**3GPP TSG-CT3 Meeting #130 *C3-234xxx***

**Xiamen, China, 9th Oct 2023 - 13th Oct 2023 revision of C3-234368**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **29.222** | **CR** | **0320** | **rev** | **1** | **Current version:** | **18.3.0** |  |
|  | | | | | | | | |
| *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:*** | HTTP RFC uplifting | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NBI18 | | | | |  | ***Date:*** | | | 2023-09-29 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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:*** | | In C4-233141 it was agreed to do the following in NBI specs:  1. Update HTTP/2 references from RFC 7540 to RFC 9113, HTTP semantics RFCs 7230, 7231, 7232, 7235, 7694 to RFC 9110, and HTTP Caching RFC 7234 to RFC 9111.  2. Replace the terms "payload" and "payload body" with the term "content" in the HTTP messages. | | | | | | | | |
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| ***Summary of change:*** | | Replace references to RFCs obsoleted by RFCs 9110, 9111 and 9113 and also replace the terms "payload" and "payload body" with the term "content" in the HTTP messages. | | | | | | | | |
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| ***Consequences if not approved:*** | | The obsoleted RFC and their functionality are referred to and the specification is not according to up to date IETF HTTP specifications. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 5.5.2.2.2, 5.6.2.3.2, 7.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 does not impact the OpenAPI descriptions defined in this specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* \* Start of changes \* \* \* \*

# 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 23.222: "Functional architecture and information flows to support Common API Framework for 3GPP Northbound APIs; Stage 2".

[3] Open API: "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.

[4] IETF RFC 9112: "HTTP/1.1".

[5] IETF RFC 9110: "HTTP Semantics".

[6] Void.

[7] Void.

[8] IETF RFC 9111: "HTTP Caching".

[9] Void.

[10] IETF RFC 9113: "HTTP/2".

[11] Void.

[12] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[13] IETF RFC 6455: "The Websocket Protocol".

[14] 3GPP TS 29.122: "T8 reference point for northbound Application Programming Interfaces (APIs)".

[15] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

[16] 3GPP TS 33.122: "Security Aspects of Common API Framework for 3GPP Northbound APIs".

[17] Void.

[18] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[19] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces Stage 3".

[20] IETF RFC 7239: "Forwarded HTTP Extension".

[21] Void.

[22] W3C HTML 4.01 Specification, <https://www.w3.org/TR/2018/SPSD-html401-20180327/>.

[23] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

[24] IETF RFC 7519: "JSON Web Token (JWT)".

[25] IETF RFC 7515: "JSON Web Signature (JWS)".

[26] 3GPP TS 29.523: "5G System; Policy Control Event Exposure Service; Stage 3".

[27] 3GPP TR 21.900: "Technical Specification Group working methods".

[28] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3"

[29] IETF RFC 5280: "Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile".

[30] 3GPP TS 29.572: "5G System; Location Management Services; Stage 3".

\* \* \* \* Next change \* \* \* \*

##### 5.5.2.2.2 API invoker on-boarding itself as a recognized user of CAPIF using Onboard\_API\_Invoker service operation

To on-board itself as a recognized user of the CAPIF, the API invoker shall send an HTTP POST message to the CAPIF core function. The body of the HTTP POST message shall include API invoker Enrolment Details, API List and a Notification Destination URI for on-boarding notification as specified in clause 8.4.2.2.3.1.

Upon receiving the above described HTTP POST message, the CAPIF core function shall check if it can determine authorization of the request and on-board the API invoker automatically. If the CAPIF core function:

1. can determine authorization of the request and on-board the API invoker automatically, the CAPIF core function:

a. shall process the API invoker Enrolment Details and the API List received in the HTTP POST message and determine if the request sent by the API invoker is authorized or not;

b. if the API invoker's request is authorized, the CAPIF core function shall:

i. create the API invoker Profile consisting of an API invoker Identifier, Authentication Information, Authorization Information and CAPIF Identity Information;

ii. verify the API List present in the HTTP POST message and create a API List of APIs the API invoker is allowed to access;

iii. create a new resource as defined in clause 8.4.2.1;

iv. return the API invoker Profile, API List of APIs the API invoker is allowed to access and the CAPIF Resource URI in the response message.

