



Standardized Connectivity Management Objects 3GPP Packet Switched Bearer Parameters

For use with OMA Device Management

Approved Version 1.0 – 24 Oct 2008

Open Mobile Alliance
OMA-DDS-DM_ConnMO_3GPPPS-V1_0-20081024-A

Use of this document is subject to all of the terms and conditions of the Use Agreement located at <http://www.openmobilealliance.org/UseAgreement.html>.

Unless this document is clearly designated as an approved specification, this document is a work in process, is not an approved Open Mobile Alliance™ specification, and is subject to revision or removal without notice.

You may use this document or any part of the document for internal or educational purposes only, provided you do not modify, edit or take out of context the information in this document in any manner. Information contained in this document may be used, at your sole risk, for any purposes. You may not use this document in any other manner without the prior written permission of the Open Mobile Alliance. The Open Mobile Alliance authorizes you to copy this document, provided that you retain all copyright and other proprietary notices contained in the original materials on any copies of the materials and that you comply strictly with these terms. This copyright permission does not constitute an endorsement of the products or services. The Open Mobile Alliance assumes no responsibility for errors or omissions in this document.

Each Open Mobile Alliance member has agreed to use reasonable endeavors to inform the Open Mobile Alliance in a timely manner of Essential IPR as it becomes aware that the Essential IPR is related to the prepared or published specification. However, the members do not have an obligation to conduct IPR searches. The declared Essential IPR is publicly available to members and non-members of the Open Mobile Alliance and may be found on the “OMA IPR Declarations” list at <http://www.openmobilealliance.org/ipr.html>. The Open Mobile Alliance has not conducted an independent IPR review of this document and the information contained herein, and makes no representations or warranties regarding third party IPR, including without limitation patents, copyrights or trade secret rights. This document may contain inventions for which you must obtain licenses from third parties before making, using or selling the inventions. Defined terms above are set forth in the schedule to the Open Mobile Alliance Application Form.

NO REPRESENTATIONS OR WARRANTIES (WHETHER EXPRESS OR IMPLIED) ARE MADE BY THE OPEN MOBILE ALLIANCE OR ANY OPEN MOBILE ALLIANCE MEMBER OR ITS AFFILIATES REGARDING ANY OF THE IPR'S REPRESENTED ON THE “OMA IPR DECLARATIONS” LIST, INCLUDING, BUT NOT LIMITED TO THE ACCURACY, COMPLETENESS, VALIDITY OR RELEVANCE OF THE INFORMATION OR WHETHER OR NOT SUCH RIGHTS ARE ESSENTIAL OR NON-ESSENTIAL.

THE OPEN MOBILE ALLIANCE IS NOT LIABLE FOR AND HEREBY DISCLAIMS ANY DIRECT, INDIRECT, PUNITIVE, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE OF DOCUMENTS AND THE INFORMATION CONTAINED IN THE DOCUMENTS.

© 2008 Open Mobile Alliance Ltd. All Rights Reserved.

Used with the permission of the Open Mobile Alliance Ltd. under the terms set forth above.

Contents

1. SCOPE.....	4
1.1 CONNECTIVITY OBJECT – 3GPP PACKET SWITCHED BEARER	4
2. REFERENCES	5
2.1 NORMATIVE REFERENCES.....	5
2.2 NORMATIVE AUTHORITIES OF REFERENCES.....	5
2.3 INFORMATIVE REFERENCES.....	5
3. TERMINOLOGY AND CONVENTIONS.....	6
3.1 CONVENTIONS.....	6
3.2 DEFINITIONS.....	6
3.3 ABBREVIATIONS.....	6
4. INTRODUCTION	7
5. JUSTIFICATION	8
5.1 STANDARDIZED CONNECTIVITY MANAGEMENT	8
5.2 APPLICATION-NEUTRAL.....	8
5.3 BEARER-NEUTRAL.....	8
6. 3GPP PACKET SWITCHED BEARER SPECIFIC MANAGEMENT OBJECT	9
6.1 INTRODUCTION.....	9
6.2 DEFINITIONS RELATED TO NAP MO.....	9
6.3 GRAPHICAL REPRESENTATION (INFORMATIVE)	10
6.4 NODE DESCRIPTIONS.....	11
7. OPERATIONAL CONSIDERATIONS	16
APPENDIX A. CHANGE HISTORY (INFORMATIVE).....	17
A.1 APPROVED VERSION HISTORY	17

Figures

Figure 1. 3GPP Packet Switched bearer specific Management Object.....	10
---	----

Tables

Table 2: NAP Authentication Protocol Types	9
Table 1: 3GPP Packet Data PDP Types.....	11

1. Scope

1.1 Connectivity Object – 3GPP Packet Switched Bearer

This document defines a 3GPP Packet Switched (e.g. WCDMA) bearer specific parameters used together with the standardized connectivity management object [CONNMO] in order to have a complete standardized Network Access Point definition for 3GPP Packet Switched connectivity settings in the OMA DM management tree.

