



RESTful Network API for Quality of Service Requirements

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Open Mobile Alliance
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1. Scope

(Informative)

This document defines the requirements for OMA RESTful Network API for Quality of Service.

2. References

2.1 Normative References

- [**Autho4API_10**] “Authorization Framework for Network APIs”, Open Mobile Alliance™, OMA-ER-Autho4API-V1_0, [URL: http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)
- [**JSON**] JavaScript Programming Language, Standard ECMA-262 3rd Edition - December 1999.
- [**RFC2119**] “Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, March 1997, [URL:http://www.ietf.org/rfc/rfc2119.txt](http://www.ietf.org/rfc/rfc2119.txt)

2.2 Informative References

- [**3GPP TS 29.199-17**] “Open Service Access (OSA); Parlay X Web Services, Part 17: Application-driven Quality of Service (QoS)”, TS 29.199-17, Release 9, [URL: http://www.3gpp.org/ftp/Specs/html-info/29-series.htm](http://www.3gpp.org/ftp/Specs/html-info/29-series.htm)
- [**OMADICT**] “Dictionary for OMA Specifications”, Version 2.9, Open Mobile Alliance™, OMA-ORG-Dictionary-V2_9, [URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)

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

3.3 Abbreviations

API	Application Programming Interface
HTTP	HyperText Transfer Protocol
JSON	JavaScript Object Notation
MSISDN	Mobile Subscriber ISDN Number
OMA	Open Mobile Alliance
QoS	Quality of Service
REST	REpresentational State Transfer
SP	Service Provider
URL	Uniform Resource Locator
XML	eXtensible Markup Language

4. Introduction (Informative)

This API provides methods that enable an application to govern the quality of service (QoS) applied on end user connection on a temporary basis.

4.1 Version 1.0

The OMA_RD_REST_NetAPI_QoS_V1.0 captures the functional requirements scoping the set of APIs exposing selected QoS parameters for an application

5. RESTful Network API for Quality of Service release description (Informative)

5.1 End-to-end Service Description

The REST_NetAPI_QoS V1.0 addresses an important field of open service creation by allowing access to QoS parameters, thus enabling service creation via advanced applications in order to decrease significantly the Time-to-Market for new services.

6. Requirements (Normative)

6.1 High-Level Functional Requirements

Label	Description	Release
HLF-001	The Network API for QoS SHALL be HTTP/REST based.	REST_NetAPI_QoS V1.0
HLF-002	Resource URLs and primitives names SHALL have an intuitive relationship with the functions and resources they are intended to represent.	REST_NetAPI_QoS V1.0
HLF-003	The RESTful Network API for QoS SHALL allow the inclusion of API version in the resource URLs.	REST_NetAPI_QoS V1.0
HLF-004	The RESTful Network API for QoS SHALL expose a functional abstraction at the user level rather than at the level of underlying protocols.	REST_NetAPI_QoS V1.0
HLF-005	The RESTful Network API for QoS SHALL support "server"-based application clients and "device"-based application clients. Instantiation examples include applications running on a Web server (where the user interacts with the application via a web browser), or running on a mobile or fixed device as a "widget" or as a native application.	REST_NetAPI_QoS V1.0
HLF-006	In order to provide controlled access to QoS functionality, the RESTful Network API for QoS SHALL support appropriate authorization mechanisms and Service Provider policies.	REST_NetAPI_QoS V1.0
HLF-007	Subject to the underlying resource capabilities, the RESTful Network API for QoS SHOULD NOT expose the real identities of the user. In particular, mobile telephone numbers (MSISDNs) or other information identifying the user SHALL NOT be exposed without user's consent. Subject to service provider policies, only trusted applications will be authorized to know that information.	REST_NetAPI_QoS V1.0
HLF-008	The RESTful Network API for QoS SHALL enable an application to request changes to quality of service available on the end user's connection on a temporary basis (e.g. time duration, volume, etc)	REST_NetAPI_QoS V1.0
HLF-009	The RESTful Network API for QoS SHALL support the retrieval of the current QoS features of the user's connection..	REST_NetAPI_QoS V1.0
HLF-010	<p>The RESTful Network API for QoS SHALL support retrieval of all pre-defined QoS features and optionally other relevant information (e.g. associated costs) available for the user. It should be possible to filter this list based on a particular application type (e.g. video, voice, gaming interactive, etc).</p> <p>This is a static list of QoS features which does not depend upon network's condition.</p> <p>The pre-defined QoS features are defined by the server. Such pre-defined features have pre-determined QoS feature properties associated with them for particular service usage.</p>	REST_NetAPI_QoS V1.0
HLF-011	The RESTful Network API for QoS SHALL support notifications e.g. on session start, on mid session policy change, etc	REST_NetAPI_QoS V1.0
HLF-012	The RESTful Network API for QoS SHALL support identification of the party (user or content/service provider) who is to be charged for the user's QoS change/upgrade. This Id MUST be an optional parameter.	REST_NetAPI_QoS V1.0
HLF-013	The RESTful Network API for QoS SHALL support retrieval of pre-defined QoS features and optionally other relevant information (e.g. associated costs) currently available for a given user based upon underlying conditions (e.g. user's location, network condition, time of day, etc) as and if available by measurement or configuration.	REST_NetAPI_QoS V1.0

