**3GPP TSG-CT WG4 Meeting #111-eC4-224252**

**E-Meeting, 18th – 26th August 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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| *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:*** | Essential Correction on Headers in Indirect Communication | | | | | | | | | |
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| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | CT4 | | | | | | | | | |
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| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *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 can be 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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | When indirect communication is used, the SCP will perform NF discovery on behalf of the NF consumer even when indirect communication without delegated discovery, e.g. when the NF consumer provide the NF Set in initial request or when the SCP perform reselection.  3GPP TS 29.500 specified that the NF consumer should provide the necessary information to allow the SCP to successfully perform the discovery on NRF: 6.10.5 NF / NF service instance selection for Indirect Communication without Delegated Discovery6.10.5.1 General …  If the NF Service Consumer only selected an NF (service) Set, it should also include at least the following information in its request to the SCP:  - the target NF type, the service name, and the requested S-NSSAI in the corresponding 3gpp-Sbi-Discovery-\*" request header(s) (see clause 6.10.3.2).  NOTE 1: This is to allow the SCP to discover and select a target NF service instance from the target NF (service) set for the corresponding service request and supporting the requested S-NSSAI, e.g. when the NF service producer supports different NF service instances serving different network slices. Likewise, other "3gpp-Sbi-Discovery-\*" request header(s), e.g. target-plmn-list, can also be included for the same purpose.  The NF service consumer may indicate the NRF to use, e.g. as a result of an NSSF query, by including the 3gpp-Sbi-Nrf-Uri header with the NRF API URIs.  If the NF service consumer includes more than one service name in the 3gpp-Sbi-Discovery-service-names header, the service name corresponding to the service request shall be listed as the first service name in the header.  NOTE 2: The SCP can assume that the service request corresponds to the first service name in the header.  An SCP that supports Indirect Communication without Delegated Discovery shall support:  - discovering and selecting a target NF service instance from the target NF (service) set identified in the 3gpp-Sbi-Discovery-target-nf-set-id, 3gpp-Sbi-Discovery-target-nf-service-set-id, 3gpp-Sbi-Discovery-amf-region-id and/or 3gpp-Sbi-Discovery-amf-set-id; and  - at least the following additional discovery headers: 3gpp-Sbi-Discovery-target-nf-type, 3gpp-Sbi-Discovery-service-names, 3gpp-Sbi-Discovery-snssais, 3gpp-Sbi-Discovery-target-plmn-list.  NOTE 3: The SCP can derive the requester NF type from the User-Agent header.  The above description is incorrect and misleading on two aspects:  1/ The requester PLMN ID is rather essential info in discovery, if the NF producer has registered the allowedPlmns in the NF profile, especially when the allowedPlmns are registered at NF service instance level, i.e. different service instance can serve different PLMN(s).  **Proposal**: Add the requester-plmn-list.  2/ The "requester-nf-type" IE is mandatory parameter when perform NRF discovery. The SCP will derive the requester NF type from the User-Agent header. However, User-Agent header is not explicitly mandated.  **Proposal**: Mandate the User-Agent header in all request via Indirect Communication when Selection/Reselection is to be performed by SCP. | | | | | | | | |
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| ***Summary of change:*** | | 1/ Mandating the User-Agent header for indirect communication  2/ add requester-plmn-list discovery factor | | | | | | | | |
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| ***Consequences if not approved:*** | | Missing header requirement when Indirect Communication, which leads to selection/reselection will fail at SCP. | | | | | | | | |
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| ***Clauses affected:*** | | 5.2.2.2, 6.10.5.1 | | | | | | | | |
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|  | | **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:  - Revert removal of target-plmn-list. requester-plmn-list added as addition.  - Editorial correction. | | | | | | | | |

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

#### 5.2.2.2 Mandatory to support HTTP standard headers

The HTTP request standard headers and the HTTP response standard headers that shall be supported on SBI are defined in Table 5.2.2.2-1 and in Table 5.2.2.2-2 respectively. Mandatory to support HTTP standard headers does not mean all the HTTP requests and responses carry the identified request and response headers respectively. It only means it is mandatory to support the processing of the identified headers in request and response message.

