

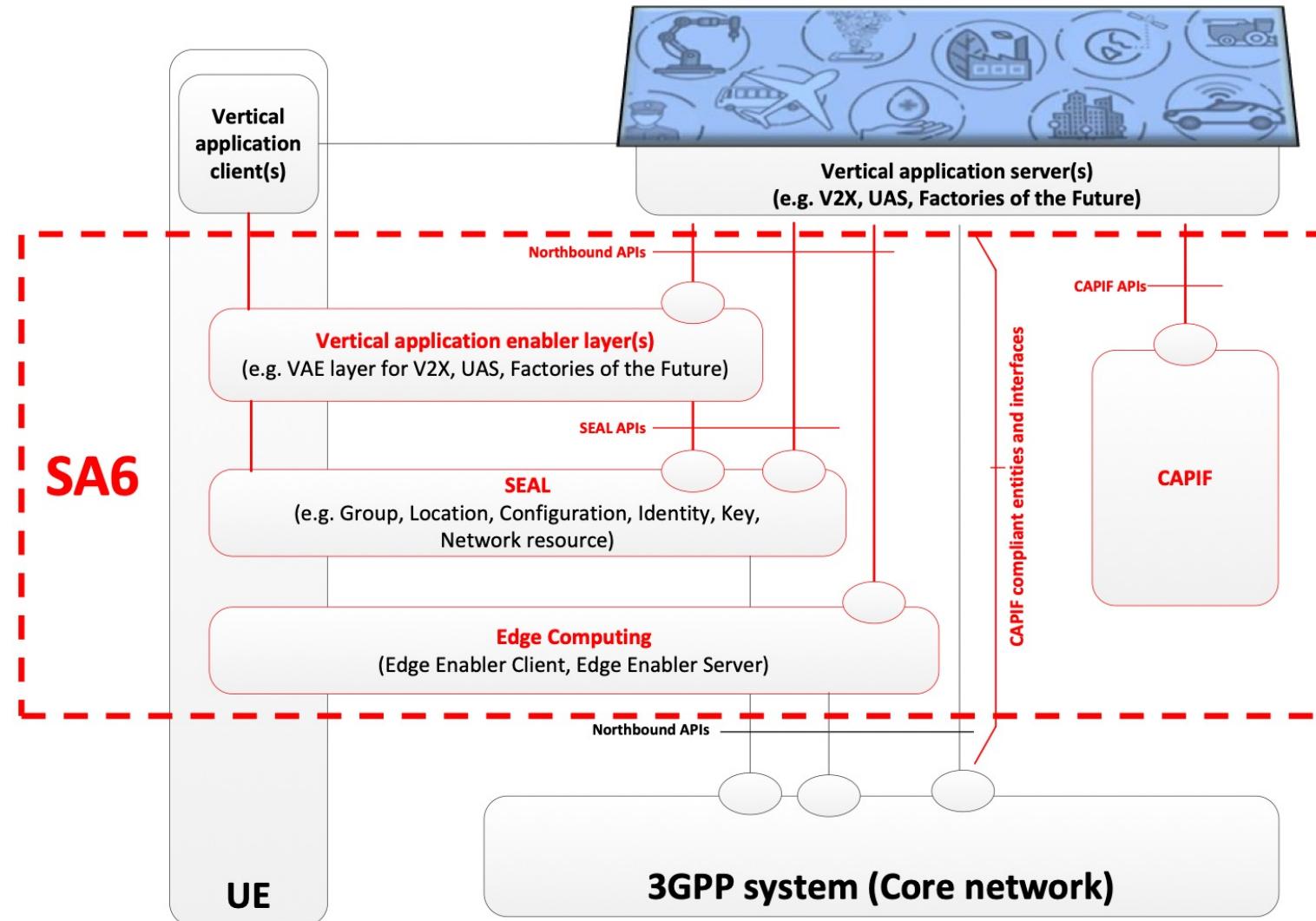
# OpenCAPIF

*by ETSI*

David Artuñedo Guillén – OpenCAPIF Convenor

# What is CAPIF?

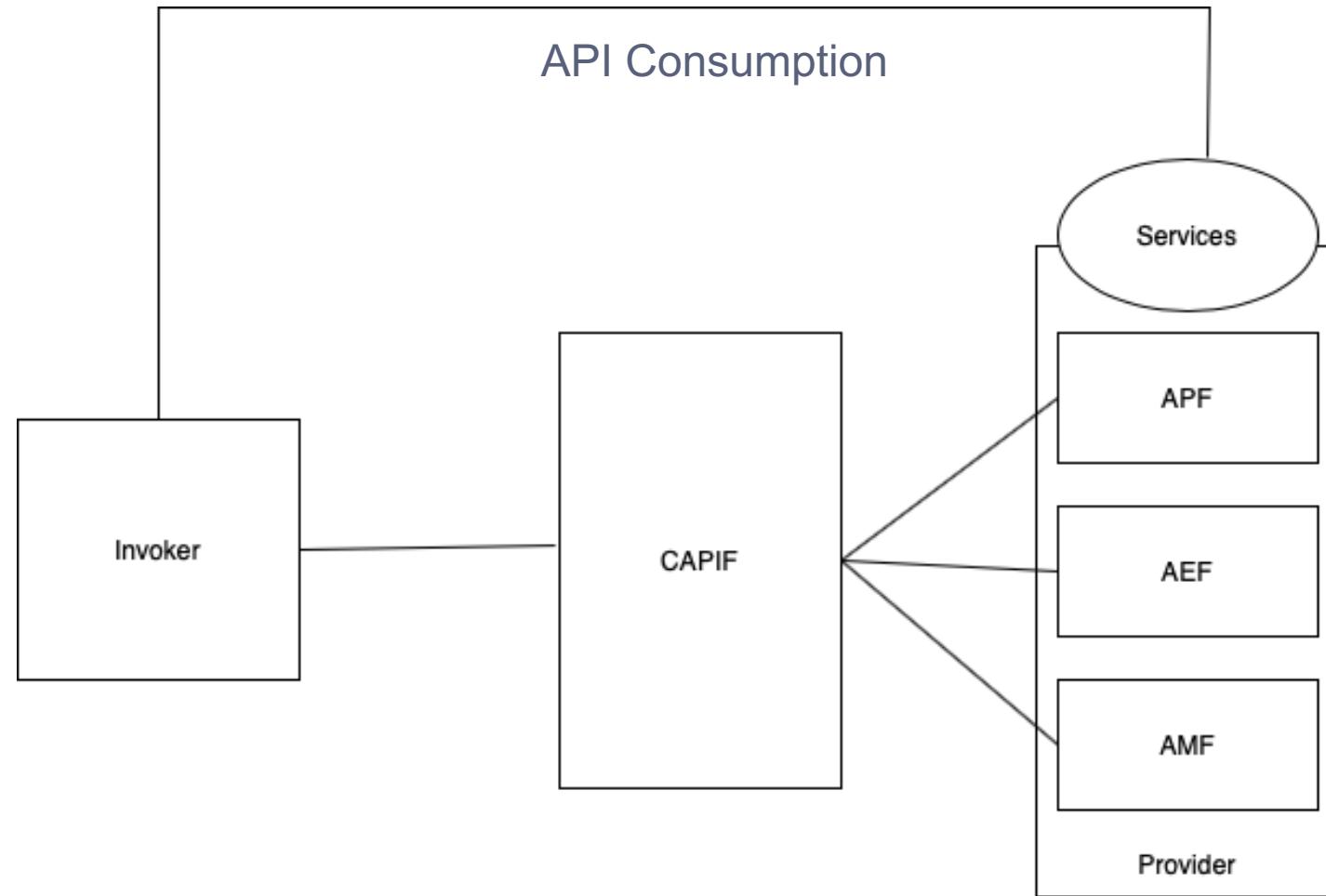
# What is CAPIF?