HLF-014	The RESTful Network API for QoS SHALL support QoS requests which may be based on either of the following: <ol style="list-style-type: none"> 1. Pre-defined QoS features 2. High level raw QoS settings such as min/max-uplink, min/max-downlink, priority, media type <p>The intention is to support different kind of application clients which may or may not be aware of QoS complexities. Support for QoS requests based on Raw QoS settings is at the discretion of the server's policy.</p>	REST_NetAPI_QoS V1.0
HLF-015	The RESTful Network API for QoS SHALL support QoS event notification for a previously unavailable pre-defined feature becoming available due to underlying conditions as noted in HLF-013.	REST_NetAPI_QoS V1.0
HLF-016	The RESTful Network API for QoS SHALL permit to cover different use cases. In particular both a third party usage, where the user may not be directly involved during the QoS API request, and an API requested as per direct user involvement.	REST_NetAPI_QoS V1.0

Table 1: High-Level Functional Requirements

6.1.1 Security

It is expected to be possible for a service provider to deploy developer security mechanisms and engagement/registration processes aimed to individual developers. Developer security mechanisms are out of the scope of this document.

6.1.1.1 Authentication

Application authentication and User authentication are out of scope.

6.1.1.2 Authorization

Label	Description	Release
OAU-001	The RESTful Network API for QoS SHOULD support application authorization based on [Autho4API_10].	REST_NetAPI_QoS V1.0
OAU-002	OAuth "scope" values matching the level of granularity of the retrievable information SHALL be supported.	REST_NetAPI_QoS V1.0
OAU-003	It SHOULD be possible to define per-service provider values of OAuth "scope" parameter to accommodate different granularity levels.	REST_QoS V1.0

Table 2: High-Level Functional Requirements – Authorization Items

6.1.1.3 Data Integrity

Data Integrity is out of scope.

6.1.1.4 Confidentiality

Confidentiality is out of scope.

6.1.2 Charging Events

Charging events are out of scope.

6.1.3 Administration and Configuration

Administration and configuration are out of scope.

6.1.4 Usability

Usability is out of scope.

6.1.5 Interoperability

Not applicable.

6.1.6 Privacy

Privacy is out of scope.

6.2 Overall System Requirements

Overall system requirements are out of scope.

6.3 Data Exchange Format Requirements

Label	Description	Release
DEF-001	OMA RESTful Network API for Quality of Service SHALL support JSON [JSON] as a resource response format.	REST_NetAPI_QoS V1.0
DEF-002	OMA RESTful Network API for Quality of Service SHOULD support XML as resource response format.	REST_NetAPI_QoS V1.0

Table 3: Data Exchange Format Requirements

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
n/a	n/a	No prior version

A.2 Draft/Candidate Version 1.0 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-RD-REST_NetAPI_QoS-V1_0	31 Jan 2013	All	First baseline
	25 Jun 2013	many	Incorporated: OMA-ARC-REST-QoS-2013-0006R03-CR_High_Level_Requirements
	23 Jul 2013	many	Incorporated: OMA-ARC-REST-QoS-2013-0009R01
	26 Sep 2013	many	Incorporated: OMA-ARC-REST-QoS-2013-0010R02 and OMA-ARC-REST-QoS-2013-0016R01
	03 Oct 2013	many	Incorporated: OMA-ARC-REST-QoS-2013-0017-CR_QoS_Support_of_different_usecase
	14 Apr 2014	6.1	Incorporated: OMA-ARC-REST-QoS-2014-0010-CR_withdraw_HLF_017_about_delayed_QoS Editorial changes to replace “QualityOfServices” with “Quality of Services” where applicable.
	03 Sep 2014	2, 4	Incorporated: OMA-ARC-REST-QoS-2014-0028-CR_RD_CONRR_issues_A001_A002_resolution
	26 Sep 2014	6.1	Incorporated: OMA-ARC-REST-QoS-2014-0041-CR_RD_CONRR_A003_resolution
Candidate Version OMA-RD-REST_NetAPI_QoS-V1_0	25 Nov 2014	n/a	Status changed to Candidate by TP TP Ref # OMA-TP-2014-0266- INP_REST_NetAPI_QoS_V1_0_ERP_and_ETR_for_Candidate_Approval

Appendix B. Use Cases (Informative)

B.1 Typical use case – Service/bandwidth tier boost

B.1.1 Short Description

This use case provides users with a dynamic boost feature where users may adjust their service tier (e.g. bandwidth) up or down (This use case is the same as “Temporary QoS Feature” in current [3GPP TS 29.199-17]).

Use case description:

Ben is a subscriber for the Internet Basic package with 500Kbps downlink/120kbps uplink bandwidth budget.

Ben requests on-demand boost from the SP’s portal - from Internet Basic to Premium with 2Mbps/500kbps down/uplinks for 2 hours.

The bandwidth boost may or may not incur the QoS class upgrade

SP checks if Ben has boost quota on his/her account.

SP upgrades Ben’s service level of for specified time duration i.e. 2 hours.

The service/bandwidth tier boost is useful for the support of all types of Internet services such as file downloading, web browsing, video services etc.

B.1.2 Market benefits

- Use of RESTful Network API in general would lower the usage barrier for developers from the Internet domain, supporting the Web 2.0 consumers
- QoS API will allow users a more controllable QoS for their applications, allow the developers to offer the users a better user experience, and allow operators to better monetize their assets