RESTful Network API for Roaming Provisioning

Candidate Version 1.0 – 12 Nov 2013

Open Mobile Alliance

OMA-TS-REST_NetAPI_RoamingProvisioning-V1_0-20131112-C

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This specification defines a RESTful API for Roaming Provisioning using HTTP protocol bindings.

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2.1 Normative References

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2.2 Informative References

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[REST_WP] "Guidelines for RESTful Network APIs", Open Mobile Alliance™, OMA-WP-Guidelines_for_RESTful_Network_APIs, URL:http://www.openmobilealliance.org/

3. Terminology and Conventions

3.1 Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

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

3.2 Definitions

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

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.

3.3 Abbreviations

API	Application Programming Interface
ARP	Alternate Roaming Provider
DSP	Domestic Service Provider
EU	European Union
GSM	Global System for Mobile Communications
GSMA	GSM Association
HTTP	HyperText Transfer Protocol
ICCID	Integrated Circuit Card IDentifier
IF7	Interface 7 of Single IMSI
IMSI	International Mobile Subscriber Identity
ISDN	Integrated Services Digital Networkf
JSON	JavaScript Object Notation
LBO	Local Break Out
MNP	Mobile Number Portability
MSISDN	Mobile Subscriber ISDN Number
OMA	Open Mobile Alliance
REST	REpresentational State Transfer
SCR	Static Conformance Requirements
SIP	Session Initiated Protocol
SMS	Short Message Service
TADIG	GSMA Transferred Account Data Interchange Group
TS	Technical Specification
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
XML	eXtensible Markup Language

XSD	XML Schema Definition

4. Introduction

The Technical Specification of the RESTful Network API for Roaming Provisioning contains HTTP protocol bindings for Roaming Provisioning 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 and JSON).

Article 4 of the new European Roaming Regulation [EU531_2012] requires that Domestic Service Providers (DSPs) shall enable their customers to access regulated voice, SMS and data roaming services as a bundle provided by an Alternative Roaming Provider (ARP): decoupling in the home country. It requires furthermore that neither domestic nor roaming providers shall prevent their customers from accessing data roaming services provided directly on a visited network: decoupling in the visited country.

Two types of decoupling models are considered in the regulation. For the first type of decoupling, where regulated voice, SMS and data roaming services are provided as a bundle, the Single IMSI solution has been chosen. Under the Single IMSI technical modality the separate sale of roaming services is technically still provided by the DSP , which serves as the host mobile network operator to the ARP. The separate sale of roaming services is provided on a wholesale basis to the ARP, which resells the services to the roaming customer at the retail level. This basic option of resale of retail roaming services does not allow the alternative roaming provider to control which visited networks are to be used in preference to others.

For the second type of decoupling, where data roaming services are provided directly on a visited network, the Local Break Out (LBO) solution has been chosen. The basic requirements are the implementation and activation of the processing of data roaming traffic in the visited network and the requirement not to prevent the manual or automatic selection of a visited network.

The RESTful Network API for Roaming Provisioning is provided to permit the technical relation between the DSP and ARP during the provisioning phase for the Single IMSI scenario.

4.1 Version 1.0

Version 1.0 of this specification supports the following operations:

- Establish a relationship between a DSP and an ARP for a Single IMSI service.
- Roaming change from DSP to an ARP. A new roaming subscription is activated.
- Roaming change with swap between two ARPs. A new roaming subscription is activated for the recipient ARP, while the roaming subscription of the donor ARP is deactivated.
- Roaming change from ARP to DSP, initiated by DSP. The roaming subscription is deactivated by DSP. This operation is also used:
    - if the subscriber ports out via MNP while having a roaming subscription with an ARP;
    - if the subscriber changes user identifier(s) while having a roaming subscription with an ARP. The ARP will activate a new roaming subscription with the new user identifier(s).
- Roaming change from ARP to DSP, initiated by ARP. The roaming subscription is deactivated by ARP.
- Roaming suspension, requested by ARP in case of suspected fraud.
- Roaming un-suspension, requested by ARP in case the fraud risk is sufficiently mitigated.
- Change of charging interface interface used for a subscriber, initiated by DSP or ARP. From online billing to offline billing or vice-versa.
- Obtain information of a Single IMSI service.

5. RoamingProvisioning API definition

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

The RESTful Network API for Roaming Provisioning is provided to permit the technical relation between the DSP and ARP during the provisioning phase for the SingleIMSI scenario.

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. Application/x-www-form-urlencoded examples are provided in Appendix C, while JSON examples are provided in Appendix D.

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

Appendix B provides the Static Conformance Requirements (SCR).

Appendix E provides the Single IMSI interface 7(IF7) operation mapping

Appendix F is left empty as there is no support for Light-weight resources

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

Appendix G 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 roamingprovisioning.

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.

The figure below visualizes the resource structure defined by this specification. Note that those nodes in the resource tree which have associated HTTP methods defined in this specification are depicted by solid boxes

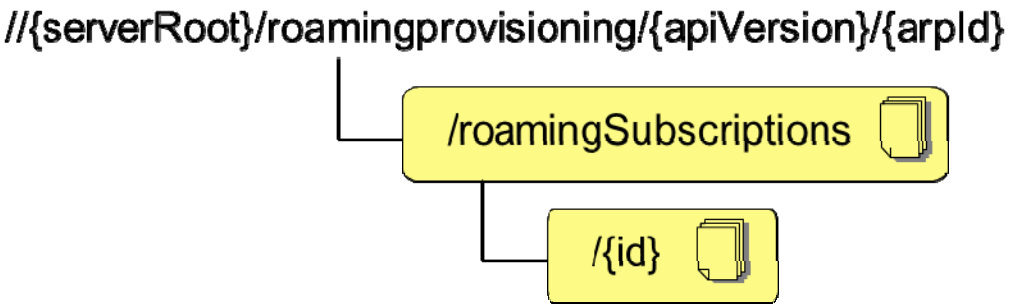

Figure 1 Resource structure defined by this specification

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 ARP to inform DSP about ARP subscriptions

Resource	URL Base URL: http://{serverRoot}/roamingprovisioning/{apiVersion}/{arpId}	Data Structures	HTTP verbs			
			GET	PUT	POST	DELETE
Creation of roaming subscription	/roamingSubscriptions	RoamingSubscription common:ResourceReference (optional alternative for POST response)	no	no	Creates a roaming subscription	no
Individual roaming subscription	/roamingSubscriptions/{id}	RoamingSubscription	Retrieves the roaming subscription	Updates the roaming subscription	no	no

Purpose: To allow the DSP to inform ARP about changes in ARP subscription

Resource	URL <Specified by the ARP>	Data Structures	HTTP verbs			
			GET	PUT	POST	DELETE
Roaming subscription notification	<Specified by the ARP when a subscription resource is created/updated>	RoamingSubscription	no	no	Notifies the ARP about changes in a roaming subscription	no

5.2 Data Types

5.2.1 XML Namespaces

The XML namespace for the roamingprovisioning data types is:

urn:oma:xml:rest:netapi:roamingprovisioning: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_roamingprovisioning].

5.2.2 Structures

The subsections of this section define the data structures used in the RoamingProvisioning 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' and 'sip' URI schemes apply.

5.2.2.1 Type: RoamingSubscription

This type represents a roaming subscription.

Element	Type	Optional	Description
roamingSubscriptionId	xsd:string	Yes	The unique roaming subscription identifier provided by DSP.
userId	UserId	No	Roaming subscription userId.
status	RoamingSubscriptionStatusType	No	Roaming subscription status.
fraudManagementStatus	FraudManagementStatusType	No	Used to request roaming suspension (e.g. in case of fraud).
arpSignallingStatus	ArpSignallingStatusType	Yes	Signalling status of roaming subscription (i.e. OnLine, OffLine, OnLineToOffLine or OffLineToOnLine). It MAY be included in POST request by the ARP, to suggest the preferred signalling status. It SHALL be included in POST requests representing notifications by the DSP to the ARP, in responses to any HTTP method that returns an entity body, and in PUT requests.
authorizationInformation	xsd:string	Yes	Optional information to be used by the authorization process. The valorization of this field is defined by national regulator.
provisioningServerId	xsd:string	No	TADIG code provided by GSMA of TADIG code of the entity (e.g. DSP,MVNO) who received handling the request to create the roaming subscription. (The TADIG codes are assigned by GSMA)

provisioningClientId	xsd:string	No	TADIG code of the entity (e.g. DSP,ARP,MVNO) sending the request to create the roaming subscription.(The TADIG codes are assigned by GSMA)
requestArrival	xsd:dateTime	Yes	Date and time of the arrival of the last request on this resource. It SHALL NOT be included in request bodies. It SHALL be included in response bodies.
lastUpdateDescription	xsd:string	Yes	Free text description about the reason of the last resource update. It SHALL NOT be included in request bodies. It MAY be included in response and notification bodies.
bilateralInformation	xsd:string	Yes	Bilaterally agreed content
interfaceProvider	InterfaceProvider [0…9]	Yes	Array of parameters that identify the provider for each interface (IF1, IF2, IF3 …) When an Interface is missing within the array, it is intended that it is provided by the client.
callbackReference	common:CallbackReference	No	ARP notification endpoint and parameters. Contains the callback URL on which notifications will be sent to and callback Data opaque string, that can be used by the ARP for correlation purposes.
resourceURL	xsd:anyURI	Yes	Self referring URL. The resourceURL SHALL NOT be included in POST requests by the ARP, but SHALL be included in POST requests representing notifications by the DSP to the ARP. The resourceURL SHALL also be included in responses to any HTTP method that returns an entity body, and in PUT requests.

A root element named roamingSubscription of type RoamingSubscription is allowed in request, response and notification bodies.

5.2.2.2 Type:UserId

This type defines the user identifier for the roaming subscription.

Element	Type	Optional	Description
msisdn	xsd:string	Choice	User's Msisdn. At least one among "msisdn", "imsi" and "iccid" parameters SHALL be included.
imsi	xsd:string	Choice	User's imsi. . At least one among "msisdn", "imsi" and "iccid" parameters SHALL be included.
Iccid	xsd:string	Choice	User's iccid. At least one among "msisdn", "imsi" and "iccid" parameters SHALL be included.

XSD modelling uses a "choice" to select a single msisdn and/or a single imsi and/or a single iccid.

5.2.2.3 Type: RoamingSubscriptionStatusType

This type defines the roaming subscription status.

Element	Type	Optional	Description
value	RoamingSubscriptionStatus	No	Roaming subscription status.
reason	RoamingSubscriptionStatusReason	Choice	Reason because the subscription has been cancelled or deactivated. It SHALL NOT be included if "customReason" field is present.
customReason	xsd:string	Choice	Reason because the subscription has been cancelled or deactivated. It SHALL NOT be included if "reason" field is present.
activationStart	xsd:dateTime	Yes	Date and time of when the activation procedure started. It SHALL be included if the roaming subscription has been activated at a certain point of time (i.e. the current status of the roaming subscription is "Active", "DeactivationPending", "DeactivationPending" or "Deactivated"). It SHALL NOT be included otherwise.
activationEnd	xsd:dateTime	Yes	Date and time of when the activation procedure ended. It SHALL be included if the roaming subscription has been activated at a certain point of time (i.e. the current status of the roaming subscription is "Active", "DeactivationPending", "DeactivationPending" or "Deactivated"). It SHALL NOT be included otherwise.
deactivationStart	xsd:dateTime	Yes	Date and time of when the deactivation procedure started. It SHALL be included if the current status of the roaming subscription is "Deactivated". It SHALL NOT be included otherwise.
deactivationEnd	xsd:dateTime	Yes	Date and time of when the deactivation procedure ended. It SHALL be included if the current status of the roaming subscription is "Deactivated". It SHALL NOT be included otherwise.
processId	xsd:string	No	Unique code that identifies all messages exchanged within the same the process (pre-provisiong and activation or deactivation). The code is generated by ARP (or DSP in specific cases, when the process is started by DSP) and identifies all messages exchanged between ARP and DSP and related to the same process (see section 6.2.3).

XSD modelling uses an optional "choice" to select either a reason or customReason, or none of them.

5.2.2.4 Type: FraudManagementStatusType

This type defines the fraud management subscription status.

Element	Type	Optional	Description
value	FraudManagementStatus	No	Fraud management status.

customReason	xsd:string	Yes	Reason because the subscription has not been suspended or un-suspended.
processId	xsd:string	Yes	Unique code that identifies all messages exchanged within the same the process (suspension or un-suspension). The code is generated by ARP and identifies all messages exchanged between ARP and DSP and related to the same process (see section 6.2.4).

5.2.2.5 Type:ArpSignallingStatusType

This type defines the fraud ARP signalling status.

Element	Type	Optional	Description
value	ArpSignallingStatus	No	ARP signalling status.
changeStart	xsd:dateTime	Yes	Date and time of when the last signalling change procedure started. It SHALL be included if a signalling status change has just completed (see section 6.2.5).
changeEnd	xsd:dateTime	Yes	Date and time of when the last signalling change procedure ended. It SHALL be included if a signalling status change has just completed (see section 6.2.5).
processId	xsd:string	Yes	Unique code that identifies all messages exchanged within the same signalling status change process. The code is generated by ARP (or DSP in specific cases, when the process is started by DSP) and identifies all messages exchanged between ARP and DSP and related to the same process (see section 6.2.5).

