**3GPP TSG-CT WG4 Meeting #124C4-243499**

**Maastricht, Netherlands; 19th – 23rd August 2024 revision of C4-243427**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** | **2** | **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:*** |  | | | | | | | | | |
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| ***Source to WG:*** | , Nokia | | | | | | | | | |
| ***Source to TSG:*** | CT4 | | | | | | | | | |
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| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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:*** | | 3GPP TS 33.501 clause X.10 has specified the procedure for secured and authorized AI/ML model sharing. This clause covers two cases, when the NF Service consumer requests access token for itself or on behalf of an ML model consumer. The support for the second case needs to be added: where the NF Service Consumer requests access token on behalf of an ML model consumer as per specification in 3GPP TS 33.501 clause X.10.  According to 3GPP TS 33.501 clause X.10:  In step 3 (Discovery of MTLF) of the procedure for secured and authorized AI/ML model sharing between different vendors  "In case of the NF service consumer (e.g. NWDAF containing MTLF) request ML models on behalf of another ML model consumer (e.g., NWDAF containing AnLF), before step 3 the ML model consumer (e.g., NWDAF containing AnLF) obtains a token for the analytics ID from NRF same as step 4 which authorizes the ML model consumer to use model retrieval service provided by the NF service consumer and sends the model retrieval service request to the NF service consumer with the Analytics ID, the obtained token, the Vendor ID and the CCA of the ML model consumer."  Further in step 4 it is stated that:  "In case of NF service consumer request ML models on behalf of another ML model consumer (e.g., NWDAF containing AnLF), the token request message shall also contain the NF instance ID and Vendor ID of the ML model consumer. The NF Service Consumer also includes the CCA of the ML model consumer that it has received in the service request from the ML model consumer."  Here the NF service consumer is an NWDAF containing MTLF discovering an NF service producer which is again an NWDAF containing MTLF on behalf of an ML model consumer (e.g., NWDAF containing AnLF).  Currently in 3GPP TS 29.500 this use of 3gpp-Sbi-Source-NF-Client-Credentials is only defined for DCCF. Therefore, it is proposed to add the related examples to support the case defined in 3GPP TS 33.501 clause X.10. | | | | | | | | |
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| ***Summary of change:*** | | The descriptions of 3gpp-Sbi-Source-NF-Client-Credentials in the table and in the related clause are updated to include the case where the NWDAF containing MTLF requests access token on behalf of an ML model consumer (NWDAF containing AnLF). | | | | | | | | |
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| ***Consequences if not approved:*** | | The stage-3 specification is incomplete and is not aligned with stage-2 specification. | | | | | | | | |
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| ***Clauses affected:*** | | 5.2.3.2.1, 5.2.3.2.22, 6.7.5.XX | | | | | | | | |
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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:  - Nokia added as a co-source.  - In clause 5.2.3.2.22, the changes to the NOTE are reverted back, NOTE X is added instead.  - In clause 6.7.5.XX text is replaced by a reference to clause 6.7.5.2.  Rev 2: space replaced with hard space in the new text in Table 5.2.3.2.1-1. | | | | | | | | |

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

##### 5.2.3.2.1 General

The 3GPP NF Services shall support the HTTP custom headers specified in Table 5.2.3.2.1-1 below. A description of each custom header and the normative requirements on when to include them are also provided in Table 5.2.3.2-1.

