**3GPP TSG-CT3 Meeting #135 *C3-243xxx***

**, , - *(Revision of C3-243065 was C3-242643)***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.486** | **CR** | **0119** | **rev** | **3** | **Current version:** | **18.2.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | QoE metric parameter in VAE\_FileDistribution | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Huawei | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NBI18, V2XAPP | | | | |  | ***Date:*** | | | 2024-05-29 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | As per the clause 9.5.2 of TS 23.286, the VAE Server (content provider) is responsible for translating the list of V2X parameters including the QoE metrics received from the V2X application to deliver to corresponding xMB interface in order to request the VAE client (act as an MBMS client) to collect it as described in clause 5.4 of TS 26.348  The below table refers to the list of the parameters mapping:    The list of the QoE Metrics parameters is described in the clause 8.4.2 of TS 26.346.  In this stage-3 specification the QoE metrics parameter is missing from the data model of the VAE\_FileDistribution service. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | This CR proposes to:   * define a new attribute "qoeMetrics" in the "FileDistributionData" data type. * define the list of QoE metrics in a new data structure " QoeMetric". * introduce a new feature "QoEReporting" to control this new functionality. * update this new attribute and associated data structure in the VAE\_FileDistribution API. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Misalignment of the stage-6 requirement. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.3.2.2.2, 6.2.6.1, 6.2.6.2.2, 6.2.6.3.5, 6.2.8, A.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 backwards compatible correction to the OpenAPI file for VAE\_FileDistribution API. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev 2 provides:  Removal of Editor's NOTE. | | | | | | | | |

\* \* \* \* Start of changes \* \* \* \*

##### 5.3.2.2.2 File Distribution

Figure 5.3.2.2.2-1 depicts a scenario where a service consumer sends a request to the VAE Server to request the creation of a File Distribution.



Figure 5.3.2.2.2-1: File Distribution

When the service consumer needs to distribute the file to the V2X UEs, the 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 service consumer shall include FileDistributionData data structure in the content 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 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;

- the duration within the "duration" attribute;

- the local MBMS information within the "localMbmsInfo" attribute or the "localMbmsActInd" set to "true", if the "LocalMBMS" feature is supported; and

- the QoE metric information within the "qoeMetrics" attribture if the "QoEReporting" feature is supported.

When the VAE Server receives the HTTP POST request from the service consumer, the VAE server shall make an authorization based on the information received from the 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 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".

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

The VAE server makes use of the xMB procedures as defined 3GPP TS 29.116 [19] 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 |
| localMbmsInfo or localMbmsActInd | local-mbms-delivery-information |
| qoeMetrics | qoe-reporting-configuration |

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 \* \* \* \*

#### 6.2.6.1 General

This clause specifies the application data model supported by the API.

Table 6.2.6.1-1 specifies the data types defined for the VAE\_FileDistribution API.

Table 6.2.6.1-1: VAE\_FileDistribution specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| FileDistributionData | 6.2.6.2.2 | Represents an individual File Distribution resource for a V2X group ID. |  |
| Filelist | 6.2.6.2.3 | Represents a file list. |  |
| FileStatus | 6.2.6.3.3 | Represents a file status. |  |
| LocalMbmsInfo | 6.2.6.2.4 | Represents the local MBMS information. | LocalMBMS |
| QoeMetric | 6.2.6.2.5 | Represents the QoE metrics information. | QoEReporting |

Table 6.1.6.1-2 specifies data types re-used by the VAE\_FileDistribution service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the VAE\_FileDistribution service based interface.

Table 6.2.6.1-2: VAE\_FileDistribution re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| BitRate | 3GPP TS 29.571 [11] |  |  |
| DateTime | 3GPP TS 29.571 [11] |  |  |
| DurationSec | 3GPP TS 29.571 [11] |  |  |
| GeographicArea | 3GPP TS 29.572 [20] |  |  |
| SupportedFeatures | 3GPP TS 29.571 [11] |  |  |
| Uinteger | 3GPP TS 29.571 [11] |  |  |
| V2xGroupId | 6.1.6.3.2 |  |  |

