



CAMARA
THE TELCO GLOBAL API ALLIANCE

Presentation

13.09.2024

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APIs enabling seamless access to
Telco network capabilities



Telco network capabilities exposed through APIs provide a large benefit for customers. By simplifying telco network complexity with APIs and making the APIs available across telco networks and countries, CAMARA enables easy and seamless access.

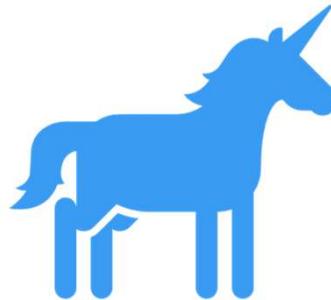


CAMARA mission

What is the CAMARA Project? Key problems we try to solve



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Scale

Developers dream of being the next unicorn... If apps, products, or services are built on our APIs they want them in all relevant markets and networks globally.

Consistency

Multi-nationals want consistency across all markets they operate in... they do not want APIs that only work in a single network in a single country. They do not want to try and build for the differences of each network.

Simplicity

Telco networks are complex, and every network is different.... Developers want simple, intent-based APIs.

Accessibility

We go to the developers where they are so the project is open sourced in the Linux Foundation. Allowing API users to work directly with CSPs creating the service.

Demand driven

We develop the APIs and design it in the way our customers need it. The demand is collected from organizations like GSMA OPAG but also from customers directly.

Key problems we try to solve

Consistency Benefit



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Availability across telco networks and countries is necessary:

- To ensure seamless customer experience
- To accelerate technology development and commercial adoption (minimize implementation effort)
- To accelerate education and promotion
- To support application portability

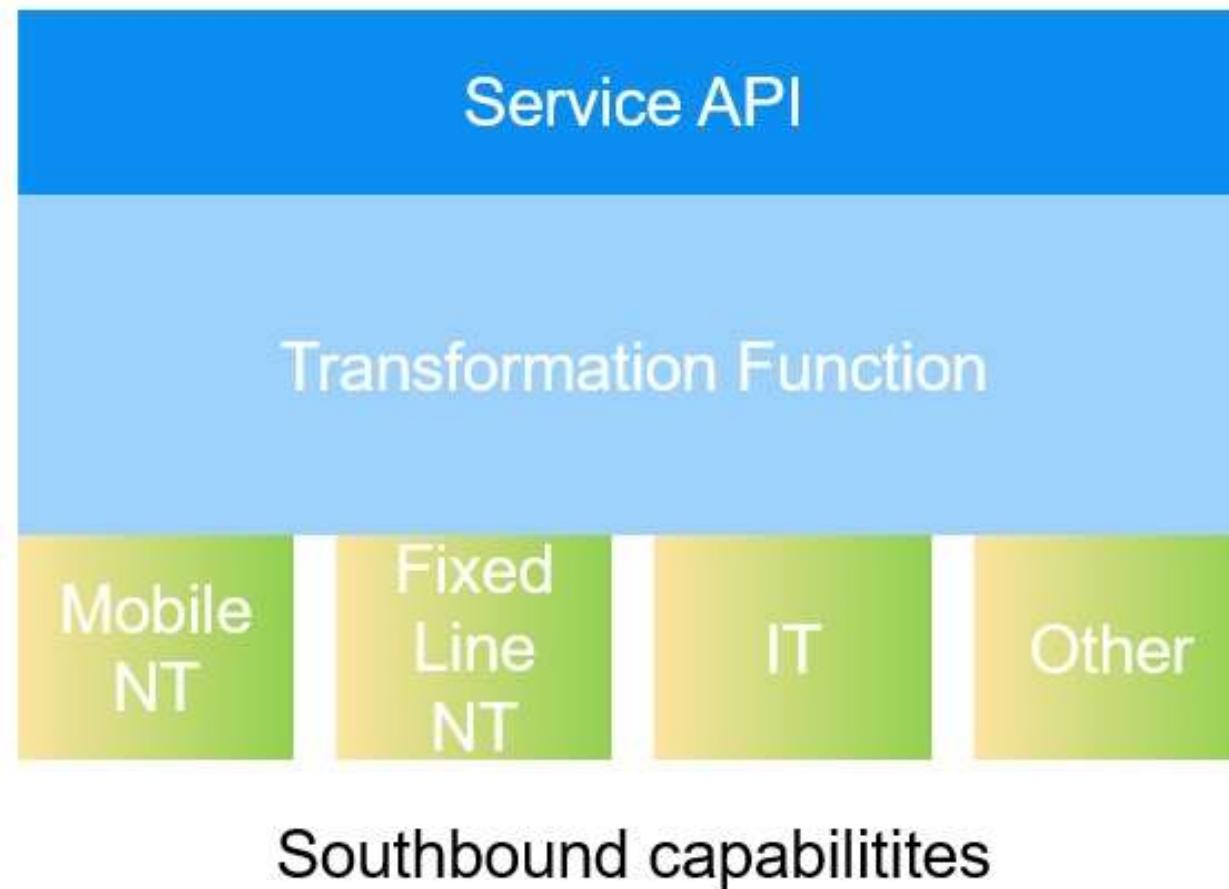
Key problems we try to solve

Simplicity Benefit



Abstraction from Network APIs to Service APIs is necessary:

- To simplify telco complexity making APIs easy to consume for customers with no telco expertise (user-friendly APIs)
- To satisfy data privacy and regulatory requirements
- To facilitate application to network integration



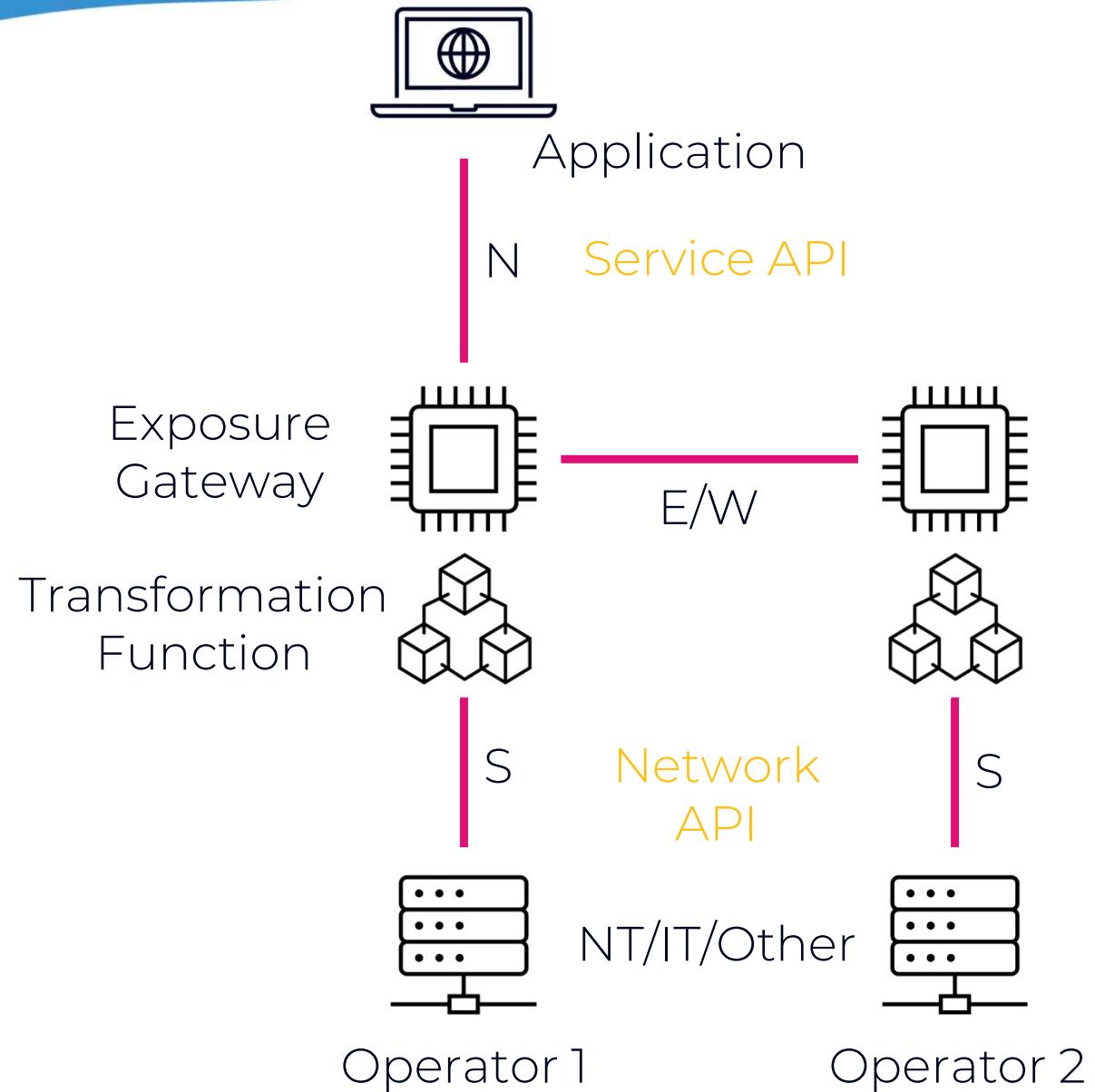
CAMARA is an open source project within Linux Foundation to define, develop and test the APIs. CAMARA works in close collaboration with the GSMA Operator Platform Group to align API requirements and publish API definitions and APIs. Harmonization of APIs is achieved through fast and agile created working code with developer-friendly documentation. API definitions and reference implementations are free to use (Apache2.0 license).



