**3GPP TSG CT WG3 Meeting #113eC3-210063**

**E-Meeting, 25th – 29th January 2021 *(revision of C3-21xxxx)***

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.486** | **CR** | 0014 | **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 |  | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Support of stateless NFs | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI17, V2XAPP | | | | |  | ***Date:*** | | | 2021-01-29 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-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:*** | | The VAE server could redirect the reques to another VAE server by returning the 3XX stauts code. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | VAE\_MessageDelivery Service, VAE\_FileDistribution, VAE\_ApplicationRequirement Service and VAE\_DynamicGroup Service are impact.  OpenAPI filed is updated with the support of 307 and 308 responses. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Lack of full support of the functionality required to become stateless NFs | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2.2.2.2, 5.2.2.3.2, 5.2.2.4.2, 5.2.2.5.2, 5.3.2.2.2, 5.4.2.2.2, 5.4.2.3.2, 5.5.2.2.2, 5.5.2.3.2, 5.6.2.2.2, 6.1.3.3.3.1, 6.1.3.3.3.2, 6.1.3.5.3.1, 6.1.3.5.3.2, 6.1.5.6.2, 6.1.7.1, 6.1.8, 6.2.3.3.3.1, 6.2.3.3.3.2, 6.2.7.1, 6.2.8, 6.3.3.3.3.1, 6.3.3.3.3.2, 6.3.5.6.2, 6.3.7.1, 6.3.8, 6.4.3.3.3.1, 6.4.3.3.3.2, 6.4.5.6.2, 6.4.7.1, 6.4.8, 6.5.7.1, A.2, A.3, A.4, A.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 introduces a backwards compatible correction to the OpenAPI file. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**…**

**Proposed changes:**

\*\*\* 1st Change \*\*\*

##### 5.2.2.2.2 Message Delivery Subscribe



Figure 5.2.2.3.2-1: Message delivery subscribe

When the NF service consumer (e.g. V2X application specific server) needs to receive the message from the V2X UE and/or send the message to the V2X UE, the NF service consumer shall send the POST method as step 1of the figure 5.2.2.2.2-1 to request to create an "Individual Message Delivery Subscription".

The NF service consumer shall include MessageDeliverySubscriptionData data structure in the payload body of the HTTP POST to request a creation of representation of the "Individual Message Delivery Subscription" resource. The "Individual Message Delivery Subscription" resource is created as described below.

The NF service consumer MessageDeliverySubscriptionData data structure shall include:

- The identity of the V2X application specific server within the "appSerId" attribute;

- The V2X service ID within the "serviceId" attribute;

- The notification URI within the "notifUri" attribute; and

- The supported features with the "suppFeat" attribute;

and may include

- The geographical area identifier within the "geoId" attribute.

When the VAE Server receives the HTTP POST request from the NF service consumer, the VAE server shall make an authorization based on the information received from the NF service consumer. If the authorization is successful, the VAE Server shall create a new resource, which represents "Individual Message Delivery Subscription", addressed by a URI as defined in clause 6.1.3.3.2 and contains a VAE Server created resource identifier. The VAE Server shall respond to the NF service consumer with a 201 Created message, including Location header field containing the URI for the created resource.

If errors occur when processing the HTTP POST request, the VAE server shall apply error handling procedures as specified in subclause 6.1.7.

The NF service consumer shall use the URI received in the Location header in subsequent requests to the VAE Server to refer to the "Individual Message Delivery Subscription".

\*\*\* Next Change \*\*\*

##### 5.2.2.3.2 Message Delivery Unsubscribe



Figure 5.2.2.3.2-1: message delivery unsubscribe

When the NF service consumer (e.g. V2X application specific server) needs to remove an existing subscription for receiving the message from the V2X UE or sending the message to the V2X UE, the NF service consumer shall send the DELETE method as step 1of the figure 5.2.2.3.2-1 to request to delete an "Individual Message Delivery Subscription".

Upon the reception of the HTTP DELETE request, if the VAE Server successfully processed and accepted the received HTTP DELETE request, the VAE Server shall:

- remove the corresponding subscription; and

- send an HTTP "204 No Content" response.

If errors occur when processing the HTTP POST request, the VAE Server shall send an HTTP error response or, if the feature "Redirect3XX" is supported, an HTTP redirect response as specified in subclause 6.1.7.

\*\*\* Next Change \*\*\*

##### 5.2.2.4.2 Deliver Downlink Message



Figure 5.2.2.4.2-1: V2X message delivery

When the NF service consumer (e.g. V2X application specific server) needs to send the message to the V2X UE, the NF service consumer shall send the POST method as step 1of the figure 5.2.2.4.2-1 to request to create an "Individual Message Delivery".

The NF service consumer shall include V2xMessageDeliveryData data structure in the payload body of the HTTP POST to request a creation of representation of the "Individual Message Delivery" resource. The "Individual Message Delivery" resource is created as described below.

The NF service consumer within the MessageDeliveryData data structure shall include:

- Either the V2X UE ID within the "ueId" attribute or the V2X Group ID within the "groupId" attribute;

- V2X message payload carried by the V2X message within the "payload" attribute;

and may include:

- The duration within the "duration" attribute; and

- The geographical area identifier within the "geoId" attribute.

When the VAE Server receives the HTTP POST request from the NF service consumer, the VAE server shall make an authorization based on the information received from the NF service consumer. If the authorization is successful, the VAE Server shall create a new resource, which represents "Individual Message Delivery", addressed by a URI as defined in clause 6.1.3.5.2 and contains a VAE Server created resource identifier. The VAE Server shall respond to the NF service consumer with a 201 Created message, including Location header field containing the URI for the created resource.

The NF service consumer shall use the URI received in the Location header in subsequent requests to the VAE Server to refer to the "Individual Message Delivery".

Upon receipt of the HTTP DELETE message from the NF service consumer, the VAE Server shall check if the Individual Message Delivery resource identified by the URI already exists. If the resource exists, the VAE Server shall delete the resource and respond to the NF service consumer with a 204 No Content success message.

