



CAMARA
THE TELCO GLOBAL API ALLIANCE

Presentation

25.04.2026

Content of the CAMARA presentation



CAMARA
THE TELCO GLOBAL API ALLIANCE

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APIs enabling seamless access to Telco network capabilities



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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.



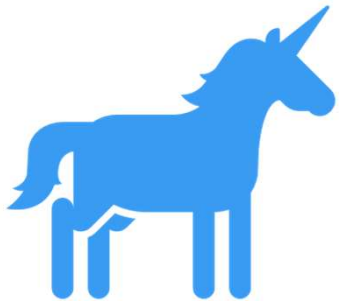
CAMARA Mission

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

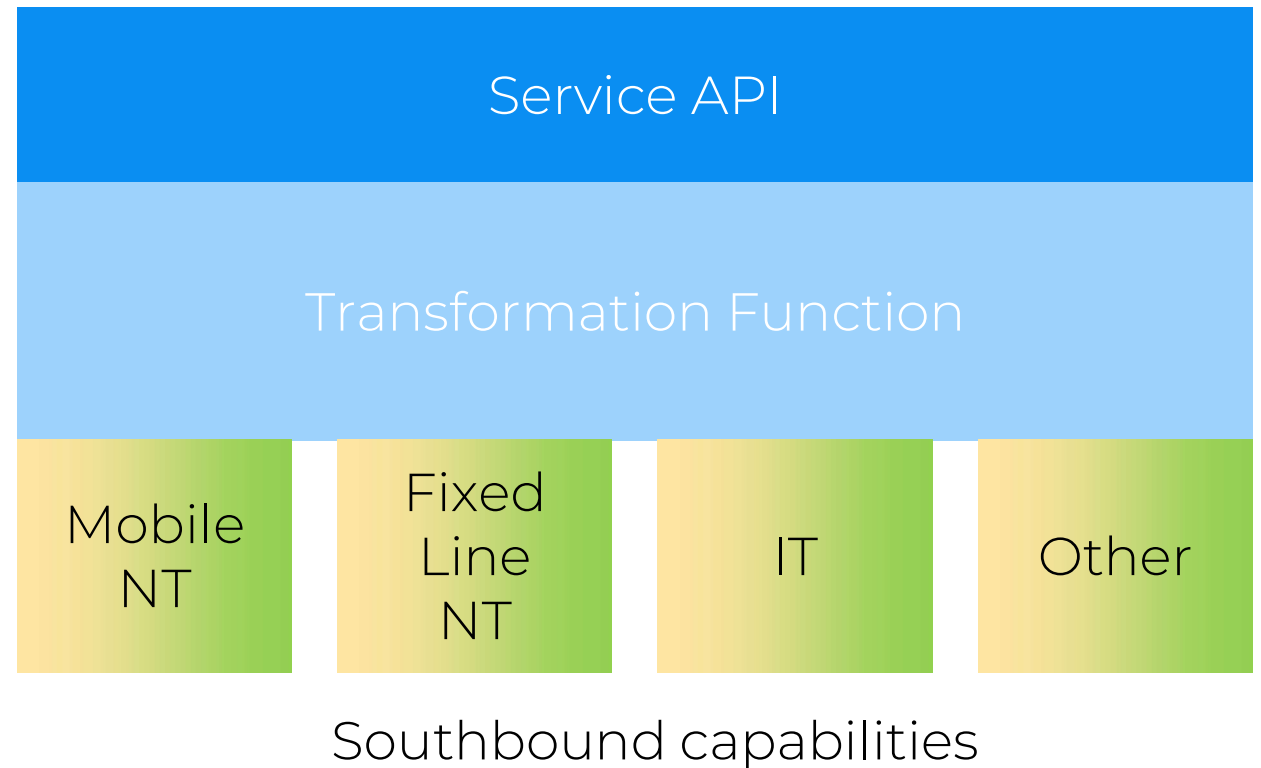
Key problems we try to solve

Simplicity Benefit



Abstraction by transformation from network capabilities 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 Open Source



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. 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).

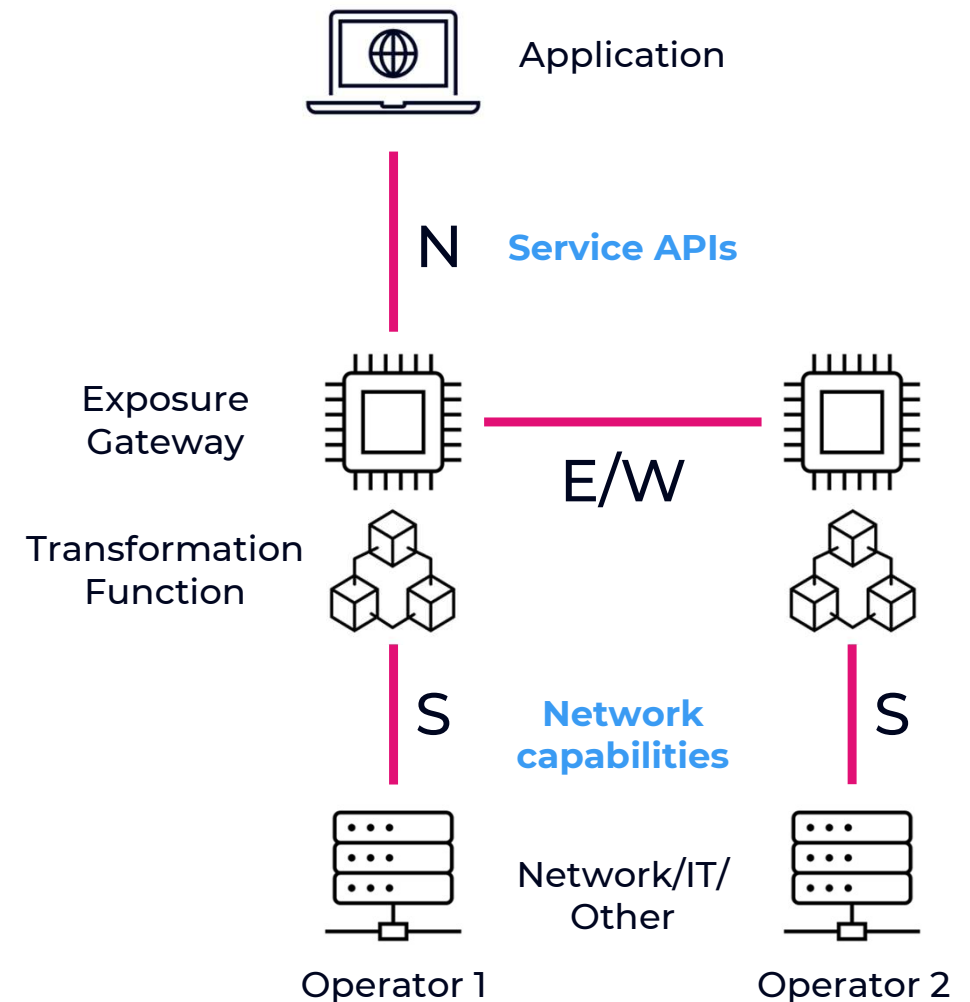


CAMARA Scope



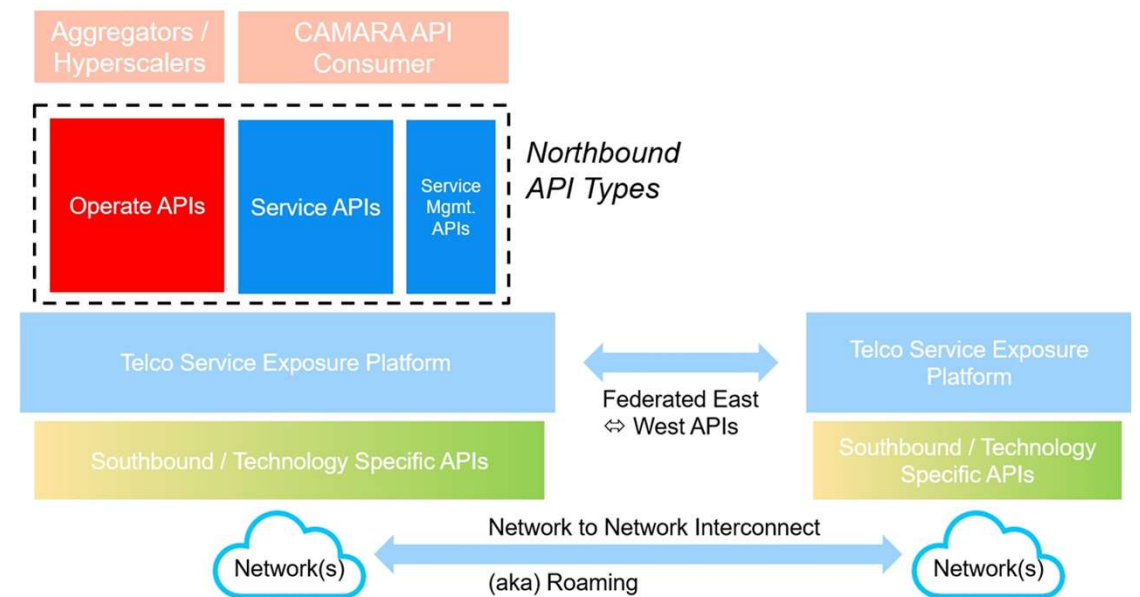
From functional perspective the scope is limited to **telco APIs**, that means APIs in the domain of telco mobile networks, telco fixed line networks, telco edge cloud, etc. or supporting these.

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.



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.