Table 5.2.3.2.1-1: Mandatory HTTP custom headers

|  |  |  |
| --- | --- | --- |
| Name | Reference | Description |
| 3gpp-Sbi-Message-Priority | Clause 5.2.3.2.2 | This header is used to specify the HTTP/2 message priority for 3GPP service based interfaces. This header shall be included in HTTP/2 messages when a priority for the message needs to be conveyed (e.g. HTTP/2 messages related to Multimedia Priority Sessions). |
| 3gpp-Sbi-Callback | Clause 5.2.3.2.3 | This header is used to indicate if a HTTP/2 message is a callback (e.g. notification).  This header shall be included in HTTP POST messages for callbacks towards NF service consumer(s) in another PLMN via the SEPP (See 3GPP TS 29.573 [27]).  This header shall also be included in HTTP POST messages for callbacks in indirect communication (See clause 6.10.7).  This header should also be included in the HTTP POST message of any event notification request for direct communications.  If the header is included in received HTTP request, the SEPP or SCP shall include this header in the HTTP request forwarded to next hop. (NOTE 1) |
| 3gpp-Sbi-Target-apiRoot | Clause 5.2.3.2.4 | This header is used by an HTTP client to indicate the apiRoot of the target URI when communicating indirectly with the HTTP server via an SCP. This header is also used by SCP to indicate the apiRoot of the target URI, if a new HTTP server is selected or reselected and there is no Location header included in the response.  This header may also be used by an HTTP client towards its local SEPP to indicate the apiRoot of the target URI towards HTTP server in another PLMN.  This header may also be used between SEPPs to indicate the apiRoot of the target URI towards HTTP server in another PLMN, when TLS security with the 3gpp-Sbi-Target-apiRoot header is used between the SEPPs. |
| 3gpp-Sbi-Routing-Binding | Clause 5.2.3.2.5 | This header is used in a service request to signal binding information to direct the service request to an HTTP server which has the targeted NF Service Resource context (see clause 6.12). |
| 3gpp-Sbi-Binding | Clause 5.2.3.2.6 | This header is used to signal binding information related to an NF Service Resource to a future consumer (HTTP client) of that resource (see clause 6.12). |
| 3gpp-Sbi-Discovery-\* | Clause 5.2.3.2.7 | Headers beginning with the prefix 3gpp-Sbi-Discovery- are used in indirect communication mode to allow the discovery and selection of a suitable NF service producer (e.g. in case of service requests) or NF service consumer (e.g. in case of notifications or callbacks) by the SCP, as specified in clause 5.2.3.2.7, clause 6.5.3 and clause 6.10. Such headers may be included in any SBI message and include information allowing an SCP to find a suitable NF service producer or NF service consumer, as per the discovery and selection parameters provided respectively by the NF service consumer or the NF service producer. |
| 3gpp-Sbi-Producer-Id | Clause 5.2.3.2.8 | This header is used in a service response from the SCP to the NF Service Consumer, when using indirect communication, to identify the NF service producer. See clause 6.10.3.4.  This header may also be used in a resource creation response from the NF Service Producer to the NF consumer (or SCP), when the resource is created in a different NF Service Producer (e.g. UE Context Create with AMF relocation during inter-PLMN N2 handover procedure). |
| 3gpp-Sbi-Oci | Clause 5.2.3.2.9 | This header may be used by an overloaded NF Service Producer in a service response, or in a notification request to signal Overload Control Information (OCI) to the NF Service Consumer.  This header may also be used by an overloaded NF Service Consumer in a notification response or in a service request to signal Overload Control Information (OCI) to the NF Service Producer. |
| 3gpp-Sbi-Lci | Clause 5.2.3.2.10 | This header may be used by a NF Service Producer to send Load Control Information (LCI) to the NF Service Consumer. |
| 3gpp-Sbi-Client-Credentials | Clause 5.2.3.2.11 | This header may be used by an NF Service Consumer to send Client Credentials Assertion to the NRF or to the NF Service Producer. See clause 6.7.5. |
| 3gpp-Sbi-Source-NF-Client-Credentials | Clause 5.2.3.2.22 | This header may be used by an NF Service Consumer (e.g., DCCF, NWDAF containing MTLF) to send Client Credentials Assertion of the source NF (e.g. NWDAF, NWDAF containing AnLF) to the NF Service Producer (e.g. AMF, SMF, NWDAF containing MTLF).  The purpose is one of the followings:  - to enable the authorization of NF service consumers for data access via DCCF as specified in Annex X of 3GPP TS 33.501 [17];  - to enable the authorization of the ML model consumer when the NF service consumer requests ML models on behalf of the ML model consumer as specified in Annex X.10 of 3GPP TS 33.501 [17].  See clause 6.7.5. |
| 3gpp-Sbi-Nrf-Uri | Clause 5.2.3.2.12 | This header may be used to indicate the NRF API URIs to be used for a given service request, e.g. in indirect communication with delegated discovery as a result of an NSSF query. It may also indicate whether OAuth2 based authorization is required for accessing the NRF services.  This header may also be used to indicate the NRF API URI to be used for a given notification request, e.g. if the NF service producer has received NRF API URI from the NF service consumer and the NF producer delegates NF consumer reselection to the SCP in indirect communication, |