When the message delivery duration expires, the VAE server may remove the associated Individual Message Delivery resource locally.

If errors occur when processing the HTTP POST or DELETE request, the VAE Server shall apply error handling procedures as specified in subclause 6.1.7.

\*\*\* Next Change \*\*\*

##### 5.2.2.5.2 Deliver Uplink Message



Figure 5.2.2.5.2-1: Deliver Uplink Message

If the VAE Server receives the uplink message for a V2X UE which an NF service consumer has subscribed to or a V2X UE belongs to a V2X group which the NF service consumer has subscribed to, the VAE Server shall send an HTTP POST request with "{notifUri}" as previously provided by the NF service consumer within the corresponding subscription as URI and UplinkMessageDeliveryData data structure as request body that shall include:

- resource URI of the individual Message Delivery Subscription related to the notification within the "resourceUri" attribute;

- The V2X UE ID within the "ueId" attribute;

- V2X message payload carried by the V2X message within the "payload" attribute; and

- The geographical area identifier within the "geoId" attribute if available.

Upon the reception of the HTTP POST message, if the NF service consumer successfully processed and accepted the received HTTP POST request, the NF service consumer shall send an "204 No Content" HTTP response for a succesfull processing.

If errors occur when processing the HTTP POST request, the NF service consumer shall send an HTTP error response or, if the feature "Redirect3XX" is supported, an HTTP redirect response as specified in subclause 6.1.7.

\*\*\* Next Change \*\*\*

##### 5.3.2.2.2 Distribute File



Figure 5.3.2.2.2-1: Distribute File

When the NF service consumer (e.g. V2X application specific server) needs to distribute the file to the V2X UEs, the NF service consumer shall send the POST method as step 1 of the figure 5.3.2.2.2-1 to request to create an "Individual File Distribution".

The NF service consumer shall include FileDistributionData data structure in the payload body of the HTTP POST to request a creation of representation of the "Individual File Distribution" resource. The "Individual File Distribution" resource is created as described below.

The NF service consumer within the FileDistributionData data structure shall include:

- The file lists within the "fileLists" attribute;

- The geographical area within the "geoArea" attribute;

- maximum bitrate for the V2X application within the "maxBitrate" attribute; and

- maximum delay for the V2X application within the "maxDelay" attribute;

and may include:

- The V2X Group ID within the "groupId" attribute;

- The serving class within the "serviceClass" attribute; and

- The duration within the "duration" attribute.

When the VAE Server receives the HTTP POST request from the NF service consumer, the VAE server shall make an authorization based on the information received from the NF service consumer. If the authorization is successful, the VAE Server shall create a new resource, which represents "Individual File Distribution", addressed by a URI as defined in clause 6.2.3.3.2 and contains a VAE Server created resource identifier. The VAE Server shall respond to the NF service consumer with a 201 Created message, including Location header field containing the URI for the created resource.

The VAE Server shall use the URI received in the Location header in subsequent requests to the VAE Server to refer to the "Individual File Distribution".

Upon receipt of the HTTP DELETE message from the NF service consumer, the VAE Server shall check if the Individual Message Delivery resource identified by the URI already exists. If the resource exists, the VAE Server shall delete the resource and respond to the NF service consumer with a 204 No Content success message.

If errors occur when processing the HTTP POST or DELETE request, the VAE Server shall apply error handling procedures as specified in subclause 6.2.7.

When the message delivery duration expires, the VAE server may remove the associated Individual Message Delivery resource locally.

The VAE server makes use of the xMB procedures as defined 3GPP TS 29.116 [y] to create MBMS sessions whose type is set to "files" and to request the delivery of files over these sessions. Before provisioning files to the BM‑SC, the VAE server prepares the file for distribution, which may include partition of large files into smaller files or encryption.

The VAE server is responsible for translating the parameters related to the V2X application triggering the file delivery into corresponding xMB parameters. Table 5.3.2.2.2-1 describes the mapping between the VAE\_FileDistribution API attribute and the xMB API properties specified in 3GPP TS 29.116 [19].

Table 5.3.2.2.2-1: Mapping between VAE\_FileDistribution API and xMB API

|  |  |
| --- | --- |
| V2X parameter | Corresponding xMB API property |
| serviceClass | service-class |
| fileLists | file-list |
| geoArea | geographical-area |
| maxBitrate | max-bitrate |
| maxDelay | max-delay |

NOTE: The list of V2X parameters needed for file delivery is not exhaustive and can be updated based on the specific V2X application requirements.

\*\*\* Next Change \*\*\*

##### 5.4.2.2.2 Reserve Network Resource



Figure 5.4.2.2.2-1: Reserve Network Resource

When the NF service consumer (e.g. V2X application specific server) needs to provide V2X application requirement to the underlying 3GPP network, the NF service consumer shall send the POST method as step 1 of the figure 5.4.2.2.2-1 to request to create an "Individual Application Requirement".

The NF service consumer shall include ApplicationRequirementData data structure in the payload body of the HTTP POST to request a creation of representation of the "Individual Application Requirement" resource. The "Individual Application Requirement" resource is created as described below.

The NF service consumer within the ApplicationRequirementData data structure shall include:

- Either the V2X Group ID within the "groupId" attribute or the V2X UE ID within the "ueId" attribute;

- notification URI within the "notifUri" attribute;

- The service Id within the "serviceId" attribute; and

- V2X application requirement within the "appRequirement" attribute;

and may include:

- The duration within the "duration" attribute.

When the VAE Server receives the HTTP POST request from the NF service consumer, the VAE server shall make an authorization based on the information received from the NF service consumer. If the authorization is successful, the VAE Server shall create a new resource, which represents "Individual Application Requirement", addressed by a URI as defined in clause 6.3.3.3.2 and contains a VAE Server created resource identifier. The VAE Server shall respond to the NF service consumer with a 201 Created message, including Location header field containing the URI for the created resource.