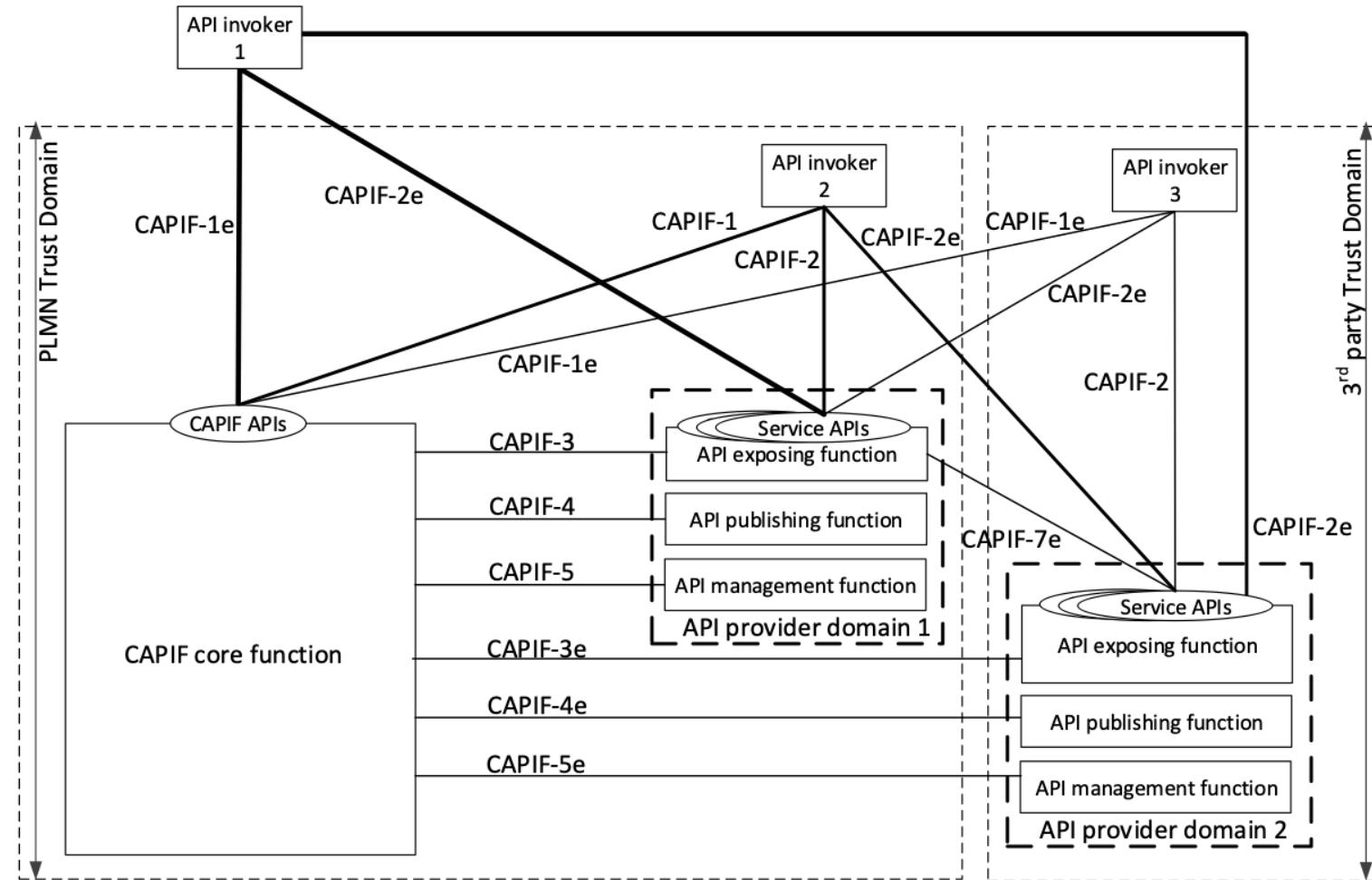
# What is CAPIF?

