsets, CPEs, and consumer electronics. A WiMAX service provider would require a dynamic over the air provisioning solution to configure, activate, enable subscription for, and manage these device types.

This document specifies Stage 3 specifications for Over-The-Air (OTA) Provisioning based on TR-069 protocol for WiMAX enabled devices. Annexes A and B specify the management objects for TR-069.

This document makes references to the WiMAX general over-the-air provision and activation specification [OTAGEN] for end to end over the air provisioning and activation procedures.

3. Abbreviations and Definitions

3.1 Abbreviations

AAA	Authentication, Authorization and Accounting
ACS	Auto-configuration Server
ASN	Access Service Network
ASN-GW	ASN – Gateway
BEK	Bootstrap Encryption Key
BS	Base Station
CAPL	Contractual Agreements Preference List
CA	Certificate Authority
CE	Consumer Electronics
CPE	Customer Premises Equipment
CRL	Certificate Revocation List
CSC	Customer Service Center
CSN	Connectivity Service Network
DM	Device Management
DB	Database
DHCP	Dynamic Host Configuration Protocol
DSL	Digital Subscriber Line
EAP	Extensible Authentication Protocol
EAP-TLS	EAP Transport Layer Security
EAP-TTLS	EAP Tunneled Transport layer Security
HA	Home Agent
HTTP	Hypertext Transfer Protocol (HTTP)
IGD	Internet Gateway Device
IMSI	International Mobile Subscriber Identity
LDAP	Lightweight Directory Access Protocol
LSB	Least Significant Bit
MO	Management Object
MS	Mobile Station
MSB	Most Significant Bit
NAP	Network Access Provider
NSP	Network Service Provider
OTA	Over The Air
PKI	Public Key Infrastructure

POA	Point of Activation
POM	Point of Manufacturing
POS	Point of Sale
RAPL	Roaming Agreements Preference List
SKU	Stock Keeping Unit
TLV	Type Length Value
URL	Uniform Resource Locator
WAN	Wide Area Network
WIB	WiMAX Initial Bootstrap

3.2 Terms & Definitions

The terms and definitions that specifically pertain to this specification are captured here. For common terms and definitions related to provisioning refer to the WiMAX Over-The-Air General Provisioning System Specification [OTAGEN].

Internet Gateway Device: The top level object used to describe a CPE gateway.

Profile: The user profile is a collection of components (personal data, preferences/policies on services, networks and devices, etc.) that indicate the preferences and current configuration of a user's account. User profiles enable several users to use the same device with their own setup. The user profile is tightly coupled with the user's identity and vice versa.

TR-069: Refers to the set of device management specifications Developed by the DSL Forum.

X.509: Digital Certificate Definition X.509 (RFC 3280)

4. References

[NIST800-38C]	NIST Special Publication 800-38C Recommendation for Block Cipher Modes of Operation: The CCM Mode for Authentication and Confidentiality, May 2004
[HTTP]	Hypertext Transfer Protocol Version 1.1, http://www.faqs.org/rfcs/rfc2616.html
[NWGSTG3]	WiMAX Forum, T33-001-R015v01 "Detailed Protocols and Procedures, Base Specification", Release 1.5
[ND&S CHANGES]	Annex E of reference [OTAOMADM]
[OTAGEN]	WiMAX Forum T33-103-R015v04, Architecture, detailed Protocols and Procedures, WiMAX Over-The-Air General Provisioning System Specification, Release 1.5
[OTAOMADM]	WiMAX Forum T33-104-R015v04, Architecture, detailed Protocols and Procedures, WiMAX Over-The-Air Provisioning & Activation Protocol based on OMA DM Specifications, Release 1.5
[RFC1766]	"Tag for the Identification of Language", H Alvestrand, March 1995, URL:http://www.ietf.org/rfc/rfc1766.txt
[RFC2119]	"Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL:http://www.ietf.org/rfc/rfc2119.txt
[RFC2141]	"URN Syntax", R. Moats, MAY 1997, URL:http://www.ietf.org/rfc/rfc2141.txt
[RFC4282]	"The Network Access Identifier", B. Aboba, M. Beadles, J. Arkko, P. Eronen, December 2005, URL:http://www.ietf.org/rfc/rfc4282.txt
[TLS]	"The TLS Protocol Version 1.0", T. Dierks, C. Allen, January 1999, URL:http://www.ietf.org/rfc/rfc2246.txt
[XML]	W3C Extensible Markup Language (XML) 1.0 (Second Edition), W3C Recommendation, Version 6-October-2000.
[DMStdObj]	*OMA Device Management Standardized Objects, Version 1.2*, Open Mobile Alliance™ OMA-TS-DM-DMStdObj-V1_2, URL:http://www.openmobilealliance.org
[DMTND]	*OMA Device Management Tree and Description, Version 1.2*, Open Mobile Alliance™ OMA-TS-DM-DMTND-V1_2, URL:http://www.openmobilealliance.org
[DMEAPMO]	OMA EAP Management Object:: http://www.openmobilealliance.org/ftp/Public_documents/DM/ConnMO/Permanent_documents/OMA-DDS-DM_ConnMO_EAP-V1_0-20071017-D.zip
[DMIPCON]	Standardized Connectivity Management Objects IP Parameters OMA-DDS-DM_ConnMO_IP-V1_0-20071106-D
[DMRD]	"OMA Device Management Requirements Document, Version 1.2". Open Mobile Alliance. OMA-RD-DM-V1_2. URL:http://www.openmobilealliance.org
[TR-069]	DSL Forum TR-069 Amendment 2, CPE WAN Management Protocol v1.1, December 2007 URL:http://www.dslforum.org
[TR-098]	DSL Forum TR-098 Amendment 1, Internet Gateway Device Data Model for TR-069, December 2006, URL: http://www.dslforum.org
[TR-106]	DSL Forum TR-106, Amendment 1, DSLHome Data Model Template for TR-069-Enabled Devices, November 2006, URL: http://www.dslforum.org
[RFC 3280]	"Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL)

	Profile" URL:http://www.ietf.org/rfc/rfc3280.txt

1

5. OTA Provisioning and Activation based on the TR-069 Protocol

5.1 INTRODUCTION TO TR-069 PROTOCOL

TR-069 is the CPE Wide Area Network (WAN) Management Protocol defined by the DSL Forum [TR-069]. It defines a mechanism that encompasses secure auto-configuration of a CPE and also incorporates other CPE management functions into a common framework.

5.1.1 Parameter Management Tree

Parameter names use a hierarchical form similar to a directory tree. The name of a particular Parameter is represented by the concatenation of each successive object in the hierarchy separated with a "." (dot), starting at the trunk of the hierarchy and leading to the leaves.

For example: Top.Group.Object.Parameter

5.1.2 TR-069 Messages

TR-069 defines set of messages with which the TR-069 client can communicate with the TR-069 Auto-configuration Server (ACS). These messages are encoded using a standard XML-based syntax, specifically SOAP 1.1, as specified in [TR-069]. These messages can be combined and sent. The message format is given in the example below.

```
<soap-env:Envelope xmlns:soap-enc="http://schemas.xmlsoap.org/soap/encoding/"
                   xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"
                   xmlns:xsd="http://www.w3.org/2001/XMLSchema"
                   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                   xmlns:cwmp="urn:dslforum-org:cwmp-1-0">
                 <soap-env:Header>
                          <cwmp:ID soap-env:mustUnderstand="1">0</cwmp:ID>
                 </soap-env:Header>
                 <soap-env:Body>
                          <cwmp:GetParameterNames>
                                   <ParameterPath>Object.</ParameterPath>
                                   <NextLevel>0</NextLevel>
                          </cwmp:GetParameterNames>
                 </soap-env:Body>
</soap-env:Envelope>
```

5.2 Bootstrapping and Provisioning Requirements

The following requirements are necessary for WiMAX OTA provisioning using TR-069:

1) The device and network MUST successfully complete Pre-Provision Phase, as specified in [OTAGEN].
2) Device and TR-069 ACS server MUST use TR-069 Protocol [TR-069] to establish a management session and interaction between each other.
3) Device MUST support WiMAX Initial Bootstrap (WIB) procedures, as specified in [OTAGEN].
4) Network MUST contain a WIB server that supports WIB procedures. The WIB server MAY be integrated in the TR-069 ACS server.
5) Bootstrap data that is not already present in the WiMAX device MUST be transmitted from the WIB server to the device via WIB procedure [OTAGEN].
6) Delivery of sensitive bootstrap data from WIB server to the device MUST be done in a mutually authenticated secure manner.

7) Service Provider locked devices MUST include minimal preprovisioning information as specified in [OTAGEN].

8) Unlocked devices MAY be factory bootstrapped with carrier specific parameters.

5.3 WIB content format

WiMAX OTA provisioning using TR-069 uses the WiMAX WIB procedure defined in [OTAGEN]. WIB defines HTTP-based messages used to negotiate the DM protocol between the network and the device. WIB is also used to pass bootstrap parameters from the network to the device.

The following sections describe how WIB message content is used to support TR-069 provisioning.

5.3.1 HTTP GET URI

A type B1 WiMAX device with a TR-069 client MUST use the WIB procedure and headers as defined in [OTAGEN]. The device MUST advertise its support for TR-069 via the HTTP GET URI. If the device supports other DM protocols, such as OMA-DM, the device MUST also advertise support for any other supported protocol. A device MUST always advertise its full DM capabilities, as specified in [OTAGEN].

The device MAY also advertise, in the HTTP GET header, the vendor name and model ID. These are optional fields.

5.3.2 WIB Response

The WIB server MUST respond to the device as specified in [OTAGEN] with the following requirements:

1) If the response header indicates that TR-069 as the DM protocol, then the device SHALL parse the rest of the WIB response in order to obtain information to bootstrap the TR-069 client.

2) The WIB server MUST include all necessary bootstrap information not available in the device such as: Nonce [OTAGEN], TR-069 ACS address, ACS X.509 certificate, username, and password used to login to the TR-069 ACS server.

If the WIB server has prior knowledge about the device characteristics and parameters and determines that the information in 2) is already present and correct within the device, then the WIB server is NOT required to pass it again in a TLV to the device. For example, the WIB server may know that a given bootstrap parameter is already present in the device based on the device information present in the WIB HTTP GET URI.

5.3.2.1 TR-069 TLV

The following TLV types are defined for the TR-069 response: Nonce, TR-069 ACS address, ACS X.509 certificate, username, and password. Username and password TLV data is encrypted with BEK. ACS address and certificate TLV data is not encrypted. The format of the ACS server certificate SHALL be X.509 DER. The format of the username, password, and ACS address fields SHALL be ASCII-encoded character strings with a maximum size of 50 characters.

