

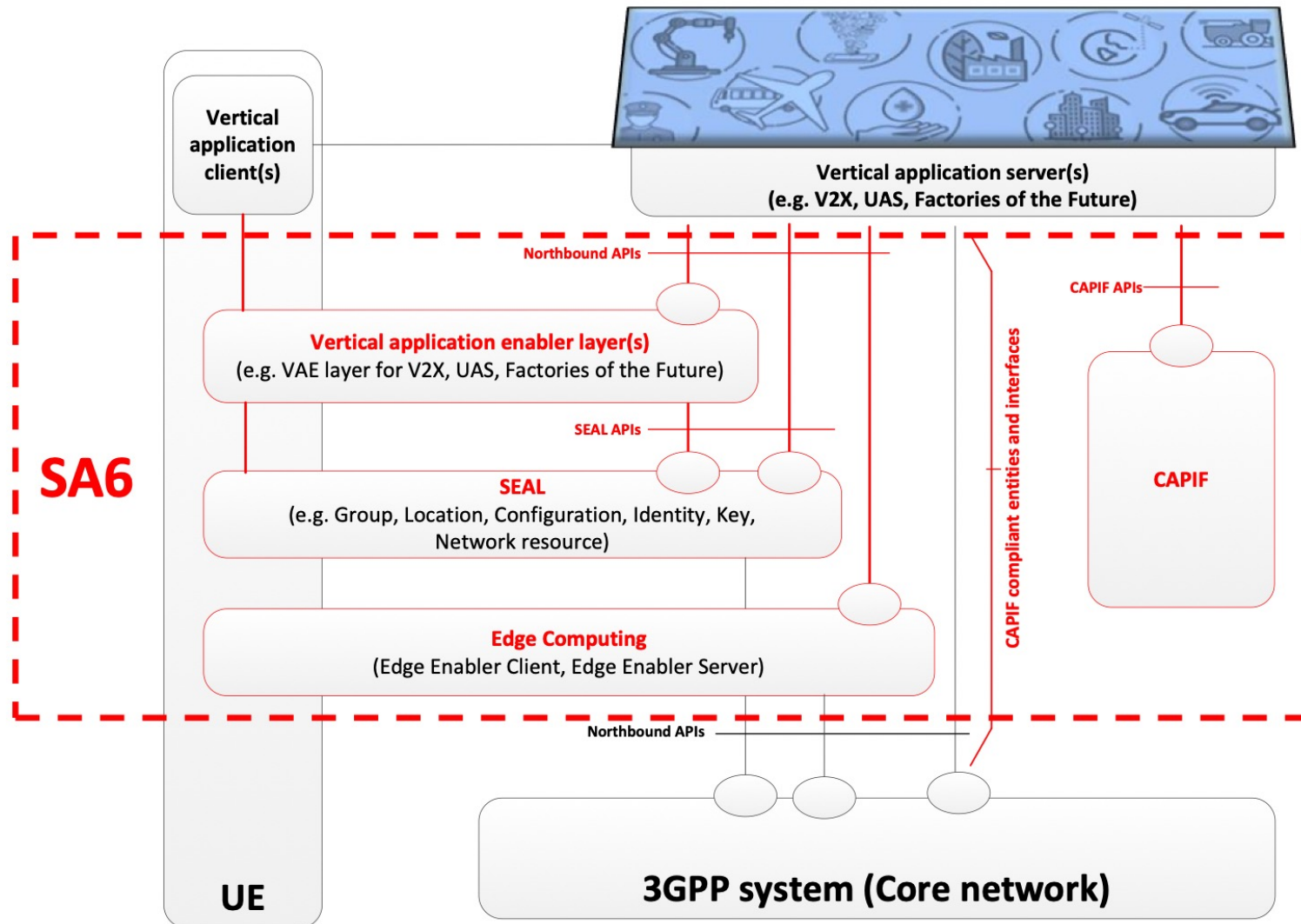
OpenCAPIF

by ETSI

David Artuñedo Guillén – OpenCAPIF Convenor

What is CAPIF?