CAMARA Scope

From functional perspective the scope is limited to **telco APIs**, that means APIs in the domain of telco mobile networks, telco fixed line networks, telco edge cloud, etc. or supporting these.

Thereby the focus is on the **northbound interface** (between telco operator and aggregator or capability consumer). East-/westbound interface APIs are out of scope for CAMARA.

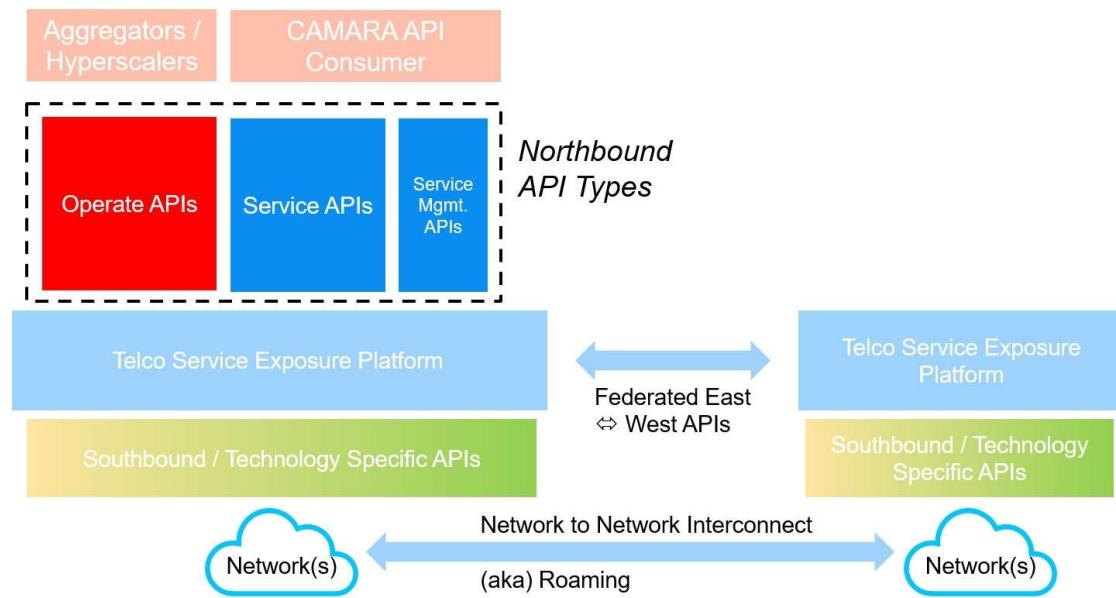


CAMARA Scope



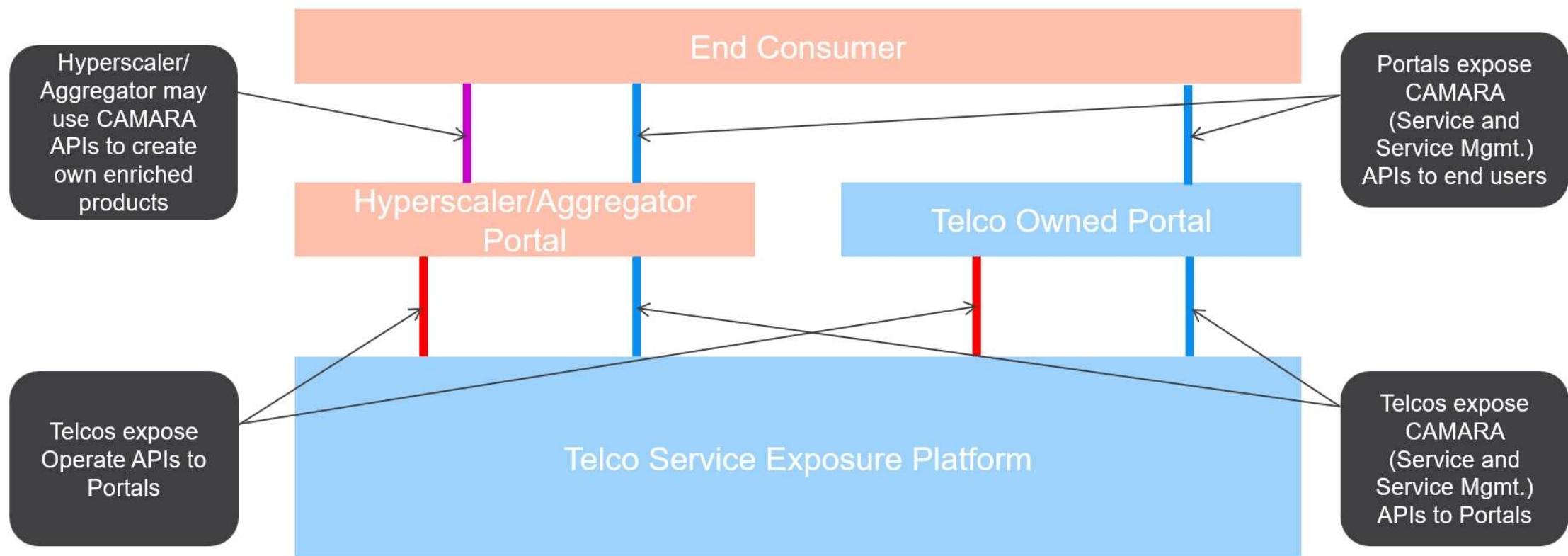
We differentiate between 3 types of Northbound APIs:

- **Service APIs:** APIs intended for end consumers and integrated by developers to invoke a certain telco capability.
- **Service Management APIs:** APIs intended for end consumers to manage or get data about offered Service APIs in application runtime, e.g., check service availability or performance information.
- Operate APIs: Operational and maintenance APIs provided by a telco to channel partners for the purpose of service fulfillment and assurance to their [channel partner] customers. This may include service provisioning for a mobile user, technical API performance monitoring, fault ticketing, information exchange such as product catalog, pricing, settlement, etc.



Service APIs and Service Management APIs are in scope of CAMARA. Operate APIs are out of scope of CAMARA (these are already covered by other SDOs = Standards Development Organizations like TM Forum).

CAMARA – Scope / Collaboration with Open Gateway and TM Forum

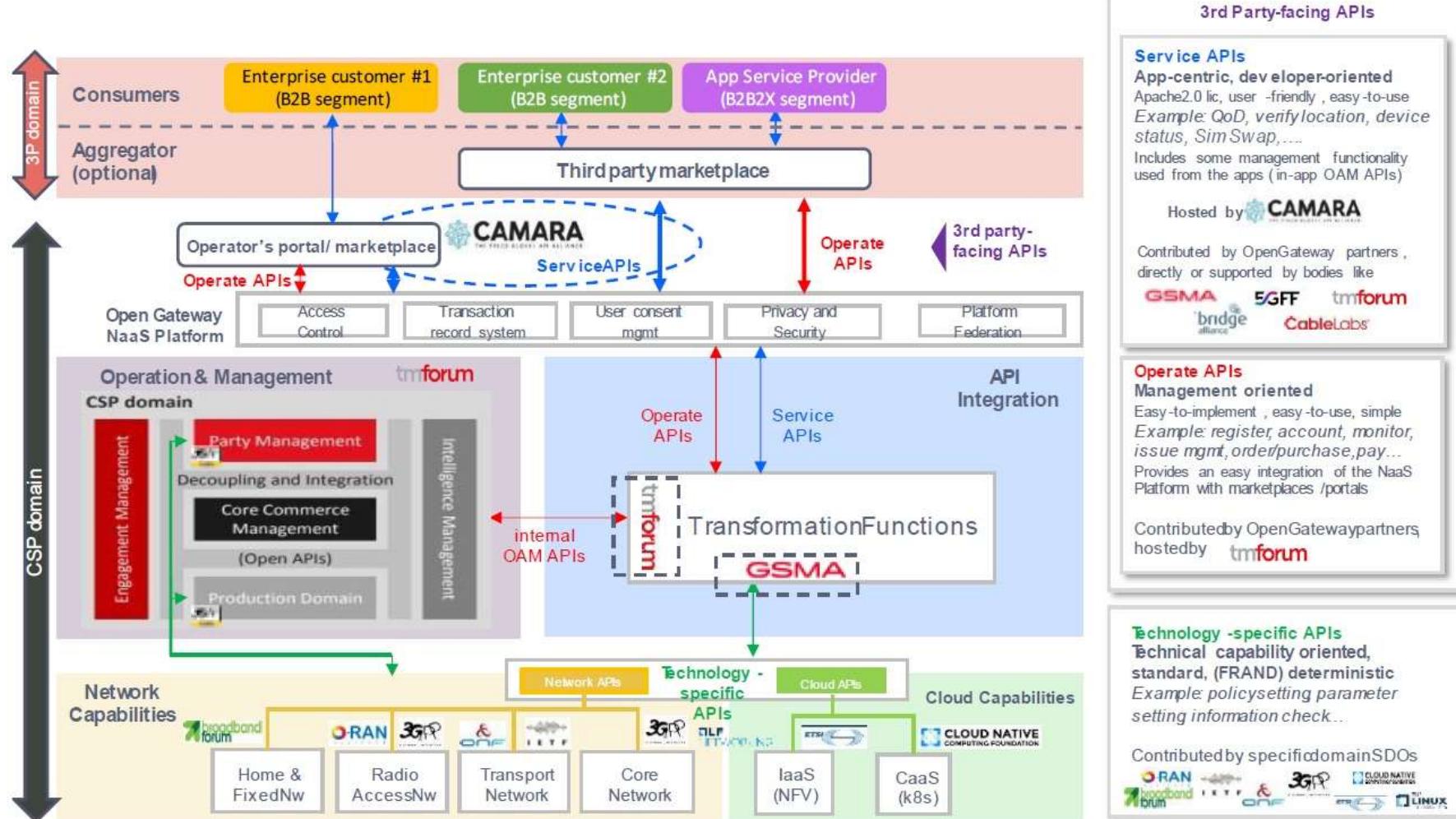


Hyperscalers and aggregators have the possibility to create own enriched products based on the CAMARA APIs and expose that in addition to the CAMARA APIs.

