

RESTful Network API for Zonal Presence

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Open Mobile Alliance

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1. Scope

This specification defines a RESTful API for Zonal Presence using HTTP protocol bindings

2. References

2.1 Normative References

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2.2 Informative References

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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

For the purpose of this TS, all definitions from the OMA Dictionary apply [OMADICT].

Access Point	Any cell, in any access technology that is accessible to the mobile network.
Client-side Notification URL	An HTTP URL exposed by a client, on which it is capable of receiving notifications and that can be used by the client when subscribing to notifications.
Long Polling	A variation of the traditional polling technique, where the server does not reply to a request unless a particular event, status or timeout has occurred. Once the server has sent a response, it closes the connection, and typically the client immediately sends a new request. This allows the emulation of an information push from a server to a client.
Notification Channel	<p>A channel created on the request of the client and used to deliver notifications from a server to a client. The channel is represented as a resource and provides means for the server to post notifications and for the client to receive them via specified delivery mechanisms.</p> <p>For example in the case of Long Polling the channel resource is defined by a pair of URLs. One of the URLs is used by the client as a call-back URL when subscribing for notifications. The other URL is used by the client to retrieve notifications from the Notification Server.</p>
Notification Server	A server that is capable of creating and maintaining Notification Channels.
Server-side Notification URL	An HTTP URL exposed by a Notification Server, that identifies a Notification Channel and that can be used by a client when subscribing to notifications.
Zone	A collection of at least one Access Point. Access points belonging to a zone may or may not be contiguous. An Access point may belong to more than one zone.

3.3 Abbreviations

ACR	Anonymous Customer Reference
API	Application Programming Interface
HTTP	HyperText Transfer Protocol
JSON	JavaScript Object Notation
LTE	Long Term Evolution
MIME	Multipurpose Internet Mail Extensions
OMA	Open Mobile Alliance
REST	REpresentational State Transfer
SCR	Static Conformance Requirements
SIP	Session Initiation Protocol
TS	Technical Specification
URI	Uniform Resource Identifier
URL	Uniform Resource Locator

WP	White Paper
XML	eXtensible Markup Language
XSD	XML Schema Definition

4. Introduction

A zone is a set of access points. Any cell type accessible to the mobile device could be an access point, for example a mobile network cell including small cells as defined by the Small Cell Forum and WiFi access point. Zones may be formed for example based on location, ownership, type of area they are deployed in, type of traffic they carry etc. in any combination. They do not have to be geographically adjacent.

The zonal presence API provides a subscription mechanism where authorized applications can receive notifications of user activities (such as zone enter, zone exit, zone transfer) within a ‘zone’ and notifications of specific user tracking or interest events (such as threshold number of users in the zone or access point, operational status of access point).

- Zone enter – When a mobile device (i.e. user) transitions to the coverage of an access point within the zone from one that is external to the zone
- Zone exit – When a mobile device transitions to the coverage of an access point external to the zone from one that is within the zone
- Zone transfer – Upon transitioning between two access points within the zone

Additionally, the zonal presence API defines operations where applications can gain information about zones, access points, and mobile devices.

The Technical Specification of the RESTful Network API for Zonal Presence contains HTTP protocol bindings for the Zonal Presence functionality, using the REST architectural style. The specification provides resource definitions, the HTTP verbs applicable for each of these resources, and the element data structures, as well as support material including flow diagrams and examples using the various supported message body formats (i.e. XML, JSON).

4.1 Version 1.0

Version 1.0 of this specification supports the following operations:

- Retrieve the zone list and individual zone information
- Retrieve the access point list and individual access point information
- Retrieve the user list and individual user information
- Manage client-specific subscriptions to zonal traffic change notifications.
- Manage client-specific subscriptions to user tracking change notifications
- Manage client-specific subscriptions to zone status change notifications

In addition this specification provides:

- Support for scope values used with authorization framework defined in [Autho4API_10]
- Support for Anonymous Customer Reference (ACR) as an end user identifier
- Support for “acr:auth” as a reserved keyword in an ACR

5. Zonal Presence API definition

This section is organized to support a comprehensive understanding of the Zonal Presence API design. It specifies the definition of all resources, definition of all data structures, and definitions of all operations permitted on the specified resources.

Common data types, naming conventions, fault definitions and namespaces are defined in [REST_NetAPI_Common].

The remainder of this document is structured as follows:

Section 5 starts with a diagram representing the resources hierarchy followed by a table listing all the resources (and their URL) used by this API, along with the data structure and the supported HTTP verbs (section 5.1). What follows are the data structures (section 5.2). A sample of typical use cases is included in section 5.3, described as high level flow diagrams.

Section 6 contains detailed specification for each of the resources. Each such subsection defines the resource, the request URL variables that are common for all HTTP methods, and the supported HTTP verbs. For each supported HTTP verb, a description of the functionality is provided, along with an example of a request and an example of a response. For each unsupported HTTP verb, the returned HTTP error status is specified, as well as what should be returned in the Allow header.

All examples in section 6 use XML as the format for the message body. JSON examples are provided in Appendix C.

Section 7 contains fault definition details such as Service Exceptions and Policy Exceptions.

Appendix B provides the Static Conformance Requirements (SCR).

Appendix D provides the operations mapping to a pre-existing baseline specification, where applicable.

Appendix E provides a list of all Light-weight Resources, where applicable.

Appendix F defines authorization aspects to control access to the resources defined in this specification.

Note: Throughout this document client and application can be used interchangeably.

5.1 Resources Summary

This section summarizes all the resources used by the RESTful Network API for Zonal Presence.

The "apiVersion" URL variable SHALL have the value "v1" to indicate that the API corresponds to this version of the specification. See [REST_NetAPI_Common] which specifies the semantics of this variable.

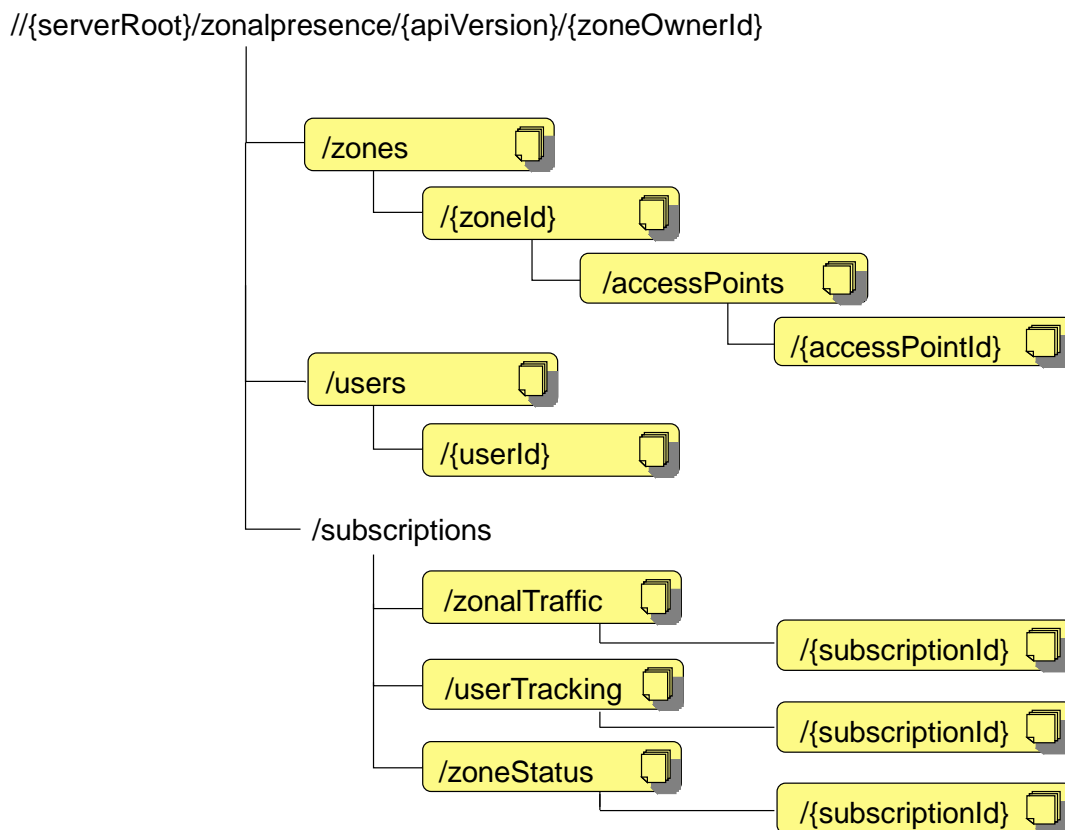


Figure 1 Resource structure defined by this specification

The following tables give a detailed overview of the resources defined in this specification, the data type of their representation and the allowed HTTP methods.

Purpose: To allow the client to retrieve list of zones, access points, users and individual information of zone, access point, user

Resource	URL Base URL: http://{serverRoot}/ zonalpresence/{apiVersion}/ {zoneOwnerId}	Data Structures	HTTP verbs			
			GET	PUT	POST	DELETE
Zone list	/zones	ZoneList	retrieve list of zones	no	no	no
Individual zone information	/zones/{zoneId}	ZoneInfo	retrieve individual zone information	no	no	no
Access point list	/zones/{zoneId}/accessPoints	AccessPointList	retrieve list of access points	no	no	no
Individual access point information	/zones/{zoneId}/accessPoints/{accessPointId}	AccessPointInfo	retrieve individual access point information	no	no	no
User list	/users	UserList	retrieve list of users Note: query strings are used to filter the response from the server, for example to include the list of users in a given zone or access point	no	no	no
Individual user information	/users/{userId}	UserInfo	retrieve individual user information	no	no	no

Purpose: To allow the client to manage its subscriptions for zonal presence change notifications

Resource	URL Base URL: http://{serverRoot}/ zonalpresence/{apiVersion}/ {zoneOwnerId}/subscriptions	Data Structures	HTTP verbs			
			GET	PUT	POST	DELETE
Zonal traffic change notification subscriptions	/zonalTraffic	NotificationSubscriptionList (used for GET) ZonalTrafficSubscription (used for POST) common:ResourceReference (optional alternative for POST response)	return all subscriptions	no	create new subscription	no
Individual zonal traffic change notification subscription	/zonalTraffic/{subscriptionId}	ZonalTrafficSubscription (used for GET and PUT)	return one subscription	update subscription	no	delete one subscription
User tracking change notification subscriptions	/userTracking	NotificationSubscriptionList (used for GET) UserTrackingSubscription (used for POST) common:ResourceReference (optional alternative for POST response)	return all subscriptions	no	create new subscription	no
Individual user tracking change notification subscription	/userTracking/{subscriptionId}	UserTrackingSubscription (used for GET and PUT)	return one subscription	update subscription	no	delete one subscription
Zone status change notification subscriptions	/zoneStatus	NotificationSubscriptionList (used for GET) ZoneStatusSubscription (used for POST) common:ResourceReference	return all subscriptions	no	create new subscription	no

Resource	URL Base URL: http://{serverRoot}/ zonalpresence/{apiVersion}/ {zoneOwnerId}/subscriptions	Data Structures	HTTP verbs			
			GET	PUT	POST	DELETE
		(optional alternative for POST response)				
Individual zone status change notification subscription	/zoneStatus/{subscriptionId}	ZoneStatusSubscription (used for GET and PUT)	return one subscription	update subscription	no	delete one subscription

Purpose: To allow the server to inform the client about zonal presence changes

Resource	URL	Data Structures	HTTP verbs			
			GET	PUT	POST	DELETE
Client notification about zonal presence changes	{provided by client}	ZonalPresenceNotification ZoneStatusNotification	no	no	notification on zonal presence change	no

5.2 Data Types

5.2.1 XML Namespaces

The XML namespace for the Zonal Presence data types is:

urn:oma:xml:rest:netapi:zonalpresence:1

The 'xsd' namespace prefix is used in the present document to refer to the XML Schema data types defined in XML Schema [XMLSchema1, XMLSchema2]. The 'common' namespace prefix is used in the present document to refer to the data types defined in [REST_NetAPI_Common]. The use of namespace prefixes such as 'xsd' is not semantically significant.

The XML schema for the data structures defined in the section below is given in [REST_SUP_ZonalPresence].

5.2.2 Structures

The subsections of this section define the data structures used in the Zonal Presence API.

Some of the structures can be instantiated as so-called root elements.

For structures that contain elements which describe a user identifier, the statements in section 6 regarding 'tel', 'sip' and 'acr' URI schemes apply.

5.2.2.1 Type: ZoneList

A type containing list of zones.

Element	Type	Optional	Description
zone	ZoneInfo [0..unbounded]	Yes	Collection of the zone information list.
resourceURL	xsd:anyURI	No	Self referring URL.

A root element named zoneList of type ZoneList is allowed in response bodies.

5.2.2.2 Type: ZoneInfo

A type containing zone information.

Element	Type	Optional	Description
zoneId	xsd:string	No	Identifier of zone (e.g. zone001).
numberOfAccessPoints	xsd:unsignedInt	No	Number of access points within the zone.
numberOfUnserviceableAccessPoints	xsd:unsignedInt	No	Number of inoperable access points within the zone.
numberOfUsers	xsd:unsignedInt	No	Number of users currently on the zone.
resourceURL	xsd:anyURI	No	Self referring URL.

A root element named zoneInfo of type ZoneInfo is allowed in response bodies.

5.2.2.3 Type: AccessPointList

A type containing list of access points.

Element	Type	Optional	Description
---------	------	----------	-------------

zoneId	xsd:string	No	Identifier of zone (e.g. zone001).
accessPoint	AccessPointInfo [0..unbounded]	Yes	Collection of the access point information list.
resourceURL	xsd:anyURI	No	Self referring URL.

A root element named accessPointList of type AccessPointList is allowed in response bodies.

5.2.2.4 Type: AccessPointInfo

A type containing access point information.

Element	Type	Optional	Description
accessPointId	xsd:string	No	Identifier of access point (e.g. ap01).
locationInfo	LocationInfo	Yes	The coordinates of the access point.
connectionType	ConnectionType	No	Connection type of access point.
operationStatus	OperationStatus	No	Operation status of access point.
numberOfUsers	xsd:unsignedInt	No	Number of users currently on the access point.
timezone	xsd:dateTimeStamp	Yes	Time zone of access point
interestRealm	xsd:string	Yes	Interest realm of access point (e.g. geographical area, a type of industry etc.).
resourceURL	xsd:anyURI	No	Self referring URL.