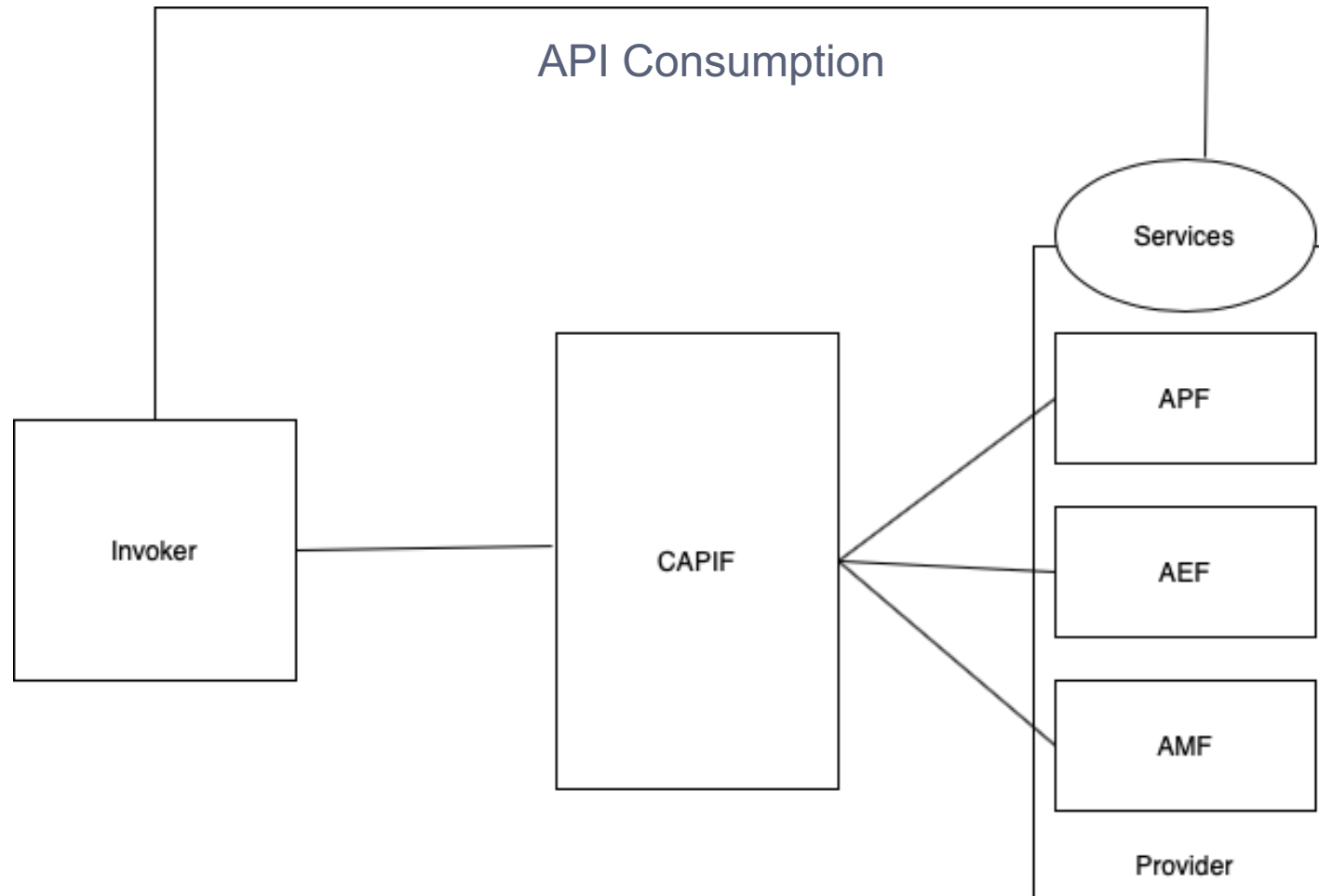
What is CAPIF?