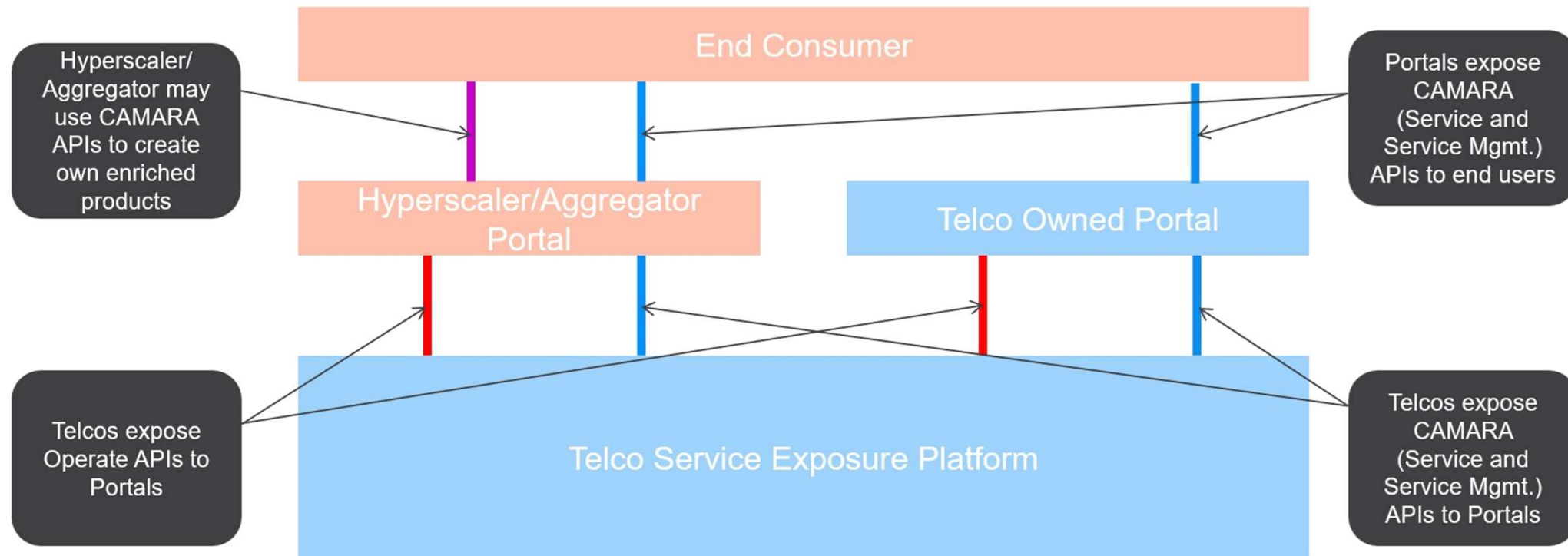


Service APIs and Service Management APIs are in scope of CAMARA. **Operate APIs** are out of scope of CAMARA (these are already covered by other SDOs = Standards Development Organizations like TM Forum).

CAMARA – Scope / Collaboration with Open Gateway and TM Forum



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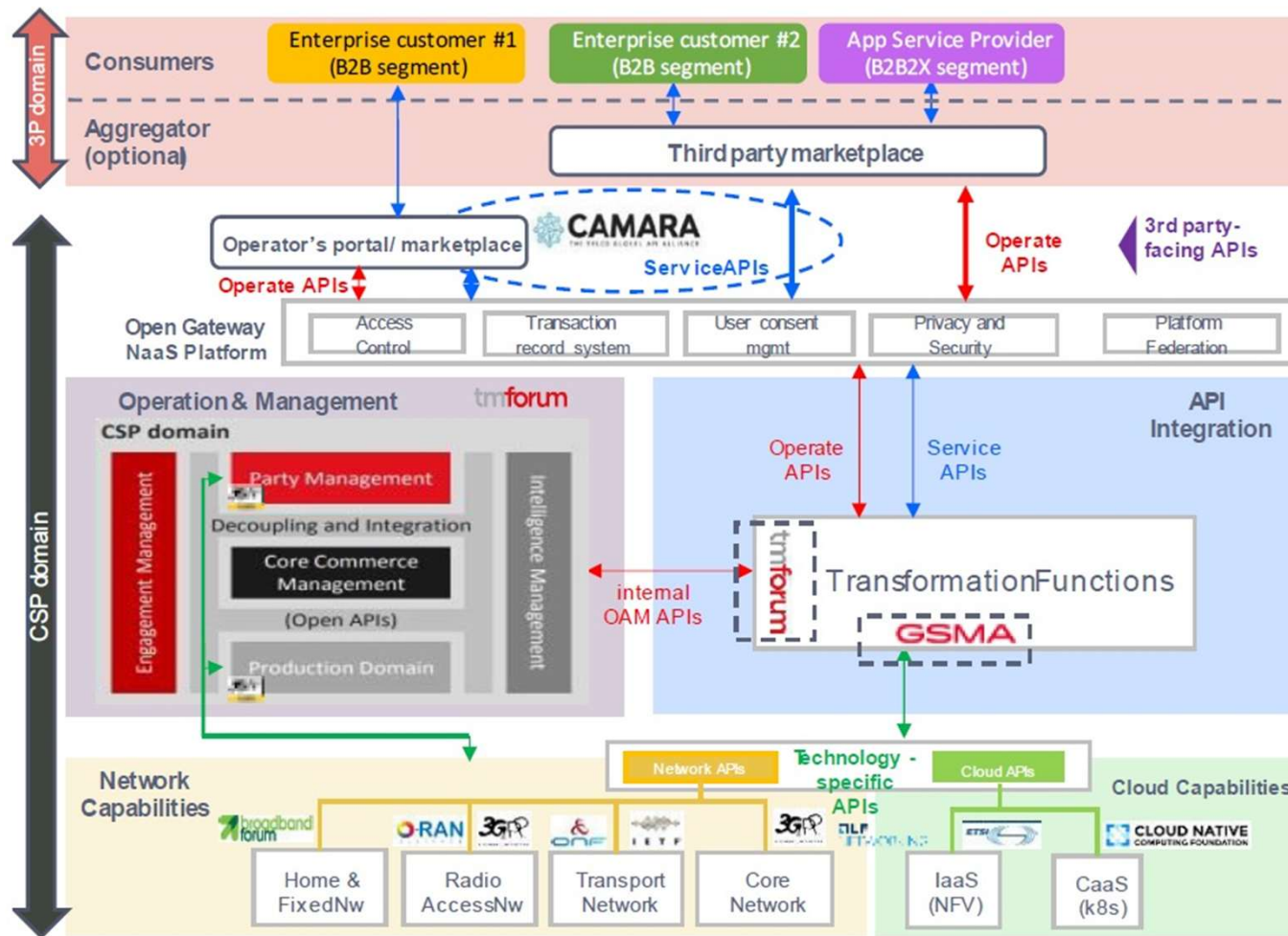


Hyperscalers and aggregators have the possibility to create own enriched products based on the CAMARA APIs and expose that in addition to the CAMARA APIs.

CAMARA – Scope / Collaboration with Open Gateway and TM Forum



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3rd Party-facing APIs

Service APIs
App-centric, dev-orientated
Apache2.0 lic, user-friendly, easy-to-use
Example: QoD, verifylocation, device status, Sim Swap,...
Includes some management functionality used from the apps (in-app OAM APIs)

Hosted by **CAMARA**

Contributed by OpenGateway partners, directly or supported by bodies like

Operate APIs
Management oriented
Easy-to-implement, easy-to-use, simple
Example: register, account, monitor, issue mgmt, order/purchase, pay...
Provides an easy integration of the NaaS Platform with marketplaces/portals

Contributed by OpenGateway partners, hosted by **tmforum**

Technology-specific APIs
Technical capability oriented, standard, (FRAND) deterministic
Example: policysetting parameter setting information check...

Contributed by specific domain SDOs

CAMARA project defines CAMARA APIs.

TMForum develops the Operate APIs.

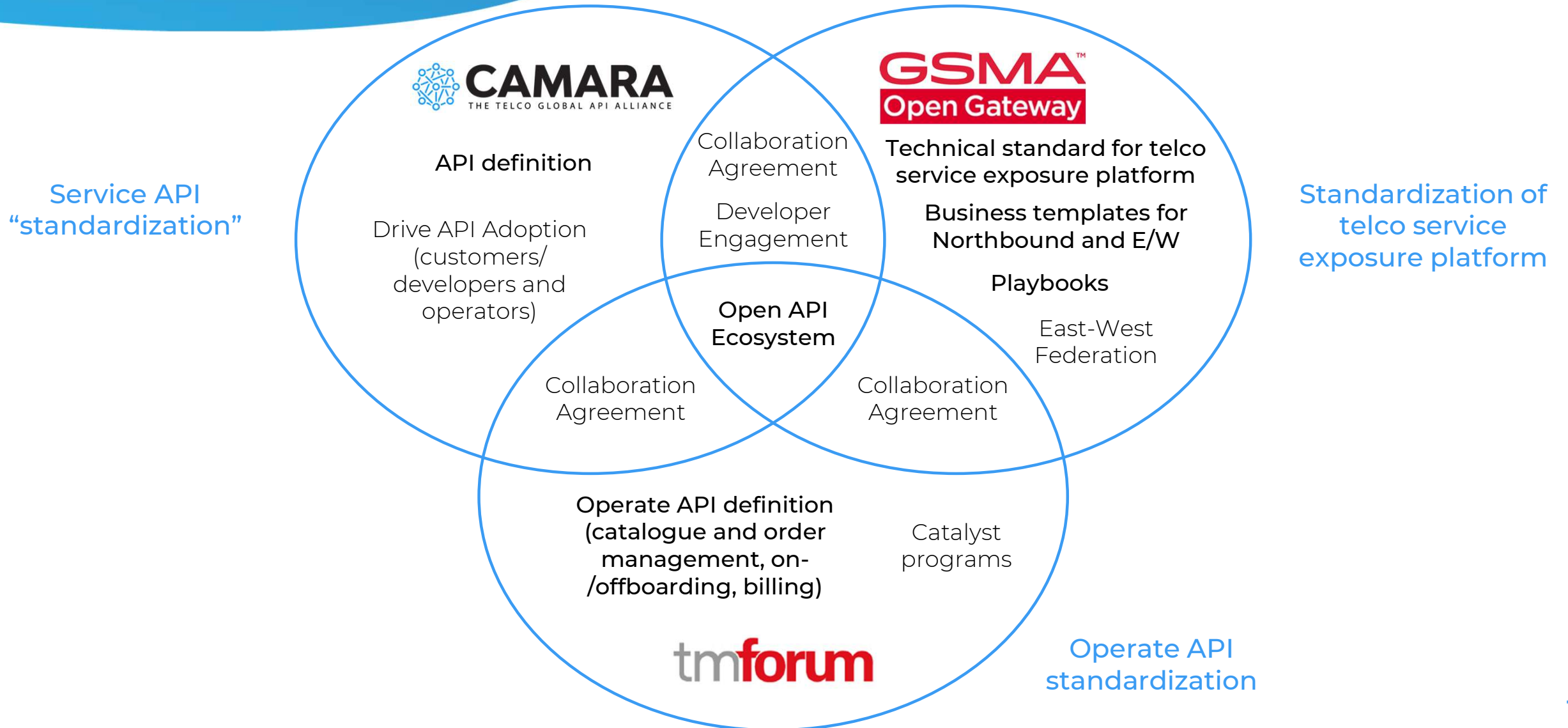
Several SDOs cover the different technology domains that provide the telco capabilities.

