**3GPP TSG-CT WG4 Meeting #96C4-200825**

**E-Meeting, 24th – 28th February 2020**

**Source: Huawei, HiSilicon, Ericsson**

**Title: Pseudo-CR on Nhss\_ImsUECM RestorationInfoGet and RestorationInfoUpdate service operations**

**Spec: 3GPP TS 29.562 0.3.0**

**Agenda item: 6.1.14**

**Document for: Agreement**

**1. Introduction**

<Introduction part (optional)>

**2. Reason for Change**

3GPP TS 23.228 16.3.0 has specified "Nhss\_ImsUECM\_RestorationInfoGet service operation" and "Nhss\_ImsUECM\_RestorationInfoUpdate service operation". The corresponding stage 3 specifications need to be completed.

**3. Conclusions**

<Conclusion part (optional)>

**4. Proposal**

It is proposed to agree the following changes to 3GPP TS 29.562 0.3.0.

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

#### 5.2.2.X RestorationInfoGet

##### 5.2.2.X.1 General

The RestorationInfoGet service operation is invoked by a NF to retrieve restoration information in HSS.

NF Consumer is S-CSCF.

The following procedures using the RestorationInfoGet service operation are supported:

- Restoration Information Retrieval

##### 5.2.2.X.2 Restoration Information Retrieval

Figure 5.2.2.X.2-1 shows a scenario where the NF service consumer (S-CSCF) sends a request to the HSS to retrieve the information related to a specific registration for a registered user. The request contains the IMS UE's identity (/{imsUeId}) which shall be an IMPU.



Figure 5.2.2.X.2-1: Restoration Information Retrieval

1. The NF service consumer (S-CSCF) sends a GET request to the resource representing the UE's S-CSCF restoration information.

2a. On success, the HSS responds with "200 OK" with the message body containing the UE's S-CSCF restoration information.

2b. If there is no valid restoration data for the UE, HTTP status code "404 Not Found" shall be returned and it should include additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

#### 5.2.2.Y RestorationInfoUpdate

##### 5.2.2.Y.1 General

The RestorationInfoUpdate service operation is invoked by a NF to update restoration information in HSS.

NF Consumer is S-CSCF.

The following procedures using the RestorationInfoUpdate service operation are supported:

- Restoration Information Update

##### 5.2.2.Y.2 Restoration Information Update

Figure 5.2.2.Y.2-1 shows a scenario where the S-CSCF sends a request to update restoration information at the HSS (see also 3GPP TS 23.228 [6] clause 4.24). The request contains the IMS UE's identity (/{imsUeId}) which shall be an IMPU.



Figure 5.2.2.Y.2-1: Restoration Information Update

1. The S-CSCF sends a PUT request to the resource representing the UE's S-CSCF restoration information to update or create S-CSCF restoration information.

2a. If there are S-CSCF restoration information related to the IMS Public Identity stored in the HSS, the HSS updates the ScscfRestorationInfo resource by replacing it with the received restoration information and responds with "200 OK" or "204 No Content".

2b. If the resource does not exist (there is no previous S-CSCF restoration information stored in HSS for that user), HSS stores the received S-CSCF restoration data and responds with HTTP Status Code "201 created".

2c. If the request can't be accepted (e.g. the S-CSCF is not allowed to create/update the restoration information), HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PUT response body.

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

#### 6.1.3.1 Overview



Figure 6.1.3.1-1: Resource URI structure of the Nhss\_imsUECM API

Table 6.1.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.1.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name(Archetype) | Resource URI | HTTP method or custom operation | Description |
| Scscf Registration(Document) | /{imsUeId}/scscf-registration | PUT | Update the S-CSCF registration state of the UE |
| PATCH | Modify the S-CSCF registration state of the UE |
| Authorize(Custom operation) | /{imsUeId}/authorize | authorize(POST) | Authorize the requested operation for the UE |
| Scscf Restoration Information(Document) | /{imsUeId}/scscf-restoration-info | GET | Retrieve the S-CSCF restoration information. |
| PUT | Update the S-CSCF restoration information. |

#### 6.1.3.X Resource: Scscf Restoration Information

##### 6.1.3.X.1 Description

This resource represents the IMS restoration information. It is queried by the service consumer (S-CSCF) to retrieve the information required for an S-CSCF to handle the requests for a user.