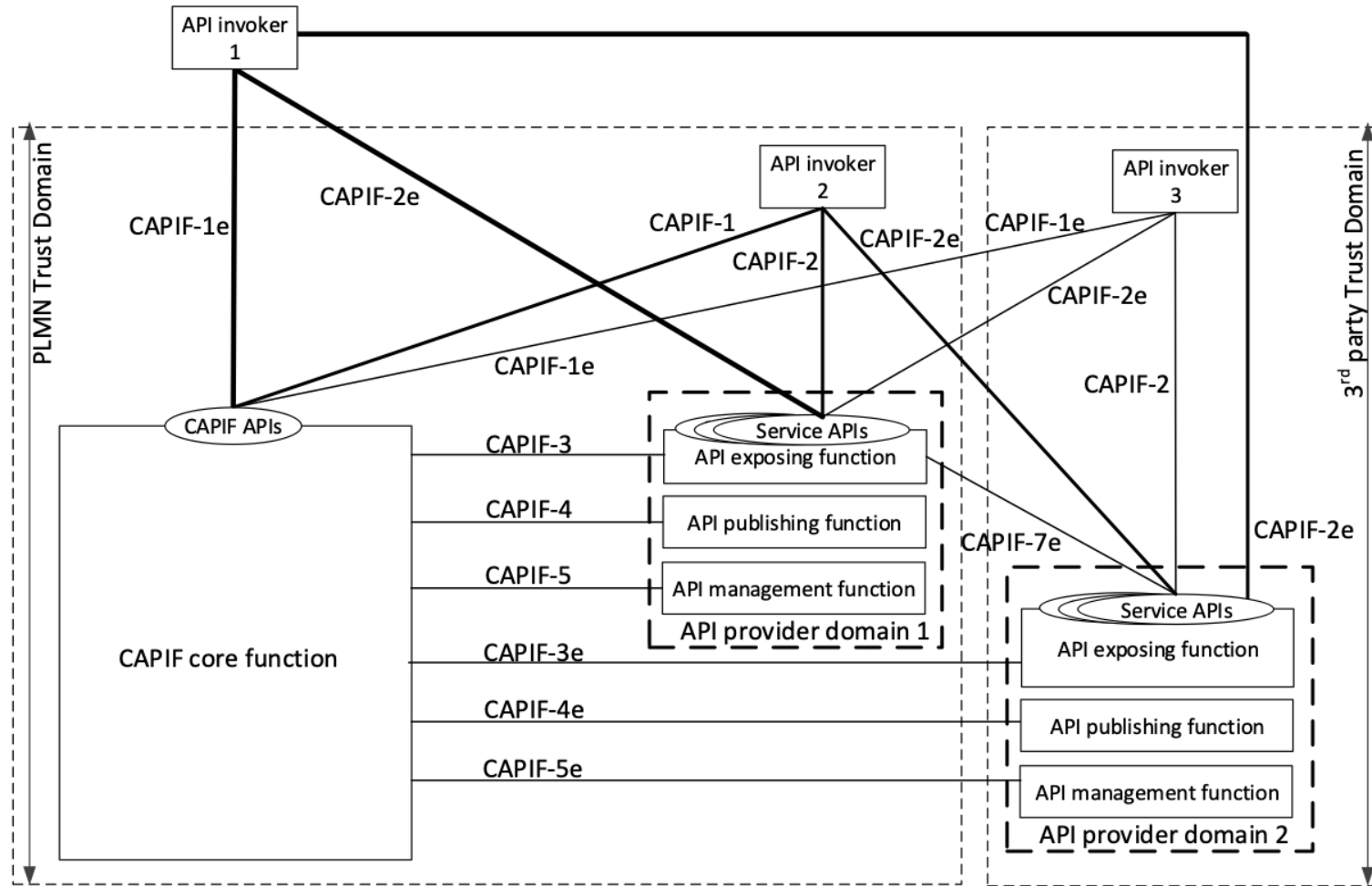
What is CAPIF?

- 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?