A root element named accessPointInfo of type AccessPointInfo is allowed in response bodies.

5.2.2.5 Type: LocationInfo

A type containing location information with latitude, longitude and altitude, in addition the accuracy of the information are provided.

Element	Type	Optional	Description
latitude	xsd:float	No	Location latitude.
longitude	xsd:float	No	Location longitude.
altitude	xsd:float	Yes	Location altitude.
accuracy	xsd:unsignedInt	No	Accuracy of location provided in meters.

5.2.2.6 Type: UserList

A type containing list of users.

Element	Type	Optional	Description
---------	------	----------	-------------

user	UserInfo [0..unbounded]	Yes	Collection of the user information list.
resourceURL	xsd:anyURI	No	Self referring URL.

A root element named userList of type UserList is allowed in response bodies.

5.2.2.7 Type: UserInfo

A type containing user information.

Element	Type	Optional	Description
address	xsd:anyURI	No	Address of user (e.g. 'sip' URI, 'tel' URI, 'acr' URI) currently on the access point.
accessPointId	xsd:string	No	Identifier of access point (e.g. ap01).
zoneId	xsd:string	No	Identifier of zone (e.g. zone001).
resourceURL	xsd:anyURI	No	Self referring URL.

A root element named userInfo of type UserInfo is allowed in response bodies.

5.2.2.8 Type: NotificationSubscriptionList

A type containing list of zonal traffic, user tracking, and zone status subscription(s).

Element	Type	Optional	Description
zonalTrafficSubscription	ZonalTrafficSubscription [0..unbounded]	Yes	Collection of ZonalTrafficSubscription elements.
userTrackingSubscription	UserTrackingSubscription [0..unbounded]	Yes	Collection of UserTrackingSubscription elements.
zoneStatusSubscription	ZoneStatusSubscription [0..unbounded]	Yes	Collection of ZoneStatusSubscription elements.
resourceURL	xsd:anyURI	No	Self referring URL.

A root element named notificationSubscriptionList of type NotificationSubscriptionList is allowed in response bodies.

5.2.2.9 Type: ZonalTrafficSubscription

A type containing zonal traffic subscription.

Element	Type	Optional	Description
clientCorrelator	xsd:string	Yes	<p>A correlator that the client can use to tag this particular resource representation during a request to create a resource on the server.</p> <p>This element MAY be present.</p> <p>Note: this allows the client to recover from communication failures during resource creation and therefore avoids duplicate subscription creation in such situations.</p> <p>In case the element is present, the server SHALL not alter its value, and SHALL provide it as part of the representation of this resource. In case the element is not present, the server SHALL NOT generate it.</p>
callbackReference	common:CallbackReference	No	Notification callback definition.
zoneld	xsd:string	No	Identifier of zone (e.g. zone001) to monitor.
interestRealm	xsd:string [0..unbounded]	Yes	Interest realms of access points within a zone (e.g. geographical area, a type of industry etc.).
userEventCriteria	UserEventType [0..unbounded]	Yes	List of user event values to generate notifications for (these apply to zone identifier or all interest realms within zone identifier specified). If this element is missing, a notification is requested to be generated for any change in user event.

duration	xsd:unsignedInt	Yes	<p>Period (in seconds) of time notifications are provided for. If set to "0" (zero), a default duration time, which is specified by the service policy, will be used. If the parameter is omitted, the notifications will continue until the maximum duration time, which is specified by the service policy, unless the notifications are stopped by deletion of subscription for notifications.</p> <p>This element MAY be given by the client during resource creation in order to signal the desired lifetime of the subscription. The server MUST return in this element the period of time for which the subscription will still be valid.</p>
resourceURL	xsd:anyURI	Yes	<p>Self referring URL. The resourceURL SHALL NOT be included in POST requests by the client, but MUST be included in POST requests representing notifications by the server to the client, when a complete representation of the resource is embedded in the notification. The resourceURL MUST also be included in responses to any HTTP method that returns an entity body, and in PUT requests.</p>

A root element named zonalTrafficSubscription of type ZonalTrafficSubscription is allowed in request and/or response bodies.

Note that the clientCorrelator is used for purposes of error recovery as specified in [REST_NetAPI_Common], and internal client purposes. The server is NOT REQUIRED to use the clientCorrelator value in any form in the creation of the URL of the resource. The specification [REST_NetAPI_Common] provides a recommendation regarding the client's generation of the value of this field.

5.2.2.10 Type: UserTrackingSubscription

A type containing user tracking subscription.

Element	Type	Optional	Description
clientCorrelator	xsd:string	Yes	<p>A correlator that the client can use to tag this particular resource representation during a request to create a resource on the server.</p> <p>This element MAY be present.</p> <p>Note: this allows the client to recover from communication failures during resource creation and therefore avoids duplicate subscription creation in such situations.</p> <p>In case the element is present, the server SHALL not alter its value, and SHALL provide it as part of the representation of this resource. In case the element is not present, the server SHALL NOT generate it.</p>
callbackReference	common:CallbackReference	No	Notification callback definition.
address	xsd:anyURI	No	Address of user (e.g. 'sip' URI, 'tel' URI, 'acr' URI) to monitor.
userEventCriteria	UserEventType [0..unbounded]	Yes	List of user event values to generate notifications for (these apply to address specified). If this element is missing, a notification is requested to be generated for any change in user event.
resourceURL	xsd:anyURI	Yes	Self referring URL. The resourceURL SHALL NOT be included in POST requests by the client, but MUST be included in POST requests representing notifications by the server to the client, when a complete representation of the resource is embedded in the notification. The resourceURL MUST also be included in responses to any HTTP method that returns an entity body, and in PUT requests.

A root element named `userTrackingSubscription` of type `UserTrackingSubscription` is allowed in request and/or response bodies.

Note that the `clientCorrelator` is used for purposes of error recovery as specified in [REST_NetAPI_Common], and internal client purposes. The server is NOT REQUIRED to use the `clientCorrelator` value in any form in the creation of the URL of the resource. The specification [REST_NetAPI_Common] provides a recommendation regarding the client's generation of the value of this field.

5.2.2.11 Type: ZoneStatusSubscription

A type containing zone status subscription.

Element	Type	Optional	Description
<code>clientCorrelator</code>	<code>xsd:string</code>	Yes	<p>A correlator that the client can use to tag this particular resource representation during a request to create a resource on the server.</p> <p>This element MAY be present.</p> <p>Note: this allows the client to recover from communication failures during resource creation and therefore avoids duplicate subscription creation in such situations.</p> <p>In case the element is present, the server SHALL not alter its value, and SHALL provide it as part of the representation of this resource. In case the element is not present, the server SHALL NOT generate it.</p>
<code>callbackReference</code>	<code>common:CallbackReference</code>	No	Notification callback definition.
<code>zoneId</code>	<code>xsd:string</code>	No	Identifier of zone (e.g. <code>zone001</code>) to monitor.
<code>numberOfUsersZoneThreshold</code>	<code>xsd:unsignedInt</code>	Yes	Threshold number of users in a zone which if crossed shall cause a notification.
<code>numberOfUsersAPThreshold</code>	<code>xsd:unsignedInt</code>	Yes	Threshold number of users in an access point which if crossed shall cause a notification.
<code>operationStatus</code>	<code>OperationStatus</code> [0..unbounded]	Yes	List of operation status values to generate notifications for (these apply to all access points within a zone).

resourceURL	xsd:anyURI	Yes	Self referring URL. The resourceURL SHALL NOT be included in POST requests by the client, but MUST be included in POST requests representing notifications by the server to the client, when a complete representation of the resource is embedded in the notification. The resourceURL MUST also be included in responses to any HTTP method that returns an entity body, and in PUT requests.
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A root element named zoneStatusSubscription of type ZoneStatusSubscription is allowed in request and/or response bodies.

Note that the clientCorrelator is used for purposes of error recovery as specified in [REST_NetAPI_Common], and internal client purposes. The server is NOT REQUIRED to use the clientCorrelator value in any form in the creation of the URL of the resource. The specification [REST_NetAPI_Common] provides a recommendation regarding the client's generation of the value of this field.

5.2.2.12 Type: ZonalPresenceNotification

A type containing zonal presence notification.

Element	Type	Optional	Description
callbackData	xsd:string	Yes	CallbackData if passed by the application during the associated ZonalTrafficSubscription and UserTrackingSubscription operation. See [REST_NetAPI_Common].
zoneld	xsd:string	No	Identifier of zone (e.g. zone001).
address	xsd:anyURI	No	Address of user (e.g. 'sip' URI, 'tel' URI, 'acr' URI).
interestRealm	xsd:string	Yes	Interest realm of access point (e.g. geographical area, a type of industry etc.).
userEventType	UserEventType	No	User event (e.g. Zone Enter, Zone Exit, Zone Transfer)
currentAccessPointId	xsd:string	No	Identifier of access point.
previousAccessPointId	xsd:string	Yes	Identifier of access point. Note: This element MUST only be present if event type is Zone Transfer.
timestamp	xsd:dateTimeStamp	No	Indicates the time of day for zonal presence notification.
link	common:Link	Yes	Link to other resources that are in

	[0..unbounded]		relationship with this notification. The server SHOULD include a link to the related subscription. No other links are required or suggested by this specification.
--	----------------	--	---

A root element named zonalPresenceNotification of type ZonalPresenceNotification is allowed in notification request bodies.

5.2.2.13 Type: ZoneStatusNotification

A type containing zone status notification.

Element	Type	Optional	Description
callbackData	xsd:string	Yes	CallbackData if passed by the application during the associated ZoneStatusSubscription operation. See [REST_NetAPI_Common].
zoneld	xsd:string	No	Identifier of zone (e.g. zone001).
accessPointId	xsd:string	Yes	Identifier of an access point (e.g. ap01). Must be included when numberOfUsersInAP or operationStatus element is included.
numberOfUsersInZone	xsd:unsignedInt	Yes	This element shall be present when ZoneStatusSubscription includes numberOfUsersZoneThreshold element and the number of users in a zone exceeds the threshold defined in this subscription.
numberOfUsersInAP	xsd:unsignedInt	Yes	This element shall be present when ZoneStatusSubscription includes numberOfUsersAPThreshold element and the number of users in an access point exceeds the threshold defined in the subscription.
operationStatus	OperationStatus	Yes	This element shall be present when ZoneStatusSubscription includes operationStatus element and the operation status value of an access point meets Serviceable or Unserviceable or Unknown defined in the subscription.
timestamp	xsd:dateTimeStamp	No	Indicates the time of day for zone status notification.
link	common:Link [0..unbounded]	Yes	Link to other resources that are in relationship with this notification. The server SHOULD include a link to the related subscription. No other links are required or suggested by this specification.

A root element named zoneStatusNotification of type ZoneStatusNotification is allowed in notification request bodies.

5.2.3 Enumerations

The subsections of this section define the enumerations used in the Zonal Presence API.

5.2.3.1 Enumeration: ConnectionType

An enumeration defining the connection type of an access point.

Enumeration	Description
Femto	Access point provides a Femto connection
LTE-femto	Access point provides a LTE-Femto connection
Smallcell	Access point provides a Smallcell connection
LTE-smallcell	Access point provides a LTE-smallcell connection
Wifi	Access point provides a Wifi connection
Pico	Access point provides a Pico connection
Micro	Access point provides a Micro connection
Macro	Access point provides a Macro connection
Wimax	Access point provides a Wimax connection
Unknown	Access point connection type is unknown

5.2.3.2 Enumeration: OperationStatus

An enumeration defining the operations status of an access point.

Enumeration	Description
Serviceable	Access point is in service
Unserviceable	Access point is out of service
Unknown	Access point status is unknown

5.2.3.3 Enumeration: UserEventType

An enumeration defining the direction of a user.

Enumeration	Description
Entering	When a mobile device transitions to the coverage of an access point within the zone from one that is external to the zone
Leaving	When a mobile device transitions to the coverage of an access point external to the zone from one that is within the zone
Transferring	Upon transitioning between two access points within the zone

5.2.4 Values of the Link “rel” attribute

The “rel” attribute of the Link element is a free string set by the server implementation, to indicate a relationship between the current resource and an external resource. The following are possible strings (list is non-exhaustive, and can be extended):

- ZonalTrafficSubscription
- UserTrackingSubscription
- ZoneStatusSubscription

These values indicate the kind of resource that the link points to.

5.3 Sequence Diagrams

The following subsections describe the resources, methods and steps involved in typical scenarios.

In a sequence diagram, a step which involves delivering a notification is labeled with “POST or NOTIFY”, where “POST” refers to delivery via the HTTP POST method, and “NOTIFY” refers to delivery using the Notification Channel [REST_NetAPI_NotificationChannel].

5.3.1 Zone list query

This figure below shows a scenario for retrieving list of zones.

The resources:

- To get list of zones including zone information.

http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/zones

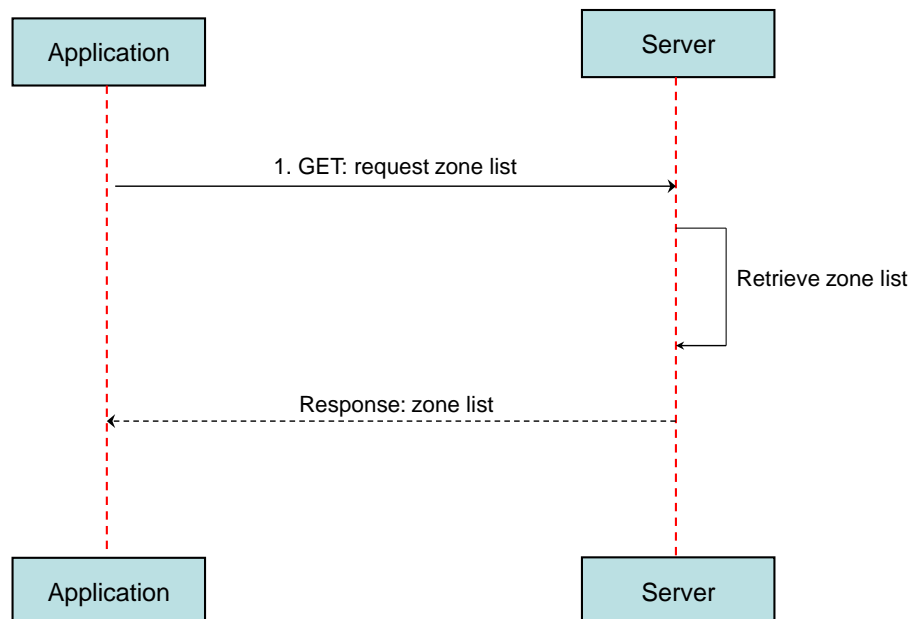


Figure 2 Zone list query

Outline of flow:

1. An application requests zone list using GET and receives the zone list information (i.e. zoneId, numberOfAccessPoints, numberOfUnserviceableAccessPoints, numberOfUsers, and so on).