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



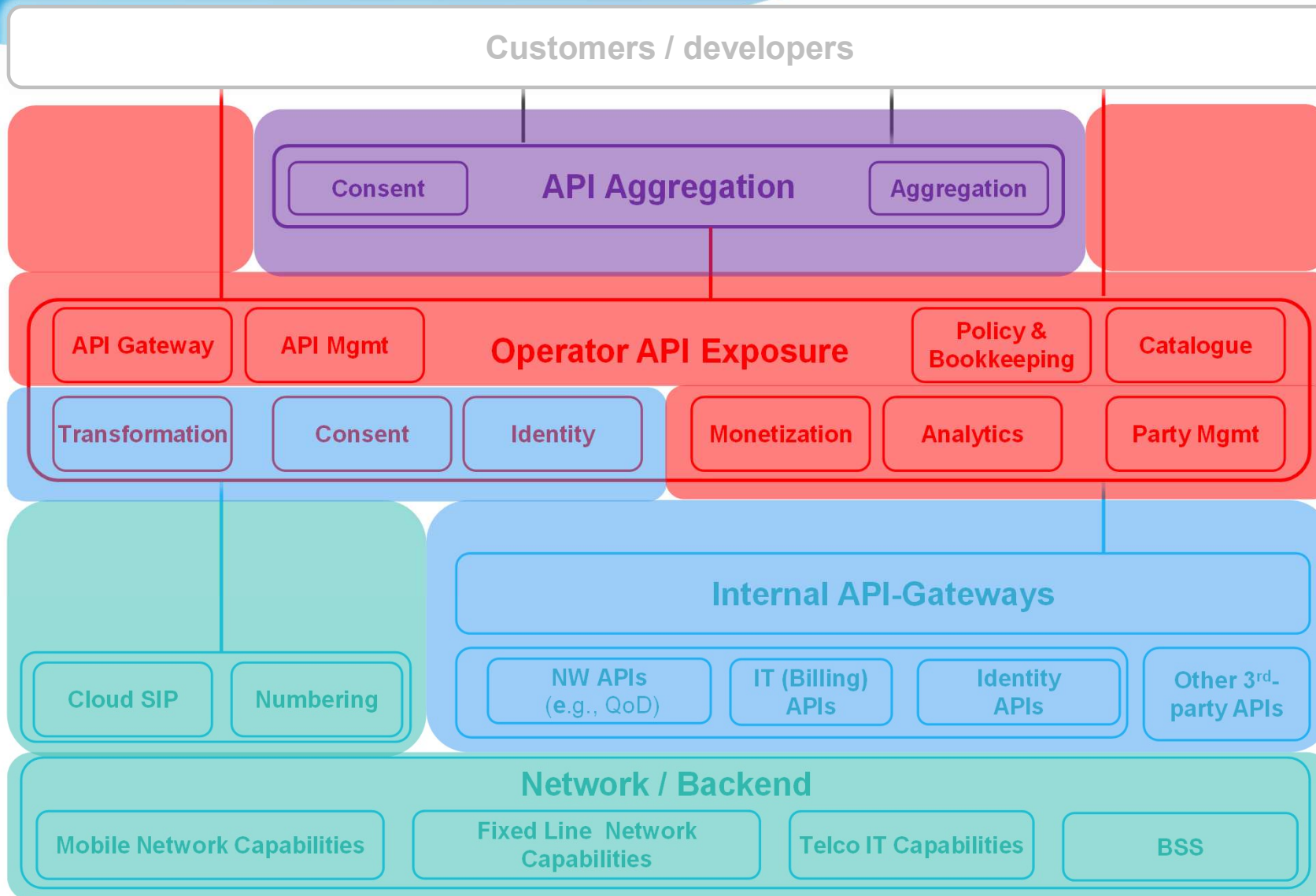
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Role of CAMARA, Open Gateway and aggregators



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Aggregators in each market



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CAMARA Scope



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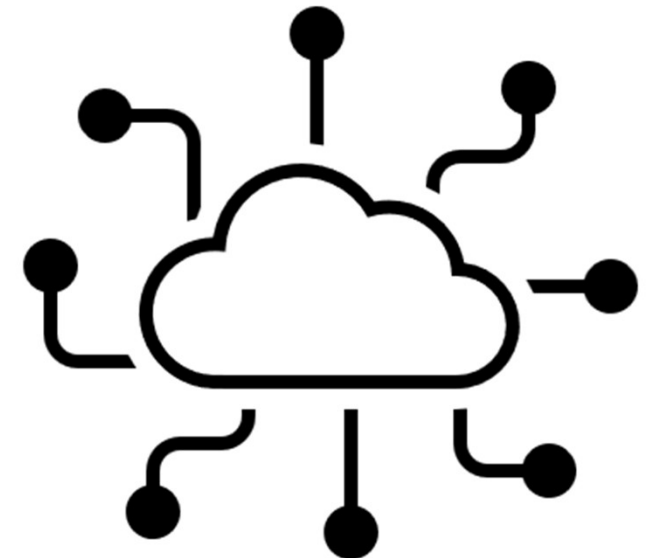
The scope of the CAMARA Project is:

- **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>.

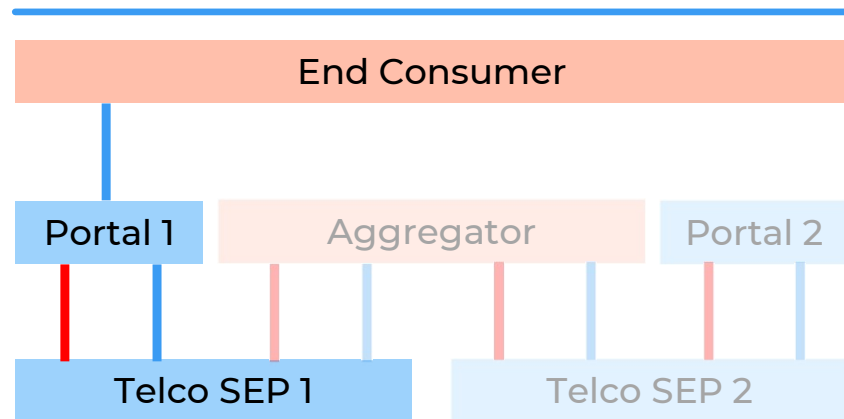


CAMARA API Distribution Options



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Single-Operator Relationship

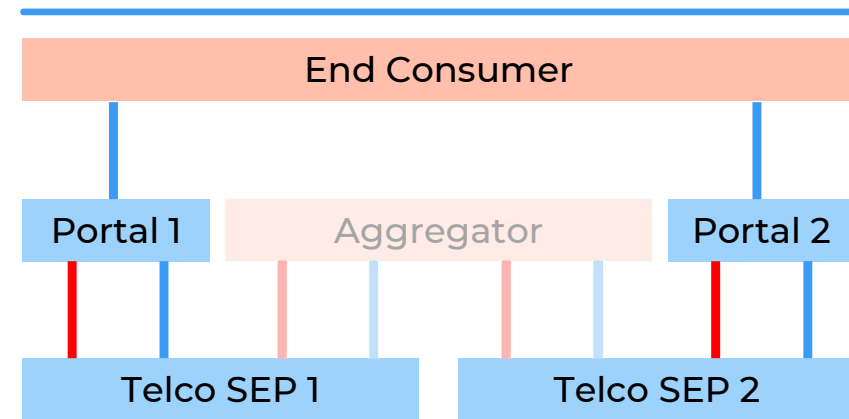


Blue lines =
CAMARA APIs

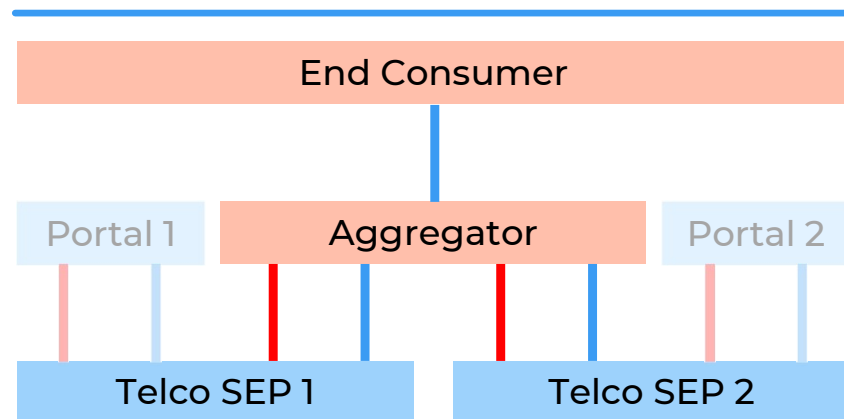
Red lines =
Operate APIs

SEP=
Service
Exposure
Platform

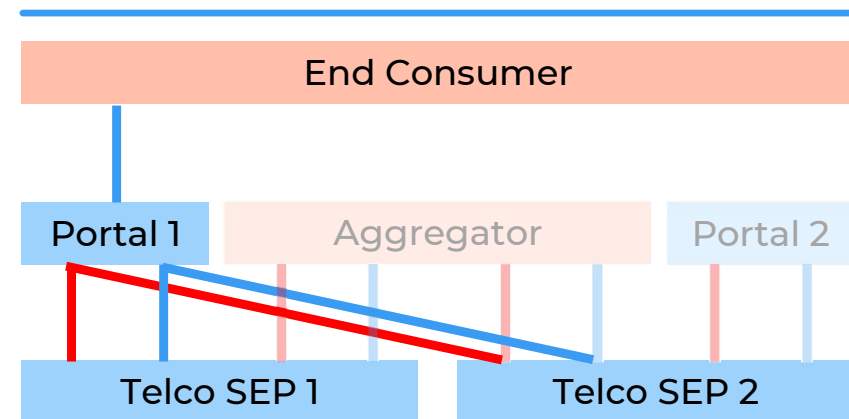
Multi-Operator Relationship



Operator Aggregation



Single-Operator "API Roaming"



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 API consumer's voice and demand
- **Availability** – Open APIs with great support of many operators on many platforms
- **Alignment** - With standardization bodies like TM Forum, GSMA or ETSI-MEC
- **Sustainability** – We have the CEOs behind (e.g. Open Gateway MoU, API Venture)
- **Telco maturity** – Telcos are now more digital and cloud oriented
- **Privacy** – Well defined

CAMARA

Where we started...



