**3GPP TSG-CT WG4 Meeting #99eC4-204xxx**

**E-Meeting, 18th – 28th August 2020 *Revision of C4-204143***

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **29.500** | **CR** | **0148** | **rev** | **1** | **Current version:** | **16.4.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | Custom headers related to indirect communication |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT4 |
|  |  |
| ***Work item code:*** | 5G\_eSBA |  | ***Date:*** | 2020-08-24 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | When multiple SCPs are involved in message routing path, if delegated discovery is used, it is possible that any SCP on the path can select the NF serivce producer.Clause 6.10.3.2 indicates the SCP shall forward the "3gpp-Sbi-Discovery-\*" request headers to the next-hop SCP, clause 5.2.3.2.7 for 3gpp-Sbi-Discovery shall also be updated to convey the header between SCPs.It needs to be further clarified how the selected NF service producer is conveyed to next hop SCP. If the NF service producer has been selected by the SCP, the selected NF service producer is conveyed to the next SCP via 3gpp-Sbi-Target-apiRoot header. |
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| ***Summary of change:*** | If the NF service producer selection is delegated to next hop SCP, the discovery paramters are passed to that SCP via 3gpp-Sbi-Discovery-\* header.If the NF service producer is selected, the selected NF service producer is conveyed to the next SCP via 3gpp-Sbi-Target-apiRoot header. |
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| ***Consequences if not approved:*** | It is not clear how the discovery parameters or selected NF service producer conveyed between SCPs. |
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| ***Clauses affected:*** | 5.2.3.2.7, 6.10.2.4, 6.10.2.5 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS/TR … CR… |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | Rev1:Update the description added in clause 6.10.2.5 |

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

##### 5.2.3.2.7 3gpp-Sbi-Discovery

These headers shall be used to convey NF service discovery factors to the SCP in indirect communication models. They contain discovery parameters to be conveyed by the NF consumer to the SCP or by an SCP to the next hop SCP and shall be used for finding a suitable NF producer instance, e.g. by performing the NF service discovery procedure with the NRF on behalf of the NF consumer in case of indirect communication with delegated discovery model.

The name of each NF service discovery factors header shall be constructed by concatenating the string "3gpp-Sbi-Discovery-" with the name of the conveyed discovery parameter, i.e. "3gpp-Sbi-Discovery-<discovery parameter>".

The discovery headers shall be used to include any of the discovery query parameters listed in 3GPP TS 29.510 [8], Table 6.2.3.2.3.1-1. The value of each NF service discovery header shall be encoded in the same way as the corresponding discovery parameter (i.e. with the same data type and cardinality). Thus, the values of these headers may be validated with the same data model as that of the corresponding discovery parameters. The discovery headers shall comply with the condition of presence of the discovery parameters defined in Table 6.2.3.2.3.1-1 of 3GPP TS 29.510 [8], e.g. discovery headers shall be included for discovery parameters defined as mandatory in this table. Table 5.2.3.2.7-1 lists examples of NF service discovery headers.

Table 5.2.3.2.7-1: NF service discovery factors headers examples

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| --- | --- | --- | --- |
| Header in request | Discovery parameter | Header value | Data Model |
| 3gpp-Sbi-Discovery-target-nf-type: AMF | target-nf-type (TS 29.510 [8], Table 6.2.3.2.3.1-1) | AMF | NFType: Enumeration as of TS 29.510 [8], Table 6.1.6.3.3-1.  |
| 3gpp-Sbi-Discovery-snssais: [{"sst": 1, "sd": "A08923"}, {"sst": 1, "sd": "0023F1"}] | snssais (TS 29.510 [8], Table 6.2.3.2.3.1-1) | [{"sst": 1, "sd": "A08923"}, {"sst": 1, "sd": "0023F1"}] | array(Snssai), where Snssai is a structured data type as of TS 29.571 [13], Table 5.4.4.2-1 |
| 3gpp-Sbi-Discovery-target-nf-instance-id: e553cf50-f32b-4638-8a7e-0d416cc60952 | target-nf-instance-id (TS 29.510 [8], Table 6.2.3.2.3.1-1) | e553cf50-f32b-4638-8a7e-0d416cc60952 | NfInstanceId: simple data type as of TS 29.571 [13], Table 5.3.2-1 |