- During 3GPP **Release 15**, the Common API Framework (**CAPIF**) was developed to enable a unified **Northbound API** framework across 3GPP network functions, and to ensure that there is a **single and harmonized approach for API development** (Refer to 3GPP TS 23.222, TS 33.122 and TS 29.222).
- CAPIF provides a **framework to host network and service APIs** of PLMN and from 3rd party domain.
- CAPIF has been integrated with Northbound APIs such as **SCEF/NEF**
- **Release 17** has been selected for implementing **OpenCAPIF**

# How CAPIF works?

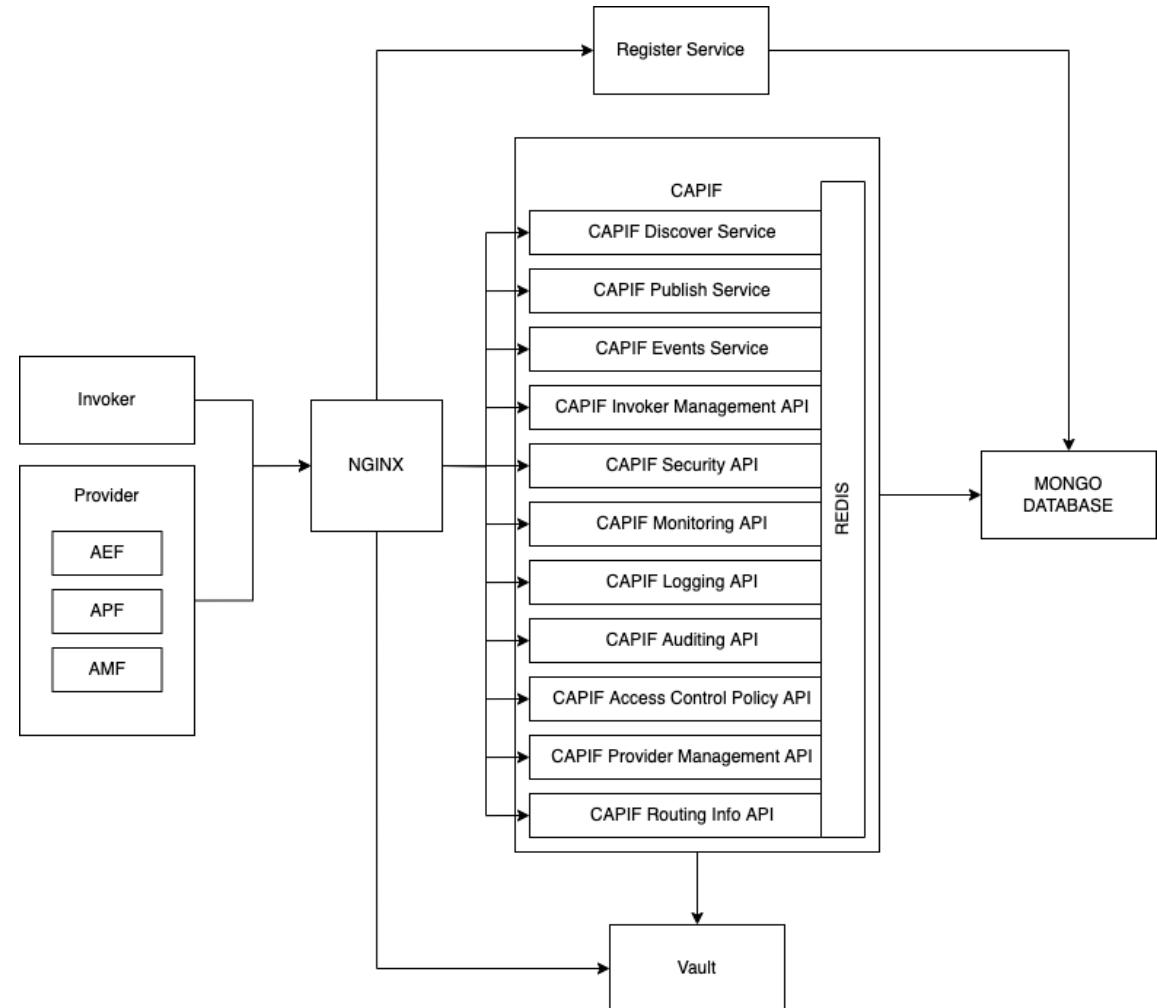


# How CAPIF works?

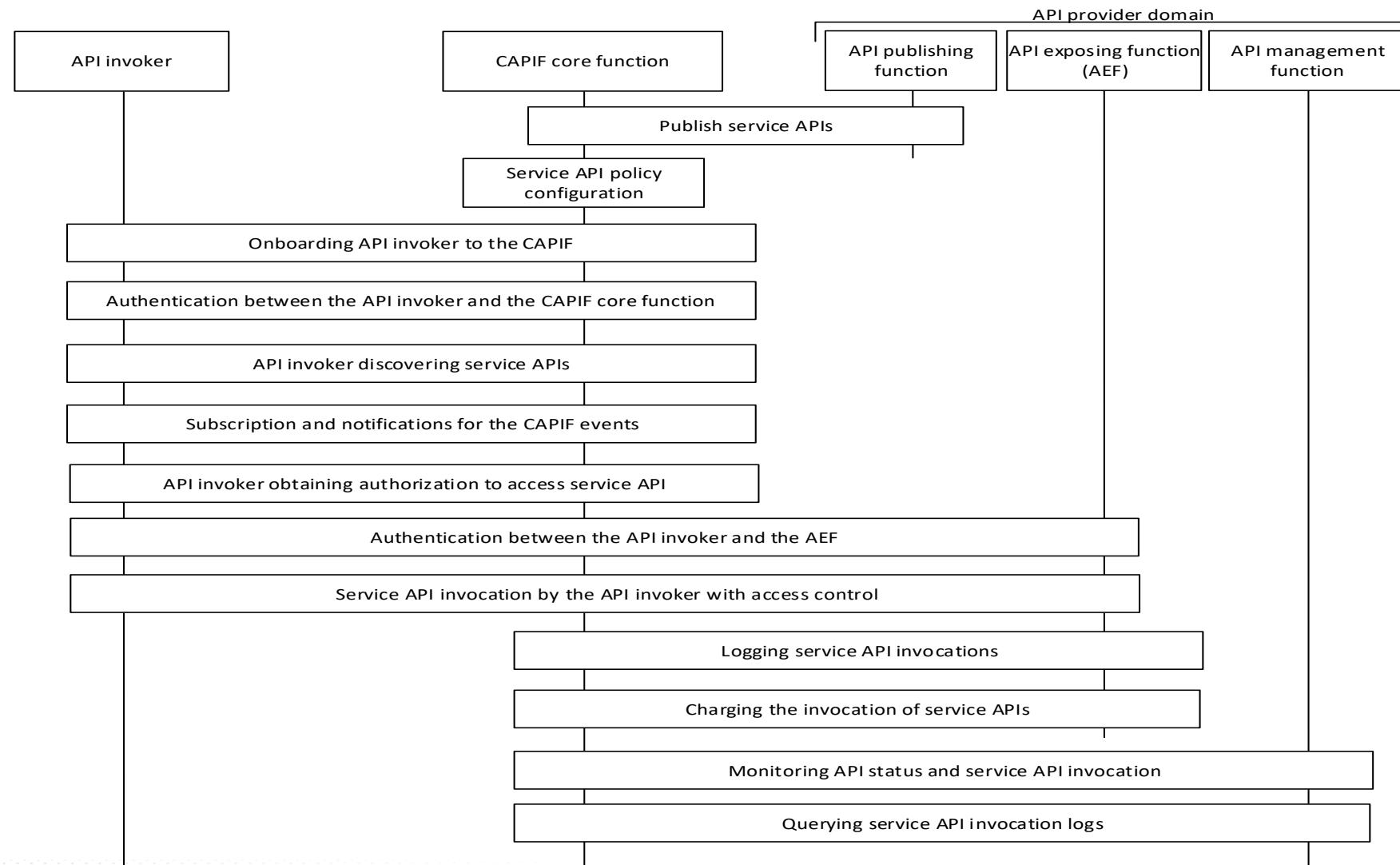


# CAPIF Implementation

- **NGINX** exposes CAPIF Core Function Services with **mutual TLS** authentication
- We use **VAULT** as the Certificate Authority to expedite Certificates
- All data is stored in **MongoDB**
- **REDIS** manages CAPIF **Events** Generation and Notifications
- Each CAPIF service is a separate **Container**
- CAPIF Core Function deploys in **Kubernetes**
- **Testing** implemented in **RobotFramework**