CAMARA – Scope / Collaboration with Open Gateway and TM Forum



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CAMARA project defines CAMARA APIs.

TMForum develops the Operate APIs.

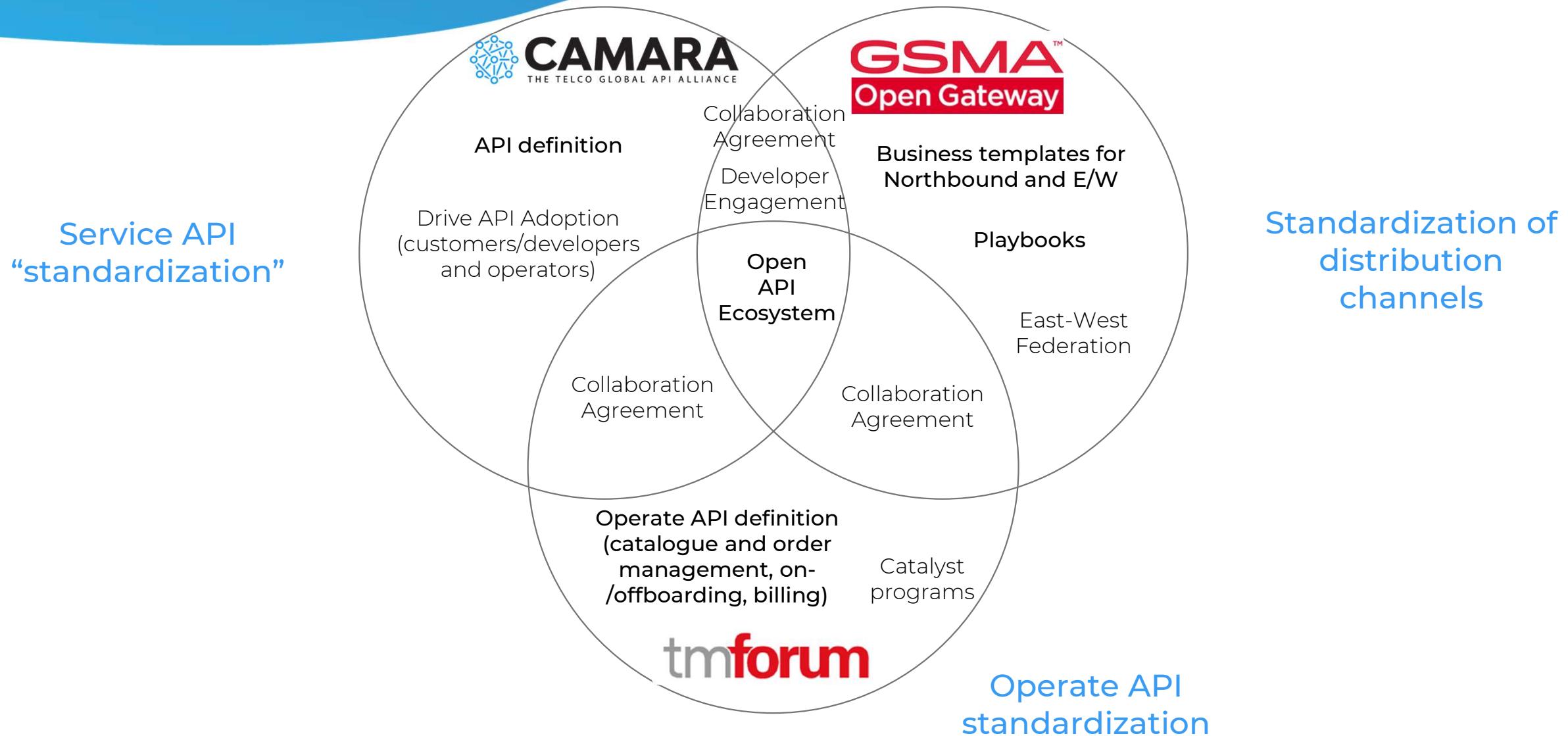
Several SDOs cover the different technology domains that provide the telco capabilities.

More details can be found in the whitepaper “The Ecosystem for Open Gateway NaaS API Development” (jointly published by GSMA, CAMARA, Linux Foundation and TMForum) available [here](#).

CAMARA – Scope / Collaboration with Open Gateway and TM Forum



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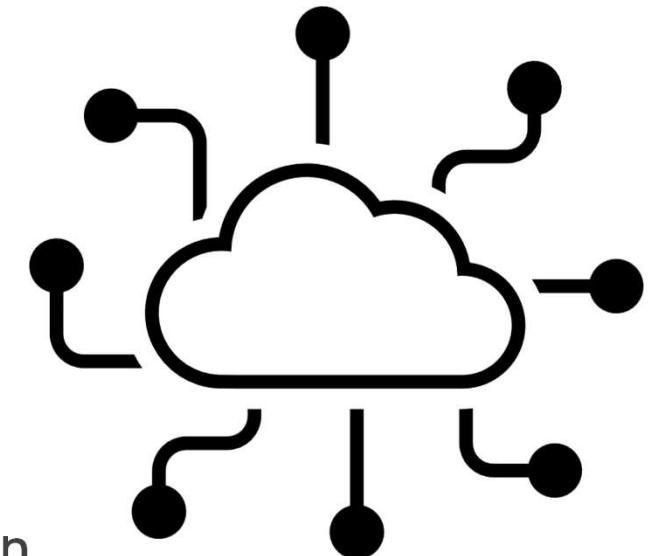
The scope of the CAMARA Project is:

- **Collect API requirements** from GSMA Operator Platform Group and other sources
- **Define Service APIs and Service Management APIs**
- Create test plans / cases / tools from an API consumer perspective
- **Develop and test Service APIs and Service Management APIs**
- Create developer friendly **documentation**

The following deliverables are provided by the CAMARA Project:

- **Service API and Service Management API definitions and documentation**
- Optionally Service API and Service Management API code and
- Test plans, cases and tools for the APIs all contained in deployment packages.

Project resources can be found in the **GitHub repository**: <https://github.com/camaraproject>.

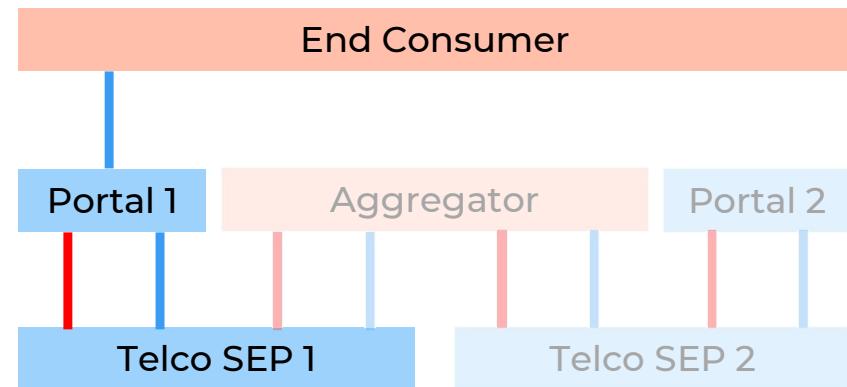


CAMARA API Distribution Options

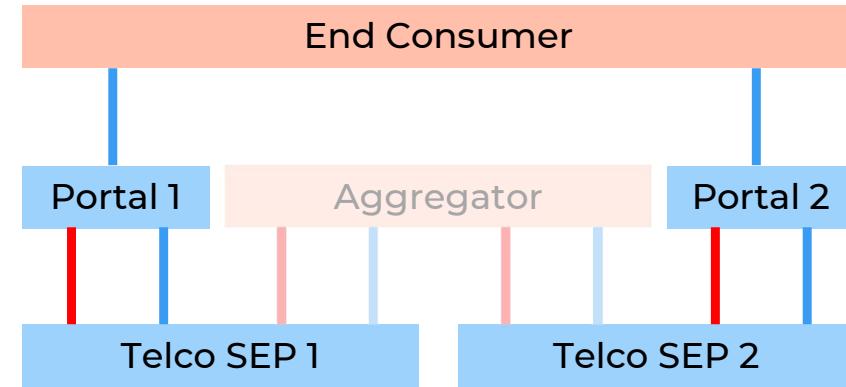


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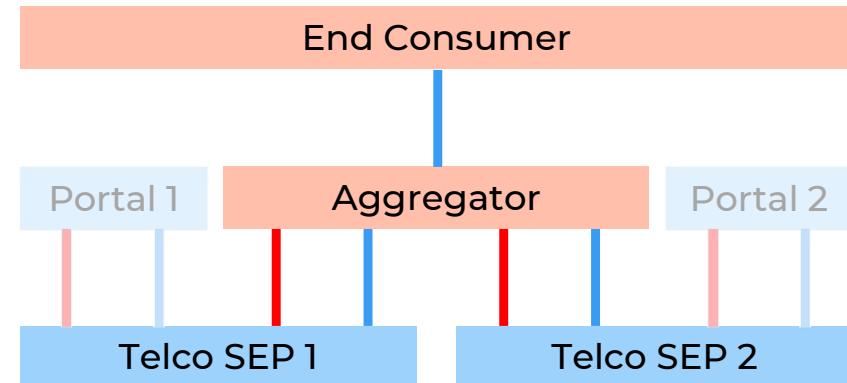
Single-Operator Relationship



