**3GPP TSG-SA3 Meeting #121 S3-25xxxx-r3**

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pCR to draft CR S3-251116 from SA3#120

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

## 6.X Security procedures for CAPIF interconnection

### 6.X.1 General

The CAPIF provider A and CAPIF provider B host the CAPIF in their trust domains as specified in clause 6.2.2 in TS 23.222 [xx]. The designated CAPIF core function of the CAPIF provider A interconnects with the designated CAPIF core function of the CAPIF provider B over CAPIF-6/6e interface.

The following clauses 6.X.2 and 6.X.3 details security aspects of the scenario where, the API invoker is onboarded to CCF-B of the CAPIF provider B and the target AEF is registered to CCF-A of CAPIF provider A.

### 6.X.2 Security method negotiation

The API invoker and the CCF-A shall negotiate a security method that shall be used by the API invoker and the AEF for CAPIF-2e interface authentication and protection. After successful mutual authentication on CAPIF-1e interface, based on the API invoker's subscribed service APIs, access scenarios (whether the API invoker access the AEF prior to service API invocation or upon the service API invocation) and AEF capabilities, the CCF-A shall select the security methods and send the selected security methods to the API invoker, along with the information required for authentication of the API invoker with the AEF.

For security method negotiation procedure in CAPIF interconnection, clause 6.3.1.2 shall be followed with the following enhancement:

* The API invoker shall send the security method request to the CCF-B. The API invoker shall include AEF details and the CAPIF-2/2e security capability information in the security method negotiation request to the CCF-B.
* Based on the AEF details received from the API invoker, CCF-B identifies the CCF-A where the AEF is registered and forwards the request to CCF-A.
* The CCF-A shall select a security method to be used over CAPIF-2/2e reference point for each AEF, considering the information received from CCF-B, access scenarios and AEF capabilities.
* The CCF-A shall send Security Method Response message to the API invoker via CCF-B, indicating the selected security method for each AEF, any security information related to the security method.

Ericsson: AEF security info (i.e., Security method supported by AEF.) is shared among CCFs.

AP:@Ericsson Please give details via email and check the discussion paper.

### 6.X.4 Authentication and authorization procedure

For the mutual authentication between the API invoker onboarded to CCF-B in CAPIF provider B and AEF registered to the CCF-A in CAPIF provider A, the procedures as defined in clause 6.5.2 shall be followed with the enhancements as specified in clause 6.X.4.1 and 6.X.4.2.

#### 6.X.4.1 Method 1 or 2: TLS-PSK or PKI

* The API invoker contacts CCF-B, which contacts CCF-A (where AEF is registered). to get frin CCF-A an OAuth access token for authorization.
* The API invoker shall include the API invoker ID, the CCF-B information (CAPIF core function the API invoker is onboarded to) and the access token in the authentication initiation request message sent to the target AEF in CAPIF provider domain A.
* The AEF shall request for security information from CCF-A to perform authentication and secure interface establishment with the API invoker, if the AEF does not have a security information. The request shall include the API invoker ID and the CCF-B information.
* AP@Samsung: Clarification for how API invoker determine to send the CCF ID (i.e., The API discovery procedure related content.)
* AP@ Xiaomi API discovery & onboarding clarification
* Ericsson: CCF-B can send CCF-A notification about onboarded API invoker.
* Ericsson: Both CCFs can issue the token.
* CT&Nokia&Xiaomi: Only one CCF can issue the token.
* Lenovo: How AEF gets the key from two CCFs.
* When the CCF-A receives the request message from the AEF for security information, the CCF-A fetches security information based on API invoker ID and the CCF-B information. If it has no security information, the CCF-A shall request the security information (AEFPSK/root CA) from CCF-B over CAPIF-6/6e reference point based on the received API invoker ID and CCF-B information
* The AEF shall authorize the API invoker's service API invocation request based on authorization information obtained from CCF-A as specified in sub clause 8.16 of TS 23.222 [3].

Editor’s Note: to be clarified: If CCF-A does not have sufficient information to authorize the service API invocation, it learns the authorization information from CCF-B.

* ??? what is the missing information that CCF-A.
* Definition of authorization information. – It is just refers to whether it is authorized. Allowed/not allowed or token. (first sentence then correct?)

#### 6.X.4.2 Method 3: TLS with OAuth Token

See above disc.

* The API invoker shall send the access token request message to the onboarded CCF-B including onboarding secret, resource owner ID, and API invoker authentication information, CCF-B determines that the service API requested is provided by the AEFs in CAPIF provider domain A and follows the following steps:

1. CCF-B forwards the access token request to the CCF-A including the API invoker authentication information.
2. After CCF-A has validated the API invoker authentication information details, CCF-A provides an access token to CCF-B as specified in clause 6.5.2.3. The access token is specific to the AEF in CAPIF provider domain A and signed by the CCF-A as per IETF RFC 7515 [zz].
3. CCF-B provides the access token to the API invoker as specified in clause 6.5.2.3. The access token is specific to the AEF in CAPIF provider domain A and signed by the CCF-B as per IETF RFC 7515 [zz].

* The API invoker shall include the API invoker ID and CCF-B information in the OAuth 2.0 based access token request sent via CCF-B to CCF-A of the target AEF in CAPIF provider domain A.
* CCF-B shall include the API invoker ID and authentication information in the OAuth 2.0 based access token request sent to CCF-A.
* Nokia: CCA-based mechanism is needed. CCF works like the SCP.
* Ericsson&Huawei: CCF works like the NRF rather than SCP. There is business agreement between CCFs.
* If the AEF does not have a security information, AEF shall request for security information from CCF-A to perform authentication and secure interface establishment with the API invoker,. The request shall include the API invoker ID and the CCF-B information.
* When the CCF-A receives the request message from the AEF for security information, the CCF-A fetches security information based on API invoker ID and the CCF-B information. If it has no security information, the CCF-A shall request the security information from CCF-B over CAPIF-6/6e reference point based on the received API invoker ID and CCF-B information.
* The AEF shall validate the access token. The AEF verifies the integrity of the access token by verifying the CCF’s signature. If validation of the access token is successful, the AEF shall verify the API invoker's Northbound API invocation request against the authorization claims in access token, ensuring that the API Invoker has access permission for the requested service API.

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