5.2.2.6 Type: InterfaceProvider

This type defines the name and provider for a specific interface.

Element	Type	Optional	Description
name	IFType	No	The name for a specific interface.
provider	xsd:string	No	The provider for a specific interface.

5.2.3 Enumerations

The subsections of this section define the enumerations used in the Roaming Provisioning API.

5.2.3.1 Enumeration: RoamingSubscriptionStatus

This enumeration defines a set of possible roaming subscription states.

Enumeration	Description
Active	The roaming subscription is active or the ARP is requesting its activation.
Deactivated	The roaming subscription has been deactivated or the ARP is requesting its deactivation.
ActivationPending	The activation of roaming subscription has been requested but it has not completed yet.

DeactivationPending	The deactivation of roaming subscription has been requested but it has not completed yet.
DeactivationProgress	The deactivation of roaming subscription is in progress.
PreProvisioningPending	The pre-provisioning of roaming subscription is under DSP check phase.
PreProvisioned	The roaming subscription is pre-provisioned or the ARP is requesting its pre-provisioning.
Cancelled	The pre-provisioning has been denied by DSP. MAY be included in POST requests representing notifications by the DSP to the ARP. SHALL NOT be used otherwise.

5.2.3.2 Enumeration: RoamingSubscriptionStatusReason

This enumeration defines possible reasons because a subscription has been cancelled or deactivated.

Enumeration	Description
The following reasons SHALL be used by DSP when pre-provisioning is refused, with roaming subscription put in "Cancelled" status and then removed, or when deactivation is refused, with roaming subscription put back in "Active" status (see section 6.2.3).	
NoActiveAgreement	No active agreement.
NotAuthorized	Not authorized – Generic.
NotAuthorizedNotDSPCustomer	Not authorized – Not customer of this DSP.
NotAuthorizedIncorrectAuthorizationMethod	Not authorized – Incorrect Authorization Method.
NotAuthorizedIncorrectAuthorizationCredentials	Not authorized – Incorrect Authorization Credentials.
NotEligible	Not eligible - Generic.
NotEligibleNoDSPRecipientARPagreement	Not eligible – recipient ARP doesn't have an agreement with DSP.
NotEligibleNotDSPCustomer	Not eligible – Customer not controlled by DSP.
NotEligibleSubscriberDomesticServiceSuspended	Not eligible – Subscriber's domestic service has been suspended.
NotEligibleSubscriberRoamingServiceSuspended	Not eligible – Subscriber's roaming service has been suspended.
NotEligibleNoSubscriberContract	Not eligible – Subscriber has no contract to receive roaming service.
NotEligibleServiceRequestorNotLegalResponsibleParty	Not eligible – The service requestor is not the legal responsible party.
NotEligibleUserPendingRequestOngoing	Not eligible - There is another ongoing provisioning or de-provisioning request for this UserId.
NotEligibleNonPrimaryUserId	Not eligible – The request is based on a non-primary UserId.
NotEligibleCustomerRequestedMNP	Not eligible – Customer requested MNP.

The following reasons SHALL be used by DSP when deactivating a roaming subscription and SHALL be used by ARP to request a roaming subscription deactivation (see section 6.2.3).	
RequestedByCustomer	The deactivation has been requested by the customer.
MNPPortOut	The deactivation has been requested because a MNP port out.
SwapToAnotherArp	The ARP subscription has been deactivated because, for the same user, a subscription of a recipient ARP has been activated.
CustomerDeactivationByDSP	The deactivation has been requested by the DSP.
FraudManagement	The deactivation has been requested within a fraud management process.
SubscriberContractTerminationBillPayerInitiated	The deactivation has been requested because the subscriber contract has been terminated by the bill-payer.
CustomerContractTerminationOperatorInitiated	The deactivation has been requested because the customer contract has been terminated by the operator.
ChangeInSubscriberPrimaryIdentifier	The deactivation has been requested because of a change in subscriber primary identifier.
SubscriptionModificationIncompatibleWithARPContract	The deactivation has been requested because of a subscription modification incompatible with ARP Contract.

5.2.3.3 Enumeration: FraudManagementStatus

This enumeration defines possible values for the fraud management status.

Enumeration	Description
UnSuspended	The roaming subscription has not been suspended or the ARP is requesting its un-suspension.
SuspensionPending	ARP requested roaming subscription suspension, but it has not been completed yet.
Suspended	The roaming subscription has been suspended or the ARP is requesting its suspension.
UnSuspensionPending	ARP requested roaming subscription un-suspension, but it has not been authorized/completed yet.

5.2.3.4 ArpSignallingStatus

This enumeration defines possible values for the ARP signalling status.

Enumeration	Description
OnLine	Online signalling status.
OffLine	Offline signalling status.
OnLineToOffLine	Signalling status is undergoing change from OnLine to OffLine. SHALL NOT be included in POST requests by the ARP.

OffLineToOnLine	Signalling status is undergoing change from OffLine to OnLine. SHALL NOT be included in POST requests by the ARP

5.2.3.5 IFType

This enumeration defines possible values for the Single IMSI interface names.

Enumeration	Description
IF1	Single IMSI Interface n.1
IF2	Single IMSI Interface n.2
IF3	Single IMSI Interface n.3
IF4	Single IMSI Interface n.4
IF5	Single IMSI Interface n.5
IF6	Single IMSI Interface n.6
IF7	Single IMSI Interface n.7
IF8	Single IMSI Interface n.8
IF9	Single IMSI Interface n.9

5.2.4 Values of the Link "rel" attribute

This section is empty in this version of the specification.

5.3 Sequence Diagrams

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

5.3.1 Roaming Change from Domestic Service Provider to an Alternate Roaming Provider

This figure below shows a scenario for a roaming change from a DSP to an ARP.

This process applies when a customer wants to subscribe an ARP roaming subscription.

The resources:

- To create a roaming subscription and start the pre-provisioning phase, create a resource
  http://{serverRoot}/roamingprovisioning/{apiVersion}/{arpId}/roamingSubscriptions
- To activate the previously pre-provisioned roaming subscription., udate the resource
  http://{serverRoot}/roamingprovisioning/{apiVersion}/{arpId}/roamingSubscriptions/{id}

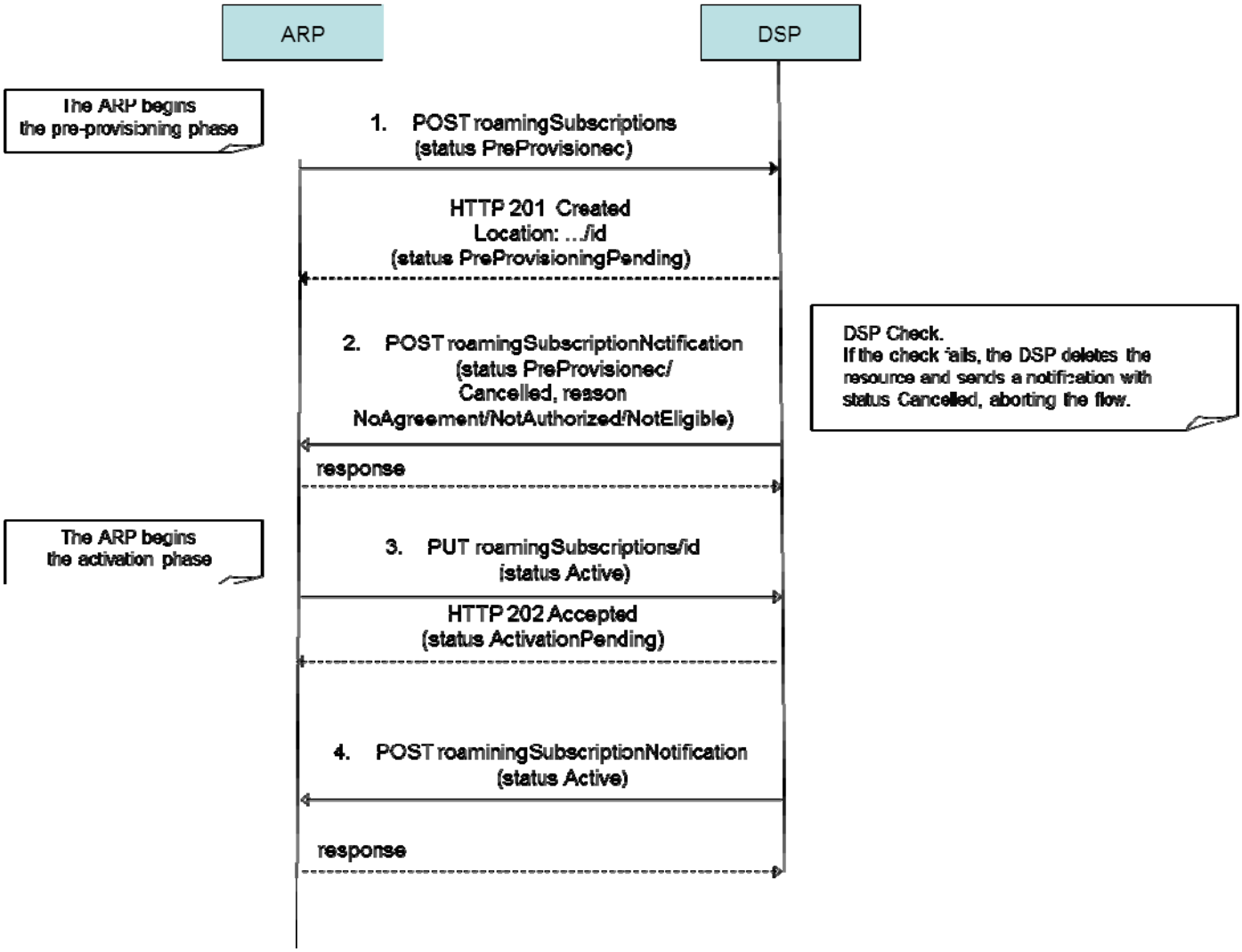

Figure 2 Roaming subscription activation

Outline of the flows:

1. An ARP requests the pre-provisioning of a roaming subscription for a certain userId by using a POST method with a roaming subscription in “PreProvisioned” state, and receives a 201 answer with the newly created resource in “PreProvisioningPending” state.

2. The DSP notifies the ARP about the result of pre provisioning (“PreProvisioned” or “Cancelled” status) by using a POST method on the callback URL provided by the ARP in step n.1. If the pre-provisioning failed the DSP deletes the resource and flow ends.

3. The ARP requests the activation of the roaming subscription by using a PUT method with a roaming subscription in “Active” state, and receives a 202 answer with the resource in “ActivationPending” state.

4. The DSP notifies the ARP about the completion of activation phase.

5.3.2 Roaming change from Alternate Roaming Provider to Domestic Service Provider, DSP initiated

This figure below shows a scenario for a change from ARP to DSP, initiated by DSP.

This process applies when a customer wants to migrate back from an ARP offer to a DSP offer.

The resources:

- To deactivate the roaming subscription, update the resource **http://{serverRoot}/roamingprovisioning/{apiVersion}/{arpId}/roamingSubscriptions/{id}**

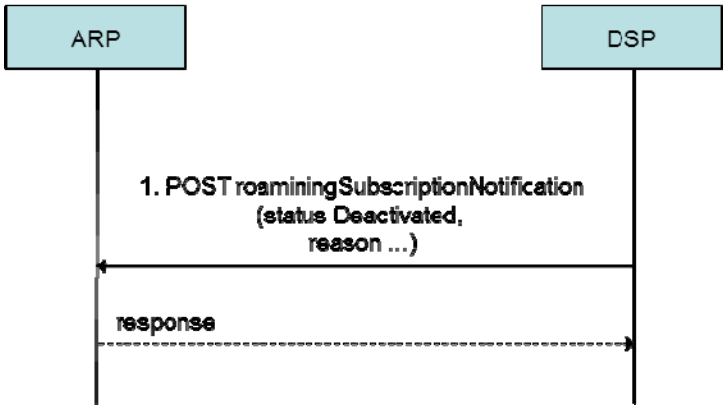

Figure 3 Change from Alternate Roaming Provider to Domestic Service Provider

Outline of the flows:

1. The DSP notifies the ARP that its subscription has been deactivated by using a POST method on the callback URL provided by ARP. Additional information about the deactivation reason MAY be provided by the “reason” field.

5.3.3 Signalling status change, ARP initiated

This figure below shows a scenario for changing the signalling status.

This process applies when an ARP requests DSP to change their billing basis for a roaming subscription from online to offline or vice versa.

