**3GPP TSG-SA5 Meeting #129 *S5-201387rev1***

**Hyderabad, India, 24 – 28 February 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Clarify and add numerous issues in the REST SS of the ProvMnS | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | REST\_SS | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | This CR corrects numerous small errors in the REST SS of the ProvMnS, and implements the required changes following the introduction of enhanced patch methods in 3GPP TS 32.158. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Numrous changes are applied to the REST SS of the ProvMnS to correct smaller errors and introduce the new patch methods added to 3GPP TS 32.158. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The ProvMnS does not work and does not support enhanced patch methods introduced in 3GPP TS 32.158. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 12.1.1.1.2, 12.1.1.1.4.2, 12.1.1.1.5, 12.1.1.2.2, 12.1.1.2.3, 12.1.1.2.4, 12.1.1.3.1, 12.1.1.3.2.1, 12.1.1.3.2.1.2, 12.1.1.3.2.1.3.3, 12.1.1.4.1, 12.1.1.4.2.4, 12.1.1.4.2.5, 12.1.1.4.2.7, 12.1.1.4.2.8, 12.1.1.4.2.9, 12.1.1.4.2.10, 12.1.1.4.2.11, 12.1.1.4.2.15, 12.1.1.4.2.16, 12.1.1.4.2.17, 12.1.1.4.2.19, 12.1.1.4.2.20, 12.1.1.4.2.21 (new), 12.1.1.4.3.1, 12.1.1.4.4.2, 12.1.1.4.4.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

|  |
| --- |
| **First modification** |

# 2 References

- The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 28.526: "Telecommunication management; Life Cycle Management (LCM) for mobile networks that include virtualized network functions; Procedures".

[3] 3GPP TS 28.541: "Management and orchestration ; 5G Network Resource Model (NRM); Stage 2 and stage3".

[4] ITU-T Recommendation X.733 (02/92): "Information technology - Open Systems Interconnection - Systems Management: Alarm reporting function".

[5] 3GPP TS 28.531: "Management and orchestration ; Provisioning; ".

[6] 3GPP TS 28.554: "Management and orchestration ; 5G end to end Key Performance Indicators (KPI)".

[7] 3GPP TS 22.261: "Technical Specification Group Services and System Aspects; Service requirements for the 5G system; Stage 1".

[8] 3GPP TS 23.501: "Technical Specification Group Services and System Aspects; System Architecture for the 5G System; Stage 2".

[9] 3GPP TS 23.003: "Technical Specification Group Core Network and Terminals; Numbering, addressing and identification".

[10] ETSI GS NFV-IFA 013 V2.4.1 (2018-02) "Network Function Virtualization (NFV); Management and Orchestration; Os-Ma-nfvo Reference Point - Interface and Information Model Specification".

[11] 3GPP TS 28.622: "Telecommunication management; Generic Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".

[12] ETSI GS NFV-IFA 015 (V2.4.1): "Network Function Virtualisation (NFV); Management and Orchestration; Report on NFV Information Model".

[13] 3GPP TS 28.533: "Management and orchestration; Architecture framework"

[14] ITU-T Recommendation X.734 (1992): "Information technology - Open Systems Interconnection - Systems management: Event report management function".

[15] 3GPP TS 32.158: "Management and orchestration; Design rules for REpresentational State Transfer (REST) Solution Sets (SS)".

[16] 3GPP TS 32.302: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP); Information Service (IS)".

[17] 3GPP TS 32.401: "Telecommunication management; Performance Management (PM); Concept and requirements".

[18] 3GPP TS 28.552: "Management and orchestration; 5G performance measurements".

[19] 3GPP TS 32.401: "Telecommunication management; Perfomance Measurement (PM); Concept and requirements".

[20] ISO 8601:2004: "Data elements and interchange formats – Information interchange – Representation of dates and times".

[21] Text Attribution: Creator: ONAP, under Creative Commons Attribution 4.0 International License, https://creativecommons.org/licenses/by/4.0/, URI to access the text: <https://docs.onap.org/en/latest/_downloads/2c2b5962df52a0c1f2862f3bba3d67c7/CommonEventFormat_30.1_ONAP.json>, accessed 21.03.2019.

[22] Figure Attribution: Creator: ONAP, under Creative Commons Attribution 4.0 International License, https://creativecommons.org/licenses/by/4.0/, URI to access the figure: <https://docs.onap.org/en/latest/submodules/vnfsdk/model.git/docs/files/ves7_1spec.html?highlight=heartbeatIntervalChange#resource-structure>, accessed 21.03.2019).

[23] Text Attribution: Creator: ONAP, under Creative Commons Attribution 4.0 International License, https://creativecommons.org/licenses/by/4.0/, URI to access the text: <https://docs.onap.org/en/latest/submodules/vnfsdk/model.git/docs/files/VESEventListener_7_0_1.html?highlight=ves%207#naming-standards-for-eventname>, accessed 11.04.2019).

[24] Text Attribution: Creator: ONAP, under Creative Commons Attribution 4.0 International License, https://creativecommons.org/licenses/by/4.0/, URI to access the text: <https://docs.onap.org/en/latest/submodules/vnfsdk/model.git/docs/files/VESEventListener_7_0_1.html?highlight=ves%207#datatype-commoneventheader>, accessed 11.04.2019).

[25] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects ".

[26] W3C REC-xmlschema-0-20010502: "XML Schema Part 0: Primer".

[27] W3C REC-xmlschema-1-20010502: "XML Schema Part 1: Structures".

[28] W3C REC-xmlschema-2-20010502: "XML Schema Part 2: Datatypes".

[29] W3C REC-xml-names-19990114: "Namespaces in XML".

[30] Text Attribution: Creator: ONAP, under Creative Commons Attribution 4.0 International License, https://creativecommons.org/licenses/by/4.0/, URI to access the text: https://onap.readthedocs.io/en/latest/submodules/vnfrqts/requirements.git/docs/Chapter8/ves7\_1spec.html#datatype-heartbeatfields, accessed 06.11.2019).

[w] IETF RFC 6901: "JavaScript Object Notation (JSON) Pointer".

[x] OpenAPI: "OpenAPI 3.0.1 Specification", <https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.1.md>.

[y] IETF RFC 7396: "JSON Merge Patch".

[z] IETF RFC 6902: "JavaScript Object Notation (JSON) Patch".

