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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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Introduction

In 3GPP, there are multiple northbound API-related specifications (e.g. APIs for Service Capability Exposure Function (SCEF) functionalities defined in 3GPP TS 23.682 [2], API for the interface between MBMS service provider and BM-SC defined in 3GPP TR 26.981 [5]). To avoid duplication and inconsistency of approach between different API specifications, 3GPP has considered the development of a common API framework (CAPIF) that includes common aspects applicable to any northbound service APIs.

The present document specifies the functional model, procedures and information flows needed to support the CAPIF, and the guidelines for consistent northbound API (service and CAPIF APIs) development in 3GPP.

NOTE: It is possible to use the CAPIF defined common aspects for other APIs as well, apart from northbound APIs.

1 Scope

The present document specifies the architecture, procedures and information flows necessary for the CAPIF. The aspects of this specification include identifying architecture requirements for the CAPIF (e.g. registration, discovery, identity management) that are applicable to any service APIs when used by northbound entities, as well as any interactions between the CAPIF and the service APIs themselves. The common API framework applies to both EPS and 5GS, can be hosted within a PLMN or SNPN, and is independent of the underlying 3GPP access (e.g. E-UTRA, NR).

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 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".

[3] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[4] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[5] 3GPP TR 26.981: "MBMS Extensions for Provisioning and Content Ingestion".

[6] 3GPP TS 32.240: "Telecommunication management; Charging management; Charging architecture and principles".

[7] ETSI GS MEC 011 (V1.1.1): "Mobile Edge Computing (MEC); Mobile Edge Platform Application Enablement".

[8] ETSI GS MEC 009 (V1.1.1): "Mobile Edge Computing (MEC); General Principles for Mobile Edge Service APIs".

[9] OMA-ER_Autho4API-V1_0-20141209-A: "Authorization Framework for Network APIs".

[10] OMA-TS-REST_NetAPI_Common-V1_0-20180116-A: "Common definitions for RESTful Network APIs".

[11] OMA-TS-NGSI_Registration_and_Discovery-V1_0-20120529-A: "NGSI Registration and Discovery".

[12] 3GPP TS 33.122: "Security Aspects of Common API Framework for 3GPP Northbound APIs".

[13] IETF RFC 6749 (October 2012): "The OAuth 2.0 Authorization Framework".

[14] 3GPP TS 23.434: "Service Enabler Architecture Layer for Verticals (SEAL); Functional architecture and information flows".

[15] 3GPP TS 33.501: "Security architecture and procedures for 5G System".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

API: The means by which an API invoker can access the service.

API invoker: The entity which invokes the CAPIF or service APIs.

API invoker profile: The set of information associated to an API invoker that allows that API invoker to utilize CAPIF APIs and service APIs.

API exposing function: The entity which provides the service communication entry point for the service APIs.

API exposing function location: The location information (e.g. civic address, GPS coordinates, data center ID) where the API exposing function providing the service API is located.

API category: A name used to group service APIs by the service domain in which they are used (e.g., IoT, V2X). The CAPIF core function maintains a list of API category names.

API management function: The entity which enables the API provider to perform administration of the service APIs.

API publishing function: The entity that enables the API provider to publish the Service APIs information in order to enable the discovery of APIs by the API invoker.

Authorization function: The entity which issues access tokens to the API invokers after successfully authenticating the resource owner and obtaining authorization.

CAPIF administrator: An authorized user with special permissions for CAPIF operations.

Common API framework: A framework comprising common API aspects that are required to support service APIs.

Designated CAPIF core function: The CAPIF core function which is configured as the serving CAPIF core function for interconnection.

Northbound API: A service API exposed to higher-layer API invokers.

Onboarding: One time registration process that enables the API invoker to subsequently access the CAPIF and the service APIs.

Resource: The object or component of the API on which the operations are acted upon.

Resource owner: A UE user or an MNO subscriber capable of granting access to a protected resource related to the invoked API via resource owner function.

Resource owner function: The entity that enables the authorization for resource access and managing and revoking authorization for resource access.

Resource owner-aware northbound API access: An API invocation scenario where the API invoker needs an authorization from the resource owner.

Service API: The interface through which a component of the system exposes its services to API invokers by abstracting the services from the underlying mechanisms.

Serving Area Information: The location information for which the service APIs are being offered to.

CAPIF provider domain: A domain that contains an instance of CAPIF core function and may contain API provider domains and API invokers. The CAPIF provider could be a PLMN, SNPN or 3rd party. Throughout this document, PLMN trust domain is often used as the typical deployment of a CAPIF provider domain however SNPN trust domain or 3rd party trust domain are applicable as well.