



Small Cells Capabilities Exposure Requirements

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1. Scope

(Informative)

This document defines the requirements for OMA Small Cells Network API V1.0.

Small Cells are low-power wireless access points that work in licensed and/or unlicensed spectrum, enabling Mobile Operators and Service Providers to increase their networks' capacity and quality in a sustainable way. Moreover, Small Cells offer peculiar capabilities that can be exposed, through convenient APIs, to Application Developers, in order to enhance Apps with new functionalities.

Such Small Cells' capabilities include fine-grained indoor localization methods, Terminals' context-awareness and their seamless integration in Digital Home environments, enablement of Application-driven QoS, resource management and call control; those capabilities are intended to be exposed to authorized Applications – the authorization mechanism requirements are also in-scope.

2. References

2.1 Normative References

[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)

[SCFAPIs2] Small Cell Services APIs Release 2 v6.1

2.2 Informative References

[OMADICT] “Dictionary for OMA Specifications”, Version x.y, Open Mobile Alliance™, OMA-ORG-Dictionary-Vx_y, [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

Small Cell	Low power wireless access points that work in licensed and/or unlicensed spectrum, enabling Mobile Operators and Service Providers to increase their networks' capacity and quality
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4. Introduction

(Informative)

Small Cells are low-power wireless access points that work in licensed and/or unlicensed spectrum, enabling Mobile Operators and Service Providers to increase their networks' capacity and quality in a sustainable way. Moreover, Small Cells offer peculiar capabilities that can be exposed, through convenient APIs, to Application Developers, in order to enhance Apps with new functionalities.

The targeted business is to provide a common and well-defined reference for the Developers communities already engaged with Small Cells enhanced Apps, and to stimulate the outreach of further Developers. Existing communities involved in Small Cells include Developers around GSMA OneAPI Initiative and those others registered to the new Small Cell Forum developers group. The targeted business is also related to leverage the steady growth of Small Cells deployments worldwide, involving Mobile Operators and Developers in joint market propositions.

4.1 Version 1.0

This document defines the requirements for OMA Small Cells Network API V1.0.

- Authorization
- Zonal Presence
- Location Streaming
- QoS
- Expected QoS
- Call Notification
- Third Party Call Control

5. Small Cells Capabilities Exposure release description (Informative)

Small Cells are low-power wireless access points that work in licensed and/or unlicensed spectrum, enabling Mobile Operators and Service Providers to increase their networks' capacity and quality in a sustainable way. Moreover, Small Cells offer peculiar capabilities that can be exposed, through convenient APIs, to Application Developers, in order to enhance Apps with new functionalities.

The objective of this WI is therefore to define detailed requirements for use cases enabled by Small Cells' capabilities, which will subsequently be used to determine the APIs needed to offer to a generic Application the functionalities to realize each use case, leveraging a Small Cells ecosystem. The subsequently needed APIs will be defined, wherever possible, using REST binding, coherently with OMA ARC NetAPIs Initiative, and attempting to reuse existing enablers if applicable (in this latter case Change Requests to existing enablers will be proposed, to cover potential Small Cells' new requirements). The APIs will not be developed under this WI, but may be added in a future phase.

This WI is also consistent with the ongoing Cooperation Agreement between OMA and Small Cell Forum.. That cooperation and the present OMA Small Cells Capabilities Exposure WI are justified and effective since they aim to avoid fragmentation in Mobile industry APIs' space.

6. Requirements

(Normative)

6.1 High-Level Functional Requirements

6.1.1 Authorization

Label	Description	Release
SmaC-Auth-001	Any API exposed by the Small Cells ecosystem SHALL be consumed only by authorized Apps, therefore an Authorization Framework is required. The Authorization Framework SHALL be compliant to OMA Autho4API enabler	1.0

6.1.2 Zonal Presence

Label	Description	Release
SmaC-ZP-001	The Small Cells ecosystem SHALL expose a "Zonal Presence" API to authorized applications that will expose the following operations: <ul style="list-style-type: none"> Initiate and terminate subscription to Zonal Presence notifications Query list of zones Query zone status Query status for access points within a zone Query users The "Zonal Presence" API shall define a zone as a collection of access points that may be in one or more sites, and where each site may have one or more access point. Each zone will have a unique "Zone ID" identifier.	1.0
SmaC-ZP-002	As small cell applications will also make use of API's defined for the OneAPI project (such as SMS, MMS, 3PCC), it is desirable that this API is REST based, and has a similar look and feel to the OneAPI API's.	1.0
SmaC-ZP-003	The mobile identity of the device shall be common with that consumed by other OneAPI API's.	1.0
SmaC-ZP-004	The Initiate Subscription to Zonal Presence Notifications operation shall include the following parameters: <ul style="list-style-type: none"> Zone ID Notification URL - the location where notifications are sent 	1.0
SmaC-ZP-005	A response to the Initiate Subscription to Zonal Presence Notifications operation shall confirm the subscription.	1.0
SmaC-ZP-006	A Zonal Presence Notification shall include one or more events of the following type: <ul style="list-style-type: none"> Zone Enter - A mobile device entered a zone by camping on to one of its access points. This event shall include a mobile identity of the device, a timestamp and current access point ID. Zone Exit - A mobile device handed over to an access point out of a zone from one that was inside the zone. This event shall include a mobile identity of the device, a timestamp and prior access point ID. Zone Transfer - A mobile device moved between access points within a zone. This event shall include a mobile identity of the device, a timestamp and access point ID's of the current and previous access point. 	1.0
SmaC-ZP-007	The Query List of Zones operation shall return a list of zone ID's visible to the authorized user.	1.0

