**3GPP TSG-CT WG4 Meeting #96eC4-200926**

**E-Meeting, 17th – 28th February 2020 (was C4-200892)**

**Source: Ericsson**

**Title: Completion of S-CSCF registration**

**Spec: 3GPP TS 29.562 v0.3.0**

**Agenda item: 6.1.14**

**Document for: Agreement**

**1. Introduction**

-

**2. Reason for Change**

Complete S-CSCF registration procedure

**3. Conclusions**

-

**4. Proposal**

It is proposed to agree the following changes to 3GPP TS 29.562 v0.3.0.

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

##### 5.2.2.2.2 S-CSCF Registration

Figure 5.2.2.2.2-1 shows a scenario where the S-CSCF sends a request to register at the HSS (see also 3GPP TS 23.228 [6] clause 5.2). The request contains the IMS UE's identity (/{imsUeId}) which shall be an IMPU, the S-CSCF Registration Information and the Registration Type.



Figure 5.2.2.2.2-1: S-CSCF registration

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

2a. If the resource already exists, and if the S-CSCF registered is the same or if another S-CSCF is registered and S-CSCF Reassignment was previously authorized, the HSS updates the scscfRegistration resource by replacing it with the received resource information (e.g. S-CSCF name, state of the related IMS public identity based on the registrationType received) and responds with "204 No Content" or “200 OK” with the updated resource information and HSS supported features..

Additionally, if the S-CSCF reassignment pending flag was set, HSS shall invoke the Deregistration Notification service operation towards the old S-CSCF using the callback URI provided by the old S-CSCF.

2b. If the resource does not exist (there is no previous S-CSCF information stored in HSS), HSS stores the received S-CSCF registration data and responds with HTTP Status Code "201 created". A response body is included with the created resource and the features supported by HSS.

2c. If the operation is not authorized due to e.g. received IMS identities do not exist or do not match, or a different S-CSCF is registered and S-CSCF reassignment is not authorized, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in "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 \* \* \* \*

###### 6.1.3.2.3.1 PUT

This method shall support the URI query parameters specified in table 6.1.3.2.3.1-1.

Table 6.1.3.2.3.1-1: 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 6.1.3.2.3.1-2 and the response data structures and response codes specified in table 6.1.3.2.3.1-3.

Table 6.1.3.2.3.1-2: Data structures supported by the PUT Request Body on this resource

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

Table 6.1.3.2.3.1-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| ScscfRegistration | M | 1 | 201 Created | A response body containing a representation of the created individual scscfRegistration resource for the received IMS Public Identity shall be returned. |
| ScscfRegistration | M | 1 | 200 OK | A response body containing a representation of the updated individual scscfRegistration resource for the received IMS Public Identity shall be returned. |
| n/a |  |  | 204 No Content | Upon success, an empty response body shall be returned. |
| ProblemDetails | M | 1 | 404 Not Found | The "cause" attribute may be used to indicate the following application error:  - USER\_NOT\_FOUND |
| ExtendedProblemDetails | M | 1 | 403 Forbidden | The "cause" attribute may be used to indicate one of the following application errors:  - IDENTITY\_ALREADY\_REGISTERED In this case include invalidParams with cscfServerName as param and with value of the currently assigned S-CSCF name in the AdditionalInfo  - IDENTITIES\_DO\_NOT\_MATCH  - ERROR\_IN\_REGISTRATION\_TYPE |

\* \* \* 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. |  |
| ScscfRegistration | 6.1.6.2.4 | Registration information of the S-CSCF for the registered UE. |  |

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 |  |

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

##### 6.1.6.2.x1 Type: ScscfRegistration

Table 6.1.6.2.x1-1: Definition of type ScscfRegistration

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| imsRegistrationType | ImsRegistrationType | M | 1 | Contains the type of the registration/deregistration requested. |  |
| impi | Impi | C | 1 | Contains an IMS Private Identity.  It may be absent during the originating or terminating request to an unregistered Public Identity (registrationType shall contain the value UNREGISTERED\_USER) |  |
| cscfServerName | String | M | 1 | Contains the S-CSCF name in SIP URI format. |  |
| scscfInstanceId | NfInstanceId | M | 1 | The NF instance id of the S-CSCF. |  |
| deregCallbackUri | Uri | C | 1 | A URI provided by the S-CSCF to receive (implicitly subscribed) notifications on deregistration.  The deregistration callback URI shall have unique information within S-CSCF set to identify the IMS Public Identity to be deregistered.  If there are implicitly identities registered (i.e. the identity belongs to an IRS) in the response, the deregistration callback URI identifies the IRS to be deregistered.  If there is a wildcarded PSI unregistered received in the response, the deregistration callback URI identifies the wildcarded PSI to be deregistered. |  |
| associatedImpis | array(Impi) | O | 1..N | Associated IMS private Identities in the subscription. If the IMS subscription contains only single Private Identity this attribute shall not be present.  (NOTE) |  |
| irsImpus | array(Impu) | O | 1...N | List of non barred IMS Public User Identities (distinct or wildcarded) which are in the Implicit Registration Set. This attribute shall be present when the received public identity belongs to an IRS.  (NOTE) |  |
| wildcardedPui | Impu | O | 1 | It shall be present when the Public Identity in the request fell within the range of a Wildcarded Public User Identity present in the IRS.  (NOTE) |  |
| wildcardedPsi | Impu | O | 1 | It shall be present if the Public Identity in the request fell within the range of a Wildcarded Public Service Identity in the HSS whose state is unregistered.  If this element is present, it shall be used by the S-CSCF to identify the identity affected by the request.  (NOTE) |  |
| looseRouteIndicator | LooseRouteIndication | O | 1 | Loose Routing Indicator  (NOTE) |  |
| supportedFeatures | SupportedFeatures | O | 0..1 | See clause 6.2.8 |  |
| NOTE: Optional attribute applicable in response messages only. | | | | | |