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| **Next modification** |

## 12.1 Generic provisioning management service

### 12.1.1 RESTful HTTP-based solution set

#### 12.1.1.1 Mapping of operations

##### 12.1.1.1.1 Introduction

The IS operations are mapped to SS equivalents according to table 12.1.1.1.1-1.

Table 12.1.1.1.1-1: Mapping of IS operations to SS equivalents

|  |  |  |  |
| --- | --- | --- | --- |
| **IS operation** | **HTTP Method** | **Resource URI** | **SQ** |
| createMOI | PUT | http://{URI-DN-prefix}/{root}/{ProvMnS}/{MnSVersion}/{URI-LDN}/{LDN-first-part}/{className}={id} | M |
| getMOIAttributes | GET | http://{URI-DN-PREFIX}/{root}/{ProvMnS}/{MnSVersion}/{URI-LDN}/{LDN-FIRST-PAT}/{className}={id} | M |
| modifyMOIAttributes | PUT  PATCH | http://{URI-DN-prefix}/{root}/{ProvMnS}/{MnSVersion}/{URI-LDN}/{LDN-first-part}/{className}={id} | M |
| deleteMOI | DELETE | http://{URI-DN-prefix}/{root}/{ProvMnS}/{MnSVersion}/{URI-LDN}/{LDN-first-part}/{className}={id} | M |
| subscribe | POST | http://{URI-DN-prefix}/{root}/{ProvMnS}/{MnSVersion}/{URI-LDN}/subscriptions | M |
| unSubscribe | DELETE | http://{URI-DN-prefix}/{root}/{ProvMnS}/{MnSVersion}/subscriptions | M |
| DELETE | http://{URI-DN-prefix}/{root}/{ProvMnS}/{MnSVersion}/subscriptions/{subscriptionId} | M |

##### 12.1.1.1.2 Operation "createMOI"

This operation creates a single resource representing a managed object instance.

Table 12.1.1.1.2-1: Mapping of IS operation input parameters to SS equivalents (HTTP PUT)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **SQ** |
| managedObjectClass  managedObjectInstance | path | /{className}={id} | className: string  id: string | M |
| referenceObjectInstance | n/a | n/a | n/a | n/a |
| attributeListIn | request body | data | resourcePut-RequestType | M |

Note 1: Void.

The IS parameter referenceObjectInstance has no SS equivalent in the present document.

Table 12.1.1.1.2-2: Mapping of IS operation output parameters to SS equivalents (HTTP PUT)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IS operation parameter name | SS parameter location | SS parameter name | SS parameter type | SQ |
| attributeListOut | response body | n/a | resourceCreation-ResponseType | M |
| status | response status codes | n/a | n/a | M |
| response body | error | error-ResponseType | O |

The message flow for creating a resource is as follows:

1. The Service Consumer sends a HTTP PUT request to the Service Provider.

- The target URI identifies the location of the new resource to be created.

- The message body shall carry the complete representation of the resource to be created.

2. The Service Provider sends a HTTP PUT response to the Service Consumer.

- On success, "201 Created" shall be returned. The Location header shall carry the URI of the new resource and the message body the complete representation of the new resource.

- On failure, an appropriate error code shall be returned. The response message body may provide additional error information

##### 12.1.1.1.3 Operation "getMOIAttributes"

This operation retrieves one or multiple resources representing managed object instances.

Table 12.1.1.1.3-1: Mapping of IS operation input parameters to SS equivalents (HTTP GET)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **SQ** |
| baseObjectInstance | path | /{className}={id} | className: string  id: string | M |
| scope | query | scope | scope-QueryType  style: form  explode: true | M |
| filter | query | filter | filter-QueryType | O |
| attributeListIn | query | attributes | attributes-QueryType  style: form  explode: false | O |
| fields | fields-QueryType  style: form  explode: false | O |

The SS parameters "scope", "filter", "attributes" and "fields" are defined in TS 32.158 [15].

Note 1: Void.

Note 2: Void.

Table 12.1.1.1.3-2: Mapping of IS operation output parameters to SS equivalents (HTTP GET)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **SQ** |
| attributeListOut | response body | n/a | resourceRetrieval-ResponseType | M |
| status | response status codes | n/a | n/a | M |
| response body | error | error-ResponseType | O |

The message flow for retrieval of one or multiple resources is as follows:

1. The Service Consumer sends a HTTP GET request to the Service Provider.

- The authority and path components of the target URI identify the base resource.

- If present, the scope query parameter identifies other resources besides the base resource.

- The filter query parameter is applied to the set of scoped resources. Only resources passing the filter criteria are targeted.

- The attributes and fields query parameters identify the attributes and sub-attributes to be returned.

2. The Service Provider sends a HTTP GET response to the Service Consumer.

- On success, "200 OK" shall be returned. The response message body is constructed according to the hierarchical response construction method (TS 32.158 [15]).

- On failure, an appropriate error code shall be returned. The response message body shall provide additional error information

##### 12.1.1.1.4 Operation "modifyMOIAttributes"

###### 12.1.1.1.4.1 Mapping to HTTP PUT

HTTP PUT is used for a full update of a single resource.

Table 12.1.1.1.4.1-1: Mapping of IS operation input parameters to SS equivalents (HTTP PUT)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **SQ** |
| baseObjectInstance | path | /{className}={id} | className: string  id: string | M |
| scope | n/a | n/a | n/a | n/a |
| filter | n/a | n/a | n/a | n/a |
| modificationList | request body | n/a | resourcePut-RequestType | M |

The IS parameters "scope" and "filter" have no meaning when targeting a single resource with the target URI and are not mapped.

Table 12.1.1.1.4.1-2: Mapping of IS operation output parameters to SS equivalents (HTTP PUT)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **SQ** |
| attributeListOut | response body | n/a | resourceUpdate-ResponseType | O |
| status | response status codes | n/a | n/a | M |
| response body | error | error-ResponseType | O |

The message flow is as follows:

1. The Service Consumer sends a HTTP PUT request to the Service Provider.

- The target URI identifies the target resource.

- The message body shall contain the representation the target resource shall be replaced with.

2. The Service Provider sends a HTTP PUT response to the Service Consumer.

- On success, "200 OK" or "204 No Content" shall be returned. In the former case the response carries the representation of the updated resource in the message body. In the latter case the response has no message body. A "200 OK" response including the representation of the updated resource shall be sent in case the updated representation of the resource is not identical to the representation received in the request.