The NF service consumer shall use the URI received in the Location header in subsequent requests to the VAE Server to refer to the "Individual Application Requirement".

Upon receipt of the HTTP DELETE message from the NF service consumer, the VAE Server shall check if the Individual Application Requirement resource identified by the URI already exists. If the resource exists, the VAE Server shall delete the resource and respond to the NF service consumer with a 204 No Content success message.

If errors occur when processing the HTTP POST or DELETE request, the VAE Server shall apply error handling procedures as specified in subclause 6.3.7.

When the message delivery duration expires, the VAE server may remove the associated Individual Application Requirement resource locally.

\*\*\* Next Change \*\*\*

##### 5.4.2.3.2 Notify Network Resource



Figure 5.4.2.3.2-1: Notify Network Resource

If the VAE Server receives the result of network resource adaptation corresponding to the V2X application requirement, the VAE Server shall send an HTTP POST request with "{notifUri}" as previously provided by the NF service consumer within the corresponding subscription as URI and AppReqNotification data structure as request body that shall include:

- resource URI of the individual Application Requirement related to the notification within the "resourceUri" attribute;

- the result of the network resource adaptation corresponding to the V2X application requirement within the "result" attribute.

Upon the reception of the HTTP POST message, if the NF service consumer successfully processed and accepted the received HTTP POST request, the NF service consumer shall send an "204 No Content" HTTP response for a succesfull processing.

If errors occur when processing the HTTP POST request, the VAE Server shall send an HTTP error response or, if the feature "Redirect3XX" is supported, an HTTP redirect response as specified in subclause 6.3.7.

\*\*\* Next Change \*\*\*

##### 5.5.2.2.2 Configure Dynamic Group



Figure 5.5.2.2.2-1: Configure Dynamic Group

When the NF service consumer (e.g. V2X application specific server) needs to configures the dynamic group information at the VAE server, the NF service consumer shall send the POST method as step 1 of the figure 5.5.2.2.2-1 to request to create an "Individual Group Configuration".

The NF service consumer shall include GroupConfigurationData data structure in the payload body of the HTTP POST to request a creation of representation of the "Individual Group Configuration" resource. The "Individual Group Configuration" resource is created as described below.

The NF service consumer within GroupConfigurationData data structure shall include:

- The dynamic Group ID within the "groupId" attribute;

- The group definition within the "definition" attribute;

- The group leader Id within the "leaderId" attribute; and

- The notification URI within the "notifUri" attribute.

and may include:

- The duration within the "duration" attribute.

When the VAE Server receives the HTTP POST request from the NF service consumer, the VAE server shall make an authorization based on the information received from the NF service consumer. If the authorization is successful, the VAE Server shall create a new resource, which represents "Individual Group Configuration", addressed by a URI as defined in clause 6.4.3.2.2 and contains a VAE Server created resource identifier. The VAE Server shall respond to the NF service consumer with a 201 Created message, including Location header field containing the URI for the created resource.

The NF service consumer shall use the URI received in the Location header in subsequent requests to the VAE Server to refer to the "Individual Application Requirement".

Upon receipt of the HTTP DELETE message from the NF service consumer, the VAE Server shall check if the Individual Message Delivery resource identified by the URI already exists. If the resource exists, the VAE Server shall delete the resource and respond to the NF service consumer with a 204 No Content success message.

If errors occur when processing the HTTP POST or DELETE request, the VAE Server shall apply error handling procedures as specified in subclause 6.4.7.

When the message delivery duration expires, the VAE server may remove the associated Individual Message Delivery resource locally.

\*\*\* Next Change \*\*\*

##### 5.5.2.3.2 Notify Dynamic Group



Figure 5.5.2.3.2-1: Notify Dynamic Group

If the VAE Server receives the dynamic group information (i.e. group member joins or leaves), the VAE Server shall send an HTTP POST request with "{notifUri}" as previously provided by the NF service consumer within the corresponding subscription as URI and DynamicGroupNotification data structure as request body that shall include:

- resource URI of the individual Application Requirement related to the notification within the "resourceUri" attribute;

- one or more joined group member within the "joinedUeIds" attribute if available; and

- one or more left group member within the "leftUeIds" attribute if available.

Upon the reception of the HTTP POST message, the NF service consumer shall send an "204 No Content" HTTP response for a succesfull processing.

If errors occur when processing the HTTP POST request, the NF service consumer shall send an HTTP error response or, if the feature "Redirect3XX" is supported, an HTTP redirect response as specified in subclause 6.4.7.

\*\*\* Next Change \*\*\*

##### 5.6.2.2.2 Query service continuity



Figure 5.6.2.2.2-1: Query service continuity

When the NF service consumer (e.g. V2X server) needs to query service continuity information, the NF service consumer shall send an HTTP GET request as step 1 of the figure 5.6.2.2.2-1 to the "Individual Geographical Area" resource with query parameter V2X service id in "service-id". When the VAE Server receives the HTTP GET request from the NF service consumer, the VAE Server shall perform the query.

On success, "200 OK" shall be returned as step 2 of the figure 5.6.2.2.2-1 to indicate that the VAE server can support the desired V2X service for the target "Individual Geographical Area" resource. The response body shall contain the "Individual Geographical Area” resource including the requested V2X service id.

If errors occur when processing the HTTP POST request, the VAE Server shall apply error handling procedures as specified in subclause 6.5.7.

\*\*\* Next Change \*\*\*

###### 6.1.3.3.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.3.3.1-1.

Table 6.1.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.1.3.3.3.1-2 and the response data structures and response codes specified in table 6.1.3.3.3.1-3.

Table 6.1.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.1.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| MessageDeliverySubscriptionData | M | 1 | 200 OK | An individual Message Delivery Subscription resource for the V2X UE ID or V2X group ID is returned successfully. |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual Message Delivery Subscription retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual Message Delivery Subscription retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| NOTE: The mandatory HTTP error status codes for the GET method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [2] shall also apply. | | | | |

Table 6.1.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

Table 6.1.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

\*\*\* Next Change \*\*\*

###### 6.1.3.3.3.2 DELETE

This method shall support the URI query parameters specified in table 6.1.3.3.3.2-1.