Launched at MWC
Barcelona 2022

22 Launch Partners

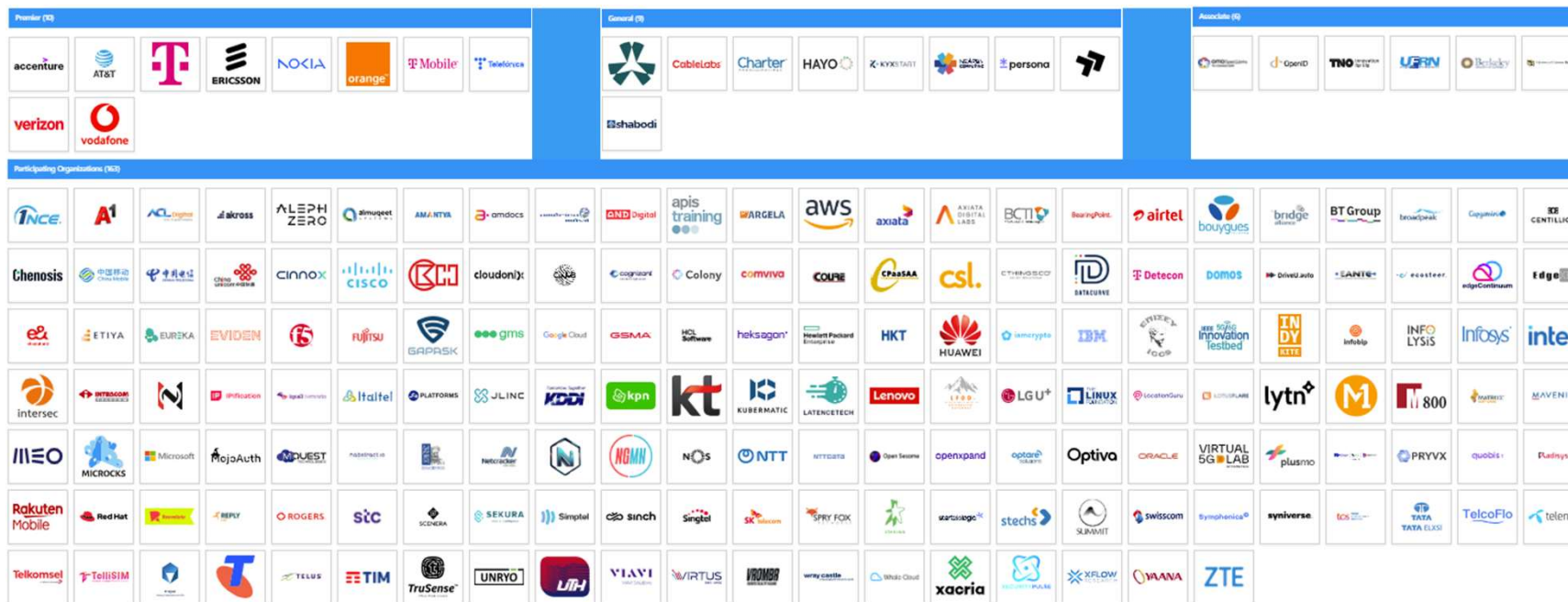
Supported by GSMA and
Linux Foundation

Simple idea to “standardize”
developer facing APIs



CAMARA

... and where we are now



- 188 Named Partners
- 481 companies participating in CAMARA
- 9 API Sub Projects
- 25 Sandbox Projects
- 68 APIs
- 5 Working Groups
- 1353 people joined CAMARA
- Development "home" for GSMA Open Gateway

CAMARA Logos



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Premier (10)

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General (9)

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Associate (6)

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Participating Organizations (163)

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Release Management Motivation and Benefits



- A **CAMARA meta-release** combines a set of CAMARA API versions into a **consistent** release.
- There are **two meta-releases per year** (in spring and fall).
 - API providers (e.g. Network operators, Channel Partners) 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 the CAMARA guidelines** from CAMARA Commonalities and Identity and Consent Management of that meta-release.
- **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

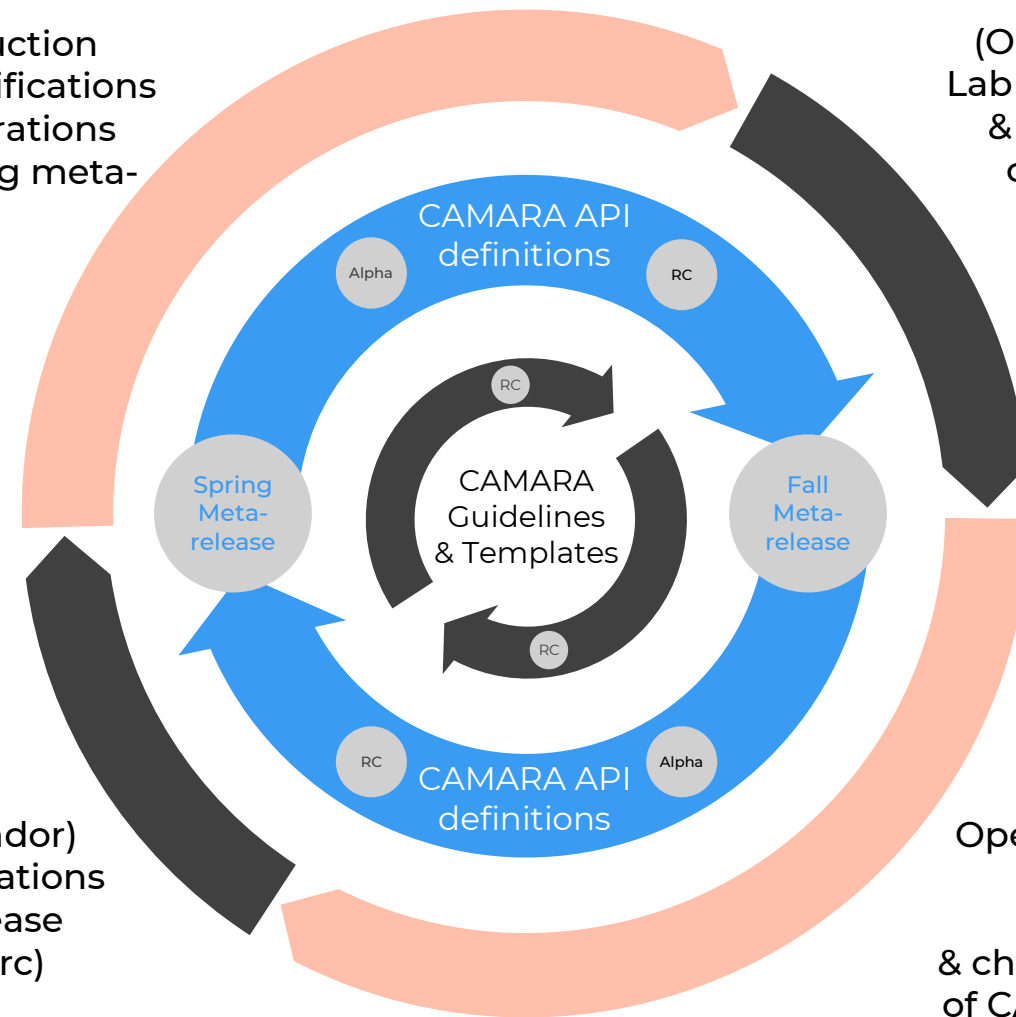


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- 2 meta-releases per year
 - Fall (in September)
 - Spring (in March)
- Continuous and overlapping cycles
 - Update of CAMARA guidelines
 - Development and updates of API definitions in CAMARA
 - Lab implementations and production deployments at network operators
- Tests of API release candidates
 - In 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

Operator production deployments, certifications & channel integrations of CAMARA Spring meta-release

(Operator/Vendor) Lab implementations & tests of release candidates (rc)



(Operator/Vendor) Lab implementations & tests of release candidates (rc)

Operator production deployments, certifications & channel integrations of CAMARA Fall meta-release

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

CAMARA Fall 25 meta-release

60 #total CAMARA APIs



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10

STABLE APIs

- device-reachability-status
- device-roaming-status
- device-swap
- location-verification
- number-verification
- one-time-password-sms
- qos-profiles
- quality-on-demand
- sim-swap
- simple-edge-discovery

23

NEW INITIAL APIs (v0.y.z)

- application-endpoint-discovery
- application-endpoint-registration
- blockchain-public-address-validation
- brand-registration
- consent-info
- dedicated-network
- dedicated-network-accesses
- dedicated-network-profiles
- device-data-volume
- device-data-volume-subscriptions
- energy-footprint-notification
- knowledge-base
- most-frequent-location
- network-slice-booking
- optimal-edge-discovery
- predictive-connectivity-data
- qa-assistant-manage
- qa-assistant-service
- qos-booking
- qos-booking-and-assignment
- subscription-status
- traffic-influence
- verified-caller

27

SPRING25 UPDATED INITIAL APIs (v0.y.z)

- application-profiles
- blockchain-public-address
- call-forwarding-signal
- carrier-billing
- carrier-billing-refund
- connected-network-type
- connected-network-type-subscriptions
- connectivity-insights
- connectivity-insights-subscriptions
- customer-insights
- device-identifier
- device-reachability-status-subscriptions
- device-roaming-status-subscriptions
- geofencing-subscriptions
- kyc-age-verification
- kyc-fill-in
- kyc-match
- kyc-tenure
- location-retrieval
- number-recycling
- population-density-data
- qos-provisioning
- region-device-count
- sim-swap-subscriptions
- webrtc-call-handling
- webrtc-events
- webrtc-registration

CAMARA API Overview



THE LINUX FOUNDATION PROJECTS

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Home About **API Overview** API Descriptions Working Groups Events Resources Join

The APIs in the following table are mature: APIs which are stable or already part of two or more CAMARA meta releases.

| Authentication and Fraud Prevention | Location Services | Communication Services | Communication Quality | Device Information | Computing Services | Payments and Charging | Service Management |
|-------------------------------------|--------------------------|---------------------------|-------------------------------------|--|-----------------------|---------------------------|--------------------|
| Call Forwarding Signal | Geofencing Subscriptions | WebRTC Call Handling | Application Profiles | Connected Network Type | Simple Edge Discovery | Blockchain Public Address | |
| Customer Insights | Location Retrieval | WebRTC Event Subscription | Connectivity Insights | Connected Network Type Subscriptions | | Carrier Billing | |
| Device Swap | Location Verification | WebRTC Registration | Connectivity Insights Subscriptions | Device Identifier | | Carrier Billing Refund | |
| Know Your Customer Age Verification | Population Density Data | | QoS Profiles | Device Reachability Status | | | |
| Know Your Customer Fill In | Region Device Count | | QoS Provisioning | Device Reachability Status Subscriptions | | | |
| Know Your Customer Match | | | Quality on Demand | Device Roaming Status | | | |
| Know Your Customer Tenure | | | | Device Roaming Status Subscriptions | | | |

- <https://camaraproject.org/api-overview/>
- Mature APIs
- APIs in earlier development

API Descriptions




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Home About API Overview **API Descriptions** Working Groups Events Resources Contact

API Description

The "Call Forwarding Signal" (CFS) API provides the API consumer with information about the status of the Call Forwarding Service on a specific phone number. The main scope of the CFS API is anti-fraud to avoid fraudsters to use the Call Forwarding Service to carry on a scam. Other use cases are anyway supported by the CFS API that also provides additional endpoints to detect the general Call Forwarding Service settings.