If the value of a TLV is encrypted with BEK, the nonce on the preceding TLV is used for the encryption/decryption. Note that the nonce TLV (with tag value 0x00) is defined in [OTAGEN].

The following are the WIB TLVs used by TR-069:

Field	Tag	Length	Value
Number of Octets	2	4	$0 – 2^{32}$-1
Octet Significance	MSB LSB	MSB LSB	MSB LSB
Contents	Username (0x200)	Variable	Username used to authenticate with ACS server

Table 1: Username TLV

Field	Tag	Length	Value
Number of Octets	2	4	$0 – 2^{32}$-1
Octet Significance	MSB LSB	MSB LSB	MSB LSB
Contents	Password (0x201)	Variable	Password used to authenticate with ACS server

Table 2: Password TLV

Field	Tag	Length	Value
Number of Octets	2	4	$0 – 2^{32}$-1
Octet Significance	MSB LSB	MSB LSB	MSB LSB
Contents	ACS address (0x202)	Variable	Address of ACS server

Table 3: ACS address TLV

Field	Tag	Length	Value
Number of Octets	2	4	$0 – 2^{32}$-1
Octet Significance	MSB LSB	MSB LSB	MSB LSB
Contents	ACS cert (0x203)	Variable	Certificate of ACS server

Table 4: ACS certificate TLV

The following is an example of the DATA field in a WIB response using TR-069, in which all bootstrap parameters are passed to the device:

Tag	Length	Value
Nonce (0x00)	13	Nonce value for next field
Username (0x200)	Variable	Username for ACS authentication (BEK encrypted)
Nonce (0x00)	13	Nonce value for next field
Password (0x201)	Variable	Password for ACS authentication (BEK encrypted)

ACS address (0x202)	Variable	ACS address server
ACS cert (0x203)	Variable	ACS server X.509 certificate

Table 5: Example WIB response

5.4 Post-conditions

Once the device receives all necessary bootstrap parameters from the WIB server, the TR-069 client will start a TR-069 DM session with the ACS server as specified in [TR-069] and [TR-098].

6. Security Considerations

Security considerations of [OTAGEN] MUST be used.

ANNEX A. WiMAX Internet Gateway Device Data Model Definition

The model definition for WiMAX IGDs is based on the DSL Forum's data model definition for IGD's as specified in [TR-098]. For WiMAX CPE, the DSL IGD model definition has been extended to include objects and parameters that are currently defined in Annex A [OTAOMADM]. Where appropriate, elements are cross referenced to the WiMAX Forum's OTA provisioning specification nodes and attributes.

All objects and parameters in this specification are version 1.0. Future versioning will follow the method used in [TR-106] and will be specified in an additional column of the parameter table.

A1 WiMAX CPE Data Module Structure

The WiMAX physical interface represents another WAN interface (WANDevice) in the IGD data model. Therefore the WANDevice object is enhanced to include new WiMAX-specific objects. Another key addition to the existing IGD model is the creation of a list X_WIMAXFORUM_OperatorProfile objects, where each Operator Profile object includes WiMAX network parameters and corresponding subscription information, among other things. In turn, the subscription object allows for a "Primary" or "Other subscription" selection for a session. The X_WIMAXFORUM_DeviceInfo object provides information about the type and module make up of the WIMAX device.

The figure below shows the data model for a WiMAX-capable IGD. The WiMAX specific elements (objects and parameters) are shaded in dark grey: X_WIMAXFORUM_OperatorProfile, X_WIMAXFORUM_WiMAXInterface Config, X_WIMAXFORUM_WiMAXLinkConfig, WANIPConnection, and WANAccessType.

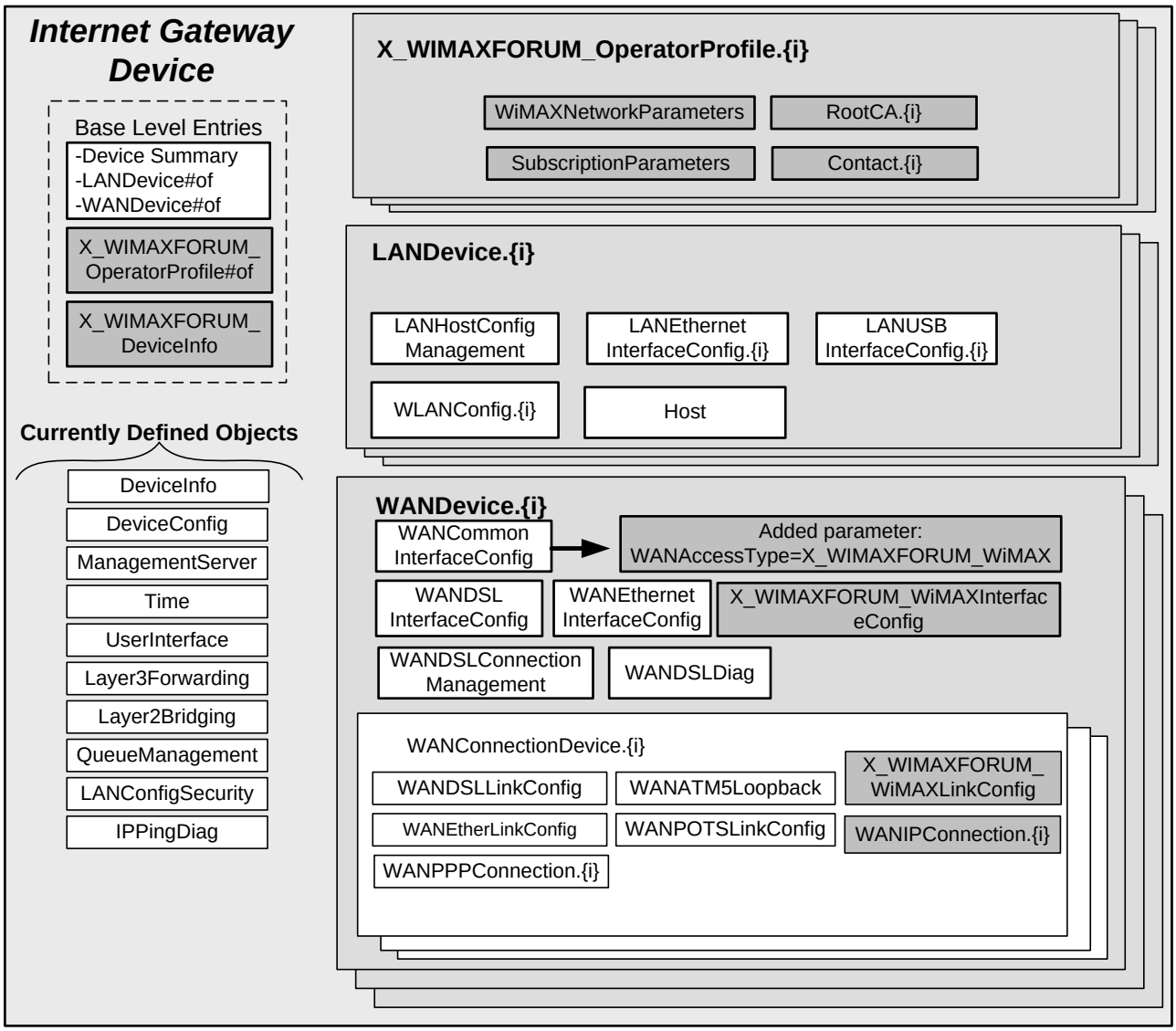

Figure 1: WiMAX IGD Data Model Structure

It should be noted that while multiple Operator Profiles may be provisioned in the IGD, there SHALL NOT be more than one Operator Profile active for an instance of a WAN interface. Section A6 provides additional information about the constraints associated with operator profiles.

The active operator profile is selected by the user. It typically does not change during handover and roaming, and only changes when the user or connection manager specifically requests it.

The WANConnectionDevice object models the link layer capabilities of the WAN interface. The X_WIMAXFORUM_WiMAXLinkConfig object contains an entry that points to the Primary or other subscribers in the SubscriptionParameters object to be authenticated across the WiMAX interface.

The WIMAXFORUM_DeviceInfo object contains WIMAX specific information related to the type of WIMAX device. The WiMAX Forum has defined specific formats or domain values to be used in the WiMAX network. Where these WiMAX formats or domain values conflict with the DSLForum IGD model, a redundant parameter has been defined.

Each of the new objects are described in the next few sections, followed by a full specification in section A7.

A2 X_WIMAXFORUM_OperatorProfile Object

In general, multiple X_WIMAXFORUM_OperatorProfile instances exist in the IGD. The number of instances is specified by the X_WIMAXFORUM_OperatorProfileNumberofEntries parameter, which is added at the base level of the IGD data model. As shown in Figure 2, an instance of X_WIMAXFORUM_OperatorProfiles contains the following objects:

- WiMAXNetworkParameters object
- SubscriptionParameters object
- RootCA object(s)
- Contact objects(s)

Each will be described in detail in the following sections.

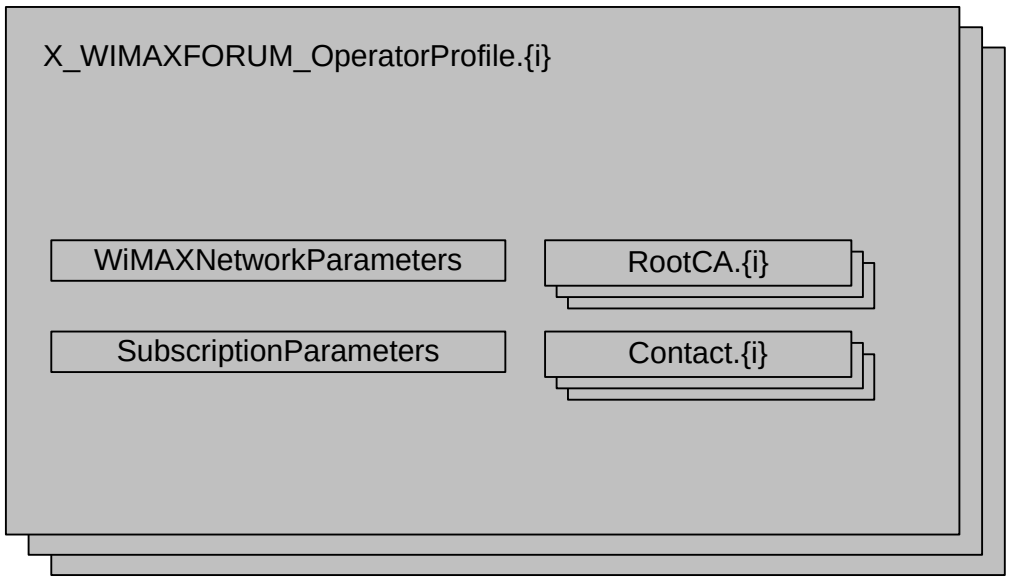

Figure 2: X_WIMAXFORUM_OperatorProfile Object

The WAN Device's X_WIMAXFORUM_WiMAXInterfaceConfig object maintains a reference to the active Operator Profile. This reference allows the Operator Profile's contained Network, Subscription, Certificate, and Contact information to be utilized within the context of the WANDevice.