5.3.2 Zonal traffic notification

This figure below shows a scenario for controlling subscriptions to notification about zonal traffic change (e.g. zone enter, zone exit, zone transfer).

The notification URL passed by the client during the subscription step can be a Client-side Notification URL, or a Server-side Notification URL. Refer to [REST_NetAPI_NotificationChannel] for sequence flows illustrating the creation of a Notification Channel and obtaining a Server-side Notification URL on the server-side, and its use by the client via Long Polling.

The resources:

- To start subscription to notifications about zonal traffic change, create new resource under **http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/subscriptions/zonalTraffic**
- To update or delete an individual subscription to notifications about zonal traffic change, update or delete resource under **http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/subscriptions/zonalTraffic/{subscriptionId}**

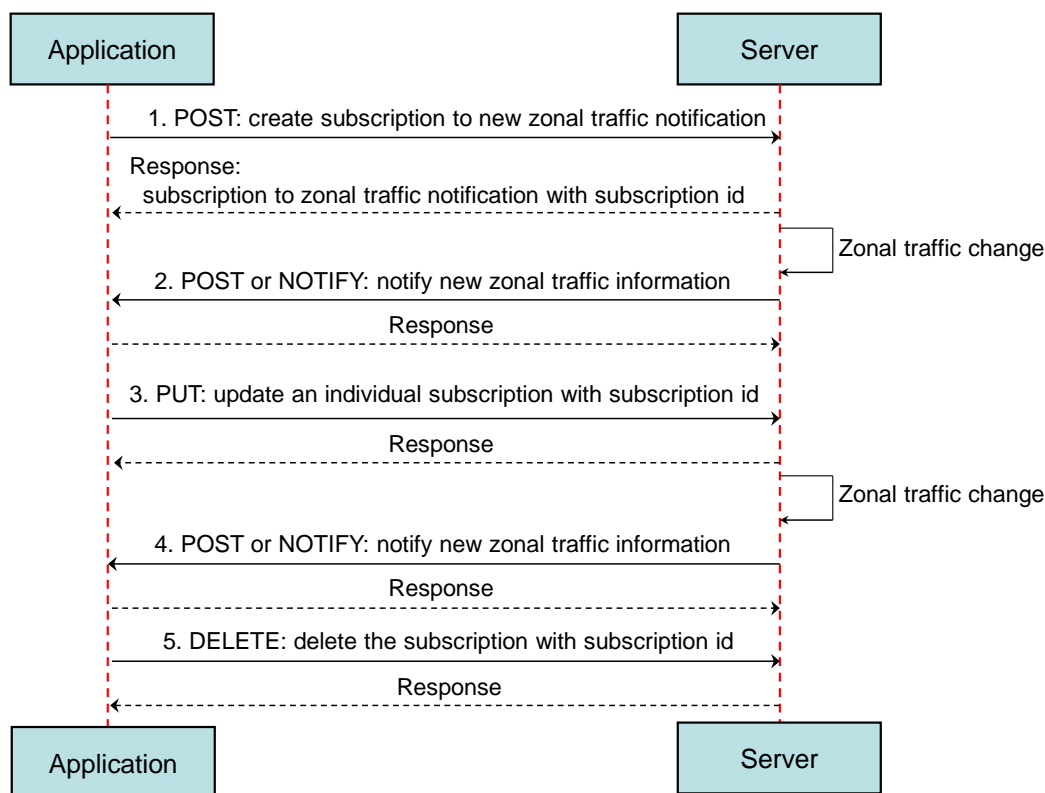


Figure 3 Zonal traffic notification

Outline of flow:

1. An application creates a new subscription to zonal traffic change notification by using POST and receives the resulting resource URL containing the subscriptionId.
2. When the zonal traffic changes (e.g. Entering in zone001), the server notifies the application using POST to the application supplied notifyURL. Alternatively, the application obtains the notifications using a Notification Channel [REST_NetAPI_NotificationChannel].
3. An application updates an individual subscription to zonal traffic change notification by using PUT to resource URL containing the subscriptionId. (e.g. interestRealm: NY)

4. When the zonal traffic changes (e.g. Entering in NY of zone001), the server notifies the application using POST to the application supplied notifyURL. Alternatively, the application obtains the notifications using a Notification Channel [REST_NetAPI_NotificationChannel].
5. An application stops the notifications of the particular subscription by using DELETE to a resource URL containing the subscriptionId.

5.3.3 User tracking notification

This figure below shows a scenario for controlling subscriptions to notification about user tracking change (e.g. zone enter, zone exit, zone transfer).

The notification URL passed by the client during the subscription step can be a Client-side Notification URL, or a Server-side Notification URL. Refer to [REST_NetAPI_NotificationChannel] for sequence flows illustrating the creation of a Notification Channel and obtaining a Server-side Notification URL on the server-side, and its use by the client via Long Polling.

The resources:

- To start subscription to notifications about user tracking change, create new resource under **http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/subscriptions/userTracking**
- To update or delete an individual subscription to notifications about user tracking change, update or delete resource under **http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/subscriptions/userTracking/{subscriptionId}**

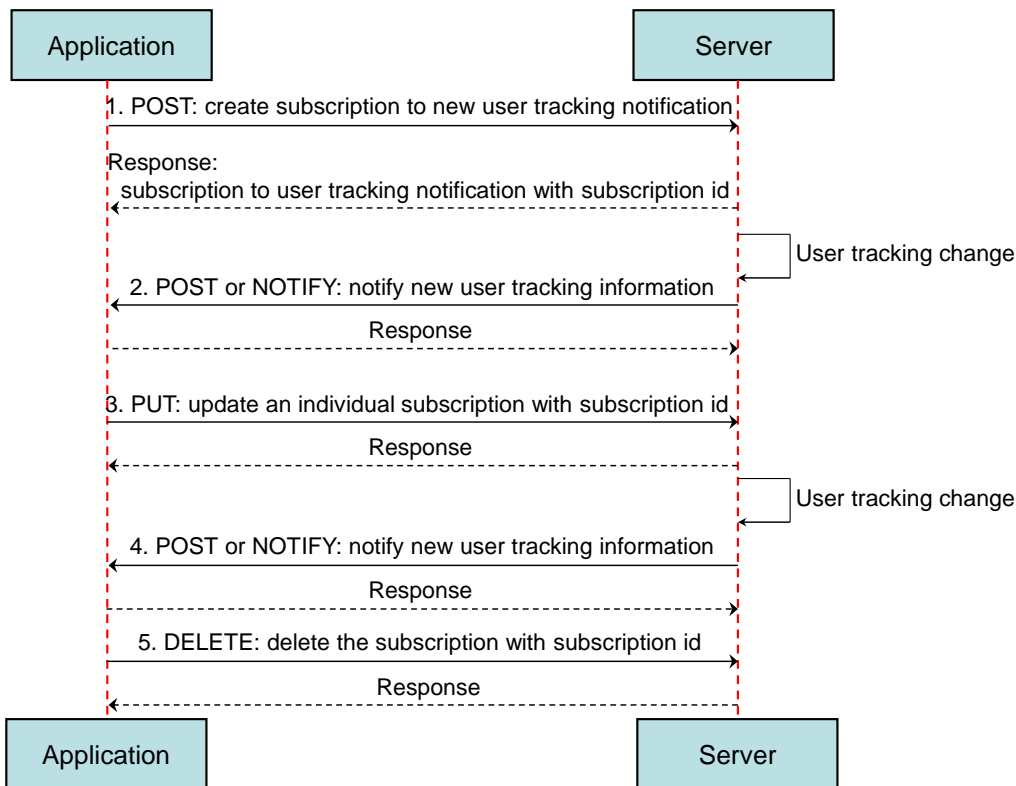


Figure 4 User tracking notification

Outline of flow:

1. An application creates a new subscription to user tracking change notification by using POST and receives the resulting resource URL containing the subscriptionId. (e.g. userEventCriteria: Zone Enter)

2. When the user tracking changes (e.g. Entering in zone001), the server notifies the application using POST to the application supplied notifyURL. Alternatively, the application obtains the notifications using a Notification Channel [REST_NetAPI_NotificationChannel].
3. An application updates an individual subscription to user tracking change notification by using PUT to resource URL containing the subscriptionId. (e.g. userEventCriteria: Zone Exit)
4. When the user tracking changes (e.g. Leaving in zone002), the server notifies the application using POST to the application supplied notifyURL. Alternatively, the application obtains the notifications using a Notification Channel [REST_NetAPI_NotificationChannel].
5. An application stops the notifications of the particular subscription by using DELETE to a resource URL containing the subscriptionId.

5.3.4 Zone status notification

This figure below shows a scenario for controlling subscriptions to notification about zone status change (e.g. threshold number of users in the zone or access point, operation status of access point etc.).

The notification URL passed by the client during the subscription step can be a Client-side Notification URL, or a Server-side Notification URL. Refer to [REST_NetAPI_NotificationChannel] for sequence flows illustrating the creation of a Notification Channel and obtaining a Server-side Notification URL on the server-side, and its use by the client via Long Polling.

The resources:

- To start subscription to notifications about zone status change, create new resource under **http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/subscriptions/zoneStatus**
- To update or delete an individual subscription to notifications about zone status change, update or delete resource under **http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/subscriptions/zoneStatus/{subscriptionId}**

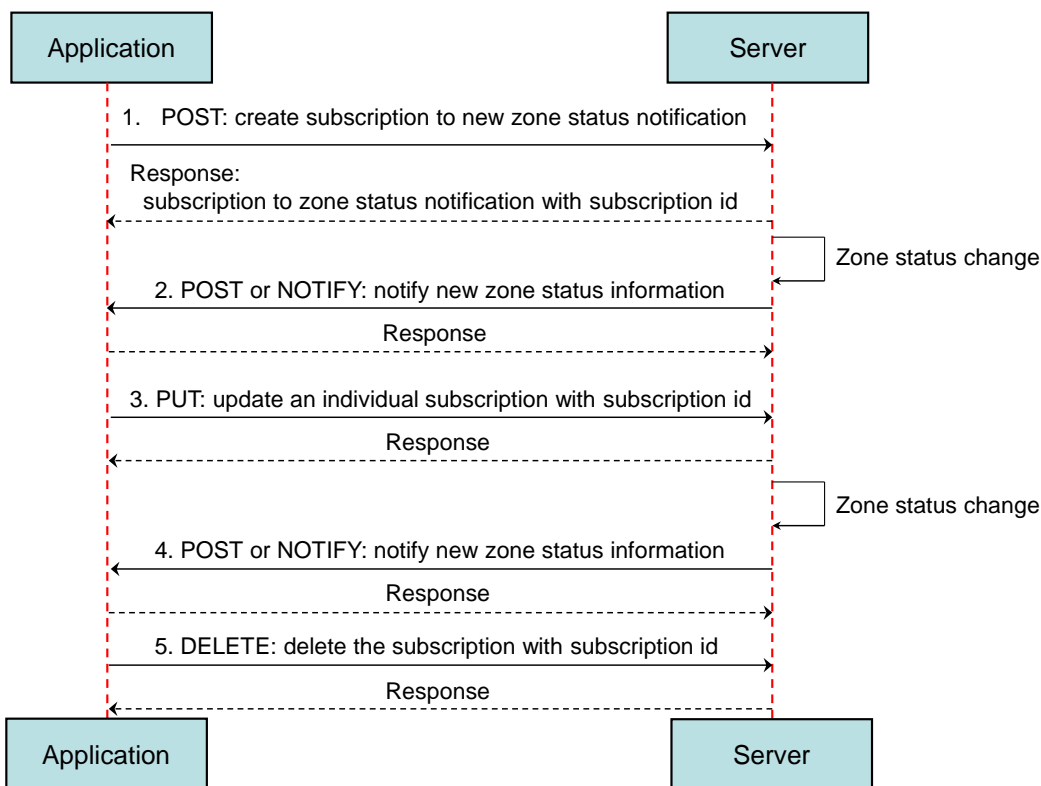


Figure 5 Zone status notification

Outline of flow:

1. An application creates a new subscription to zone status change notification by using POST and receives the resulting resource URL containing the subscriptionId. (e.g. numberOfUsersZoneThreshold: 100)
2. When the zone status changes, the server notifies the application using POST to the application supplied notifyURL. Alternatively, the application obtains the notifications using a Notification Channel [REST_NetAPI_NotificationChannel].
3. An application updates an individual subscription to zone status change notification by using PUT to resource URL containing the subscriptionId. (e.g. numberOfUsersZoneThreshold: 200)
4. When the zone status changes, the server notifies the application using POST to the application supplied notifyURL. Alternatively, the application obtains the notifications using a Notification Channel [REST_NetAPI_NotificationChannel].
5. An application stops the notifications of the particular subscription by using DELETE to a resource URL containing the subscriptionId.

