**3GPP TSG-SA5 Meeting #140-e *S5-216291rev1\_MS***

**Online, , 15th Nov 2021 - 24th Nov 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **28.622** | **CR** | **Draft CR** | **rev** | **-** | **Current version:** | **16.9.0** |  |
|  | | | | | | | | |
| *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:*** | Rel-17 Input to DraftCR 28.622 Add file download NRM fragment | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, Ericsson | | | | | | | | | |
| ***Source to TSG:*** | SA5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FIMA | | | | |  | ***Date:*** | | | 2021-11-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | 17 |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Requirements for file download were agreed at SA5#138. This contribution proposes the corresponding file download control NRM fragment. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The WI FIMA cannot progress. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Baseline DraftCR for FIMA: S5-214758 | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| **First modification** |

## 4.2 Class diagrams

### 4.2.1 Relationships

This clause depicts the set of classes (e.g. IOCs) that encapsulates the information relevant for this IRP. This clause provides the overview of the relationships of relevant classes in UML. Subsequent clauses provide more detailed specification of various aspects of these classes.

The following figure shows the containment/naming hierarchy and the associations of the classes defined in the present document. See Annex A of a class diagram that combines this figure with Figure 1 of [2], the class diagram of UIM.



NOTE 1: ManagedElement may be contained either

- in a SubNetwork (since *SubNetwork* inherits from *Domain*\_ and *ManagedElement* inherits from *ManagedElement*\_ and *Domain*\_ name-contained *ManagedElement\_* as observed in the figure of Annex A) or

- in a MeContext instance as observed by the above figure or in the figure of Annex A.

This either-or relation cannot be shown by using an {xor} constraint in the above figure.

ManagedElement may also have no parent instance at all.

NOTE 2: Void

NOTE 3: If the configuration contains several instances of SubNetwork, exactly one SubNetwork instance shall directly or indirectly contain all the other SubNetwork instances.

NOTE 4: The SubNetwork instance not contained in any other instance of SubNetwork is referred to as "the root SubNetwork instance".

NOTE 5: ManagementNode shall be contained in the root SubNetwork instance.

NOTE 6: If contained in a SubNetwork instance, MnsAgent shall be contained in the root SubNetwork instance.

NOTE 7: For a clarification on the choice of containment of the IRPAgent (since it has three possible parents), see the definition of MnsAgent.

NOTE 8: The MnsAgent shall be replaced by the IRPAgent in deployments using the IRP framework as defined in TS 32.102 [2].

Figure 4.2.1-1: NRM fragment

Each Managed Object is identified with a Distinguished Name (DN) according to 3GPP TS 32.300 [13] that expresses its containment hierarchy. As an example, the DN of a ManagedElement instance could have a format like:

SubNetwork=Sweden,MeContext=MEC-Gbg-1,ManagedElement=RNC-Gbg-1.



NOTE 8: Void

NOTE 9: Void

Figure 4.2.1-2: Vendor specific data container NRM fragment



Figure 4.2.1-3: PM control NRM fragment



Figure 4.2.1-4: Threshold monitoring control NRM fragment



Figure 4.2.1-5: Notification subscription and heartbeat notification control NRM fragment



Figure 4.2.1-6: FM control NRM fragment



Figure 4.2.1-7: Trace control NRM fragment

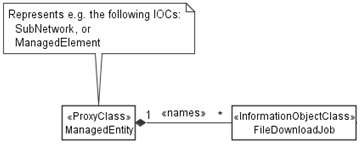


Figure 4.2.1-9: File download NRM fragment

### 4.2.2 Inheritance

This clause depicts the inheritance relationships.





Figure 4.2.2-1: NRM fragment



Figure 4.2.2-2: PM control NRM fragment



Figure 4.2.2-3: Threshold monitoring control NRM fragment



Figure 4.2.2-4: Notification subscription and heartbeat notification control NRM fragment



Figure 4.2.2-5: FM control NRM fragment



Figure 4.2.2-6: Trace control NRM fragment



Figure 4.2.2-8: File download NRM fragment

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| **Next modification** |

### 4.3.A FileDownloadJob

#### 4.3.A.1 Definition

The "FileDownloadJob" represents a job on a MnS producer that downloads a file from a MnS consumer. It can be name-contained by "ManagedElement" or "SubNetwork".