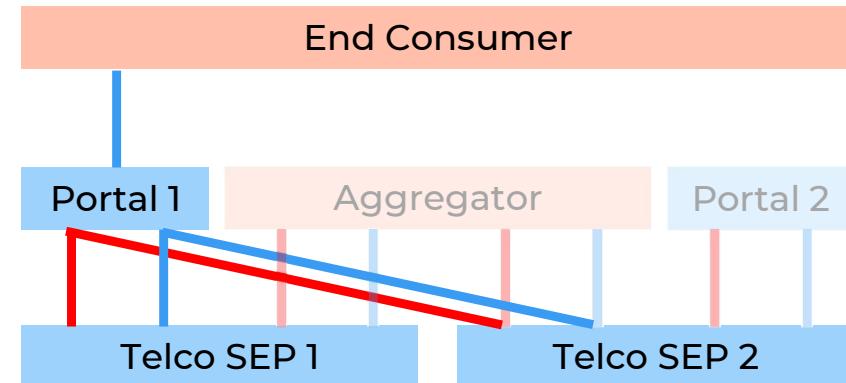
Multi-Operator Relationship



Operator Aggregation



Single-Operator “API Roaming”



Blue lines =
CAMARA APIs

Red lines =
Operate APIs

SEP=
Service
Exposure
Platform

What is different now in comparison
to former API exposure trials?



- **Simplicity** – Telco complexity is hidden behind simple, easy to use APIs
- **Demand driven** - Listening to customer's voice and demand
- **Availability** – Open APIs with great support of many operators on many platforms
- **Alignment** - With standardization bodies like TM Forum or ETSI-MEC
- **Sustainability** – We have the CEOs behind

CAMARA

Where we started...



CAMARA
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Launched at MWC Barcelona 2022

22 Launch Partners

Supported by GSMA and Linux Foundation

Simple idea to “standardize” developer facing APIs



CAMARA

... and where we are now



CAMARA
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Members	Premier	General										Associate Membership							
	accenture	T-Mobile	ERICSSON	Microsoft	NOKIA	orange	T-Mobile	T-Mobile	ALEPH ZERO	CableLabs	centillion	Charter	INDY	invia	OpenID				
	verizon	vodafone							SCENERA	shabodi									
Participating Organizations																			
	T-ACE	EGFF	A1	ACL Digital	akross	AMANTYA	amdocs	ARGELA	AT&T	aws	axiata	AXIATA DIGITAL LABS	BCTI	BearingPoint	bridge alliance	broadpeak	Cognizant	中国电信	China unicom
	CISCO	KM	cloudoniX	cognizant	Colony	comviva	CSA	csl.	CTHINGS CO	DATAVERSE	DETECON	DOMOS	DriveU.auto	EANTS+	Edge	e&	ETIYA	EVIDEN	
	F5	FUJITSU	GAPASK	Google Cloud	GSMA	HCL Software	Hewlett Packard Enterprise	HKT	HUAWEI	IBM	infobip	INFO LYSIS	Infosys	intel	iHification	ipall networks	Italtel	KDDI	LATENTECH
	Lenovo	Linux Foundation	LOTUSPLATE	MATRIXC	MAVENIR	MICROKS	MOQUEST	nabstraktia	NEARBY COMPUTING	Netcracker	Nexmo	NGMN	NOS	NTT DATA	Open Sesame	Optiva	ORACLE		
	VIRTUAL 5G LAB	quobis	Radisys	Red Hat	REPLY	SIC	SEKURA	Simpltel	Singtel	SK Telecom	SPRY FOX	startologic	swisscom	syniverse	TOS	TELUS	ETIM		
	TruSense	VROMBR	Whale Cloud	ZTE															

* Number in brackets indicates companies and people who are in contact but haven't joined

- 118 Named Partners
- 396 (+337*) companies participating in CAMARA
- 26 Active API family Sub Projects with 46 APIs, and 5 Working Groups
- 1128 (+1658*) people joined CAMARA
- Development "home" for GSMA Open Gateway

CAMARA Logos



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Members	Premier	General										Associate Membership			
	accenture	T-Mobile	ERICSSON	Microsoft	NOKIA	orange	T-Mobile	T-Mobile	ALEPH ZERO	CableLabs	B2B CENTILLION	Charter	INDY	invia	OpenID
Participating Organizations															
	INCE	5GFF	A1	ACL Digital	akross	AMANTYA	amdocs	ARGELA	AT&T	aws	axiata	BCTI	BearingPoint	bridge alliance	broadpeak
	cisco	BH	cloudoni	Cognizant	Colony	comviva	CHASSAA	csl.	CTHINGSICO	DATACURVE	DETECON CONSULTING	DOMOS	DriveU.auto	EANTEC	Edge
	f5	FUJITSU	GAPASK	Google Cloud	GSMA	HCL Software	Hewlett Packard Enterprise	HKT	HUAWEI	IBM	infobip	INFOLYSIS	intel	iPavilion	Italtel
	Lenovo	LENIN	LINUX FOUNDATION	LOTUSFLARE	MATRIXOC	MAVENIR	MICROCKS	QUEST	nabstract.io	NEARBY COMPUTING	Netcracker	NGMN	NOS	NTT DATA	Open Sesame
	VIRTUAL 5G LAB	quobis	Radisys	Red Hat	REPLY	SIC	SEKURA	Simpltel	Singtel	SK telecom	SPRY FOX	stategic-ic	swisscom	syniverse	tcs
	TruSense	VROMBR	White Cloud	ZTE							STARWIS	SUMMIT		TELUS	TIM

Release Management Motivation and Benefits

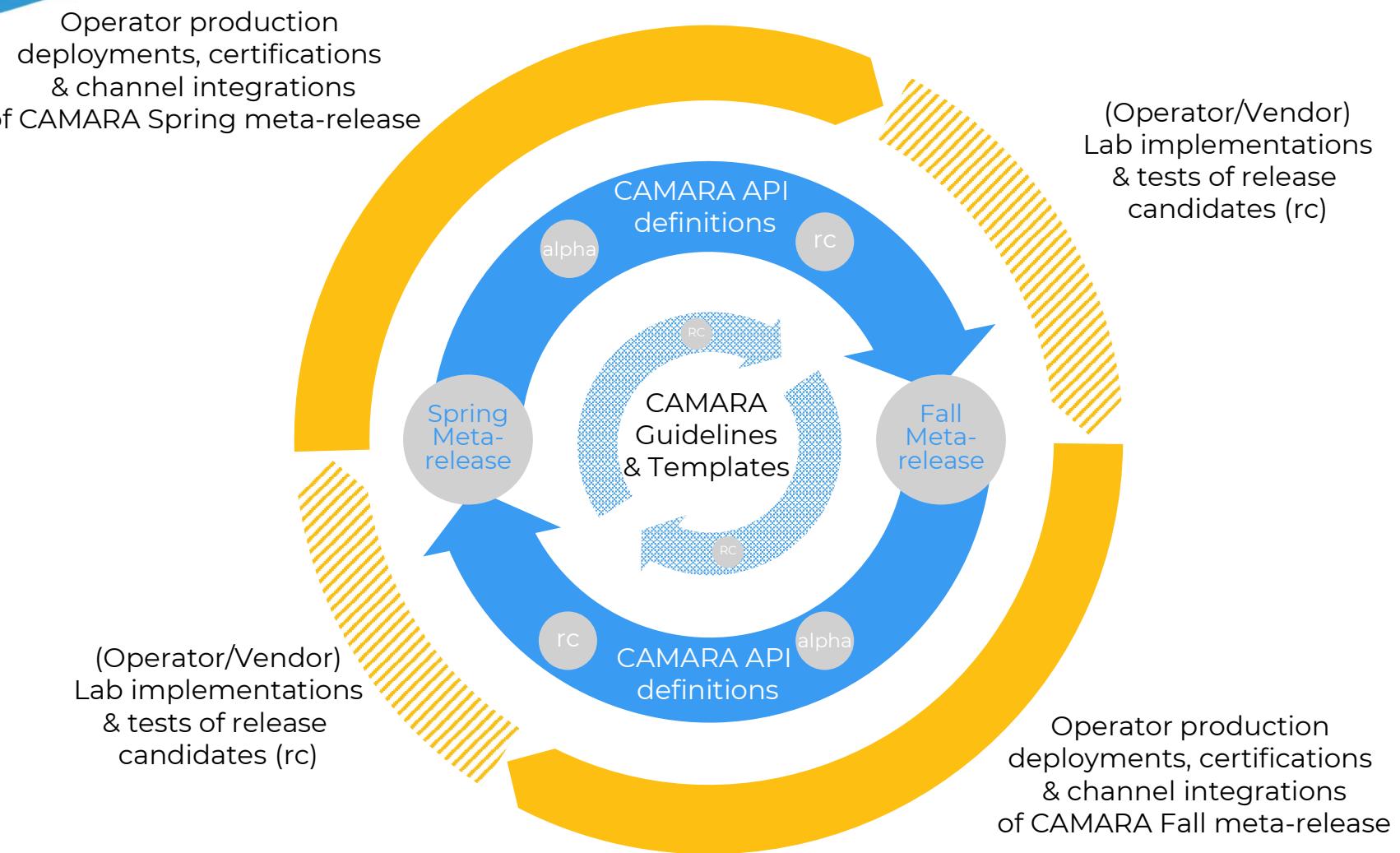


- A **CAMARA meta-release** combines a set of CAMARA API versions into a **consistent** release.
- There will be **two meta-releases per year** (in spring and fall).
 - Network operator can plan their implementations and deployments in production.
 - API consumers can plan the integration in their platform and applications.
- All API versions in a meta-release **fulfill defined quality criteria** and are **compliant to current CAMARA guidelines** like from CAMARA Commonalities and Identity and Consent Management.
- **CAMARA meta-releases** ensure the
 - Availability of consistent API definitions (by use of guidelines, templates, and linting),
 - Quality of API definitions (by use of checklists, test definitions, and release management),
 - Stability of API definitions (clear criteria for stable versus initial API versions) and
 - Reliability of schedule and deliverables (with defined milestones and release candidates).
- **CAMARA meta-releases** provide the foundation for API version management in production.

