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5G;**

**Common API Framework for 3GPP Northbound APIs  
(3GPP TS 23.222 version 15.4.0 Release 15)**

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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, and is independent of the underlying 3GPP access (e.g. E-UTRA, NR).

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## 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".

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## 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.

**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.

**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.

**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.

**PLMN trust domain:** The entities protected by adequate security and controlled by the PLMN operator or a trusted 3<sup>rd</sup> party.

For the purposes of the present document, the following terms and definitions given in 3GPP TS 32.240 [6] apply:

**Offline charging**

**Online charging**

## 3.2 Abbreviations

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

5GS	5G System
AEF	API Exposing Function
AF	Application Function
API	Application Program Interface
AS	Application Server
BM-SC	Broadcast Multicast Service Centre
CAPIF	Common API Framework
CDR	Charging Data Record
CRUD	Create, Read, Update, Delete
DDoS	Distributed Denial of Service
E-UTRA	Evolved Universal Terrestrial Radio Access
EPS	Evolved Packet System
ETSI	European Telecommunications Standards Institute
GS	Group Specification
IP	Internet Protocol
MBMS	Multimedia Broadcast and Multicast Service
MEC	Multi-access Edge Computing
NEF	Network Exposure Function
NGSI	Next Generation Service Interfaces
NR	New Radio
OMA	Open Mobile Alliance
OAM	Operations, Administration and Maintenance
OWSER	OMA Web Services
PC	Protocol Converter
PLMN	Public Land Mobile Network
REST	REpresentational State Transfer
RPC	Remote Procedure Call
SCEF	Service Capability Exposure Function

SCS	Service Capability Server
UDDI	Universal Description, Discovery and Integration
URI	Uniform Resource Identifier
WSDL	Web Services Description Language

---

## 4 Architectural requirements

### 4.1 General

#### 4.1.1 Introduction

This subclause specifies the general requirements for CAPIF architecture.

#### 4.1.2 Requirements

[AR-4.1.2-a] The CAPIF shall provide mechanisms (e.g. publish service APIs, authorization, logging, charging) to support service API operations.

[AR-4.1.2-b] The CAPIF shall enable API invoker(s) to discover and communicate with service APIs from the API providers.

[AR-4.1.2-c] Reference points between CAPIF and external applications shall be provided as APIs.

[AR-4.1.2-d] Reference points internal to CAPIF may be provided as APIs.

#### 4.1.3 Requirements for supporting 3<sup>rd</sup> party API providers

[AR-4.1.3-a] The CAPIF shall provide mechanisms (e.g. publish service APIs, authorization, logging, charging) to support service API operations from trusted 3<sup>rd</sup> party API providers.

[AR-4.1.3-b] The CAPIF shall enable API invoker(s) to discover and communicate with service APIs from trusted 3<sup>rd</sup> party API providers.

NOTE: The solutions to the requirements for 3<sup>rd</sup> party API providers are not addressed in the current release of this specification.

### 4.2 Service API publish and discover

#### 4.2.1 Introduction

This subclause specifies the service API publish and discover related requirements.

#### 4.2.2 Requirements

[AR-4.2.2-a] The CAPIF shall provide a mechanism to publish the service API information to be used by the API invokers to discover and subsequently invoke the service API.

[AR-4.2.2-b] The CAPIF shall provide a mechanism for the API invokers to discover the published service API information as specified in [AR-4.2.2-a] according to the API invokers' interest.

[AR-4.2.2-c] The CAPIF shall provide a mechanism to restrict the discovery of the published service API information by the API invokers, based on configured policies.

[AR-4.2.2-d] The CAPIF shall provide a mechanism to configure policies to restrict the discovery of the published service API information.