**3GPP TSG-SA3 Meeting #104-e ad-hoc *draft\_S3-213501-r2***

e-meeting, 27 - 30 September 2021

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **33.501** | **CR** | **DRAFT** | **rev** | **1** | **Current version:** | **17.2.1** |  |
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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:***  | Modifications in the access token procedures to implement the conclusions of KI 1.3 of TR 33.866 |
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| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, Lenovo, Motorola Mobility |
| ***Source to TSG:*** | S3 |
|  |  |
| ***Work item code:*** | eNA\_Ph2 |  | ***Date:*** | 2021-09-27 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | As concluded in the KI 1.3 of TR 33.866, Solution 10 is considered as the baseline. |
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| ***Summary of change:*** | The newly added Annex is referrenced in Clause 13. |
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| ***Consequences if not approved:*** | No security procedure for eNA Rel-17 feature |
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| ***Clauses affected:*** | 13.4.1.1.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  |  |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | Annex X is a new annex on eNA aspects |
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| ***This CR's revision history:*** | S3-213501 |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Start of Change 1 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 13.4.1.1.2 Service Request Process

The complete service request is a two-step process including requesting an access token by NF Service Consumer (Step 1, i.e. 1a or 1b), and then verification of the access token by NF Service Producer (Step 2).

NOTE: The service request process regarding the enabler for network automation is specified in Annex X.

**Step 1: Access token request**

Pre-requisite:

- The NF Service consumer (OAuth2.0 client) is registered with the NRF (Authorization Server).

- The NF Service Producer (OAuth2.0 resource server) is registered with the NRF (Authorization Server) with "additional scope" information per NF type.

- The NRF and NF Service Producer share the required credentials.

- The NRF and NF have mutually authenticated each other.

**1a. Access token request** **for** **accessing services of NF Service Producers of a specific NF type**

The following procedure describes how the NF Service Consumer obtains an access token before service access to NF Service Producers of a specific NF type.



Figure 13.4.1.1.2-1: NF Service Consumer obtaining access token before NF Service access

1. The NF Service Consumer shall request an access token from the NRF in the same PLMN using the Nnrf\_AccessToken\_Get request operation. The message shall include the NF Instance Id(s) of the NF Service Consumer, the requested "scope" including the expected NF Service name(s) and optionally "additional scope" information (i.e. requested resources and requested actions (service operations) on the resources), NF type of the expected NF Service Producer instance and NF Service Consumer. The NF Service Consumer may also include a list of NSSAIs or list of NSI IDs for the expected NF Service Producer instances.

The message may include the NF Set ID of the expected NF Service Producer instances.

The message may include a list of S-NSSAIs of the NF Service Consumer.

2. The NRF may verify that the input parameters (e.g., NF type) in the access token request match with the corresponding ones in the public key certificate of the NF Service Consumer or those in the NF profile of the NF Service Consumer. The NRF checks whether the NF Service Consumer is authorized to access the requested service(s). If the NF Service Consumer is authorized, the NRF shall then generate an access token with appropriate claims included. The NRF shall digitally sign the generated access token based on a shared secret or private key as described in RFC 7515 [45]. If the NF Service Consumer is not authorized, the NRF shall not issue an access token to the NF Service Consumer.

The claims in the token shall include the NF Instance Id of NRF (issuer), NF Instance Id of the NF Service Consumer (subject), NF type of the NF Service Producer (audience), expected service name(s), (scope), expiration time (expiration) and optionally "additional scope" information (allowed resources and allowed actions (service operations) on the resources). The claims may include a list of NSSAIs or NSI IDs for the expected NF Service Producer instances. The claims may include the NF Set ID of the expected NF Service Producer instances.

3. If the authorization is successful, the NRF shall send access token to the NF Service Consumer in the Nnrf\_AccessToken\_Get response operation, otherwise it shall reply based on Oauth 2.0 error response defined in RFC 6749 [43]. The other parameters (e.g., the expiration time, allowed scope) sent by NRF in addition to the access token are described in TS 29.510 [68].

The NF Service Consumer may store the received token(s). Stored tokens may be re-used for accessing service(s) from NF Service Producer NF type listed in claims (scope, audience) during their validity time.

**1b. Access token request for accessing services of a specific NF Service Producer instance / NF Service Producer service instance**

The following steps describes how the NF Service Consumer obtains an access token before service access to a specific NF Service Producer instance / NF Service Producer service instance. 1. The NF Service Consumer shall request an access token from the NRF for a specific NF Service Producer instance / NF Service Producer service instance. The request shall include the NF Instance Id(s) of the requested NF Service Producer, the expected NF Service name, optionally "additional scope" information (allowed resources and allowed actions (service operations) on the resources) and NF Instance Id of the NF Service Consumer.

2.The NRF checks whether the NF Service Consumer is authorized to use the requested NF Service Producer instance/NF Service Producer service instance, and then proceeds to generate an access token with the appropriate claims included. If the NF Service Consumer is not authorized, the NRF shall not issue an access token to the NF Service Consumer.

The claims in the token shall include the NF Instance Id of NRF (issuer), NF Instance Id of the NF Service Consumer (subject), NF Instance Id or several NF Instance Id(s) of the requested NF Service Producer (audience), expected service name(s) (scope), optionally "additional scope" information (allowed resources and allowed actions (service operations) on the resources), and expiration time (expiration).

3. The token shall be included in the Nnrf\_AccessToken\_Get response sent to the NF Service Consumer. The NF Service Consumer may store the received token(s). Stored tokens may be re-used for accessing service(s) from NF Instance Id or several NF Instance Id(s) of the requested NF Service Producer instance listed in claims (scope, audience) during their validity time.

**Step 2: Service access request based on token verification**

The following figure and procedure describe how authorization is performed during Service request of the NF Service Consumer. Prior to the request, the NF Service Consumer may perform Nnrf\_NFDiscovery\_Request operation with the requested additional scopes to select a suitable NF Service Producer (resource server) which is able to authorize the Service Access request.



Figure 13.4.1.1.2-2: NF Service Consumer requesting service access with an access token

Pre-requisite: The NF Service Consumer is in possession of a valid access token before requesting service access from the NF Service Producer.

1. The NF Service Consumer requests service from the NF Service Producer. The NF Service Consumer shall include the access token.

The NF Service Consumer and NF Service Producer shall authenticate each other following clause 13.3.

2. The NF Service Producer shall verify the token as follows:

 - The NF Service Producer ensures the integrity of the token by verifying the signature using NRF’s public key or checking the MAC value using the shared secret. If integrity check is successful, the NF Service Producer shall verify the claims in the token as follows:

NOTE: Void.

- It checks that the audience claim in the access token matches its own identity or the type of NF Service Producer. If a list of NSSAIs or list of NSI IDs is present, the NF Service Producer shall check that it serves the corresponding slice(s).

- If an NF Set ID present, the NF Service Producer shall check the NF Set ID in the claim matches its own NF Set ID.

- If scope is present, it checks that the scope matches the requested service operation.

- If the access token contains "additional scope" information (i.e. allowed resources and allowed actions (service operations) on the resources), it checks that the additional scope matches the requested service operation.

- It checks that the access token has not expired by verifying the expiration time in the access token against the current data/time.

- If the CCA is present in the service request, it may verify the CCA as specified in clause 13.3.8.3 and that the subject claim (i.e., the NF Instance Id of the NF Service Consumer) in the access token matches the subject claim in the CCA.

3. If the verification is successful, the NF Service Producer shall execute the requested service and responds back to the NF Service Consumer. Otherwise it shall reply based on Oauth 2.0 error response defined in RFC 6749 [43].

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of Change 1 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*