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

##### 6.1.6.2.x2 Type: ExtendedProblemDetails

Table 6.1.6.2.x2-1: Definition of type ExtendedProblemDetails

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| problemDetails | ProblemDetails | M | 1 | More information on the error shall be provided in the "cause" attribute of the "ProblemDetails" structure. |
| additionalInfo | AdditionalInfo | O | 1 | Contains the currently assigned S-CSCF name in SIP URI format. |

##### 6.1.6.2.x3 Type: AdditionalInfo

Table 6.1.6.2.x3-1: Definition of type AdditionalInfo

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| cscfServerName | String | O | 1 | Current S-CSCF assigned to the user (in SIP URI format). This attribute shall be included when “cause” is IDENTITY\_ALREADY\_REGISTERED. |

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

##### 6.1.6.3.x1 Enumeration: ImsRegistrationType

The enumeration ImsRegistrationType represents the type of registration associated to the REGISTER request.

Table 6.1.6.3.x1-1: Enumeration ImsRegistrationType

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| "INITIAL\_REGISTRATION" | The request is related to an initial registration |  |
| "RE\_REGISTRATION" | The request is related to a re-registration |  |
| "TIMEOUT\_DEREGISTRATION" | The registration timer of an identity has expired. |  |
| "USER\_DEREGISTRATION" | The S-CSCF has received a user initiated de-registration request |  |
| “ADMINISTRATIVE\_DEREGISTRATION” | The S-CSCF, due to administrative reasons or network issues, has performed the de-registration of an identity. |  |
| “AUTHENTICATION\_FAILURE” | The authentication of a user has failed. |  |
| “AUTHENTICATION\_TIMEOUT” | Authentication timeout has occurred. |  |

##### 6.1.6.3.x2 Enumeration: LooseRouteIndication

The enumeration ImsRegistrationType represents the type of registration associated to the REGISTER request.

Table 6.1.6.3.x2-1: Enumeration LooseRouteIndication

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| "LOOSE\_ROUTE\_NOT\_REQUIRED" | indicates whether loose route mechanism is not required to serve the user. |  |
| "LOOSE\_ROUTE\_REQUIRED " | indicates the S-CSCF whether loose route mechanism is required to serve the user. |  |

\* \* \* 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.

© 2019, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

All rights reserved.

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

/{imsUeId}/scscf-registration:

put:

summary: SCSCF registration information

operationId: SCSCF registration

tags:

- SCSCF registration and deregistration

parameters:

- name: imsUeId

in: path

description: IMS Identity

required: true

schema:

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

requestBody:

content:

application/json:

schema:

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

required: true

responses:

'201':

description: Created

content:

application/json:

schema:

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

'200':

description: Expected response to a valid request

content:

application/json:

schema:

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

'204':

description: No content

'403':

description: Forbidden

content:

application/problem+json:

schema:

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

'404':

description: Not found

content:

application/problem+json:

schema:

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

default:

description: Unexpected error

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

ScscfRegistration:

description: Scscf Registration

type: object

required:

- imsRegistrationType

- cscfServerName

properties:

impi:

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

imsRegistrationType:

description: Ims registration type

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

cscfServerName:

type: string

scscfInstanceId:

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

deregCallbackUri:

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

associatedImpis:

type: array

items:

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

irsImpus:

type: array

items:

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

minItems: 1

uniqueItems: true

wildcardedPui:

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

looseRouteIndicator:

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

wildcardedPsi:

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

supportedFeatures:

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

ExtendedProblemDetails:

allOf:

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

- $ref: '#/components/schemas/AdditionalInfo'

AdditionalInfo:

type: object

properties:

scscfServerName:

type: string

# SIMPLE TYPES

ImsUeId:

type: string

pattern: '^(impu-sip\:([a-zA-Z0-9\_\-.!~\*()&=+$,;?\/]+)\@([A-Za-z0-9]+([-A-Za-z0-9]+)\.)+[a-z]{2,}|impu-tel\:\+[0-9]{5,15}|impi-.+|.+)$'

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

ImsRegistrationType:

anyOf:

- type: string

enum:

- INITIAL\_REGISTRATION

- RE\_REGISTRATION

- TIMEOUT\_DEREGISTRATION

- USER\_DEREGISTRATION

- ADMINISTRATIVE\_DEREGISTRATION

- AUTHENTICATION\_FAILURE

- AUTHENTICATION\_TIMEOUT

- type: string

LooseRouteIndication:

anyOf:

- type: string

enum:

- LOOSE\_ROUTE\_NOT\_REQUIRED

- LOOSE\_ROUTE\_REQUIRED

- type: string

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