- On failure, an appropriate error code shall be returned. The response message body may provide additional error information

###### 12.1.1.1.4.2 Mapping to HTTP PATCH

HTTP PATCH is used to create, update or delete one or multiple resources.

Table 12.1.1.1.4.2-1: Mapping of IS operation input parameters to SS equivalents (HTTP PATCH)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **SQ** |
| baseObjectInstance | path | /{className}={id} | className: string  id: string | M |
| scope | n/a | n/a | n/a | n/a |
| filter | n/a | n/a | n/a | n/a |
| modificationList | request body | n/a | jsonMergePatch-RequestType  3gppJsonMergePatch-RequestType  jsonPatch-RequestType  3gppJsonPatch-RequestType | M |

The IS parameters "scope" and "filter" have no SS equivalents in the present document.

The following patch media types are available

- "application/merge-patch+json" (RFC 7396 [y])

- "application/3gpp-merge-patch+json" (TS 32.158 [15])

- "application/json-patch+json" (RFC 6902 [z])

- "application/3gpp-json-patch+json" (TS 32.158 [15])

Table 12.1.1.1.4.2-2: Mapping of IS operation output parameters to SS equivalents (HTTP PATCH)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **SQ** |
| attributeListOut | n/a | n/a | n/a | n/a |
| status | response status codes | n/a | n/a | M |
| response body | error | error-ResponseType | O |

The message flow for modification of one or multiple resources is as follows:

1. The Service Consumer sends a HTTP PATCH request to the Service Provider.

- The path component of the target URI identifies the base resource.

- The message body shall contain the patch document.

2. The Service Provider sends a HTTP PATCH response to the Service Consumer.

- On success, "200 OK" or "204 No Content" shall be returned. When "200 OK" is returned the message body shall include a representation of the updated resources constructed according to the hierarchical response construction method (TS 32.158 [15]).

- On failure, an appropriate error code shall be returned. The response message body may provide additional error information

Note 1: Void.

##### 12.1.1.1.5 Operation "deleteMOI"

This operation deletes one or multiple resources representing managed object instances.

Table 12.1.1.1.5-1: Mapping of IS operation input parameters to SS equivalents (HTTP DELETE)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **SQ** |
| baseObjectInstance | path | /{className}={id} | className: string  id: string | M |
| scope | query | scope | scope-QueryType  style: form  explode: true | M |
| filter | query | filter | filter-QueryType | O |

Note 1: Void.

Note 2: Void.

Table 12.1.1.1.5-2: Mapping of IS operation output parameters to SS equivalents (HTTP DELETE)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **SQ** |
| deletionlist | response body | n/a | resourceDeletion-ResponseType | O |
| status | response status codes | n/a | n/a | M |
| response body | error | error-ResponseType | O |

The message flow for deletion of one or multiple resources is as follows:

1. The Service Consumer sends a HTTP DELETE request to the Service Provider.

- The authority and path components of the target URI identify the base resource.

- If present, the scope query parameter identifies other resources besides the base resource.

- The filter query parameter may be applied to the set of scoped resources. Only resources passing the filter criteria are targeted.

2. The Service Provider sends a HTTP DELETE response to the Service Consumer.

- On success, when no query parameters are present in the request and only one resource is deleted, "204 No Content" shall be returned. Otherwise, when query parameters are present in the request, "200 OK" shall be returned and the response message body shall carry the URIs of the deleted resources.

- On failure, an appropriate error code shall be returned. The response message body shall provide additional error information

##### 12.1.1.1.6 Operation "subscribe"

See clause 12.2.1.1.8.

##### 12.1.1.1.7 Operation "unsubscribe"

See clause 12.2.1.1.9.

#### 12.1.1.2 Mapping of notifications

##### 12.1.1.2.1 Introduction

The IS notifications are mapped to SS equivalents according to table 12.1.1.2.1-1.

**Table 12.1.1.2.1-1: Mapping of IS notifications to SS equivalents**

|  |  |  |  |
| --- | --- | --- | --- |
| **IS notifications** | **HTTP Method** | **Resource URI** | **SQ** |
| notifyMOICreation | POST | /notificationSink | M |
| notifyMOIDeletion | POST | /notificationSink | M |
| notifyMOIAttributeValueChange | POST | /notificationSink | M |

##### 12.1.1.2.2 Notification "notifyMOICreation"

The IS notification parameters are mapped to SS equivalents according to table 12.1.1.2.2-1.

Table 12.1.1.2.2-1: Mapping of IS notification input parameters to SS equivalents (HTTP POST)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **SQ** |
| objectClass  objectInstance | request body | href | uri-Type | M |
| notificationId | request body | notificationId | notificationId-Type | M |
| notificationType | request body | notificationType | notificationTyp-Type | M |
| eventTime | request body | eventTime | dateTime-Type | M |
| systemDN | request body | systemDN | systemDN-Type | M |
| correlatedNotifications | request body | correlatedNotifications | array(correlatedNotification-Type) | O |
| additionalText | request body | additionalText | additionalText-Type | O |
| sourceIndicator | request body | sourceIndicator | sourceIndicator-Type | O |
| attributeList | request body | attributeList | map(anyValue) | O |

##### 12.1.1.2.3 Notification "notifyMOIDeletion"

The IS notification parameters are mapped to SS equivalents according to table 12.1.1.2.3-1.

Table 12.1.1.2.3-1: Mapping of IS notification input parameters to SS equivalents (HTTP POST)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **SQ** |
| objectClass  objectInstance | request body | href | uri-Type | M |
| notificationId | request body | notificationId | notificationId-Type | M |
| notificationType | request body | notificationType | notificationType-Type | M |
| eventTime | request body | eventTime | dateTime-Type | M |
| systemDN | request body | systemDN | systemDN-Type | M |
| correlatedNotifications | request body | correlatedNotifications | array(correlatedNotification-Type) | O |
| additionalText | request body | additionalText | additionalText-Type | O |
| sourceIndicator | request body | sourceIndicator | sourceIndicator-Type | O |
| attributeList | request body | attributeList | map(anyValue) | O |

##### 12.1.1.2.4 Notification "notifyMOIAttributeValueChange"

The IS notification parameters are mapped to SS equivalents according to table 12.1.1.2.4-1.