Table 5.2.2.2-1: Mandatory to support HTTP request standard headers

|  |  |  |
| --- | --- | --- |
| Name | Reference | Description |
| Accept | IETF RFC 7231 [11] | This header is used to specify response media types that are acceptable. |
| Accept-Encoding | IETF RFC 7231 [11] | This header may be used to indicate what response content-encodings (e.g. gzip) are acceptable in the response. |
| Content-Length | IETF RFC 7230 [12] | This header is used to provide the anticipated size, as a decimal number of octets, for a potential payload body. |
| Content-Type | IETF RFC 7231 [11] | This header is used to indicate the media type of the associated representation. |
| Content-Encoding | IETF RFC 7231 [11] | This header may be used in some requests to indicate the content encodings (e.g. gzip) applied to the resource representation beyond those inherent in the media type. |
| User-Agent | IETF RFC 7231 [11] | This header shall be mainly used to identify the NF type of the HTTP/2 client. This header should be included in every HTTP/2 request sent over any SBI; This header shall be included in every HTTP/2 request sent using indirect communication when target NF (re-)selection is to be performed at SCP.  For Indirect communications, the User-Agent header in a request that is:  - forwarded by the SCP (with or without delegated discovery) shall identify the NF type of the original NF that issued the request (i.e. the SCP shall forward the header received in the incoming request);  - originated by the SCP towards the NRF (e.g. NF Discovery or Access Token Request) shall identify the SCP.  The pattern of the content should start with the value of NF type (e.g. "UDM", see NOTE 1) or "SCP" (for a request originated by an SCP) and followed by a "-" and any other specific information if needed afterwards. |
| Cache-Control | IETF RFC 7234 [20] | This header may be used in some HTTP/2 requests to provide the HTTP cache-control directives that the client is willing to accept from the server. |
| If-Modified-Since | IETF RFC 7232 [24] | This header may be used in a conditional GET request, for server revalidation. This is used in conjunction with the Last-Modified server response header, to fetch content only if the content has been modified from the cached version. |
| If-None-Match | IETF RFC 7232 [24] | This header may be used in a conditional GET request. This is used in conjunction with the ETag server response header, to fetch content only if the tag value of the resource on the server differs from the tag value in the If-None-Match header. |
| If-Match | IETF RFC 7232 [24] | This header may be used in a conditional POST or PUT or DELETE or PATCH request. This is used in conjunction with the ETag server response header, to update / delete content only if the tag value of the resource on the server matches the tag value in the If-Match header. |
| Via | IETF RFC 7230 [12] | This header shall be inserted by HTTP proxies and it shall be inserted by an SCP and SEPP when relaying an HTTP request.  When inserted by an SCP or SEPP, the header field value should be formatted as defined for the Via header in Table 5.2.2.2-2. |
| Authorization | IETF RFC 7235 [21] | This header shall be used if OAuth 2.0 based access authorization with "Client Credentials" grant type is used as specified in clause 13.4.1 of 3GPP TS  33.501 [17], clause 7 of IETF RFC 6749 [22] and IETF RFC 6750 [23]. |
| NOTE 1: The value of NF type in the User-Agent header shall comply with the enumeration value of Table 6.1.6.3.3-1 in 3GPP TS 29.510 [8]. | | |