The 3gpp-Sbi-Discovery-\* header is not documented in OpenAPI specification files. It shall comply with the following OpenAPI definition:

 headers:

 3gpp-Sbi-Discovery-<Discovery parameter name>:

 description: Discovery parameter defined in Table 6.2.3.2.3.1-1 of 3GPP TS 29.510

 schema:

 type: <Data type defined in Table 6.2.3.2.3.1-1 of 3GPP TS 29.510>

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

#### 6.10.2.4 Pseudo-header setting

For Indirect Communications with or without delegated discovery, when sending a request to the SCP, the HTTP client shall set the pseudo-headers as follows:

- ":scheme"set to "http" or "https";

- ":authority" set to the FQDN or IP address of the SCP (if the scheme is "http"), or to the FQDN of the SCP (if the scheme is "https");

- ":path" including the optional deployment-specific string of the SCP and the path and query components of the target URI excluding the optional deployment-specific string of the target URI.

An HTTP client sending a notification or callback request cannot know whether the callback URI contains any deployment specific string or not. Accordingly, it shall behave assuming that there is no deployment specific string in the callback (i.e. target) URI.

Additionally, for HTTP requests for which an HTTP client may cache responses (e.g. GET request), the HTTP client should include the cache key (ck) query parameter set to an implementation specific value that is bound to the target NF (see clause 6.10.2.6).

The HTTP client shall include the apiRoot of an authority server for the target resource (including the optional deployment-specific string of the target URI), if available, in the 3gpp-Sbi-Target-apiRoot header (see clause 6.10. 2.5).

When forwarding a request to another SCP, an SCP shall replace the apiRoot of the SCP received in the request URI of the incoming request by the apiRoot of the next hop SCP. The SCP shall include a 3gpp-Sbi-Target-apiRoot header set to the apiRoot of an authority server for the target resource (including the optional deployment-specific string of the target URI), if available, e.g. if the 3gpp-Sbi-Target-apiRoot header was received in the request. The SCP shall set the pseudo-headers as specified in clause 6.1, with the following additions:

- the SCP shall modify the ":authority" HTTP/2 pseudo-header field to the FQDN of the next hop SCP.

- the SCP shall remove any optional deployment-specific string of the SCP in the ":path" HTTP/2 pseudo-header and add any optional deployment-specific string of the next hop SCP;

- the SCP shall remove the cache key query parameter, if this parameter was received in the request.

When forwarding a request to the HTTP server, the SCP shall replace the apiRoot of the SCP received in the request URI of the incoming request by the apiRoot of the target NF service instance. If the 3gpp-Sbi-Target-apiRoot header was received in the request, the SCP shall use it as the apiRoot of the target NF service instance, if the SCP does not (re)select a different HTTP server, and regardless shall remove it from the forwarded request. The SCP shall set the pseudo-headers as specified in clause 6.1, with the following additions:

- the SCP shall modify the ":authority" HTTP/2 pseudo-header field to the FQDN of the target NF service instance.

- the SCP shall remove any optional deployment-specific string of the SCP in the ":path" HTTP/2 pseudo-header and add any optional deployment-specific string of the target URI;

- the SCP shall remove the cache key query parameter, if this parameter was received in the request.