Table 12.1.1.2.4-1: Mapping of IS notification input parameters to SS equivalents (HTTP POST)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **SQ** |
| objectClass  objectInstance | request body | href | uri-Type | M |
| notificationId | request body | notificationId | notificationId-Type | M |
| notificationType | request body | notificationType | notificationTyp-Type | M |
| eventTime | request body | eventTime | dateTime-Type | M |
| systemDN | request body | systemDN | systemDN-Type | M |
| correlatedNotifications | request body | correlatedNotifications | array(correlatedNotification-Type) | O |
| additionalText | request body | additionalText | additionalText-Type | O |
| sourceIndicator | request body | sourceIndicator | sourceIndicator-Type | O |
| attributeListValueChange | request body | attributeListValueChange | map(array(anyValue)) | M |

#### 12.1.1.3 Resources

##### 12.1.1.3.1 Resource structure

Figure 12.1.1.3.1-1 shows the resource structure of the Provisioning MnS.

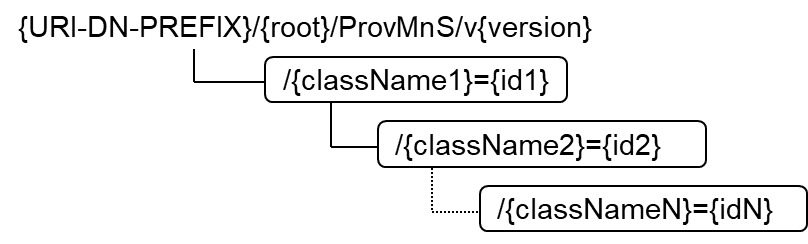


Figure 12.1.1.3.1-1: Resource URI structure of the Provisioning MnS

Table 12.1.1.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 12.1.1.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method | Description |
| MOI | /{className}={id} | PUT | Creates a resource representing a managed object instance |
| MOI | /{className}={id} | GET | Retrieves one or multiple resources representing managed object instances |
| MOI | /{className}={id} | PATCH | Modifies one or multiple resources representing managed object instances |
| MOI | /{className}={id} | DELETE | Deletes one or multiple resources representing managed object instances |
| subscriptions | /subscriptions | POST | Creates a subscription |
| subscriptions | /subscriptions | DELETE | Deletes all subscriptions made with a consumerReferenceId |
| subscription | /subscriptions/{subscriptionId} | DELETE | Deletes a single subscription |
| notificationSink | /notificationSink | POST | Sends notifications |

##### 12.1.1.3.2 Resource definitions

###### 12.1.1.3.2.1 Resource "/{className}={id}"

12.1.1.3.2.1.1 Description

This resource represents a managed object instance.

12.1.1.3.2.1.2 URI

Resource URI: http://{URI-DN-PREFIX}/{root}/ProvMnS/v1630/{LDN-first-part}

The resource URI variables a defined in the following table.

Table 12.1.1.3.2.1.2-1: URI variables

|  |  |
| --- | --- |
| **Name** | **Definition** |
| URI-DN-prefix | See clause 4.4 of TS 32.158 [15] |
| root | See clause 4.4 of TS 32.158 [15] |
| LDN-first-part | See subclause 4.4 of TS 32.158 [15] |
| className | The class name of the resource to be targeted |
| id | The id of the resource to be targeted |

12.1.1.3.2.1.3 HTTP methods

12.1.1.3.2.1.3.1 HTTP PUT

This method shall support the URI query parameters specified in the following table.

Table 12.1.1.3.2.1.3.1-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Data type** | **Description** | **SQ** |
| n/a | n/a | n/a | n/a |

This method shall support the request data structures, the response data structures and response codes specified in the following table.

Table 12.1.1.3.2.1.3.1-2: Data structures supported by the PUT request body on this resource

|  |  |  |
| --- | --- | --- |
| **Data type** | **Description** | **SQ** |
| resourcePut-RequestType | The resource representation of the resource to be created or replaced | M |

Table 12.1.1.3.2.1.3.1-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **Response**  **codes** | **Description** | **SQ** |
| resourceUpdate-ResponseType | 200 OK | This status code shall be returned when the resource is replaced, and when the replaced resource representation is not identical to the resource representation in the request.  This status code may be retourned when the resource is updated and when the updated resource representation is identical to the resource representation in the request.  The representation of the updated resource is returned in the response message body. | M |
| resourceCreation-ResponseType | 201 Created | This status code shall be returned when the resource is created.  The representation of the created resource is returned in the response message body. | M |
| n/a | 204 No Content | This status code may be returned only when the replaced resource representation is identical to the representation in the request.  The response has no message body. | M |
| error-Type | 4xx/5xx | Returned in case of an error | O |

12.1.1.3.2.1.3.2 HTTP GET

This method shall support the URI query parameters specified in the following table.

Table 12.1.1.3.2.1.3.2-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Data type** | **Description** | **SQ** |
| scope | scope-QueryType | This parameter extends the set of targeted resources beyond the base resource identified with the authority and path component of the URI. | M |
| filter | filter-QueryType | This parameter reduces the targeted set of resources by applying a filter to the scoped set of resource representations. Only resources representations for which the filter construct evaluates to "true" are targeted. | O |
| attributes | attributes-QueryType | This parameter specifies the attributes of the scoped resources that are returned. The value is a comma-separated list of attribute names. | O |
| fields | fields-QueryType | This parameter specifies the attribute fields of the scoped resources that are returned. The value is a comma-separated list of JSON pointers to the attribute fields. | O |

This method shall support the request data structures, the response data structures and response codes specified in the following tables.

Table 12.1.1.3.2.1.3.2-2: Data structures supported by the GET request body on this resource

|  |  |  |
| --- | --- | --- |
| **Data type** | **Description** | **SQ** |
|  |  |  |

Table 12.1.1.3.2.1.3.2-3: Data structures supported by the GET response body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **Response**  **codes** | **Description** | **SQ** |
| resourceRetrieval-ResponseType | 200 OK | The resources identified in the request for retrieval are returned in the response message body. In case the attributes or fields query parameters are used, only the selected attributes or sub-attributes are returned. The response message body is constructed according to the hierarchical response construction method (TS 32.158 [15]). | M |
| error-Type | 4xx/5xx | Returned in case of an error | M |

12.1.1.3.2.1.3.3 HTTP PATCH

This method shall support the URI query parameters specified in the following table.

