**3GPP TSG-SA5 Meeting #158 *S5-247131***

Orlando, USA, 18 - 22 November 2024

**Source: Nokia**

**Title: Rel-19 pCR TR 28.879 Clean-up and enhancement of the registration UC to add MSEF as the API provider entity**

**Document for: Approval**

**Agenda Item: 6.19.21**

# 1 Decision/action requested

***In this box give a very clear / short /concise statement of what is wanted.***

# 2 References

[1] 3GPP TR 28.879, " Study on OAM for service management and exposure to external consumers".

# 3 Rationale

The pCR proposes to clean-up the registration UC by adding the MSED as the API provider domain for management services and enhancement of the use case requirements and solution to capture these aspects.

# 4 Detailed proposal

It is proposed that the following changes be made to clause 5.1.2 of TR 28.879 [1].

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| **Begin Change** |

### 5.1.1 Use case #1: API provider domain registration into CAPIF

#### 5.1.1.1 Description

For management services to be made available for external consumption through CAPIF, it is needed that the 3GPP management system defines an API provider domain for management services. This API provider domain includes the functionality to ensure that selected management services can be exposed through CAPIF for external consumption.

In CAPIF, the registration represents a procedure where the API provider domain becomes a recognized API provider domain in the CAPIF domain. The registration involves registering the API provider domain functions (i.e., API Exposing Function (AEF), API Publishing Function (APF) and API Management Function (AMF)) to be provided by the API provider domain. The registration is the procedure whereby these API provider domain functions become recognized users of the CCF. This procedure is described in clause 8.28 of 3GPP TS 23.222 [5], with stage 3 solution set detailed in clause 8.9 of 3GPP TS 29.222 [13].

To register (de-register and/or update the registration information of) an API provider domain on the CCF, the AMF of this API provider domain communicates with the CCF over CAPIF-5 interface. This means that:

- This API provider domain should have an AMF.

- The AMF of this API provider domain should be an authorized user of CCF.

- The AMF security information for CCF to validate the registration request is provisioned by the CAPIF administrator.

#### 5.1.1.2 Potential requirements

**PREQ-FS\_MExpo-Reg-01:** The 3GPP management system shall provide the capability to define an API provider domain for management services.

**PREQ-FS\_MExpo-Reg-02:** The 3GPP management system shall provide the capability to register the API provider domain for management services to the CCF.

**PREQ-FS\_MExpo-Reg-03:** The 3GPP management system shall provide the capability to deregister the API provider domain for management services from the CCF.

**PREQ-FS\_MExpo-Reg-04:** The 3GPP management system shall provide the capability to update the registration details of the API provider domain for management services at the CCF.

#### 5.1.1.3 Potential solutions

##### 5.1.1.3.1 Potential solution #1: Map MSED information into APIProviderEnrolmentDetails.

5.1.1.3.1.1 Introduction

The solution assumes that the MSED is the entity that needs to get registered onto the CCF.

In CAPIF, the registration procedure is executed with the CAPIF\_API\_Provider\_Management API (see clause 8.3 in TS 29.222 [13]), initiated by the AMF functionalityof the MSED over the CAPIF-5 interface. The AMFfunctionality of the MSED sends a HTTP POST message to the CCF with a request body containing the following dataType: "APIProviderEnrolmentDetails" (see 3GPP TS 29.222 [13], clause 8.9.4.2.2).

The solution proposes to capture the MSED information with the "APIProviderEnrolmentDetails" and reuse the CAPIF\_API\_Provider\_Management API to register, de-register and update registration information related to the MSED.

5.1.1.3.1.2 Description

How the MSED information relevant for registration can be captured with "APIProviderEnrolmentDetails" is described in tables 5.1.1.3.1.2-1, 5.1.1.3.1.2-2 and 5.1.1.3.1.2-3.

