**3GPP TSG-SA5 Meeting #155 *S5-243253***

Jeju, South Korea, 27 - 31 May 2024 revision of S5-242881

**Source: Nokia**

**Title: Rel-19 pCR TR 28.879 Add potential solutions for publishing management services to the CCF**

**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

This pCR proposes adding new potential solutions for publishing management services in clause 5.1 of TR 28.879 [1].

# 4 Detailed proposal

It is proposed that the following changes be made in clause 5.1 of TR 28.879

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| **First Change** |

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 28.533: "Management and orchestration; Architecture Framework".

[3] 3GPP TS 28.622: "Telecommunication management; Generic Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)"

[4] 3GPP TS 28.537: "Management and orchestration; Management capabilities".

[5] 3GPP TS 23.222: "Functional architecture and information flows to support Common API Framework for 3GPP Northbound APIs; Stage 2"

[6] SP-231669: "LS on collaboration and alignment of 3GPP defined application enablers with GSMA Open Gateway".

[7] 3GPP [TS 23.434](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3587): "Service Enabler Architecture Layer for Verticals (SEAL); Functional architecture and information flows".

[8] 3GPP [TS 23.255](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3843): "Application layer support for Vehicle-to-Everything (V2X) services; Functional architecture and information flows".

[9] 3GPP [TS 23.286](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3562): "Application layer support for Uncrewed Aerial Systems (UAS) services; Functional architecture and information flows".

[10] 3GPP [TS 23.545](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3948): "Application layer support for Factories of the Future (FF) ".

[11] 3GPP [TS 23.542](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=4156): "Application layer support for Personal IoT Networks".

[12] 3GPP [TS 23.554](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3818): "Application architecture for MSGin5G Service; Stage 2".

[13] 3GPP [TS 29.222](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3450): "Common API Framework for 3GPP Northbound APIs; stage 3".

[14] 3GPP [TS 33.122](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3420): "Security aspects of Common API Framework (CAPIF) for 3GPP Northbound APIs".

[15] "The Ecosystem for Open Gateway NaaS API Development", white paper, June 2023 [[link](https://www.gsma.com/solutions-and-impact/gsma-open-gateway/wp-content/uploads/2023/05/The-Ecosystem-for-Open-Gateway-NaaS-API-development.pdf)]

[16] "GSMA Operator Platform Group – Requirements and Architecture", version 5.0, July 2023 [[link](https://www.gsma.com/futurenetworks/wp-content/uploads/2023/07/OPG.02-v5.0-Operator-Platform-Requirements-and-Architecture.pdf)]

[17] 3GPP TS 28.532: "Management and orchestration; Generic management services".

[18] 3GPP [TS 28.531](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3274): "Management and orchestration; Provisioning"

[19] 3GPP [TS 23.435](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=4092): "Procedures for Network Slice Capability Exposure for Application Layer Enablement Service"

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| **Second Change** |

#### 5.1.Y.3 Potential solutions

##### 5.1.Y.3.X Potential solution #X: Publishing of management services into the CCF

###### 5.1.Y.3.X.1 Introduction

 and is able to publish management services to the CCF.

###### 5.1.Y.3.X.2 Description

To publish a management service to the CCF, there is a need to map the management service (described by the MnsInfo IOC attributes (defined in clause 4.3.42 TS 28.622[3])) into a service API using the service API description data type (defined in Clause 8.2.4.2.2 TS 29.222[13]). This transformation is given in Table 5.1.Y.3.X.2-1 and gives a relation between the MnsInfoIOC attributes and the ServiceAPIDescription data type (defined in Clause 8.2.4.2.2 TS 29.222[13]).