The resources:

- To change signalling status of the roaming subscription, update the resource **http://{serverRoot}/roamingprovisioning/{apiVersion}/{arpId}/roamingSubscriptions/{id}**

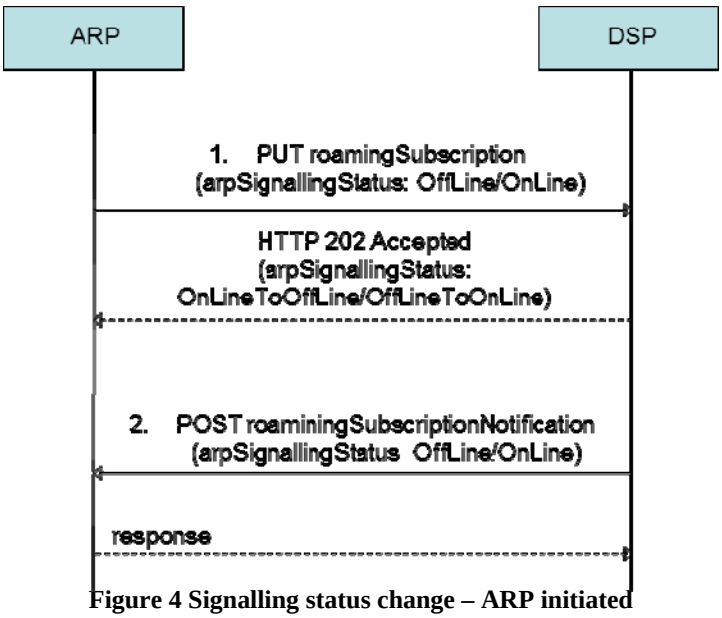

Figure 4 Signalling status change – ARP initiated

Outline of the flows:

1. The ARP request DSP to change the customer charge type, by using a PUT method containing the new signalling status, “OffLine” or “OnLine”, and receives a 202 answer containing the resource with signalling status “OnLineToOffLine” or “OffLineToOnLine”.
2. The DSP informs the ARP about the outcome of signalling status change , by using a POST method on the callback URL provided by ARP, containing the resource with the new signalling status requested by ARP at step 1 or the previous signalling status.

5.3.4 Signalling status change, DSP initiated

This figure below shows a scenario for changing the signalling status.

This process applies when DSP changes the billing interface for an ARP customer.

The resources:

- To change signalling status of the roaming subscription, update the resource **http://{serverRoot}/roamingprovisioning/{apiVersion}/{arpId}/roamingSubscriptions/{id}**

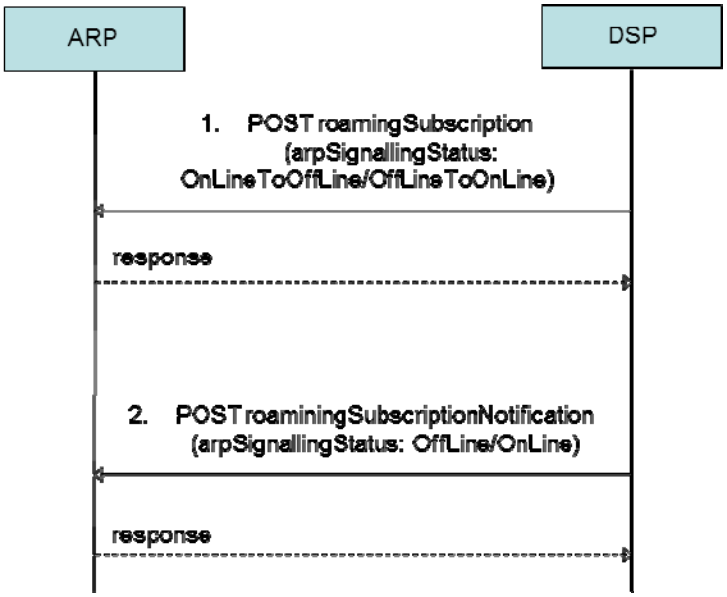

Figure 5 Signalling status change – DSP initiated

Outline of the flows:

1. The DSP informs the ARP that the signalling status is going to change, by using a POST method on the callback URL provided by ARP, containing the resource with signalling status "OnLineToOffLine" or "OffLineToOnLine".
2. The DSP informs the ARP about the completion of signalling status change, by using a POST method on the callback URL provided by ARP, containing the resource with the new signalling status.

5.3.5 Activation with Swap between two ARPs

This figure below shows a scenario for the subscription swap between two ARPs.

The resources:

- To create a roaming subscription and start the pre-provisioning phase, create a resource

  http://{serverRoot}/roamingprovisioning/{apiVersion}/{arpId}/roamingSubscriptions

- To activate a previously pre-provisioned roaming subscription and start the provisioning phase, update

  http://{serverRoot}/roamingprovisioning/{apiVersion}/{arpId}/roamingSubscriptions/{id}

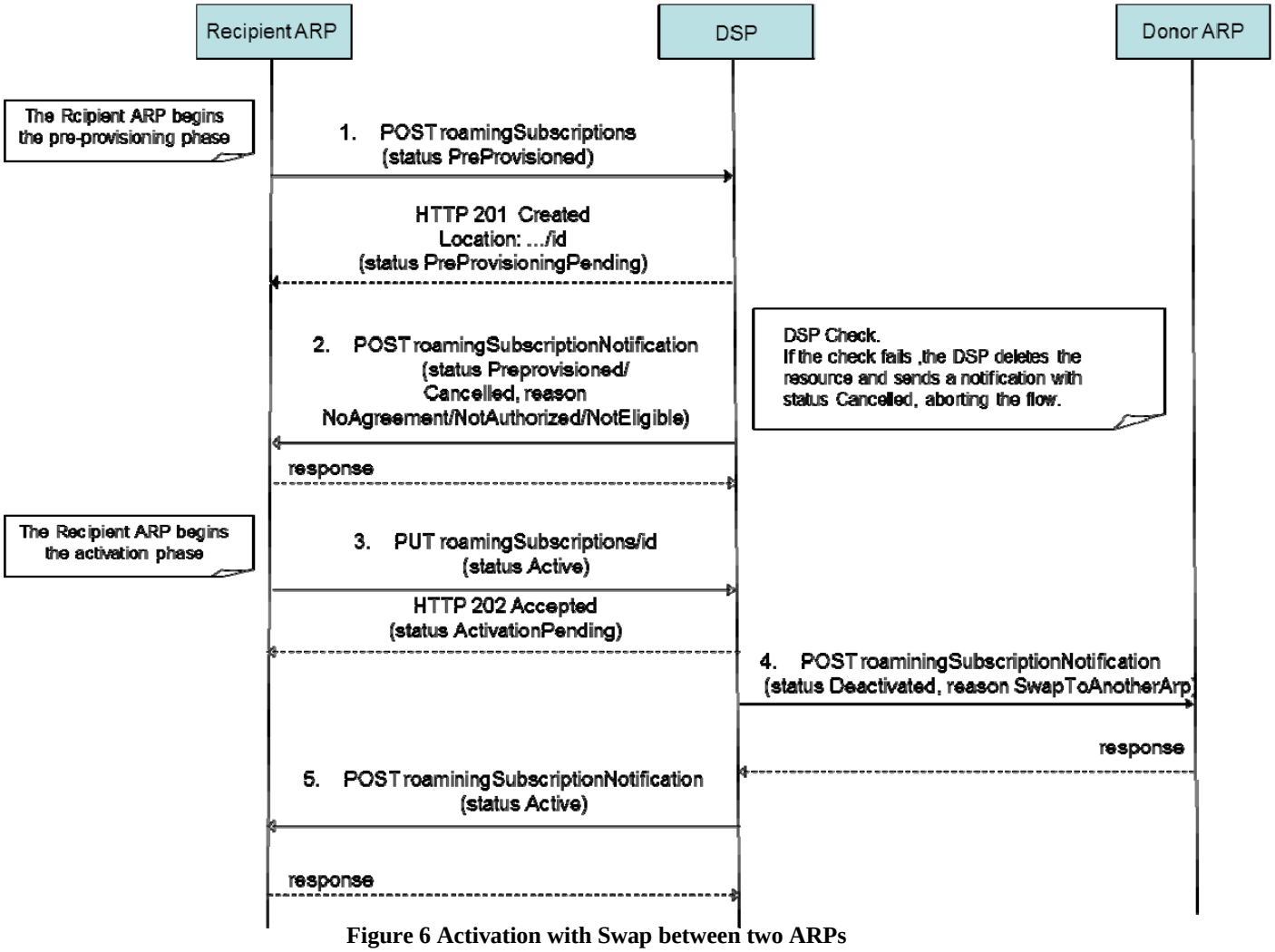

Figure 6 Activation with Swap between two ARPs

Outline of the flows:

1. A recipient ARP requests the pre-provisioning of a roaming subscription for a certain userId by using a POST method with a roaming subscription in “PreProvisioned” state, and receives a 201 answer with the newly created resource in “PreProvisioningPending” state.

2. The DSP notifies the recipient ARP about the result of pre provisioning (“PreProvisioned” or “Cancelled” status) by using a POST method on the callback URL provided by the recipient ARP in step n.1. If the pre provisioning failed with a “Cancelled” status, the DSP deletes the resource and flow ends.

3. The recipient ARP requests the activation of the roaming subscription by using a PUT method with a roaming subscription in “Active” state, and receives a 202 answer with the resource in “ActivationPending” state.

4. The DSP notifies the donor ARP, which had an active roaming subscription for the same user, that its roaming subscription has been deactivated (“Deactivated” status, reason “SwapToAnotherArp”), by using a POST method on the callback URL provided by the donor ARP.

5. The DSP notifies the recipient ARP about the completion of activation phase.

5.3.6 Fraud Management and Prevention: ARP suspends and then un-suspends the roaming subscription

This figure below shows a scenario for the suspension and subsequent un-suspension of a subscription within a fraud management process.

The resources:

- To request the suspension/un-suspension of an roaming subscription, update the resource

  http://{serverRoot}/roamingprovisioning/{apiVersion}/{arpId}/roamingSubscriptions/{id}

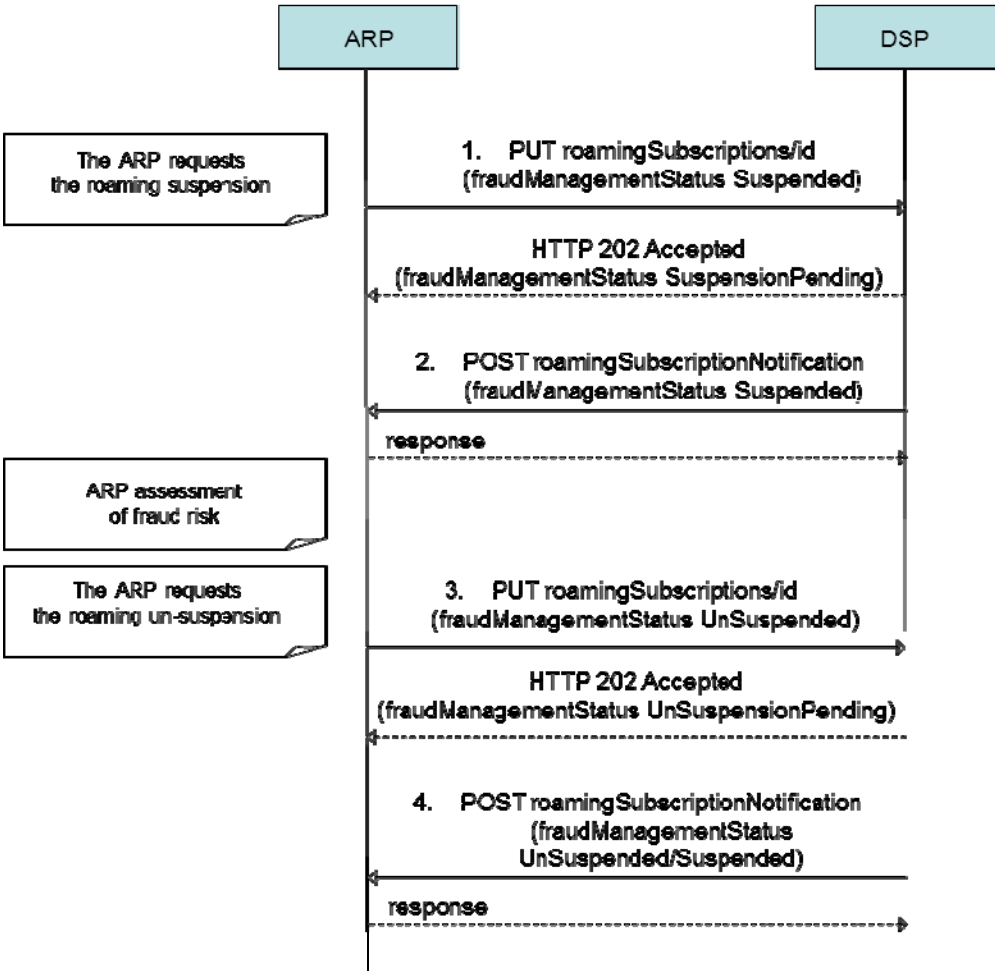

Figure 7 Roaming subscription suspension and un-suspension

Outline of the flows:

1. The ARP requests the suspension of a roaming subscription by using a PUT method with a roaming subscription in "Suspended" fraud management state, and receives a 202 answer with the resource in "SuspensionPending" fraud management state.

2. The DSP informs the ARP about the completion of suspension, by using a POST method on the callback URL provided by ARP.

3. The ARP requests the un-suspension of the suspended roaming subscription by using a PUT method with a roaming subscription in “UnSuspended” fraud management state, and receives a 202 answer with the resource in “SuspensionPending” fraud management state.

4. The DSP notifies the ARP about the result of the un-suspension (“UnSuspended” or back to the “Suspended” fraud management status), by using a POST method on the callback URL provided by the ARP.

5.3.7 Fraud Management and Prevention: ARP suspends and then deactivates the roaming subscription

This figure below shows a scenario for the suspension and subsequent deactivation of a subscription within a fraud management process.