Table 12.1.1.3.2.1.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Data type** | **Description** | **SQ** |
| n/a | n/a | n/a | n/a |

This method shall support the request data structures, the response data structures and response codes specified in the following tables.

Table 12.1.1.3.2.1.3.3-2: Data structures supported by the PATCH request body on this resource

|  |  |  |
| --- | --- | --- |
| **Data type** | **Description** | **SQ** |
| jsonMergePatch-RequestType  3gppJsonMergePatch-RequestType  jsonPatch-RequestType  3gppJsonPatch-RequestType | Describes the set of modifications to be applied to the targeted resources.  The following patch media types are available:  - "application/merge-patch+json" (RFC 7396 [y12])  - "application/3gpp-merge-patch+json" (TS 32.158 [15])  - "application/json-patch+json" (RFC 6902 [z13])  - "application/3gpp-json-patch+json" (TS 32.158 [15]) | M |

Table 12.1.1.2.1.1.3.3-3: Data structures supported by the PATCH response body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **Response**  **codes** | **Description** | **SQ** |
| resourceUpdate-ResponseType | 200 OK | This status code is returned when the updated the resource representations shall be returned for some reason.  The resource representations are returned in the response message body. The response message body is constructed according to the hierarchical response construction method (TS 32.158 [15]) |  |
| n/a | 204 No Content | This status code is returned when there is no need to return the updated resource representations.  The response message body is empty. |  |
| error-Type | 4xx/5xx | Returned in case of an error | M |

12.1.1.3.2.1.3.4 HTTP DELETE

This method shall support the URI query parameters specified in the following table.

Table 12.1.1.3.2.1.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Data type** | **Description** | **SQ** |
| scope | scope-QueryType | This parameter extends the set of targeted resources beyond the base resource identified with the authority and path component of the URI. | M |
| filter | filter-QueryType | This parameter reduces the targeted set of resources by applying a filter to the scoped set of resource representations. Only resources representations for which the filter construct evaluates to "true" are targeted. | O |

This method shall support the request data structures, the response data structures and response codes specified in the following tables.

Table 12.1.1.3.2.1.3.4-2: Data structures supported by the DELETE request body on this resource

|  |  |  |
| --- | --- | --- |
| **Data type** | **Description** | **SQ** |
| n/a | n/a | n/a |

Table 12.1.1.3.2.1.3.4-3: Data structures supported by the DELETE response body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **Response**  **codes** | **Description** | **SQ** |
| resourceDeletion-ResponseType | 200 OK | This status code shall be returned, when query parameters are present in the request and one or multiple resources are deleted.  The URIs of the deleted resources are returned in the response message body. | M |
| n/a | 204 No Content | This status code shall be returned, when no query parameters are present in the request and only one resource is deleted.  The message body is empty. |  |
| error-Type | 4xx/5xx | Returned in case of an error | M |

###### 12.1.1.3.2.2 Resource "/subscriptions"

12.1.1.3.2.2.1 Description

This resource is a container resource for individual subscriptions.

12.1.1.3.2.2.2 URI

The resource URI is:

Resource URI: {DN\_prefix\_authority\_part}/{DN\_prefix\_remainder}/ProvMnS/v1510/

The resource URI variables are defined in the following table.

Table 12.1.1.3.2.2.2-1: URI variables

|  |  |
| --- | --- |
| **Name** | **Definition** |
| DN\_prefix\_authority\_part | See clause 4.4 of TS 32.158 [15] |
| DN\_prefix\_remainder | See clause 4.4 of TS 32.158 [15] |

12.1.1.3.2.2.3 HTTP methods

12.1.1.3.2.2.3.1 POST

This method shall support the URI query parameters specified in table 12.1.1.3.2.2.3.1-1.

Table 12.1.1.3.2.2.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Description | Qualifier |
| n/a | n/a | n/a | n/a |

This method shall support the request data structures specified in table 12.1.1.3.2.2.3.1-2 and the response data structures and response codes specified in table 12.1.1.3.2.2.3.1-3.

Table 12.1.1.3.2.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |
| --- | --- | --- |
| Data type | Description | SQ |
| subscription-RequestType | Details of the subscription to be created | M |

Table 12.1.1.3.2.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Response  codes | Description | SQ |
| subscription-ResponseType | 201 Created | In case of success the representation of the created subscription is returned. | M |
| error-Type | 4xx/5xx | In case of failure the error object is returned. | M |

12.1.1.3.2.2.3.2 DELETE

This method shall support the URI query parameters specified in table 12.1.1.3.2.2.3.2-1.

Table 12.1.1.3.2.2.3.2-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Description | Qualifier |
| consumerReferenceId | consumerReferenceId-QueryType | Identifies the consumer whose subscriptions shall be deleted | M |

This method shall support the request data structures specified in table 12.1.1.3.2.2.3.2-2 and the response data structures and response codes specified in table 12.1.1.3.2.2.3.2-3.

Table 12.1.1.3.2.2.3.2-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |
| --- | --- | --- |
| Data type | Description | SQ |
| n/a | n/a | n/a |

Table 12.1.1.3.2.2.3.2-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Response  codes | Description | SQ |
| n/a | 204 No Content | In case of success no message body is returned | n/a |
| error-Type | 4xx/5xx | In case of failure the error object is returned. | M |

###### 12.1.1.3.2.3 Resource "/subscriptions /{subscriptionId}"

12.1.1.3.2.3.1 Description

This resource represents a subscription.

12.1.1.3.2.3.2 URI

The resource URI is:

Resource URI: {DN\_prefix\_authority\_part}/{DN\_prefix\_remainder}/ProvMnS/v1510/ subscriptions/{subscriptionId}

Table 12.1.1.3.2.3.2-1: URI variables

|  |  |
| --- | --- |
| Name | Definition |
| DN\_prefix\_authority\_part | See clause 4.4 of TS 32.158 [15] |
| DN\_prefix\_remainder | See clause 4.4 of TS 32.158 [15] |
| subscriptionId | Subscription identifier |

12.1.1.3.2.3.3 HTTP methods

12.1.1.3.2.3.3.1 DELETE

This method shall support the URI query parameters specified in table 12.1.1.3.2.3.3.1-1.