Table 5.1.Y.3.X.2-1: Mapping of MnSInfo information attributes to the serviceAPIDescription information elements (extract Table 8.2.4.2.2-1 in TS 29.222[13])

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Equivalent MnS Info IOC attribute/comments |
| apiName | string | M | 1 | API name, it is set as {apiName} part of the URI structure as defined in clause 5.2.4 of 3GPP TS 29.122 [14]. | mnsLabel |
| apiId | string | O | 0..1 | API identifier assigned by the CAPIF core function to the published service API. Shall not be present in the HTTP POST request from the API publishing function to the CAPIF core function. Shall be present in the HTTP POST response from the CAPIF core function to the API publishing function and in the HTTP GET response from the CAPIF core function to the API invoker (discovery API). |  |
| aefProfiles | array(AefProfile) | C | 1..N | AEF profile information, which includes the exposed API details (e.g. protocol). For CAPIF-4/4e interface, API publishing function shall provide this attribute to the CAPIF core function in service API publishing. For CAPIF-1/1e interface, the CAPIF core function shall provide this attribute to the API Invoker during service API discovery. (NOTE 2) | See Table 5.1.Y.1-2  |
| description | string | O | 0..1 | Text description of the API |  |
| supportedFeatures | SupportedFeatures | O | 0..1 | The supported optional features of the CAPIF API. (NOTE 1) |  |
| shareableInfo | ShareableInformation | O | 0..1 | Represents whether the service API and/or the service API category can be published to other CCFs. |  |
| serviceAPICategory | string | C | 0..1 | The service API category to which the service API belongs to. This attribute is only applicable for CAPIF-6/6e interface. (NOTE 2) | Not a significant concern for publishing management services |
| ccfId | string | C | 0..1 | CAPIF core function identifier which can be contacted further for discovering the details of service API information. This attribute is only applicable for CAPIF-6/6e interface and shall be provided with serviceAPICategory. (NOTE 2) | Not a significant concern for publishing management services |
| apiSuppFeats | SupportedFeatures | O | 0..1 | Provided by the consumer to indicate the features supported by the service API. |  |
| pubApiPath | PublishedApiPath | C | 0..1 | It contains the published API path within the same CAPIF provider domain. it shall be provided by the CCF when publishing the service API to other CCF via the CAPIF-6 reference point. | Not a significant concern for publishing management services |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| NOTE 1: For CAPIF\_Publish\_Service\_API, the supported features attribute shall be provided in the HTTP POST request and in the response of successful resource creation. In addition, the supportedFeatures attribute may include one or more the supported features as defined in clause 8.2.6.NOTE 2: For CAPIF-6/6e interface, at least one of aefProfiles or serviceAPICategory and the corresponding ccfId shall be provided. |

Table 5.1.Y.1-2 Transformation of MnSInfo IOC attributes to AefProfile data type attributes (extract Table 8.2.4.2.4-1 in TS 29.222[13])

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Equivalent MnS Info IOC attribute/comments |
| aefId | string | M | 1 | AEF identifier  | Provided to the MnS producer by the management system during the registration of the API provider domain functions. |
| versions | array(Version) | M | 1..N | API version | See Table 5.1.Y.1-3 for more information  |
| protocol | Protocol | O | 0..1 | Protocol used by the API. |  |
| dataFormat | DataFormat | O | 0..1 | Data format used by the API |  |
| securityMethods | array(SecurityMethod) | O | 1..N | Security methods supported by the AEF for all interfaces. Certain interfaces may have different security methods supported in the attribute interfaceDescriptions. | Will most likely always be OAUTH 2.0 for SA5 |
| domainName | string | O | 0..1 | Domain to which API belongs to(NOTE 1) |  |
| interfaceDescriptions | array(InterfaceDescription) | O | 1..N | Interface details(NOTE 1) | See TTable 5.1.Y.1-5 for more information |
| aefLocation | AefLocation | O | 0..1 | The location information (e.g. civic address, GPS coordinates, data center ID) where the AEF providing the service API is located. |  |
| NOTE 1: Only one of the attributes "domainName" or "interfaceDescriptions" shall be included.NOTE 2: Notification or callback type of resource is not included. |

Table 5.1.Y.1-3 Mapping of MnSInfo IOC attributes to Version datatype (extract Table 8.2.4.2.5-1 in TS 29.222[13])