6. Detailed specification of the resources

The following applies to all resources defined in this specification regardless of the representation format (i.e. XML, JSON):

- Reserved characters in URL variables (parts of a URL denoted below by a name in curly brackets) **MUST** be percent-encoded according to [RFC3986]. Note that this always applies, no matter whether the URL is used as a Request URL or inside the representation of a resource (such as in “resourceURL” and “link” elements).
- If a user identifier (e.g. address, participantAddress, etc.) of type anyURI is in the form of an MSISDN, it **MUST** be defined as a global number according to [RFC3966] (e.g. tel:+19585550100). The use of characters other than digits and the leading “+” sign **SHOULD** be avoided in order to ensure uniqueness of the resource URL. This applies regardless of whether the user identifier appears in a URL variable or in a parameter in the body of an HTTP message.
- If an equipment identifier of type anyURI is in the form of a SIP URI, it **MUST** be defined according to [RFC3261].
- If a user identifier (e.g. address, userId, etc) of type anyURI is in the form of an Anonymous Customer Reference (ACR), it **MUST** be defined according to [REST_NetAPI_ACR], i.e. it **MUST** include the protocol prefix 'acr:' followed by the ACR.
 - The ACR ‘auth’ is a supported reserved keyword, and **MUST NOT** be assigned as an ACR to any particular end user. See F.1.2 for details regarding the use of this reserved keyword.
- For requests and responses that have a body, the following applies: in the requests received, the server **SHALL** support JSON and XML encoding of the parameters in the body. The Server **SHALL** return either JSON or XML encoded parameters in the response body, according to the result of the content type negotiation as specified in [REST_NetAPI_Common]. In notifications to the Client, the server **SHALL** use either XML or JSON encoding, depending on which format the client has specified in the related subscription. The generation and handling of the JSON representations **SHALL** follow the rules for JSON encoding in HTTP Requests/Responses as specified in [REST_NetAPI_Common].

6.1 Resource: Zone list

The resource used is:

http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/zones

This resource is used for retrieving list of zones.

6.1.1 Request URL variables

The following request URL variables are common for all HTTP commands:

Name	Description
serverRoot	Server base url: hostname+port+base path. Port and base path are OPTIONAL. Example: example.com/exampleAPI
apiVersion	Version of the API client wants to use. The value of this variable is defined in section 5.1.
zoneOwnerId	Identifier of zone owner (e.g. zowner0001)

See section 6 for a statement on the escaping of reserved characters in URL variables.

6.1.2 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to Zonal Presence, see section 7.

6.1.3 GET

This operation is used for retrieving list of zones.

6.1.3.1 Example: Retrieve list of zones (Informative)

6.1.3.1.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/zones HTTP/1.1
Host: example.com
Accept: application/xml
```

6.1.3.1.2 Response

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<zp:zoneList xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <zone>
    <zoneId>zone001</zoneId>
    <numberOfAccessPoints>3</numberOfAccessPoints>
    <numberOfUnserviceableAccessPoints>1</numberOfUnserviceableAccessPoints>
    <numberOfUsers>10</numberOfUsers>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001</resourceURL>
  </zone>
  <zone>
    <zoneId>zone002</zoneId>
    <numberOfAccessPoints>12</numberOfAccessPoints>
    <numberOfUnserviceableAccessPoints>0</numberOfUnserviceableAccessPoints>
    <numberOfUsers>36</numberOfUsers>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone002</resourceURL>
  </zone>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones</resourceURL>
</zp:zoneList>
```

6.1.4 PUT

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the ‘Allow: GET’ field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.1.5 POST

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the ‘Allow: GET’ field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.1.6 DELETE

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the ‘Allow: GET’ field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.2 Resource: Individual zone information

The resource used is:

http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/zones/{zoneId}

This resource is used for retrieving individual zone information.

6.2.1 Request URL variables

The following request URL variables are common for all HTTP commands:

Name	Description
serverRoot	Server base url: hostname+port+base path. Port and base path are OPTIONAL. Example: example.com/exampleAPI
apiVersion	Version of the API client wants to use. The value of this variable is defined in section 5.1.
zoneOwnerId	Identifier of zone owner (e.g. zowner0001)
zoneId	Identifier of zone (e.g. zone001).

See section 6 for a statement on the escaping of reserved characters in URL variables.

6.2.2 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to Zonal Presence, see section 7.

6.2.3 GET

This operation is used for retrieving individual zone information.

6.2.3.1 Example: Retrieve individual zone information (Informative)

6.2.3.1.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/zones/zone001 HTTP/1.1
Host: example.com
Accept: application/xml
```

6.2.3.1.2 Response

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<zp:zoneInfo xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <zoneId>zone001</zoneId>
  <numberOfAccessPoints>3</numberOfAccessPoints>
  <numberOfUnserviceableAccessPoints>1</numberOfUnserviceableAccessPoints>
  <numberOfUsers>10</numberOfUsers>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001</resourceURL>
</zp:zoneInfo>
```

6.2.4 PUT

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the ‘Allow: GET’ field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.2.5 POST

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the ‘Allow: GET’ field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.2.6 DELETE

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the ‘Allow: GET’ field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.3 Resource: Access point list

The resource used is:

http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/zones/{zoneId}/accessPoints

This resource is used for retrieving list of access points.

6.3.1 Request URL variables

The following request URL variables are common for all HTTP commands:

Name	Description
------	-------------

serverRoot	Server base url: hostname+port+base path. Port and base path are OPTIONAL. Example: example.com/exampleAPI
apiVersion	Version of the API client wants to use. The value of this variable is defined in section 5.1.
zoneOwnerId	Identifier of zone owner (e.g. zowner0001)
zoneId	Identifier of zone (e.g. zone001).

See section 6 for a statement on the escaping of reserved characters in URL variables.

6.3.2 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to Zonal Presence, see section 7.

6.3.3 GET

This operation is used for retrieving list of access points.

Supported parameters in the query string of the Request URL are:

Name	Type/Values	Optional	Description
interestRealm	xsd:string	Yes	Interest realm of access point (e.g. geographical area, a type of industry etc.).

6.3.3.1 Example 1: Retrieve list of access points (Informative)

6.3.3.1.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints HTTP/1.1
Host: example.com
Accept: application/xml
```

6.3.3.1.2 Response

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<zp:accessPointList xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <zoneId>zone001</zoneId>
  <accessPoint>
    <accessPointId>ap01</accessPointId>
    <locationInfo>
      <latitude>90.123</latitude>
      <longitude>80.123</longitude>
      <altitude>10.0</altitude>
      <accuracy>0</accuracy>
    </locationInfo>
    <connectionType>Femto</connectionType>
    <operationStatus>Serviceable</operationStatus>
    <numberOfUsers>5</numberOfUsers>
    <interestRealm>NY</interestRealm>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints/ap01</resourceURL>
```



```
</accessPoint>
<accessPoint>
  <accessPointId>ap02</accessPointId>
  <locationInfo>
    <latitude>91.123</latitude>
    <longitude>81.123</longitude>
    <altitude>12.0</altitude>
    <accuracy>1</accuracy>
  </locationInfo>
  <connectionType>Femto</connectionType>
  <operationStatus>Unserviceable</operationStatus>
  <numberOfUsers>0</numberOfUsers>
  <interestRealm>DC</interestRealm>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints/ap02</resourceURL>
</accessPoint>
<accessPoint>
  <accessPointId>ap03</accessPointId>
  <locationInfo>
    <latitude>93.123</latitude>
    <longitude>83.123</longitude>
    <altitude>16.0</altitude>
    <accuracy>3</accuracy>
  </locationInfo>
  <connectionType>Femto</connectionType>
  <operationStatus>Serviceable</operationStatus>
  <numberOfUsers>5</numberOfUsers>
  <interestRealm>NY</interestRealm>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints/ap03</resourceURL>
</accessPoint>
<resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints</resourceURL>
</zp:accessPointList>
```

6.3.3.2 Example 2: Retrieve list of access points with same interest realm (Informative)

6.3.3.2.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints?interestRealm=NY HTTP/1.1
Host: example.com
Accept: application/xml
```

6.3.3.2.2 Response

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<zp:accessPointList xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <zoned>zone001</zoned>
  <accessPoint>
    <accessPointId>ap01</accessPointId>
    <locationInfo>
      <latitude>90.123</latitude>
      <longitude>80.123</longitude>
      <altitude>10.0</altitude>
      <accuracy>0</accuracy>
    </locationInfo>
    <connectionType>Femto</connectionType>
    <operationStatus>Serviceable</operationStatus>
    <numberOfUsers>5</numberOfUsers>
    <interestRealm>NY</interestRealm>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints/ap01</resourceURL>
  </accessPoint>
  <accessPoint>
    <accessPointId>ap03</accessPointId>
    <locationInfo>
      <latitude>93.123</latitude>
      <longitude>83.123</longitude>
      <altitude>16.0</altitude>
      <accuracy>3</accuracy>
    </locationInfo>
    <connectionType>Femto</connectionType>
    <operationStatus>Serviceable</operationStatus>
    <numberOfUsers>5</numberOfUsers>
    <interestRealm>NY</interestRealm>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints/ap03</resourceURL>
  </accessPoint>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints</resourceURL>
</zp:accessPointList>
```

6.3.4 PUT

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.3.5 POST

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.3.6 DELETE

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.4 Resource: Individual access point information

The resource used is:

http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/zones/{zoneId}/accessPoints/{accessPointId}

This resource is used for retrieving individual access point information.

6.4.1 Request URL variables

The following request URL variables are common for all HTTP commands:

Name	Description
serverRoot	Server base url: hostname+port+base path. Port and base path are OPTIONAL. Example: example.com/exampleAPI
apiVersion	Version of the API client wants to use. The value of this variable is defined in section 5.1.
zoneOwnerId	Identifier of zone owner (e.g. zowner0001)
zoneId	Identifier of zone (e.g. zone001).
accessPointId	Identifier of access point (e.g. ap01).

See section 6 for a statement on the escaping of reserved characters in URL variables.

6.4.2 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to Zonal Presence, see section 7.

6.4.3 GET

This operation is used for retrieving individual access point information.

6.4.3.1 Example: Retrieve individual access point information (Informative)

6.4.3.1.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints/ap01 HTTP/1.1
Host: example.com
Accept: application/xml
```

6.4.3.1.2 Response

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
```

```
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<zp:accessPointInfo xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <accessPointId>ap01</accessPointId>
  <locationInfo>
    <latitude>90.123</latitude>
    <longitude>80.123</longitude>
    <altitude>10.0</altitude>
    <accuracy>0</accuracy>
  </locationInfo>
  <connectionType>Femto</connectionType>
  <operationStatus>Serviceable</operationStatus>
  <numberOfUsers>5</numberOfUsers>
  <interestRealm>NY</interestRealm>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/owner0001/zones/zone001/accessPoints/ap01</resourceURL>
</zp:accessPointInfo>
```

6.4.4 PUT

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.4.5 POST

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.4.6 DELETE

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.5 Resource: User list

The resource used is:

http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/users

This resource is used for retrieving list of users.

6.5.1 Request URL variables

The following request URL variables are common for all HTTP commands:

Name	Description
serverRoot	Server base url: hostname+port+base path. Port and base path are OPTIONAL. Example: example.com/exampleAPI
apiVersion	Version of the API client wants to use. The value of this variable is defined in section 5.1.
zoneOwnerId	Identifier of zone owner (e.g. zowner0001)

See section 6 for a statement on the escaping of reserved characters in URL variables.

6.5.2 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to Zonal Presence, see section 7.

6.5.3 GET

This operation is used for retrieving list of users.

Supported parameters in the query string of the Request URL are:

Name	Type/Values	Optional	Description
zoneld	xsd:string	Yes	Identifier of zone (e.g. zone001).
accessPointId	xsd:string	Yes	Identifier of access point (e.g. ap01).

6.5.3.1 Example 1: Retrieve list of users (Informative)

6.5.3.1.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/users HTTP/1.1
Host: example.com
Accept: application/xml
```

6.5.3.1.2 Response

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<zp:userList xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <user>
    <address>tel:+19585550100</address>
    <accessPointId>ap01</accessPointId>
    <zoned>zone001</zoned>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550100</resourceURL>
  </user>
  <user>
    <address>tel:+19585550101</address>
    <accessPointId>ap01</accessPointId>
    <zoned>zone001</zoned>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550101</resourceURL>
  </user>
  <user>
    <address>tel:+19585550102</address>
    <accessPointId>ap01</accessPointId>
    <zoned>zone002</zoned>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550102</resourceURL>
  </user>
  <user>
    <address>tel:+19585550103</address>
    <accessPointId>ap01</accessPointId>
    <zoned>zone002</zoned>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550103</resourceURL>
  </user>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users</resourceURL>
</zp:userList>
```

6.5.3.2 Example 2: Retrieve list of users in a zone (Informative)

6.5.3.2.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/users?zoneld=zone001 HTTP/1.1
Host: example.com
Accept: application/xml
```

6.5.3.2.2 Response

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<zp:userList xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <user>
    <address>tel:+19585550100</address>
    <accessPointId>ap01</accessPointId>
    <zoneld>zone001</zoneld>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550100</resourceURL>
  </user>
  <user>
    <address>tel:+19585550101</address>
    <accessPointId>ap01</accessPointId>
    <zoneld>zone001</zoneld>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550101</resourceURL>
  </user>
  <user>
    <address>tel:+19585550102</address>
    <accessPointId>ap03</accessPointId>
    <zoneld>zone001</zoneld>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550102</resourceURL>
  </user>
  <user>
    <address>tel:+19585550103</address>
    <accessPointId>ap03</accessPointId>
    <zoneld>zone001</zoneld>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550103</resourceURL>
  </user>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users</resourceURL>
</zp:userList>
```

6.5.3.3 Example 3: Retrieve list of users in an access point (Informative)

6.5.3.3.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/users?zoneld=zone001&accessPointId=ap01 HTTP/1.1
Host: example.com
Accept: application/xml
```

6.5.3.3.2 Response

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<zp:userList xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <user>
    <address>tel:+19585550100</address>
    <accessPointId>ap01</accessPointId>
    <zoneld>zone001</zoneld>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550100</resourceURL>
  </user>
  <user>
    <address>tel:+19585550101</address>
    <accessPointId>ap01</accessPointId>
    <zoneld>zone001</zoneld>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550101</resourceURL>
  </user>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users</resourceURL>
</zp:userList>
```

6.5.4 PUT

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.5.5 POST

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.5.6 DELETE

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.6 Resource: Individual user information

The resource used is:

http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/users/{userId}

This resource is used for retrieving individual user information.

6.6.1 Request URL variables

The following request URL variables are common for all HTTP commands:

Name	Description
serverRoot	Server base url: hostname+port+base path. Port and base path are OPTIONAL. Example: example.com/exampleAPI
apiVersion	Version of the API client wants to use. The value of this variable is defined in section 5.1.
zoneOwnerId	Identifier of zone owner (e.g. zowner0001)
userId	Identifier of user (e.g. tel:+19585550100, acr:pseudonym123)

See section 6 for a statement on the escaping of reserved characters in URL variables.