Release Management Release Cycle



- 2 releases each year
 - Fall (in September)
 - Spring (in March)
- Continuous and overlapping cycles
 - Update of CAMARA guidelines
 - Development and updates of API definitions in CAMARA
 - Lab implementations and production deployments at network operators
- Tests of API release candidates
 - Within operator (lab) implementations
 - Based on CAMARA test definitions
- Feedback in all phases
 - From (lab) implementations and deployments to CAMARA API definitions and guidelines
 - From API definition work to CAMARA guidelines



For details see <https://wiki.camaraproject.org/display/CAM/Meta-release+Process>

Meta-release Fall 2024



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Stable CAMARA APIs (v1.0.0)

Previous versions launched in at least one market¹



**Number
Verification**



**OTP¹ (SMS)
Validation**



**Location
Verification**



**Sim
Swap**



**Simple Edge
Discovery**

Updated initial CAMARA APIs (v0.y.z)

Previous versions launched in at least one market¹



**Carrier
Billing**



**Device
Roaming Status**



**Device
Reachability Status**



**KYC³
Match**



**KYC³
Fill-In**



**Location
Retrieval**



**Home
Devices QoD**



**QoS
Profiles**



**Quality on
Demand**

Application Profiles

Call Forwarding Signal

Carrier Billing Refund

Connectivity Insights

Population Density Data

QoD Provisioning

New initial APIs to subscribe for event notifications in CloudEvents format (v0.y.z)

Connectivity Insights Subscriptions

Device Reachability Status Subscriptions

Device Roaming Status Subscriptions

Geofencing Subscriptions

SIM Swap Subscriptions

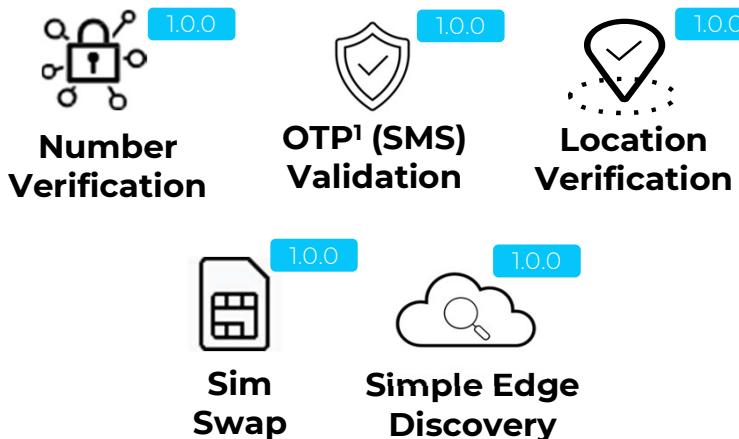
Meta-release Fall 2024



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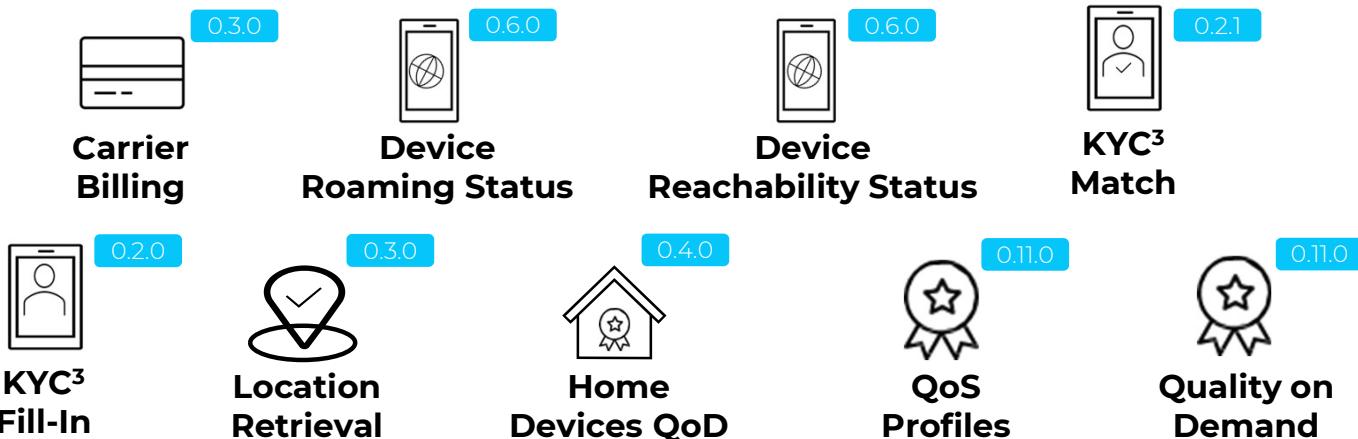
Stable CAMARA APIs (v1.0.0)

Previous versions launched in at least one market¹

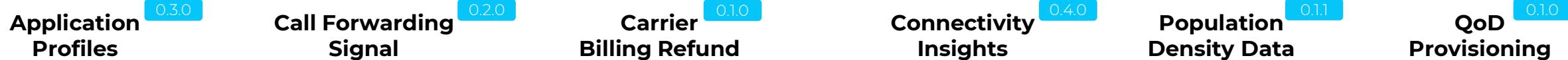


Updated initial CAMARA APIs (v0.y.z)

Previous versions launched in at least one market¹



New initial APIs (v0.y.z)



New initial APIs to subscribe for event notifications in CloudEvents format (v0.y.z)



Beyond Fall24 Meta-release – Upcoming APIs



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Upcoming APIs

Work in progress or newly started

Age Verification (KYC ¹)	Application Endpoint Discovery (Edge Cloud)	Blockchain Public Address	Click To Dial	Device Data Volume (Device Status)
Device Identifier	Device Quality Indicator (Device Status)	Device Swap	Edge Application Management (Edge Cloud)	Network Access Management (Home Devices)
Network Slice Booking	Number Recycling (KYC ¹)	Most Frequent Location (Location Insights)	Region Device Count	Short Message Service
Site to Cloud VPN	Subscription Status (KYC ¹)	Tenure (KYC ¹)	Traffic Influence (Edge Cloud)	Verified Caller
				WebRTC – BYON ²

Current CAMARA API Families (1)



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Blockchain Public Address Manage a blockchain public address associated to a phone number	Call Forwarding Signal Determine if a “call forwarding” service is enabled	Carrier Billing CheckOut Purchase, pay, and follow up on fulfilment of products	Click to Dial Establish web-based communication by clicking an object	Connectivity Insights Alerts the consumers if and when the QoS threshold has breached	Device Identifier Check the identity of the subscribers' device
Device Location Check the location of a device	Device Status Check the network connection and roaming status of a device	Device Swap Check if the MSISDN has had a change of device in the last 30 days	Edge Cloud Provide and manage network and compute resources for an application	Home Devices QoD Request prioritization of traffic on a specific device on the home network	Know Your Customer Allows service providers to validate user information with operators
Location Insights Give insights to the home area and latest location of a device	Network Access Management Manage fixed devices that reside at customer premises	Network Slice Booking Reserve, dynamically provision, query, dynamically delete a slice	Number Verification Allows users to verify the phone number of the connected device	OTP Validation To offer secure user authentication to service providers	Population Density Data Get dynamic population density data in a specific area for a future date & time

Current CAMARA API Families (2)



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Quality on Demand

Allows users to set mobile connection quality and get notifications

Region Device Count

Query the number of active devices in the specified area

Short Message Service

Send SMS to the destination address(es)

SIM Swap

Allows users to get information on SIM pairing changes

Simple Edge Discovery

Discover the closest edge cloud zone to a given device

Site to Cloud VPN

Create and configure site to cloud network service by one click

Verified Caller

Show certified information on the phone before a call is answered

Web RTC

Add real-time communication capabilities to applications

CAMARA Working Groups

API Backlog

Maintains the API Backlog for CAMARA

Commonalities

Guidelines and assets mandatory for all CAMARA Sub Projects

Identity and Consent Mgmt

Provides solutions to capture, store and manage user consent

Marketing / Outreach

Plans and performs marketing activities for CAMARA

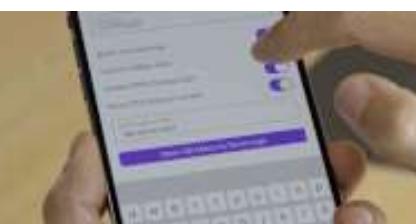
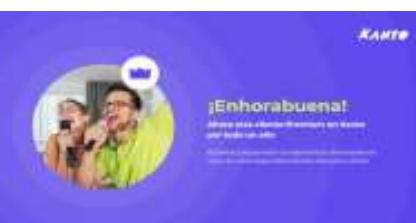
Release Management

