**3GPP TSG-SA5 Meeting #129 *S5-201385rev1***

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

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **28.532** | **CR** | **0100** | **rev** | **--** | **Current version:** | **16.2.0** |  |
|  | | | | | | | | |
| *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:*** | Add summary CM notification to the ProvMnS | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | <Related\_WIs> | | | | |  | ***Date:*** | | | 14-02-2020 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B>** |  | | | | | ***Release:*** | | | 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:*** | | Currently the CM notifications can report only one single CM change, which is either the creation of an object, the deletion of an object, or the replacement of an attribute value. It is not possible to report multiple CM changes in a single notification. | | | | | | | | |
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| ***Summary of change:*** | | A new notification is added. This notification can report multiple CM changes. | | | | | | | | |
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| ***Consequences if not approved:*** | | It is not possible to report multiple CM changes in a single notification. With massive bulk configuration changes being applied to the NRM, this will leda to an undesirable CM notification flood. | | | | | | | | |
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| ***Clauses affected:*** | | 11.1.1.x (new), 11.1.2.1.1, 12.1.1.2.1, 12.1.1.2.x, 12.1.1.4.1, 12.1.1.4.2.22 (new), 12.1.1.4.3.3 (new), 12.1.1.4.4.6 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

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| **First modification** |

#### 11.1.1x Notification notifyMOIChanges

##### 11.1.1.x.1 Definition

This notification notifies subscribed consumers that Managed Object Instances have been created or deleted, or that values of Managed Object Instance attributes have been replaced. This notification can report multiple updates that happened at the same time.

##### 11.1.1.x.2 Input parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter Name | Support Qualifier | Information Type / Legal Values | Comment |
| objectClass | M | See clause 11.1.1.7.2 | This parameter specifies the class name of the local root in the MIB |
| objectInstance | M | See clause 11.1.1.7.2 | This parameter specifies the instance of the local root in the MIB |
| notificationId | M | See clause 11.1.1.7.2 | See clause 11.1.1.7.2 |
| notificationType | M | const string “notifyMOIChanges” | See clause 11.1.1.7.2 |
| eventTime | M | See clause 11.1.1.7.2 | See clause 11.1.1.7.2 |
| systemDN | M | See clause 11.1.1.7.2 | See clause 11.1.1.7.2 |
| correlatedNotifications | CM | See clause 11.1.1.7.2 | See clause 11.1.1.7.2 |
| additionalText | O | See clause 11.1.1.7.2 | See clause 11.1.1.7.2 |
| sourceIndicator | O | See clause 11.1.1.7.2 | See clause 11.1.1.7.2 |
| MOIChanges | M | List of SEQUENCE {  notificationId  path,  operation,  value  } | This paramter describes the NRM updates to be reported.  The notificationId is an identfier of one MOI change.  The path member specifies the MOI created or deleted or an attribute of an MOI that was replaced with a new value. When the attribute is a structured data type the path may indentify also parts of the attribute (sub-attributes).  The operation member specifies the type of operation that has been applied to the MOI specified by the path. It can have the values "create", "delete" and "replace".  The value member specifies all attributes and its values of the created or deleted MOI. When an attribute value change is reported, then only changed attributes with their new values shall be present. |

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| **Next modification** |

### 11.1.2 Managed Information

#### 11.1.2.1 ManagedEntity

##### 11.1.2.1.1 Definition

The ProxyClass ManagedEntity represents the role that can be played by an instance of an IOC defined in NRMs, e.g. Generic NRM, NR and NG-RAN NRM, or 5GC NRM. ManagedEntity is used in the specification of provisioning operations and notifications to represent an instance of an IOC defined in these NRMs.

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| **Next modification** |

#### 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 |
| notifyMOIChanges | POST | /notificationSink | M |

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| **Next modification** |

##### 12.1.1.2.x Notification "notifyMOIChanges"

The IS notification parameters are mapped to SS equivalents according to table 12.1.1.2.x-1.

Table 12.1.1.2.x-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 |
| MOIChanges | request body | MOIChanges | MOIChanges-Type | M |

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| **Next modification** |

#### 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 |  | 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.y | 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 [12]) |
| jsonEnhancedMergePatch-RequestType | 12.1.1.4.2.z | 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/enhanced-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 |
| subscription-RequestType | 12.1.1.4.2.12 | Used in the request body of HTTP POST on /subscriptions to create alarm notification subscriptions |
| **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 |
| subscription-ResponseType | 12.1.1.4.2.13 | Used in the response body of HTTP POST on /subscriptions to create alarm notification subscriptions |
| **Types used for resources** | | |
| resourceRepresentationType | 12.1.1.4.2.11 | Used for resource representations |
| subscription-ResourceType |  | Representation of a subscription resource |
| **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 |
| notifyMOIChanges-NotifType | 12.1.1.4.2.22 | Used in the request body of HTTP POST for the notification type notifyMOIChanges |
| **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] |
| attributeNameValuePair-Type | 12.1.1.4.3.1 | Attribute name and attribute value pair |
| MOIChange-Type | 12.1.1.4.3.4 | Single NRM update reported by notifyMOIChanges |
| 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. |
| operation-Type | 12.1.1.4.4.6 | Enum wth "create", "delete" and "replace" |

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| **Next modification** |

###### 12.1.1.4.2.22 Type notifyMOIChanges-NotifType

**Table 12.1.1.4.2.22-1: Definition of type notifyMOIChanges-NotifType**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute name** | **Data type** | **Description** | **SQ** |
| href | uri-Type | URI of the local root in the MIB | M |
| notificationId | notificationId-Type | Notification identifier as defined in ITU-T Rec. X. 733 [4]. | M |
| notificationType | notificationType-Type | Notification type (notifyMOIChanges) | M |
| eventTime | dateTime-Type | Event (NRM updates) 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 |
| MOIChanges | array(MOIChange-Type) | NRM updates to be reported | M |

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| **Next modification** |

###### 12.1.1.4.3.3 Type MOIChange-Type

Table 12.1.1.4.3.3-1: Definition of type MOIChange-Type

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute name | Data type | Description | SQ |
| notificationId | notificationId-Type | Notification identifier as defined in ITU-T Rec. X. 733 [4] | M |
| path | URI-Type | URI specifying the updated resource | M |
| operation | operation-Type | Operation (create, delete, update) | M |
| value | any value | Name and value of all attributes for created or deleted resources, or new value for updated attributes | M |

When the "path" specifies an attribute or a sub-attribute the URI fragment component shall be used. The host and path components of the URI specify the updated resource. The fragment component references the attribute or sub-attribute within the resource. It is specified using JSON pointer in the URI fragment identifier representation as defined in clause 6 of of RFC 6901 [w]. The context for JSON pointer is the updated resource.

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| **Next modification** |

12.1.1.4.4.6 Enumeration operation-Type

Table 12.1.1.4.4.4.6-1: Enumeration operation-Type

|  |  |
| --- | --- |
| Enumeration value | Description |
| CREATE | Create operation |
| DELETE | Delete operation |
| UPDATE | Update operation |

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| **End of modifications** |