Table 6.1.3.3.3.2-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.1.3.3.3.2-2 and the response data structures and response codes specified in table 6.1.3.3.3.2-3.

Table 6.1.3.3.3.2-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.1.3.3.3.2-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Individual Message Delivery Subscription was successfully deleted. |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual Message Delivery Subscription deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual Message Delivery Subscription deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| NOTE: The mandatory HTTP error status codes for the DELETE method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [5] also apply. | | | | |

Table 6.1.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

Table 6.1.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

\*\*\* Next Change \*\*\*

###### 6.1.3.5.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.5.3.1-1.

Table 6.1.3.5.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 5.1.3.5.3.1-2 and the response data structures and response codes specified in table 5.1.3.5.3.1-3.

Table 6.1.3.5.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.1.3.5.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| DownlinkMessageDeliveryData | M | 1 | 200 OK | An individual Downlink Message Delivery resource for the V2X UE ID **or** V2X group ID is returned successfully. |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual Downlink Message Delivery retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual Downlink Message Delivery retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| NOTE: The mandatory HTTP error status codes for the GET method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [2] shall also apply. | | | | |

Table 6.1.3.5.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

Table 6.1.3.5.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

\*\*\* Next Change \*\*\*

###### 6.1.3.5.3.2 DELETE

This method shall support the URI query parameters specified in table 6.1.3.5.3.2-1.

Table 6.1.3.5.3.2-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.1.3.5.3.2-2 and the response data structures and response codes specified in table 6.1.3.5.3.2-3.

Table 6.1.3.5.3.2-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.1.3.5.3.2-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Individual Downlink Message Delivery resource was successfully deleted. |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual Downlink Message Delivery deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual Downlink Message Delivery deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| NOTE: The mandatory HTTP error status codes for the DELETE method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [5] also apply. | | | | |

Table 6.1.3.5.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

Table 6.1.3.5.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

\*\*\* Next Change \*\*\*

##### 6.1.5.6.2 Operation Definition

This operation shall support the request data structures specified in table 6.1.5.6.2-1 and the response data structure and response codes specified in table 6.1.5.6.2-2.

Table 6.1.5.6.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| UplinkMessageDeliveryData | M | 1 | Contains the uplink message delivery data |

Table 6.1.5.6.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | The uplink message is delivery successfully. |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during uplink message delivery. The response shall include a Location header field containing an alternative URI representing the end point of an alternative NF consumer (service) instance where the uplink message should be sent.  Applicable if the feature "Redirect3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during uplink message delivery. The response shall include a Location header field containing an alternative URI representing the end point of an alternative NF consumer (service) instance where the uplink message should be sent.  Applicable if the feature "Redirect3XX" is supported. |
| NOTE 1: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] shall also apply. | | | | |

Table 6.1.5.6.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative NF consumer (service) instance towards which the uplink message should be redirected. |

Table 6.1.5.6.2-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative NF consumer (service) instance towards which the uplink message should be redirected. |

\*\*\* Next Change \*\*\*

#### 6.1.7.1 General

HTTP error handling shall be supported as specified in clause 5.2.4 of 3GPP TS 29.500 [2].

For the VAE\_MessageDelivery Service API, HTTP error responses shall be supported as specified in subclause 4.8 of 3GPP TS 29.501 [3].

Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [2] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [2].

If the "Redirect3XX" feature is supported, an HTTP redirect response, i.e. 307 Temporary Redirect or 308 Permanent Redirect, shall be supported.

In addition, the requirements in the following subclauses are applicable for the VAE\_MessageDelivery Service API.

\*\*\* Next Change \*\*\*

### 6.1.8 Feature negotiation

The optional features in table 6.1.8-1 are defined for the VAE\_MessageDelivery API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [2].

Table 6.1.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | Notification\_test\_event | The testing of notification connection is supported according to clause 6.1.5.3. |
| 2 | Notification\_websocket | The delivery of notifications over Websocket is supported according to clause 6.1.5.4. This feature requires that the Notification\_test\_event feature is also supported. |
| x1 | Redirect3XX | Extended Support for 3xx redirections. This feature indicates the support of redirection for any service operation. |

\*\*\* Next Change \*\*\*

###### 6.2.3.3.3.1 GET

This method shall support the URI query parameters specified in table 6.2.3.3.3.1-1.

Table 6.2.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.2.3.3.3.1-2 and the response data structures and response codes specified in table 6.2.3.3.3.1-3.

Table 6.2.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.2.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| FileDistributionData | M | 1 | 200 OK | An individual File Distribution resource for the V2X group ID is returned successfully. |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual File Distribution retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual File Distribution retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| NOTE: The mandatory HTTP error status codes for the GET method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [2] shall also apply. | | | | |

Table 6.2.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the request is redirected |

Table 6.2.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the request is redirected |

\*\*\* Next Change \*\*\*

###### 6.2.3.3.3.2 DELETE

This method shall support the URI query parameters specified in table 6.2.3.3.3.2-1.

Table 6.2.3.3.3.2-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.2.3.3.3.2-2 and the response data structures and response codes specified in table 6.2.3.3.3.2-3.

Table 6.2.3.3.3.2-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.2.3.3.3.2-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Individual File Distribution resource was successfully deleted. |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual File Distribution deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual File Distribution deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| NOTE: The mandatory HTTP error status code for the DELETE method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [2] also apply. | | | | |

Table 6.2.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

Table 6.2.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

\*\*\* Next Change \*\*\*

#### 6.2.7.1 General

HTTP error handling shall be supported as specified in clause 5.2.4 of 3GPP TS 29.500 [2].