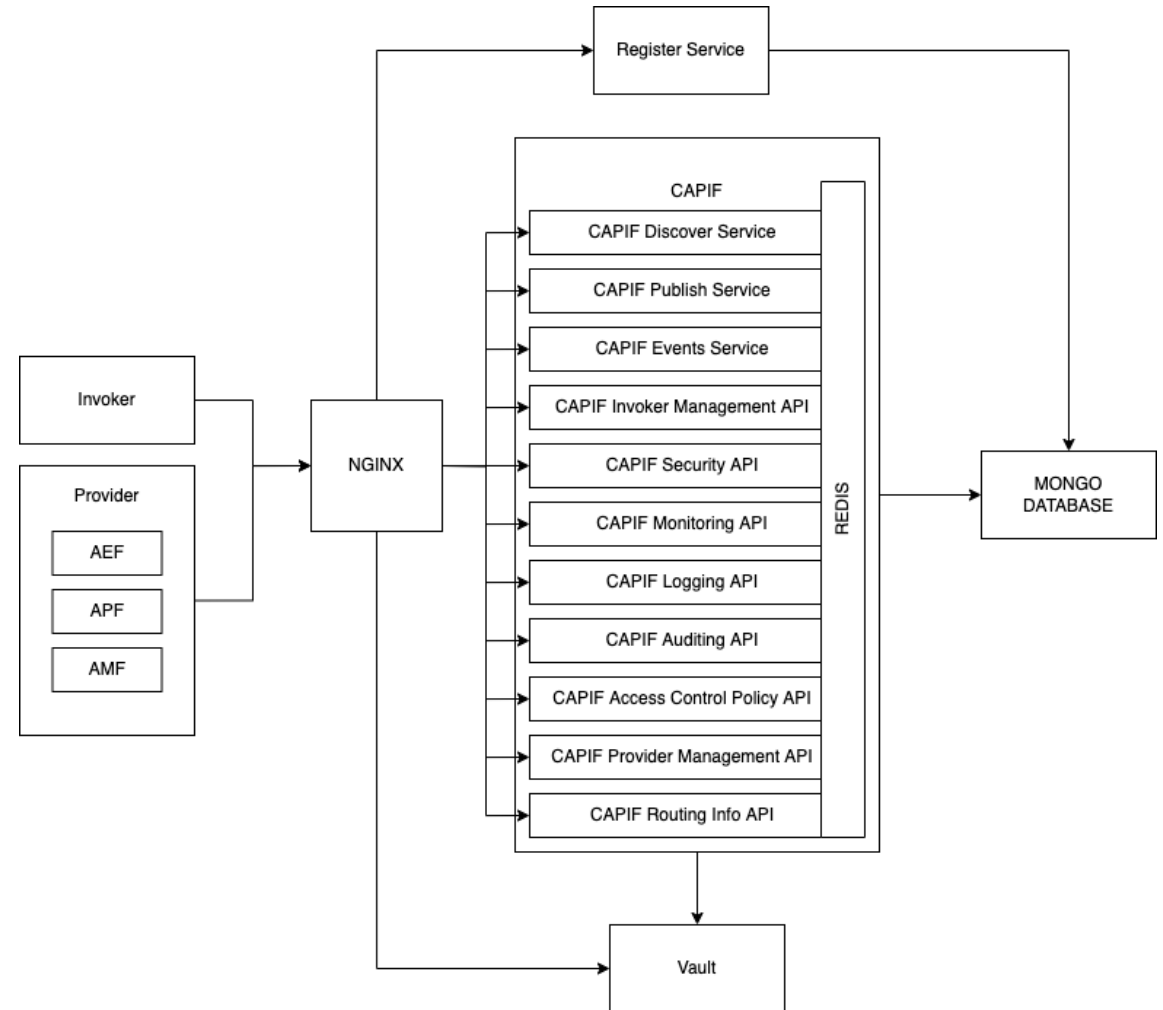


How CAPIF works?