\* \* \* \* Next change \* \* \* \*

##### 6.2.6.2.2 Type: FileDistributionData

Table 6.2.6.2.2-1: Definition of type FileDistributionData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| groupId | V2xGroupId | O | 0..1 | Indicates a group ID for which the V2X message is addressed. |  |
| fileLists | array(FileList) | M | 1..N | File lists. |  |
| serviceClass | string | O | 0..1 | Information about the V2X application (e.g., software update, HD map download). |  |
| geoArea | GeographicArea | M | 1 | Target geographical area for the V2X Ues |  |
| maxBitrate | BitRate | M | 1 | Maximum bitrate for the V2X application. |  |
| maxDelay | Uinteger | M | 1 | Unsigned integer identifying a maximum delay in units of milliseconds for the V2X application. |  |
| duration | DateTime | O | 0..1 | Identifies the absolute time at which the related Individual File Distribution Data resource is considered to expire. When omitted in the request, it indicates the resource is requested to be valid forever by the service consumer. When omitted in the response, it indicates the resource is set to valid forever by the VAE server. |  |
| localMbmsInfo | LocalMbmsInfo | O | 0..1 | Contains the local MBMS inforamtion. The information only can be provided by the service consumer in the trust domain. | LocalMBMS |
| localMbmsActInd | boolean |  | 0..1 | When this attribute is included and set to true, it indicates that the local MBMS is activated.  The default value "false" shall apply, if the attribute is not present. | LocalMBMS |
| suppFeat | SupportedFeatures | C | 0..1 | Indicates the features supported by the service consumer and VAE server. It shall be included in the request and response of the Creation of Individual File Distribution Data resource. |  |
| qoeMetrics | array(QoeMetric) | O | 1..N | Contains the QoE metrics the service consumer is interested in receiving about the V2X application. | QoEReporting |

\* \* \* \* Next change \* \* \* \*

##### 6.2.6.3.5 Enumeration: QoeMetric

Table 6.2.6.3.5-1: Enumeration QoeMetric

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| CORR\_DUR\_METRIC | Indicates that the QoE metric is the corruption duration metric. |  |
| REBUFF\_DUR\_METRIC | Indicates that the QoE metric is the rebuffering duration metric. |  |
| INITBUFF\_DUR\_METRIC | Indicates that the QoE metric is the initial buffering duration metric. |  |
| LOSS\_RTP\_PACKETS | Indicates that the QoE metric is the successive loss of RTP packets. |  |
| FRAME\_RATE\_DEV | Indicates that the QoE metric is the frame rate deviation. |  |
| JITTER\_DURATION | Indicates that the QoE metric is the jitter duration. |  |
| CON\_ACC\_SW\_TIME | Indicates that the QoE metric is the content access/switch time. |  |
| NET\_RESOURCE | Indicates that the QoE metric is the network resource. |  |
| AVG\_CODEC\_BIT\_RATE | Indicates that the QoE metric is average codec bitrate. |  |
| CODEC\_INFO | Indicates that the QoE metric is the codec information. |  |
| LOSS\_OBJECT | Indicates that the QoE metric is the Loss of Objects. |  |
| SYM\_COUNT\_FOR\_FAILED\_BLOCK | Indicates that the QoE metric is the distribution of symbol count underrun for Failed Blocks. |  |

\* \* \* \* 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 |
| 1 | LocalMBMS | Indicate the support of local MBMS transmission. |
| 2 | QoEReporting | Indicate the support of QoE metrics provisioning. |

\* \* \* \* Next change \* \* \* \*

# A.3 VAE\_FileDistribution API

openapi: 3.0.0

info:

version: 1.2.0-alpha.2

title: VAE\_FileDistribution

description: |

API for VAE File Distribution Service

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All rights reserved.

externalDocs:

description: 3GPP TS 29.486 V18.2.0 V2X Application Enabler (VAE) Services

url: 'https://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:

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

/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':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'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':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'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:

FileDistributionData:

description: Represents an individual File Distribution resource for a V2X group ID.

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'

duration:

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

localMbmsInfo:

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

localMbmsActInd:

type: boolean

suppFeat:

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

qoeMetrics:

type: array

items:

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

minItems: 1

required:

- fileLists

- geoArea

- maxBitrate

- maxDelay

FileList:

description: Represents a file list.

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

LocalMbmsInfo:

description: Contains the local MBMS information.

type: object

properties:

mbmsEnbIpv4MulAddr:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

mbmsEnbIpv6MulAddr:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Prefix'

mbmsGwIpv4SsmAddr:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

mbmsGwIpv6SsmAddr:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'

cteid:

type: string

bmscIpv4Addr:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

bmscIpv6Addr:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'

bmscPort:

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

# Simple data types and Enumerations

FileStatus:

description: Represents a file status.

anyOf:

- type: string

enum:

- PENDING

- FETCHED

- PREPARED

- TRANSMITTING

- SENT

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration and is not used to encode

content defined in the present version of this API.

QoeMetric:

description: Represents the QoE metric.

anyOf:

- type: string

enum:

- CORR\_DUR\_METRIC

- REBUFF\_DUR\_METRIC

- INITBUFF\_DUR\_METRIC

- LOSS\_RTP\_PACKETS

- FRAME\_RATE\_DEV

- JITTER\_DURATION

- CON\_ACC\_SW\_TIME

- NET\_RESOURCE

- AVG\_CODEC\_BIT\_RATE

- CODEC\_INFO

- LOSS\_OBJECT

- SYM\_COUNT\_FOR\_FAILED\_BLOCK

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration and is not used to encode

content defined in the present version of this API.

\* \* \* \* End of changes \* \* \* \*