The resources:

- To request the suspension/deactivation of an roaming subscription, update the resource

  http://{serverRoot}/roamingprovisioning/{apiVersion}/{arpId}/roamingSubscriptions/{id}

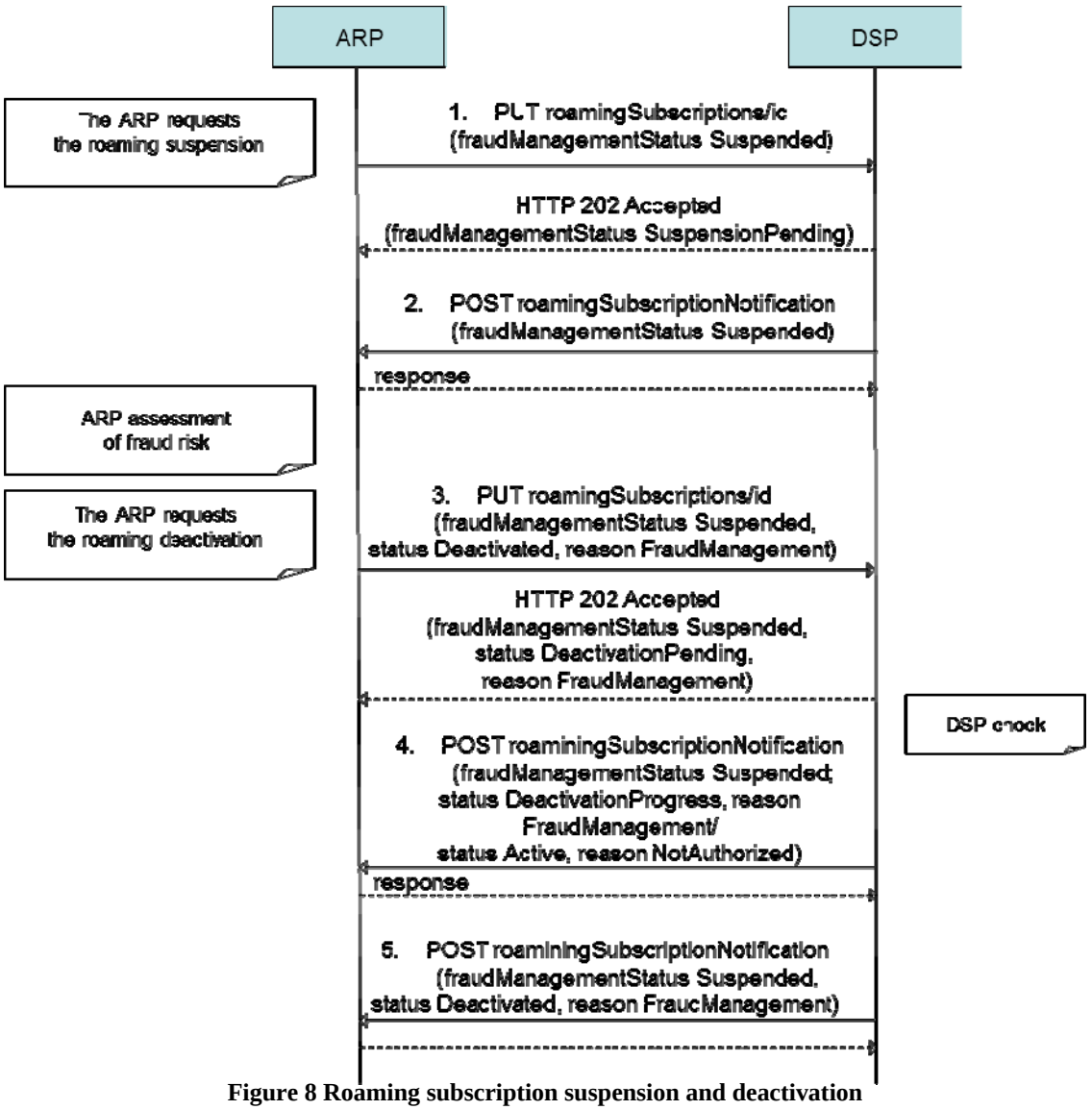

Figure 8 Roaming subscription suspension and deactivation

Outline of the flows:

1. The ARP requests the suspensions of a roaming subscription, by using a PUT method with a roaming subscription in "Suspended" fraud management state, and receives a 202 answer with the resource in "SuspensionPending" fraud management state.

2. The DSP informs the ARP about the completion of suspension, by using a POST method on the callback URL provided by ARP.

3. The ARP requests the deactivation of the suspended roaming subscription, by using a PUT method with a roaming subscription in "Deactivated" state with reason "FraudManagement", and receives a 202 Accepted answer with the resource in "DeactivationPending" state with reason "FraudManagement". The fraudManagementStatus is unchanged ("Suspended").

4. The DSP notifies the ARP about the result of the deactivation ("DeactivationPending" or back to the "Active" status), by using a POST method on the callback URL provided by the ARP. If the DSP has refused the deactivation with an "Active" status, it updates the reason field and the flow stops here. The fraudManagementStatus is unchanged ("Suspended").

5. The DSP notifies the ARP about the completion of the deactivation process, by sending a POST method containing a roaming subscription in "Deactivated" status, on the callback URL provided by the ARP. The fraudManagementStatus is unchanged ("Suspended").

5.3.8 Roaming Change from Alternate Roaming Provider to Domestic Service Provider, ARP initiated

This figure below shows a scenario for the deactivation of a roaming subscription, initiated by ARP.

The resources are used:

- To deactivate a roaming subscription. Updating the resource

  http://{serverRoot}/roamingprovisioning/{apiVersion}/{arpId}/roamingSubscriptions/{id}

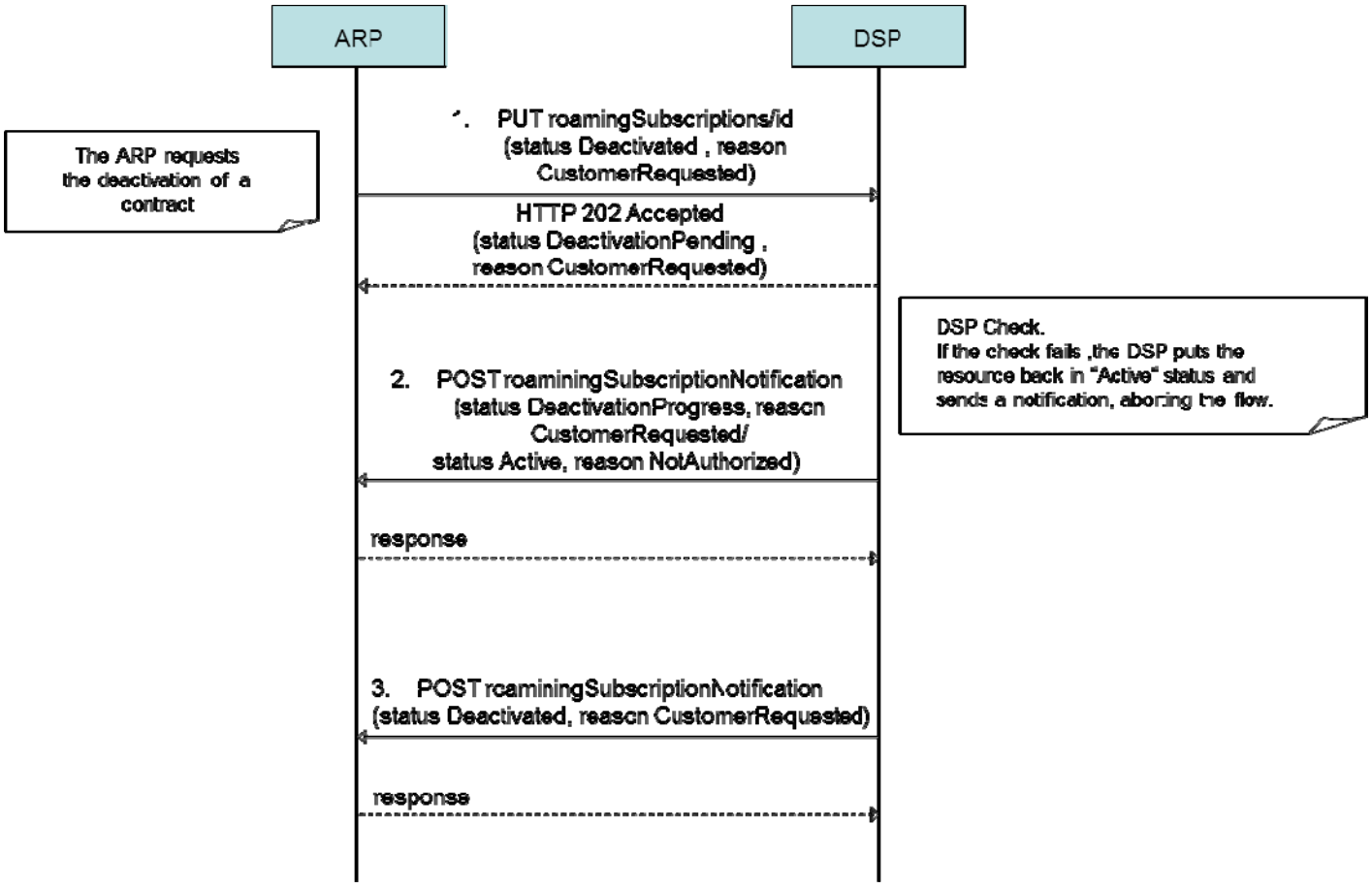

Figure 9 Deactivation of roaming subscription

Outline of the flows:

1. The ARP requests the deactivation of a roaming subscription in “Active” status by using a PUT method with a roaming subscription in “Deactivated” state and a “reason” field. It receives a 202 answer with the resource in “DeactivationPending” state.

2. The DSP notifies the ARP about the result of the deactivation (“DeactivationProgress” or back to the “Active” status), by using a POST method on the callback URL provided by the ARP. If the DSP has refused the deactivation with an “Active” status, it updates the reason field and the flow stops here.

3. The DSP notifies the ARP about the completion of the deactivation process, by sending a POST method containing a roaming subscription in “Deactivated” status, on the callback URL provided by the ARP.

6. Detailed specification of the resources

The following applies to all resources defined in this specification regardless of the representation format (i.e. XML and 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].
- 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: Creation of roaming subscription

The resource used is:

http://{serverRoot}/roamingprovisioning/{apiVersion}/{arpId}/roamingSubscriptions

This is a resource factory, used by the ARP to create roaming subscription resources.

6.1.1 Request URL variables

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

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
arpId	Alternate Roaming Provider Id (TADIG code provided by GSMA). MUST match the identifier of the requesting ARP.

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 roamingprovisioning, see section 7.

6.1.3 GET

Method not allowed by the resource. The returned HTTP error status is 405. The DSP should also include the 'Allow: [POST]' field in the response as per section 14.7 of [RFC2616].

6.1.4 PUT

Method not allowed by the resource. The returned HTTP error status is 405. The DSP should also include the 'Allow: [POST]' field in the response as per section 14.7 of [RFC2616].

6.1.5 POST

This operation is used by an ARP for requesting the creation of a roaming subscription and the start of the pre-provisionig process. The roaming subscription status in the request SHALL be "PreProvisioned" (see section 6.2.3) and the fraud management status SHALL be "UnSuspended" (see section 6.2.4). The ARP SHALL also set the "processId" field in "status" to a new unique value, obtained by the concatenation of ARP TADIG code and a unique code.

The "notifyURL" in the "callbackReference" SHALL to contain a Client-side Notification URL (as defined by the client).

When receiving a POST request on this resource, the DSP SHALL update the "requestArrival" field of the new resource with the current timestamp.

6.1.5.1 Example: ARP requests the creation of a roaming subscription(Informative)

6.1.5.1.1 Request

```
POST /exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions HTTP/1.1
Content-Type: application/xml
Content-Length: nnnn
Accept: application/xml
Host: example.com

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>PreProvisioned</value>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
</rp:roamingSubscription>
```


6.1.5.1.2 Response

```
HTTP/1.1 201 Created
Location: http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123
Date: Fri, 26 Oct 2012 19:32:52 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>PreProvisioningPending</value>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <requestArrival>2012-10-26T19:32:52+00:00</requestArrival>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.1.6 DELETE

Method not allowed by the resource. The returned HTTP error status is 405. The DSP should also include the 'Allow: [POST]' field in the response as per section 14.7 of [RFC 2616].

6.2 Resource: Individual roaming subscription

The resource used is: **http://{serverRoot}/roamingprovisioning/{apiVersion}/{arpId}/roamingSubscriptions/{id}**

This resource is used to manage a roaming subscription for a user, by the user's DSP and an ARP the user has activated a roaming subscription with.

This resource has to be used in conjunction with a Client-side Notification URL, provided by the "notifyURL" field in "callbackReference".

When receiving a request on this resource, the DSP SHALL update the "requestArrival" field with the current timestamp.

6.2.1 Request URL variables

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

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
arpId	Alternate Roaming Provider Id (TADIG code provided by GSMA). MUST match the identifier of the requesting ARP.
id	The unique resource identifier provided by DSP.

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 roamingprovisioning, see section 7.

6.2.3 GET

This operation is used to obtain a roaming subscription resource.

6.2.3.1 Example: ARP retrieves a roaming subscription (Informative)

6.2.3.1.1 Request

```
GET /exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123 HTTP/1.1
Accept: application/xml
Host: example.com
```

6.2.3.1.2 Response

```
HTTP/1.1 200 OK
Date: Thu, 09 May 2013 14:38:59 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>PreProvisioned</value>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <requestArrival>2013-05-09T14:38:59+00:00</requestArrival>
```



```
  <callbackReference>
     <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
     <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.2.4 PUT

This operation is used for updating the data of a roaming subscription.