A3 WiMAX Network Parameters

An instance of Operator Profiles contains information needed by the WiMAX WAN interface in order to communicate in a particular operator's network. Information is maintained about the operators channel plans for the home network service providers that is selected; Network Access Providers that the operator has contractual agreements (CAPL); and Visiting Network Service Providers that the operator has roaming agreements (RAPL).

An operator profile that has been activated for the WiMAX WAN interface also has an active channel plan and network provider. The active network provider is one of the corresponding Home Network Service Provider, Network Access Provider or Visiting Network Service Providers. The containment object for the WiMAX Network Parameters object is shown below.

The ActiveOperator object in the X_WIMAXFORUM_WiMAXInterfaceConfig maintains references to the selected Channel Plan and Network Provider.

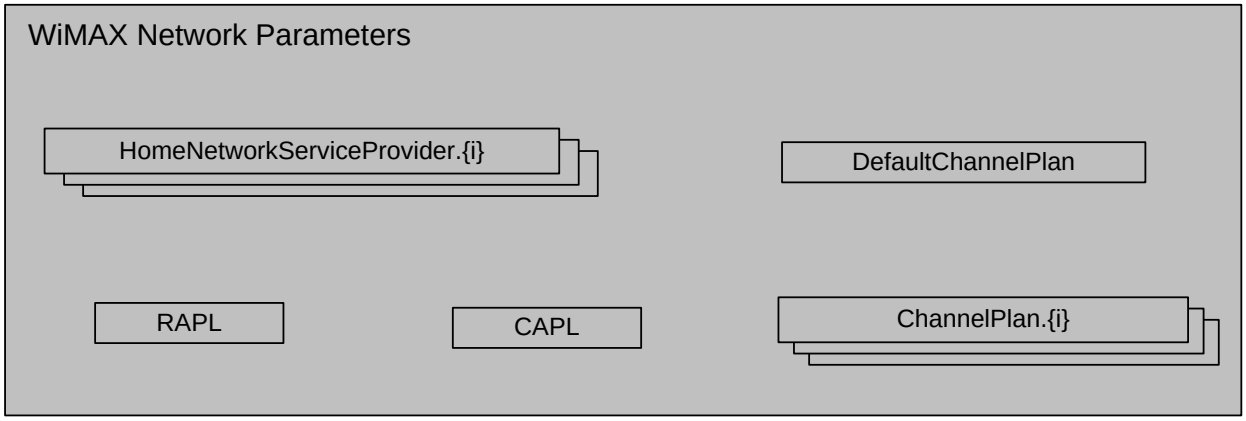

Figure 3: WiMAX Network Parameters Object

A4 WiMAX Subscription Parameters

An instance of Operator Profiles contains subscription information needed by the WiMAX WAN interface in order to communicate in the operator's network. The subscription information maintained by the IGD allows the subscriber to be identified and authorized within the operator's network. SubscriptionParameters (Primary, OtherSubscriptions) and the list of EAP Profile sub-objects are associated with an instance of a WANConnectionDevice contained within the WAN Device instance. This association is performed by referencing the selected subscription object within the X_WIMAXFORUM_WiMAXLinkConfig object.

This association allows multiple subscriptions to be active within the WAN Interface. However, only one (1) subscription is active per WANConnectionDevice.

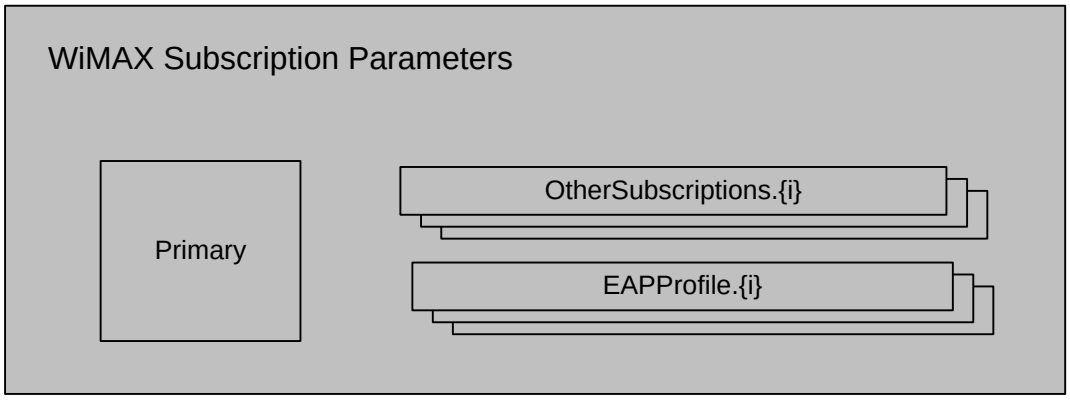

Figure 4: WiMAX SubscriptonParameters

The subscription objects (Primary, OtherSubscriptions) maintain a reference to a list of selected EAP Profiles. When the X_WIMAXFORUM_WiMAXLinkConfig object is provisioned with the active subscription object, the referenced EAP Profiles within the subscription object are used for authentication purposes.

A5 WiMAX IP Connection Constraints

In order for a WiMAX CPE to utilize an IP Connection, the current DSL Forum IP connection model must be extended to include support for Mobile IP addressing as defined in [DMIPCON]. The extensions necessary for Mobile IP is to add an additional domain value for the IP connection's AddressingType and to add a subobject under InternetGatewayDevice.WANDevice.{i}.WANConnectionDevice.{i}.WANIPConnection.{i}. for the mobility protocol.

A6 Operator Profile Constraints

Based on the current release of the WiMAX Forum's OMA-DM OTA provisioning specification, the WiMAX model definition permits provisioning multiple operator profiles (nodes). Operator profiles that have been activated affect the processing associated with the management of the device as well as physical and link attributes of the WiMAX WAN interfaces.

The WiMAX OMA-DM OTA provisioning specification defines interior nodes of the operator node that incorporate behavior for network processing, customer subscription and general support and management.

Since the DSL Forum current model definition for IGD's assumes one (1) instance of an operator is active at any point in time, this WiMAX IGD model defines a constraint where multiple operator profiles may be provisioned, but only one (1) instance of a profile may be active at any point in time. The elements of the active profiles are linked to the associated elements in the IGD model.

When objects and parameters are 'associated', changes reflected in one object or parameter is reflected in the associated object or parameter. This allows IGDs to support multiple profiles with one profile active at a time.

The mechanism to 'associate' the IGD objects and parameters with the associated profile object and parameters is outside the scope of this document.

A7 WiMAX IGD Data Model Definition

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
InternetGatewayDevice.	object	-	The top-level object for an Internet Gateway Device.	-	
X_WIMAXFORUM_OperatorProfileNumberOfEntries	unsigned Int	-	This parameter defines the number of operator profiles defined within this CPE.	-	WiMAXSupp/Operator/<X>
InternetGatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.	object	W	This object defines information related to the domain of network operators that can be selected for use by this device.	-	WiMAXSupp/Operator/<X>
RootCANumberOfEntries	unsigned Int	-	This parameter defines the number of Root CA entries trusted by this operator.	-	WiMAXSupp/Operator/<X>/RootCA/<X>

[1] The full name of a Parameter is the concatenation of the object name shown in the yellow header with the individual Parameter name.

[2] "W" indicates the parameter MAY be writable (if "W" is not present, the parameter is defined as read-only). For an object, "W" indicates object instances can be Added or Deleted.

[3] The default value of the parameter on creation of an object instance via TR-069. If the default value is an empty string, this is represented by the symbol <Empty>. A hyphen indicates that no default value is specified. For a parameter in which no default value is specified, on creation of a parent object instance, the CPE MUST set the parameter to a value that is valid according to the definition of that parameter.

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
ContactNumberOfEntries	unsigned Int	-	This parameter defines the number of contact instances provisioned that can be used for contacting the operator.	-	WiMAXSupp/ Operator/<X>/ Contacts /<X>/
InternetGatewayDevice.-X_WIMAXFORUM_ OperatorProfile.{i}. WiMAXNetwork Parameters.	object	-	This object defines the WiMAX network attributes associated with this instance of the operator. This object only exists if the device has a WiMAX interface.	-	WiMAXSupp/ Operator/<X>/Net-workParameters/
OperatorName	string (255)	W	This parameter defines the name of the operator. The format of the name SHALL utilize the UTF-8 format.	<Empty>	WiMAXSupp/ Operator/<X>/Net-workParameters/ OperatorName
HomeNetworkService ProviderNumberOfEntries	unsigned Int	-	This parameter defines the number of home network service providers for this operator.	-	WiMAXSupp/ Operator/<X>/Net-workParameters/ H-NSP/<X>
ChannelPlanNumberOf Entries	unsigned Int	-	This parameter defines the number of channel plans associated with this operator.	-	WiMAXSupp/ Operator/X/Net-workParameters/ ChannelPlan/ Entries/<X>

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
InternetGatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.HomeNetworkServiceProvider.{i}.	object	W	This object defines an instance of a home network service provider. One or more home network service providers can be provisioned, however only one instance is selected for each WANDevice. All instances of the HomeNetworkService Provider are mapped into one Network Service Provider Realm. Since the Network Service Provider is selected via the realm in the Network Access Identifier (NAI), only 1 realm is contained in the subscription instances.	-	WiMAXSupp/Operator/<X>/NetworkParameters/H-NSP/<X>
HNSPIdentifier	int[0:16777215]	W	This parameter defines the Home Network Service Provider Identifier. (H-NSP-ID) The format of the H-NSP-ID is specified in [NWGSTG3]. Valid values are: 0-((2**24) – 1) as the identifier is a 24 bit identifier.	0	WiMAXSupp/Operator/<X>/NetworkParameters/H-NSP/<X>/H-NSP-ID