For the VAE\_FileDistribution Service API, HTTP error responses shall be supported as specified in subclause 4.8 of 3GPP TS 29.501 [3].

Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [2] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [2].

If the "Redirect3XX" feature is supported, an HTTP redirect response, i.e. 307 Temporary Redirect or 308 Permanent Redirect, shall be supported.

In addition, the requirements in the following subclauses are applicable for the VAE\_FileDistribution Service API.

\*\*\* Next Change \*\*\*

### 6.2.8 Feature negotiation

The optional features in table 6.1.8-1 are defined for the VAE\_FileDistribution API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [2].

Table 6.1.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| x1 | Redirect3XX | Extended Support for 3xx redirections. This feature indicates the support of redirection for any service operation. |

\*\*\* Next Change \*\*\*

###### 6.3.3.3.3.1 GET

This method shall support the URI query parameters specified in table 6.3.3.3.3.1-1.

Table 6.3.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.3.3.1-2 and the response data structures and response codes specified in table 6.3.3.3.3.1-3.

Table 6.3.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.3.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| ApplicationRequirementData | M | 1 | 200 OK | An individual Application Requirement resource for the V2X UE ID or V2X group ID is returned successfully. |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual Application Requirement retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual Application Requirement retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| NOTE: The mandatory HTTP error status codes for the GET method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [2] shall also apply. | | | | |

Table 6.3.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

Table 6.3.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

\*\*\* Next Change \*\*\*

###### 6.3.3.3.3.2 DELETE

This method shall support the URI query parameters specified in table 6.3.3.3.3.2-1.

Table 6.3.3.3.3.2-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.3.3.2-2 and the response data structures and response codes specified in table 6.3.3.3.3.2-3.

Table 6.3.3.3.3.2-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.3.3.3.3.2-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Individual Application Requirement resource was successfully deleted |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual Application Requirement deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual Application Requirement deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| NOTE: The mandatory HTTP error status code for the DELETE method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [5] also apply. | | | | |

Table 6.3.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

Table 6.3.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

\*\*\* Next Change \*\*\*

##### 6.3.5.6.2 Operation Definition

This operation shall support the request data structures specified in table 6.3.5.6.2-1 and the response data structure and response codes specified in table 6.3.5.6.2-2.

Table 6.3.5.6.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| AppReqNotification | M | 1 | Notify the result of the network resource adaptation corresponding to the V2X application requirement. |

Table 6.3.5.6.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | . |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during the notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative NF consumer (service) instance where the notification should be sent.  Applicable if the feature "Redirect3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during the notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative NF consumer (service) instance where the notification should be sent.  Applicable if the feature "Redirect3XX" is supported. |
| NOTE 1: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] shall also apply. | | | | |

Table 6.3.5.6.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative NF consumer (service) instance towards which the notification should be redirected. |

Table 6.3.5.6.2-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative NF consumer (service) instance towards which the notification should be redirected. |

\*\*\* Next Change \*\*\*

#### 6.3.7.1 General

HTTP error handling shall be supported as specified in clause 5.2.4 of 3GPP TS 29.500 [2].

For the VAE\_ApplicationRequirement Service API, HTTP error responses shall be supported as specified in subclause 4.8 of 3GPP TS 29.501 [3].

Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [2] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [2].

If the "Redirect3XX" feature is supported, an HTTP redirect response, i.e. 307 Temporary Redirect or 308 Permanent Redirect, shall be supported.

In addition, the requirements in the following subclauses are applicable for the VAE\_ApplicationRequirement Service API.

\*\*\* Next Change \*\*\*

### 6.3.8 Feature negotiation

The optional features in table 6.3.8-1 are defined for the VAE\_ApplicationRequirement API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [2].

Table 6.3.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | Notification\_test\_event | The testing of notification connection is supported according to clause 6.3.5.3. |
| 2 | Notification\_websocket | The delivery of notifications over Websocket is supported according to clause 6.3.5.4. This feature requires that the Notification\_test\_event feature is also supported. |
| x1 | Redirect3XX | Extended Support for 3xx redirections. This feature indicates the support of redirection for any service operation. |

\*\*\* Next Change \*\*\*

###### 6.4.3.3.3.1 GET

This method shall support the URI query parameters specified in table 6.4.3.3.3.1-1.

Table 6.4.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.4.3.3.3.1-2 and the response data structures and response codes specified in table 6.4.3.3.3.1-3.

Table 6.4.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.4.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| GroupConfigurationData | M | 1 | 200 OK | An individual Group Configuration resource for the V2X group ID is returned successfully. |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual Group Configuration retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual Group Configuration retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| NOTE: The mandatory HTTP error status codes for the GET method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [2] shall also apply. | | | | |

Table 6.4.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

Table 6.4.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

\*\*\* Next Change \*\*\*

###### 6.4.3.3.3.2 DELETE

This method shall support the URI query parameters specified in table 6.4.3.3.3.2-1.

Table 6.4.3.3.3.2-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.4.3.3.3.2-2 and the response data structures and response codes specified in table 6.4.3.3.3.2-3.

Table 6.4.3.3.3.2-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.4.3.3.3.2-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content |  |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual Group Configuration deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual Group Configuration deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative VAE Server (service) instance.  Applicable if the feature "Redirect3XX" is supported. |
| NOTE: The mandatory HTTP error status codes for the DELETE method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [2] shall also apply. | | | | |

Table 6.4.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

Table 6.4.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative VAE Server (service) instance. |

\*\*\* Next Change \*\*\*

##### 6.4.5.6.2 Operation Definition

This operation shall support the request data structures specified in table 6.4.5.6.2-1 and the response data structure and response codes specified in table 6.4.5.6.2-2.