The API consumer invokes the CFS API to determine if a specific phone number has an active "call forwarding" setup. "Call forwarding" is a network service that redirects incoming calls to another phone number (configured in the service). The CFS API can be used by a bank to verify if a "call forwarding" option is active on the customer's phone number to avoid frauds. A call from the

API Portfolio: Authentication and Fraud Prevention

- SubProject Wiki: [Call Forwarding Signal](#) (incl. how to meet the team)
- API Wiki: [Call Forwarding Signal](#)
- API Repository: [Call Forwarding Signal](#)

API Repository Status: **Incubating**

API Status: **Initial**

API Version(s) and Release Date(s):

- [v0.2.0](#) (2024-09-15), Fall24 meta-release
- [v0.3.0](#) (06.03.2025), Spring25 meta-release

API availability: Information which APIs are available in which country and network, and how to get access can be found on the [GSMA public launch status page](#).

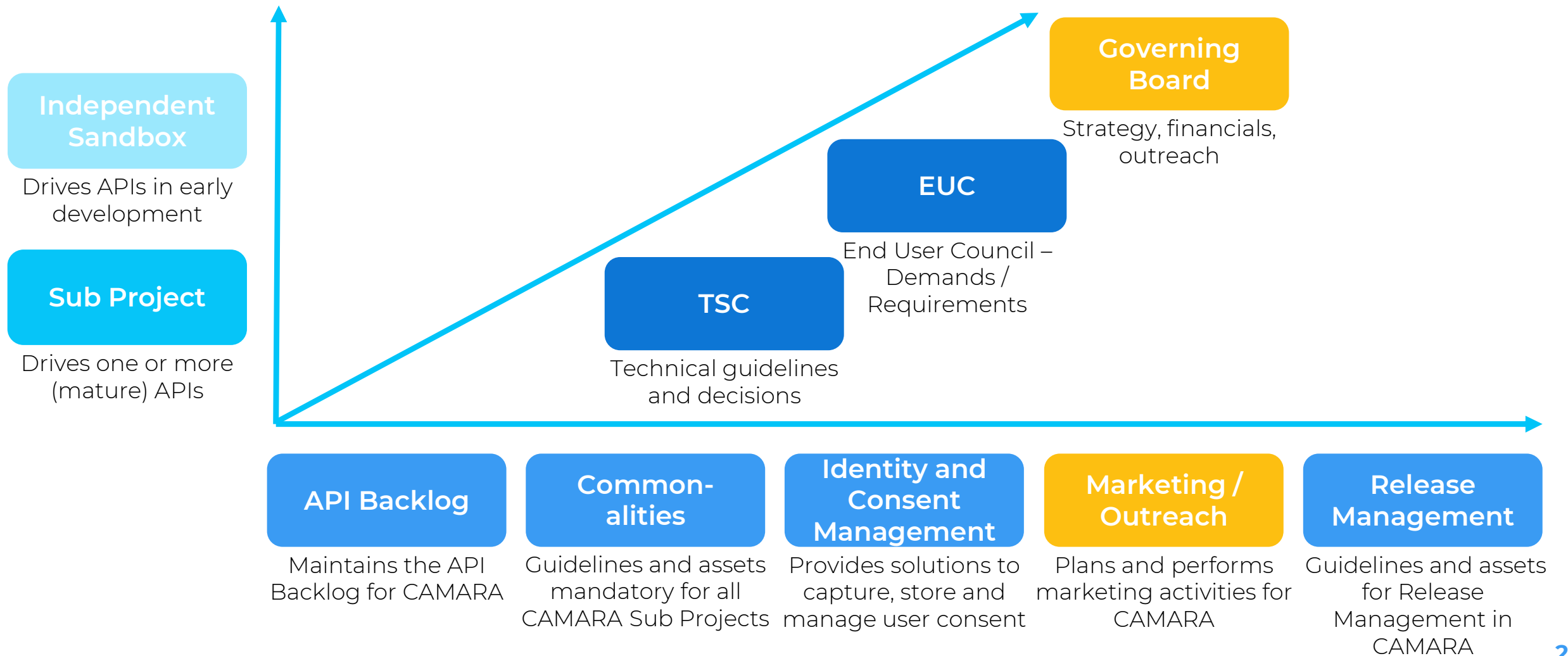
- API description
- Use Cases
- Benefits

- Links to
 - Sub Project (contacts)
 - API Wiki
 - API repository
 - API version(s)
 - GSMA public launch status

How CAMARA Works



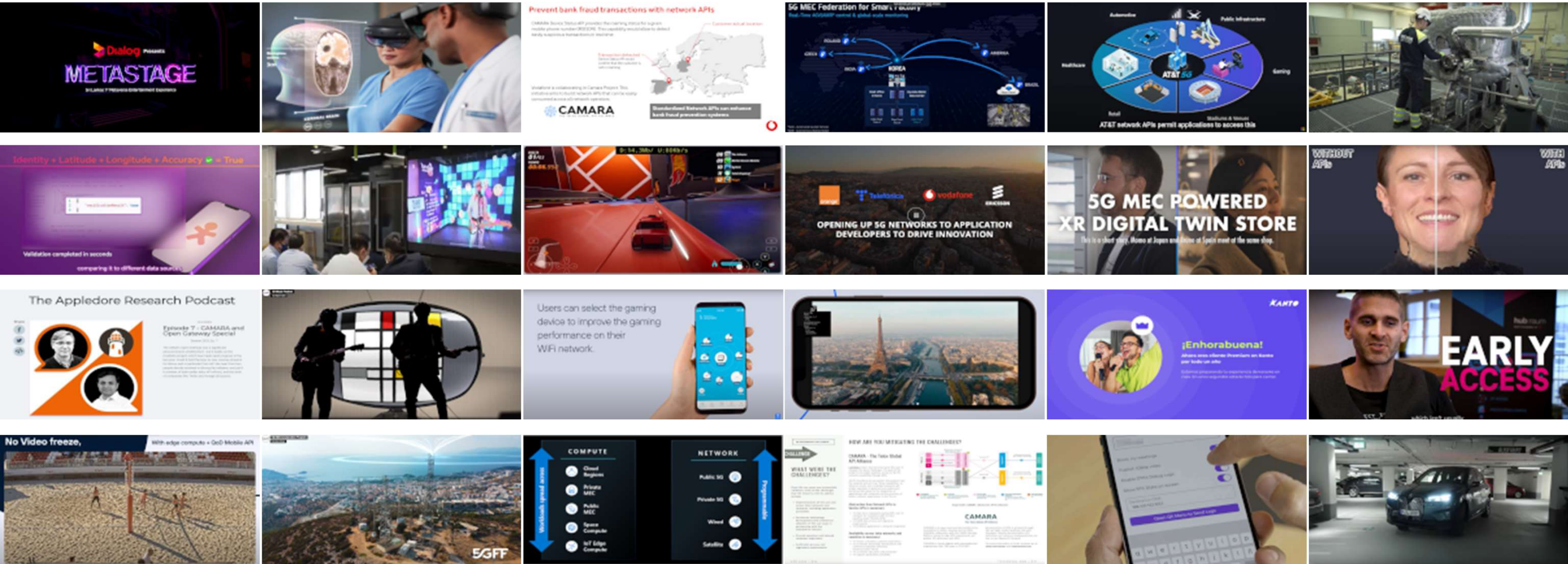
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CAMARA / Open Gateway API Showcases



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

CAMARA / Open Gateway API public launch status



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GSMA Solutions and impact Discover Get involved About us Newsroom

APPLIED FILTERS
CLEAR ALL

CARRIER API'S
SELECT (ALL) TOTAL (14)

- Carrier Billing
- Device Identifier
- Device Status (Roaming Status)
- Device Location Geofencing
- Device Location Retrieval
- Device Location

COUNTRIES
SELECT (ALL) AVAIL (2) TOTAL (2)

- Argentina
- Australie
- Brazil
- China
- Finland

OPERATORS
SELECT (ALL) AVAIL (36) TOTAL (36)

- AIS
- AT&T
- Axlete
- Bharti Airtel
- BT

COUNTRIES AND MARKET SHARE

| Country | Provider | Api Name | Version | Certified | Link |
|-----------|-------------------|---|---------|--------------------|------|
| Argentina | Telecom Argentina | SIM Swap - Check | 0.4.0 | GSMA API Certified | N/A |
| Argentina | Telecom Argentina | SIM Swap - Retrieve Date | 0.4.0 | GSMA API Certified | N/A |
| Argentina | Telecom Argentina | Number Verification - Phone number verify | 0.3.1 | GSMA API Certified | N/A |

Country Grid

<https://open-gateway.gsma.com/>

CAMARA / Open Gateway API public launch status



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Commitment

138

80 operator groups
and **58** Channel
Partners supporting the
Open Gateway MOU

291

operator networks
represented

>80%

of mobile
connections
represented

Assets

66

APIs published in
 **CAMARA**
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34 APIs in Development

Technical

Standardization through certification
Certified APIs

Commercial

Open Service Agreement, Channel
Partner On-Boarding and E-W
Federation Agreement Templates

Impact

270

commercial API
launches

21

market champion launches
with align GTM services,
engaged with **68** Markets

17,096

media mentions in 2025,
22K in 2024

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



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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



Authentication and Fraud Prevention



Secure Auth
Fraud Prevention

Number Verify, Sim Swap, etc.