Table 5.1.1.3.1.2-1 lists the attributes of type APIProviderEnrolmentDetails (see clause 8.9.4.2.2 of TS 29.222 [13]) and how the MSED information can be mapped. See table 8.9.4.2.2-1 of TS 29.222 [13] for the data type, presence indicator, cardinality, description and applicability information for the attributes of type APIProviderEnrolmentDetails.

Table 5.1.1.3.1.2-1: Representing MSED registration information with  
APIProviderEnrolmentDetails attributes

| Attribute name | Attribute additional information | Mapping to MnSInfo IOC attributes/Comments |
| --- | --- | --- |
| apiProvDomId | The data type of this attribute is defined as "string" and presence qualifier is defined as "O" (see table 8.9.4.2.2-1 of TS 29.222 [13]). | Assigned by the CCF to the AMF functionality of the MSEF during registration of the MSEF as the API provider domain. |
| regSec | The data type of this attribute is defined as "string" and presence qualifier is defined as "M" (see table 8.9.4.2.2-1 of TS 29.222 [13]). | It can be used to store the security credentials of the MSED. |
| apiProvFuncs | The data type of this attribute is defined as "array(APIProviderFunctionDetails)" and presence qualifier is defined as "O" (see table 8.9.4.2.2-1 of TS 29.222 [13]). | See Table 5.1.1.3.1.2-2. |
| apiProvDomInfo | The data type of this attribute is defined as "string" and presence qualifier is defined as "O" (see table 8.9.4.2.2-1 of TS 29.222 [13]). |  |
| suppFeat | The data type of this attribute is defined as "SupportedFeatures" and presence qualifier is defined as "C" (see table 8.9.4.2.2-1 of TS 29.222 [13]). | Only applicable when API provider is SCEF/NEF, and thus not applicable when API provider is MSED.. |
| failReason | The data type of this attribute is defined as "string" and presence qualifier is defined as "C" (see table 8.9.4.2.2-1 of TS 29.222 [13]). |  |
| apiProvName | The data type of this attribute is defined as "string" and presence qualifier is defined as "O" (see table 8.9.4.2.2-1 of TS 29.222 [13]). | RNAA. |

Table 5.1.1.3.1.2-2 lists the attributes of type APIProviderFunctionDetails (see clause 8.9.4.2.3 of TS 29.222 [13]) and how the MSED information can be mapped. See table 8.9.4.2.3-1 of TS 29.222 [13] for the data type, presence indicator, cardinality, description and applicability information for the attributes of type APIProviderFunctionDetails.

Table 5.1.1.3.1.2-2: Representing MSED registration information with  
APIProviderFunctionDetails attributes

| Attribute name | Attribute additional information | Mapping to MnSInfo IOC attributes/Comments |
| --- | --- | --- |
| apiProvFuncId | The data type of this attribute is defined as "string" and presence qualifier is defined as "C" (see table 8.9.4.2.3-1 of TS 29.222 [13]). | The API provider function id assigned to each function composing the MSED (i.e., AEF, APF or the AMF) by the CCF as part of the MSED registration request response. |
| regInfo | The data type of this attribute is defined as "RegistrationInformation" and presence qualifier is defined as "M" (see table 8.9.4.2.3-1 of TS 29.222 [13]). | See Table 5.1.1.3.1.2-3. |
| apiProvFuncRole | The data type of this attribute is defined as "ApiProviderFuncRole" and presence qualifier is defined as "M" (see table 8.9.4.2.3-1 of TS 29.222 [13]). | This data type serves to specify, for the MSED to be registered, which CAPIF API provider domain function(s) will be supported. |
| apiProvFuncInfo | See clause 8.9.4.3.3 of TS 29.222 [13] for the enumeration values and description of type ApiProviderFuncRole. |  |

Table 5.1.1.3.1.2-3 lists the attributes of type RegistrationInformation (see clause 8.9.4.2.4 of TS 29.222 [13]) and how the MSED information can be mapped. See table 8.9.4.2.4-1 of TS 29.222 [13] for the data type, presence indicator, cardinality, description and applicability information for the attributes of type RegistrationInformation.