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Equivalent MnS Info IOC attribute/comments |
| apiVersion | string | M | 1 | API major version in URI (e.g. v1) | mnsVersion |
| expiry | DateTime | O | 0..1 | Expiry date and time of the AEF service. This represents the planned retirement date as specified in clause 4.3.1.5 of 3GPP TS 29.501 [18]. |  |
| resources | array(Resource) | O | 1..N | Resources supported by the API. It may include the custom operations with resource association. | mnsScope (each MOI under the mnsScope will be mapped to the Resource datatype (See Table 5.1.Y.1-4)) |
| custOperations | array(CustomOperation) | O | 1..N | Custom operations without resource association.  |  |

Table 5.1.Y.1-4: Mapping of MnSInfo IOC attributes to Resource data type (extract Table 8.2.4.2.6-1 in TS 29.222[13])

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Equivalent MnS Info IOC attribute/comments |
| resourceName | string | M | 1 | Resource name. | No possible mapping to MnSInfo attributes (could be the IOC name) |
| commType | CommunicationType | M | 1 | Communication type used by the API resource. (NOTE 1) | Shall be either REQUEST\_RESPONSE or SUBSCRIBE\_NOTIFY |
| uri | string | M | 1 | Relative URI of the API resource, it is set as {apiSpecificSuffixes} part of the URI structure as defined in clause 5.2.4 of 3GPP TS 29.122 [14]. | Shall be the DN that uniquely identifies the MOI |
| custOpName | string | O | 0..1 | it is set as {custOpName} part of the URI structure for the case where there is only a single custom operation associated with this resource as defined in clause 5.2.4 of 3GPP TS 29.122 [14]. (NOTE 2) |  |
| custOperations | array(CustomOperation) | O | 1..N | List of custom operations associated to this resource. (NOTE 2) | MultipleCustomOperations |
| operations | array(Operation) | C | 1..N | Supported HTTP methods for the API resource. Only applicable when the protocol in AefProfile indicates HTTP. | HTTP methods invocable on the MOI |
| description | string | O | 0..1 | Text description of the API resource. |  |
| NOTE 1: The communication type refers to the semantics of the resource or custom operation and is independent of the HTTP methods that are supported (e.g. if a resource is used for subscriptions then its CommunicationType shall be SUBSCRIBE\_NOTIFY even if it supports also the GET method for retrieving the subscriptions).NOTE 2: The attributes "custOpName" and "custOperations" are mutually exclusive.  |

Table 5.1.Y.1-5 Mapping of MnSInfo IOC attributes to InterfaceDescription datatype (extract Table 8.2.4.2.3-1 in TS 29.222[13])

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Equivalent MnS Info IOC attribute/comments |
| ipv4Addr | Ipv4Addr | C | 0..1 | String identifying an IPv4 address (NOTE 1) | fqdn attribute applies incase of MnS |
| ipv6Addr | Ipv6Addr | C | 0..1 | String identifying an IPv6 address (NOTE 1) | fqdn attribute applies incase of MnS |
| fqdn | Fqdn | C | 0..1 | String containing a Fully Qualified Domain Name. (NOTE 1) | mnsAddress |
| port | Port | O | 0..1 | Port |  |
| apiPrefix | string | O | 0..1 | A string representing an optional deployment-specific string (API prefix) in the form of a sequence of path segments that starts with a "/" character. |  |
| securityMethods | array(SecurityMethod) | M | 1..N | Security methods supported by the interface. It takes precedence over the security methods provided in AefProfile, for this specific interface | It will most likely always be OAUTH 2.0 for SA5 |
| NOTE 1: Exactly one of the attributes "ipv4Addr", "ipv6Addr" and "fqdn" shall be included.NOTE 2: When the contents of this data type are used to construct the apiRoot of an API, they are used as described in clause 4.4.1 of 3GPP TS 29.501 [18]. |

After the mapping, we now have a service API description information element representing the management service.

Accordingly the MnS producer can send an HTTP POST via the CAPIF-4 interface to publish the management service to the CCF (as defined in clause 8.2 in TS 29.222[]).

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| **End of Changes** |