While this 3GPP Packet Switched object is optional for any OMA DM implementation, their widespread use will simplify the management of 3GPP Packet Switched connectivity parameters in devices.

The object is defined using the OMA DM Device Description Framework [DMTND]. The object has standardized points of extension to permit implementation-specific parameters to accompany the standardized parameters. This added flexibility is intended to encourage the use of the standardized object while not unnecessarily restricting individual vendor innovations.

2. References

2.1 Normative References

- [CONNMO] *Standardized Connectivity Management Objects, Version 1.0*, Open Mobile Alliance™, OMA-DDS-DM_ConnMO_V1_0-D, URL:<http://www.openmobilealliance.org>
- [DMTND] *Device Management Tree and Description, Version 1.2*, Open Mobile Alliance™, OMA-TS-DM-DMTND-V1_2, URL:<http://www.openmobilealliance.org>
- [RFC2119] “Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, March 1997, URL:<http://www.ietf.org/rfc/rfc2119.txt>

2.2 Normative Authorities of References

Various parameters specified in the management objects defined in this document rely on an authority outside the scope of this specification to supply the set of acceptable values and value formats. In such references to external authority, only the directly cited material is referenced, not the entire external specification. The following authorities of reference are cited in this document:

- [3GPP23.107-Attributes] 3GPP TS 23.107 Quality of Service (QoS) concept and architecture, chapter 6.4 QoS Attributes, URL:<http://www.3gpp.org/>
- [3GPP23.107-Ranges] 3GPP TS 23.107 Quality of Service (QoS) concept and architecture, chapter 6.5 Attribute Value Ranges, URL:<http://www.3gpp.org/>
- [3GPP24.008-PDP] *3GPP TS 24.008 Mobile radio interface Layer 3 specification, chapter 10.5.6.4 Packet data protocol address*, URL:<http://www.3gpp.org/>
- [3GPP24.008-QoS] *3GPP TS 24.008 Mobile radio interface Layer 3 specification, chapter 10.5.6.5 Quality of service*, URL:<http://www.3gpp.org/>
- [AUTH-APN] *3GPP TS 23.003, Numbering, addressing and identification, chapter 9*, URL:<http://www.3gpp.org/>
- [AUTH-PS] *3GPP 27.060, Mobile Station (MS) Supporting Packet Switched Services, chapter 9*, URL:<http://www.3gpp.org/>
- [RFC1321] *RFC1321, The MD5 Message-Digest Algorithm*, R. Rivest 1992, URL; <http://www.ietf.org/rfc/rfc1321.txt>

2.3 Informative References

None

3. Terminology and Conventions

3.1 Conventions

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].

All sections and appendixes, except “Scope” and “Introduction”, are normative, unless they are explicitly indicated to be informative.

3.2 Definitions

See the DM Tree and Description [DMTND] document for definitions of terms related to the management tree.

3.3 Abbreviations

NAP	Network Access Point
OMA	Open Mobile Alliance
QoS	Quality of Service
UE	User Equipment

4. Introduction

Usually over time network protocols grow and are replaced as the market cycle plays out. Connectivity Management Object [CONNMO] is structured in such a way as to be resilient to the addition of new bearer and proxy types without requiring wholesale replacement of the object definitions. In this way, the common structure survives into future versions of the management objects thus easing the burden of transition from old bearer types to new.

This document specifies 3GPP Packet Switched bearer specific part of the general Network Access Point management object and it also allows for vendor specific extensions.

5. Justification

This Reference Release includes several Management Object definitions for use, in conjunction with the OMA Device Management Enabler, to manage data network connectivity settings for mobile terminals over common bearer and proxy types.

5.1 Standardized Connectivity Management

Providing a standardized set of management objects for configuration of data network connectivity through the OMA Device Management system will improve the usability and customer experience of mobile terminals that rely upon data services. As proposed, the management object definitions may be used in conjunction with OMA Device Management Candidate and Approved Enabler Releases over a variety of transports including: HTTP, HTTPS, OBEX over IrDA, OBEX over Bluetooth, and various forms of Smart Card.