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
InternetGatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.RAPL.	object	-	This object defines the processing for the selection of visiting network service providers provisioned within the operator's Roaming Agreements Preference List. The information in these objects are used in the network discovery and selection phase for roaming when network access providers, which have direct connections to the home network service provider are not available.	-	WiMAXSupp/Operator/<X>/NetworkParameters/RAPL
NetworkSelectionPolicy	int[0:3]	W	This parameter defines how network access providers selected. 0 – Reserved 1 – Strict Policy 2 – Partially Flexible Policy 3 – Fully Flexible Policy The definition and usage of the policies are found in reference [ND&S CHANGES].	-	WiMAXSupp/Operator/<X>/NetworkParameters/RAPL/SelectPolicy
RAPNumberOfEntries	unsigned Int	-	This parameter defines the number of provisioned visiting network service providers in the RAPL list.	-	WiMAXSupp/Operator/<X>/NetworkParameters/RAPL/<X>
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.RAPL.RAP.{i}.	object	W	This object defines an instance of a visiting network service provider provisioned within the operator's RAPL List. These providers have a direct relationship with the HomeNetworkServiceProvider.	-	WiMAXSupp/Operator/<X>/NetworkParameters/RAPL/<X>

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
VNSPIdentifier	int[0:16777215]	W	This parameter defines the visiting network service provider's identifier (v-nsp-id). The format of the v-nsp-id is specified in [NWGSTG3]. Valid values are: 0-((2**24) – 1) as the identifier is a 24 bit identifier.	0	WiMAXSupp/ Operator/<X>/Net-workParameters/ RAPL/<X>/ V-NSP-ID
NetworkSelectionPriority	int [-1:255]	W	This parameter defines the priority of the Visited Network Service Provider. The definition and usage of priorities are found in reference [ND&S CHANGES]. Value Description -1 Omitted 0 Reserved. 1 Highest priority 2-249 Other priorities 250 Lowest priority 251-254 Reserved 255 Forbidden	-1	WiMAXSupp/ Operator/<X>/Net-workParameters/ RAPL/<X>/ Priority

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
InternetGatewayDevice.Operator.Profile.{i}.WiMAXNetworkParameters.CAPL.	object	-	This object defines the processing for the selection of network access providers provisioned within the operator's Contractual Agreements Preference List. The CAPL list instructs which NAP will be selected to establish connection to the home network. Refer to [ND&S CHANGES] for examples of how the CAPL list is used in network discovery and selection.	-	WiMAXSupp/Operator/<X>/NetworkParameters/CAPL
NetworkSelectionPolicy	int[0:3]	W	This parameter defines how network access providers selected. 0 – Reserved 1 – Strict Policy 2 – Partially Flexible Policy 3 – Fully Flexible Policy The definition and usage of the policies are found in reference [ND&S CHANGES]	-	WiMAXSupp/Operator/<X>/NetworkParameters/CAPL/Select Policy
CAPNumberOfEntries	unsigned Int	-	This parameter defines the number of provisioned network access providers in the CAPL list.	-	WiMAXSupp/Operator/<X>/NetworkParameters/CAPL/<X>
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.CAPL.CAP.{i}.	object	W	This object defines an instance of a network access provider provisioned within the operator's Contractual Agreements Preference List.	-	WiMAXSupp/Operator/<X>/NetworkParameters/CAPL/<X>

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
NAPIdentifier	int[0:16777215]	W	This parameter defines the network access provider's identifier (NAP-ID). The format of the NA-ID is specified in [NWGSTG3]. Valid values are: 0-((2**24) – 1) as the identifier is a 24 bit identifier.	0	WiMAXSupp/ Operator/<X>/NetworkParameters/ CAPL/<X>/NAP-ID
NetworkSelectionPriority	int [-1:255]	W	This parameter defines the priority of the NAP. The definition and usage of priorities are found in reference [ND&S CHANGES]. Value Description -1 Omitted 0 Reserved. 1 Highest priority 2-249 Other priorities 250 Lowest priority 251-254 Reserved 255 Forbidden	-1	WiMAXSupp/ Operator/<X>/NetworkParameters/. CAPL/<X>/ Priority
ChannelPlans	string (1024)	W	This parameter defines a comma separated ordered list of channel plan identifiers values. Channel plan identifier values are related to the ChannelPlanIdentifier parameter contained within the ChannelPlan instance object. Reference [ND&S CHANGES] provides additional details about the usage of NAP based channel plans.	-	WiMAXSupp/ Operator/<X>/NetworkParameters/. CAPL/<X> /ChPlanRefIds/ <X>/RefId

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
InternetGatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.DefaultChannelPlan.	object	-	This object defines the default parameter settings for all channel plans where values are not specified for a channel plan instance.	-	
Bandwidth	int	W	The parameter defines the default bandwidth value for all channel plans that do not have a Bandwidth provisioned. The value is in kHz.	-	WiMAXSupp/ Operator/X/Net-workParameters/ ChannelPlan/BW
FFTSize	int	W	This parameter defines the default FFT size for all channel plans that do not have a FFT size provisioned.	-	WiMAXSupp/ Operator/X/Net-workParameters/ ChannelPlan// FFTSize
DuplexMode	int[0:255]	W	This parameter defines the default duplex mode for all channel plans that do not have a duplex mode provisioned. The domain of values are: 0 – Reserved 1 – TDD 2 – FDD 3 - HFDD 4-255 – Reserved.	-	WiMAXSupp/ Operator/X/Net-workParameters/ ChannelPlan// DuplexMode

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.ChannelPlan.{i}.	object	W	This object defines the instance of a channel plan.A Channel Plan is used in the network discovery and selection process. Reference [ND&S CHANGES] provides additional details about the usage of channel plans. In the case where the ChannelPlan instance is used as a Root Channel Plan, the precedence of the Channel Plan selection is based on the value of the instance number of the ChannelPlan instance.	-	WiMAXSupp/ Operator/X/Net-workParameters/ ChannelPlan// Entries/<X>/
ChannelPlanIdentifier	string(20)	W	This parameter defines identifier assigned to the channel plan instance.ChannelPlanIdentifier values MUST be unique within the context of the Operator profile. The ChannelPlanIdentifier MAY be used to associate a ChannelPlan instance contained within a CAP instance. If the ChannelPlanIdentifer is associated with a CAP instance, then the parameter Internet-GatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.CAPL.CAP.{i}.ChannelPlans maintains the list of associated ChannelPlanIdentifiers.	<Empty>	WiMAXSupp/ Operator/X/Net-workParameters/ ChannelPlan / Entries/<X>/ Id

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
Bandwidth	int[-1:]	W	The parameter defines the individual bandwidth value for this channel plan. The value is in kHz. A value of -1 indicates that this parameter has not been provisioned.	-1	WiMAXSupp/ Operator/X/Net-workParameters/ ChannelPlan / Entries/<X>/BW
FFTSize	int[-1:]	W	This parameter defines the FFT size for this channel plan. A value of -1 indicates that this parameter has not been provisioned.	-1	WiMAXSupp/ Operator/X/Net-workParameters/ ChannelPlan/ Entries/<X>/ FFTSize
DuplexMode	int [-1:255]	W	This parameter defines the duplex mode for this channel plan. A value of -1 indicates that this parameter has not been provisioned. The domain of values are: -1 - Omitted 0 – Reserved 1 – TDD 2 – FDD 3 - HFDD 4-255 – Reserved	-1	WiMAXSupp/ Operator/X/Net-workParameters/ ChannelPlan/ Entries/<X>/ DuplexMode
FirstFrequency	int	W	This parameter defines the first center frequency, in kHz, that is defined for this channel range.	-	WiMAXSupp/ Operator/X/Net-workParameters/ ChannelPlan/ Entries/<X>/ FirstFreq
LastFrequency	int	W	This parameter defines the last center frequency, in kHz, that is defined for this channel range. If this value equals the FirstFrequency or this value is 0, then this channel plan instance refers to single channel rather than a channel range.	0	WiMAXSupp/ Operator/X/Net-workParameters/ ChannelPlan/ Entries/<X>/ LastFreq

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
NextFrequencyStep	int	W	This parameter defines the frequency step in kHz to reach the next central frequency when a channel range has been defined using the FirstFrequency and LastFrequency parameters. If the value of this parameter is 0, then this channel plan instance refers to single channel rather than a channel range. The formula to calculate the next center frequency is: *CurrentFreq = FirstFrequency* *While (CurrentFreq <= LastFrequency) CurrentFreq = CurrentFreq + NextFrequencyStep*	0	WiMAXSupp/ Operator/X/Net-workParameters/ ChannelPlan/ Entries/<X>/ NextFreqStep
Preambles	string(29)	W	This parameter defines the valid preambles for each channel in this channel range. The parameter is a bitmap of 114 bits. The value is a hexadecimal string that is 29 digits long. The two MSB are zeroed and the LSB represents channel 0.	<Empty>	WiMAXSupp/ Operator/X/Net-workParameters/ ChannelPlan/ Entries/<X>/ Preambles

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.SubscriptionParameters.	object	-	This object defines the primary and additional user subscriptions. Each subtype (primary, other) of a SubscriptionParamaters instance is associated with one (1) instance of a WANConnectionDevice. SubscriptionParameters instances to WANConnectionDevices associations are unique as only one (1) EAP profile is permitted per WANConnectionDevice. If multiple subscriptions are necessary, then additional WANConnectionDevices would be provisioned.	-	WiMAXSupp/Operator/<X>/SubscriptionParameters
OtherSubscriptionsNumberOfEntries	unsignedInt	-	This parameter defines the number of provisioned additional (other) subscriptions that are not considered the primary subscription.	-	WiMAXSupp/Operator/<X>/SubscriptionParameters/OtherSubscriptions/<X>
EAPProfileNumberOfEntries	unsignedInt	-	This parameter defines the number of provisioned EAP profile instances.	-	WiMAXSupp/Operator/<X>/SubscriptionParameters/<X>/EAP/<X>/
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.SubscriptionParameters.Primary.	object	-	This object defines the primary subscription attributes.	-	WiMAXSupp/Operator/<X>/SubscriptionParameters/Primary

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
Activated	boolean	W	This parameter indicates the provisioning status of the primary subscriber. When FALSE, the device will enter the network in the provisioning mode when using the primary subscription. When TRUE, the device will use the regular network entry mode. The point of time when this parameter is set is considered as the completion point of provisioning phase by the device. Refer to [OTAGEN] section 8.2 for more information of the modes of network entry.	FALSE	WiMAXSupp/ Operator/<X>/ SubscriptionPara-meters/Primary/ Activated
Name	string (255)	W	This parameter defines the human readable name of the subscriber. The format of the name SHALL be UTF-8 format. The name of the primary subscriber MUST be unique from the names of the other subscriber instances.	<Empty>	WiMAXSupp/ Operator/<X>/ SubscriptionPara-meters/Primary/ Name