6.6.2 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to Zonal Presence, see section 7.

6.6.3 GET

This operation is used for retrieving individual user information.

6.6.3.1 Example: Retrieve individual user information (Informative)

6.6.3.1.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550100 HTTP/1.1
Host: example.com
Accept: application/xml
```

6.6.3.1.2 Response

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<zp:userInfo xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <address>tel:+19585550100</address>
  <accessPointId>ap01</accessPointId>
  <zoneId>zone001</zoneId>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550100</resourceURL>
</zp:userInfo>
```

6.6.4 PUT

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.6.5 POST

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.6.6 DELETE

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.7 Resource: Zonal traffic change notification subscriptions

The resource used is:

http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/subscriptions/zonalTraffic

This resource is used for controlling subscriptions to notification about zonal traffic change.

This resource can be used in conjunction with a Client-side Notification URL, or in conjunction with a Server-side Notification URL. In this latter case, the application **MUST** first create a Notification Channel (see [REST_NetAPI_NotificationChannel]) before creating a subscription.

6.7.1 Request URL variables

The following request URL variables are common for all HTTP commands:

Name	Description
serverRoot	Server base url: hostname+port+base path. Port and base path are OPTIONAL. Example: example.com/exampleAPI
apiVersion	Version of the API client wants to use. The value of this variable is defined in section 5.1.
zoneOwnerId	Identifier of zone owner (e.g. zowner0001)

See section 6 for a statement on the escaping of reserved characters in URL variables.

6.7.2 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to Zonal Presence, see section 7.

6.7.3 GET

This operation is used for retrieving all active subscriptions to zonal traffic change notifications.

6.7.3.1 Example: Retrieve zonal traffic subscriptions (Informative)

6.7.3.1.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic HTTP/1.1
Accept: application/xml
Host: example.com
```

6.7.3.1.2 Response

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

<?xml version="1.0" encoding="UTF-8"?>
<zp.notificationSubscriptionList xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <zonalTrafficSubscription>
    <clientCorrelator>0001</clientCorrelator>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123</resourceURL>
    <callbackReference>
      <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
    </callbackReference>
    <zoneld>zone001</zoneld>
    <interestRealm>NY</interestRealm>
    <userEventCriteria>Entering</userEventCriteria>
  </zonalTrafficSubscription>
  <zonalTrafficSubscription>
    <clientCorrelator>0002</clientCorrelator>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub124</resourceURL>
    <callbackReference>
      <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
    </callbackReference>
    <zoneld>zone002</zoneld>
    <interestRealm>DC</interestRealm>
    <userEventCriteria>Entering</userEventCriteria>
  </zonalTrafficSubscription>
</resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic</resourceURL>
</zp.notificationSubscriptionList>
```

6.7.4 PUT

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the ‘Allow: GET, POST’ field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.7.5 POST

This operation is used for creating a new subscription to zonal traffic change notification.

The notifyURL in the callbackReference either contains the Client-side Notification URL (as defined by the client) or the Server-side Notification URL (as obtained during the creation of the Notification Channel [REST_NetAPI_NotificationChannel]).

6.7.5.1 Example 1: Create new zonal traffic subscription (Informative)

6.7.5.1.1 Request

```
POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic HTTP/1.1
Content-Type: application/xml
Content-Length: nnnn
Accept: application/xml
Host: example.com

<?xml version="1.0" encoding="UTF-8"?>
<zp:zonalTrafficSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <zoned>zone001</zoned>
  <interestRealm>NY</interestRealm>
  <userEventCriteria>Entering</userEventCriteria>
</zp:zonalTrafficSubscription >
```

6.7.5.1.2 Response

```
HTTP/1.1 201 Created
Content-Type: application/xml
Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

<zp:zonalTrafficSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123</resourceURL>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <zoned>zone001</zoned>
  <interestRealm>NY</interestRealm>
  <userEventCriteria>Entering</userEventCriteria>
</zp:zonalTrafficSubscription >
```

6.7.5.2 Example 2: Create new zonal traffic subscription, response with location of created resource (Informative)

6.7.5.2.1 Request

```
POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic HTTP/1.1
Content-Type: application/xml
```

```
Content-Length: nnnn
Accept: application/xml
Host: example.com

<?xml version="1.0" encoding="UTF-8"?>
<zp:zonalTrafficSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <zoned>zone001</zoned>
  <interestRealm>NY</interestRealm>
  <userEventCriteria>Entering</userEventCriteria>
</zp:zonalTrafficSubscription >
```

6.7.5.2.2 Response

```
HTTP/1.1 201 Created
Content-Type: application/xml
Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

<?xml version="1.0" encoding="UTF-8"?>
<common:resourceReference xmlns:common="urn:oma:xml:rest:netapi:common:1">
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123</resourceURL>
</common:resourceReference>
```

6.7.6 DELETE

Method not allowed by the resource. The returned HTTP error status is 405. The server **SHOULD** also include the 'Allow: GET, POST' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.8 Resource: Individual zonal traffic change notification subscription

The resource used is:

http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/subscriptions/zonalTraffic/{subscriptionId}

This resource is used for controlling individual subscription to notification about zonal traffic change.

6.8.1 Request URL variables

The following request URL variables are common for all HTTP commands:

Name	Description
serverRoot	Server base url: hostname+port+base path. Port and base path are OPTIONAL. Example: example.com/exampleAPI
apiVersion	Version of the API client wants to use. The value of this variable is defined in section 5.1.
zoneOwnerId	Identifier of zone owner (e.g. zowner0001)
subscriptionId	Identifier of the subscription. Example: sub123

See section 6 for a statement on the escaping of reserved characters in URL variables.

6.8.2 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to Zonal Presence, see section 7.

6.8.3 GET

This operation is used for retrieving an individual subscription to zonal traffic change notification.

6.8.3.1 Example: Retrieve individual zonal traffic subscription (Informative)

6.8.3.1.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123 HTTP/1.1
Accept: application/xml
Host: example.com
```

6.8.3.1.2 Response

```

HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

<?xml version="1.0" encoding="UTF-8"?>
<zp:zonalTrafficSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123</resourceURL>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <zoneId>zone001</zoneId>
  <interestRealm>NY</interestRealm>
  <userEventCriteria>Entering</userEventCriteria>
</zp:zonalTrafficSubscription>

```

6.8.4 PUT

This operation is used for updating an individual subscription to zonal traffic change notification.

6.8.4.1 Example: Update individual zonal traffic subscription (Informative)

6.8.4.1.1 Request

```

PUT /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123 HTTP/1.1
Content-Type: application/xml
Content-Length: nnnn
Accept: application/xml
Host: example.com

<?xml version="1.0" encoding="UTF-8"?>
<zp:zonalTrafficSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123</resourceURL>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <zoneId>zone001</zoneId>
  <interestRealm>NY</interestRealm>
  <userEventCriteria>Leaving</userEventCriteria>
</zp:zonalTrafficSubscription >

```


6.8.4.1.2 Response

```

HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

<?xml version="1.0" encoding="UTF-8"?>
<zp:zonalTrafficSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123</resourceURL>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <zoned>zone001</zoned>
  <interestRealm>NY</interestRealm>
  <userEventCriteria>Leaving</userEventCriteria>
</zp:zonalTrafficSubscription >

```

6.8.5 POST

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET, PUT, DELETE' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.8.6 DELETE

This operation is used for cancelling a subscription and stopping corresponding notifications.

6.8.6.1 Example: Cancelling a subscription (Informative)

6.8.6.1.1 Request

```

DELETE /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123 HTTP/1.1
Accept: application/xml
Host: example.com

```

6.8.6.1.2 Response

```

HTTP/1.1 204 No Content
Date: Tue, 03 Feb 2015 02:51:59 GMT

```

6.9 Resource: User tracking change notification subscriptions

The resource used is:

http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/subscriptions/userTracking

This resource is used for controlling subscriptions to notification about user tracking change.

This resource can be used in conjunction with a Client-side Notification URL, or in conjunction with a Server-side Notification URL. In this latter case, the application MUST first create a Notification Channel (see [REST_NetAPI_NotificationChannel]) before creating a subscription.

6.9.1 Request URL variables

The following request URL variables are common for all HTTP commands:

Name	Description
serverRoot	Server base url: hostname+port+base path. Port and base path are OPTIONAL. Example: example.com/exampleAPI
apiVersion	Version of the API client wants to use. The value of this variable is defined in section 5.1.
zoneOwnerId	Identifier of zone owner (e.g. zowner0001)

See section 6 for a statement on the escaping of reserved characters in URL variables.

6.9.2 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to Zonal Presence, see section 7.

6.9.3 GET

This operation is used for retrieving all active subscriptions to user tracking change notifications.

6.9.3.1 Example: Retrieve user tracking subscriptions (Informative)

6.9.3.1.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking HTTP/1.1
Accept: application/xml
Host: example.com
```

6.9.3.1.2 Response

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

<?xml version="1.0" encoding="UTF-8"?>
<zp.notificationSubscriptionList xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <userTrackingSubscription>
    <clientCorrelator>0001</clientCorrelator>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123</resourceURL>
    <callbackReference>
      <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
    </callbackReference>
    <address>tel:+19585550100</address>
    <userEventCriteria>Entering</userEventCriteria>
  </userTrackingSubscription>
  <userTrackingSubscription>
    <clientCorrelator>0002</clientCorrelator>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub124</resourceURL>
    <callbackReference>
      <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
    </callbackReference>
  </userTrackingSubscription>
</zp.notificationSubscriptionList>
```

```

</callbackReference>
<address>tel:+19585550101</address>
<userEventCriteria>Entering</userEventCriteria>
</userTrackingSubscription>
<resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking</resourceURL>
</zp.notificationSubscriptionList>

```

6.9.4 PUT

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET, POST' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.9.5 POST

This operation is used for creating a new subscription to user tracking change notification.

The notifyURL in the callbackReference either contains the Client-side Notification URL (as defined by the client) or the Server-side Notification URL (as obtained during the creation of the Notification Channel [REST_NetAPI_NotificationChannel]).

6.9.5.1 Example 1: Create new user tracking subscription using tel URI (Informative)

6.9.5.1.1 Request

```

POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking HTTP/1.1
Content-Type: application/xml
Content-Length: nnnn
Accept: application/xml
Host: example.com

<?xml version="1.0" encoding="UTF-8"?>
<zp:userTrackingSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <address>tel:+19585550100</address>
  <userEventCriteria>Entering</userEventCriteria>
</zp:userTrackingSubscription>

```

6.9.5.1.2 Response

HTTP/1.1 201 Created
Content-Type: application/xml
Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

```
<?xml version="1.0" encoding="UTF-8"?>
<zp:userTrackingSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123</resourceURL>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <address>tel:+19585550100</address>
  <userEventCriteria>Entering</userEventCriteria>
</zp:userTrackingSubscription>
```

6.9.5.2 Example 2: Create new user tracking subscription using ACR (Informative)

6.9.5.2.1 Request

POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking HTTP/1.1
Content-Type: application/xml
Content-Length: nnnn
Accept: application/xml
Host: example.com

```
<?xml version="1.0" encoding="UTF-8"?>
<zp:userTrackingSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <address>acr:pseudonym123</address>
  <userEventCriteria>Entering</userEventCriteria>
</zp:userTrackingSubscription>
```

6.9.5.2.2 Response

HTTP/1.1 201 Created
 Content-Type: application/xml
 Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123
 Content-Length: nnnn
 Date: Tue, 03 Feb 2015 02:51:59 GMT

```
<?xml version="1.0" encoding="UTF-8"?>
<zp:userTrackingSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123</resourceURL>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <address>acr:pseudonym123</address>
  <userEventCriteria>Entering</userEventCriteria>
</zp:userTrackingSubscription>
```

6.9.5.3 Example 3: Create new user tracking subscription using tel URI, response with location of created resource (Informative)

6.9.5.3.1 Request

POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking HTTP/1.1
 Content-Type: application/xml
 Content-Length: nnnn
 Accept: application/xml
 Host: example.com

```
<?xml version="1.0" encoding="UTF-8"?>
<zp:userTrackingSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <address>tel:+19585550100</address>
  <userEventCriteria>Entering</userEventCriteria>
</zp:userTrackingSubscription>
```

6.9.5.3.2 Response

HTTP/1.1 201 Created
 Content-Type: application/xml
 Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123
 Content-Length: nnnn
 Date: Tue, 03 Feb 2015 02:51:59 GMT

```
<?xml version="1.0" encoding="UTF-8"?>
<common:resourceReference xmlns:common="urn:oma:xml:rest:netapi:common:1">
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123</resourceURL>
</common:resourceReference>
```

6.9.6 DELETE

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET, POST' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.10 Resource: Individual user tracking change notification subscription

The resource used is:

`http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/subscriptions/userTracking/{subscriptionId}`

This resource is used for controlling individual subscription to notification about user tracking change.

6.10.1 Request URL variables

The following request URL variables are common for all HTTP commands:

Name	Description
serverRoot	Server base url: hostname+port+base path. Port and base path are OPTIONAL. Example: example.com/exampleAPI
apiVersion	Version of the API client wants to use. The value of this variable is defined in section 5.1.
zoneOwnerId	Identifier of zone owner (e.g. zowner0001)
subscriptionId	Identifier of the subscription. Example: sub123

See section 6 for a statement on the escaping of reserved characters in URL variables.

6.10.2 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to Zonal Presence, see section 7.

6.10.3 GET

This operation is used for retrieving an individual subscription to user tracking change notification.

6.10.3.1 Example: Retrieve individual user tracking subscription (Informative)

6.10.3.1.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123 HTTP/1.1
Accept: application/xml
Host: example.com
```

6.10.3.1.2 Response

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

<?xml version="1.0" encoding="UTF-8"?>
<zp:userTrackingSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123</resourceURL>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <address>tel:+19585550100</address>
  <userEventCriteria>Entering</userEventCriteria>
</zp:userTrackingSubscription>
```

6.10.4 PUT

This operation is used for updating an individual subscription to user tracking change notification.

6.10.4.1 Example: Update individual user tracking subscription (Informative)

6.10.4.1.1 Request