EXAMPLE 1: For indirect communication without delegated discovery, if the NF Service Consumer needs to send the request "GET [https://example.com/a/b/c/nudm-sdm/v1/{supi}/nssai](https://example.com/a/b/c/nudm-sdm/v1/%7Bsupi%7D/nssai)" to the NF Service Producer (represented by the FQDN "example.com" and where "a/b/c" is the apiPrefix of the NF service producer figured out from NRF discovery):

- the NF service consumer shall send the request "GET [https://scp.com/1/2/3/nudm-sdm/v1/{supi}/nssai](https://scp.com/1/2/3/nudm-sdm/v1/%7Bsupi%7D/nssai)" to the SCP (where "1/2/3" is the "apiPrefix" of the SCP), with the "3gpp-sbi-target-apiRoot" header set to "<https://example.com/a/b/c>".

- the SCP shall send the request "GET [https://example.com/a/b/c/nudm-sdm/v1/{supi}/nssai](https://example.com/a/b/c/nudm-sdm/v1/%7Bsupi%7D/nssai)" to the NF Service Producer, without any "3gpp-sbi-target-apiRoot" header.

EXAMPLE 2: For indirect communication, if the NF Service Producer needs to send a notification request "POST <https://example.com/a/b/c/>notification" to the NF Service Consumer (represented by the FQDN "example.com", i.e. the host part of the callback URI):

- the NF service producer shall send the request "POST <https://scp.com/1/2/3/a/b/c/notification>" to the SCP (where "1/2/3" is the "apiPrefix" of the SCP), with the "3gpp-sbi-target-apiRoot" header set to "[https://example.com](https://example.com/a/b/c)".

- the SCP shall send the request "POST <https://example.com/a/b/c/notification>" to the NF Service Producer, without any "3gpp-sbi-target-apiRoot" header.

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

#### 6.10.2.5 3gpp-Sbi-Target-apiRoot header setting

For Indirect Communications with or without delegated discovery, the HTTP client shall include a 3gpp-Sbi-Target-apiRoot header set to the apiRoot of an authority server for the target resource, if available, in requests it sends to the SCP. In particular:

- for Indirect Communication without Delegated Discovery, a service request sent to the SCP to create a resource shall include a 3gpp-Sbi-Target-apiRoot header set to the apiRoot of the selected NF service instance of the NF Service Producer, if the NF Service Consumer has indeed selected a specific NF service instance;

- after a resource has been created, subsequent service requests sent to the SCP and targeting the resource shall include a 3gpp-Sbi-Target-apiRoot header set to the apiRoot received earlier in Location header of service responses from the NF Service Producer;

- notifications or callbacks sent via the SCP shall include a 3gpp-Sbi-Target-apiRoot header set to the apiRoot of the notification or callback URI (i.e. "http" or "https" scheme, the fixed string "://" and authority (host and optional port) as defined in IETF RFC 3986 [14]).

An SCP shall include a 3gpp-Sbi-Target-apiRoot header set to the apiRoot of an authority server for the target resource, if available, in requests it sends to the next hop SCP. In particular:

* if the received request does not include a 3gpp-Sbi-Target-apiRoot header containing the apiRoot of a selected NF service instance, and NF service discovery is not delegated to a next hop SCP, then the SCP shall select a target NF service instance (performing an NF service discovery with the NRF or based on local configuration (i.e. without interacting with NRF) according to the received "3gpp-Sbi-Discovery-\*" request header(s)) and insert a 3gpp-Sbi-Target-apiRoot header set to the apiRoot of the selected target NF service instance;
* if the received request includes a 3gpp-Sbi-Target-apiRoot header containing the apiRoot of a selected NF service instance, but the SCP needs to reselect a different NF service instance, the SCP shall modify and set the 3gpp-Sbi-Target-apiRoot header to the apiRoot of the newly selected target NF service instance;
* if the received request includes a 3gpp-Sbi-Target-apiRoot header containing the apiRoot of a selected NF service instance and the SCP does not reselect a different NF service instance, the SCP shall forward the received 3gpp-Sbi-Target-apiRoot header to the next hop SCP.

When forwarding the request to the HTTP server, the SCP shall set the pseudo-headers as specified in clause 6.10.2.4.

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