Table 12.1.1.3.2.3.3.1-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Description | Qualifier |
| n/a | n/a | n/a | n/a |

This method shall support the request data structures specified in table 12.1.1.3.2.3.3.1-2 and the response data structures and response codes specified in table 12.1.1.3.2.3.3.1-3.

Table 12.1.1.3.2.3.3.1-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |
| --- | --- | --- |
| Data type | Description | SQ |
| n/a | n/a | n/a |

Table 12.1.1.3.2.3.3.1-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Response  codes | Description | SQ |
| n/a | 204 No Content | In case of success no message body is returned | M |
| error-Type | 4xx/5xx | In case of failure the error object is returned. | M |

#### 12.1.1.4 Data type definitions

##### 12.1.1.4.1 General

Table 12.1.1.4.1-1: Data types defined in this specification

|  |  |  |
| --- | --- | --- |
| Data type | Reference | Description |
| **General types** | | |
| dateTime-Type | 12.1.1.4.4.2 | Date and time |
| long-Type | 12.1.1.4.4.2 | Long type |
| uri-Type | 12.1.1.4.4.2 | Type of an URI |
| **Types used in paths** | | |
| className-PathType | 12.1.1.4.4.2 | Used in the path to identify a resource object |
| id-PathType | 12.1.1.4.4.2 | Used in the path to identify a resource object |
| **Types in query parts** | | |
| attributes-QueryType | 12.1.1.4.2.18 | Used in the query part of HTTP GET to select the attributes of the scoped resource objects to be returned. |
| fields-QueryType | 12.1.1.4.2.1 | Used in the query part of HTTP GET to select the resource object properties (attributes) to be returned |
| filter-QueryType | 12.1.1.4.2.2 | Used in the query part of HTTP GET, HTTP PATCH and HTTP DELETE to filter scoped resource objects |
| scope-QueryType | 12.1.1.4.2.3 | Used in the query part of HTTP GET, HTTP PATCH and HTTP DELETE to extend the set of targeted resources beyond the base resource identified with the path component of the URI |
| **Types used in request bodies** | | |
| resourcePut-RequestType | 12.1.1.4.3.4 | Used in the request body of HTTP PUT describing the resource to be created or updated |
| jsonMergePatch-RequestType | 12.1.1.4.2.19 | Used in the request body of HTTP PATCH describing the set of modifications to be applied to the targeted resources for the media type "application/merge-patch+json" (RFC 7396 [y]) |
| 3gppJsonMergePatch-RequestType | 12.1.1.4.2.20 | Used in the request body of HTTP PATCH describing the set of modifications to be applied to the targeted resources for the media type "application/3gpp-merge-patch+json" (TS 32.158 [15]) |
| jsonPatch-RequestType | 12.1.1.4.2.5 | Used in the request body of HTTP PATCH describing the set of modifications to be applied to the targeted resources for the media type "application/json-patch+json" (RFC 6902 [z]). |
| 3gppJsonPatch-RequestType | 12.1.1.4.2.21 | Used in the request body of HTTP PATCH describing the set of modifications to be applied to the targeted resources for the media type "application/3gpp-json-patch+json" (TS 32.158 [15]) |
| **Types used in response bodies** | | |
| error-ResponseType | 12.1.1.4.2.6 |  |
| resourcePut-ResponseType | 12.1.1.4.2.7 | Used in the response body of HTTP PUT describing the resource created |
| resourceDeletion-ResponseType | 12.1.1.4.2.8 | Used in the response body of HTTP DELETE identifying the URIs of the deleted resources |
| resourceModification-ResponseType | 12.1.1.4.2.9 | Used in the response body of HTTP PATCH describing the set of modified resources |
| resourceRetrieval-ResponseType | 12.1.1.4.2.10 | Used in the response body of HTTP GET to return the resources identified in the request for retrieval, or the selected attributes in case the fields query parameter is used |
| **Types used for resources** | | |
| resourceRepresentationType | 12.1.1.4.2.11 | Used for resource representations |
| **Types used in notifications** | | |
| notifyMOICreation-NotifType | 12.1.1.4.2.15 | Used in the request body of HTTP POST for the notification type notifyMOICreation |
| notifyMOIDeletion-NotifType | 12.1.1.4.2.16 | Used in the request body of HTTP POST for the notification type notifyMOIDeletion |
| notifyMOIAttributeValueChange-NotifType | 12.1.1.4.2.17 | Used in the request body of HTTP POST for the notification type notifyMOIAttributeValueChange |
| notifyNRMUpdates-NotifType | 12.1.1.4.2.22 | Used in the request body of HTTP POST for the notification type notifyNRMUpdates |
| **Types referenced by the definitions above** | | |
| additionalText-Type | 12.1.1.4.4.2 | Allows a free form text description to be reported as defined in ITU-T Rec. X. 733 [4] |
| nRMUpdate-Type | 12.1.1.4.3.4 | Single NRM update reported by notifyNRMUpdates |
| correlatedNotification-Type | 12.1.1.4.3.2 | Describes the correlated notifications of a single source |
| notificationId-Type | 12.1.1.4.4.2 | Notification identifier as defined in ITU-T Rec. X. 733 [4] |
| notificationType-Type | 12.1.1.4.4.3 | Notification type (notifyMOICreation, etc.) |
| sourceIndicator-Type | 12.1.1.4.4.4 | Indicates the source of the operation that led to the generation of the notification. |
| scopeType-Type | 12.1.1.4.4.5 | Scope type of a scope |
| scopeLevel-Type | 12.1.1.4.4.2 | Scope level of a scope |
| systemDN-Type | 12.1.1.4.4.2 | Type of the System DN |
| operation-Type | 12.1.1.4.4.6 | Enum wth "create", "delete" and "replace" |

##### 12.1.1.4.2 Query, message body and resource data types

###### 12.1.1.4.2.1 Type fields-QueryType

Table 12.1.1.4.2.1-1: Definition of type fields-QueryType

|  |  |  |
| --- | --- | --- |
| Type | Definition | Description |
| fields-QueryType | array(string) | Used in the query part of HTTP GET to select the resource object properties (attribute fields) to be returned |

###### 12.1.1.4.2.2 Type filter-QueryType

**Table 12.1.1.4.2.2-1: Definition of type filter-QueryType**

|  |  |  |
| --- | --- | --- |
| **Type** | **Definition** | **Description** |
| filter-QueryType | string | Used in the query part of HTTP GET, and HTTP DELETE to filter scoped resource objects |