```
PUT /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123 HTTP/1.1
Content-Type: application/xml
Content-Length: nnnn
Accept: application/xml
Host: example.com

<?xml version="1.0" encoding="UTF-8"?>
<zp:userTrackingSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123</resourceURL>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <address>tel:+19585550100</address>
  <userEventCriteria>Leaving</userEventCriteria>
</zp:userTrackingSubscription>
```

6.10.4.1.2 Response

```

HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

<?xml version="1.0" encoding="UTF-8"?>
<zp:userTrackingSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123</resourceURL>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <address>tel:+19585550100</address>
  <userEventCriteria>Leaving</userEventCriteria>
</zp:userTrackingSubscription>

```

6.10.5 POST

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET, PUT, DELETE' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.10.6 DELETE

This operation is used for cancelling a subscription and stopping corresponding notifications.

6.10.6.1 Example: Cancelling a subscription (Informative)

6.10.6.1.1 Request

```

DELETE /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123 HTTP/1.1
Accept: application/xml
Host: example.com

```

6.10.6.1.2 Response

```

HTTP/1.1 204 No Content
Date: Tue, 03 Feb 2015 02:51:59 GMT

```

6.11 Resource: Zone status change notification subscriptions

The resource used is:

http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/subscriptions/zoneStatus

This resource is used for controlling subscriptions to notification about zone status change.

This resource can be used in conjunction with a Client-side Notification URL, or in conjunction with a Server-side Notification URL. In this latter case, the application MUST first create a Notification Channel (see [REST_NetAPI_NotificationChannel]) before creating a subscription.

6.11.1 Request URL variables

The following request URL variables are common for all HTTP commands:

Name	Description
serverRoot	Server base url: hostname+port+base path. Port and base path are OPTIONAL. Example: example.com/exampleAPI
apiVersion	Version of the API client wants to use. The value of this variable is defined in section 5.1.
zoneOwnerId	Identifier of zone owner (e.g. zowner0001)

See section 6 for a statement on the escaping of reserved characters in URL variables.

6.11.2 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to Zonal Presence, see section 7.

6.11.3 GET

This operation is used for retrieving all active subscriptions to zone status change notifications.

6.11.3.1 Example: Retrieve zone status subscriptions (Informative)

6.11.3.1.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus HTTP/1.1
Accept: application/xml
Host: example.com
```

6.11.3.1.2 Response

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

<?xml version="1.0" encoding="UTF-8"?>
<zp.notificationSubscriptionList xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <zoneStatusSubscription>
    <clientCorrelator>0001</clientCorrelator>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123</resourceURL>
    <callbackReference>
      <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
    </callbackReference>
    <zoneId>zone001</zoneId>
    <numberOfUsersZoneThreshold>500</numberOfUsersZoneThreshold>
    <operationStatus>Serviceable</operationStatus>
  </zoneStatusSubscription>
  <zoneStatusSubscription>
    <clientCorrelator>0002</clientCorrelator>
    <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub124</resourceURL>
    <callbackReference>
      <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
    </callbackReference>
    <zoneId>zone002</zoneId>
    <numberOfUsersAPThreshold>50</numberOfUsersAPThreshold>
```

```

</zoneStatusSubscription>
<resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus</resourceURL>
</zp.notificationSubscriptionList>

```

6.11.4 PUT

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET, POST' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.11.5 POST

This operation is used for creating a new subscription to zone status change notification.

The notifyURL in the callbackReference either contains the Client-side Notification URL (as defined by the client) or the Server-side Notification URL (as obtained during the creation of the Notification Channel [REST_NetAPI_NotificationChannel]).

6.11.5.1 Example 1: Create new zone status subscription (Informative)

6.11.5.1.1 Request

```

POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus HTTP/1.1
Content-Type: application/xml
Content-Length: nnnn
Accept: application/xml
Host: example.com

<?xml version="1.0" encoding="UTF-8"?>
<zp:zoneStatusSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <zoneId>zone001</zoneId>
  <numberOfUsersZoneThreshold>500</numberOfUsersZoneThreshold>
  <operationStatus>Serviceable</operationStatus>
</zp:zoneStatusSubscription>

```

6.11.5.1.2 Response

HTTP/1.1 201 Created
 Content-Type: application/xml
 Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123
 Content-Length: nnnn
 Date: Tue, 03 Feb 2015 02:51:59 GMT

```
<?xml version="1.0" encoding="UTF-8"?>
<zp:zoneStatusSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123</resourceURL>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <zoneId>zone001</zoneId>
  <numberOfUsersZoneThreshold>500</numberOfUsersZoneThreshold>
  <operationStatus>Serviceable</operationStatus>
</zp:zoneStatusSubscription>
```

6.11.5.2 Example 2: Create new zone status subscription, response with location of created resource (Informative)

6.11.5.2.1 Request

POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus HTTP/1.1
 Content-Type: application/xml
 Content-Length: nnnn
 Accept: application/xml
 Host: example.com

```
<?xml version="1.0" encoding="UTF-8"?>
<zp:zoneStatusSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <zoneId>zone001</zoneId>
  <numberOfUsersZoneThreshold>500</numberOfUsersZoneThreshold>
  <operationStatus>Serviceable</operationStatus>
</zp:zoneStatusSubscription>
```

6.11.5.2.2 Response

HTTP/1.1 201 Created
 Content-Type: application/xml
 Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123
 Content-Length: nnnn
 Date: Tue, 03 Feb 2015 02:51:59 GMT

```
<?xml version="1.0" encoding="UTF-8"?>
<common:resourceReference xmlns:common="urn:oma:xml:rest:netapi:common:1">
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123</resourceURL>
</common:resourceReference>
```

6.11.6 DELETE

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: GET, POST' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.12 Resource: Individual zone status change notification subscription

The resource used is:

http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}/subscriptions/zoneStatus/{subscriptionId}

This resource is used for controlling individual subscription to notification about zone status change.

6.12.1 Request URL variables

The following request URL variables are common for all HTTP commands:

Name	Description
serverRoot	Server base url: hostname+port+base path. Port and base path are OPTIONAL. Example: example.com/exampleAPI
apiVersion	Version of the API client wants to use. The value of this variable is defined in section 5.1.
zoneOwnerId	Identifier of zone owner (e.g. zowner0001)
subscriptionId	Identifier of the subscription. Example: sub123

See section 6 for a statement on the escaping of reserved characters in URL variables.

6.12.2 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to Zonal Presence, see section 7.

6.12.3 GET

This operation is used for retrieving an individual subscription to zone status change notification.

6.12.3.1 Example: Retrieve individual zone status subscription (Informative)

6.12.3.1.1 Request

```
GET /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123 HTTP/1.1
Accept: application/xml
Host: example.com
```

6.12.3.1.2 Response

```
HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

<?xml version="1.0" encoding="UTF-8"?>
<zp:zoneStatusSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123</resourceURL>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <zoneId>zone001</zoneId>
  <numberOfUsersZoneThreshold>500</numberOfUsersZoneThreshold>
  <operationStatus>Serviceable</operationStatus>
</zp:zoneStatusSubscription>
```

6.12.4 PUT

This operation is used for updating an individual subscription to zone status change notification.

6.12.4.1 Example: Update individual zone status subscription (Informative)

6.12.4.1.1 Request

```
PUT /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123 HTTP/1.1
Content-Type: application/xml
Content-Length: nnnn
Accept: application/xml
Host: example.com

<?xml version="1.0" encoding="UTF-8"?>
<zp:zoneStatusSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123</resourceURL>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <zoneId>zone001</zoneId>
  <numberOfUsersZoneThreshold>250</numberOfUsersZoneThreshold>
  <operationStatus>Serviceable</operationStatus>
</zp:zoneStatusSubscription>
```

6.12.4.1.2 Response

```

HTTP/1.1 200 OK
Content-Type: application/xml
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

<?xml version="1.0" encoding="UTF-8"?>
<zp:zoneStatusSubscription xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <clientCorrelator>0001</clientCorrelator>
  <resourceURL>http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123</resourceURL>
  <callbackReference>
    <notifyURL>http://applicationClient.example.com/zonalpresence/notifications/77777</notifyURL>
  </callbackReference>
  <zoneId>zone001</zoneId>
  <numberOfUsersZoneThreshold>250</numberOfUsersZoneThreshold>
  <operationStatus>Serviceable</operationStatus>
</zp:zoneStatusSubscription>

```

6.12.5 POST

Method not allowed by the resource. The returned HTTP error status is 405. The server **SHOULD** also include the ‘Allow: GET, PUT, DELETE’ field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.12.6 DELETE

This operation is used for cancelling a subscription and stopping corresponding notifications.

6.12.6.1 Example: Cancelling a subscription (Informative)

6.12.6.1.1 Request

```

DELETE /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123 HTTP/1.1
Accept: application/xml
Host: example.com

```

6.12.6.1.2 Response

```

HTTP/1.1 204 No Content
Date: Tue, 03 Feb 2015 02:51:59 GMT

```

6.13 Resource: Client notification about zonal presence changes

This resource is a callback URL provided by the client for notification about Zonal Presence events.

The RESTful Zonal Presence API does not make any assumption about the structure of this URL. If this URL is a Client-side Notification URL, the server will POST notifications directly to it. If this URL is a Server-side Notification URL, the server uses it to determine the address of the Notification Server to which the notifications will subsequently be POSTed. The way the server determines the address of the Notification Server is out of scope of this specification.

Note: In the case when the client has set up a Notification Channel to obtain the notifications, the client needs to use the mechanisms described in [REST_NetAPI_NotificationChannel], instead of the mechanism described below in section 6.13.4.

6.13.1 Request URL variables

Client provided.

6.13.2 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to Zonal Presence, see section 7.

6.13.3 GET

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: POST' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.13.4 PUT

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: POST' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

6.13.5 POST

This operation is used for notifying client about zonal presence changes.

6.13.5.1 Example 1: Zonal presence notification for zonal traffic (Informative)

6.13.5.1.1 Request

```
POST /zonalpresence/notifications/77777 HTTP/1.1
Content-Type: application/xml
Accept: application/xml
Host: applicationClient.example.com

<?xml version="1.0" encoding="UTF-8"?>
<zp:zonalPresenceNotification xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <callbackData>12345</callbackData>
  <zonedId>zone001</zonedId>
  <address>tel:+19585550100</address>
  <interestRealm>NY</interestRealm>
  <userEventType>Entering</userEventType>
  <currentAccessPointId>ap01</currentAccessPointId>
  <timestamp>2015-02-03T02:51:57Z</timestamp>
  <link rel="ZonalTrafficSubscription"
    href="http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123"/>
</zp:zonalPresenceNotification>
```

6.13.5.1.2 Response

```
HTTP/1.1 204 No Content
Date: Tue, 03 Feb 2015 02:51:59 GMT
```

6.13.5.2 Example 2: Zonal presence notification for user tracking (Informative)

6.13.5.2.1 Request

```
POST /zonalpresence/notifications/77777 HTTP/1.1
Content-Type: application/xml
Accept: application/xml
Host: applicationClient.example.com
```

```
<?xml version="1.0" encoding="UTF-8"?>
<zp:zonalPresenceNotification xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <callbackData>12345</callbackData>
  <zoneId>zone002</zoneId>
  <address>tel:+19585550101</address>
  <userEventType>Entering</userEventType>
  <currentAccessPointId>ap02</currentAccessPointId>
  <timestamp>2015-02-03T02:51:57Z</timestamp>
  <link rel="UserTrackingSubscription"
    href="http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123"/>
</zp:zonalPresenceNotification>
```

6.13.5.2.2 Response

HTTP/1.1 204 No Content
Date: Tue, 03 Feb 2015 02:51:59 GMT

6.13.5.3 Example 3: Zone status notification (Informative)

6.13.5.3.1 Request

POST /zonalpresence/notifications/77777 HTTP/1.1
Content-Type: application/xml
Accept: application/xml
Host: applicationClient.example.com