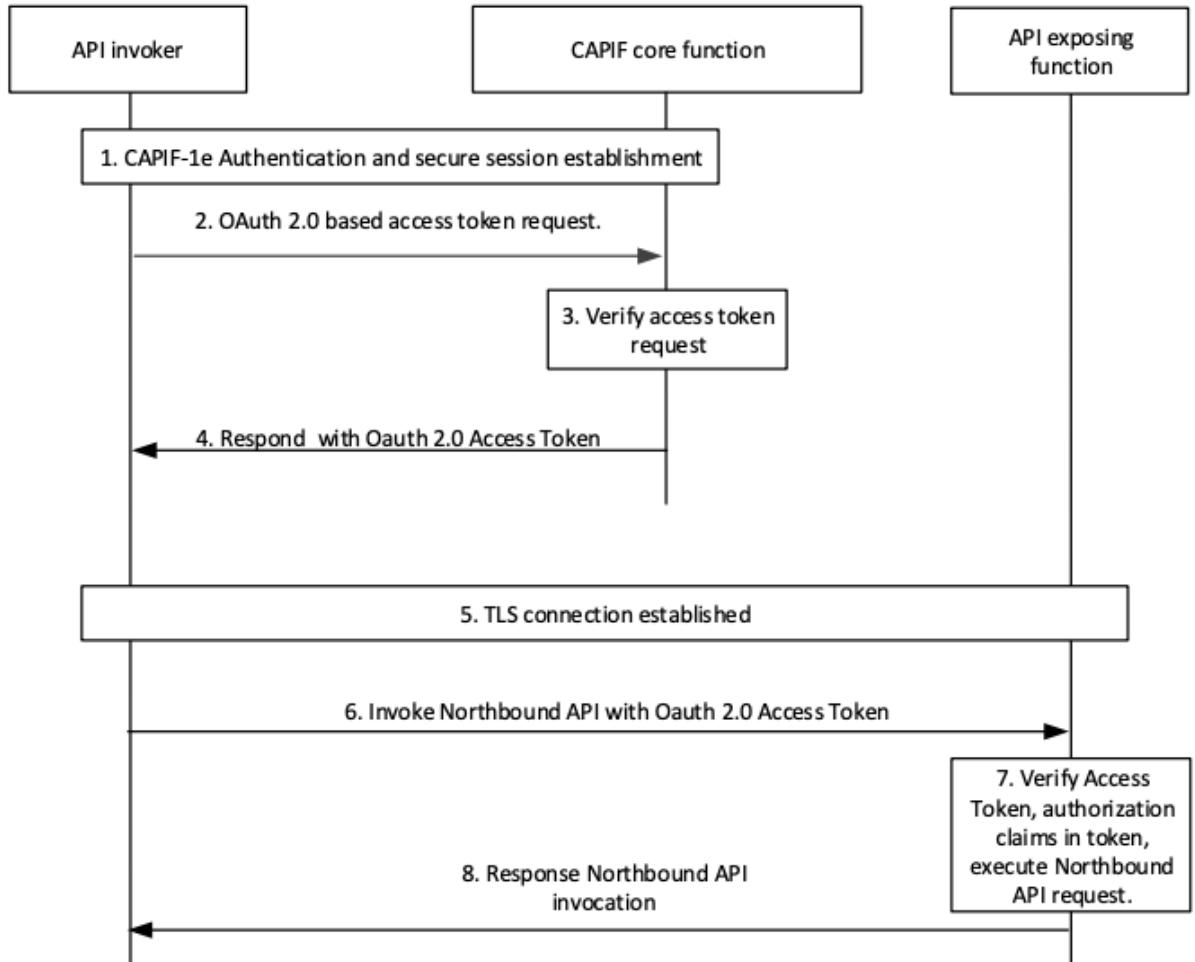


# CAPIF Flows



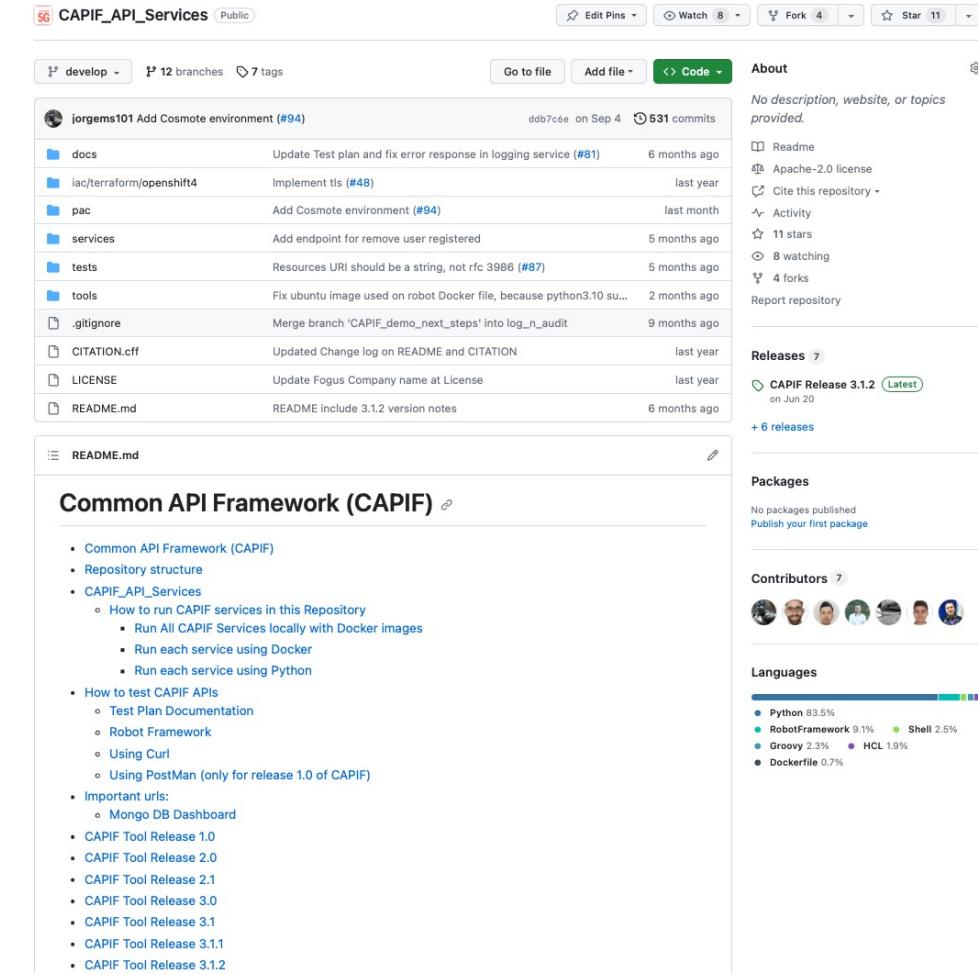
# CAPIF Security

- CAPIF Core Function supports only **TLS mutual authentication** for API Invokers and API Providers
- CAPIF Core Function developed includes a **Certificate Authority** to expedite Certificates for API Invokers and API Providers
- API Consumption between API Invokers and API Providers supports **three security** mechanisms:
  1. Pre-Shared Key
  2. Certificates
  3. Oauth 2.0Tokens