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
EAPProfiles	string (256)	W	This parameter defines a comma separated list of EAPProfile object instance numbers to be used for the client authentication for the associated connection device. For example, the comma separated list that contains (1,7,9) within the X_WIMAXFORUM_OperatorProfile #3 instance would reference EAPProfiles (Internet-Gateway-Device.X_WIMAXFORUM_OperatorProfile.3.SubscriptionParameters.EAPProfile.1, Internet-Gateway-Device.X_WIMAXFORUM_OperatorProfile.3.SubscriptionParameters.EAPProfile.7, Internet-Gateway-Device.X_WIMAXFORUM_OperatorProfile.3.SubscriptionParameters.EAPProfile.9).	<Empty>	WiMAXSupp/Operator/<X>/SubscriptionParameters/EAP/<X>

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.SubscriptionParameters.OtherSubscriptions.{i}.	object	W	This object defines the instances of other (non-primary) subscription attributes.	-	WiMAXSupp/Operator/<X>/SubscriptionParameters/OtherSubscriptions/<X>
Activated	boolean	W	This parameter indicates the provisioning status of the subscription. When FALSE, the device will enter the network in the provisioning mode when using this subscription instance. When TRUE, the device will use the regular network entry mode when using this subscription instance. The point of time when this parameter is set is considered as the completion point of provisioning phase by the device. Refer to [OTAGEN] section 8.2 for more information of the modes of network entry.	FALSE	WiMAXSupp/Operator/<X>/SubscriptionParameters/OtherSubscriptions/<X>/Activated
Name	string (255)	W	This parameter defines the human readable name of the subscriber. The format of the name SHALL be UTF-8 format. The name of the primary subscriber MUST be unique from the names of the primary and other subscription instances.	<Empty>	WiMAXSupp/Operator/<X>/SubscriptionParameters/OtherSubscriptions/<X>/Name

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
EAPProfiles	string (256)	W	This parameter defines a comma separated list of EAPProfile object instance numbers to be used for the client authentication for the associated connection device. For example, the comma separated list that contains (1,7,9) within the X_WIMAXFORUM_OperatorProfile #3 instance would reference EAPProfiles (InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.3.SubscriptionParameters.EAPProfile.1, InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.3.SubscriptionParameters.EAPProfile.7, InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.3.SubscriptionParameters.EAPProfile.9).	<Empty>	WiMAXSupp/Operator/<X>/SubscriptionParameters/OtherSubscriptions/<X>/EAP/<X>
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.SubscriptionParameters.EAPProfile{i}.	object	W	This parameter defines the instances of subscription authtenication credentials used for the subscriber	-	WiMAXSupp/Operator/<X>/SubscriptionParameters/<X>/EAP/<X>
Type	string	W	This parameter defines the type of authentication protocol and credentials. Enumeration of: “EAP-TLS” “EAP-TTLS” “EAP-AKA” “PLAIN-MSCHAPV2”	-	WiMAXSupp/Operator/<X>/SubscriptionParameters/<X>/EAP/<X>/METHOD-TYPE

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
Identity	string (253)	W	This parameter defines the identity used within the selected protocol. If this is not specified then the type itself decides what it sends as the username. For example EAP-TLS might get the username from the user's certificate. If necessary it can also be asked from the user during authentication	<Empty>	WiMAXSupp/ Operator/<X>/ SubscriptionPara-meters/<X>/EAP/ <X>/USER-IDENTITY
SharedSecret	string (253)	W	This parameter defines the password used within the selected protocol. The SharedSecret that is used in EAP Authentication. When returned the SharedSecret returns an empty string.	-	WiMAXSupp/ Operator/<X>/ SubscriptionParam eters/<X>/EAP/ <X>/PASSWORD
Realm	string (256)	W	This parameter defines the override realm that is sent in the EAP identity response packet. The identity response is: "USERNAME@REALM ". The realm format is specified in [RFC4282].	-	WiMAXSupp/ Operator/<X>/ SubscriptionPara-meters/<X>/EAP/ <X>/REALM

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
VerifyServerRealmList Enable	boolean	W	This parameter defines if the realm of the server's certificate is verified for certificates that are presented to the device.	-	WiMAXSupp/ Operator/<X>/ SubscriptionPara-meters/<X>/EAP/ <X>/VFY-SRV-REALM
ServerRealmList	string (512)	W[4]	This parameter defines the list of comma separated of allowed realms that the device MUST accept for the subjectAltName dNSName field in the server certificate of the EAP Peer. The elements in this parameter can be FQDN or partial domain names.	-	WiMAXSupp/ Operator/<X>/ SubscriptionPara-meters/<X>/EAP/ <X>/SRV-REALM/<X>/ SRV-REALMS

[4] A set of examples follows whereby the MS will use the SRV Realm and compare the dNSName provided in the network certificate and produce the following authentication result.

SRV Realm	dNSName	Result
carrier.com	aaa1.carrier.com	Accepted
carrier.com	aaa1.acarrier.com	Not Accepted
carrier.com	carrier.com	Accepted
carrier.com	carrier.net	Not Accepted
wimax.carrier.com	carrier.com	Accepted
wimax.carrier.com	a1.wimax.carrier.com	Accepted
wimax.carrier.com	wimax.acarrier.com	Not Accepted
wimax.carrier.com	wimax.carrier.com	Accepted
com	a.com	Accepted
com	a.net	Not Accepted

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
EncapsulationProtocol	string	W	This parameter defines if the payload secured by this profile is to be transported within a secure tunnel defined by another profile instance. This parameter specifies encapsulating type of the associated profile. Enumeration of: “EAP-TTLS” **“None”** For example if the value of this parameter is “EAP-TTLS” then these settings are meant for EAP-TTLS encapsulation. If this parameter value is “None” then the profile is secured without a tunnel. There MUST NOT be two profile instances with the same encapsulating tunnel.	”None”	WiMAXSupp/ Operator/<X>/ SubscriptionPara-meters/<X>/EAP/ <X>/ENCAPS
PseudonymIdentity	string (253)	W	This parameter defines the pseudonym identity to be used when EAP-AKA is used for the user authentication for first network entry. When this parameter is not empty the pseudonym identity MUST be used and the permanent identity MUST NOT be sent to the network during authentication.	<Empty>	WiMAXSupp/ Operator/<X>/ SubscriptionParameters/<X>/EAP/ <X>/PROVISIONED-PSEUDO-IDENTITY

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
IdentityPrivacyEnable	boolean	W	This parameter defines if the EAP method identity privacy mechanism is enabled. Each EAP method has its own identity privacy mechanism. In EAP-AKA, there are two possible ways the device can operate upon receipt of a permanent identity request from the AAA server [RFC 4187 Section 4.1.6]. This parameter defines which way the device MUST perform upon that request, i.e., AT_PERMANENT_ID_REQ. If the value of this parameter is TRUE and if the device has a pseudonym identity available then the permanent identity MUST NOT be sent to the network even if it is explicitly requested by the server.	FALSE	WiMAXSupp/Operator/<X>/SubscriptionParameters/<X>/EAP/<X>/USE-PRIVACY

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
			If this parameter is FALSE, then the permanent identity MUST be sent to the network when the permanent identity is requested by the server. If the device has no pseudonym identity available then the permanent identity MUST be sent to the network when requested, regardless of this parameter setting. In other EAP methods, excluding EAP-TLS, if this parameter is TRUE then the device MUST use a randomly generated username in outer EAP-Response/Identity. If this parameter is FALSE or missing then any type of identity conforming to each EAP method can be used. Realm portion of the NAI (Network Access Identified) is still required to route authentication to the home network in all cases.		

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
CheckCodeEnable	boolean	W	This parameter defines the EAP-AKA security option use of the AT_CHECKCODE attribute that can protect EAP/AKA-Identity messages exchanged between the device and the AAA before the keying material is derived. If this parameter is TRUE then AT_CHECKCODE MUST be included in EAP-Response/AKA-Challenge or EAP-Response/AKA-Reauthentication message. If this parameter is FALSE or missing then AT_CHECKCODE is not sent by the device. However, regardless of this parameters value, the AT_CHECKCODE MUST be used when new attributes are included in EAP-Request/AKA-Identity or EAP-Response/AKA-Identity message [RFC 4187 Chapter 8.2].	FALSE	WiMAXSupp/Operator/<X>/SubscriptionParameters/<X>/EAP/<X>/EAP-AKA/USE_CHECKCODE

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
CertificateNumberOfEntries	unsignedInt	-	This parameter defines the number of certificates instances associated with this profile.	-	WiMAXSupp/Operator/<X>/SubscriptionParameters/<X>/EAP/<X>/
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.SubscriptionParameters.EAPProfile.{i}.Certificate.{i}.	object	W	This object defines the properties associated with certificates presented by the device.	-	WiMAXSupp/Operator/<X>/SubscriptionParameters/<X>/EAP/<X>/CERT
Type	string	W	This parameter defines the type of certificate to be presented. Enumeration of: "DEVICE" "CA" "DEVICE" -Device certificate. This indicates that device authentication is performed under this subscription profile. The CPE's embedded device certificate would be utilized for authentication. "CA" -CA certificate. This indicates that this object contains information about the CA certificate used by the operator. The following CertificateIdentifier parameter references the corresponding WIMAXFORUM_OperatorProfile.{i}.RootCA.{i} object.	-	WiMAXSupp/Operator/<X>/SubscriptionParameters/<X>/EAP/<X>/CERT/<X>/CERT-TYPE

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
CertificateIdentifier	string (256)	W	This parameter is a reference to the associated certificate instance currently associated with this operator. When the type of the certificate is "CA" this parameter MUST be the full path name of the corresponding InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.RootCA.{i} object instance. For example: InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.1.RootCA.1 This indicates that this certificate is the Root CA associated with X_WIMAXFORUM_OperatorProfile #1 Root CA instance 1.	-	EAP/<X>/CERT/<X>/SER-NUM EAP/<X>/CERT/<X>/ISSUER
SerialNumber	string (256)	-	This parameter defines the serial number of associated certificate per RFC 3280 §4.1.2.2 & §3.3 defined by the CertificateIdentifier parameter. If the CertificateIdentifier parameter is empty, then this parameter MUST return an empty string.	-	EAP/<X>/CERT/<X>/SER-NUM