A "FileDownloadJob" is created by a MnS consumer on a MnS producer. The creation requests the MnS producer to download a file from the MnS consumer to the MnS producer. Upon completion of the file download, the MnS consumer shall delete the "FileDownloadJob".

The creation request contains the information required by the MnS producer to download the file, namely the attribute "fileLocation", and the file properties "fileCompression" and "fileSize".

The creation request may contain in addition a "notificationRecipientAddress". If present, this attribute instructs the MnS producer to create, on behalf of the MnS consumer, a subscription for attribute value change notifications of the new "FileDownloadMonitor". The "notificationRecipientAddress" attribute of the created "NtfSubscriptionControl" object shall be set to the value of the "notificationRecipientAddress" in the "FileDownloadJob" creation request (implicit notification subscription).

The "downloadProgress" represents the status of a file download job in a general manner independent from details of the file transfer protocol.

The "downloadProgress" is created by the MnS producer together with the associated "FileDownloadJob" upon receiving a "FileDownloadJob" creation request. These attributes are populated and updated by the MnS producer as the file download progresses. After the download is terminated, the MnS producer shall set the "jobStatus" attribute to either "Finished" or "Cancelled".

The attributes "jobResult", "jobProgressPercentage", "jobStartTime" and "jobEndTime" are provided for monitoring the status of the file download progress.

In case the file download fails for some reason, the "jobResult" attribute shall be set to "failure" and the "jobResultInfo" attribute shall indicate the error reason.

To cancel a file download, the MnS consumer shall set the "cancelJob" attribute to "TRUE". Cancellation is possible in the "Running" state. The MnS Producer shall set "jobStatus" to "cancelling", and update it to "Cancelled" once the job has been cancelled.

The "downloadProgress" attribute allows a MnS consumer to create simple notification subscriptions related to the "FileDownloadMonitor". and allows for deployments not relying on notifications for reporting the file download status, where the MnS consumer just polls the attributes.

#### 4.3.A.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | S | isReadable | isWritable | isInvariant | isNotifyable |
| operationalState | M | T | F | F | T |
| administrativeState | M | T | T | F | T |
| fileLocation | M | T | T | T | F |
| fileCompression | M | T | T | T | F |
| fileSize | O | T | T | T | F |
| notificationRecipientAddress | O | T | T | T | F |
|  |  |  |  |  |  |
| \_ |  |  |  |  |  |
| jobProgress | M | T | T | F | T |

#### 4.3.A.2a Attribute definitions

| Attribute Name | Documentation and Allowed Values | Properties |
| --- | --- | --- |
| operationalState | See definition in clause 3a.2.2.1  *Editor's note: Clause above not approved yet* | N/A |
| administrativeState | See definition in clause 3a.2.2.2  *Editor's note: Clause above not approved yet* | N/A |
| fileLocation | See definition in clause 4.3.Y.2a  *Editor's note: Clause above not approved yet* | N/A |
| fileCompression | See definition in clause 4.3.Y.2a  *Editor's note: Clause above not approved yet* | N/A |
| fileSize | See definition in clause 4.3.Y.2a  *Editor's note: Clause above not approved yet* | N/A |
| notificationRecipientAddress | Notification recipient address for implicit notification subscription.  AllowedValues: N/A | Type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: FALSE  isNullable: False |
|  |  |  |
| \_ |  |  |
| \_jobProgress | Provides monitoring for the download job. | Type: JobProgress  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: FALSE  isNullable: False |

#### 4.3.A.3 Attribute constraints

None.

#### 4.3.A.4 Notifications

The common notifications defined in clause 4.5 are valid for this IOC, without exceptions or additions.

### 4.3.B JobProgress <<Datatype>>

4.3.B.1 DefinitionThis datatype provides attributes to monitor the progress of a job.