###### 12.1.1.4.2.3 Type scope-QueryType

Table 12.1.1.4.2.3-1: Definition of type scope-QueryType

|  |  |  |
| --- | --- | --- |
| **Type** | **Definition** | **Description** |
| scope-QueryType | string | Used in the query part of HTTP GET, HTTP PATCH and HTTP DELETE to extend the set of targeted resources beyond the base resource identified with the path component of the URI |

###### 12.1.1.4.2.4 Type resourcePut-RequestType

Table 12.1.1.4.2.4-1: Definition of type resourcePut-RequestType

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| n/a | resourceRepresentation-Type | Key indicating thev request body contains data. | M |

###### 12.1.1.4.2.5 Type jsonPatch-RequestType

**Table 12.1.1.4.2.5-1: Definition of type jsonPatch-RequestType**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| n/a | array(object) | Used in the request body of HTTP PATCH describing the set of modifications to be applied to the targeted resources for the media type "application/json-patch+json" (RFC 6902 [z]). | M |

###### 12.1.1.4.2.6 Type error-ResponseType

**Table 12.1.1.4.2.6-1: Definition of type error-ResponseType**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| error | object | Key indicating the response body contains an error | M |
| > errorInfo | string | Attribute allowing to convey error information in string format | M |

###### 12.1.1.4.2.7 Type resourceCreation-ResponseType

**Table 12.1.1.4.2.7-1: Definition of type resourceCreation-ResponseType**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| n/a | resourceRepresentation-Type | Used in the response body of HTTP PUT describing the resource created | M |

###### 12.1.1.4.2.8 Type resourceDeletion-ResponseType

**Table 12.1.1.4.2.8-1: Definition of type resourceDeletion-ResponseType**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| n/a | array(uri-Type) | Used in the response body of HTTP DELETE identifying the URIs of the deleted resources | M |

###### 12.1.1.4.2.9 Type resourceModification-ResponseType

**Table 12.1.1.4.2.9-1: Definition of type resourceModification-ResponseType**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| n/a | resourceRepresentation-Type | Used in the response body of HTTP PATCH describing the set of modified resources | M |

###### 12.1.1.4.2.10 Type resourceRetrieval-ResponseType

**Table 12.1.1.4.2.10-1: Definition of type resourceRetrieval-ResponseType**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| n/a | resourceRepresentation-Type | Used in the response body of HTTP GET to return the resources identified in the request for retrieval. | M |

###### 12.1.1.4.2.11 Type resourceRepresentation-Type

**Table 12.1.1.4.2.11-1: Definition of type resourceRepresentation-Type**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| id | string | The id of the resource object | M |
| attributes | object | The attributes object whose members are the class attribute names and values. | M |
| nameContainedObjects | map(array(object)) | Name contained objects |  |

This definition of "resourceRepresentation-Type" does not specify any attributes or specific name contained objects. Concrete resource representations with specific attributes and specific name contained objects are included in the NRM definitions. These concrete definitions should be used in implementations of the Provisioning MnS instead of this generic definition.

###### 12.1.1.4.2.12 Type subscription-RequestType

Table 12.1.1.4.2.12-1: Definition of type subscription-RequestType

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| data | subscription-ResourceType | Used in the request body of HTTP POST on /subscriptions describing the representation of the subscription to be created | M |

###### 12.1.1.4.2.13 Type subscription-ResponseType

Table 12.1.1.4.2.13-1: Definition of type subscription-ResponseType

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| data | subscription-ResourceType | Used in the response body of HTTP POST on /subscriptions describing the representation of the created subscription | M |

###### 12.1.1.4.2.14 Type subscription-ResourceType

Table 12.1.1.4.2.14-1: Definition of type subscription-ResourceType

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| consumerReference | uri-Type | The URI of the endpoint to send the notification to (/notificationSink). | M |
| timeTick | long-Type | Time window within which the subscriber intends to subscribe again to confirm its subscription, see clause 10.2.2.2.5.1 | O |
| filter | filter-Type | Filter settings for this subscription, to define the subset of all notifications this subscription relates to. A notification is sent to the subscriber if the filter matches, or if there is no filter. | O |

###### 12.1.1.4.2.15 Type notifyMOICreation-NotifType

Table 12.1.1.4.2.15-1: Definition of type notifyMOICreation-NotifType

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| href | uri-Type | URI of the resource where the event (alarm) occurred | M |
| notificationId | notificationId-Type | Notification identifier as defined in ITU-T Rec. X. 733 [4] | M |
| notificationType | notificationType-Type | Notification type (notifyMOICreation) | M |
| eventTime | dateTime-Type | Event (MOI creation) occurrence time | M |
| systemDN | systemDN-Type | System DN | M |
| correlatedNotifications | array(correlatedNotification-Type) | Set of all notifications to which this notification is considered to be correlated as defined in ITU-T Rec. X. 733 [4] | O |
| additionalText | additionalText-Type | Allows a free form text description to be reported as defined in ITU-T Rec. X. 733 [4] | O |
| sourceIndicator | sourceIndicator-Type | Indicates the source of the operation that led to the generation of this notification. | O |
| attributeList | map(anyValue) | The attributes (name/value pairs) of the created MOI. | O |

###### 12.1.1.4.2.16 Type notifyMOIDeletion-NotifType

Table 12.1.1.4.2.16-1: Definition of type notifyMOIDeletion-NotifType

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| href | uri-Type | URI of the resource where the event (alarm) occurred | M |
| notificationId | notificationId-Type | Notification identifier as defined in ITU-T Rec. X. 733 [4] | M |
| notificationType | notificationType-Type | Notification type (notifyMOIDeletion) | M |
| eventTime | dateTime-Type | Event (MOI creation) occurrence time | M |
| systemDN | systemDN-Type | System DN | M |
| correlatedNotifications | array(correlatedNotification-Type) | Set of all notifications to which this notification is considered to be correlated as defined in ITU-T Rec. X. 733 [4] | O |
| additionalText | additionalText-Type | Allows a free form text description to be reported as defined in ITU-T Rec. X. 733 [4] | O |
| sourceIndicator | sourceIndicator-Type | Indicates the source of the operation that led to the generation of this notification. | O |
| attributeList | map(anyValue) | The attributes (name/value pairs) of the deleted MOI. | O |