| 3gpp-Sbi-Target-Nf-Id | Clause 5.2.3.2.13 | This header is used in a 307 Temporary Redirect or 308 Permanent Redirect response, to identify the target NF (service) instance towards which the request is redirected. See clause 6.10.9.1. |
| 3gpp-Sbi-Max-Forward-Hops | Clause 5.2.3.2.14 | This header may be used to indicate the maximum number of allowed hops with specified node type to relay the request message to the target HTTP server.  If node type is "scp", its value indicates the maximum number of allowed SCP hops to relay the request message to the target NF as HTTP server when indirect communication is used. |
| 3gpp-Sbi-Originating-Network-Id | Clause 5.2.3.2.15 | This header shall be inserted by an NF service consumer or an NF service producer originating an HTTP request message towards a different PLMN or SNPN.  It should be inserted by the sending SCP in SBI HTTP request messages towards the SEPP, only if the header is not present in the SBI HTTP request message and the SCP can determine which PLMN-ID value should be included in the header.  It shall be inserted by the sending SEPP or the receiving SEPP in SBI HTTP request messages towards the target PLMN or SNPN, only if the header is not present in the SBI HTTP request message and the sending SEPP or the receiving SEPP (respectively) can determine the PLMN ID or SNPN ID of the source PLMN or SNPN.  If the SEPP cannot uniquely determine the PLMN-ID or SNPN-ID, it is a configuration/deployment aspect to determine which PLMN-ID or SNPN-ID value should be included in the header by these entities. In such case, the message should either be rejected, or the SEPP shall indicate to the peer that the header is derived based on configuration.  It shall indicate the PLMN-ID or the SNPN-ID of the source PLMN or SNPN of the HTTP request message (i.e., the PLMN ID or the SNPN ID of the NF Service Consumer or NF Service Producer).  See clause 5.9.3.2 of 3GPP TS 33.501 [17] for the handling of this header by the sending NF, the sending SCP, the sending SEPP and the receiving SEPP. (NOTE 2) |
| 3gpp-Sbi-Access-Scope | Clause 5.2.3.2.16 | This header is used in a service request for Indirect Communication to indicate the access scope of the service request for NF service access authorization. See clauses 6.7.3 and 6.10.11. |
| 3gpp-Sbi-Access-Token | Clause 5.2.3.2.17 | This header is used in a service response forwarded by the SCP to an NF service consumer to provide an access token for possible re-use in subsequent service requests. See clause 6.10.1. |
| 3gpp-Sbi-Target-Nf-Group-Id | Clause 5.2.3.2.19 | This header is used in a service response from the SCP to the NF Service Consumer, when using indirect communication with delegated discovery, to indicate the NF Group ID of the NF service producer selected by the SCP. See clause 6.10.3.4. |
| 3gpp-Sbi-Nrf-Uri-Callback | Clause 5.2.3.2.20 | This header may be included in service request (e.g. subscription creation request) from the NF service consumer to the NF service producer, to indicate:  - the NRF NFDiscovery API URI to be used to discover an alternative NF service consumer for callback, e.g. during NF service consumer reselection for callback when the original NF service consumer is no longer available; and  - if available, the NRF NFManagement API URI to be used to subscribe to NF status change of the NF service consumer.  For indirect communication, if the NF service producer delegates NF service consumer reselection to the SCP, the NF service producer should include 3gpp-Sbi-Nrf-Uri header with received NRF API URI (which was received in the 3gpp-Sbi-Nrf-Uri-Callback from the NF service consumer) in the notification requests to the NF service consumer. |
| 3gpp-Sbi-NF-Peer-Info | Clause 5.2.3.2.21 | This header is used in HTTP requests and responses to indicate the sender and receiver of the message.  The HTTP client and server should include this header in every HTTP request and response messages.  HTTP intermediaries (e.g. SCP) should forward this header, when relaying HTTP messages to next hop, and may update the destination in the header if the receiver NF of the message is (re)selected. The parameters defined for the source and destination of SCPs or SEPPs (as defined in clause 5.2.3.2.21) may also need to be updated according to the source and destination of the HTTP message. |
| NOTE 1: The callback URI for event subscription may receive event notifications from different NF producers, e.g. UDM may subscribe to AMF/SMF on behalf of NEF with directly reporting mode for certain UDM events in the subscription, which should be inspected with corresponding OpenAPI schema where the notification is defined. For both direct and indirect communications, to include this header in all event notification requests can help NF consumer to identify the type of event notification and select corresponding schema to perform OpenAPI inspection.  NOTE 2: The value of this header shall be verified by the sending SEPP and receiving SEPP (see clause 5.9.3.2 of 3GPP TS 33.501 [17]) . If the PLMN ID or SNPN ID in this header does not match with any of the PLMN IDs that the sending SEPP represents, the sending SEPP or the receiving SEPP shall reject the received signalling message using the error cause "ORIGINATING\_NETWORK\_ID\_MISMATCH". | | |