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
Issuer	string (256)	-	This parameter specifies the Distinguished Name of the certificate's issuer in human readable UTF-8 form (for example "/C=US/O=Some organization/CN=Some common name") per the RFC3280of associated certificate defined by the CertificateIdentifier parameter. If the CertificateIdentifier parameter is empty, then this parameter MUST return an empty string.	-	EAP/<X>/CERT/<X>/ISSUER
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.RootCA.{i}.	object	W	This object defines a Root CA entry trusted by this operator and is used by the device to authenticate the operator's network.	-	WiMAXSupp/Operator/<X>/RootCA/<X>
VendorConfigurationIdentifier	string (256)	W	This parameter defines the instance of a VendorConfigFile that is associated with this RootCA. The RootCA MUST be a DER encoded X.509 certificate. This parameter is a reference to a VendorConfigFile instance. It MUST be the full path name of the corresponding VendorConfigFile object instance. For example: InternetGatewayDevice.DeviceInfo.VendorConfigFile.1 This indicates that this instance of the RootCA is associated with VendorConfigFile #1's instance.	<Empty>	WiMAXSupp/Operator/<X>/RootCA/<X>/Certificate

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.Contact.{i}.	object	W	This parameter defines the instance of a contact within the operator instance.	-	WiMAXSupp/ Operator/<X>/ Contacts /<X>
Type	int[0:255]	W	This parameter defines contact type that will be made visible to the user. 0 – Contact is for the operator's Technical Support contact information 1 – Contact is for operator's Subscription Portal contact information. 2 – 199 Reserved for future use 200-255 Operator specific codes	-	WiMAXSupp/ Operator/<X>/ Contacts/<X>/ Type
URI	string (1024)	W	This parameter defines the URI string for contact purposes. The URI will most often be a telephone number 'tel:+911', a SIP VoIP contact 'sip:alice@wonderland.com' or a URL 'http://wireless.com/TechnicalSupport'. Other URI resource types can be specified, but the device might not implement support for all URI formats.	-	WiMAXSupp/ Operator/<X>/ Contacts/<X>/URI
ContactRequestEnable	boolean	W	This parameter defines if contact is requested by the operator.	FALSE	WiMAXSupp/ Operator/<X>/ Contacts/<X>/ Trigger
UserInterfaceText	string (255)	W	This parameter defines the message to be displayed to the user when contact is requested by the operator. The mechanism used to display the message is implementation specific.	<Empty>	WiMAXSupp/ Operator/<X>/ Contacts/<X>/Text

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
InternetGatewayDevice.WANDevice.{i}.WANCommonInterfaceConfig.	object	-	This object models WAN interface properties common across all connection instances.	-	
WANAccessType	string	-	Specifies the WAN access (modem) type. Enumeration of: "DSL" "Ethernet" "POTS" "X_WIMAXFORUM_WiMAX"	-	Note: X_WIMAXFORUM_WiMAX access type is added to the existing enumeration
InternetGatewayDevice.-WANDevice.{i}.X_WIMAXFORUM_WiMAXInterfaceConfig.	object	-	This object defines the information necessary to provision and manage the WiMAX interface within the device.	-	WiMAX
InternetGatewayDevice.-WANDevice.{i}.X_WIMAXFORUM_WiMAXInterfaceConfig.RadioModule.	object	-	This object defines the information necessary to identify the radio module associated with the interface.	-	WiMAX/WiMAX RadioModule/<X>
Manufacturer	string(50)	-	This parameter defines the manufacturer of the radio module.	-	WiMAX/WiMAX RadioModule/<X>/Man
MACAddress	string(17)	-	This parameter defines the MAC address of the WiMAX Modem of the radio module. The MACAddress is displayed is 48-bit hexadecimal represented as a string of six octets. The octets are displayed from left to right, in the order that they are transmitted on the network, separated by hyphens. Each octet of the address is displayed as two hexadecimal digits For example: "0B-84-AA-BB-CC-11"	-	WiMAX/WiMAX RadioModule/<X>/MACAddress
OperatorProfileIdentifier	string(50)	-	This parameter specifies the hardware version of the radio module.	-	WiMAX/WiMAX RadioModule/<X>/HwV

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
SoftwareVersion	string(50)	-	This parameter specifies the driver software version of the radio module. If the software version is not applicable then an empty string is returned.	-	WiMAX/WiMAX RadioModule/<X> /SwV
FirmwareVersion	string(50)	-	This parameter specifies the firmware version of the radio module.	-	WiMAX/WiMAX RadioModule/<X> /FwV
Model	string(50)	-	This parameter specifies the model of the radio module.	-	WiMAX/WiMAX RadioModule/<X> /Mod
InternetGatewayDevice.-WANDevice.{i}. X_WIMAXFORUM_WiMAXInterfaceConfig. Layer3Capability.	object	-	This object defines the information necessary to advertise the capabilities of the device with respect to the layer 3 protocols supported	-	WIMAX/DevCap/ IPCap
IPv4Support	boolean	-	This parameter defines if the interface supports IPv4 PDUs.	-	WIMAX/DevCap/ IPCap/IPV4
IPv6Support	boolean	-	This parameter defines if the interface supports IPv6 PDUs.	-	WIMAX/DevCap/ IPCap/IPV6
CMIPv4Support	boolean	-	This parameter defines if the interface supports CMIPv4 PDUs.	-	WIMAX/DevCap/ IPCap/CMIPV4
CMIPv6Support	boolean	-	This parameter defines if the interface supports CMIPv6 PDUs.	-	WIMAX/DevCap/ IPCap/CMIPV6

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
InternetGateway-Device.WANDevice.{i}.-X_WIMAXFORUM_WiMAXInterfaceConfig.ActiveOperator.	object	-	This object defines the active operator network parameter settings for the selected WAN interface.	-	
OperatorProfileIdentifier	string (256)	-	This parameter is a reference to the associated operator profile instance currently associated with this WANDevice instance. It MUST be the full path name of the corresponding X_WIMAXFORUM_OperatorProfile object instance. For example: InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.1 This indicates that this WANDevice instance is associated with X_WIMAXFORUM_OperatorProfile #1.	-	WiMAXSupp/Operator/<X>/

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
CurrentOperatorName	string (255)	-	This parameter defines the name of the current operator. The current operator name is the provisioned OperatorName for the associated OperatorProfile. If the provisioned OperatorName is not used this parameter MAY be the operator name received from the WiMAX Medium Access Control (MAC) layer, NSP verbose name. The determination of when to use the provisioned OperatorName or the NSP verbose name is implementation specific. The format of the name SHALL utilize the UTF-8 format.	-	WiMAXSupp/ Operator/<X>/Net-workParameters/ OperatorName

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
ChannelPlanIdentifier	string (256)	-	This parameter defines the associated channel plan instance that has been activated for this WANDevice. This parameter is a reference channel plan instance of the currently associated operator profile for this WANDevice instance. It MUST be the full path name of the corresponding ChannelPlan object instance. For example: InternetGateway-Device.X_WIMAXFORUM_OperatorProfile.1.WiMAXNetworkPara-meters.ChannelPlan.3 This indicates that this WANDevice instance is associated with X_WIMAXFORUM_OperatorProfile #1's ChannelPlan instance #3.	-	WiMAXSupp/ Operator/<X>/ ChannelPlan/
Frequency	int	-	This parameter defines the current center frequency, in kHz that is in use for this WANDevice instance.	-	-

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
NAPIdentifier	string (256)	-	This parameter is a reference to the network access provider instance that is currently associated with this WANDevice instance. It MUST be the full path name of the corresponding CAP (Contractual Agreement Preference) object instance. For example: InternetGatewayDevice. X_WIMAXFORUM_Op eratorProfile.1.WiMAXN etworkParameters. CAPL.CAP.1 This indicates that this WANDevice is associated with X_WIMAXFORUM_Op eratorProfile #1's CAP instance #1.	-	WiMAXSupp/ Operator/<X>/Net- workParameters/ CAPL/<X>/ NAP-ID
HNSPIdentifier	string (256)	-	This parameter is a reference to the home network service provider instance that is currently associated with this WANDevice instance. It MUST be the full path name of the corresponding HomeNetworkServicePro vider object instance. For example: InternetGatewayDevice. X_WIMAXFORUM_Op eratorProfile.1.WiMAXN etworkParameters. HomeNetworkServicePro vider.1 This indicates that this WANDevice is associated with X_WIMAXFORUM_Op eratorProfile #1's HomeNetworkServicePro vider instance #1.	-	WiMAXSupp/ Operator/<X>/Net- workParameters. H-NSP/<X>/ H-NSP-ID

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
VNSPIdentifier	string (256)	-	This parameter is a reference to the visiting network service provider instance that is currently associated with this WANDevice instance. It MUST be the full path name of the corresponding RAP (Roaming Agreement Preference) object instance. When a visiting network service provider is not available this parameter SHALL be empty. For example: InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.1.WiMAXNetworkParameters.RAPL.RAP.1 This indicates that this WANDevice is associated with X_WIMAXFORUM_OperatorProfile #1's RAP instance #1.	-	WiMAXSupp/Operator/<X>/NetworkParameters/RAPL/<X>/v-nsp-id

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
InternetGateway-Device.WANDevice.-{i}.WANConnection Device.{i}.X_WIMAXFORUM_WiMAXLink Config.	object	-	This object models the WiMAX link layer properties specific to a single physical connection used for Internet access on a CPE. This object is intended for a CPE with a WiMAX WAN interface, and is exclusive of any other WAN*LinkConfig object within a given WAN-ConnectionDevice instance.	-	
SubscriptionParametersIdentifier	string (256)	W	This parameter is a reference to the currently associated subscription instance that is to be used for this WANConnectionDevice. It MUST be the full path name of the corresponding PrimarySubscription or OtherSubsciption object instance. For example: X_WIMAXFORUM_OperatorProfile.1.SubscriptionParameters.Primary This indicates that this WANConnectionDevice is associated with X_WIMAXFORUM_OperatorProfile #1's PrimarySubscription object.	-	WiMAXSupp/ Operator/<X>/ SubscriptionPara-meters/OtherSub-scriptions/ <X> Or WiMAXSupp/ Operator/<X>/ SubscriptionPara-meters/Primary
InternetGatewayDevice.-WANDevice.{i}.WAN-ConnectionDevice.{i}.-WANIPConnection.{i}.	object	W	This object enables configuration of IP connections on the WAN interface of a CPE.	-	

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
AddressingType	string	W	The method used to assign an address to the WAN side interface of the CPE for this connection. Enumeration of: "DHCP" "Static" "X_WIMAXFORUM_MobileIP"	-	Added enumeration type: X_WIMAXFORUM_MobileIP
InternetGatewayDevice.-WANDevice.{i}.WAN-ConnectionDevice.{i}.-WANIPConnection.{i}.-X_WIMAXFORUM_MobileIP.	object	-	This object enables configuration of parameters for the Mobile clients that obtain addressing using [RFC 3344] on the IP connections on the interface of a device. This object and associated sub-objects are relevant when the IP connections address type is X_WIMAXFORUM_MobileIP.	-	MIPv4 MIPv4/Protocol
ProtocolMode	string	W	This parameter defines the MIP mode that is used. Enumeration of: "CO" (Co-located CoA Mode. [RFC3344]) "FA" (Foreign Agent Mode [RFC3344]) "FA-ENCAPS" (Foreign Agent Mode [RFC3024])	CO	MIPv4/Protocol/Mode