###### 12.1.1.4.2.17 Type notifyMOIAttributeValueChange-NotifType

Table 12.1.1.4.2.17-1: Definition of type notifyMOIAttributeValueChange-NotifType

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| href | uri-Type | URI of the resource where the event (alarm) occurred | M |
| notificationId | notificationId-Type | Notification identifier as defined in ITU-T Rec. X. 733 [4] | M |
| notificationType | notificationType-Type | Notification type (notifyMOIAttributeValueChange) | M |
| eventTime | dateTime-Type | Event (MOI creation) occurrence time | M |
| systemDN | systemDN-Type | System DN | M |
| correlatedNotifications | array(correlatedNotification-Type) | Set of all notifications to which this notification is considered to be correlated as defined in ITU-T Rec. X. 733 [4] | O |
| additionalText | additionalText-Type | Allows a free form text description to be reported as defined in ITU-T Rec. X. 733 [4] | O |
| sourceIndicator | sourceIndicator-Type | Indicates the source of the operation that led to the generation of this notification. | O |
| attributeListValueChange | map(array(anyValue)) | List with names of changed attributes, together with new value and optionally old value | O |

###### 12.1.1.4.2.18 Type attributes-QueryType

**Table 12.1.1.4.2.18-1: Definition of type filter-QueryType**

|  |  |  |
| --- | --- | --- |
| **Type** | **Definition** | **Description** |
| attributes-QueryType | array(string) | Used in the query part of HTTP GET to select the attributes of the scoped resource objects to be returned. |

###### 12.1.1.4.2.19 Type jsonMergePatch-RequestType

**Table 12.1.1.4.2.19-1: Definition of type jsonMergePatch-RequestType**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| n/a | resourceRepresentation-Type | Used in the request body of HTTP PATCH describing the set of modifications to be applied to the targeted resources for the media type "application/merge-patch+json" (RFC 7396 [y]) | M |

###### 12.1.1.4.2.20 Type 3gppJsonMergePatch-RequestType

**Table 12.1.1.4.2.29-1: Definition of type jsonMergePatch-RequestType**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| n/a | resourceRepresentation-Type | Used in the request body of HTTP PATCH describing the set of modifications to be applied to the targeted resources for the media type "application/3gpp-merge-patch+json" (TS 32.158 [15]) | M |

###### 12.1.1.4.2.21 Type 3gppJsonPatch-RequestType

**Table 12.1.1.4.2.21-1: Definition of type 3gppJsonPatch-RequestType**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| n/a | array(object) | Used in the request body of HTTP PATCH describing the set of modifications to be applied to the targeted resources for the media type "application/3gpp-json-patch+json" (RFC 6902 [z]). | M |

##### 12.1.1.4.3 Referenced structured data types

###### 12.1.1.4.3.1 Void



###### 12.1.1.4.3.2 Type correlatedNotification-Type

Table 12.1.1.4.3.2-1: Definition of type correlatedNotification-Type

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute name | Data type | Description | SQ |
| source | uri-Type | Source of the correlated notifications | M |
| notificationIds | array(notificationId-Type) | Notification identifiers of correlated notifications of that source | M |

##### 12.1.1.4.4 Simple data types and enumerations

12.1.1.4.4.1 General

This clause defines simple data types and enumerations that are used by the data structures defined in the previous clauses.

12.1.1.4.4.2 Simple data types

Table 12.1.1.4.3.2-1: Simple data types

|  |  |  |
| --- | --- | --- |
| Type name | Type definition | Description |
| dateTime-Type | string | Date and time with type: string and format:date-time [x] |
| long-Type | integer | Signed 64 bits with type: integer and format: int64 [x] |
| uri-Type | string | Type of a URI |
| className-PathType | string | Type used in the path component for the class name |
| subscriptionId-PathType | sring | Used in the path component to identify a subscription |
| id-PathType | string | Type used in the path component for the id. |
| consumerReferenceId-QueryType | uri-Type | Used in the query part of HTTP DELETE on /subscriptions to delate all subscriptions made with a specific consumerReferenceId |
| additionalText-Type | string | Allows a free form text description to be reported as defined in ITU-T Rec. X. 733 [4] |
| filter-Type | string | Filter of a subscription resource |
| notificationId-Type | long-Type | Notification identifier as defined in ITU-T Rec. X. 733 [4] |
| scopeLevel-Type | integer | Scope level of a scope |
| systemDN-Type | string | Type of the System DN |

12.1.1.4.4.3 Enumeration notificationType-Type

Table 12.1.1.4.4.3-1: Enumeration notificationType-Type

|  |  |
| --- | --- |
| Enumeration value | Description |
| notifyMOICreation | Notification type is notifyMOICreation |
| notifyMOIDeletion | Notification type is notifyMOIDeletion |
| notifyMOIAttributeValueChange | Notification type is notifyMOIAttributeValueChange |

12.1.1.4.4.4 Enumeration sourceIndicator-Type

Table 12.1.1.4.4.4-1: Enumeration sourceIndicator-Type

|  |  |
| --- | --- |
| Enumeration value | Description |
| resourceOperation | The notification was generated in response to an internal operation of the resource. |
| mangementOperation | The notification was generated in response to a management operation applied across the managed object boundary external to the managed object |
| sONOperation | The notification was generated as result of a SON (Self Organising Network) process like self-configuration, self-optimization, self-healing etc. . |
| unknown | It is not possible to determine the source of the operation. |

12.1.1.4.4.5 Enumeration scopeType-Type

Table 12.1.1.4.4.4.5-1: Enumeration scopeType-Type

|  |  |
| --- | --- |
| Enumeration value | Description |
| BASE\_ONLY | Selects only the base resource. The "scopeLevel" parameter shall be absent or ignored if present. |
| BASE\_ALL | Selects the base resource and all of its subordinate resources (incl. the leaf resources). The "scopeLevel" parameter shall be absent or ignored if present. |
| BASE\_NTH\_LEVEL | Selects all resources on the level, which is indicated by the "scopeLevel" parameter, below the base resource. The base resource is at "scopeLevel" zero. |
| BASE\_SUBTREE | Selects the base resource and all of its subordinate resources down to and including the resources on the level indicated by the "scopeLevel" parameter. The base resource is at "scopeLevel" zero. |

|  |
| --- |
| **End of modifications** |