5.2 Application-Neutral

Producing these management object definitions in an application-neutral fashion, we avoid reinvention of solutions to the same set of problems for each of new application that requires data connectivity. This reduces the connectivity parameters that an application must define to a simple reference node, ConRef (Connectivity Reference).

5.3 Bearer-Neutral

By presenting the specifications in two parts, a bearer-neutral part and bearer-specific bindings, we reinforce the OMA principle of network neutrality while providing specificity where needed but without bias for or against any particular network type.

6. 3GPP Packet Switched Bearer Specific Management Object

6.1 Introduction

A general introduction of the connectivity management object is given in the connectivity management object document [CONNMO] as well as the needed compliance rules. This document specifies the CDMA bearer specific NAP Object.

6.2 Definitions related to NAP MO

The 3GPPS subtree specified in this document MUST be placed under the BearerParams node in [CONNMO].

BearerType

The *BearerType* node value specified in [CONNMO] MUST be “3GPPS”.

AddrType

AddrType in the NAP MO specified in [ConnMO], if it exists, MUST have the value ‘APN’. The Addr value specified in the NAP MO in [ConnMO] MUST be an Access Point Name [AUTH-APN] in dotted alphanumeric notation.

AuthType

The AuthType value in the NAP MO specified in [ConnMO] MUST be from the table below:

AuthType	Description
PAP	Password Authentication Protocol [AUTH-PS]
CHAP	Challenge Handshake Authentication Protocol [AUTH-PS]
MD5	MD5 Message Digest Authentication Protocol [RFC1321]

Table 1: NAP Authentication Protocol Types

6.3 Graphical Representation (Informative)

The following figure provides the structure of 3GPP Packet Switched bearer specific management object.