Table 5.2.2.2-2: Mandatory to support HTTP response standard headers

|  |  |  |
| --- | --- | --- |
| Name | Reference | Description |
| Content-Length | IETF RFC 7230 [12] | This header may be used to provide the anticipated size, as a decimal number of octets, for a potential payload body. |
| Content-Type | IETF RFC 7231 [11] | This header shall be used to indicate the media type of the associated representation. |
| Location | IETF RFC 7231 [11] | This header may be used in some responses to refer to a specific resource in relation to the response. |
| Retry-After | IETF RFC 7231 [11] | This header may be used in some responses to indicate how long the user agent ought to wait before making a follow-up request. |
| Content-Encoding | IETF RFC 7231 [11] | This header may be used in some responses to indicate to the HTTP/2 client the content encodings (e.g. gzip) applied to the resource representation beyond those inherent in the media type. |
| Cache-Control | IETF RFC 7234 [20] | This header may be used in some responses (e.g. NRF responses to queries) to provide HTTP response cache control directives. The cache directives "no-cache", "no-store", "max-age" and "must-revalidate" values shall be supported. |
| Age | IETF RFC 7234 [20] | This header may be inserted by HTTP proxies when returning a cached response. The "Age" header field conveys the sender's estimate of the amount of time since the response was generated or successfully validated at the origin server. The presence of an Age header field implies that the response was not generated or validated by the origin server for this request. |
| Last-Modified | IETF RFC 7232 [24] | This header may be sent to allow for conditional GET with the If-Modified-Since header. |
| ETag | IETF RFC 7232 [24] | This header may be sent to allow for conditional GET with the If-If-None-Match header or a conditional POST / PUT / PATCH / DELETE with the If-Match header. |
| Via | IETF RFC 7230 [12] | This header shall be inserted by HTTP proxies.  This header shall be inserted by an SCP or SEPP when relaying an HTTP error response (see clause 6.10.8). It may be inserted when relaying other HTTP responses.  When inserted by an SCP or SEPP, the received-protocol portion of the header field value should be set to "HTTP/2.0" or "2.0" and the received-by portion of the header field value should be formatted as follows:  - "SCP-<SCP FQDN>" for an SCP  - "SEPP-<SEPP FQDN>" for a SEPP  See examples in clause 6.10.8. |
| Allow | IETF RFC 7231 [11] | This header field shall be used to indicate methods supported by the target resource. |
| WWW-Authenticate | IETF RFC 7235 [21] | This header field shall be included when an NF service producer rejects a request with a "401 Unauthorized" status code (e.g. when a request is sent without an OAuth 2.0 access token or with an invalid OAuth 2.0 access token). |
| Accept-Encoding | IETF RFC 7694 [33] | See clause 6.9 for the use of this header. |
| Server | IETF RFC 7231 [11] | This header should be inserted by the originator of an HTTP error response (see clause 6.10.8). It may be inserted otherwise.  When inserted by an NF, an SCP or a SEPP, the pattern of the header should be formatted as follows:  - "SCP-<SCP FQDN>" for an SCP  - "SEPP-<SEPP FQDN>" for a SEPP - "<NFType>-<NF Instance ID>" for an NF |

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

#### 6.10.5.1 General

For Indirect Communication without Delegated Discovery, the NF Service Consumer performs the discovery procedure by querying the NRF and the selection of a NF (Service) Set or a specific NF (service) instance. The selection of the target NF service instance may hence be done either by the NF Service Consumer or the SCP (e.g. based on NF (Service) Set information received from the NF Service Consumer).

The NF Service Consumer shall send its request to the SCP containing:

- the 3gpp-Sbi-Target-apiRoot header set to the apiRoot of the selected NF service instance, if the SCP is known to the NF Service Consumer and if the NF Service Consumer has selected a specific NF service instance;

- the identity of the selected NF (Service) Set in the associated "3gpp-Sbi-Discovery-\*" request header(s) (see clause 6.10.3.2), if the NF Service Consumer has selected a target NF (Service) Set ID.

If the NF Service Consumer only selected an NF (service) Set, it should also include at least the following information in its request to the SCP:

- the target NF type, the service name, and the requested S-NSSAI in the corresponding 3gpp-Sbi-Discovery-\*" request header(s) (see clause 6.10.3.2).