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
ReverseTunnelEnable	boolean	W	This parameter defines if reverse tunneling between a) in FA mode, the Foreign Agent and the Home Agent b) in CoA mode, the Mobile Device (CPE) and the Home Agent [RFC3024]. When the value is TRUE, reverse tunneling is used and when the value is FALSE reverse tunneling is not used	TRUE	MIPv4/Protocol/ RevTun
RelativeReregistration Period	int[0:]	W	This parameter defines the relative re-registration period. It defines the period in percentages, when the re-registration process is started. E.g. if the re-registration lifetime is 100 minutes and the relative re-registration lifetime is 90%, then the re-registration process MUST be started after 90 minutes [RFC3344].	90	MIPv4/Protocol/ RegPeriodRel
RegistrationPeriod	int[1:65535]	W	The parameter defines the number of seconds prior to the end of the registration period, when re-registration process is started. For example, if the registration lifetime is 3600 seconds and the re-registration period is 600 seconds, the re-registration process MUST be started after 3000 seconds at the registration [RFC3344].	600	MIPv4/Protocol/RegPeriod

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
RetryTimer	int[1:16]	W	This parameter defines the initial registration timer, in seconds, before new registration is attempted. An Exponential backoff algorithm defines the time interval between subsequent registration attempts [RFC3344].	1	MIPv4/Protocol/ RetryTimer
RetryCount	int[1:256]	W	This parameter defines the maximum number of registration retry attempts [RFC3344]	3	MIPv4/Protocol/ RetryCount
InternetGatewayDevice.-WANDevice.{i}.WAN-ConnectionDevice.{i}.-WANIPConnection.{i}.-X_WIMAXFORUM_ MobileIP.UserProfile.	object	-	This object defines the parameters needed for establishing a mobility session with a Home Agent [RFC3344].	-	MIPv4/UserProfile
HomeAddress	string (50)	W	This parameter defines the IP address that is assigned for an extended period of time to a mobile device. It remains unchanged regardless of where the device is attached. When empty the HomeAddress is requested dynamically from the network. All packets are emitted with the source through the interface using the home address.	<Empty>	MIPv4/UserProfile /HomeAddr
HomeAgentNumberOfEntries	unsigned Int	-	This parameter defines the number of provisioned HomeAgent instances.	-	MIPv4/UserProfile /HA/<X>
InternetGatewayDevice.-WANDevice.{i}.WAN-ConnectionDevice.{i}.-WANIPConnection.{i}.-X_WIMAXFORUM_ MobileIP.UserProfile. HomeAgent.{i}.	object	W	This object defines the parameters associated with an instance of Home Agent (HA).	-	MIPv4/UserProfile /HA/<X>

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
SharedKey	string (256)	W	This parameter defines the shared secret key between the mobile device (CPE) and the Home Agent (HA) [RFC3344]	-	MIPv4/UserProfile /HA/<X>/HAKey
HomeAgentAddress	string (50)	W	This parameter specifies the Home Agent (HA) address. If this parameter is empty then the HA IP address is obtained dynamically from the network [RFC3344] and [NWGSTAGE3].	<Empty>	MIPv4/UserProfile /HA/<X>/HAAddr
HomeAgentPrefixLen	int[-1:]	W	This parameter specifies the home network prefix length of the Home Agent (HA) [RFC3344]. If the value of the prefix length is -1, then how the HA prefix is detected is implementation specific	-1	MIPv4/UserProfile /HA/<X>/ HAPrefixLen
HomeAgentSPI	int[-1:]	W	This parameter defines the 32-bit Security Parameter Index (SPI) for the MIP authentication of registration between the device and the Home Agent (HA) [RFC3344]. SPI values 0 through 255 are reserved and MUST NOT be used in any Mobility Security Association If the value is -1, the SPI is determined according to section 4.3.1.1.1 of [NWGSTG3]	-1	MIPv4/UserProfile /HA/<X>/HASpi

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
AAASPI	int[-1:]	W	This parameter defines the 32-bit Security Parameter Index (SPI) for the MIP authentication of registration between the device and the Authorization, Authentication and Accounting (AAA) or Radius Server [RFC3012]. SPI values 0 through 255 are reserved and MUST NOT be used in any Mobility Security Association If the value is -1, the SPI is determined according to section 4.3.1.1.1 of [NWGSTG3]	-1	MIPv4/UserProfile /HA/<X>/AAASpi
InternetGatewayDevice.-WANDevice.{i}.WAN-ConnectionDevice.{i}.-WANIPConnection.{i}.-X_WIMAXFORUM_ MobileIP.SharedSecret.	object	-	This object defines an instance the shared secret used for securing the MIPv4 signaling [RFC3344].	-	MIPv4/Shared Secrets/
SharedKey	string (256)	W	This parameter defines the shared secret key between the Mobile Device (CPE) and the Authorization, Authentication and Accounting (AAA) or Radius Server [RFC3012]	-	MIPv4/Shared Secret/AAAKey
NAINumberOfEntries	unsigned Int	-	This parameter defines the number of provisioned Network Access Identifier instances.	-	MIPv4/Shared Secret/NAI/<X>
InternetGatewayDevice.-WANDevice.{i}.WAN-ConnectionDevice.{i}.-WANIPConnection.{i}.-X_WIMAXFORUM_ MobileIP.SharedSecret. NAI.{i}.	object	W	This object defines an instance of Network Access Identifiers (NAI) [RFC4282] to be used in MIP registration	-	MIPv4/Shared Secret/NAI/<X>

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
Username	string (253)	W	This parameter defines the user name portion of Network Access Identifier (NAI), encoded in UTF-8 string, refer to [RFC4282]. The NAI is of the form user@realm [RFC2794].	-	MIPv4/Shared Secret/NAI/<X>/ Username
Realm	string (256)	W	This parameter defines the realm portion of Network Access Identifier (NAI), encoded in UTF-8 string, refer to [RFC4282]. The NAI is of the form user@realm [RFC2794].	-	MIPv4/Shared Secret/NAI/<X>/ Realm
UsePseudo	boolean	W	This parameter defines if the user portion is pseudo generated. When the value is TRUE, the pseudo user portion MUST be used. When the value is FALSE the user portion provided in Username MUST be used. How the user portion is generated is technology specific and hence is not specified in this document	FALSE	MIPv4/Shared Secret/NAI/<X>/ UsePseudo
InternetGatewayDevice.-UserInterface.	object	-		-	
InternetGatewayDevice.UserInterface.X_WIMAXFORUM_CurrentLanguage	string (16)	W	This parameter specifies the current language setting of the IGD. The syntax of the language tags and their use are defined in [RFC1766]. Language codes are defined by ISO in the standard ISO 639. The default value is: “en’’	-	DevInfo/Lang

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
InternetGatewayDevice.-X_WIMAXFORUM_DeviceInfo.	object	-	This object defines the objects and parameters specific to the WiMAX Forum's Host Device and Terminal Equipment implementation. As an IGD, the Terminal Equipment object is always present. The Host Device object is present when WiMAX radio interfaces are not embedded within the IGD. The WiMAX radio interfaces are embedded within the Host Device and the Host Device is embedded within the IGD.	-	
InternetGatewayDevice.-X_WIMAXFORUM_DeviceInfo.TerminalEquipment.	object	-	This object defines the parameters associated with the Terminal equipment attributes of the IGD. Several parameters within this object relate to parameters contained within the IGD's DevInfo object. However, since the WiMAX Forum has specified different formats, the parameters are defined within the TerminalEquipment object to reflect the WiMAX Forum specific formats and domain values.	-	WiMAX/Terminal Equipment

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
DeviceIdentifier	string(50)	-	This parameter defines the device identifier of the Terminal Equipment. The value of this parameter MUST be unique and formatted as a URN as defined in [RFC2141]. The value MUST be the concatenation of the terminal equipment manufacturer, equipment model number and serial number. The elements are separated by a ":". For example: "urn: CPEMakerX:Model3:12345678" If the serial number is not defined, a globally unique hexadecimal value MUST be used instead of the formatted elements. For example: "urn:abcdef0123456789" The parameter is related to the device identifier defined within the TR-069 protocol.	-	WiMAX/Terminal Equipment/DevID
DeviceType	string(50)	-	This parameter defines the type of device. Enumeration of: "Laptop" "PMP" "MultiModePMP" "UMPC" "InternetTablet" "GamingDev" "Digital Camera" "Digital Camcorder" "MultiModeMsgDev" "EBook" "NavigationDev" "InVehicleEntDev" "CPE"	-	WiMAX/Terminal Equipment/ DevType

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
Manufacturer	string(50)	-	This parameter defines the manufacturer of the terminal equipment. This parameter is related to the DevicInfo/Manufacturer parameter.	-	WiMAX/Terminal Equipment/Man
Model	string(50)	-	This parameter defines the model of the terminal equipment. This parameter is related to the DeviceInfo/ModelName parameter.	-	WiMAX/Terminal Equipment/Mod
FirmwareVersion	string(50)	-	This parameter defines the firmware version of the terminal equipment. If the firmware version is not available, then this parameter MUST have the value: “none” This parameter is related to the DeviceInfo/SoftwareVersion parameter.	-	WiMAX/Terminal Equipment/FwV
HardwareVersion	string (250)	-	This parameter defines the hardware version of the terminal equipment. This parameter is related to the DeviceInfo/HardwareVersion parameter.	-	WiMAX/Terminal Equipment/HwV

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
OSName	string(50)	-	This parameter defines the operating system name of the terminal equipment. The OSName MUST be a concatenation of the current operating system name, the operating system version and the operating system architecture of the terminal equipment. The elements are concatenated with a ":". The operating system version element is not available, then this parameter MUST have the value: "none" For example: "Windows:XP:X86"	-	WiMAX/Terminal Equipment/SwV
InternetGatewayDevice.-X_WIMAXFORUM_ DeviceInfo.HostDevice.	object	-	This object defines the parameters associated with the Host Device of the IGD. The Host Device is present when the WiMAX radio interfaces are not embedded within the IGD but are contained within the Host device The Host device is embedded within the IGD.	-	/DevInfo /DevDetail