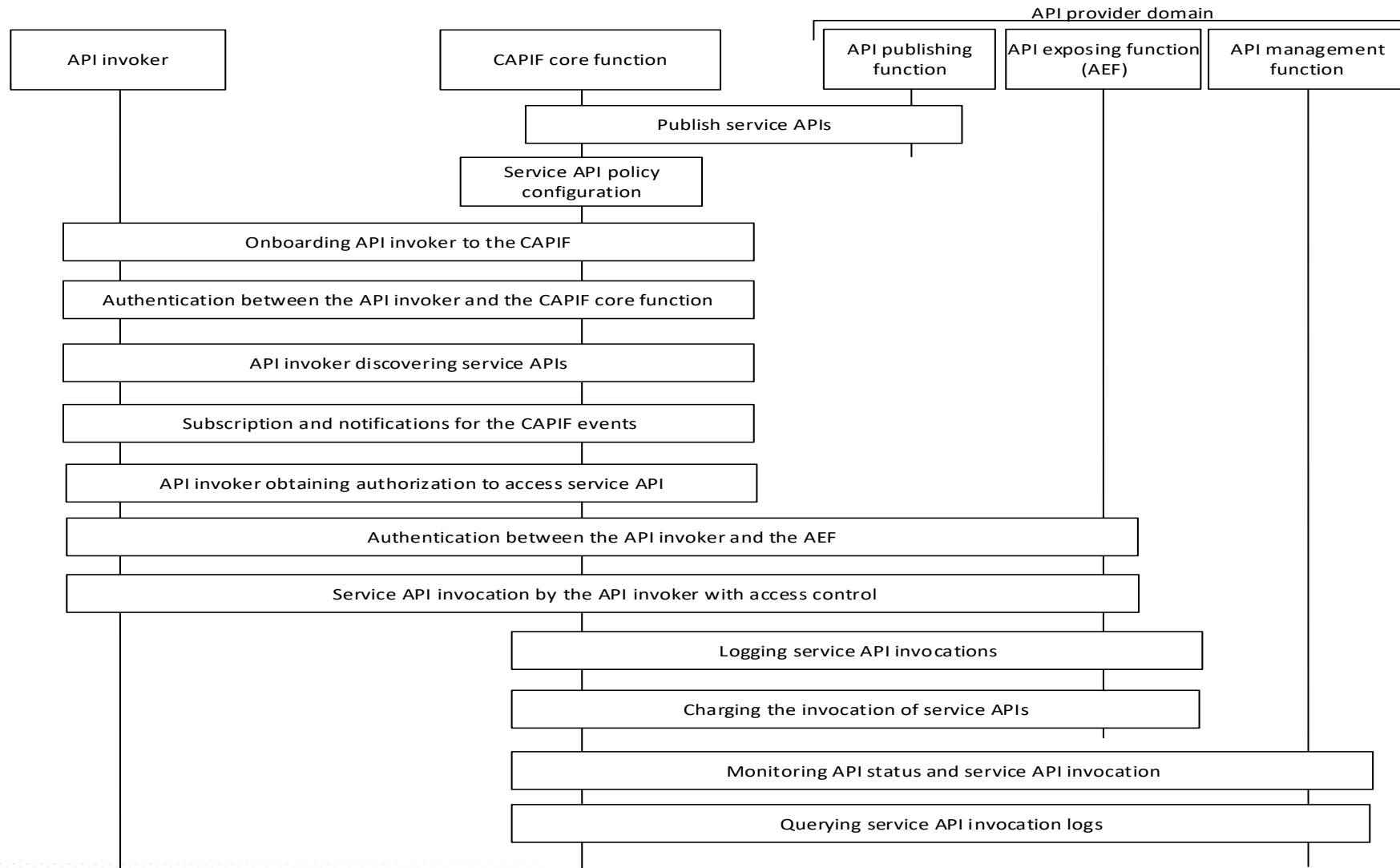


CAPIF Implementation

- **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**

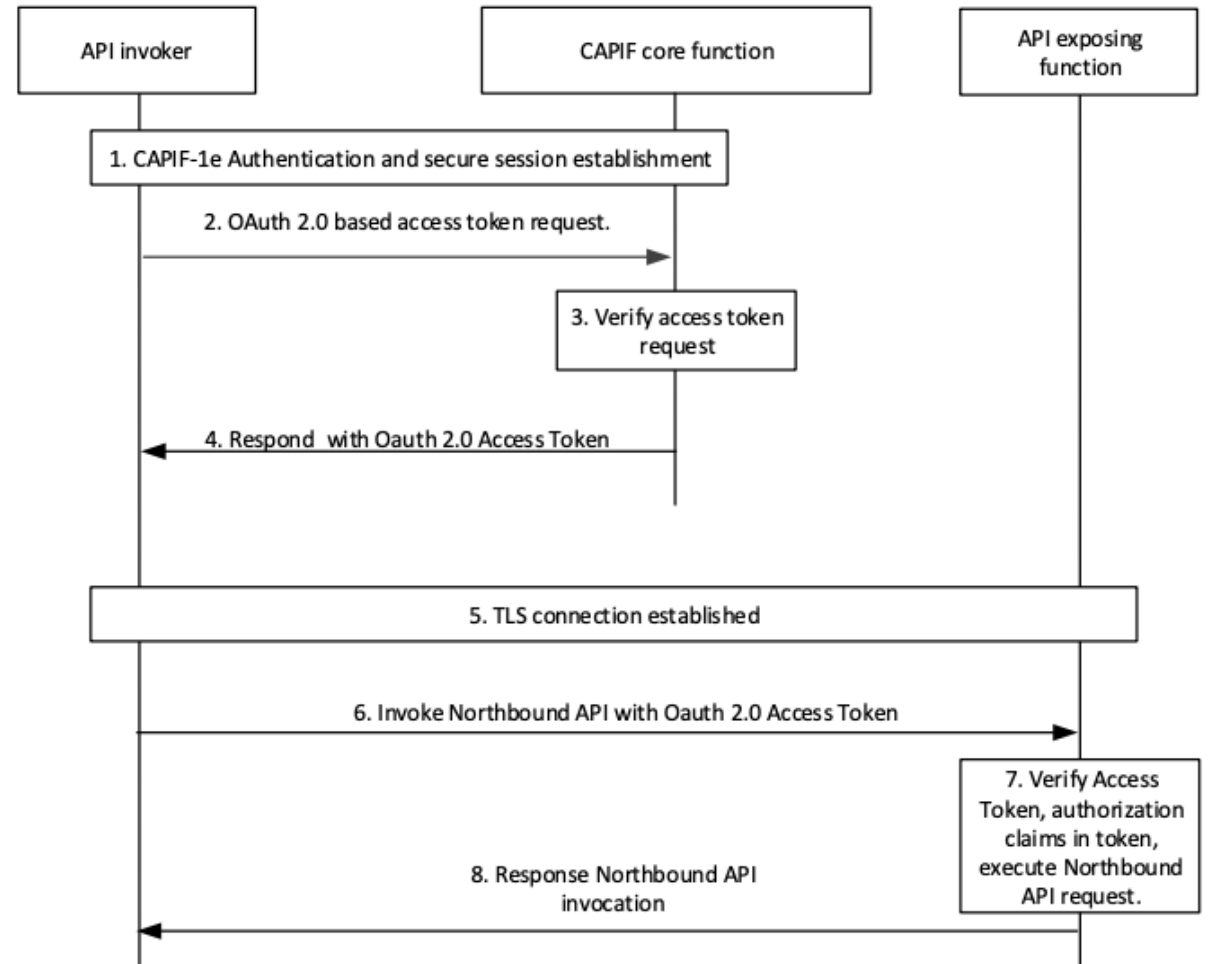


CAPIF Flows



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.
- 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

