**3GPP TSG-CT WG3 Meeting #108-eC3-201201**

**E-Meeting, 19th – 28th February 2020 *(revision of C3-200xyz)***

**Source: Ericsson**

**Title: Pseudo-CR on Add VAE service continuity API**

**Spec: 3GPP TS 29.486 v0.3.0**

**Agenda item: 16.25**

**Document for: Decision**

**1. Introduction**

<Introduction part (optional)>

**2. Reason for Change**

The last SA6#35 meeting approved new VAE\_ServiceContinuity API.

This is a proposal for the corresponding stage 3 API details.

**3. Conclusions**

<Conclusion part (optional)>

**4. Proposal**

It is proposed to agree the following changes to 3GPP TS 29.486 v0.3.0.

\* \* \* First Change \* \* \* \*

# 1 Scope

The present document specifies the stage 3 protocol and data model for Vs interface between the V2X application specific server and VAE server and VAE-E interface between VAE servers. It provides stage 3 protocol definitions and message flows, and specifies the API for each service offered by the VAE server. The Vs, VAE-E interfaces and the related stage 2 functional requirements are defined in 3GPP TS 23.286 [4].

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

# 4 Overview

The Vs interface is between the V2X application specific server and the VAE Server. It specifies RESTful APIs that allow the V2X application specific server to access the services and capabilities provided by VAE Server.

The stage 2 level requirements and signalling flows for the Vs interface are defined in 3GPP TS 23.286 [4].

The Vs interface supports the following APIs:

- VAE\_V2X\_Message\_Delivery

- VAE\_File\_Distribution

- VAE\_V2X\_Application\_Requirement

The VAE-E interface is between VAE Servers. It specifies RESTful APIs that allow the VAE server to access the services and capabilities provided by other VAE Server.

The stage 2 level requirements and signalling flows for the VAE-E interface are defined in 3GPP TS 23.286 [4].

The VAE-E interface supports the following APIs:

- VAE\_ServiceContinuity

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

## 5.1 Introduction

The table 5.1-1 shows the services provided by the VAE server and corresponding Service Operations:

Table 5.1-1 List of services provided by the VAE Server

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | OperationSemantics | Example Consumer(s) |
| VAE\_V2X\_Message\_Delivery | V2X\_Message\_Delivery | Request/Response | V2X application specific server |
| VAE\_File\_Distribution | Initiate\_File\_Distribution | Request/ Response | V2X application specific server |
| VAE\_V2X\_Application\_Requirement | V2X\_Application\_Requirement | Request/Response | V2X application specific server |
| VAE\_ServiceContinuity | Query\_ServiceContinuity | Request/Response | VAE server |
| NOTE: A subscription applies for one UE, group of UE(s) or any UE. |

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

## 5.X VAE\_ServiceContinuity Service

### 5.X.1 Service Description

This service provided by the VAE server enables exposing information to facilitate the V2X service continuity.

### 5.X.2 Service Operations

#### 5.X.2.1 Introduction

The VAE\_ServiceContinuity service supports following service operations:

- Query\_ServiceContinuity

#### 5.X.2.2 Query\_ServiceContinuity

##### 5.X.2.2.1 General

The Query\_ServiceContinuity service operation is used to query the VAE server whether it can support the desired V2X service in the designated geographical area.

##### 5.X.2.2.2 Query service continuity



Figure 5.x.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.x.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.x.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.

## 6.X VAE\_ServiceContinuity Service API

### 6.X.1 Introduction

The VAE\_ServiceContinuity shall use the VAE\_ServiceContinuity API.

The request URI used in HTTP request from the NF service consumer towards the VAE Server shall have the structure defined in clause 4.4.1 of 3GPP TS 29.501 [3], i.e.:

**{apiRoot}/<apiName>/{apiVersion}/<apiSpecificResourceUriPart>**

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [3].

- The <apiName>shall be "vae-service-continuity".

- The {apiVersion} shall be "v1".

- The <apiSpecificResourceUriPart> shall be set as described in clause 5.3.

### 6.X.2 Usage of HTTP

#### 6.X.2.1 General

Support of HTTP/1.1 (IETF RFC 7230 [12], IETF RFC 7231 [13], IETF RFC 7232 [14], IETF RFC 7233 [15], IETF RFC 7234 [16] and IETF RFC 7235 [17]) over TLS (IETF RFC 5246 [18]) is mandatory and support of HTTP/2 as specified in clause 5 of 3GPP TS 29.500 [2] is recommended. A V2X application specific server desiring to use HTTP/2 shall use the HTTP upgrade mechanism to negotiate applicable HTTP version as described in IETF RFC 7540 [5].

HTTP/2, shall be transported as specified in clause 5.3 of 3GPP TS 29.500 [2].

An OpenAPI [6] specification of HTTP messages and content bodies for the VAE\_ServiceContinuity is contained in Annex A.

#### 6.X.2.2 HTTP standard headers

##### 6.X.2.2.1 General

See clause 5.2.2 of 3GPP TS 29.500 [2] for the usage of HTTP standard headers.

##### 6.X.2.2.2 Content type

JSON, IETF RFC 8259 [7], shall be used as content type of the HTTP bodies specified in the present specification as specified in clause 5.4 of 3GPP TS 29.500 [2]. The use of the JSON format shall be signalled by the content type "application/json".

#### 6.X.2.3 HTTP custom headers

##### 6.X.2.3.1 General

The mandatory HTTP custom header fields specified in clause 5.2.3.2 of 3GPP TS 29.500 [2] shall be applicable.