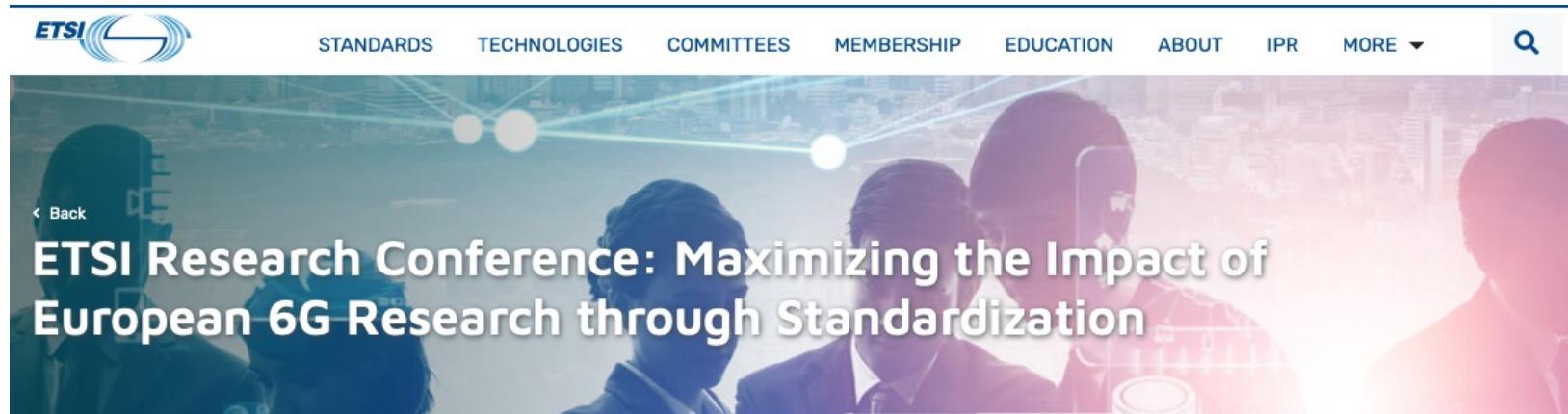


# OpenCAPIF Genesis

- Evolved5G Project (ICT-41) did a definition of **Network Applications** concept explained in Whitepaper ["Network Applications: Opening up 5G and Beyond Networks"](#).
- The **northbound** interfaces (APIs) of 5G Networks selected for Network Applications development were **NEF and CAPIF**.
- 3GPP CAPIF and NEF APIs **are available** at [https://forge.3gpp.org/rep/all/5G\\_APIs](https://forge.3gpp.org/rep/all/5G_APIs).
- We used **Open API Generator** used to generate code for CAPIF APIs (YAML), followed by a **Python implementation** of CAPIF Services
- **Open Source (Apache 2)** implementation of CAPIF Core Function has been published in **Evolved5G** Github



# OpenCAPIF Conception



- ETSI **Software Development Groups** were presented at ETSI Research Conference in February 2023
- CAPIF development partners and ETSI engaged in **expression of interest** in March 2023
- **SDG Open CAPIF** submission request in July 2023
- SDG Open CAPIF was discussed at **ETSI Board** and **approved by ETSI D-G** in September 2023

# OpenCAPIF What's next....

- OpenCAPIF Founding members:



UNIVERSIDAD  
DE MÁLAGA



NATIONAL CENTRE FOR  
SCIENTIFIC RESEARCH "DEMOKRITOS"



HELLENIC REPUBLIC  
National and Kapodistrian  
University of Athens

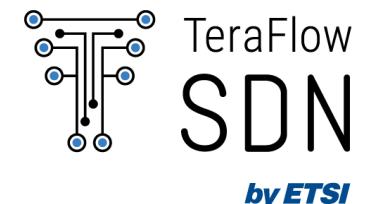
- OpenCAPIF **SDG Agreement** is in signature process
- **SDG Creation Announcement** planned for November 2023
- **Kick off** meeting scheduled for **January 2024** at Telefónica HQ (Madrid)
- OpenCAPIF will be **open for all contributors** to participate

# Just the beginning...

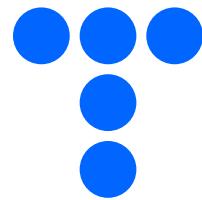
- **SNS Projects** using CAPIF:



- Conversations with other **Open Source** Initiatives and open for discussions:



# Thank You!



Telefónica