The following structures MAY be modified by means of a PUT request: “status”, “fraudManagementStatus”, “arpSignallingStatus” and “callbackReference”. Any other field SHALL NOT be modified by means of a PUT request.

Some updates requires asynchronous processing on the DSP side. In that case the DSP SHALL defer answer, sending a 202 Accepted. When the asynchronous processing/check has completed, the DSP SHALL send a notification containing the result of the operation.

The DSP SHALL send a 202 Accepted answer if one or more of the following conditions happen:

- The PUT request modifies the roaming subscription status, setting it to “Active”. The DSP SHALL set instead the subscription status to “ActivationPending” and send a “202 Accepted” response containing a representation of the resource. When the asynchronous processing on the DSP side has completed, the DSP SHALL send a notification with subscription status “Active” (see sections 5.3.1 and 5.3.5).

- The PUT request modifies the roaming subscription status, setting it to “Deactivated”. The DSP SHALL set instead the subscription status to “DeactivationPending” and send a “202 Accepted” response containing a representation of the resource. When the asynchronous processing on the DSP side has completed, the DSP SHALL send a notification with subscription status “DeactivationPending” or “Active” (see section 5.3.8).

- The PUT request modifies the fraud management status, setting it to “Suspended”. The DSP SHALL set instead the fraud management status to “SuspensionPending” and send a “202 Accepted” response containing a representation of the resource. When the asynchronous processing on the DSP side has completed, the DSP SHALL send a notification with fraud management status “Suspended” (see sections 5.3.6 and 5.3.7).

- The PUT request modifies the fraud management status, setting it to “UnSuspended”. The DSP SHALL set instead the fraud management status to “UnSuspensionPending” and send a “202 Accepted” response containing a representation of the resource. When the asynchronous processing on the DSP side has completed, the DSP SHALL send a notification with fraud management status “Suspended” or “UnSuspended”(see sections 5.3.6 and 5.3.7).

- The PUT request modifies the ARP signalling status. The DSP SHALL set instead the ARP signalling status to “OnLineToOffLine” or “OffLineToOnLine” and send a “202 Accepted” response containing a representation of the resource. When the asynchronous processing on the DSP side has completed, the DSP SHALL send a notification with the new ARP signalling status ”OnLine” or “OffLine” (see section 6.2.4).

6.2.4.1 Example 1: ARP requests roaming subscription activation (Informative)

Preconditions: the roaming subscription status is “PreProvisioned”, the ARP signalling status is “OnLine” and fraud management status is “unSuspended”.

6.2.4.1.1 Request

```
PUT /exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123 HTTP/1.1
Host: example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn
```



```
<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA011234567891234567891 2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
      <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
      <callbackData>12345</callbackData>
  </callbackReference>
<resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.2.4.1.2 Response

```
HTTP/1.1 202 Accepted
Date: Mon, 13 May 2013 16:01:03 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA011234567891234567891 2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>ActivationPending</value>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <requestArrival>2013-05-13T16:01:03+00:00</requestArrival>
  <callbackReference>
      <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
```

```
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.2.4.2 Example 2: ARP requests roaming subscription deactivation(Informative)

Preconditions: the roaming subscription status is “Active”, the ARP signalling status is “OnLine” and fraud management status is “unSuspended”.

6.2.4.2.1 Request

```
PUT /exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123 HTTP/1.1
Host: example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Deactivated</value>
    <reason>RequestedByCustomer</reason>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01ghijkl</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
     <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
     <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.2.4.2.2 Response

```
HTTP/1.1 202 Accepted
Date: Mon, 13 May 2013 16:01:03 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
```

```
<roamingSubscriptionId>ITASIITA0112345678912345678912</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>DeactivationPending</value>
    <reason>RequestedByCustomer</reason>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01ghijkl</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <requestArrival>2013-05-13T16:01:03+00:00</requestArrival>
  <callbackReference>
      <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
      <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.2.4.3 Example 3: ARP requests roaming subscription suspension (Informative)

Preconditions: the roaming subscription status is “Active”, the ARP signalling status is “OnLine” and the fraud management status is “UnSuspended”,

6.2.4.3.1 Request

```
PUT /exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123 HTTP/1.1
Host: example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA0112345678912345678912</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>Suspended</value>
```



```
    <processId>ITA01mnopqr</processId>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
      <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
      <callbackData>12345</callbackData>
  </callbackReference>
<resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.2.4.3.2 Response

```
HTTP/1.1 202 Accepted
Date: Mon, 13 May 2013 16:01:03 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA0112345678912345678912</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>SuspensionPending</value>
    <processId>ITA01mnopqr</processId>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <requestArrival>2013-05-13T16:01:03+00:00</requestArrival>
  <callbackReference>
      <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
      <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.2.4.4 Example 4: ARP requests roaming subscription un-suspension(Informative)

Preconditions: the roaming subscription status is “Active”, the ARP signalling status is “OnLine” and the fraud management status is “Suspended”.

6.2.4.4.1 Request

```
PUT /exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123 HTTP/1.1
Host: example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
    <processId>ITA01stuvwx</processId>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
      <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
      <callbackData>12345</callbackData>
  </callbackReference>
<resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.2.4.4.2 Response

```
HTTP/1.1 202 Accepted
Date: Mon, 13 May 2013 16:01:03 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01abcdef</processId>
```

```
  </status>
  <fraudManagementStatus>
    <value>UnSuspensionPending</value>
    <processId>ITA01stuvwx</processId>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <requestArrival>2013-05-13T16:01:03+00:00</requestArrival>
  <callbackReference>
      <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
      <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.2.4.5 Example 5: ARP sets signalling status to “OffLine” (Informative)

Preconditions: the roaming subscription status is “Active”, the ARP signalling status is “OnLine” and the fraud management status is “UnSuspended”.

6.2.4.5.1 Request

```
PUT /exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123 HTTP/1.1
Host: example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OffLine</value>
    <processId>ITA01yzABC</processId>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
      <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
      <callbackData>12345</callbackData>
```



```
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.2.4.5.2 Response

```
HTTP/1.1 202 Accepted
Date: Mon, 13 May 2013 16:01:03 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLineToOffLine</value>
    <processId>ITA01yzABC</processId>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <requestArrival>2013-05-13T16:01:03+00:00</requestArrival>
  <callbackReference>
      <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
      <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.2.4.6 Example 6: ARP updates notify URL and callback data (Informative)

Preconditions: the roaming subscription status is “Active”, the ARP signalling status is “OnLine” and the fraud management status is “UnSuspended”.

6.2.4.6.1 Request

```
PUT /exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123 HTTP/1.1
Host: example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
```



```
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
      <notifyURL>http://arp.example.com/notifications/alternativeRoamingSubscriptionCallback</notifyURL>
      <callbackData>67890</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.2.4.6.2 Response

```
HTTP/1.1 200 OK
Date: Mon, 13 May 2013 16:01:03 GMT
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <requestArrival>2013-05-13T16:01:03+00:00</requestArrival>
  <callbackReference>
```



```
    <notifyURL>http://arp.example.com/notifications/alternativeRoamingSubscriptionCallback</notifyURL>
    <callbackData>67890</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.2.5 POST

Method not allowed by the resource. The returned HTTP error status is 405. The DSP should also include the 'Allow: [GET/PUT]' field in the response as per section 14.7 of [RFC 2616].

6.2.6 DELETE

Method not allowed by the resource. The returned HTTP error status is 405. The DSP should also include the 'Allow: [GET/PUT]' field in the response as per section 14.7 of [RFC 2616].

6.3 Resource: Roaming Subscription Notification

This resource is a callback URL provided by the ARP for notification about roaming subscription updates. The RESTful Roaming Provisioning API does not make any assumption about the structure of this URL.

The DSP SHALL send a notification whenever there is a change in the roaming subscription "status", "fraudManagementStatus" or "arpSignallingStatus" structures as a result of internal DSP processing. The DSP SHALL NOT send a notification when there is an update of the roaming subscription as a result of an ARP PUT request.

6.3.1 Response Codes and Error Handling

For HTTP response codes, see [REST_NetAPI_Common].

For Policy Exception and Service Exception fault codes applicable to roamingprovisioning, see section7.

6.3.2 GET

Method not allowed by the resource. The returned HTTP error status is 405. The ARP should also include the 'Allow: [POST]' field in the response as per section 14.7 of [RFC 2616].

6.3.3 PUT

Method not allowed by the resource. The returned HTTP error status is 405. The ARP should also include the 'Allow: [POST]' field in the response as per section 14.7 of [RFC 2616].

6.3.4 POST

This operation is used by the DSP when a new notification is generated.

6.3.4.1 Example 1: DSP notifies pre-provisioning success (Informative)

The DSP sends this notification to the ARP right after transition 3 of roaming subscription state machine (see 6.2.3).

6.3.4.1.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Host: arp.example.com
Accept: application/xml
Content-Type: application/xml
```

```
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>PreProvisioned</value>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.1.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.4.2 Example 2: DSP notifies pre-provisioning failure due to lack of agreement between ARP and DSP (Informative)

The DSP sends this notification to the ARP right after transition 2 of roaming subscription state machine (see 6.2.3).

6.3.4.2.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Host: arp.example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Cancelled</value>
```



```
    <reason>NoActiveAgreement</reason>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <lastUpdateDescription>We have not a roaming agreement with you</lastUpdateDescription>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.2.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.4.3 Example 3: DSP notifies activation completion (Informative)

The DSP sends this notification to the ARP right after transition 5 of roaming subscription state machine (see 6.2.3).

6.3.4.3.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Host: arp.example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789123</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
```

```
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.3.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.4.4 Example 4: DSP notifies authorization of ARP-initiated deactivation (Informative)

The DSP sends this notification to the ARP right after transition 8 of roaming subscription state machine (see 6.2.3).

6.3.4.4.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Host: arp.example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA011234567891234567891 2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>DeactivationPending</value>
    <reason>RequestedByCustomer</reason>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01ghijkl</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.4.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.4.5 Example 5: DSP notifies completion of ARP-initiated deactivation (Informative)

The DSP sends this notification to the ARP right after transition 10 of roaming subscription state machine (see 6.2.3).

6.3.4.5.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Host: arp.example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Deactivated</value>
    <reason>RequestedByCustomer</reason>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <deactivationStart>2012-10-28T22:02:10+00:00</deactivationStart>
    <deactivationEnd>2012-10-29T21:53:50+00:00</deactivationEnd>
    <processId>ITA01ghijkl</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.5.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.4.6 Example 6: DSP notifies failure of ARP-initiated deactivation(Informative)

The DSP sends this notification right after transition 7 of roaming subscription state machine (see 6.2.3), to inform the ARP that the deactivation has been refused. The subscription status is put back to “Active”.

6.3.4.6.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Host: arp.example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <reason>NotEligible</reason>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01ghijkl</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.6.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.4.7 Example 7: DSP notifies completion of DSP-initiated deactivation (Informative)

The DSP sends this notification right after transition 11 of roaming subscription state machine, to inform the ARP that the subscription has been deactivated by the DSP itself (see 6.2.3).