Table 6.4.5.6.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| DynamicGroupNotification | M | 1 | Notify the dynamic group information (i.e. group member joins or leaves). |

Table 6.4.5.6.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | . |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during dynamic group notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative NF consumer (service) instance where the notification should be sent.  Applicable if the feature "Redirect3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during dynamic group notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative NF consumer (service) instance where the notification should be sent.  Applicable if the feature "Redirect3XX" is supported. |
| NOTE 1: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] shall also apply. | | | | |

Table 6.4.5.6.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative NF consumer (service) instance towards which the notification should be redirected. |

Table 6.4.5.6.2-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative NF consumer (service) instance towards which the notification should be redirected. |

\*\*\* Next Change \*\*\*

#### 6.4.7.1 General

HTTP error handling shall be supported as specified in clause 5.2.4 of 3GPP TS 29.500 [2].

For the VAE\_DynamicGroup Service API, HTTP error responses shall be supported as specified in subclause 4.8 of 3GPP TS 29.501 [3].

Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [2] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [2].

If the "Redirect3XX" feature is supported, an HTTP redirect response, i.e. 307 Temporary Redirect or 308 Permanent Redirect, shall be supported.

In addition, the requirements in the following subclauses are applicable for the VAE\_DynamicGroup Service API.

\*\*\* Next Change \*\*\*

### 6.4.8 Feature negotiation

The optional features in table 6.4.8-1 are defined for the VAE\_DynamicGroup API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [2].

Table 6.4.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | Notification\_test\_event | The testing of notification connection is supported according to clause 6.4.5.3. |
| 2 | Notification\_websocket | The delivery of notifications over Websocket is supported according to clause 6.4.5.4. This feature requires that the Notification\_test\_event feature is also supported. |
| x1 | Redirect3XX | Extended Support for 3xx redirections. This feature indicates the support of redirection for any service operation. |

\*\*\* Next Change \*\*\*

#### 6.5.7.1 General

HTTP error handling shall be supported as specified in clause 5.2.4 of 3GPP TS 29.500 [2].

For the VAE\_ServiceContinuity Service API, HTTP error responses shall be supported as specified in subclause 4.8 of 3GPP TS 29.501 [3].

Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [2] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [2].

In addition, the requirements in the following subclauses are applicable for the VAE\_ServiceContinuity Service API.

\*\*\* Next Change \*\*\*

# A.2 VAE\_MessageDelivery API

openapi: 3.0.0

info:

version: 1.0.0

title: VAE\_MessageDelivery

description: |

API for VAE Message Delivery Service

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externalDocs:

description: 3GPP TS 29.486 V16.1.0 V2X Application Enabler (VAE) Services

url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.486/'

security:

- {}

- oAuth2ClientCredentials: []

servers:

- url: '{apiRoot}/vae-message-delivery/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

paths:

/subscriptions:

post:

summary: Create a new Individual Message Delivery Data Subscription resource

operationId: CreateIndividualMessageDeliveryDataSubscription

tags:

- Message Delivery Data Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MessageDeliverySubscriptionData'

responses:

'201':

description: The subscription was created successfully.

content:

application/json:

schema:

$ref: '#/components/schemas/MessageDeliverySubscriptionData'

headers:

Location:

description: 'Contains the URI of the newly created resource'

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

callbacks:

uplinkMessageDelivery:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/UplinkMessageDeliveryData'

responses:

'204':

description: No Content, Notification was successful

'307':

description: temporary redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'A URI pointing to the endpoint of another NF service consumer instance to which the uplink message should be sent'

required: true

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

required: true

description: 'A URI pointing to the endpoint of an alternative NF service consumer instance towards which the uplink message should be redirected.'

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:

get:

summary: Get an existing individual Message Delivery Subscription resource

operationId: ReadIndividualMessageDeliverySubscription

tags:

- Individual Message Delivery Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: String identifying a subscription to the Individual Message Delivery Subscription

required: true

schema:

type: string

responses:

'200':

description: The subscription information is returned.

content:

application/json:

schema:

$ref: '#/components/schemas/MessageDeliverySubscriptionData'

'307':

description: Temporary Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29571\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

delete:

summary: Delete an individual Message Delivery Subscription resource

operationId: DeleteMessageDeliverySubscription

tags:

- Individual Message Delivery Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: String identifying a subscription to the Individual Message Delivery Subscription

required: true

schema:

type: string

responses:

'204':

description: The subscription was terminated successfully.

'307':

description: Temporary Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}/message-deliveries:

post:

summary: VAE Message delivery resource create service Operation

tags:

- message deliveries collection (Collection)

operationId: CreateDownlinkMessageDelivery

parameters:

- name: subscriptionId

in: path

description: String identifying a subscription to the Individual Message Delivery Subscription

required: true

schema:

type: string

requestBody:

content:

application/json:

schema:

$ref: '#/components/schemas/DownlinkMessageDeliveryData'

required: true

responses:

'201':

description: Downlink Message Delivery Resource Created

headers:

Location:

description: 'Contains the URI of the newly created resource'

required: true

schema:

type: string

content:

application/json:

schema:

$ref: '#/components/schemas/DownlinkMessageDeliveryData' '400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

description: Unexpected error

/subscriptions/{subscriptionId}/message-deliveries/{dlDeliveryId}:

get:

summary: VAE Message delivery resource Read service Operation

tags:

- Individual downlink message delivery (Document)

operationId: ReadIndividualDownlinkMessageDelivery

parameters:

- name: subscriptionId

in: path

description: String identifying a subscription to the Individual Message Delivery Subscription

required: true

schema:

type: string

- name: dlDeliveryId

in: path

description: Identifier of a downlink messge delivery resource

required: true

schema:

type: string

responses:

'200':

description: OK. Resource representation is returned

content:

application/json:

schema:

$ref: '#/components/schemas/DownlinkMessageDeliveryData'

'307':

description: Temporary Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29571\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

delete:

summary: VAE Message delivery resource delete service Operation

tags:

- Individual message delivery (Document)

operationId: DeleteMessageDelivery

parameters:

- name: subscriptionId

in: path

description: String identifying a subscription to the Individual Message Delivery Subscription

required: true

schema:

type: string

- name: dlDeliveryId

in: path

required: true

description: Unique ID of the message delivery to be deleted

schema:

type: string

responses:

'204':

description: No Content (Successful deletion of the existing subscription)

'307':

description: Temporary Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

description: Unexpected error

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

DownlinkMessageDeliveryData:

type: object

properties:

ueId:

$ref: '#/components/schemas/V2xUeId'

groupId:

$ref: '#/components/schemas/V2xGroupId'

duration:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

geoId:

$ref: '#/components/schemas/GeoId'

payload:

$ref: '#/components/schemas/V2xMessagePayload'

required:

- payload

MessageDeliverySubscriptionData:

type: object

properties:

appSerId:

$ref: '#/components/schemas/AppServerId'

serviceId:

$ref: '#/components/schemas/V2xServiceId'

geoId:

$ref: '#/components/schemas/GeoId'

notifUri:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

requestTestNotification:

type: boolean

description: Set to true by the NF service consumer to request the VAE server to send a test notification as defined in clause 6.1.5.3. Set to false or omitted otherwise.

websockNotifConfig:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/WebsockNotifConfig'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- appSerId

- serviceId

- notifUri

UplinkMessageDeliveryData:

type: object

properties:

resourceUri:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

ueId:

$ref: '#/components/schemas/V2xUeId'

geoId:

$ref: '#/components/schemas/GeoId'

payload:

$ref: '#/components/schemas/V2xMessagePayload'

required:

- resourceUri

- ueId

- payload

AppServerId:

type: string

V2xUeId:

type: string

V2xGroupId:

type: string

V2xServiceId:

type: string

GeoId:

type: string

V2xMessagePayload:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Bytes'

\*\*\* Next Change \*\*\*

# A.3 VAE\_FileDistribution API

openapi: 3.0.0

info:

version: 1.0.0

title: VAE\_FileDistribution

description: |

API for VAE File Distribution Service

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externalDocs:

description: 3GPP TS 29.486 V16.1.0 V2X Application Enabler (VAE) Services

url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.486/'

security:

- {}

- oAuth2ClientCredentials: []

servers:

- url: '{apiRoot}/vae-file-distribution/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

paths:

/file-distributions:

post:

summary: VAE File Distributions resource create service Operation

tags:

- file distributions collection (Document)

operationId: CreateFileDistributions

requestBody:

content:

application/json:

schema:

$ref: '#/components/schemas/FileDistributionData'

required: true

responses:

'201':

description: File Distribution Resource Created

headers:

Location:

description: 'Contains the URI of the newly created resource'

required: true

schema:

type: string

content:

application/json:

schema:

$ref: '#/components/schemas/FileDistributionData'

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

description: Unexpected error

/file-distributions/{distributionId}:

get:

summary: Get an existing individual file distribution resource

operationId: ReadIndividualFileDistribution

tags:

- Individual File Distribution (Document)

parameters:

- name: distributionId

in: path

description: Identifier of a file distribution resource

required: true

schema:

type: string

responses:

'200':

description: OK. Resource representation is returned

content:

application/json:

schema:

$ref: '#/components/schemas/FileDistributionData'

'307':

description: Temporary Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29571\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

delete:

summary: VAE File Distribution resource delete service Operation

tags:

- Individual file distribution (Document)

operationId: DeleteFileDistribution

parameters:

- name: distributionId

in: path

required: true

description: Unique ID of the file distribution to be deleted

schema:

type: string

responses:

'204':

description: The subscription was terminated successfully.

'307':

description: Temporary Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

description: Unexpected error

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

FileDistributionData:

type: object

properties:

groupId:

$ref: 'TS29486\_VAE\_MessageDelivery.yaml#/components/schemas/V2xGroupId'

fileLists:

type: array

items:

$ref: '#/components/schemas/FileList'

minItems: 1

serviceClass:

type: string

geoArea:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/GeographicArea'

maxBitrate:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'

maxDelay:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- fileLists

- geoArea

- maxBitrate

- maxDelay

FileList:

type: object

properties:

fileUri:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

fileDisplayUri:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

fileEarFetchTime:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

fileLatFetchTime:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

fileSize:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

fileStatus:

$ref: '#/components/schemas/FileStatus'

completionTime:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

keepUpdateInterval:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'

uniAvailability:

type: boolean

fileRepetition:

type: integer

required:

- fileUri

- fileDisplayUri

- fileEarFetchTime

- fileLatFetchTime

- fileStatus

- completionTime

- keepUpdateInterval

FileStatus:

anyOf:

- type: string

enum:

- PENDING

- FETCHED

- PREPARED

- TRANSMITTING

- SENT

- type: string

\*\*\* Next Change \*\*\*

# A.4 VAE\_ApplicationRequirement API

openapi: 3.0.0

info:

version: 1.0.0

title: VAE\_ApplicationRequirement

description: |

API for VAE Application Requirement Service

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externalDocs:

description: 3GPP TS 29.486 V16.1.0 V2X Application Enabler (VAE) Services

url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.486/'

security:

- {}

- oAuth2ClientCredentials: []

servers:

- url: '{apiRoot}/vae-app-req/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

paths:

/application-requirements:

post:

summary: VAE\_Application\_Requirements resource create service Operation

tags:

- application requirements collection (Document)

operationId: CreateApplicationRequirement

requestBody:

content:

application/json:

schema:

$ref: '#/components/schemas/ApplicationRequirementData'

required: true

responses:

'201':

description: Application Requirement Resource Created

headers:

Location:

description: 'Contains the URI of the newly created resource'

required: true

schema:

type: string

content:

application/json:

schema:

$ref: '#/components/schemas/ApplicationRequirementData'

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

callbacks:

NotifyNetworkResource:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/AppReqNotification'

responses:

'204':

description: No Content, Notification was succesfull

'307':

description: temporary redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'A URI pointing to the endpoint of another NF service consumer instance to which the notification should be sent'

required: true

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

required: true

description: 'A URI pointing to the endpoint of an alternative NF service consumer instance towards which the notification should be redirected.'