Table 5.1.1.3.1.2-3: Representing MSED registration information with  
RegistrationInformation attributes

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| --- | --- | --- |
| Attribute name | Attribute additional information | Mapping to MnSInfo IOC attributes/Comments |
| apiProvPubKey | The data type of this attribute is defined as "string" and presence qualifier is defined as "M" (see table 8.9.4.2.4-1 of TS 29.222 [13]). | It can be used to store the public key of the MSED. |
| apiProvCert | The data type of this attribute is defined as "string" and presence qualifier is defined as "O" (see table 8.9.4.2.4-1 of TS 29.222 [13]). | It can be used to store the client certificate of the MSED, if existing. |

##### 5.1.1.3.Y Potential solution #Y: MSED is the API provider domain for management services

This potential solution proposes to use MSED as the API provider domain for management services. To register the MSED to the CCF, it is needed that MSED supports the following API provider domain functionality:

- AEF. If supported, this means that the MSED will need to support:

- CAPIF-2/2e interface, so that the API invokers acting as external MnS consumers can access service APIs, when required. The functionality supported on this reference point is defined in clauses 6.4.4 and 6.4.5 of TS 23.222[5] and the API operations that will be implemented on this interface are defined in clause 9.1 of TS 29.222 [13]).

- CAPIF-3 interface, so that the AEF functionality of the MSED can communicate with CCF to exercise access and policy related control for service API invocations initiated by the API invoker. The functionality supported on this reference point is defined in clause 6.4.6 of TS 23.222[5] and the API operations that will be implemented on this interface are defined in clauses 8.3, 8.5, 8.7 and 8.6 of TS 29.222 [13]).

- APF. If supported, this means that the MSED will need to support the CAPIF-4 interface, so that it can communicate with CCF to publish (and manage the published) MnS information. The functionality supported on this reference point is defined in clause 6.4.7 of TS 23.222[5] and the API operations that will be implemented on this interface are defined in clause 8.2 of TS 29.222 [13].

- AMF. If supported, this means that MSED will need to support the CAPIF-5 interface. The functionality supported on this reference point is defined in clause 6.4.8 of TS 23.222[5] and the API operations that will be implemented on this interface are defined in clauses 8.3 and 8.9 of TS 29.222 [13].

To register the MSED as the API provider domain for management services, the AMF functionality of the MSED communicates the MSED details (including supported API provider domain functions) to the CCF using the CAPIF\_API\_Provider\_Management\_API as described in clause 5.1.1.3.1 of the present document.

#### 5.1.1.4 Evaluation of potential solutions

##### 5.1.1.4.1 Evaluation of potential solution #1: Capturing MSED registration information with APIProviderEnrolmentDetails

To manage the registration of the MSED to the CCF using CAPIF\_API\_Provider\_Management API, it is needed to populate the "APIProviderEnrolmentDetails" datatype with the registration information of the MSED. Detailed in clause 5.1.1.3.1.2, the mapping solution is summarized below:

- The security credentials of the MSED can be mapped to "APIProviderEnrolmentDetails /regSec".

- The different functions composing the MSED can be mapped to "APIProviderEnrolmentDetails /apiProvFuncs".

- The public key of the MSED can be mapped to "APIProviderEnrolmentDetails/ apiProvFuncs/regInfo/apiProvPubKey".

The solution satisfies the use case requirements, i.e., PREQ-FS\_MExpo-Reg-02, PREQ-FS\_MExpo-Reg-03 and PREQ‑FS\_MExpo-Reg-04.

##### 5.1.1.4.Y Evaluation of potential solution #Y: MSEF is the API provider domain for management services

The potential solution proposes to use MSEF as the API provider domain for management services. The potential solution enables the fulfilment of the use case requirements PREQ-FS\_MExpo-Reg-01

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| **End Change** |