6.3.4.7.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
```

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

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
 <userId>
  <msisdn>19585550100</msisdn>
  <imsi>222011234567890</imsi>
 </userId>
 <status>
  <value>Deactivated</value>
  <reason>SwapToAnotherArp</reason>
  <activationStart>2012-10-26T19:32:52+00:00</activationStart>
  <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
  <deactivationStart>2012-10-28T22:02:10+00:00</deactivationStart>
  <deactivationEnd>2012-10-29T21:53:50+00:00</deactivationEnd>
  <processId>ITA01DEFGHI</processId>
 </status>
 <fraudManagementStatus>
  <value>UnSuspended</value>
 </fraudManagementStatus>
 <arpSignallingStatus>
  <value>OnLine</value>
 </arpSignallingStatus>
 <provisioningServerId>ITASI</provisioningServerId>
 <provisioningClientId>ITA01</provisioningClientId>
 <callbackReference>
  <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
  <callbackData>12345</callbackData>
 </callbackReference>
 <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.7.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.4.8 Example 8: DSP notifies completion of suspension (Informative)

The DSP sends this notification right after transition 3 of fraud management state machine, to inform the ARP that the subscription has been suspended (see 6.2.4).

6.3.4.8.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Host: arp.example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
```

```
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01abcdef </processId>
  </status>
  <fraudManagementStatus>
    <value>Suspended</value>
    <processId>ITA01mnopqr</processId>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.8.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.4.9 Example 9: DSP notifies completion of un-suspension (Informative)

The DSP sends this notification right after transition 6 of fraud management state machine, to inform the ARP that the subscription has been un-suspended (see 6.2.4).

6.3.4.9.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Host: arp.example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
```



```
    <processId>ITA01abcdef </processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
    <processId>ITA01stuvwx</processId>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.9.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.4.10 Example 10: DSP notifies failure of un-suspension (Informative)

The DSP sends this notification right after transition 5 of fraud management state machine, to inform the ARP that the subscription un-suspension has been refused (see 6.2.4).

6.3.4.10.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Host: arp.example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789 12</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01abcdef </processId>
  </status>
  <fraudManagementStatus>
    <value>Suspended</value>
    <processId>ITA01stuvwx</processId>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
```



```
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.10.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.4.11 Example 11: DSP notifies failure of ARP-initiated deactivation of a suspended subscription (Informative)

The DSP sends this notification right after transition 7 of roaming subscription state machine (see 6.2.3), to inform the ARP that the deactivation has been refused. The subscription status is put back to ”Active” , while the fraud management status remains “Suspended”.

6.3.4.11.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Host: arp.example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <reason>NotEligible</reason>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01JKLMNO</processId>
  </status>
  <fraudManagementStatus>
    <value>Suspended</value>
    <processId>ITA01mnopqr</processId>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLine</value>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
```



```
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.11.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.4.12 Example 12: DSP notifies signalling status change completion, from "OnLine" to "OffLine" (Informative)

The DSP sends this notification right after transition 3 of ARP signalling state machine (see 6.2.5), to inform the ARP that the signalling status change has been completed.

6.3.4.12.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Host: arp.example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA011234567891234567891 2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OffLine</value>
    <changeStart>2012-10-28T22:02:10+00:00</changeStart>
    <changeEnd>2012-10-29T21:53:50+00:00</changeEnd>
    <processId>ITA01yzABC</processId>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.12.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.4.13 Example 13: DSP refuses to change signalling status from "OffLine" to "OnLine" (Informative)

The DSP sends this notification right after transition 5 of ARP signalling state machine (see 6.2.5), to inform the ARP that the signalling status change to "OnLine" has been refused (e.g. because DSP does not support online charging).

6.3.4.13.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Host: arp.example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
     <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OffLine</value>
    <processId>ITA01PQRSTU</processId>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.13.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.4.14 Example 14: DSP notifies DSP-initiated signalling status change, from "OnLine" to "OffLine" (Informative)

The DSP sends this notification to inform the ARP that it is going to change the signalling status from online to offline (see 6.2.5, transition 1).

6.3.4.14.1 Request

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Host: arp.example.com
Accept: application/xml
Content-Type: application/xml
Content-Length: nnnn

<?xml version="1.0" encoding="UTF-8"?>
<rp:roamingSubscription xmlns:rp="urn:oma:xml:rest:netapi:roamingprovisioning:1">
<roamingSubscriptionId>ITASIITA01123456789123456789l2</roamingSubscriptionId>
  <userId>
    <msisdn>19585550100</msisdn>
    <imsi>222011234567890</imsi>
  </userId>
  <status>
    <value>Active</value>
    <activationStart>2012-10-26T19:32:52+00:00</activationStart>
    <activationEnd>2012-10-27T10:22:53+00:00</activationEnd>
    <processId>ITA01abcdef</processId>
  </status>
  <fraudManagementStatus>
    <value>UnSuspended</value>
  </fraudManagementStatus>
  <arpSignallingStatus>
    <value>OnLineToOffLine</value>
    <processId>ITA01PQRSTU</processId>
  </arpSignallingStatus>
  <provisioningServerId>ITASI</provisioningServerId>
  <provisioningClientId>ITA01</provisioningClientId>
  <callbackReference>
    <notifyURL>http://arp.example.com/notifications/roamingSubscriptionCallback</notifyURL>
    <callbackData>12345</callbackData>
  </callbackReference>
  <resourceURL>http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123</resourceURL>
</rp:roamingSubscription>
```

6.3.4.14.2 Response

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

6.3.5 DELETE

Method not allowed by the resource. The returned HTTP error status is 405. The ARP should also include the 'Allow: [POST]' field in the response as per section 14.7 of [RFC 2616].

7. Fault definitions

7.1 Service Exceptions

For common Service Exceptions refer to [REST_NetAPI_Common]. The following additional Service Exception codes are defined for the RESTful Roaming Provisioning API.

7.1.1 SVC1008: Bad status transition

Name	Description
MessageID	SVC1008
Text	Transition from %1 status to %2 roaming subscription status, fraud management status or ARP signalling status cannot be requested by ARP.
Variables	%1 roaming subscription status, fraud management status or ARP signalling status of the roaming subscription resource at the time the DSP received the request. %2 new status received in the request.
HTTP status code(s)	400 Bad Request

7.2 Policy Exceptions

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

Appendix A. Change History (Informative)

A.1 Approved Version History

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

A.2 Draft/Candidate Version 1.0 History

Document Identifier	Date	Sections	Description
Draft Versions: REST_NetAPI _RoamingProvisioning-V1_0	29 Apr 2013	all	first draft TS
	30 Apr 2013	3,5	OMA-ARC-REST-Roaming-2013-0023R01-CR_ArpOfferTyOMA-ARC-REST-Roaming-2013-0022R01-CR_flowUserIdChange OMA-ARC-REST-Roaming-2013-0020R01-CR_ARP2DSP OMA-ARC-REST-Roaming-2013-0017R01-CR_RoamingContractNotificationType_additional_fields OMA-ARC-REST-Roaming-2013-0016R01-CR_RoamingContractType_additional_fields OMA-ARC-REST-Roaming-2013-0015R01-CR_NotificationReasonEnum OMA-ARC-REST-Roaming-2013-0014R01-CR_ContractStatusEnum OMA-ARC-REST-Roaming-2013-0012R01-CR_RoamingContractNotification OMA-ARC-REST-Roaming-2013-0011-CR_RoamingContractType OMA-ARC-REST-Roaming-2013-0010R01-CR_resources
	06 May 2013	5	OMA-ARC-REST-Roam-2013-0026-CR_resources_revised OMA-ARC-REST-Roaming-2013-0027-CR_DataTypes_revised OMA-ARC-REST-Roaming-2013-0028-CR_Enumeration_revised OMA-ARC-REST-Roaming-2013-0029-CR_flows_revised
	06 May 2013	all, 5.1	Fixed some editorial typos (e.g. substituting Contract with Subscription) Fixed some editorial typos (e.g. missing {arpId} on the first table, first row, second column)
	08 May 2013	5	OMA-ARC-REST-Roaming-2013-0031-CR_Flows_url_and_outline_fix OMA-ARC-REST-Roaming-2013-0032-CR_initialTimeStamp
	09 May 2013	5	Fixed typo on 2 figures (removed the previous figures was still on top of the new ones)
	20 May 2013	5,6	OMA-ARC-REST-Roaming-2013-0033R01-CR_signallingStatus.doc OMA-ARC-REST-Roaming-2013-0034-CR_PreProvisioningCancelledStatus OMA-ARC-REST-Roaming-2013-0035R01-CR_Detailed_RoamingSubscription_resource_specification.doc
	27 May 2013	3,4,5	OMA-ARC-REST-Roaming-2013-0036-CR_RoamingContextTex
	28 May 2013	headers&footers	Reapplied the TS template to fix OMA headers&footers
	3 June 2013	5,6	OMA-ARC-REST-Roaming-2013-0039-CR_Notification_fix.doc OMA-ARC-REST-Roaming-2013-0040R01-CR_Suspended.doc OMA-ARC-REST-Roaming-2013-0041R01-CR_Notification_structure_refactoring.doc OMA-ARC-REST-Roaming-2013-0042R02-CR_Detailed_RoamingSubscriptions_resource_specification.doc OMA-ARC-REST-Roaming-2013-0043R01-CR_Old_userid.doc OMA-ARC-REST-Roaming-2013-0044R01-CR_DSP_initiated_signalling_status_change.doc

Document Identifier	Date	Sections	Description
	17 June 2013	5,6	OMA-ARC-REST-Roaming-2013-0045-CR_Deactivation_fix.doc OMA-ARC-REST-Roaming-2013-0046-CR_Fraud_management_deactivation.doc OMA-ARC-REST-Roaming-2013-0047-CR_Deactivation_Authorized.doc OMA-ARC-REST-Roaming-2013-0048-CR_Asynchronous_Processing.doc OMA-ARC-REST-Roaming-2013-0049-CR_Service_Exceptions.doc OMA-ARC-REST-Roaming-2013-0050-CR_Policy_Exceptions.doc OMA-ARC-REST-Roaming-2013-0051-CR_Appendix_C_F.doc OMA-ARC-REST-Roaming-2013-0052-CR_Appendix_E.doc OMA-ARC-REST-Roaming-2013-0053R01-CR_Detailed_notification_resource_description.doc
	26 June 2013	2,3,4,5,6, Appendix C, Appendix D	OMA-ARC-REST-Roaming-2013-0055-CR_Appendix_D OMA-ARC-REST-Roaming-2013-0056-CR_Namespace_fix OMA-ARC-REST-Roaming-2013-0057-CR_Removal_of_userId_change_scenario OMA-ARC-REST-Roaming-2013-0058-CR_Clean_up OMA-ARC-REST-Roaming-2013-0059-CR_Appendix_C_fix OMA-ARC-REST-Roaming-2013-0060-Signalling_state_machine
	03 July 2013	4, 5, 6, 7, Appendix D, Appendix E	OMA-ARC-REST-Roaming-2013-0061-CR_BP_call_update OMA-ARC-REST-Roaming-2013-0063-CR_Introduction
	09 July 2013	3, 5, 6, 7, Appendix D, Appendix E	OMA-ARC-REST-Roaming-2013-0064-CR_Abbreviations OMA-ARC-REST-Roaming-2013-0065-CR_API_Definition OMA-ARC-REST-Roaming-2013-0066-CR_Deactivation_flow_fix OMA-ARC-REST-Roaming-2013-0067-CR_Editorials_and_minor_bug_fixes OMA-ARC-REST-Roaming-2013-0068-CR_Signalling_change_refusal OMA-ARC-REST-Roaming-2013-0069-CR_ProcessId_and_customReason
	16 July 2013	2, 3, 4, 5, 6, Appendix B, Appendix E, Appendix G	OMA-ARC-REST-Roaming-2013-0071-CR_Authorization_aspects OMA-ARC-REST-Roaming-2013-0072-CR_Appendix_B OMA-ARC-REST-Roaming-2013-0074-CR_Additional_clarifications_in_Appendix_E OMA-ARC-REST-Roaming-2013-0075R01-CR_Reason_field_use OMA-ARC-REST-Roaming-2013-0076-CR_Diagrams_clerical_fix
	05 Aug 2013	2, 3, 4, 5, 6, Appendix D, Appendix E	OMA-ARC-REST-Roaming-2013-0079-CR_State_machines_update OMA-ARC-REST-Roaming-2013-0080R01-CR_IF7.V1_Alignement OMA-ARC-REST-Roaming-2013-0082R01-CR_MVNOsupport
	23 Sep 2013	all	First set of editorial CONR comment resolution: A001 to A0016, A0018, A0020 to A0024, A0029, A0032, A0034, A0036, A0042, A0043, A0046, A0058, A0059, A0074
	26 Sep 2013	all	editorial CONR comment resolution as per Bangkok face2face meeting comments resolution: A028, A039, A040, A044, A045, A070, A072, A060, A061, A062, A063, A064 ,A065, A066, A67, A068, A069
	08 Oct 2013	all	CR implementation: OMA-ARC-REST-Roaming-2013-0086-CR_CONR_Comment30_Resolution.zip OMA-ARC-REST-Roaming-2013-0088-CR_CONR_Comment31_Resolution.zip OMA-ARC-REST-Roaming-2013-0089-CR_CONR_Comment47_to_54_Resolution.zip

Document Identifier	Date	Sections	Description
	25 Oct 2013	all	CR implementation: OMA-ARC-REST-Roaming-2013-0090R01-CR_Comment55_Resolution.doc OMA-ARC-REST-Roaming-2013-0091-CR_Comment57_Resolution OMA-ARC-REST-Roaming-2013-0092-CR_Comment47_Resolution.doc OMA-ARC-REST-Roaming-2013-0095R01-CR_CR_CommentA062_063_Resolution.doc OMA-ARC-REST-Roaming-2013-0097R01-CR_CommentA033_Resolution.doc
	05 Nov 2013	6.1.5, 6.2.4.1.2, 6.3.4.13.1, 6.3.4.14.1, H.3	Incorporated CR: OMA-ARC-REST-Roaming-2013-0099-CR_XmlValidationFix
Candidate Version: REST_NetAPI _RoamingProvisioning-V1_0	12 Nov 2013	n/a	Status changed to Candidate by TP TP Ref # OMA-TP-2013-0355-INP_RoamAPI_V1_0_ERP_and_ETR_for_Candidate_approval

Appendix B. Static Conformance Requirements (Normative)

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

B.1 SCR for REST. RoamingProvisioning Server

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

B.1.1 SCR for REST.RoamingProvisioning.RoamingSubscriptions Server

Item	Function	Reference	Requirement
REST-ROA-CRE-S-001-M	Support for creation of roaming subscription	6.1	
REST-ROA-CRE-S-002-M	Create a roaming subscription -POST	6.1.5	

B.1.2 SCR for REST.RoamingProvisioning.ManageSubscription Server

Item	Function	Reference	Requirement
REST-ROA-MAN-S-001-M	Support for managing a roaming subscription for a user	6.2	
REST-ROA- MAN -S-002-M	Read a roaming subscription -GET	6.2.3	
REST-ROA- MAN -R-S-003-M	Update individual roaming subscription -PUT	6.2.4	

B.1.3 SCR for REST.RoamingProvisioning.SubscriptionNotification Server

Item	Function	Reference	Requirement
REST-ROA-ROAM-S-001-M	Support for creation of roaming subscription notification	6.3	
REST-ROA-ROAM-S-002-M	Create a roaming subscription notification -POST	6.3.4	

Appendix C. Application/x-www-form-urlencoded Request Format for POST Operations (Normative)

In most OMA RESTful Network API specifications, Appendix C defines a format for API requests where the body of the request is encoded using the application/x-www-form-urlencoded MIME type.