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

/application-requirement/{requirementId}:

get:

summary: VAE Application Requirement resource read service Operation

tags:

- Individual application requirement (Document)

operationId: ReadApplicationRequirement

parameters:

- name: requirementId

in: path

description: Identifier of an application requirement resource

required: true

schema:

type: string

responses:

'200':

description: OK. Resource representation is returned

content:

application/json:

schema:

$ref: '#/components/schemas/ApplicationRequirementData'

'307':

description: Temporary Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29571\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

delete:

summary: VAE Application Requirement resource delete service Operation

tags:

- Individual application requirement (Document)

operationId: DeleteApplicationRequirement

parameters:

- name: requirementId

in: path

required: true

description: Unique ID of the application requirement to be deleted

schema:

type: string

responses:

'204':

description: The subscription was terminated successfully.

'307':

description: Temporary Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

ApplicationRequirementData:

type: object

properties:

ueId:

$ref: 'TS29486\_VAE\_MessageDelivery.yaml#/components/schemas/V2xUeId'

groupId:

$ref: 'TS29486\_VAE\_MessageDelivery.yaml#/components/schemas/V2xGroupId'

duration:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

serviceId:

$ref: 'TS29486\_VAE\_MessageDelivery.yaml#/components/schemas/V2xServiceId'

appRequirement:

$ref: '#/components/schemas/ApplicationRequirement'

notifUri:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

requestTestNotification:

type: boolean

description: Set to true by the NF service consumer to request the VAE server to send a test notification as defined in clause 6.3.5.3. Set to false or omitted otherwise.

websockNotifConfig:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/WebsockNotifConfig'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- serviceId

- appRequirement

- notifUri

ApplicationRequirement:

type: object

properties:

serviceLevel:

$ref: '#/components/schemas/ServiceLevel'

AppReqNotification:

type: object

properties:

resourceUri:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

result:

$ref: '#/components/schemas/ReservationResult'

required:

- resourceUri

- result

ServiceLevel:

anyOf:

- type: string

enum:

- HIGH

- MEDIUM

- LOW

- type: string

ReservationResult:

anyOf:

- type: string

enum:

- SUCCESSFUL

- FAILURE

- type: string

\*\*\* Next Change \*\*\*

# A.5 VAE\_DynamicGroup API

openapi: 3.0.0

info:

version: 1.0.0

title: VAE\_DynamicGroup

description: |

VAE\_Dynamic\_Group Service

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externalDocs:

description: 3GPP TS 29.486 V16.1.0 V2X Application Enabler (VAE) Services

url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.486/'

security:

- {}

- oAuth2ClientCredentials: []

servers:

- url: '{apiRoot}/vae-dynamic-group/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause clause 4.4 of 3GPP TS 29.501

paths:

/group-configurations:

post:

summary: VAE\_Dynamice\_Group resource create service Operation

tags:

- application requirements collection (Document)

operationId: CreateGroupConfiguration

requestBody:

content:

application/json:

schema:

$ref: '#/components/schemas/GroupConfigurationData'

required: true

responses:

'201':

description: Application Requirement Resource Created

headers:

Location:

description: 'Contains the URI of the newly created resource'

required: true

schema:

type: string

content:

application/json:

schema:

$ref: '#/components/schemas/GroupConfigurationData'

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

callbacks:

NotifyDynamicGroup:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/DynamicGroupNotification'

responses:

'204':

description: No Content, Notification was succesfull

'307':

description: temporary redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'A URI pointing to the endpoint of another NF service consumer instance to which the notification should be sent'

required: true

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

required: true

description: 'A URI pointing to the endpoint of an alternative NF service consumer instance towards which the notification should be redirected.'

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29571\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29571\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29571\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

/group-configuration/{configId}:

get:

summary: VAE Group Configuration resource read service Operation

tags:

- Individual Group Configuration(Document)

operationId: ReadDynamicGroupConfiguration

parameters:

- name: configId

in: path

description: Identifier of an group configuration resource

required: true

schema:

type: string

responses:

'200':

description: OK. Resource representation is returned

content:

application/json:

schema:

$ref: '#/components/schemas/GroupConfigurationData'

'307':

description: Temporary Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29571\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

delete:

summary: VAE Group Configuration resource delete service Operation

tags:

- Individual group configuration (Document)

operationId: DeleteGroupConfiguration

parameters:

- name: configId

in: path

required: true

description: Unique ID of the group configuration to be deleted

schema:

type: string

responses:

'204':

description: The subscription was terminated successfully.

'307':

description: Temporary Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'308':

description: Permanent Redirect

content:

application/problem+json:

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

headers:

Location:

description: 'An alternative URI of the resource located on an alternative VAE server (service) instance.'

required: true

schema:

type: string

'400':

$ref: 'TS29571\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29571\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29571\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29571\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29571\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29571\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29571\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29571\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

GroupConfigurationData:

type: object

properties:

groupId:

$ref: 'TS29486\_VAE\_MessageDelivery.yaml#/components/schemas/V2xGroupId'

definition:

type: string

leaderId:

$ref: 'TS29486\_VAE\_MessageDelivery.yaml#/components/schemas/V2xUeId'

notifUri:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

duration:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

requestTestNotification:

type: boolean

description: Set to true by the NF service consumer to request the VAE server to send a test notification as defined in clause 6.4.5.3. Set to false or omitted otherwise.

websockNotifConfig:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/WebsockNotifConfig'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- groupId

- definition

- leaderId

- notifUri

DynamicGroupNotification:

type: object

properties:

resourceUri:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

joinedUeIds:

type: array

items:

$ref: 'TS29486\_VAE\_MessageDelivery.yaml#/components/schemas/V2xUeId'

minItems: 1

leftUeIds:

type: array

items:

$ref: 'TS29486\_VAE\_MessageDelivery.yaml#/components/schemas/V2xUeId'

minItems: 1

required:

- resourceUri

\*\*\* End of Changes \*\*\*