**3GPP TSG-SA5 Meeting #154 *S5-241384***

Changsha, China, 15 - 19 April 2024

**Source: Ericsson, Deutsche Telekom**

**Title: Discussion paper on issues with the Deallocate operations**

**Document for: Information**

**Agenda Item: 6.3.9**

# 1 Decision/action requested

***The group is asked to take the provided information into account.***

# 2 References

[1] 3GPP [TS 28.531](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3274) Management and orchestration; Provisioning

[2] 3GPP [TS 28.541](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3400) Management and orchestration; 5G Network Resource Model (NRM); Stage 2 and stage 3

[3] IETF [RFC 9110](https://datatracker.ietf.org/doc/rfc9110/) (June 2022), HTTP Semantics

# 3 Rationale

When developing the network slice operation DeallocateNsi and DeallocateNssi implementation we find that a mandatory parameter is specified but not needed, and that the REST API is not compliant to the current OpenAPI specification.

Question: does SA5 want to update the legacy OpenAPI specification to the current OpenAPI specification?

If SA5 wants to update to the latest OpenAPI specification TS 32.158 should be updated to be based on RFC 9110, which supersedes and obsoletes RFC 7231.

It may impact other specifications that rely on 32.158, this is FFS

The issues that give rise to the introduction above are described below for the stage 2 and stage 3 specification of TS 28.531, reference [1]

**Stage 2 Deallocate operations do not need mandatory NSI/NSSI identifier.**

**Issue:** DeallocateNssi and DeallocateNsi operations takes two parameters as input, networkSliceSubnetDN/networkSliceDN and sliceProfileId/serviceProfileId. Both are marked as M mandatory. But due to the parent-child model [2] relation between these two objects, networkSliceSubnetDN/networkSliceDN can be derived from the identified sliceProfile/serviceProfile by the Producer and does not need to be provided by the Consumer. It should be made optional.

NOTE: The consumer must have a unique REST endpoint to manage their allocated slice/subnet. The uniqueness is specified as follows: "The attribute sliceProfileId defines the service profile identifier provided by the MnS producer. This attribute allows in uniquely identifying the network slice related requirements received from the MnS consumer."   See TS.28.541 clause 6.3.40.1

An example of change is shown below:

**Proposed changes to TS 28.531:** Replace the networkSliceDN/networkSliceSubnetDN support qualifier property M with O and provide a comment about how it can be derived, if needed and not provided.

**Stage 3 DeallocateNssi RESTful solution set is not Open API 3.0 compliant.**

**Issue**: REST solution set for deallocate NSSI (Section 9 RESTful HTTP-based solution set of provisioning, TS 28.531 V.18.4 and earlier) does not adhere to Open API 3.0 specification for defining and documenting REST APIs. The specification does not allow a GET or DELETE operation to have a requestBody payload, instead they only operate on a REST endpoint alone.

**Manifests as**: An error is shown in Swagger Editor when editing a 3GPP compliant REST solution set.

The underlying reason for the OpenAPI specification to classify DELETE with requestBody content as an error is for further investigation. It is noted that the IETF HTTP Semantics standard, ref. RFC 9110 updated the previously ambiguous semantics of DELETE with content.

RFC 9110 (June 2022), [The fact that request bodies on GET, HEAD, and DELETE are not interoperable has been clarified.](https://www.rfc-editor.org/rfc/rfc9110.html#name-changes-from-rfc-7231) See following quote:

[*section 9.3.5 Delete*](https://www.rfc-editor.org/rfc/rfc9110.html#name-delete)

*Although request message framing is independent of the method used, content received in a DELETE request has no generally defined semantics, cannot alter the meaning or target of the request, and might lead some implementations to reject the request and close the connection because of its potential as a request smuggling attack (Section 11.2 of [HTTP/1.1]). A client SHOULD NOT generate content in a DELETE request unless it is made directly to an origin server that has previously indicated, in or out of band, that such a request has a purpose and will be adequately supported. An origin server SHOULD NOT rely on private agreements to receive content, since participants in HTTP communication are often unaware of intermediaries along the request chain.*

**Examples of changes to TS 28.531**:

#### 9.1.1.3 Operation deallocateNsi

This operation deallocate a service profile in an NSI. The provider may terminate the requested NSI or modify the requested NSI without termination to satisfy the request.

Table 9.1.1.3-1: Mapping of IS operation input parameters to SS equivalents (HTTP DELETE)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IS operation parameter name | SS parameter location | SS parameter name | SS parameter type | Qualifier |
| ~~networkSliceDN~~ | ~~request body~~ | ~~n/a~~ | ~~Resource~~ | ~~M~~ |
| serviceProfileId | ~~Request body~~URI | n/a | Resource | M |

Table 9.1.1.3-2: Mapping of IS operation output parameters to SS equivalents (HTTP DELETE)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IS operation parameter name | SS parameter location | SS parameter name | SS parameter type | Qualifier |
| status | response status codes | n/a | n/a | M |
| response body | error | ErrorResponse | O |

The message flow for deallocation is as follows:

1. The MnS consumer sends a HTTP DELETE request to the MnS producer.

- The target URI is equal to the concatenation of URI of the parent resource and the resource (in this case ServiceProfile) to be deleted.

~~- The message body shall contain the networkSliceDN identifying the NetworkSlice MOI.~~

2. The MnS producer sends a HTTP DELETE response to the MnS consumer.

- On success, "204 No content" shall be returned.

- On failure, an appropriate error code shall be returned. The response message body may provide additional error information.

#### 9.2.1.3          Operation deallocateNssi

This operation deallocate a slice profile in an NSSI. The provider may terminate the requested NSSI or modify the requested NSSI without termination to satisfy the request.

Table 9.2.1.3-1: Mapping of IS operation input parameters to SS equivalents (HTTP DELETE)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **Qualifier** |
| ~~networkSliceSubnetDN~~ | ~~request body~~ | ~~n/a~~ | ~~Resource~~ | ~~M~~ |
| sliceProfileId | ~~request body~~URI | n/a | Resource | M |

Table 9.2.1.3-2: Mapping of IS operation output parameters to SS equivalents (HTTP DELETE)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IS operation parameter name** | **SS parameter location** | **SS parameter name** | **SS parameter type** | **Qualifier** |
| status | response status codes | n/a | n/a | M |
| response body | error | ErrorResponse | O |

The message flow for deallocation is as follows:

1.  The MnS consumer sends a HTTP DELETE request to the MnS producer.

-    The target URI is equal to the concatenation of URI of the parent resource and the resource (in this case SliceProfile) to be deleted.

~~-    The message body shall contain the networkSliceSubnetDN identifying the NetworkSliceSubnet MOI.~~

2.  The MnS producer sends a HTTP DELETE response to the MnS consumer.

-    On success, "204 No content" shall be returned.

-    On failure, an appropriate error code shall be returned. The response message body may provide additional error information.

The complete detailed solutions are proposed for his meeting in the following contributions:

S5-24XXXX Rel-18 CR TS 28.531 Correction of deallocateNsi and deallocateNssi api

S5-24XXXX Rel-18 CR TS 28.531 Correction of deallocateNsi and deallocateNssi operation

S5-24XXXX Rel-17 CR TS 28.531 Correction of deallocateNsi and deallocateNssi api

S5-24XXXX Rel-17 CR TS 28.531 Correction of deallocateNsi and deallocateNssi operation

# 4 Detailed proposal

 The group is asked to take the provided information into account.