Guidelines and assets for Release Management in CAMARA

CAMARA / Open Gateway API Showcases



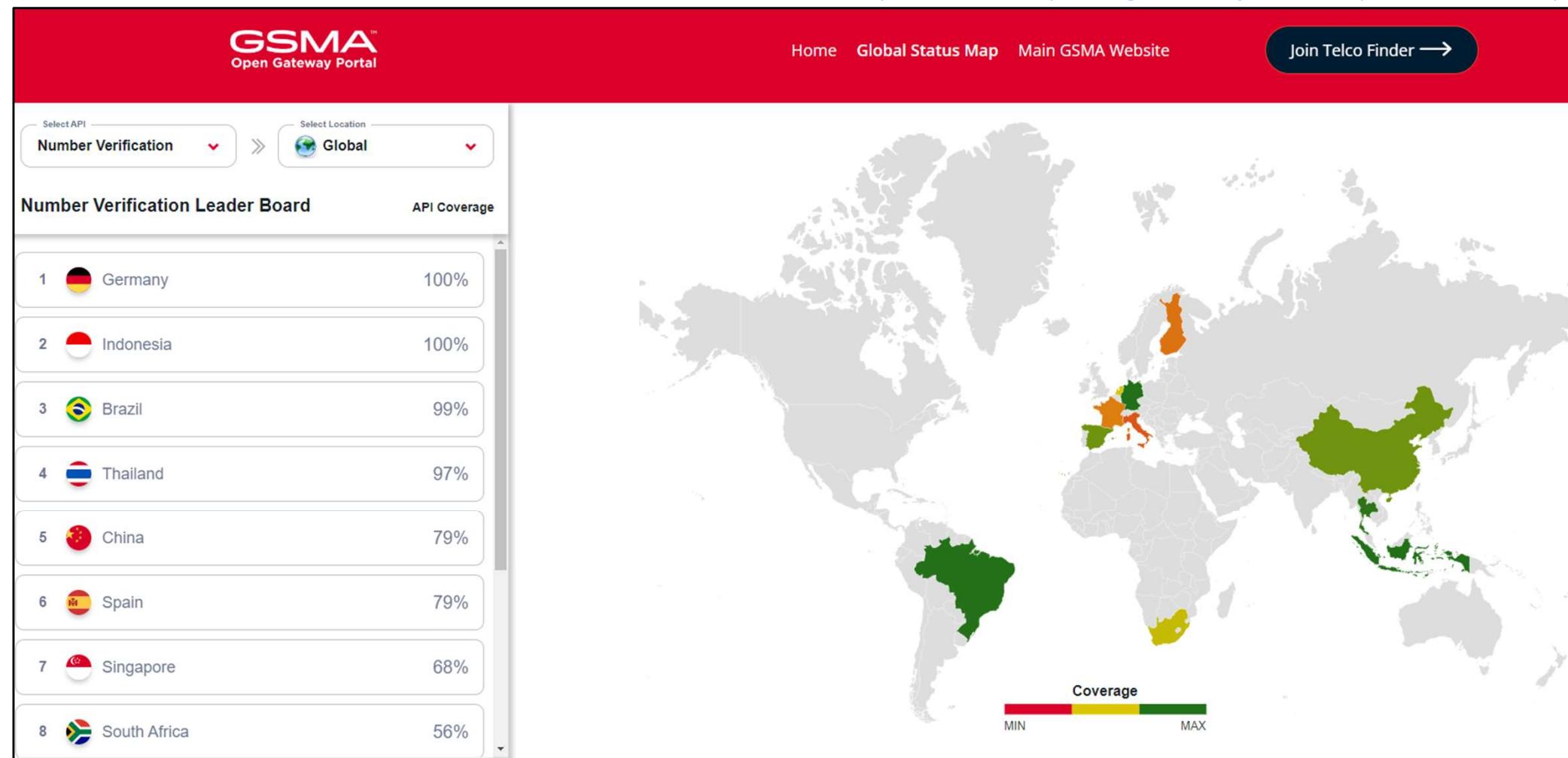
<https://camaraproject.org/resources/>



CAMARA / Open Gateway API public launch status



<https://www.open-gateway.com/operators-map>



5G network capabilities

Introduction



Telco network capabilities are functions partly available already in 4G but new and much more powerful in the 5G network. These functions enable to get information out of the network but also to configure the network.

The on-demand, secure and controlled exposure of these capabilities pave the way for transforming operator networks into service enablement platforms, facilitating the application-to-network integration, which will be key to deliver enhanced and service-tailored customer experience in the 5G era.

5G network capabilities

Introduction



Reachability and Location of UEs
Identify (last known) location of drone



of UEs in geographic region
Traffic jam or Corona warning



of UEs in slice, network congestion
Adapt resolution for video transmission



Quality on Demand / Traffic influence
Enable augmented reality



Wake up UEs
Support low energy IoT devices



Block UEs in geographic region
Crisis management



Potential Business Use Cases



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Fraud



Secure Auth
Fraud Prevention

Location



Location Verification
Location Retrieval
Location Geofencing

Enhanced communication



Safeguarding of Transactions
Remote Control
AR/VR/XR
Gaming

Video Production



Live Video Production
Video Production
Video Broadcasting

• • •

Number Verify,
Sim Swap, etc.

Location APIs

Quality on Demand

Slicing APIs

Network APIs offer
the opportunity

- For customers to optimize their use cases and applications
- For operators to monetize their investment in 5G infrastructure

It's a win-win!

Benefit for developers to use CAMARA APIs



- 1** Reduces friction for developers to access network information across telcos globally.
- 2** Increases usage and value of telco networks by providing easy access to network capabilities.
- 3** Enables developers to create new applications or improve existing ones with access to these capabilities.



Additional revenue on existing assets, leveraging SDN and NFV capabilities

Developers Getting Started with CAMARA APIs



The screenshot shows the CAMARA website's navigation bar. A red arrow points to the "Sub Projects A-H" dropdown menu, which is currently open, displaying a list of ten sub-projects: Blockchain Public Address, Call Forwarding Signal, Carrier Billing Check Out, ClickToDial, Connectivity Insights, Device Identifier, Device Location, Device Status, Device Swap, Edge Cloud, and Home Devices QoD. The background of the page features a blue network-like graphic and a large white text overlay that reads: "APIs enable seamless access to Telco network capabilities".

THE LINUX FOUNDATION PROJECTS

CAMARA
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Home About Sub Projects A-H Sub Projects I-Z Working Groups Events Resources Contact

Latest News: Initial focus areas of colla...
ays to process connecte... [Read More →](#)

Blockchain Public Address

Call Forwarding Signal

Carrier Billing Check Out

ClickToDial

Connectivity Insights

Device Identifier

Device Location

Device Status

Device Swap

Edge Cloud

Home Devices QoD

APIs enable seamless access to Telco network capabilities

Developers Getting Started with CAMARA APIs



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Quality on Demand



Scope

- Service APIs for "Quality on Demand" (see APIBacklog.md)
- It provides the customer with the ability to:
 - set quality for access network connections (e.g. mobile device connection or fixed access between a home gateway and the service providers gateway router)
 - get notification if network cannot fulfill
- Describe, develop, document and test the APIs (with 1-2 Service Providers)
- Started: October 2021
- Location: virtually

Meetings

- Meetings are held virtually: [Meeting registration / Join](#)
- Schedule: bi-weekly, Friday, 2 PM CET/CEST (13:00 UTC, 12:00 UTC during European DST). For date/time of next meeting see previous [meeting minutes](#).

Results and Status

- Note: Please be aware that the project will have frequent updates to the main branch. There are no compatibility guarantees associated with code in any branch, including main, until a new release is created. For example, changes may be reverted before a release is created. **For best results, use the latest available release.**
- The latest available and released version 0.10.0 is available within the [release-0.10.0 branch](#)

- API definition v0.10.0 with inline documentation:
 - [View it on ReDoc](#)
 - [View it on Swagger Editor](#)
 - OpenAPI YAML spec file

- The previous released version v0.9.0 is available within the [release-0.9.0 branch](#)
- For changes between v0.10.0 and v0.9.0 see the [CHANGELOG.md](#)
- Provider implementations (PI) are available within separate repositories (partly for previous releases):

- [QualityOnDemand_PI1](#) by Deutsche Telekom
- [QualityOnDemand_PI2](#) by Orange
- [QualityOnDemand_PI3](#) by Spry Fox Networks

Contributorship and mailing list

- To subscribe / unsubscribe to the mailing list of this Sub Project and join or resign as a Contributor, please visit <https://lists.camaraproject.org/g/sp-qod>.
- A message to all Contributors of this Sub Project can be sent using sp-qod@lists.camaraproject.org.

Developers Getting Started with CAMARA APIs



The screenshot illustrates the developer workflow for the CAMARA Project. On the left, the main project page shows pinned repositories like 'Governance' and 'Commonalities'. A red arrow points from the title area to the 'QualityOnDemand' repository on the right, which is shown in a detailed view. This repository is described as 'Repository to describe, develop, document and test the QualityOnDemand API family'. It has 20 issues, 6 pull requests, and 37 stars. The repository page includes sections for 'About', 'Activity', and 'Releases'.