```
<?xml version="1.0" encoding="UTF-8"?>
<zp:zoneStatusNotification xmlns:zp="urn:oma:xml:rest:netapi:zonalpresence:1">
  <callbackData>12345</callbackData>
  <zoneId>zone001</zoneId>
  <accessPointId>ap01</accessPointId>
  <numberOfUsersInAP>50</numberOfUsersInAP>
  <timestamp>2015-02-03T02:51:57Z</timestamp>
  <link rel="ZoneStatusSubscription"
    href="http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123"/>
</zp:zoneStatusNotification>
```

6.13.5.3.2 Response

HTTP/1.1 204 No Content
Date: Tue, 03 Feb 2015 02:51:59 GMT

6.13.6 DELETE

Method not allowed by the resource. The returned HTTP error status is 405. The server SHOULD also include the 'Allow: POST' field in the response as per section 6.5.5 and 7.4.1 of [RFC7231].

7. Fault definitions

7.1 Service Exceptions

For common Service Exceptions refer to [REST_NetAPI_Common]. There are no additional Service Exception codes defined for the RESTful Zonal Presence API.

7.2 Policy Exceptions

For common Policy Exceptions refer to [REST_NetAPI_Common]. There are no additional Policy Exception codes defined for the RESTful Zonal Presence API.

Appendix A. Change History

(Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-TS-REST_NetAPI_ZonalPresence-V1_0-20180621-A	21 Jun 2018	Status changed to Approved by ARC Doc Ref # OMA-ARC-2018-0025-INP_REST_NetAPI_ZonalPresence_V1_0_ERP_for_final_Approval

Appendix B. Static Conformance Requirements (Normative)

The notation used in this appendix is specified in [SCRRULES].

B.1 SCR for REST.ZonalPresence Server

Item	Function	Reference	Requirement
REST-ZON-SUPPORT-S-001-M	Support for the RESTful Zonal Presence API	5, 6	
REST-ZON-SUPPORT-S-002-M	Support for the XML request & response format	6	
REST-ZON-SUPPORT-S-003-M	Support for the JSON request & response format	6	

B.1.1 SCR for REST.ZonalPresence.ZoneList Server

Item	Function	Reference	Requirement
REST-ZON-ZL-S-001-M	Support for retrieving list of zones	6.1	
REST-ZON-ZL-S-002-O	Retrieving list of zones - GET	6.1.3	

B.1.2 SCR for REST.ZonalPresence.IndZoneInfo Server

Item	Function	Reference	Requirement
REST-ZON-IZI-S-001-M	Support for retrieving individual zone information	6.2	
REST-ZON-IZI-S-002-O	Retrieving individual zone information - GET	6.2.3	

B.1.3 SCR for REST.ZonalPresence.AccessPointList Server

Item	Function	Reference	Requirement
REST-ZON-APL-S-001-M	Support for retrieving list of access points	6.3	
REST-ZON-APL-S-002-O	Retrieving list of access points - GET	6.3.3	

B.1.4 SCR for REST.ZonalPresence.IndAccessPointInfo Server

Item	Function	Reference	Requirement
REST-ZON-I-API-S-001-M	Support for retrieving individual access point information	6.4	
REST-ZON-I-API-S-002-O	Retrieving individual access point information - GET	6.4.3	

B.1.5 SCR for REST.ZonalPresence.UserList Server

Item	Function	Reference	Requirement
REST-ZON-UL-S-001-M	Support for retrieving list of users	6.5	
REST-ZON-UL-S-002-O	Retrieving list of users - GET	6.5.3	

B.1.6 SCR for REST.ZonalPresence.IndUserInfo Server

Item	Function	Reference	Requirement
REST-ZON-IUI-S-001-M	Support for retrieving individual user information	6.6	
REST-ZON-IUI-S-002-O	Retrieving individual user information - GET	6.6.3	

B.1.7 SCR for REST.ZonalPresence.ZonalTrafficSubscr Server

Item	Function	Reference	Requirement
REST-ZON-ZTS-S-001-M	Support for zonal traffic subscriptions	6.7	
REST-ZON-ZTS-S-002-O	Read all active subscriptions - GET	6.7.3	
REST-ZON-ZTS-S-003-M	Create a new zonal traffic notification subscription for the client - POST	6.7.5	

B.1.8 SCR for REST.ZonalPresence.IndZonalTrafficSubscr Server

Item	Function	Reference	Requirement
REST-ZON-IZTS-S-001-M	Support for controlling individual subscription of zonal traffic	6.8	
REST-ZON-IZTS-S-002-O	Read individual subscription of zonal traffic - GET	6.8.3	
REST-ZON-IZTS-S-003-O	Update individual subscription of zonal traffic - PUT	6.8.4	
REST-ZON-IZTS-S-004-M	Delete a subscription of zonal traffic for the client - DELETE	6.8.6	

B.1.9 SCR for REST.ZonalPresence.UserTrackingSubscr Server

Item	Function	Reference	Requirement
REST-ZON-UTS-S-001-M	Support for user tracking subscriptions	6.9	
REST-ZON-UTS-S-002-O	Read all active subscriptions - GET	6.9.3	
REST-ZON-UTS-S-003-M	Create a new user tracking notification subscription for the client - POST	6.9.5	

B.1.10 SCR for REST.ZonalPresence.IndUserTrackingSubscr Server

Item	Function	Reference	Requirement
REST-ZON-IUTS-S-001-M	Support for controlling individual subscription of user tracking	6.10	
REST-ZON-IUTS-S-002-O	Read individual subscription of user tracking - GET	6.10.3	
REST-ZON-IUTS-S-003-O	Update individual subscription of user tracking - PUT	6.10.4	
REST-ZON-IUTS-S-004-M	Delete a subscription of user tracking for the client - DELETE	6.10.6	

B.1.11 SCR for REST.ZonalPresence.ZoneStatusSubscr Server

Item	Function	Reference	Requirement
REST-ZON-ZSS-S-001-M	Support for zone status subscriptions	6.11	
REST-ZON-ZSS-S-002-O	Read all active subscriptions - GET	6.11.3	
REST-ZON-ZSS-S-003-M	Create a new zone status notification subscription for the client - POST	6.11.5	

B.1.12 SCR for REST.ZonalPresence.IndZoneStatusSubscr Server

Item	Function	Reference	Requirement
REST-ZON-IZSS-S-001-M	Support for controlling individual subscription of zone status	6.12	
REST-ZON-IZSS-S-002-O	Read individual subscription of zone status - GET	6.12.3	
REST-ZON-IZSS-S-003-O	Update individual subscription of zone status - PUT	6.12.4	
REST-ZON-IZSS-S-004-M	Delete a subscription of zone status for the client - DELETE	6.12.6	

B.1.13 SCR for REST.ZonalPresence.ClientNotificationCallback Server

Item	Function	Reference	Requirement
REST-ZON-CNC-S-001-M	Support for notifying client about zonal presence changes	6.13	
REST-ZON-CNC-S-002-M	Notify client about zonal presence changes - POST	6.13.5	

Appendix C. JSON examples (Informative)

JSON (JavaScript Object Notation) is a Light-weight, text-based, language-independent data interchange format. It provides a simple means to represent basic name-value pairs, arrays and objects. JSON is relatively trivial to parse and evaluate using standard JavaScript libraries, and hence is suited for REST invocations from browsers or other processors with JavaScript engines. Further information on JSON can be found at [RFC7159].

The following examples show the request and response for various operations using the JSON data format. The examples follow the XML to JSON serialization rules in [REST_NetAPI_Common]. A JSON response can be obtained by using the content type negotiation mechanism specified in [REST_NetAPI_Common].

For full details on the operations themselves please refer to the section number indicated.

C.1 Retrieve list of zones (section 6.1.3.1)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/zones HTTP/1.1
Host: example.com
Accept: application/json
```

Response:

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/json
Content-Length: nnnn

{"zoneList": {
  "zone": [
    {
      "zoneId": "zone001",
      "numberOfAccessPoints": "3",
      "numberOfUnserviceableAccessPoints": "1",
      "numberOfUsers": "10",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001"
    },
    {
      "zoneId": "zone002",
      "numberOfAccessPoints": "12",
      "numberOfUnserviceableAccessPoints": "0",
      "numberOfUsers": "36",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone002"
    }
  ],
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones"
}}
```

C.2 Retrieve individual zone information (section 6.2.3.1)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/zones/zone001 HTTP/1.1
Host: example.com
Accept: application/json
```

Response:

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/json
Content-Length: nnnn

{"zoneInfo": {
  "zoneId": "zone001",
  "numberOfAccessPoints": "3",
  "numberOfUnserviceableAccessPoints": "1",
  "numberOfUsers": "10",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001"
}}
```

C.3 Retrieve list of access points (section 6.3.3.1)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints HTTP/1.1
Host: example.com
Accept: application/json
```

Response:

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/json
Content-Length: nnnn

{"accessPointList": {
  "zoneId": "zone001",
  "accessPoint": [
    {
      "accessPointId": "ap01",
      "locationInfo": {
        "latitude": "90.123",
        "longitude": "80.123",
        "altitude": "10.0",
        "accuracy": "0"
      },
      "connectionType": "Femto",
      "operationStatus": "Serviceable",
      "numberOfUsers": "5",
      "interestRealm": "NY",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints/ap01"
    }
  ]
}}
```

```
},
{
  "accessPointId": "ap02",
  "locationInfo": {
    "latitude": "91.123",
    "longitude": "81.123",
    "altitude": "12.0",
    "accuracy": "1"
  },
  "connectionType": "Femto",
  "operationStatus": "Unserviceable",
  "numberOfUsers": "0",
  "interestRealm": "DC",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints/ap02"
},
{
  "accessPointId": "ap03",
  "locationInfo": {
    "latitude": "93.123",
    "longitude": "83.123",
    "altitude": "16.0",
    "accuracy": "3"
  },
  "connectionType": "Femto",
  "operationStatus": "Serviceable",
  "numberOfUsers": "5",
  "interestRealm": "NY",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints/ap03"
}
],
"resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints"
}}
```


C.4 Retrieve list of access points with same interest realm (section 6.3.3.2)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints?interestRealm=NY HTTP/1.1
Host: example.com
Accept: application/json
```

Response:

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/json
Content-Length: nnnn

{"accessPointList": {
  "zoneId": "zone001",
  "accessPoint": [
    {
      "accessPointId": "ap01",
      "locationInfo": {
        "latitude": "90.123",
        "longitude": "80.123",
        "altitude": "10.0",
        "accuracy": "0"
      },
      "connectionType": "Femto",
      "operationStatus": "Serviceable",
      "numberOfUsers": "5",
      "interestRealm": "NY",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints/ap01"
    },
    {
      "accessPointId": "ap03",
      "locationInfo": {
        "latitude": "93.123",
        "longitude": "83.123",
        "altitude": "16.0",
        "accuracy": "3"
      },
      "connectionType": "Femto",
      "operationStatus": "Serviceable",
      "numberOfUsers": "5",
      "interestRealm": "NY",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints/ap03"
    }
  ],
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints"
}}
```

C.5 Retrieve individual access point information (section 6.4.3.1)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints/ap01 HTTP/1.1
Host: example.com
Accept: application/json
```

Response:

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/json
Content-Length: nnnn

{"accessPointInfo": {
  "accessPointId": "ap01",
  "locationInfo": {
    "latitude": "90.123",
    "longitude": "80.123",
    "altitude": "10.0",
    "accuracy": "0"
  },
  "connectionType": "Femto",
  "operationStatus": "Serviceable",
  "numberOfUsers": "5",
  "interestRealm": "NY",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones/zone001/accessPoints/ap01"
}}
```

C.6 Retrieve list of users (section 6.5.3.1)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/users HTTP/1.1
Host: example.com
Accept: application/json
```

Response:

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/json
Content-Length: nnnn

{"userList": {
  "user": [
    {
      "address": "tel:+19585550100",
      "accessPointId": "ap01",
      "zoneId": "zone001",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550100"
    },
    {
      "address": "tel:+19585550101",
      "accessPointId": "ap01",
      "zoneId": "zone001",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550101"
    },
    {
      "address": "tel:+19585550102",
      "accessPointId": "ap01",
      "zoneId": "zone002",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550102"
    },
    {
      "address": "tel:+19585550103",
      "accessPointId": "ap01",
      "zoneId": "zone002",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550103"
    }
  ],
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users"
}}
```

C.7 Retrieve list of users in a zone (section 6.5.3.2)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/users?zoneId=zone001 HTTP/1.1
Host: example.com
Accept: application/json
```

Response:

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/json
Content-Length: nnnn

{"userList": {
  "user": [
    {
      "address": "tel:+19585550100",
      "accessPointId": "ap01",
      "zoneId": "zone001",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550100"
    },
    {
      "address": "tel:+19585550101",
      "accessPointId": "ap01",
      "zoneId": "zone001",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550101"
    },
    {
      "address": "tel:+19585550102",
      "accessPointId": "ap03",
      "zoneId": "zone001",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550102"
    },
    {
      "address": "tel:+19585550103",
      "accessPointId": "ap03",
      "zoneId": "zone001",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550103"
    }
  ],
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users"
}}
```

C.8 Retrieve list of users in an access point (section 6.5.3.3)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/users?zoneId=zone001&accessPointId=ap01 HTTP/1.1
Host: example.com
Accept: application/json
```

Response:

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/json
Content-Length: nnnn

{"userList": {
  "user": [
    {
      "address": "tel:+19585550100",
      "accessPointId": "ap01",
      "zoneId": "zone001",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550100"
    },
    {
      "address": "tel:+19585550101",
      "accessPointId": "ap01",
      "zoneId": "zone001",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550101"
    }
  ],
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users"
}}
```

C.9 Retrieve individual user information (section 6.6.3.1)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550100 HTTP/1.1
Host: example.com
Accept: application/json
```

Response:

```
HTTP/1.1 200 OK
Date: Tue, 03 Feb 2015 02:51:59 GMT
Content-Type: application/json
Content-Length: nnnn

{"userInfo": {
  "address": "tel:+19585550100",
  "accessPointId": "ap01",
  "zoneId": "zone001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/users/tel%3A%2B19585550100"
}}
```

C.10 Retrieve zonal traffic subscriptions (section 6.7.3.1)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic HTTP/1.1
Accept: application/json
Host: example.com
```

Response:

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

{"notificationSubscriptionList": {
  "zonalTrafficSubscription": [
    {
      "clientCorrelator": "0001",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123",
      "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
      "zoneId": "zone001",
      "interestRealm": "NY",
      "userEventCriteria": "Entering"
    },
    {
      "clientCorrelator": "0002",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub124",
      "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
      "zoneId": "zone002",
      "interestRealm": "DC",
      "userEventCriteria": "Entering"
    }
  ],
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/zones"
}}
```

C.11 Create new zonal traffic subscription (section 6.7.5.1)

Request:

```
POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Accept: application/json
Host: example.com

{"zonalTrafficSubscription": {
  "clientCorrelator": "0001",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "zoneId": "zone001",
  "interestRealm": "NY",
  "userEventCriteria": "Entering"
}}
```

Response:

```
HTTP/1.1 201 Created
Content-Type: application/json
Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT
```

```
{"zonalTrafficSubscription": {
  "clientCorrelator": "0001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "zoneId": "zone001",
  "interestRealm": "NY",
  "userEventCriteria": "Entering"
}}
```

C.12 Create new zonal traffic subscription, response with location of created resource (section 6.7.5.2)

Request:

```
POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Accept: application/json
Host: example.com

{"zonalTrafficSubscription": {
  "clientCorrelator": "0001",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "zoneId": "zone001",
  "interestRealm": "NY",
  "userEventCriteria": "Entering"
}}
```

Response:

```
HTTP/1.1 201 Created
Content-Type: application/json
Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

{"resourceReference": {"resourceURL":
"http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123"}}
```

C.13 Retrieve individual zonal traffic subscription (section 6.8.3.1)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123 HTTP/1.1
Accept: application/json
Host: example.com
```

Response:

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

{"zonalTrafficSubscription": {
  "clientCorrelator": "0001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "zoneId": "zone001",
  "interestRealm": "NY",
  "userEventCriteria": "Entering"
}}
```

C.14 Update individual zonal traffic subscription (section 6.8.4.1)

Request:

```
PUT /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123 HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Accept: application/json
Host: example.com

{"zonalTrafficSubscription": {
  "clientCorrelator": "0001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "zoneId": "zone001",
  "interestRealm": "NY",
  "userEventCriteria": "Leaving"
}}
```