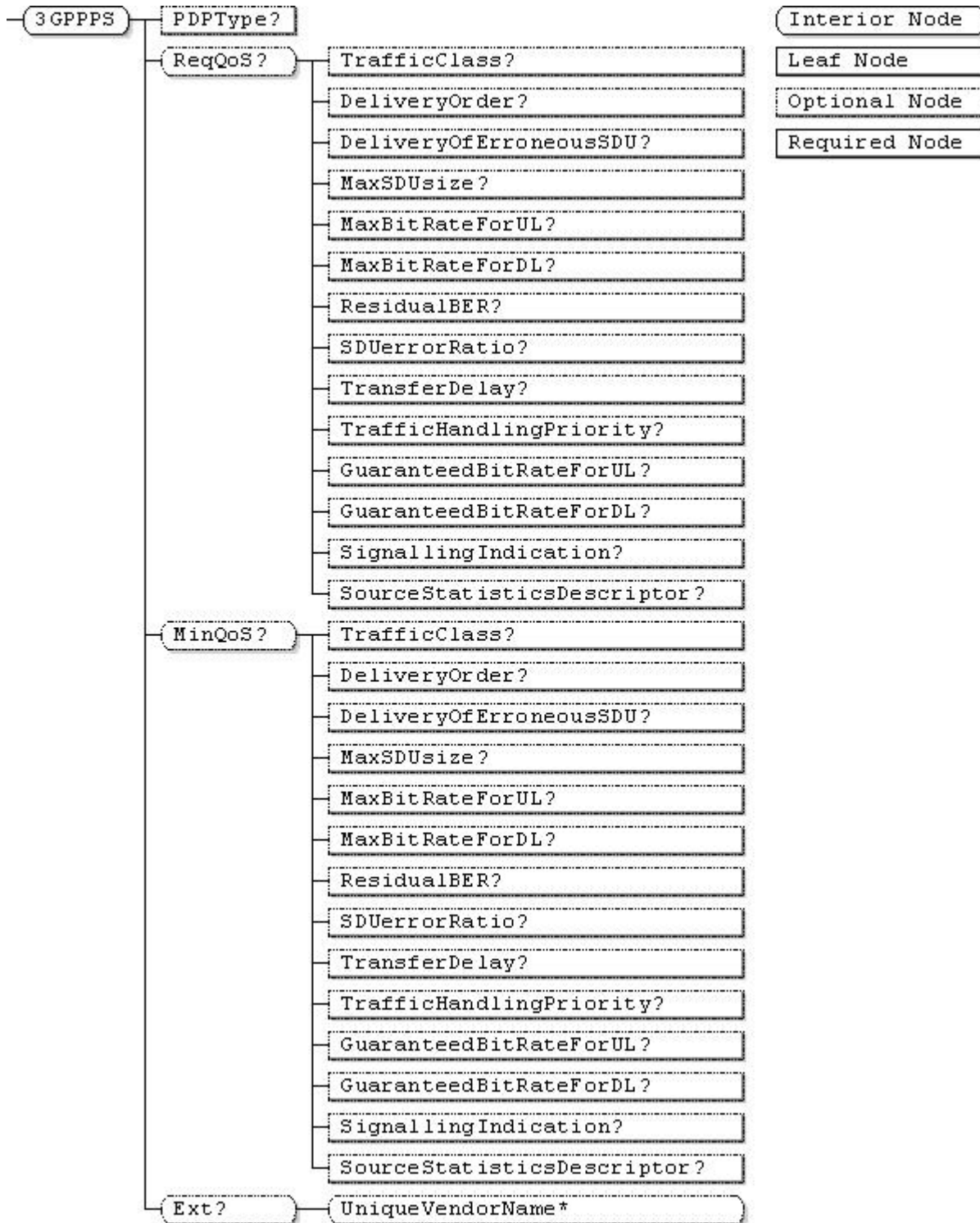


Figure 1. 3GPP Packet Switched bearer specific Management Object

6.4 Node descriptions

.../BearerParams/3GPPPS

Status	Occurrence	Format	Min. Access Types
Required	One	node	Get

This interior node specifies the 3GPP Packet Switched bearer specific management object for a *network access point*, or NAP, management object. Management Object Identifier for the 3GPP PS MO MUST be: “urn:oma:mo:oma-connmo-3gppps:1.0”.

PDPTType

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	chr	Get

This leaf node specifies the 3GPP Packet Data PDP Type. See definitions in [3GPP24.008-PDP]. Possible PDP types are defined in the following table.

PDPTType	Description
IPv4	IPv4 in use.
IPv6	IPv6 in use.
PPP	PPP in use.

Table 2: 3GPP Packet Data PDP Types

ReqQoS

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	node	Get

This interior node’s leaf nodes specify the requested QoS parameters. Rules and usage of these leaf nodes parameters are defined in [3GPP24.008-QoS].

MinQoS

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	node	Get

This interior node’s leaf nodes specify the minimum QoS parameters. Rules and usage of these leaf nodes parameters are defined in [3GPP24.008-QoS]. With this node it is possible to configure the minimum acceptable QoS for this connection in the UE.

ReqQoS/TrafficClass**MinQoS/TrafficClass**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the 3GPP parameter: “Traffic Class”. See definition in [3GPP24.008-QoS]. The bit pattern shall be encoded as in [3GPP24.008-QoS] with the least significant bit in the rightmost position of the integer. Example: If the parameter is encoded into bit 6, 7 & 8 in [3GPP24.008-QoS] then it must be encoded into bit 1, 2 & 3 in this node.

ReqQoS/DeliveryOrder**MinQoS/DeliveryOrder**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the 3GPP parameter: “Delivery order”. See definition in [3GPP24.008-QoS]. The bit pattern shall be encoded as in [3GPP24.008-QoS] with the least significant bit in the rightmost position of the integer. Example: If the parameter is encoded into bit 6, 7 & 8 in [3GPP24.008-QoS] then it must be encoded into bit 1, 2 & 3 in this node.

ReqQoS/DeliveryOfErroneousSDU**MinQoS/DeliveryOfErroneousSDU**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the 3GPP parameter: “Delivery of erroneous SDU”. See definition in [3GPP24.008-QoS].

ReqQoS/MaxSDUsize**MinQoS/MaxSDUsize**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the 3GPP parameter: “Maximum SDU size”. See definition in [3GPP24.008-QoS].

ReqQoS/MaxBitRateForUL**MinQoS/MaxBitRateForUL**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the combined value of the 3GPP parameters: “Maximum bit rate for uplink” and “Maximum bit rate for uplink (extended)”. See [3GPP24.008-QoS] for definitions and allowed values. The value shall be encoded as an unsigned integer and represents the bit rate in kbit/sec. The value range is defined in [3GPP23.107-Ranges] and the purpose is defined in [3GPP23.107-Attributes].

ReqQoS/MaxBitRateForDL**MinQoS/MaxBitRateForDL**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the combined value of the 3GPP parameters: “Maximum bit rate for downlink” and “Maximum bit rate for downlink (extended)”. See [3GPP24.008-QoS] for definitions and allowed values. The value shall be encoded as an unsigned integer and represents the bit rate in kbit/sec. The value range is defined in [3GPP23.107-Ranges] and the purpose is defined in [3GPP23.107-Attributes].