Location Services



Location Verification
Location Retrieval
Location Geofencing

Location APIs


Communication Quality



Safeguarding of Transactions
Remote Control
AR/VR/XR
Gaming

Quality on Demand


Device Information



Proactive User Information

Device Data Volume

Computing Services



Edge Application hosting
Latency optimization

Simple Edge Discovery

Network APIs offer the opportunity

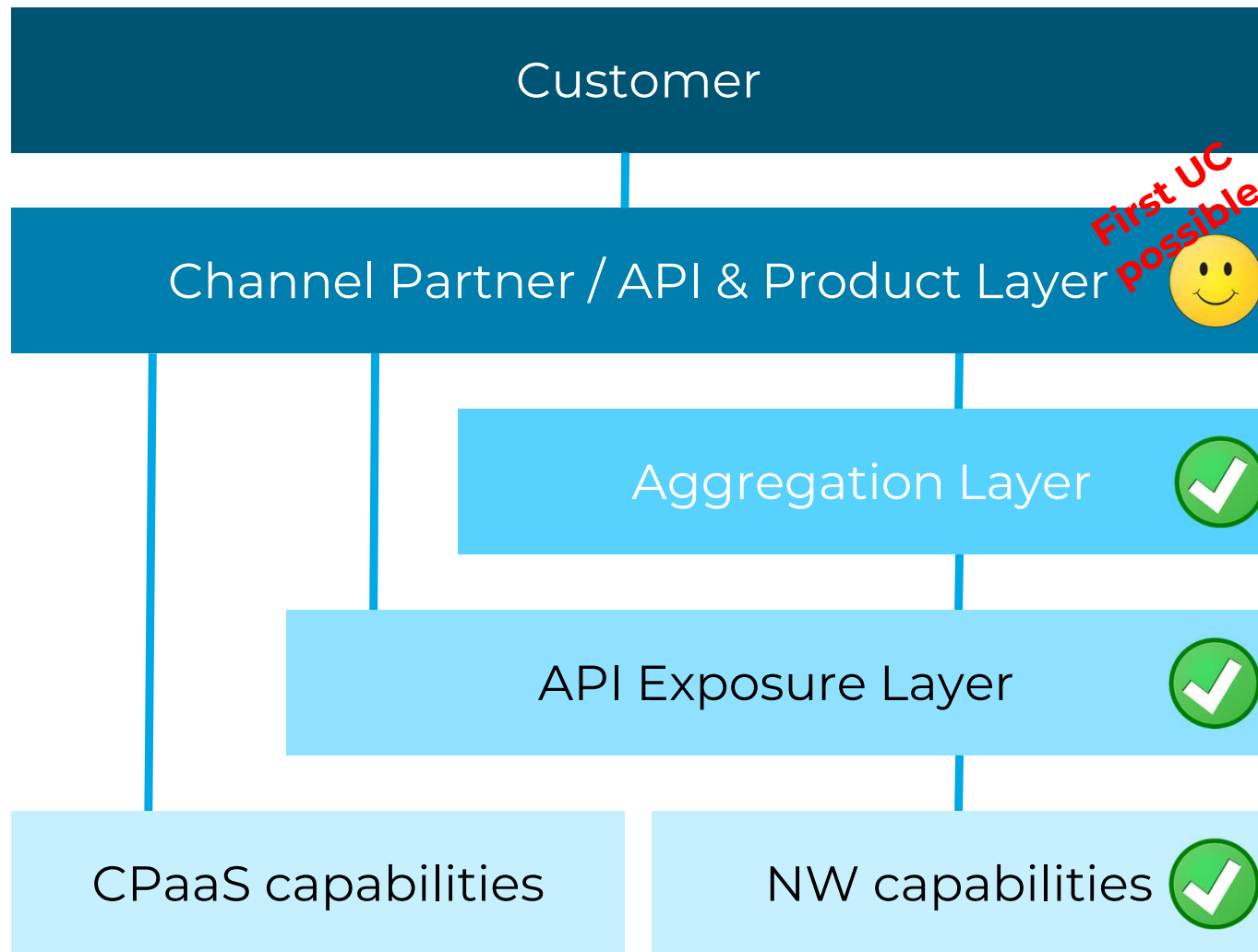
- For customers to optimize their use cases and applications
- For operators to monetize their invest in 5G infrastructure

It's a win-win!

The API ecosystem – Current status and challenges

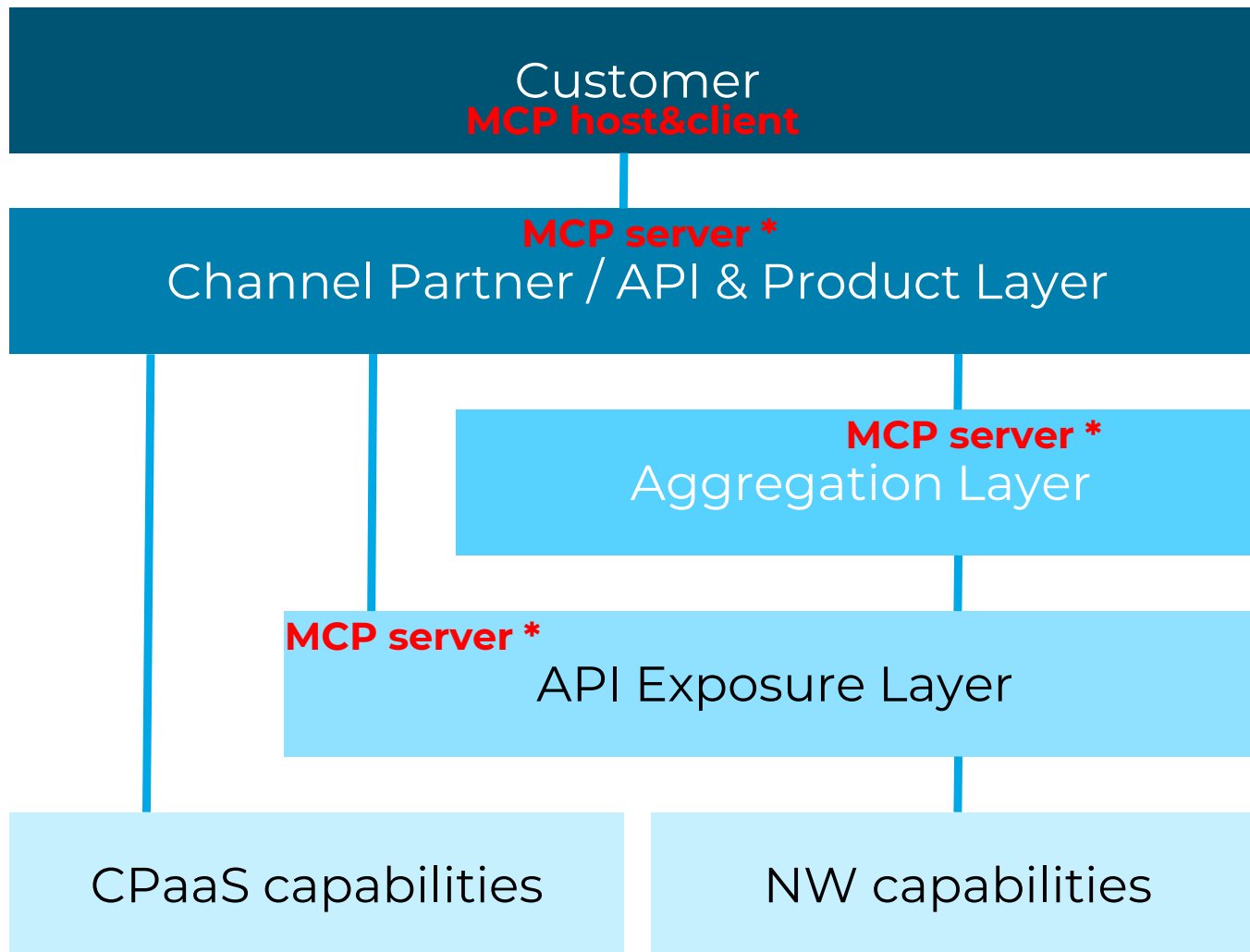


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- Show the figures (successful revenues) - [GSMA](#)
- Find balance between regulation/data privacy and usability for the markets - [GSMA](#)
- Prepare all layers for (agentic) AI – [Channel Partners](#), [GSMA](#), [CAMARA](#) *Next slide*
- Introduce products - [Channel Partners](#)
 - Change communication (solve customer problems instead of expose capabilities)
 - Design and develop products following customer need, considering alternative (non-telco) solutions and attractive pricing
- Push market coverage and communicate it - [GSMA](#)
- Close gaps at operators - [Operators](#)
- Enable Consent API for multi-API one-step consent independent of API flows - [CAMARA](#) 32

The API ecosystem – Prepare for agentic AI



- CAMARA should provide context for MCP servers, esp. scopes and purposes, user consent requirements
- CAMARA should adjust security guidelines and API design guidelines
- CAMARA should provide authoritative MCP function definitions versioned in lockstep with corresponding CAMARA API definitions
- GSMA/OGW should add MCP servers to technical standards, launch map, certification
- Operators and Aggregators should expose MCP servers in parallel to APIs
- Channel partners and Customers should use LLMs/MCP hosts/MCP clients in parallel to products. Channel partners also can expose MCP servers to customers.