##### 6.1.3.X.2 Resource Definition

Resource URI: **{**apiRoot}/nhss-ims-uecm**/**{apiVersion}**/**{imsUeId}/scscf-restoration-info

This resource shall support the resource URI variables defined in table 6.1.3.X.2-1.

Table 6.1.3.X.2-1: Resource URI variables for this resource

|  |  |
| --- | --- |
| Name | Definition |
| apiRoot | See clause 6.1.1 |
| apiVersion | See clause 6.1.1 |
| imsUeId | Represents the IMS Subscription Identifier, either the IMS Public Identity (i.e. IMPU or Public PSI) or the Private Identity (i.e. IMPI or PSI). See 3GPP TS 23.228 [6] clause 4.3).IMS Public Identity is used with the PUT method;IMS Public Identity or IMS Private Identity is used with the PATCH methods. pattern: tbd |

##### 6.1.3.X.3 Resource Standard Methods

###### 6.1.3.X.3.1 GET

This method shall support the URI query parameters specified in table 6.1.3.X.3.1-1.

Table 6.1.3.X.3.1-1: URI query parameters supported by the GET method on this resource

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

This method shall support the request data structures specified in table 6.1.3.X.3.1-2 and the response data structures and response codes specified in table 6.1.3.X.3.1-3.

Table 6.1.3.X.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.X.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| ScscfRestorationInfo | M | 1 | 200 OK | A response body containing information for the S-CSCF to handle the requests for a user. |
| ProblemDetails | O | 0..1 | 404 Not Found | The "cause" attribute may be used to indicate the following application error:- USER\_NOT\_FOUND |
| NOTE: In addition, common data structures as listed in table 6.1.7-1 are supported. |

###### 6.1.3.X.3.2 PUT

This method shall support the URI query parameters specified in table 6.1.3.X.3.2-1.

Table 6.1.3.X.3.2-1: URI query parameters supported by the PUT method on this resource

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

This method shall support the request data structures specified in table 6.1.3.X.3.2-2 and the response data structures and response codes specified in table 6.1.3.X.3.2-3.

Table 6.1.3.X.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| ScscfRestorationInfo | M | 1 | S-CSCF restoration information for indicated IMS Public Identity is updated with the received information. |

Table 6.1.3.X.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| ScscfRestorationInfo | M | 1 | 201 Created | Upon success, a response body containing a representation of the created individual ScscfRestorationInfo resource for the received IMS Public Identity shall be returned. |
| ScscfRestorationInfo | M | 1 | 200 OK | Upon success, a response body containing a representation of the updated individual ScscfRestorationInfo resource shall be returned. |
| n/a |  |  | 204 No Content | Upon success, an empty response body shall be returned. |
| ProblemDetails | O | 0..1 | 403 Forbidden | The "cause" attribute may be used to indicate one of the following application errors:- OPERATION\_NOT\_ALLOWED |

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

### 6.1.6 Data Model

#### 6.1.6.1 General

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

Table 6.1.6.1-1 specifies the data types defined for the Nhss\_imsUECM service-based interface protocol.

Table 6.1.6.1-1: Nhss\_imsUECM specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
|  |  |  |  |
| AuthorizationRequest | 6.1.6.2.2 | Information for the type of authorization requested and the visited PLMN-ID |  |
| AuthorizationResponse | 6.1.6.2.3 | Result of the authorization requested for registration. |  |
| ScscfRestorationInfo | 6.1.6.2.A | Information required for an S-CSCF to handle the requests for a user. |  |
| RestorationInfo | 6.1.6.2.B | Information related to a specific registration required for an S-CSCF to handle the requests for a user. |  |
| SubscriptionInfo | 6.1.6.2.C | UE's subscription information. |  |
| PcscfSubscriptionInfo | 6.1.6.2.D | P-CSCF's subscription information. |  |

Table 6.1.6.1-2 specifies data types re-used by the Nhss\_imsUECM 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 Nhss\_imsUECM service-based interface.