The mandatory attributes provide an identifier, status and result for the associated job,

For jobs which are long-running other attributes, such as jobProgressInfo, can be used to provide more details on the progress.

*Editor's note: The proposed attribute names and definitions are preliminary and may be updated based on further discussion.*

#### 4.3.B.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | S | isReadable | isWritable | isInvariant | isNotifyable |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **jobId** | M | T | F | F | T |
| **jobStatus** | M | T | F | F | T |
| **jobProgressPercentage** | O | T | F | F | T |
| **jobProgressInfo** | O | T | F | F | T |
| **jobResult** | M | T | F | F | T |
| **jobResultInfo** | O | T | F | F | T |
| **jobTimer** | O | T | T | F | T |
| **jobStartTime** | O | T | F | F | T |
| **jobEndTime** | O | T | F | F | T |
| **cancelJob** | O | T | T | F | T |

#### 4.3.B.2a Attribute definitions

| Attribute Name | Documentation and Allowed Values | Properties |
| --- | --- | --- |
| status | Status of the file download process.  allowedValues:  - NOT\_STARTED  - ONGOING  - SUCCESS  - FAILURE  - CANCELLED | Type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| errorReason | Error reason, present when the file download failed and "status"="FAILURE". Otherwise, the attribute shall be absent or carry the "NULL" value.  allowedValues:  - NULL  - UNKNOWN  - NO\_STORAGE  - LOW\_MEMROY  - NO\_CONNECTION\_TO\_REMOTE\_SERVER  - FILE\_NOT\_AVAILABLE  - DNS\_CANNOT\_BE\_RESOLVED  - OTHER | Type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| progress | Indicates how much of the file is already downloaded.  Unit is percent.  Allowed values:  integer between 0 and 100 with increments of 5 | Type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| startTime | Start time of the file download process.  allowedValues: N/A | Type: DateTime  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| endTimePredicted | Predicted end time of the file download process.  allowedValues: N/A | Type: DateTime  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| **jobId** | Id of the associated job | Type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| **jobStatus** | Status of the job:   * Running: execution of the associated job is currently in progress * Cancelling: cancellation is in progress * Finished: the associated job is finished * Cancelled: the job was cancelled   allowedValues: RUNNING, CANCELLING, FINISHED, CANCELLED | Type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: RUNNING  isNullable: False |
| **jobProgressPercentage** | Progress of the associated job as percentage: 0..100 | Type: Integer  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: 0  isNullable: False |
| **jobProgressInfo** | Textual information about the state and progress of the associated job. | Type: String  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| **jobResult** | Result of the job:   * Success: the associated job has ended with success * Failure: the associated job ended with failure * not-available: No result is available yet   allowedValues: SUCCESS, FAILURE, NOT\_AVAILABLE | Type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| **jobResultInfo** | Detailed result or reason | Type: String  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| **jobTimer** | Time until the associated job is automatically cancelled by the provider. If set, the system decreases the jobTimer with time. When it reaches zero the cancellation of the associated job is initiated. If not set, there is no time limit for the job. | Type: Integer  multiplicity: 0.. 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| **jobStartTime** | Date and time when the associated job was started. | Type: DateTime  multiplicity: 0.. 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| **jobEndTime** | Date and time when the state changed to finished or cancelled | Type: DateTime  multiplicity: 0.. 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| **cancelJob** | If set to True, the job is requested to be cancelled | Type: Boolean  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: False  isNullable: False |

#### 4.3.B.4 Notifications

The common notifications defined in clause W4.5 are not valid for this IOC. The set of notifications defined in the following table is valid.

| Name | S | Notes |
| --- | --- | --- |
| notifyMOICreation | M |  |
| notifyMOIDeletion | M |  |
| notifyMOIAttributeValueChanges | M |  |
| notifyMOIChanges | M |  |

*Editor's note: This contribution does not follow the agreed NRM template in 3GPP TS 32.156. It is based instead on an alternative for NRM fragments that is currently under discussion. Based on the outcome of this discussion this contribution needs to be updated.*

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| **End of modifications** |