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

##### 5.2.3.2.22 3gpp-Sbi-Source-NF-Client-Credentials

The header contains client credentials assertion of a source NF instance (e.g. NWDAF, NWDAF containing AnLF) in a service request that is sent from an NF Service Consumer (e.g., DCCF, NWDAF containing MTLF) to an NF Service Producer (e.g. AMF, SMF, NWDAF containing MTLF). The purpose is to enable the authorization of NF service consumers for data access via DCCF or NWDAF containing MTLF (see clause 13.3.8.1 and Annex X of 3GPP TS 33.501 [17]).

The encoding of the header follows the ABNF as defined in IETF RFC 9110 [11].

Sbi-Source-NF-Client-Credentials-Header = "3gpp-Sbi-Source-NF-Client-Credentials:" OWS jwt OWS

The client credentials assertion shall be a JSON Web Token (JWT) as defined in clause 5.2.3.2.11, with the sub claim identifying the source NF instance, i.e. corresponding to the sourceNfInstanceId claim specified in Table 6.3.5.2.4-1 of 3GPP TS 29.510 [8].

The ABNF of the JSON Web Token (JWT) is defined in clause 5.2.3.2.11.

NOTE 1: The 3gpp-Sbi-Source-NF-Client-Credentials header in the service request sent from the NF Service Consumer (e.g., DCCF) to an NF Service Producer (e.g. AMF, SMF) has the same contents as the 3gpp-Sbi-Client-Credentials header received by the NF Service Consumer (e.g. DCCF) from the source NF instance (e.g. NWDAF).

NOTE X: In the scenario of the authorization of a first MTLF to request ML models to a second MTLF on behalf of an AnLF, the 3gpp-Sbi-Source-NF-Client-Credentials header in the service request sent from the NF Service Consumer (e.g. NWDAF containing the first MTLF) to the NF Service Producer (e.g. NWDAF containing the second MTLF) has the same contents as the 3gpp-Sbi-Client-Credentials header received by the NF Service Consumer (i.e. the first MTLF) from the source NF instance i.e, ML model consumer (e.g. AnLF).

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

#### 6.7.5.XX Authorization of requesting ML models on behalf of another ML model consumer

The requirements for security for AI/ML model storage and sharing are specified in clause X.10 of 3GPP TS 33.501 [17].

From the perspective of the NF Service Producer, the ML model consumer (e.g. NWDAF containing AnLF) defined in clause X.10 of 3GPP TS 33.501 [17] correspond to the Source NF Instance, and the NWDAF containing MTLF, or in short MTLF, corresponds to the NF Service Consumer, defined in 3GPP TS 29.510 [8] and in this specification.

The following requirements apply when the source NF Instance and/or the MTLF need to signal their own respective CCAs towards the NF Service Producer:

- In the service request from the source NF instance to the MTLF:

- the 3gpp-Sbi-Client-Credentials conveys the client credentials assertion of the source NF Instance.

- In the service request from the MTLF to the NF Service Producer:

- the 3gpp-Sbi-Client-Credentials shall convey the client credentials assertion of the MTLF; and

- if received from the source instance NF, the 3gpp-Sbi-Source-NF-Client-Credentials shall convey the client credentials assertion of the source NF Instance.

The "403 Forbidden" response with the cause attribute values described in clause 6.7.5.2 is applicable.

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