CAMARA Project

444 followers | Germany | <http://camaraproject.org> | adm@lists.camaraproject.org

Pinned

Governance (Public)

Telco network capabilities exposed through APIs provide a large benefit for customers. By simplifying telco network complexity with APIs and making the APIs available across telco networks and coun...

52 stars | 44 forks

Commonalities (Public)

Repository to describe, develop, document and test the common guidelines and assets for CAMARA APIs

JavaScript | 8 stars | 22 forks

Repositories

Find a repository... | Type | Language | Sort

QualityOnDemand (Public)

Repository to describe, develop, document and test the QualityOnDemand API family

Java | 37 stars | Apache-2.0 | 60 forks | 20 issues | 6 pull requests | Updated 51 minutes ago

Code | Issues 20 | Pull requests 6 | Discussions | Actions | Projects | Security | Insights

Type to search | Watch 29 | Fork 60 | Star 37

QualityOnDemand (Public)

main | 6 Branches | 9 Tags

Go to file | Add file | Code

About

Repository to describe, develop, document and test the QualityOnDemand API family

wiki.camaraproject.org/x/DAEG

Readme | Apache-2.0 license | Activity | Custom properties | 37 stars | 29 watching | 60 forks | Report repository

Releases 9

patch-1 | a531a6a · 3 weeks ago | 754 Commits

ate swagger-editor-validator.yml | last month

ate code/API_definitions/qos-profiles.yaml | 3 weeks ago

ate README.md | 5 months ago

ed configuration for linting ruleset | 3 months ago

ed .unotes/ to .gitignore | 2 years ago

ed configuration for linting ruleset | 3 months ago

ed configuration for linting ruleset | 3 months ago

ate CHANGELOG.md | 2 months ago

ate CODEOWNERS | 2 months ago

Follow

View as: Public

You are viewing the README and pinned repositories as a public user.

People

View all

Top languages

JavaScript | Java | Gherkin | Go | Kotlin

Benefit for developers to work in CAMARA



As a typical Open Source Project **CAMARA is driven by contribution!**

People who contribute define priorities and drive the direction.

Working in CAMARA on API definitions, API documentations and API code (transformation functions) enables to

- **Bring in own demand** and contribute a solution
- **Influence the definition** of new APIs and API versions
- Ensure that own requirements are considered
- **Provide code which can be used globally**
- **Learn** about CAMARA, Open Gateway and the Network API ecosystem
- **Get deep knowledge about the APIs**
- **Become maintainer and TSC member** to influence technical decisions in CAMARA

Joining CAMARA as Developer



To join the CAMARA mailing list send an (empty) email to all+subscribe@lists.camaraproject.org.

A screenshot of the CAMARA Members page. The top navigation bar shows "CAMARA" and "Your Groups". The left sidebar has links for Home (Owner), Subscription, Admin, Pending, Members (which is selected and highlighted in blue), and Activity. The main content area shows a breadcrumb path: All / Members / markus / markus.kuemmerle@telekom.de. Below this is a "Membership" dropdown menu. A "User Details" section shows the email address "markus.kuemmerle@telekom.de". A note at the bottom states: "Note: Changing this email address changes the email address for this person's account, affecting all of their other subscriptions."

CAMARA Your Groups ▾

Home Owner

Subscription

Admin

Pending

Members

Activity

All / Members / markus / markus.kuemmerle@telekom.de Mod

Membership

User Details

Email Address

markus.kuemmerle@telekom.de

Note: Changing this email address changes the email address for this person's account, affecting all of their other subscriptions.

The CAMARA GitHub <https://github.com/camaraproject> can be accessed without any prerequisite. To create issues and start contributing to CAMARA you need a free GitHub account.

Joining CAMARA as Developer



Each API family / working group in CAMARA is organized as a separate Sub Project with (example QoD):

- A dedicated lead repository (containing API definition and API documentation)
- 0...n provider implementation repositories (containing API code)
- A dedicated mailing list

QualityOnDemand Public

Repository to describe, develop, document and test the QualityOnDemand API family

Java ⭐ 37 Apache-2.0 60 19 5 Updated 3 days ago

QualityOnDemand_PI1 Public

Provider Implementation of QualityOnDemand by Deutsche Telekom

Java ⭐ 5 Apache-2.0 8 0 0 Updated 2 hours ago

QualityOnDemand_PI2 Public

Provider Implementation of QualityOnDemand by Orange

Kotlin ⭐ 0 Apache-2.0 1 1 0 Updated on Nov 9, 2023

QualityOnDemand_PI3 Public

Provider Implementation of QualityOnDemand by Spry Fox Networks

Go ⭐ 0 Apache-2.0 2 0 0 Updated on Apr 24, 2023



sp-qod@lists.camaraproject.org

Sub Project "Quality on Demand"

Group Information

- 95 Members
- 27 Topics , Last Post: May 17
- Started on 07/05/22
- RSS Feed

Group Email Addresses

Post: sp-qod@lists.camaraproject.org
Subscribe: sp-qod+subscribe@lists.camaraproject.org
Unsubscribe: sp-qod+unsubscribe@lists.camaraproject.org
Group Owner: sp-qod+owner@lists.camaraproject.org
Help: sp-qod+help@lists.camaraproject.org

Joining a Sub Project as Developer



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To join a Sub Project please have a look into its Readme.md (example Quality on Demand):

last commit may issues 20 open pull requests 5 open contributors 27 repo size 11.4 MB License Apache 2.0

QualityOnDemand

Repository to describe, develop, document and test the QualityOnDemand API family

Scope

- Service APIs for "Quality on Demand" (see APIBacklog.md)
- It provides the customer with the ability to:
 - set quality for a flow within an access network connections (e.g. mobile device connection or fixed access between a home gateway and the service providers gateway router)
 - Session mode, for a specific duration
 - Provision mode, indefinitely for each time the device connects to the same access network
 - get notification if network cannot fulfill
- Describe, develop, document and test the APIs (with 1-2 Service Providers)
- Started: October 2021
- Location: virtually

Meetings

- meetings are held virtually: [Meeting registration / Join](#)
- Schedule: bi-weekly, Friday, 2 PM CET/CEST (13:00 UTC, 12:00 UTC during European DST). For date/time of next meeting see previous [meeting minutes](#).

Status and released versions

- Note: Please be aware that the project will have frequent updates to the main branch. There are no compatibility guarantees associated with code in any branch, including main, until a new release is created. For example, changes may be reverted before a release is created. For best results, use the latest available release.
- The latest available and released version 0.10.1 is available [here](#)
 - API definition v0.10.1 with inline documentation:
 - [View it on ReDoc](#)
 - [View it on Swagger Editor](#)
 - OpenAPI [YAML spec file](#)
 - The previous released version v0.9.0 is available within the [release-0.9.0 branch](#)
 - For changes between v0.10.0 and v0.9.0 see the [CHANGELOG.md](#)
 - Provider implementations (PI) are available within separate repositories (partly for previous releases):
 - [QualityOnDemand_PI1](#) by Deutsche Telekom
 - [QualityOnDemand_PI2](#) by Orange
 - [QualityOnDemand_PI3](#) by Spry Fox Networks