NOTE 1: This is to allow the SCP to discover and select a target NF service instance from the target NF (service) set for the corresponding service request and supporting the requested S-NSSAI, e.g. when the NF service producer supports different NF service instances serving different network slices. Likewise, other "3gpp-Sbi-Discovery-\*" request header(s), e.g. target-plmn-list, requester-plmn-list, can also be included for the same purpose.

The NF service consumer may indicate the NRF to use, e.g. as a result of an NSSF query, by including the 3gpp-Sbi-Nrf-Uri header with the NRF API URIs.

If the NF service consumer includes more than one service name in the 3gpp-Sbi-Discovery-service-names header, the service name corresponding to the service request shall be listed as the first service name in the header.

NOTE 2: The SCP can assume that the service request corresponds to the first service name in the header.

SCPs shall support Indirect Communication without Delegated Discovery, which requires support for the following:

- discovering and selecting a target NF service instance from the target NF (service) set identified in the 3gpp-Sbi-Discovery-target-nf-set-id, 3gpp-Sbi-Discovery-target-nf-service-set-id, 3gpp-Sbi-Discovery-amf-region-id and/or 3gpp-Sbi-Discovery-amf-set-id; and

- at least the following additional discovery headers: 3gpp-Sbi-Discovery-target-nf-type, 3gpp-Sbi-Discovery-service-names, 3gpp-Sbi-Discovery-snssais, 3gpp-Sbi-Discovery-target-plmn-list, 3gpp-Sbi-Discovery-requester-plmn-list.

NOTE 3: The SCP can derive the requester NF type from the User-Agent header.

SCPs shall additionally support reselecting an alternative target NF service instance when a (Routing) Binding Indication is not available, as specified in clauses 6.5.3 and 6.6.3 of 3GPP TS 23.527 [38] and shall also support the 3gpp-Sbi-Discovery-target-nf-instance-id.

NOTE 4: The inclusion of the 3gpp-Sbi-Discovery-target-nf-instance-id in an HTTP request enables the SCP to discover the profile of the target NF instance and to possibly reselect a different target NF service instance from the same NF instance or from a different NF instance in the same set, e.g. when the target NF instance is not reachable, as specified in 3GPP TS 23.527 [38].

If the request does not include the apiRoot of a selected NF service instance, or if the SCP needs to reselect a different NF service instance, the SCP shall select an NF service instance using the NF (Service) Set ID and any additional information (e.g. S-NSSAI, service name, target NF type) received in the corresponding "3gpp-Sbi-Discovery-\*" request header(s), if available. If the SCP is to invoke NF service discovery towards the NRF to fulfil this task, the SCP should use the NRF indicated in the 3gpp-Sbi-Nrf-Uri header, if this header is present in the request. The SCP that reselected the target NF service instance shall include the 3gpp-Sbi-Producer-Id header in the 2xx HTTP response it forwards towards the NF Service Consumer, containing the NF Instance ID and the NF Service Instance ID of the NF Service Producer selected by the SCP, as specified in clause 6.10.3.4; if the SCP received a 4xx/5xx HTTP response including a 3gpp-Sbi-Response-Info header with "context-transferred" parameter set to value "true" from the reselected target NF service instance, which indicates the corresponding resource or context has been transferred to the reselected target NF service instance, the SCP shall also insert a 3gpp-Sbi-Producer-Id header in the HTTP response it forwards to the NF Service Consumer.

The SCP shall then route the request to the selected NF service instance of the target NF service producer.

NOTE 5: For Indirect Communication without Delegated Discovery, the NF Service Consumer decides if it will perform the reselection or delegate the SCP to perform the reselection as specified in clause 6.5 of 3GPP TS 23.527 [38].

When the 3gpp-Sbi-Selection-Info header is included in a HTTP request message and if the SCP supports this header, the SCP shall use it together with 3gpp-Sbi-Routing-Binding or 3gpp-Sbi-Discovery-\* heads whichever available.

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