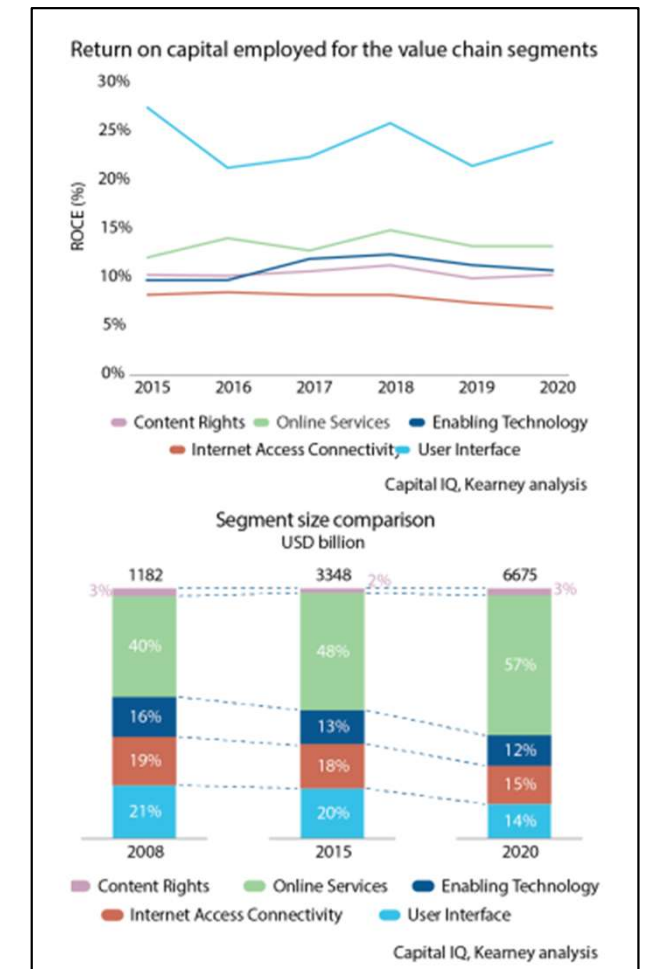
*** MCP server can sit in exposure layer (for single operator APIs), aggregation layer (for aggregated APIs) or Channel Partner layer. But aggregation only happens on API side, not on MCP side**

AI does not solve the telco dilemma



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- AI offers a low-hanging fruit for telcos to save cost and improve UX, e.g.
 - Hotline automation (for customers and employees)
 - Network automation up to autonomous networks
 - ...
- For that reason telcos prioritize AI activities in the moment (sometimes at the expense of APIs)
- But AI won't solve the telco dilemma, APIs are key for that. You cannot build an AI agent / MCP server without a tool / API
- AI gives a breather to the API teams, but it should be used to
 - Prepare for (agentic) AI
 - Close gaps

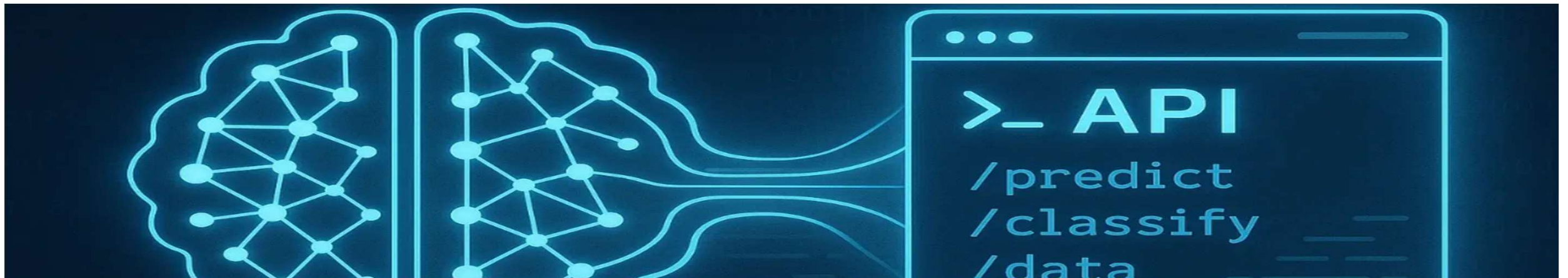


APIs and AI – The intersection



4 different scenarios:

- AI used by developers inside operators for their daily work
- AI used inside operators to develop better APIs (e.g. prediction)
- AI used by operators as an additional portfolio (MaaS)
- AI used as sales channel (agentic AI)

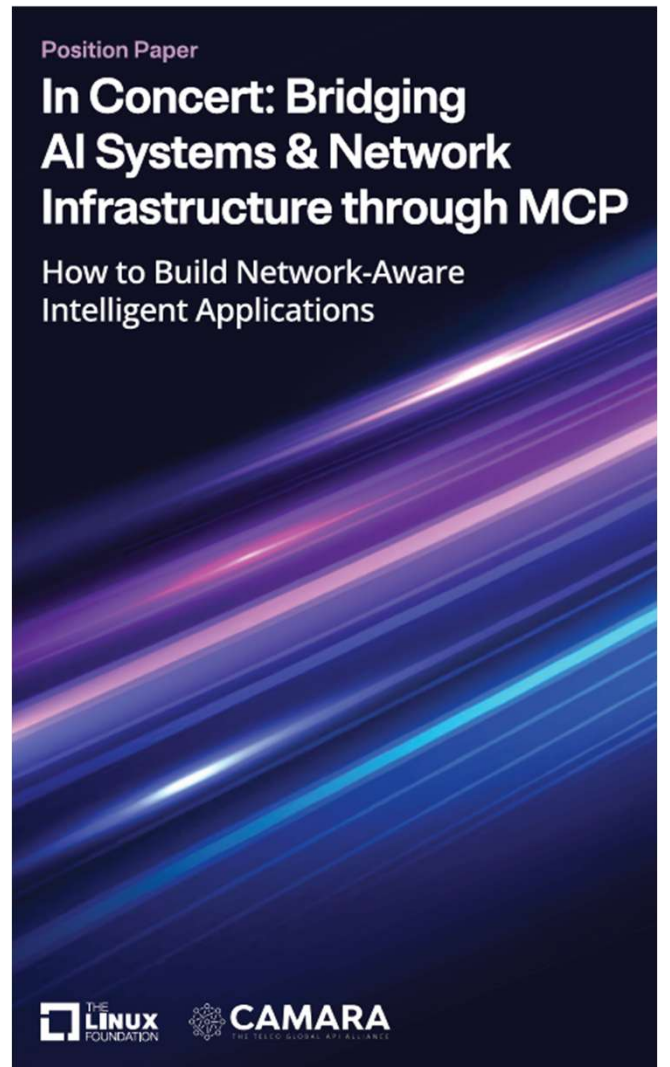


In Concert: Bridging AI Systems and Network Infrastructure through MCP



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- To enable LLMs accessing network capabilities, APIs and a bridging protocol (MCP) is needed. Combining both AI developers can
 - Deliver more intelligent, network context-aware services
 - Reduce delivery complexity, accelerate time-to-market, expand global reach
 - Enable AI models to make real-time, policy-compliant decisions that optimize UX and resource utilization
- Example use cases are listed in the whitepaper

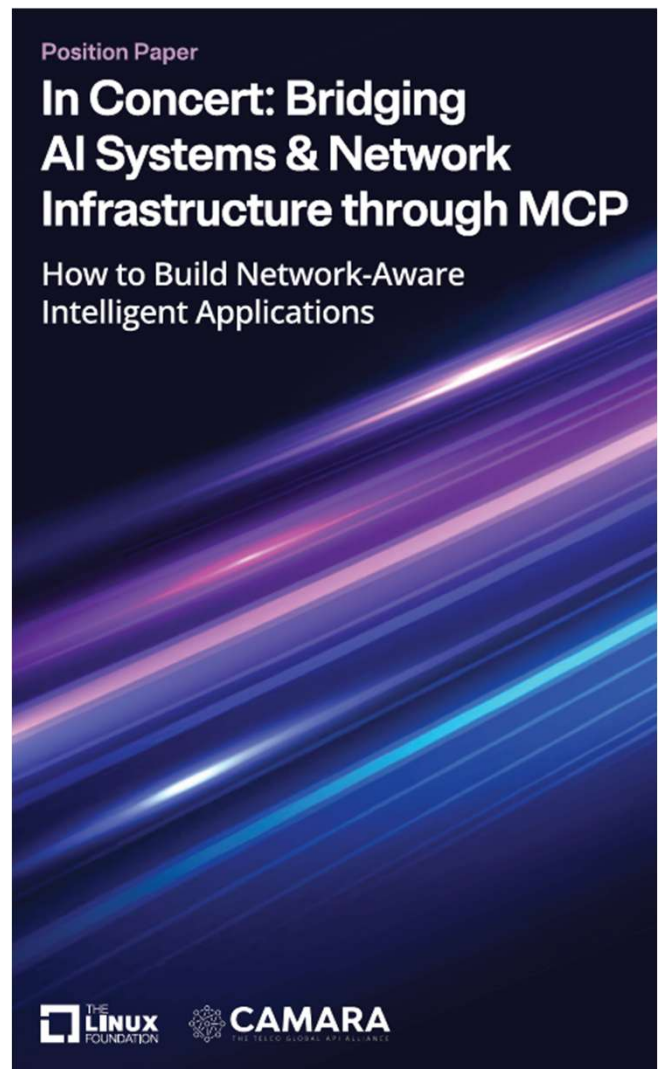


In Concert: Bridging AI Systems and Network Infrastructure through MCP



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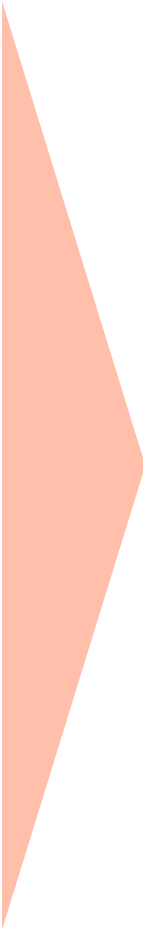
- No fundamental changes are required to either ecosystem
 - Provide context for MCP servers, esp. scopes and purposes, user consent requirements
 - Follow CAMARA security guidelines and API design guidelines (both need to be adjusted to AI)
 - CAMARA may provide authoritative MCP function definitions versioned in lockstep with corresponding CAMARA API definitions
- Details are documented in the whitepaper



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



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THE **LINUX** FOUNDATION PROJECTS

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Home About API Overview **API Descriptions** Working Groups Events Resources Contact

Latest News: CAMARA Spring25 meta-release announced on LinuxFoundation KubeCon

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.

- Authentication and Fraud Prevention
- Location Services
- Communication Services
- Communication Quality
- Device Information
- Computing Services
- Payments and Charging
- Service Management
- Call Forwarding Signal
- Customer Insights
- Device Swap
- Know Your Customer Age Verification
- Know Your Customer Fill In
- Know Your Customer Match
- Know Your Customer Tenure
- Number Recycling
- Number Verification
- One Time Password SMS
- Sim Swap
- Sim Swap Subscriptions
- Verified Caller

Developers Getting Started with CAMARA APIs



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API Description

The "Location Verification" API determines whether a mobile device is within the proximity of a specified geographical area. The API request includes the target area, defined as a circle with a specified center (latitude and longitude) and a radius or accuracy threshold. The API response confirms whether the location detected by the mobile network operator falls within the requested accuracy range.



Depending on the version of the API, other request and response parameters can be used. For example, the request can specify the maximum accepted age of the location information used in the verification, and the response can give information about such age and how the detected location matches the requested one.