2. cannot determine authorization of the request to on-board the API invoker automatically, the CAPIF core function:

a. shall acknowledge the receipt of the on-boarding request to the API invoker.

b. shall request the CAPIF administrator to validate the on-boarding request or the API management to validate the on-boarding request by sharing the API invoker Enrolment Details and the API List received in the HTTP POST message;

c. on receiving confirmation of successful validation of the on-boarding request from the CAPIF administrator or the API management, the CAPIF core function shall:

i. create the API invoker Profile consisting of an API invoker Identifier, Authentication Information, Authorization Information and CAPIF Identity Information;

ii. create a new resource as defined in clause 8.4.3;

iii. deliver the API invoker Profile, API List of APIs the API invoker is allowed to access and the CAPIF Resource URI to the API invoker in a notification.

NOTE 1: How the CAPIF core function determines that the CAPIF core function can process the request and on-board the API invoker automatically is out-of-scope of this specification.

NOTE 2: How the CAPIF core function determines that the API invoker's request to on-board is authorized is specified in 3GPP TS 33.122 [16].

NOTE 3: Interactions between the CAPIF core function and the CAPIF administrator or the API management is out-of-scope of this specification.

NOTE 4: The onboarding credential received by the API invoker from the service provider as specified in 3GPP TS 33.122 [16] is included in the Authorization header field of the HTTP request message as described in IETF RFC 9110 [5].

NOTE 5: After the onboarding operation is completed the API Invoker no longer needs to maintain the Notification Destination URI and may delete it.

\* \* \* \* Next change \* \* \* \*

##### 5.6.2.3.2 Obtain authorization using Obtain\_Authorization service operation

To obtain authorization information from the CAPIF core function to invoke service APIs, the API invoker shall perform the functions of the resource owner, client and redirection endpoints as described in clause 6.5.2.3 of 3GPP TS 33.122 [16].

The API invoker shall send a POST request to the "Token Endpoint", as described in IETF RFC 6749 [23], clause 3.2. The "Token Endpoint" URI shall be:

{apiRoot}/capif-security/v1/securities/{securityId}/token

where {securityId} is the API invoker identifier and represents the "Individual trusted API invoker" resource created during obtain security method, as described in clause 5.6.2.2.  
  
The body of the HTTP POST request shall indicate that the required OAuth2 grant must be of type "client\_credentials". The "scope" parameter (if present) shall include a list of AEF identifiers and its associated API names the API invoker is trying to access (i.e., the API invoker expected scope).

The API invoker may use HTTP Basic authentication towards this endpoint, using the API invoker identifier as "username" and the onboarding secret as "password". Such username and password may be included in the header or body of the HTTP POST request.

On success, "200 OK" shall be returned. The content of the POST response shall contain the requested access token, the token type and the expiration time for the token. The access token shall be a JSON Web Token (JWT) as specified in IETF RFC 7519 [24]. The access token returned by the CAPIF core function shall include the claims encoded as a JSON object as specified in clause 8.5.4.2.8 and then digitally signed using JWS as specified in IETF RFC 7515 [25] and in Annex C.1 of 3GPP TS 33.122 [16].

The digitally signed access token shall be converted to the JWS Compact Serialization encoding as a string as specified in clause 7.1 of IETF RFC 7515 [25].

If the access token request fails at the CAPIF core function, the CAPIF core function shall return "400 Bad Request" status code, including a JSON object in the response content, that includes details about the specific error that occurred.

\* \* \* \* Next change \* \* \* \*

## 7.3 Usage of HTTP

For CAPIF APIs, support of HTTP/1.1 (IETF RFC 9112 [4], IETF RFC 9110 [5], and IETF RFC 9111 [8]) over TLS is mandatory and support of HTTP/2 (IETF RFC 9113 [10]) over TLS is recommended. TLS shall be used as specified in 3GPP TS 33.122 [16].

A functional entity desiring to use HTTP/2 shall use the HTTP upgrade mechanism to negotiate applicable HTTP version as described in IETF RFC 9113 [10].

\* \* \* \* End of changes \* \* \* \*