In this particular specification, Appendix C has been intentionally left empty.

Appendix D. 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 [RFC4627].

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.

D.1 ARP requests the creation of a roaming subscription (section 6.1.5.1)

Request:

```
POST /exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Accept: application/json
Host: example.com

{" roamingSubscription": {
    "userId": {
        "msisdn": "19585550100",
        " imsi ": "222011234567890"
     },
    "status": {
        "value": "PreProvisioned",
        "processId": "ITA01abcdef"
    },
    "fraudManagementStatus": {
        "value": "UnSuspended",
    },
    "arpSignallingStatus": {
        "value": "OnLine",
    },
    "provisioningServerId": "ITASI",
    "provisioningClientId": "ITA01",
    "callbackReference": {
        "notifyURL": "http://arp.example.com/notifications/roamingSubscriptionCallback",
        "callbackData": "12345"
    },
}}
```

Response:

```
HTTP/1.1 201 Created
Location: http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123
Date: Fri, 26 Oct 2012 19:32:52 GMT
Content-Type: application/json
Content-Length: nnnn
```

```
{" roamingSubscription": {
    "roamingSubscriptionId": "ITASIITA0112345678912345678912",
    "userId": {
        "msisdn": "19585550100",
        " imsi ": "222011234567890"
     },
    "status": {
        "value": "PreProvisioningPending",
        "processId": "ITA01abcdef"
    },
    "fraudManagementStatus": {
        "value": "UnSuspended",
    },
    "arpSignallingStatus": {
        "value": "OnLine",
    },
    "provisioningServerId": "ITASI",
    "provisioningClientId": "ITA01",
    "callbackReference": {
        "notifyURL": "http://arp.example.com/notifications/roamingSubscriptionCallback",
        "callbackData": "12345"
    },
    "resourceURL": "http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123"
}}
```

D.2 ARP requests roaming subscription activation (section 6.2.4.1)

Request:

```
PUT /exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123 HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Accept: application/json
Host: example.com

{" roamingSubscription": {
    "roamingSubscriptionId": "ITASIITA0112345678912345678912",
    "userId": {
        "msisdn": "19585550100",
        " imsi ": "222011234567890"
     },
    "status": {
        "value": "Active",
        "processId": "ITA01abcdef"
    },
    "fraudManagementStatus": {
        "value": "UnSuspended",
    },
    "arpSignallingStatus": {
        "value": "OnLine",
    },
    "provisioningServerId": "ITASI",
    "provisioningClientId": "ITA01",
```

```
    "callbackReference": {
        "notifyURL": "http://arp.example.com/notifications/roamingSubscriptionCallback",
        "callbackData": "12345"
    },
    "resourceURL": "http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123"
}}
```

Response:

```
HTTP/1.1 202 Accepted
Date: Fri, 26 Oct 2012 19:32:52 GMT
Content-Type: application/json
Content-Length: nnnn

{" roamingSubscription": {
    "roamingSubscriptionId": "ITASIITA0112345678912345678912",
    "userId": {
         "msisdn": "19585550100",
         " imsi ": "222011234567890"
     },
    "status": {
        "value": "ActivationPending",
        "processId": "ITA01abcdef"
    },
    "fraudManagementStatus": {
        "value": "UnSuspended",
    },
    "arpSignallingStatus": {
        "value": "OnLine",
    },
    "provisioningServerId": "ITASI",
    "provisioningClientId": "ITA01",
    " requestArrival": "2013-05-13T16:01:03+00:00",
    "callbackReference": {
        "notifyURL": "http://arp.example.com/notifications/roamingSubscriptionCallback",
        "callbackData": "12345"
    },
    "resourceURL": "http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123"
}}
```

D.3 DSP notifies pre-provisioning success (section 6.3.4.1)

Request:

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Host: arp.example.com

{" roamingSubscription": {
    "roamingSubscriptionId": "ITASIITA0112345678912345678912",
    "userId": {
         "msisdn": "19585550100",
         " imsi ": "222011234567890"
     },
```

```
    "status": {
        "value": "PreProvisioned",
        "processId": "ITA01abcdef"
    },
    "fraudManagementStatus": {
        "value": "UnSuspended",
    },
    "arpSignallingStatus": {
        "value": "OnLine",
    },
    "provisioningServerId": "ITASI",
    "provisioningClientId": "ITA01",
    "callbackReference": {
        "notifyURL": "http://arp.example.com/notifications/roamingSubscriptionCallback",
        "callbackData": "12345"
    },
    "resourceURL": "http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123"
}}
```

Response:

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

D.4 DSP notifies pre-provisioning failure due to lack of agreement between ARP and DSP (section 6.3.4.2)

Request:

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Host: arp.example.com

{" roamingSubscription": {
    "roamingSubscriptionId": "ITASIITA0112345678912345678912",
    "userId": {
         "msisdn": "19585550100",
         " imsi ": "222011234567890"
     },
    "status": {
        "value": "Cancelled",
        "reason": "NoActiveAgreement"
        "processId": "ITA01abcdef"
    },
    "fraudManagementStatus": {
        "value": "UnSuspended",
    },
    "arpSignallingStatus": {
        "value": "OnLine",
    },
    "provisioningServerId": "ITASI",
    "provisioningClientId": "ITA01",
    "lastUpdateDescription": "We have not a roaming agreement with you",
```

```
    "callbackReference": {
        "notifyURL": "http://arp.example.com/notifications/roamingSubscriptionCallback",
        "callbackData": "12345"
    },
    "resourceURL": "http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123"
}}
```

Response:

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

D.5 DSP notifies activation completion (section 6.3.4.3)

Request:

```
POST notifications/roamingSubscriptionCallback HTTP/1.1
Content-Type: application/json
Content-Length: nnnn
Host: arp.example.com

{" roamingSubscription": {
    "roamingSubscriptionId": "ITASIITA0112345678912345678912",
    "userId": {
         "msisdn": "19585550100",
         " imsi ": "222011234567890"
     },
    "status": {
        "value": "Active",
        "activationStart": "2012-10-26T19:32:52+00:00",
        "activationEnd": "2012-10-27T10:22:53+00:00"
        "processId": "ITA01abcdef"
    },
    "fraudManagementStatus": {
        "value": "UnSuspended",
    },
    "arpSignallingStatus": {
        "value": "OnLine",
    },
    "provisioningServerId": "ITASI",
    "provisioningClientId": "ITA01",
    "callbackReference": {
        "notifyURL": "http://arp.example.com/notifications/roamingSubscriptionCallback",
        "callbackData": "12345"
    },
    "resourceURL": "http://exampleAPI/roamingprovisioning/v1/ITA01/roamingSubscriptions/prov123"
}}
```

Response:

```
HTTP/1.1 204 No Content
Date: Fri, 26 Oct 2012 19:32:52 GMT
```

Appendix E. IF7 specification operations mapping (Informative)

The table below illustrates the mapping between REST resources/methods defined in this specification and [IF_7_SPEC] equivalent operations.

REST Resource	REST Method	REST Section reference	IF7 specification equivalent operation
Resource factory to create roaming subscription	POST	6.1.5.1.1	PreProvisioningRequest
Resource factory to create roaming subscription	POST	6.1.5.1.2	PreProvisioningRequestAcknowledgement
Roaming subscription	GET	6.2.3.1	No equivalent
Roaming subscription	PUT	6.2.4.1.1	ProvisioningRequest
Roaming subscription	PUT	6.2.4.5.1	ReProvisioningRequest
Roaming subscription	PUT	6.2.4.5.2	ReProvisioningAcknowledgement (after ARP ReProvisioningRequest)
Roaming subscription	PUT	6.2.4.6	No equivalent
Roaming subscription	PUT	6.2.4.3.1	SuspendRoaming
Roaming subscription	PUT	6.2.4.4.1	UnSuspendRoaming
Roaming subscription	PUT	6.2.4.2.1	DeProvisioningRequest
Roaming subscription notification	POST	6.3.4.1.1, 6.3.4.2.1	PreProvisioningCompletion
Roaming subscription notification	POST	6.3.4.3.1	ProvisioningCompletion
Roaming subscription notification	POST	6.3.4.4.1, 6.3.4.6.1, 6.3.4.11.1	DeProvisioningAcknowledgement
Roaming subscription notification	POST	6.3.4.5.1, 6.3.4.7.1	DeProvisioningCompletion
Roaming subscription notification	POST	6.3.4.12.1, 6.3.4.13.1	ReProvisioningCompletion
Roaming subscription notification	POST	6.3.4.14.1	ReProvisioningNotification
Roaming subscription notification	POST	6.3.4.14.2	ReProvisioningAcknowledgement (after DSP ReProvisioningNotification)
Roaming subscription notification	POST	6.3.4.8.1, 6.3.4.10.1	RoamingSuspended
Roaming subscription notification	POST	6.3.4.9.1	RoamingUnSuspended

Table 1 IF7 specification operations mapping

The table below illustrates the mapping between operation parameters defined in [IF_7_SPEC] and equivalent fields of the roaming subscription resource.

IF7 specification parameter	IF7 specification operation	RoamingSubscription equivalent field
SENDER	PreProvisioningRequest, ProvisioningRequest, DeProvisioningRequest, SuspendRoaming, UnSuspendRoaming, ReProvisioningRequest	provisioningClientId
RECEIVER	PreProvisioningRequest,	provisioningServerId

IF7 specification parameter	IF7 specification operation	RoamingSubscription equivalent field
	ProvisioningRequest, DeProvisioningRequest, SuspendRoaming, UnSuspendRoaming, ReProvisioningRequest	
SENDER	PreProvisioningRequestAcknowledgement, PreProvisioningCompletion, ProvisioningCompletion, DeProvisioningAcknowledgement, DeProvisioningCompletion, RoamingSuspended, UnSuspendRoaming, RoamingUnSuspended, ReProvisioningAcknowledgement, ReProvisioningCompletion, ReProvisioningNotification	provisioningServerId
RECEIVER	PreProvisioningRequestAcknowledgement, PreProvisioningCompletion, ProvisioningCompletion, DeProvisioningAcknowledgement, DeProvisioningCompletion, RoamingSuspended, UnSuspendRoaming, RoamingUnSuspended, ReProvisioningAcknowledgement, ReProvisioningCompletion, ReProvisioningNotification	provisioningClientId
ARP	PreProvisioningRequest	arpId included in the resource URL
UserIdentifier	PreProvisioningRequest, PreProvisioningCompletion, DeProvisioningAcknowledgement	userId
ARPSignallingStatus	PreProvisioningRequest, ReProvisioningCompletion PreProvisioningCompletion	arpSignallingStatus →value
AuthorizationInformation	PreProvisioningRequest	authorizationInformation
TransactionId	PreProvisioningRequest, PreProvisioningRequestAcknowledgement, PreProvisioningCompletion, ProvisioningRequest, ProvisioningCompletion, DeProvisioningRequest, DeProvisioningAcknowledgement, DeProvisioningCompletion	status →processId
TransactionId	ReProvisioningRequest, ReProvisioningAcknowledgement, ReProvisioningCompletion, ReProvisioningNotification	arpSignallingStatus →processId
TransactionId	SuspendRoaming, RoamingSuspended, UnSuspendRoaming, RoamingUnSuspended	fraudManagementStatus →processId
SubscriptionId	All operations except PreProvisioningRequest	roamingSubscriptionId
RequestArrivalTimestamp	PreProvisioningRequestAcknowledgement	requestArrival
ArrivalTimestamp	ReProvisioningAcknowledgement	requestArrival

IF7 specification parameter	IF7 specification operation	RoamingSubscription equivalent field
ProvisioningStartTimestamp	ProvisioningCompletion	status →activationStart
ProvisioningEndTimestamp	ProvisioningCompletion	status →activationEnd
NotificationCode	PreProvisioningCompletion, DeProvisioningAckowledgement, DeProvisioningCompletion	status →reason/customReason
DeactivationReason	DeProvisioningRequest, DeProvisioningCompletion	status →reason
NotificationCode	RoamingSuspended, RoamingUnSuspended	fraudManagementStatus →customReason[1]
NotificationDescription	PreProvisioningCompletion, DeProvisioningAckowledgement, DeProvisioningCompletion	lastUpdateDescription
OLD ARP Signalling Status	ReProvisioningRequest	No equivalent
NEW ARP Signalling Status	ReProvisioningRequest	arpSignallingStatus →value
ChangeStartTimestamp	ReProvisioningCompletion	arpSignallingStatus →changeStart
ChangeEndTimestamp	ReProvisioningCompletion	arpSignallingStatus →changeEnd
ChangeType	ReProvisioningNotification	arpSignallingStatus →value
DeProvisioningStartTimestamp	DeProvisioningCompletion	status →deactivationStart
DeProvisioningEndTimestamp	DeProvisioningCompletion	status →deactivationEnd

Table 2 IF7 specification parameters mapping

[1] "1: Not Activated – Generic" corresponds to the absence of the customReason field; "2: Not Activated – invalid Transaction ID" and "3: Not Activated – Invalid SubscriptionId" errors are handled with a 400 Bad Request response.