Response:

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

{"zonalTrafficSubscription": {
  "clientCorrelator": "0001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "zoneId": "zone001",
  "interestRealm": "NY",
  "userEventCriteria": "Leaving"
}}
```

C.15 Cancelling a subscription (section 6.8.6.1)

Request:

```
DELETE /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123 HTTP/1.1
Accept: application/json
Host: example.com
```

Response:

```
HTTP/1.1 204 No Content
Date: Tue, 03 Feb 2015 02:51:59 GMT
```

C.16 Retrieve user tracking subscriptions (section 6.9.3.1)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking HTTP/1.1
Accept: application/json
Host: example.com
```

Response:

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

{"notificationSubscriptionList": {
  "zonalTrafficSubscription": [
    {
      "clientCorrelator": "0001",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123",
      "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
      "address": "tel:+19585550100",
      "userEventCriteria": "Entering"
    },
    {

```

```

    "clientCorrelator": "0002",
    "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub124",
    "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
    "address": "tel:+19585550101",
    "userEventCriteria": "Entering"
  }
],
"resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking"
}}

```

C.17 Create new user tracking subscription using tel URI (section 6.9.5.1)

Request:

```

POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Accept: application/json
Host: example.com

{"userTrackingSubscription": {
  "clientCorrelator": "0001",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "address": "tel:+19585550100",
  "userEventCriteria": "Entering"
}}

```

Response:

```

HTTP/1.1 201 Created
Content-Type: application/json
Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

{"userTrackingSubscription": {
  "clientCorrelator": "0001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "address": "tel:+19585550100",
  "userEventCriteria": "Entering"
}}

```

C.18 Create new user tracking subscription using ACR (section 6.9.5.2)

Request:

```
POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Accept: application/json
Host: example.com

{"userTrackingSubscription": {
  "clientCorrelator": "0001",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "address": "acr:pseudonym123",
  "userEventCriteria": "Entering"
}}
```

Response:

```
HTTP/1.1 201 Created
Content-Type: application/json
Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

{"userTrackingSubscription": {
  "clientCorrelator": "0001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "address": "acr:pseudonym123",
  "userEventCriteria": "Entering"
}}
```

C.19 Create new user tracking subscription using tel URI, response with location of created resource (section 6.9.5.3)

Request:

```
POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Accept: application/json
Host: example.com

{"userTrackingSubscription": {
  "clientCorrelator": "0001",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "address": "tel:+19585550100",
  "userEventCriteria": "Entering"
}}
```

Response:

```
HTTP/1.1 201 Created
Content-Type: application/json
Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

{"resourceReference": {"resourceURL": "
http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123"}}
```

C.20 Retrieve individual user tracking subscription (section 6.10.3.1)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123 HTTP/1.1
Accept: application/json
Host: example.com
```

Response:

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

{"userTrackingSubscription": {
  "clientCorrelator": "0001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "address": "tel:+19585550100",
  "userEventCriteria": "Entering"
}}
```

C.21 Update individual user tracking subscription (section 6.10.4.1)

Request:

```
PUT /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123 HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Accept: application/json
Host: example.com
```

```
{"userTrackingSubscription": {
  "clientCorrelator": "0001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "address": "tel:+19585550100",
  "userEventCriteria": "Leaving"
}}
```

Response:

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT
```

```
{"userTrackingSubscription": {
  "clientCorrelator": "0001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "address": "tel:+19585550100",
  "userEventCriteria": "Leaving"
}}
```

C.22 Cancelling a subscription (section 6.10.6.1)

Request:

```
DELETE /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123 HTTP/1.1
Accept: application/json
Host: example.com
```

Response:

```
HTTP/1.1 204 No Content
Date: Tue, 03 Feb 2015 02:51:59 GMT
```

C.23 Retrieve zone status subscriptions (section 6.11.3.1)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus HTTP/1.1
Accept: application/json
Host: example.com
```

Response:

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

{"notificationSubscriptionList": {
  "zoneStatusSubscription": [
    {
      "clientCorrelator": "0001",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123",
      "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
      "zoneId": "zone001",
      "numberOfUsersZoneThreshold": "500",
      "operationStatus": "Serviceable"
    },
    {
      "clientCorrelator": "0002",
      "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub124",
      "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
      "zoneId": "zone002",
      "numberOfUsersAPThreshold": "50",
    }
  ],
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus"
}}
```

C.24 Create new zone status subscription (section 6.11.5.1)

Request:

```
POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Accept: application/json
Host: example.com

{"zoneStatusSubscription": {
  "clientCorrelator": "0001",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "zoneId": "zone001",
  "numberOfUsersZoneThreshold": "500",
  "operationStatus": "Serviceable"
}}
```

Response:

```

HTTP/1.1 201 Created
Content-Type: application/json
Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

```

```

{"zoneStatusSubscription": {
  "clientCorrelator": "0001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "zoneId": "zone001",
  "numberOfUsersZoneThreshold": "500",
  "operationStatus": "Serviceable"
}}

```

C.25 Create new zone status subscription, response with location of created resource (section 6.11.5.2)

Request:

```

POST /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Accept: application/json
Host: example.com

```

```

{"zoneStatusSubscription": {
  "clientCorrelator": "0001",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "zoneId": "zone001",
  "numberOfUsersZoneThreshold": "500",
  "operationStatus": "Serviceable"
}}

```

Response:

```

HTTP/1.1 201 Created
Content-Type: application/json
Location: http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

```

```

{"resourceReference": {"resourceURL": "
http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123"}}

```

C.26 Retrieve individual zone status subscription (section 6.12.3.1)

Request:

```
GET /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123 HTTP/1.1
Accept: application/json
Host: example.com
```

Response:

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

{"zoneStatusSubscription": {
  "clientCorrelator": "0001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "zoneId": "zone001",
  "numberOfUsersZoneThreshold": "500",
  "operationStatus": "Serviceable"
}}
```

C.27 Update individual zone status subscription (section 6.12.4.1)

Request:

```
PUT /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123 HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Accept: application/json
Host: example.com

{"zoneStatusSubscription": {
  "clientCorrelator": "0001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "zoneId": "zone001",
  "numberOfUsersZoneThreshold": "250",
  "operationStatus": "Serviceable"
}}
```


Response:

```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: nnnn
Date: Tue, 03 Feb 2015 02:51:59 GMT

{"zoneStatusSubscription": {
  "clientCorrelator": "0001",
  "resourceURL": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123",
  "callbackReference": {"notifyURL": "http://applicationClient.example.com/zonalpresence/notifications/77777"},
  "zoneId": "zone001",
  "numberOfUsersZoneThreshold": "250",
  "operationStatus": "Serviceable"
}}
```

C.28 Cancelling a subscription (section 6.12.6.1)

Request:

```
DELETE /exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123 HTTP/1.1
Accept: application/json
Host: example.com
```

Response:

```
HTTP/1.1 204 No Content
Date: Tue, 03 Feb 2015 02:51:59 GMT
```

C.29 Zonal presence notification for zonal traffic (section 6.13.5.1)

Request:

```
POST /zonalpresence/notifications/77777 HTTP/1.1
Content-Type: application/json
Accept: application/json
Host: applicationClient.example.com

{"zonalPresenceNotification": {
  "callbackData": "12345",
  "zoneId": "zone001",
  "address": "tel:+19585550100",
  "interestRealm": "NY",
  "userEventType": "Entering",
  "currentAccessPointId": "ap01",
  "timestamp": "2015-02-03T02:51:57Z"
  "link": {
    "rel": "ZonalTrafficSubscription",
    "href": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zonalTraffic/sub123"
  }
}}
```

Response:

HTTP/1.1 204 No Content
Date: Tue, 03 Feb 2015 02:51:59 GMT

C.30 Zonal presence notification for user tracking (section 6.13.5.2)

Request:

```
POST /zonalpresence/notifications/77777 HTTP/1.1
Content-Type: application/json
Accept: application/json
Host: applicationClient.example.com
```

```
{"zonalPresenceNotification": {
  "callbackData": "12345",
  "zoneId": "zone002",
  "address": "tel:+19585550101",
  "userEventType": "Entering",
  "currentAccessPointId": "ap02",
  "timestamp": "2015-02-03T02:51:57Z"
  "link": {
    "rel": "UserTrackingSubscription",
    "href": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/userTracking/sub123"
  }
}}
```

Response:

HTTP/1.1 204 No Content
Date: Tue, 03 Feb 2015 02:51:59 GMT

C.31 Zone status notification (section 6.13.5.3)

Request:

```
POST /zonalpresence/notifications/77777 HTTP/1.1
```

```
Content-Type: application/json
```

```
Accept: application/json
```

```
Host: applicationClient.example.com
```

```
{
  "zoneStatusNotification": {
    "callbackData": "12345",
    "zoneId": "zone001",
    "accessPointId": "ap01",
    "numberOfUsers": "50",
    "timestamp": "2015-02-03T02:51:57Z",
    "link": {
      "rel": "ZoneStatusSubscription",
      "href": "http://example.com/exampleAPI/zonalpresence/v1/zowner0001/subscriptions/zoneStatus/sub123"
    }
  }
}
```

Response:

```
HTTP/1.1 204 No Content
```

```
Date: Tue, 03 Feb 2015 02:51:59 GMT
```

Appendix D. Operations mapping

(Informative)

As this specification does not have a baseline specification, this appendix is empty.

Appendix E. Light-weight Resources (Informative)

As this version of the specification does not define any Light-weight Resources, this appendix is empty.

Appendix F. Authorization aspects (Normative)

This appendix specifies how to use the RESTful Zonal Presence API in combination with some authorization frameworks.

F.1 Use with OMA Authorization Framework for Network APIs

The RESTful Zonal Presence API MAY support the authorization framework defined in [Autho4API_10].

A RESTful Zonal Presence API supporting [Autho4API_10]:

- SHALL conform to section D.1 of [REST_NetAPI_Common];
- SHALL conform to this section F.1.

F.1.1 Scope values

F.1.1.1 Definitions

In compliance with [Autho4API_10], an authorization server serving clients requests for getting authorized access to the resources exposed by the RESTful Zonal Presence API:

- SHALL support the scope values defined in the table below;
- MAY support scope values not defined in this specification.

Scope value	Description	For one-time access token
oma_rest_zonalpresence.all_{apiVersion}	Provide access to all defined operations on the resources in this version of the API. The {apiVersion} part of this identifier SHALL have the same value as the “apiVersion” URL variable which is defined in section 5.1. This scope value is the union of the other scope values listed in next rows of this table.	No
oma_rest_zonalpresence.poll	Provide access to all defined operations on polling zone, access point, and user.	No
oma_rest_zonalpresence.subscr	Provide access to all defined operations on zonal traffic, user tracking, and zone status subscriptions.	No

Table 1 Scope values for RESTful Zonal Presence API

F.1.1.2 Downscoping

In the case where the client requests authorization for “oma_rest_zonalpresence.all_{apiVersion}” scope, the authorization server and/or resource owner MAY restrict the granted scope to some of the following scope values:

- oma_rest_zonalpresence.poll
- oma_rest_zonalpresence.subscr

F.1.1.3 Mapping with resources and methods

Tables in this section specify how the scope values defined in section F.1.1.1 for the RESTful Zonal Presence API map to the REST resources and methods of this API. In these tables, the root “oma_rest_zonalpresence.” of scope values is omitted for readability reasons.

Resource	URL Base URL: http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}	Section reference	HTTP verbs			
			GET	PUT	POST	DELETE
Zone List	/zones	6.1	all_{apiVersion} or poll	n/a	n/a	n/a
Individual Zone Information	/zones/{zoneId}	6.2	all_{apiVersion} or poll	n/a	n/a	n/a
Access Point List	/zones/{zoneId}/accessPoints	6.3	all_{apiVersion} or poll	n/a	n/a	n/a
Individual Access Point Information	/zones/{zoneId}/accessPoints/{accessPointId}	6.4	all_{apiVersion} or poll	n/a	n/a	n/a
User List	/users	6.5	all_{apiVersion} or poll	n/a	n/a	n/a
Individual User Information	/users/{userId}	6.6	all_{apiVersion} or poll	n/a	n/a	n/a

Table 2 Required scope values for: polling zone, access point, and user

Resource	URL Base URL: http://{serverRoot}/zonalpresence/{apiVersion}/{zoneOwnerId}	Section reference	HTTP verbs			
			GET	PUT	POST	DELETE
Zonal traffic change notification subscriptions	/zonalTraffic	6.7	all_{apiVersion} or subscr	n/a	all_{apiVersion} or subscr	n/a
Individual zonal traffic change notification subscription	/zonalTraffic/{subscriptionId}	6.8	all_{apiVersion} or subscr	all_{apiVersion} or subscr	n/a	all_{apiVersion} or subscr
User tracking change notification subscriptions	/userTracking	6.9	all_{apiVersion} or subscr	n/a	all_{apiVersion} or subscr	n/a

Individual user tracking change notification subscription	/userTracking /{subscriptionId}	6.10	all_{apiVersion} or subscr	all_{apiVersion} or subscr	n/a	all_{apiVersion} or subscr
Zone status change notification subscriptions	/zoneStatus	6.11	all_{apiVersion} or subscr	n/a	all_{apiVersion} or subscr	n/a
Individual zone status change notification subscription	/zoneStatus/{subscriptionId}	6.12	all_{apiVersion} or subscr	all_{apiVersion} or subscr	n/a	all_{apiVersion} or subscr

Table 3 Required scope values for: zonal traffic, user tracking, and zone status subscriptions

F.1.2 Use of 'acr:Authorization'

This section specifies the use of 'acr:auth' in place of an end user identifier in a resource URL path.

An 'acr' URI of the form 'acr:auth', where 'auth' is a reserved keyword MAY be used to avoid exposing a real end user identifier in the resource URL path.

A client MAY use 'acr:auth' in a resource URL in place of a {userId} when the the RESTful Zonal Presence API is used in combination with [Autho4API_10].

In the case the RESTful Zonal Presence API supports [Autho4API_10], the server:

- SHALL accept 'acr:auth' as a valid value for the resource URL variable {userId}
- SHALL conform to [REST_NetAPI_Common] section 5.8.1.1 regarding the processing of 'acr:auth'