SmaC-ZP-008	As a function of a Zone ID, the Query Zone Status operation shall provide a response containing: <ul style="list-style-type: none"> • The Zone ID • Number of users currently in the zone • Number of access points in the zone • Number of unserviceable access points. 	1.0
SmaC-ZP-009	The Query Status for Access Points Within a Zone operation shall provide a means to query the status for all access points as a function of a Zone ID, or a named set of access points for a given Zone ID. Each access point in the result shall contain the following parameters: <ul style="list-style-type: none"> • Location and altitude • Access point type that indicates either femto, LTE-femto, WiFi or Wimax type • Operational status indicating either serviceable or unserviceable condition • Number of mobile devices camped on the access point 	1.0
SmaC-ZP-010	The Query Users operation shall return a list of mobile devices camped onto the access point(s) within a zone. For each user, it shall return the following parameters: <ul style="list-style-type: none"> • Mobile identity • Access point ID It shall be possible to query for a specific user, list of users on a given access point or all users within a zone.	1.0

6.1.3 Location Streaming

Label	Description	Release
SmaC-LOCS-001	The Small Cells ecosystem SHALL expose to authorized applications an API to subscribe to location streaming notifications related to the position of one or more UEs under Small Cells coverage. The subscription request can select between absolute location (latitude, longitude) or a relative location Additionally, the application may influence the period between location updates.	1.0
SmaC-LOCS-002	Such Location Streaming API shall allow authorized Apps to add a user (UE) that will be included in the location streaming notification. Users that can be included in the location streaming notification previously gave their consent; consent is NOT asked for on-the-fly and initial consent grant mechanism is out of scope.	1.0
SmaC-LOCS-003	The Location Streaming API shall allow authorized Apps to remove a user (UE) that will be no more included in the location streaming notification.	1.0

6.1.4 QoS

Label	Description	Release
SmaC-QoS-001	The Small Cells ecosystem SHALL expose to authorized Apps an API to dynamically set, in a per UE and App base, the QoS of connections under Small Cell coverage, expressed as a high level class of services provided to Apps running on the UE.	1.0

6.1.5 Expected QoS

Label	Description	Release
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SmaC-EQS-001	The Small Cells ecosystem SHALL expose to authorized Apps (e.g. evolved Connection Manager on Devices) an API to retrieve the availability of resources for a given UE moving in a heterogeneous network, not yet camped on a specific Small Cell but entering its coverage area.	1.0
SmaC-EQS-002	The availability of resources for a given UE aiming to camp on specific Small Cell SHALL be expressed by a set of three parameters characterizing the IP connection between the given UE and Small Cells SeGW, as such IP connection would be established at the time when the API is consumed. The three mentioned parameters are: RTT, jitter, packet loss.	1.0

6.1.6 Call Notification

Label	Description	Release
SmaC-CNCF-001	The Small Cells ecosystem SHALL expose to authorized Apps an API to monitor <i>mobile originated</i> and <i>mobile terminated</i> call events of devices camped on a Small Cell.	1.0
SmaC-CNCF-002	Call events shall reflect call origination and progress events such as ringing, early media, busy, connection.	1.0
SmaC-CNCF-003	The Small Cells ecosystem SHALL expose to authorized Apps an API to modify originating and / or terminating leg attributes (e.g. endpoints) of calls with at least the calling/called party being under Small Cells coverage – calls can be in the setup phase or already established .	1.0

6.1.7 Third Party Call Control

Label	Description	Release
SmaC-3PCC-001	The Small Cells ecosystem SHALL expose to authorized applications an API to initiate audio calls between one UE under a Small Cell coverage and one external calling party, as well as between two UEs under the same Small Cell coverage.	1.0

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-RDSmaC-V1_0	29 May 2012	All	Incorporates input to committee: OMA-ARC-SmaC-2012-0001-INP_RDbaseline.doc Note: first draft baseline
	21 Jan	All	Agreed CR incorporated
Candidate Version OMA-RD-SmaC-V1_0	05 Mar 2013	n/a	Status changed to Candidate by TP TP Ref # OMA-TP-2013-0077- INP_SmaC_V1.0_ERP_for_Candidate_approval