Appendix F. Light-weight Resources (Informative)

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

Appendix G. Authorization aspects (Normative)

Security requirements between DSP and ARP are defined by bilateral agreements. It is RECOMMENDED to send messages over secure VPN tunnel.

Appendix H. State Machine (Normative)

H.1 Roaming subscription state machine

The roaming subscription resource contains a “status” structure that can be modified by the ARP, via the roaming provisioning API, and by the DSP. Only certain status transitions are allowed, as described in Figure 9. The only transitions that can be requested by the client (an ARP) by means of POST and PUT requests are in bold (transitions 1 via POST, transitions 4 and 6 via PUT). The DSP can internally operate every transition not in bold.

At transition 3, the DSP SHALL set the “subscriptionId” field to a unique value, obtained by the concatenation of DSP TADIG code, ARP TADIG code and a unique code. The “subscriptionId” field SHALL NOT be modified in any other case.

At transitions 1 and 6, the ARP SHALL set the “processId” field in “status” to a new unique value, obtained by the concatenation of ARP TADIG code and a unique code. At transition 11, the DSP SHALL set the “processId” field in “status” to a new unique value, obtained by the concatenation of ARP TADIG code and a unique code. The “processId” field in “status” SHALL NOT be modified in any other case.

At transitions 2, 7 and 9, the DSP SHALL set the “reason” or the “customReason” field in “status” to specify the reason of the refusal. At transition 11, the DSP MAY set the “reason” or the “customReason” field in “status” to specify the reason for the deactivation. At transition 6, the ARP SHALL set the “reason” or the “customReason” field in “status” to specify the reason for the deactivation. The “reason” and “customReason” fields in “status” SHALL NOT be modified in any other case.

At transition 5, the DSP SHALL set the “activationStart” and “activationEnd” fields with the timestamps of the beginning and the end of the activation process. The “activationStart” and “activationEnd” fields SHALL NOT be modified in any other case.

At transitions 10 or 11, the DSP SHALL set the “deactivationStart” and “deactivationEnd” fields with the timestamps of the beginning and the end of the deactivation process. The “deactivationStart” and “deactivationEnd” fields SHALL NOT be modified in any other case.

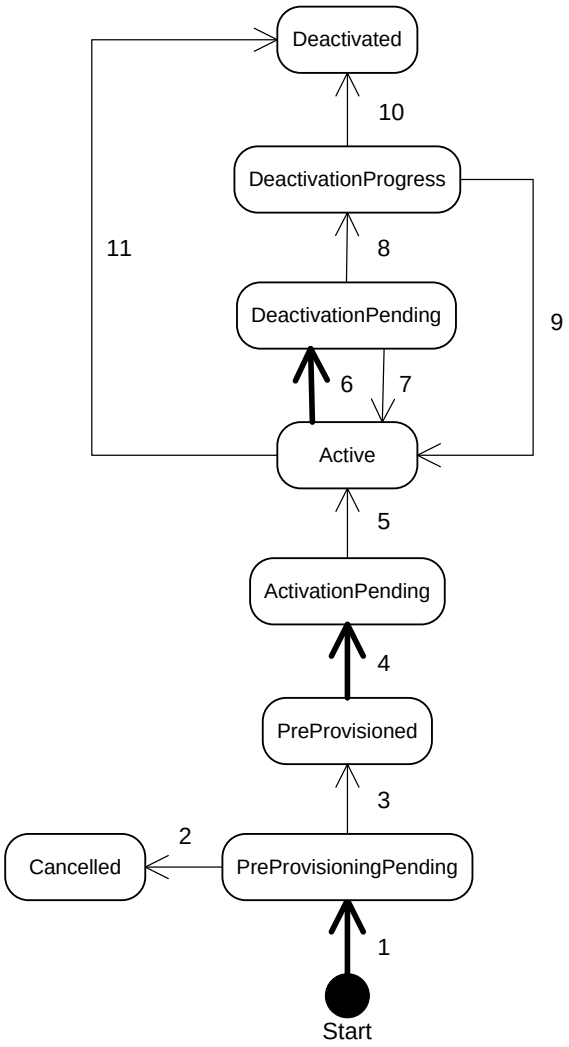

Figure 10 Roaming subscription state machine

Description of allowed status transitions:

1. An ARP requests pre-provisioning of a roaming subscription, using a POST request in “PreProvisioned” status on the /roamingSubscriptions resource. The ARP sets the “processId” field in “status” to a new unique value: it will identify this pre-provisioning and activation process. DSP puts the roaming subscription in “PreProvisioningPending” status after receiving the POST.
2. If pre-provisioning check fails, DSP removes the roaming subscription and notifies ARP.
3. If pre-provisioning successfully passes DSP check, DSP puts the roaming subscription in “PreProvisioned” status and notifies ARP.
4. ARP requests the activation of the roaming subscription, using a PUT request in “Active” status on the /roamingSubscriptions/{id} resource. DSP puts the roaming subscription in “ActivationPending” status after receiving the PUT.
5. When DSP completes the asynchronous processing required by the activation, it puts the roaming subscription in “Active” status, sets “activationStart” and “activationEnd” fields and notifies ARP.
6. ARP requests the deactivation of the roaming subscription, using a PUT request in “Deactivated” status on the /roamingSubscriptions/{id} resource. The ARP sets the “processId” field in “status” to a new unique value: it will

identify this ARP-initiated deactivation process. DSP puts the roaming subscription in “DeactivationPending” status after receiving the PUT.

7. The DSP refuses the deactivation of the subscription, setting it back in the “Active” status, and notifies ARP.
8. The DSP accepts the deactivation, it sets the roaming subscription in “DeactivationPending” status and notifies ARP.
9. The DSP refuses the deactivation of the subscription, setting it back in the “Active” status, and notifies ARP.
10. The DSP completes the deactivation process, it puts the roaming subscription in “Deactivated” status, sets “deactivationStart” and “deactivationEnd” fields and notifies ARP.
11. The DSP puts the roaming subscription to “Deactivated” status, sets “deactivationStart” and “deactivationEnd” fields and notifies ARP. The DSP sets also the “processId” field in “status” to a new unique value: it will identify this DSP-initiated deactivation process..

H.2 Fraud Management state machine

The roaming subscription resource contains a “fraudManagementStatus” structure that can be modified by the ARP, via the roaming provisioning API, and by the DSP. Only certain status transitions are allowed, as described in Figure 10. The only transitions that can be requested by the client (an ARP) by means of PUT requests are in bold (transitions 1 and 4). The DSP can internally operate every transition not in bold.

At transitions 1 and 4, the ARP SHALL set the “processId” field in “fraudManagementStatus” to a new unique value, obtained by the concatenation of ARP TADIG code and a unique code. The “processId” field in “fraudManagementStatus” SHALL NOT be modified in any other case.

At transitions 2 and 5, the DSP MAY set the “customReason” field in “fraudManagementStatus” to specify the reason of the failure.

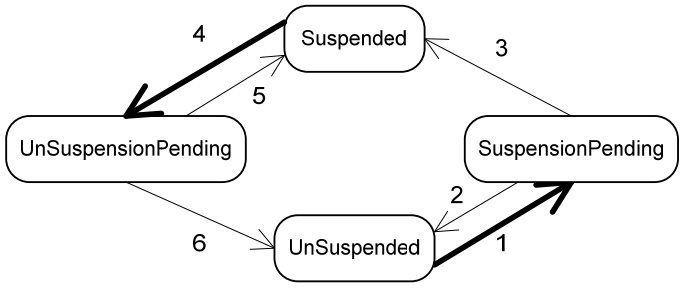

Figure 11 Fraud management state machine

Description of allowed status transitions:

1. ARP requests the roaming subscription suspension (e.g. in case of potential fraud), using a PUT request in “Suspended” fraud management state on the /roamingSubscription/{subscriptionId} resource. The ARP sets the “processId” field in “fraudManagementStatus” to a new unique value: it will identify this suspension process. DSP puts the roaming subscription in “SuspensionPending” fraud management status after receiving the PUT.
2. The suspension fails due to an error. The DSP puts the roaming subscription back in “UnSuspended” fraud management state and notifies the ARP.
3. When DSP completes the asynchronous processing required by the suspension, it sets the roaming subscription in “Suspended” fraud management status and notifies ARP.
4. ARP requests the roaming subscription un-suspension, using a PUT request in “UnSuspended” fraud management state on the /roamingSubscription/{subscriptionId} resource. The ARP sets the “processId” field in “fraudManagementStatus” to a new unique value: it will identify this un-suspension process. DSP puts the roaming subscription in “UnSuspensionPending” fraud management status after receiving the PUT.

5. The un-suspension fails due to an error or the DSP refuses to un-suspend the roaming subscription. The DSP puts the roaming subscription back in "Suspended" fraud management state and notifies the ARP.
6. The DSP accepts to un-suspend the roaming subscription, putting the roaming subscription in "UnSuspended" fraud management state and notifying the ARP.

H.3 ARP signalling state machine

The roaming subscription resource contains an "arpSignallingStatus" structure that can be modified by the ARP, via the roaming provisioning API, and by the DSP. Only certain status transitions are allowed, as described in Figure 11. The only transitions that can be requested by the client (an ARP) by means of PUT requests are in bold (transitions 1 and 4). The DSP can internally operate every transition in Figure 11.

The ARP MAY include an "arpSignallingStatus" structure in the initial POST request, to suggest the preferred signalling status.

- If the ARP included an "arpSignallingStatus" structure in the initial POST request and the DSP has capability to support that signalling status, the DSP SHOULD set the "arpSignallingStatus" to the value requested by the ARP.
- If the ARP included an "arpSignallingStatus" structure in the initial POST request but the DSP hasn't capability to support that signalling status, the DSP SHALL set the "arpSignallingStatus" to the supported value.
- If the ARP didn't include an "arpSignallingStatus" structure in the initial POST request, the DSP SHALL set the "arpSignallingStatus" to any supported value.

While the signalling status is "OnLineToOffLine" or "OffLineToOnLine" the ARP needs to be capable of handling both online and offline charging for the roaming subscription.

At transitions 1 and 4, the ARP or the DSP SHALL set the "processId" field in "arpSignallingStatus" to a new unique value, obtained by the concatenation of ARP TADIG code and a unique code. The "processId" field in "arpSignallingStatus" SHALL NOT be modified in any other case.

At transitions 3 and 6, the DSP SHALL set the "changeStart" and "changeEnd" fields with the timestamps of the beginning and the end of the signalling change process. The "changeStart" and "changeEnd" fields SHALL not be modified in any other case.

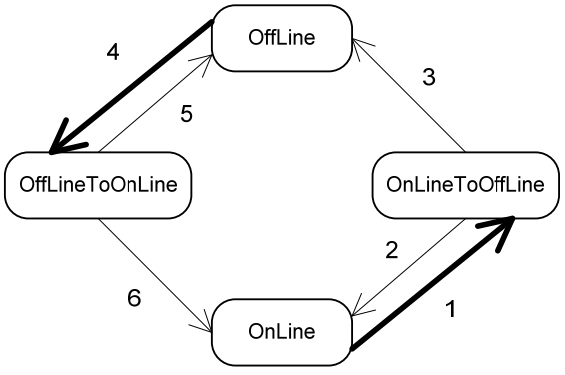

Figure 12 ARP Signalling state machine

Description of allowed status transitions:

1. One of the following:
    a. An ARP requests the change of signalling status for a roaming subscription, using a PUT request with "OffLine" signalling status on the /roamingSubscriptions{subscriptionId} resource. The ARP sets the

"processId" field in "arpSignallingStatus" to a new unique value: it will identify this signalling change process. DSP puts the signalling status to "OnLineToOffLine" after receiving the PUT.

b. The DSP notifies the ARP about a (DSP-initiated) signalling status change, sending a notification with signalling status "OnLineToOffLine". The DSP sets the "processId" field in "arpSignallingStatus" to a new unique value: it will identify this signalling change process.

2. The DSP refuses to change the signalling status, putting it back to "OnLine" and notifying the ARP.
3. The DSP sets "changeStart" and "changeEnd" fields and notifies the ARP about the completion of the signalling status change (ARP-initiated or DSP-initiated), sending a notification with signalling status "OffLine".
4. One of the following:
    a. An ARP requests the change of signalling status for a roaming subscription, using a PUT request with "OnLine" signalling status on the /roamingSubscriptions{subscriptionId} resource. The ARP sets the "processId" field in "arpSignallingStatus" to a new unique value: it will identify this signalling change process. DSP puts the signalling status to "OffLineToOnLine" after receiving the PUT.
    b. The DSP notifies the ARP about a (DSP-initiated) signalling status change, sending a notification with signalling status "OffLineToOnLine". The DSP sets the "processId" field in "arpSignallingStatus" to a new unique value: it will identify this signalling change process.
5. The DSP refuses to change the signalling status, putting it back to "OffLine" and notifying the ARP.
6. The DSP sets "changeStart" and "changeEnd" fields and notifies the ARP about the completion of the signalling status change (ARP-initiated or DSP-initiated), sending a notification with signalling status "OnLine".