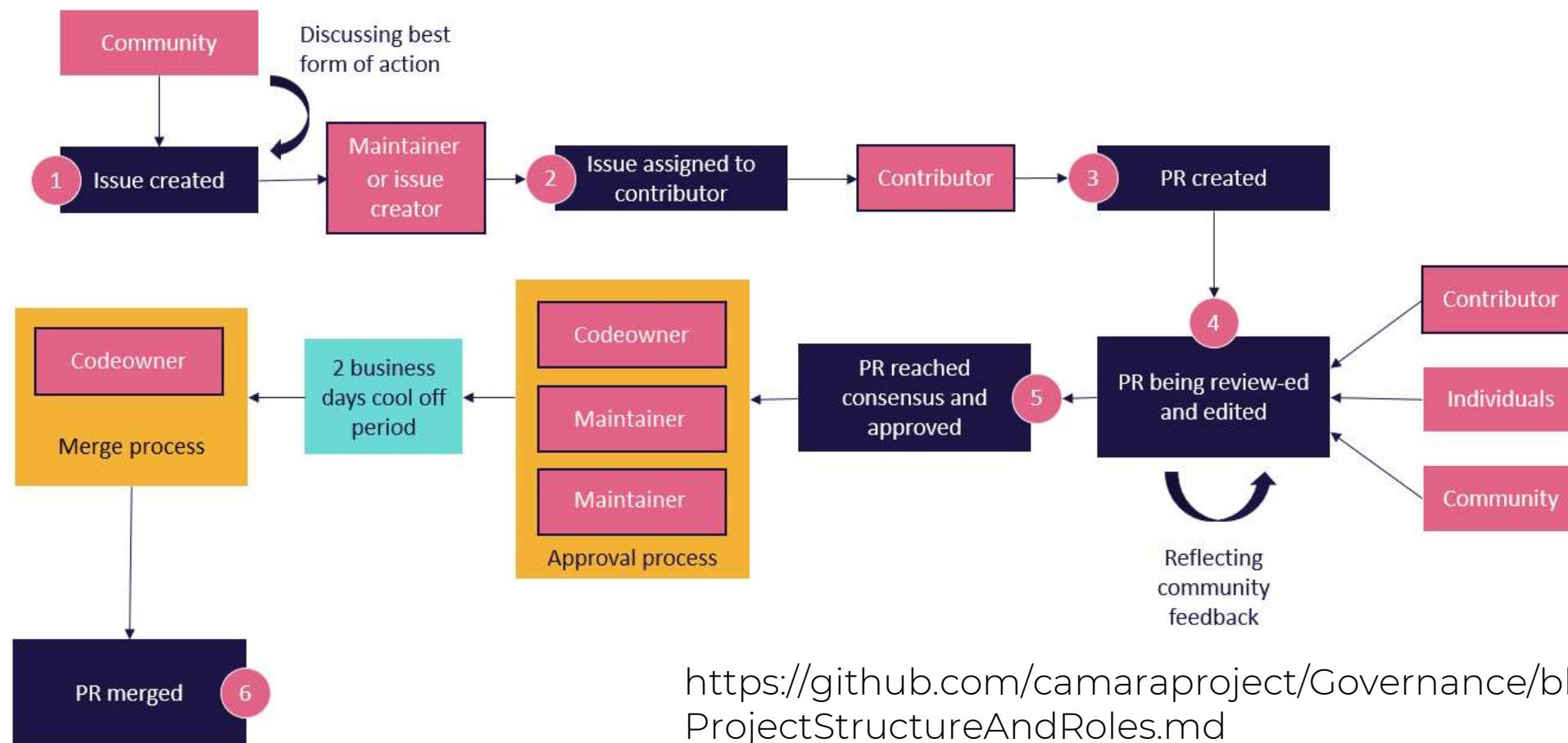
Contributorship and mailing list

- To subscribe / unsubscribe to the mailing list of this Sub Project and thus be / resign as Contributor please visit <https://lists.camaraproject.org/g/sp-qod>
- A message to all Contributors of this Sub Project can be sent using sp-qod@lists.camaraproject.org.

Contributing to CAMARA



In the Project the “Fork and pull model” is used. Changes and contributions to CAMARA shall follow this process:



<https://github.com/camaraproject/Governance/blob/main/ProjectStructureAndRoles.md>

Benefit for operators to implement CAMARA APIs in their networks



Operators have made high investments in

- Spectrum licences
- Infrastructure (cell towers, fibre)

Operators haven't been successful in

- Increasing customer prices for connectivity contracts

CAMARA APIs open a possibility

- To monetize the high investments
- To improve customer experience
- For market positioning



What have operators to do to implement Network APIs?



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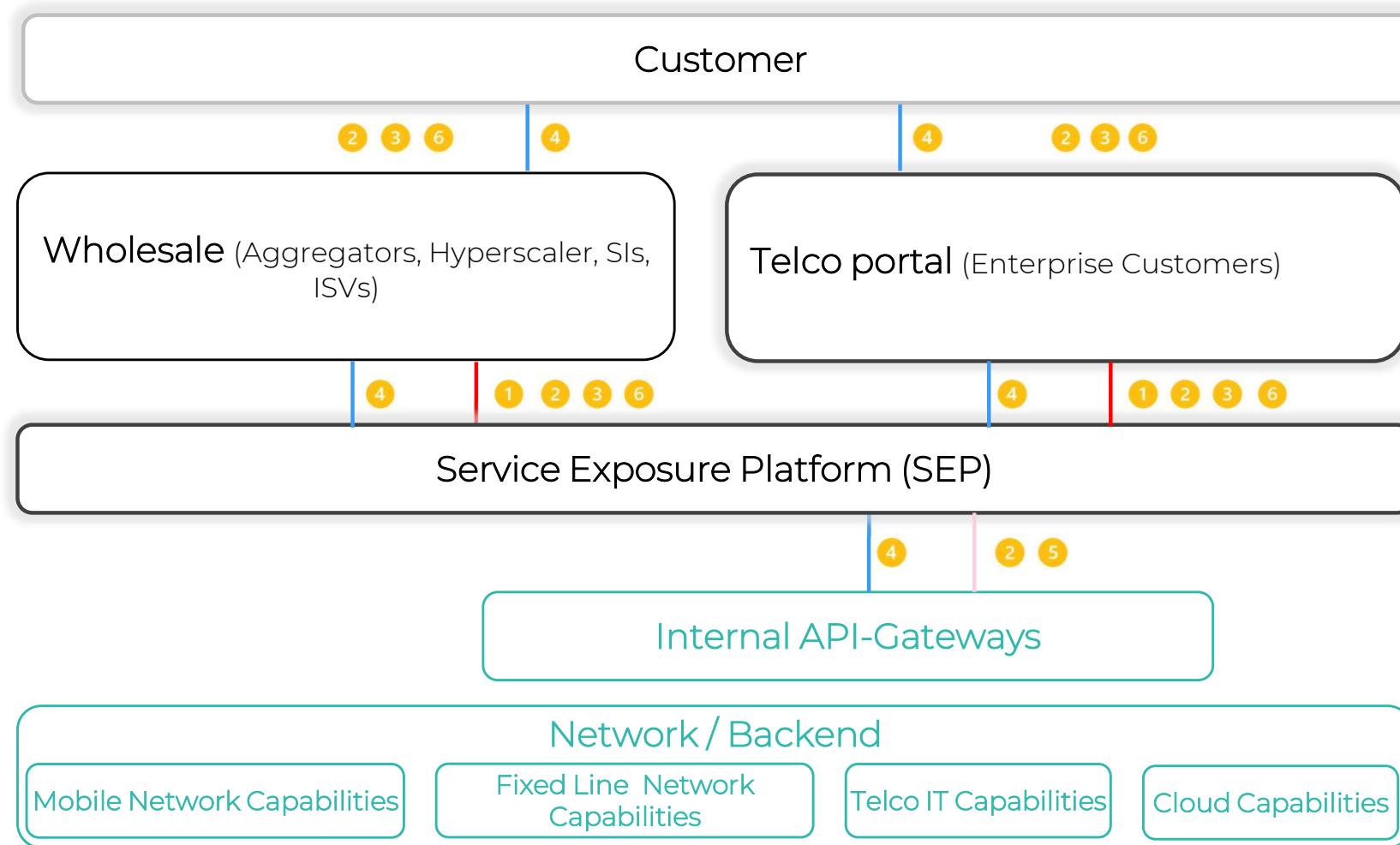
- Develop APIs and products based on the network capabilities
- Implement an exposure infrastructure
- Define commercial products
- Sell it

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GSMATM
Open Gateway

tmforum

What have operators to do to implement Network APIs?



Possible API workflows

1. Catalog published from SEP to portals
2. Customer onboarding to SEP
3. Customer orders API, SEP sends credentials to access API
4. If necessary SEP requests user consent for API. Capacity management is done.
Customer uses API. SEP performs metering (wholesale) / metering and rating (retail).
5. SEP initiates billing for wholesale and retail
6. Customer offboarding

Benefit for operators to work in CAMARA



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Collaborative Innovation

- Industry Collaboration
- Standardization: contribute to development of industry standards, ensuring interoperability and consistency across networks and services
- Bring in your requirements!

Networking and Partnerships

- Access to a growing global network of industry leaders
- Technological Advancements
- Knowledge Exchange

Shared Resources

- Collaborative projects often lead to cost savings through shared resources and reduced duplication of efforts
- Benefit from the collective research efforts

Benefit for operators
to work in CAMARA



Why Join CAMARA as a sponsor /member?

Seat on the Governing
Board to influence CAMARA
strategy

Elevate your Brand

Signal Support &
Commitment to open API
development

Discounts on Linux
Foundation events &
programs

Help ensure the Project
continues to provide needed
governance & infrastructure

Platform to showcase
thought leadership

Operators Getting Started with CAMARA



Individuals and organizations from API customers (e.g. enterprises and startups), aggregators, cloud operators, telco operators, network equipment vendors, system integrators, and software vendors are welcome to join CAMARA.

For organizations:

- If you are interested to show your logo on the CAMARA website as "**Participating Organization**" send a .SVG version of it to adm@lists.camaraproject.org. Participation is free, without any fees or obligations.
- If you would like to become a **CAMARA sponsor** please don't hesitate to use the [enrollment link](#). The cost is depending on the kind of membership and the number of employees.
- Associate Members of The Linux Foundation can also join as "**Associating organization**" for free, without any fees or obligations.

CAMARA

Where are we going next...



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1

Additional APIs and roadmap sync across CSPs,
Aggregators and Hyperscalers

2

API lifecycle management consistency,
Documentation of API versioning and availability globally

3

Drive API Adoption (customers/developers and operators)

CAMARA Contacts



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Individuals and organizations from API customers (e.g. enterprises and startups), aggregators, cloud operators, telco operators, network equipment vendors, system integrators, and software vendors are welcome to join CAMARA.

To access CAMARA technical resources like API definitions, API specifications or API code just visit the [CAMARA GitHub](#). All resources are reachable without any prerequisite. To create issues and start contributing to CAMARA you need a free GitHub account without any further prerequisite. This participation is free, without any fees or obligation to work.

If you are interested to be included in the CAMARA communication, please subscribe to all+subscribe@lists.camaraproject.org. You may unsubscribe from CAMARA and these communications at any time. Participation is free.

If you are interested to show your logo on the CAMARA website as “Participating Organization” you can send it to adm@lists.camaraproject.org. Participation is also free.

If you would like to join as CAMARA sponsor or associating organization, please don't hesitate to use the enrollment link <https://enrollment.lfx.linuxfoundation.org/?project=camarafund>. Cost is depending on the kind of membership and the number of employees.





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