Table 6.1.6.1-2: N<NF> re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| Uri | 3GPP TS 29.571 [16] | Uniform Resource Identifier |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | see 3GPP TS 29.500 [4] clause 6.6 |  |
| DateTime | 3GPP TS 29.571 [16] | String with format "date-time" as defined in OpenAPI Specification [9] |  |

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

##### 6.1.6.2.A Type: ScscfRestorationInfo

Table 6.1.6.2.A-1: Definition of type ScscfRestorationInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| userName | Uri | M | 1 | Private Identity of the user for whom the data is required. |  |
| restorationInfo | array(RestorationInfo) | M | 1..N | This IE shall contain the information related to a specific registration required for an S-CSCF to handle the requests for a user. |  |
| registrationTimeOut | DateTime | O | 1 | This IE indicates the point of time at which the UE's registration expires. |  |
| sipAuthenticationScheme | string | O | 1 | This IE indicates the authentication scheme to be used in the authentication of SIP requests. |  |

##### 6.1.6.2.B Type: RestorationInfo

Table 6.1.6.2.B-1: Definition of type RestorationInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| path | string | M | 1 | This IE shall contain a comma separated list of SIP proxies in the Path header. |  |
| contact | string | M | 1 | This IE shall contain the Contact Addresses and Parameters in the Contact header. |  |
| initialCSeqSequenceNumber | Uint32 | O | 1 | This IE contains the sequence number of the CSeq header field contained in the initial successful REGISTER request. |  |
| callIdSipHeader | string | O | 1 | This IE contains the information in the Call-ID header. |  |
| subscriptionInfo | SubscriptionInfo | O | 1 | This IE contains the UE's subscription information. |  |
| pcscfSubscriptionInfo | PcscfSubscriptionInfo | O | 1 | This IE contains the P-CSCF's subscription information. |  |

##### 6.1.6.2.C Type: SubscriptionInfo

Table 6.1.6.2.C-1: Definition of type SubscriptionInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| callIdSipHeader | string | M | 1 | This IE contains the information in the Call-ID header. |  |
| fromSipHeader | string | M | 1 | This IE shall contain the information in the From header. |  |
| toSipHeader | string | M | 1 | This IE shall contain the information in the To header. |  |
| recordRoute | string | M | 1 | This IE shall contain a comma separated list of Record Route header(s). |  |
| contact | string | M | 1 | This IE shall contain the Contact Addresses and Parameters in the Contact header. |  |

##### 6.1.6.2.D Type: PcscfSubscriptionInfo

Table 6.1.6.2.D-1: Definition of type PcscfSubscriptionInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| callIdSipHeader | string | M | 1 | This IE contains the information in the Call-ID header. |  |
| fromSipHeader | string | M | 1 | This IE shall contain the information in the From header. |  |
| toSipHeader | string | M | 1 | This IE shall contain the information in the To header. |  |
| contact | string | M | 1 | This IE shall contain the Contact Addresses and Parameters in the Contact header. |  |

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

## A.2 Nhss\_imsUECM API

openapi: 3.0.0

info:

 version: '1.0.0.alpha-1'

 title: 'Nhss\_imsUECM'

 description: |

 Nhss Subscriber Data Management Service for IMS.

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externalDocs:

 description: 3GPP TS 29.562 Unified Data Management Services, version 0.3.0

 url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.562/'

servers:

 - url: '{apiRoot}/nhss-ims-uecm/v1'

 variables:

 apiRoot:

 default: https://example.com

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

security:

 - oAuth2ClientCredentials:

 - nhss-ims-uecm

 - {}

paths:

 /{impu}/authorize:

 post:

 summary: Authorize IMS Identities to register in the network or establish multimedia sessions and return CSCF location if it is stored

 operationId: Authorize

 tags:

 - Authorize Ims identities

 parameters:

 - name: impu

 in: path

 description: Public identity of the user.

 required: true

 schema:

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

 requestBody:

 content:

 application/json:

 schema:

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

 required: true

 responses:

 '200':

 description: Expected response to a valid request

 content:

 application/json:

 schema:

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

 '400':

 description: Bad Request

 content:

 application/problem+json:

 schema:

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

 '403':

 description: Forbidden

 content:

 application/problem+json:

 schema:

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

 '404':

 description: Not found

 content:

 application/problem+json:

 schema:

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

 '500':

 description: Internal Server Error

 content:

 application/problem+json:

 schema:

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

 default:

 description: Unexpected error

 /{impu}/scscf-restoration-info:

 put:

 summary: Update the S-CSCF restoration information of the UE

 operationId: UpdateScscfRestorationInfo

 tags:

 - Update the S-CSCF restoration information of the UE

 parameters:

 - name: impu

 in: path

 description: Public identity of the user.

 required: true

 schema:

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

 requestBody:

 content:

 application/json:

 schema:

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

 required: true

 responses:

 '201':

 description: Created

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: 'Contains the URI of the newly created resource, according to the structure: {apiRoot}/nhss\_imsUECM/v1/{impu}/scscf-restoration-info'

 required: true

 schema:

 type: string

 '200':

 description: OK

 content:

 application/json:

 schema:

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

 '204':

 description: No content

 '403':

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

 get:

 summary: Retrieve the S-CSCF restoration

 operationId: GetScscfRestorationInfo

 tags:

 - S-CSCF Registration Info Retrieval

 parameters:

 - name: impu

 in: path

 description: Public identity of the user.

 required: true

 schema:

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

 responses:

 '200':

 description: Expected response to a valid request

 content:

 application/json:

 schema:

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

 '404':

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

components:

 schemas:

# COMPLEX TYPES:

 AuthorizationRequest:

 description: Ims authorization request data

 type: object

 required:

 - authorizationType

 properties:

 impi:

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

 authorizationType:

 description: authorization type

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

 visitedNetworkIdentifier:

 type: string

 emergencyIndicator:

 type: boolean

 supportedFeatures:

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

 AuthorizationResponse:

 description: Ims Registration authorization information result

 type: object

 properties:

 authorizationResult:

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

 cscfServerName:

 type: string

 SCSCFRestorationInfo:

 description: S-CSCF restoration information

 type: object

 required:

 - userName

 - restorationInfo

 properties:

 userName:

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

 restorationInfo:

 type: array

 items:

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

 registrationTimeOut:

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

 sipAuthenticationScheme:

 type: string

 RestorationInfo:

 description: The information relevant to a specific registration required for an S-CSCF to handle the requests for a user

 type: object

 required:

 - path

 - contact

 properties:

 path:

 type: string

 contact:

 type: string

 initialCSeqSequenceNumber:

 type: Uint32

 callIdSipHeader:

 type: string

 subscriptionInfo:

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

 pcscfSubscriptionInfo:

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

 SubscriptionInfo:

 type: object

 required:

 - callIdSipHeader

 - fromSipHeader

 - toSipHeader

 - recordRoute

 - contact

 properties:

 callIdSipHeader:

 type: string

 fromSipHeader:

 type: string

 toSipHeader:

 type: string

 recordRoute:

 type: string

 contact:

 type: string

 PcscfSubscriptionInfo:

 type: object

 required:

 - callIdSipHeader

 - fromSipHeader

 - toSipHeader

 - contact

 properties:

 callIdSipHeader:

 type: string

 fromSipHeader:

 type: string

 toSipHeader:

 type: string

 contact:

 type: string

# SIMPLE TYPES

 Impu:

 type: string

 Impi:

 type: string

# ENUMS:

 AuthorizationType:

 anyOf:

 - type: string

 enum:

 - REGISTRATION

 - DEREGISTRATION

 - type: string

 AuthorizationResult:

 anyOf:

 - type: string

 enum:

 - FIRST\_REGISTRATION

 - SUBSEQUENT\_REGISTRATION

 - type: string

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