### 6.X.3 Resources

#### 6.X.3.1 Overview



Figure 6.X.3.1-1: Resource URI structure of the VAE\_ServiceContinuity API

Table 6.X.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.X.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Individual Geographical Area | {apiRoot}/vae-service-continuity/v1/geo-areas/{geoId} | GET | Query the Individual Geographical Area resource. |

#### 6.X.3.2 Resource: Individual Geographical Area

##### 6.X.3.2.1 Description

This resource represents the individual geographical area resource in the VAE Server.

##### 6.X.3.2.2 Resource Definition

Resource URI: **{apiRoot}/vae-service-continuity/{apiVersion}/geo-areas/{geoId}**

This resource shall support the resource URI variables defined in table 6.x.3.2.2-1.

Table 6.X.3.2.2-1: Resource URI variables for this resource

|  |  |
| --- | --- |
| Name | Definition |
| apiRoot | See clause 6.X.1 |
| apiVersion | See clause 6.X.1 |
| geoId | Geographical area id. |

##### 6.X.3.2.3 Resource Standard Methods

###### 6.X.3.2.3.1 GET

This method shall support the URI query parameters specified in table 6.X.3.2.3.1-1.

Table 6.X.3.2.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| service-id | string | M | 1 | V2X service id |  |
| supp-feat | SupportedFeatures | O | 0..1 | To filter irrelevant responses related to unsupported features. |  |

This method shall support the request data structures specified in table 6.X.3.2.3.1-2 and the response data structures and response codes specified in table 6.X.3.2.3.1-3.

Table 6.X.3.2.3.1-2: Data structures supported by the GET Request Body on this resource

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

Table 6.X.3.2.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| V2xServiceInfo | M | 1 | 200 OK | An individual geographical area resource including the designated V2X service id is returned successfully. |
| 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. |

##### 6.X.3.2.4 Resource Custom Operations

None.

### 6.X.4 Custom Operations without associated resources

There are no custom operations without associated resources supported on VAE\_ServiceContinuity.

### 6.X.5 Notifications

Notifications are not applicable for the current Release.

### 6.X.6 Data Model

#### 6.X.6.1 General

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

Table 6.X.6.1-1 specifies the data types defined for the VAE\_ServiceContinuity API.

Table 6.X.6.1-1: VAE\_ServiceContinuity specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| V2xServiceInfo | 6.X.6.2.2 |  |  |

Table 6.X.6.1-2 specifies data types re-used by the VAE\_ServiceContinuity 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\_ServiceContinuity service based interface.

Table 6.X.6.1-2: VAE\_ServiceContinuity re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| V2xServiceId | 6.1.6.3.2 | Defines a V2X service ID. |  |

#### 6.X.6.2 Structured data types

##### 6.X.6.2.1 Introduction

This clause defines the structures to be used in resource representations.

##### 6.X.6.2.2 Type: V2xServiceInfo

Table 6.X.6.2.2-1: Definition of type V2xServiceInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| serviceIds | array(V2xServiceId) | M | 1..N | Indicates a list of supported V2X service identifiers. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Indicates the features supported by the service consumer and VAE server. It shall be included if the query request includes supported features.  |  |

#### 6.X.6.3 Simple data types and enumerations

##### 6.X.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

##### 6.X.6.3.2 Simple data types

The simple data types defined in table 6.X.6.3.2-1 shall be supported.

Table 6.X.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

### 6.X.7 Error Handling

#### 6.X.7.1 General

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

#### 6.X.7.2 Protocol Errors

#### 6.X.7.3 Application Errors

The application errors defined for the VAE\_ServiceContinuity service are listed in Table 6.2.7.3-1.

Table 6.X.7.3-1: Application errors

|  |  |  |
| --- | --- | --- |
| Application Error | HTTP status code | Description |
|  |  |  |

### 6.X.8 Feature negotiation

The optional features in table 6.X.8-1 are defined for the VAE\_ServiceContinuity API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [2].

Table 6.X.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

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

## A.X VAE\_ServiceContinuity API

openapi: 3.0.0

info:

 version: 1.0.0.alpha-1

 title: VAE\_Service Continuity

 description: |

 API for VAE Service Continuity Service

 © 2020, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

 All rights reserved.

externalDocs:

 description: 3GPP TS 29.486 V0.3.0 V2X Application Enabler (VAE) Services

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

security:

 - {}

 - oAuth2ClientCredentials: []

servers:

 - url: '{apiRoot}/vae-service-continuity/v1'

 variables:

 apiRoot:

 default: https://example.com

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

paths:

 /geo-areas/{geoId}:

 get:

 summary: VAE service continuity query service operation

 tags:

 - Individual geographical area (Document)

 operationId: QueryServiceContinuity

 parameters:

 - name: geoId

 in: path

 description: Identifier of a geographical area

 required: true

 schema:

 type: string

 - name: svcId

 in: query

 description: Identifier of a V2X service

 required: true

 schema:

 type: string

 - name: supp-feat

 in: query

 description: To filter irrelevant responses related to unsupported features

 schema:

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

 responses:

 '200':

 description: OK. Resource representation is returned

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/V2xServiceInfo'

 '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'

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{tokenUrl}'

 scopes: {}

 schemas:

 V2xServiceInfo:

 type: object

 properties:

 serviceIds:

 type: array

 items:

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

 minItems: 1

 suppFeat:

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

 required:

 - serviceIds

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