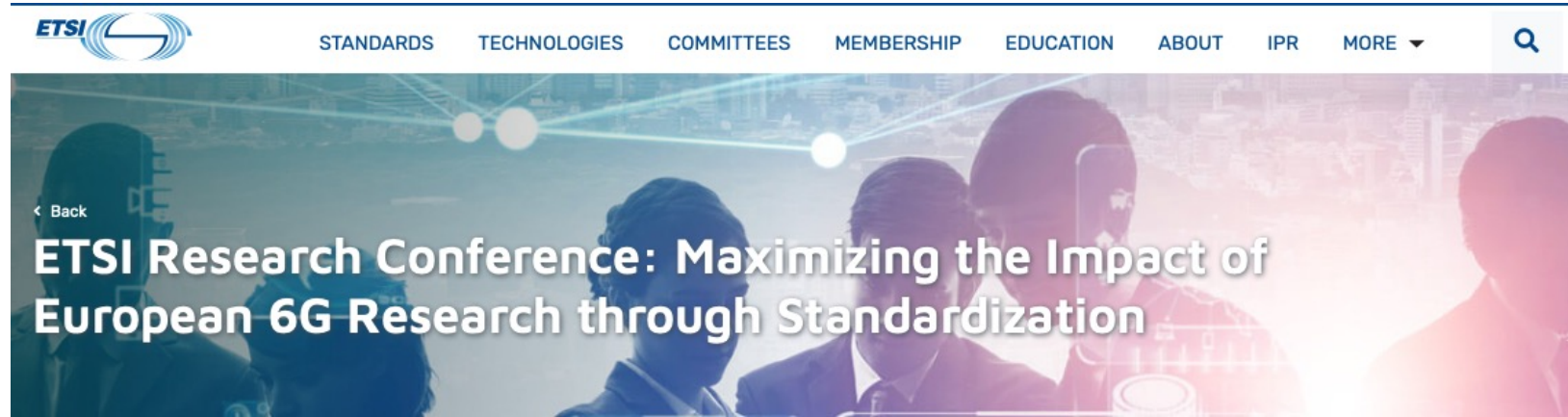
The screenshot shows the GitHub repository for 'CAPIF_API_Services'. The repository is public and has 531 commits. The main content area displays the README.md file, which is titled 'Common API Framework (CAPIF)'. The README includes a table of contents with the following items:

- Common API Framework (CAPIF)
- Repository structure
- CAPIF_API_Services
 - How to run CAPIF services in this Repository
 - Run All CAPIF Services locally with Docker images
 - Run each service using Docker
 - Run each service using Python
- How to test CAPIF APIs
 - Test Plan Documentation
 - Robot Framework
 - Using Curl
 - Using PostMan (only for release 1.0 of CAPIF)
- Important urls:
 - Mongo DB Dashboard
- CAPIF Tool Release 1.0
- CAPIF Tool Release 2.0
- CAPIF Tool Release 2.1
- CAPIF Tool Release 3.0
- CAPIF Tool Release 3.1
- CAPIF Tool Release 3.1.1
- CAPIF Tool Release 3.1.2

The right sidebar of the repository page shows the following information:

- About:** No description, website, or topics provided. License: Apache-2.0.
- Releases:** CAPIF Release 3.1.2 (Latest) on Jun 20.
- Packages:** No packages published.
- Contributors:** 7 contributors.
- Languages:** Python 83.5%, RobotFramework 9.1%, Shell 2.5%, Groovy 2.3%, HCL 1.9%, Dockerfile 0.7%.

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

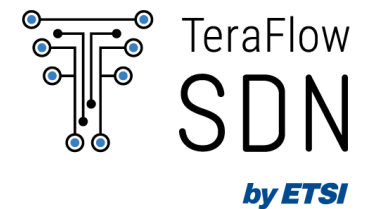
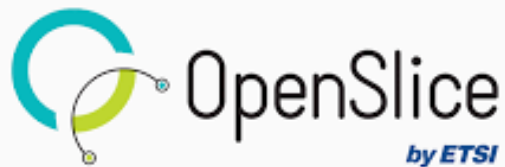
- OpenCAPIF **SDG Agreement** is in signature process
- **SDG Creation Announcement** planned for November 2023
- **Kick off** meeting scheduled for **January 2024** at Telefónica HQ (Madrid)
- OpenCAPIF will be **open for all contributors** to participate

Just the beginning...

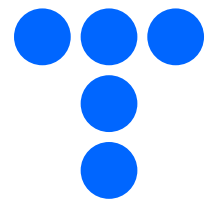
- **SNS Projects** using CAPIF:



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



Thank You!



Telefónica