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
DeviceIdentifier	string(50)	-	This parameter defines the globally unique indentifer (GUID) of the Host Device. The value MAY use a MACAddress as the identifier. However if a MACAddress is used, the MACAddress MUST be formatted as follows: <DeviceIdentifier> ::= < mac> ":" <mac_address> <mac> ::= %d77.65.67 <mac_address> ::= 12 * 12 <hex> <hex> ::= <numbers> | "A" | "B" | "C" | "D" | "E" | "F" | "a" | "b" | "c" | "d" | "e" | "f" <numbers> ::= "0" | "1" | "2" | "3" | "4" | "5" | "6" | "7" | "8" | "9" Examples of valid MAC Addresses used as the Device identifier: "MAC:112233445566" "MAC:a12233445566" "MAC:A12233445566"	-	DevInfo/DevId

Name[1]	Type	Write[2]	Description	Object Default[3]	Corresponding WiMAX OMA-DM MO
DeviceType	string(50)	-	This parameter defines the type of host device. Enumeration of: "SingleModePCCard" " MultiModePCCard" "SingleModeExpressPCCard" "MultiModeExpressPCCard" "SingleModeUSBCard" "MultiModeUSBCard" "BasicModem" "SOHOModem" "PMP" "MultiModePMP" "UMPC" "Laptop" "InternetTablet" "SingleModeHandset" "MultiModeHandset" "PDA" "GamingDev" "VideoPhone" "M2M" "Digital Camera" "Digital Camcorder" "WearableDev" "MultiModeMsgDev" "EBook" "NavigationDev" "InVehicleEntDev" "HomeMediaGW" "MusicPlayer"	-	DevDetail/DevType
OEM	string	-	This parameter defines the OEM manufacturer of the host device.	-	DevDetail/OEM
FirmwareVersion	string	-	This parameter defines the firmware version of the host device.	-	DevDetail/FwV
HardwareVersion	string	-	This parameter defines the hardware version of the host device.	-	DevDetail/HwV

ANNEX B. WiMAX Forum Profile Support Cross Reference

B1 WiMAX Forum WiMAXBaseline Profile

Table 6 defines the X_WIMAXFORUM_WiMAXBaseline:1 profile for the InternetGatewayDevice:1 object. The minimum required version for this profile is InternetGatewayDevice: 1.2.

Table 6: X_WIMAXFORUM_WiMAXBaseline:1 profile definition for InternetGatewayDevice:1

Name	Requirement
InternetGatewayDevice.	P
X_WIMAXFORUM_OperatorProfileNumberOfEntries	R
InternetGatewayDevice.UserInterface.	P
X_WIMAXFORUM_CurrentLanguage	W
InternetGatewayDevice.DeviceInfo.	P
VendorConfigFileNumberOfEntries	R
InternetGatewayDevice.DeviceInfo.VendorConfigFile.{i}.	P
Name	R
InternetGatewayDevice. X_WIMAXFORUM_DeviceInfo.	P
InternetGatewayDevice. X_WIMAXFORUM_DeviceInfo.TerminalEquipment.	P
DeviceIdentifier	R
DeviceType	R
Manufacturer	R
Model	R
FirmwareVersion	R
HardwareVersion	R
OSName	R
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.	P
ContactNumberOfEntries	R
InternetGatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.	P
OperatorName	W
HomeNetworkServiceProviderNumberOfEntries	R
ChannelPlanNumberOfEntries	R
InternetGatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.NetworkParameters.WiMAXHomeNetwork ServiceProvider.{i}.	P
HNSPIdentifier	W

Name	Requirement
InternetGatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.RAPL.	P
NetworkSelectionPolicy	W
RAPNumberOfEntries	R
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.RAPL.RAP.{i}.	P
VNSPIdentifier	W
NetworkSelectionPriority	W
InternetGateway-Device.{i}.X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.CAPL.	P
NetworkSelectionPolicy	W
CAPNumberOfEntries	R
InternetGatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.CAPL.CAP.{i}.	P
NAPIdentifier	W
NetworkSelectionPriority	W
InternetGatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.DefaultChannelPlan.	P
Bandwidth	W
FFTSize	W
DuplexMode	W
InternetGateway-Device.X_WIMAXFORUM_OperatorProfile.{i}.WiMAXNetworkParameters.ChannelPlan.{i}.	P
ChannelPlanIdentifier	W
Bandwidth	W
FFTSize	W
DuplexMode	W
FirstFrequency	W
LastFrequency	W
NextFrequencyStep	W

Name	Requirement
InternetGatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.SubscriptionParameters.	P
OtherSubscriptionsNumberOfEntries	R
InternetGatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.SubscriptionParameters.Primary.	P
Activated	W
Name	W
InternetGatewayDevice.-WANDevice.{i}.X_WIMAXFORUM_WiMAXInterfaceConfig.	P
InternetGatewayDevice.-WANDevice.{i}.X_WIMAXFORUM_WiMAXInterfaceConfig.RadioModule.	P
Manufacturer	R
MACAddress	R
HardwareVersion	R
FirmwareVersion	R
Model	R
InternetGatewayDevice.WANDevice.{i}.-X_WIMAXFORUM_WiMAXInterfaceConfig.ActiveOperator.	P
OperatorProfileIdentifier	R
CurrentOperatorName	R
ChannelPlanIdentifier	R
Frequency	R
NAPIdentifier	R
HNSPIdentifier	R
VNSPIdentifier	R
InternetGatewayDevice.-WANDevice.{i}.X_WIMAXFORUM_WiMAXInterfaceConfig.Layer3Capability.	P
IPv4Support	R
IPv6Support	R
CMIPv4Support	R
CMIPv6Support	R
InternetGatewayDevice. WANDevice.{i}.-WANConnectionDevice.{i}.X_WIMAXFORUM_WiMAXLinkConfig.	P
SubscriptionParametersIdentifier	W

B2 WiMAX Forum Mobile IP Profile

Table 6 defines the X_WIMAXFORUM_MobileIP:1 profile for the InternetGatewayDevice:1 object. The minimum required version for this profile is InternetGatewayDevice: 1.2.

Table 7: X_WIMAXFORUM_MobileIP:1 profile definition for InternetGatewayDevice:1

Name	Requirement
InternetGatewayDevice.WANDevice.{i}.WANConnectionDevice.-{i}.WANIPConnection.{i}.X_WIMAXFORUM_MobileIP.	P[5]
ProtocolMode	W
ReverseTunnelEnable	W
RegistrationPeriod	W
RelativeReregistrationPeriod	W
RetryTimer	W
RetryCount	W
InternetGatewayDevice.WANDevice.{i}.WANConnectionDevice.-{i}.WANIPConnection.{i}.-X_WIMAXFORUM_MobileIP.UserProfile.	P
HomeAddress	W
HomeAgentNumberOfEntries	R
InternetGatewayDevice.WANDevice.{i}.WANConnectionDevice.-{i}.WANIPConnection.{i}.-X_WIMAXFORUM_MobileIP.UserProfile.HomeAgent.{i}.	P
SharedKey	W
HomeAgentAddress	W
HomeAgentPrefixLen	W
HomeAgentSPI	W
AAASPI	W
InternetGatewayDevice.WANDevice.{i}.WANConnectionDevice.-{i}.WANIPConnection.{i}.-X_WIMAXFORUM_MobileIP.SharedSecret.	P
SharedKey	W
NAINumberOfEntries	R
InternetGatewayDevice.WANDevice.{i}.WANConnectionDevice.-{i}.WANIPConnection.{i}.-X_WIMAXFORUM_MobileIP.SharedSecret.NAI.{i}.	P
Username	W
Realm	W
UsePseudo	W

[5] The X_WIMAXFORUM_MobileIP node MUST be present if the Layer3NetworkCapabilities indicates MobileIP is a supported protocol.

B3 WiMAX Forum ConnDevEAP Profile

Table 8 defines the X_WIMAXFORUM_ConnDevEAP:1 profile for the InternetGatewayDevice:1 object. The minimum required version for this profile is InternetGatewayDevice: 1.2.

Table 8: X_WIMAXFORUM_ConnDevEAP:1 profile definition for InternetGatewayDevice:1

Name	Requirement
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.	P
RootCANumberOfEntries	R
InternetGatewayDevice.X_WIMAXFORUM_OperatorProfile.{i}.RootCA.{i}.	P
VendorConfigurationIdentifier	R
InternetGateway-Device.X_WIMAXFORUM_OperatorProfile{i}.SubscriptionParameters.	P
EAPProfileNumberOfEntries	R
InternetGatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.SubscriptionParameters.Primary.	P
EAPProfiles	W
InternetGatewayDevice.-X_WIMAXFORUM_OperatorProfile.{i}.SubscriptionParameters.EAPProfile.{i}.	P
Type	W
Identity	W
SharedSecret	W
Realm	W
EncapsulationProtocol	W
PseudonymIdentity	W
IdentityPrivacyEnable	W
CertificateNumberOfEntries	R
InternetGateway-Device.X_WIMAXFORUM_OperatorProfile.{i}.SubscriptionParameters.EAPProfile.{i}.Certificate.{i}.	P
Type	W
CertificateIdentifier	W

B4 Unused WiMAX Forum OMA-DM OTA Elements

Elements that are in the WiMAX OTA OMA-DM Provisioning Model that are not needed in the TR-069 model.

DevInfo/Ext, DmV, Bearer, DmV - OMA-DM protocol specific objects

DMAcc/<X>/ServerId – OMA Server; Management URL is used for TR-069

DevDetail/URI, LrgObj – OMA-DM protocol specific objects

WiMAX/TerminalEquipment/Bearer – This definition is modeled as the associated LANDevices.

WiMAXDevDetail/WiMAXRadioModule/<X>/SpLock – The definition of the service provide lock is to allow data under the WIMAXSupp/Operator node to be manipulated by that service provider. Also the client may only establish a session with the server in the SpLock/serverId. In TR-069 access control is handled through access lists and TR69 client sessions may only ever be established with a specified management server.

WiMAXDevDetail/WiMAXRadioModule/<X>/TO-FUMO-REF – The TR-069 protocol implements firmware updates in a protocol specific manner. This is an OMA-DM protocol specific object.

WiMAX/DevCap/UAProfURL,UpdateMethods, ServerInitiated, ClientInitiated, PollingSupported, PollingInterval – OMA-DM protocol specific nodes.

WiMAXSupp/Operator/<X>/NetworkParameters/PollingInterval - OMA-DM protocol specific attributes.

EAP Node – The elements defined in Annex D have been incorporated in the EAP Profile model. This is a subset of the elements in [DMEAPMO].

EAP/<X>/VENDOR-TYPE and VENDOR-ID are not used for MS CHAPv2 as the values are static as defined in ANNEX B of [OTAOMADM].

NAP MO – This object is specific to the OMA-DM protocol. The information is contained within the associated subscription parameters.