ReqQoS/ResidualBER**MinQoS/ResidualBER**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the 3GPP parameter: “Residual BER”. See definition in [3GPP24.008-QoS]. The bit pattern shall be encoded as in [3GPP24.008-QoS] with the least significant bit in the rightmost position of the integer. Example: If the parameter is encoded into bit 6, 7 & 8 in [3GPP24.008-QoS] then it must be encoded into bit 1, 2 & 3 in this node.

ReqQoS/SDUerrorRatio**MinQoS/SDUerrorRatio**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the 3GPP parameter: “SDU error ratio”. See definition in [3GPP24.008-QoS].

ReqQoS/TransferDelay**MinQoS/TransferDelay**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the 3GPP parameter: “Transfer delay”. See definition in [3GPP24.008-QoS]. The bit pattern shall be encoded as in [3GPP24.008-QoS] with the least significant bit in the rightmost position of the integer. Example: If the parameter is encoded into bit 6, 7 & 8 in [3GPP24.008-QoS] then it must be encoded into bit 1, 2 & 3 in this node.

ReqQoS/TrafficHandlingPriority**MinQoS/TrafficHandlingPriority**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the 3GPP parameter: “Traffic Handling priority”. See definition in [3GPP24.008-QoS].

ReqQoS/GuaranteedBitRateForUL**MinQoS/GuaranteedBitRateForUL**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the combined value of the 3GPP parameters: “Guaranteed bit rate for uplink” and “Guaranteed bit rate for uplink (extended)”. See [3GPP24.008-QoS] for definitions and allowed values. The value shall be encoded as an unsigned integer and represents the bit rate in kbit/sec. The value range is defined in [3GPP23.107-Ranges] and the purpose is defined in [3GPP23.107-Attributes].

ReqQoS/GuaranteedBitRateForDL**MinQoS/GuaranteedBitRateForDL**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the combined value of the 3GPP parameters: “Guaranteed bit rate for downlink” and “Guaranteed bit rate for downlink (extended)”. See [3GPP24.008-QoS] for definition and allowed values. The value shall be encoded as an unsigned integer and represents the bit rate in kbit/sec. The value range is defined in [3GPP23.107-Ranges] and the purpose is defined in [3GPP23.107-Attributes].

ReqQoS/SignallingIndication**MinQoS/SignallingIndication**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the 3GPP parameter: “Signalling Indication”. See definition in [3GPP24.008-QoS]. The bit pattern shall be encoded as in [3GPP24.008-QoS] with the least significant bit in the rightmost position of the integer. Example: If the parameter is encoded into bit 6, 7 & 8 in [3GPP24.008-QoS] then it must be encoded into bit 1, 2 & 3 in this node.

ReqQoS/SourceStatisticsDescriptor**MinQoS/SourceStatisticsDescriptor**

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	int	Get

This node is used for the 3GPP parameter: “Source Statistics Descriptor”. See definition in [3GPP24.008-QoS].

Ext

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrOne	node	Get

This optional interior node designates the single top-level branch of the NAP DM management object tree into which vendor extensions MAY be supported, permanently or dynamically. Ext sub trees, such as this one, are included at various places in the DM connectivity management objects to provide flexible points of extension for implementation-specific parameters. However, vendor extensions MUST NOT be defined outside of the Ext subtrees.

Ext/UniqueVendorName

Status	Occurrence	Format	Min. Access Types
Optional	ZeroOrMore	node	Get

This interior node is supplied by a vendor to distinguish their extension from those of other vendors. The *UniqueVendorName* SHOULD be a trademark or company name controlled by each vendor to ensure uniqueness. The structure of any subtree below a *UniqueVendorName* interior node is implementation-specific.

7. Operational Considerations

ConnMO is normatively dependent on the DM 1.2 specifications. However, this normative dependency should not be seen as restricting these MO definitions only to DM clients implementing that version of the DM enabler.

For example, a management authority may exchange ConnMO data-files using means not specifically defined in the DM 1.2 enabler.

Appendix A. Change History

(Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-DDS-DM_ConnMO_3GPPS-V1_0-20081024-A	24 Oct 2008	Approved by OMA Technical Plenary: Ref TP#: OMA-TP-2008-0405- INP_ConnMO_V1_0_RRP_for_Notification_and_Final_Approval