Use Cases

- **Fraud prevention in location-dependent transactions for Banking and Financial Services:** For example, if someone attempts to withdraw cash from an ATM or make a payment using your credit card number in a city within your country where you are not physically present

API Portfolio: Location Services


 SubProject Wiki: [Device Location](#) (incl. how to meet the team)

 API Wiki: [Location Verification](#)

 API Repository: [Device Location](#)

API Repository Status: **Incubating**

API Status: **Stable**

 API Version(s) and Release Date(s):

- **v0.2.0** (27.02.2024), second alpha version
- **v1.0.0** (10.09.2024), Fall24 meta-release
- **v2.0.0** (10.03.2025), Spring25 meta-release

API availability: Information which APIs are available in which country and network, and how to get access can be found on the [GSMA public launch status page](#).

Developers Getting Started with CAMARA APIs



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The screenshot shows the GitHub repository page for 'DeviceLocation' under the 'camaraproject' organization. The repository is public and has 32 stars, 33 forks, and 25 watchers. It contains 30 branches and 9 tags. The main branch is selected. The repository description is 'Repository to describe, develop, document and test the DeviceLocation API family'. The file list includes folders like '.github', 'code', 'documentation', and 'lint_function', and files like '.spectral.yml', '.yamllint.yml', 'CHANGELOG.md', 'CODEOWNERS', 'GOVERNANCE.MD', 'LICENSE', 'MAINTAINERS.MD', and 'README.md'. The right sidebar shows repository statistics and release information, including the latest release 'r2.2' from March 10.

| File/Folder | Description | Last Modified |
|----------------|---|---------------|
| .github | Linting ruleset | last year |
| code | Back to wip | last month |
| documentation | Update documentation/API_documentation/location-verifica... | 2 months ago |
| lint_function | Linting ruleset | last year |
| .spectral.yml | Linting ruleset | last year |
| .yamllint.yml | Linting ruleset | last year |
| CHANGELOG.md | release: changelog since 1.2 | 2 months ago |
| CODEOWNERS | Update CODEOWNERS | 10 months ago |
| GOVERNANCE.MD | Create GOVERNANCE.MD | 3 years ago |
| LICENSE | Initial commit | 3 years ago |
| MAINTAINERS.MD | Update MAINTAINERS.MD | 2 months ago |
| README.md | Update README.md | 2 months ago |

Developers Getting Started with CAMARA APIs



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Integrate API call in own code, e.g. for Sim Swap:

- Get API definition and documentation from <https://camaraproject.org/api-overview/> (open&free!)
- Get API availability from GSMA public launch status map (linked in API description)
- Get API access e.g. from DT, Orange, Telefonica (linked in map)

| Authentication and Fraud Prevention | Location Services | Communication Services | Communication Quality | Device Information | Computing Services | Payments and Charging | Service Management |
|-------------------------------------|--------------------------|---------------------------|-------------------------------------|--|-----------------------|---------------------------|--------------------|
| Call Forwarding Signal | Geofencing Subscriptions | WebRTC Call Handling | Application Profiles | Connected Network Type | Simple Edge Discovery | Blockchain Public Address | |
| Customer Insights | Location Retrieval | WebRTC Event Subscription | Connectivity Insights | Connected Network Type Subscriptions | | Carrier Billing | |
| Device Swap | Location Verification | WebRTC Registration | Connectivity Insights Subscriptions | Device Identifier | | Carrier Billing Refund | |
| Know Your Customer Age Verification | Population Density Data | | Home Devices QoD | Device Reachability Status | | | |
| Know Your Customer Fill In | Region Device Count | | QoD Provisioning | Device Reachability Status Subscriptions | | | |
| Know Your Customer Match | | | QoS Profiles | Device Roaming Status | | | |
| Know Your Customer Tenure | | | Quality on Demand | Device Roaming Status Subscriptions | | | |

API Description

The "Sim Swap" API is a service that monitors and detects changes in the SIM card associated with a mobile number. It provides businesses with insights into whether a SIM card has been swapped recently, either by returning a timestamp of the last change or a yes/no response for a defined period (e.g., the last 24 hours). Additionally, the API offers a subscription mode, enabling businesses to receive real-time notifications whenever there is a change in the SIM card status. This service is particularly valuable for enhancing security in scenarios like fraud prevention, account protection, and transaction validation by identifying potential unauthorized SIM swaps.

API Portfolio: Authentication and Fraud Prevention

- SubProject Wiki: [Number Insights](#) (incl. how to meet the team)
- API Wiki: [Sim Swap](#)
- API Repository: [Sim Swap](#)

API Repository Status: **Incubating**

API Status: **Stable**

API Version(s) and Release Date(s):

- v0.4.0 (14.11.2023)
- v1.0.0 (04.04.2025), Fall24 meta-release, patch release
- v2.0.0 (13.03.2025), Spring25 meta-release

API availability: Information which APIs are available in which country and



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 web interface. The top navigation bar is dark blue with 'CAMARA' and 'Your Groups' dropdown. A left sidebar contains navigation items: Home (Owner), Subscription, Admin, Pending, Members (highlighted), and Activity. The main content area shows a breadcrumb trail: All / Members / markus / markus.kuemmerle@telekom.de (Mod). Below this is a 'Membership' dropdown, followed by a 'User Details' section. The 'Email Address' field contains 'markus.kuemmerle@telekom.de' and has a note below it: '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 in CAMARA is developed in a separate repository under a Sub Project or as an Independent Sandbox 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 and meeting schedule to discuss progress/issues on the APIs

A screenshot of a GitHub repository page for the QualityOnDemand API family. It lists four repositories: QualityOnDemand (Public), QualityOnDemand_PI1 (Public), QualityOnDemand_PI2 (Public), and QualityOnDemand_PI3 (Public). Each entry includes a description, programming language, license, and update date. The QualityOnDemand repository is the lead repository, while the others are provider implementations by Deutsche Telekom, Orange, and Spry Fox Networks respectively.

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 april issues 10 open pull requests 2 open contributors 27 repo size 11.5 MiB License Apache 2.0 release r2.2
Incubating API Repository

QualityOnDemand

Incubating API Repository to evolve and maintain the definitions and documentation of QualityOnDemand Service API(s) within the Sub Project [Quality On Demand](#)

Scope

- Service APIs for "Quality on Demand" (see APIBacklog.md)
- The Service APIs provide the API consumer with the ability to:
 - retrieve the possible quality options (profiles) from the network (qos-profiles)
 - set the quality for a connection of a mobile device or a home device within the access network
 - dynamically, for a selected session of a specific duration (quality-on-demand)
 - provisioned, applying the same quality each time the device connects to the network (qod-provisioning)
 - get a notification if the network cannot fulfill the requested quality profile (quality-on-demand, qod-provisioning)
- Describe, develop, document and test the APIs (with 1–2 Service Providers)
- Started: October 2021
- Incubating stage since: February 2025
- 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

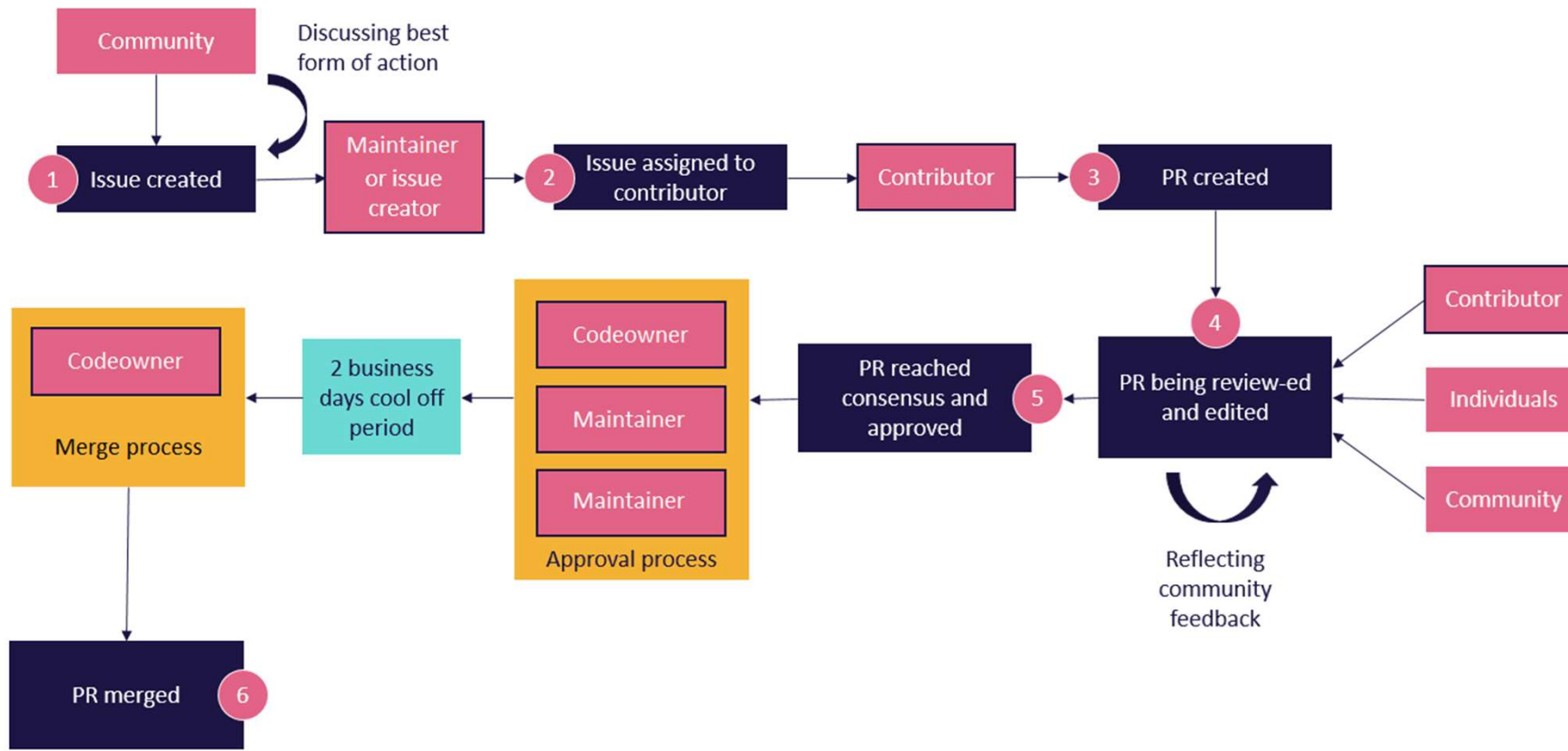
Contributorship and mailing list

- 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 licenses
- Infrastructure (cell towers, fibre)

Operators haven't been successful in

- Increasing prices for connectivity contracts

CAMARA APIs open opportunities

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



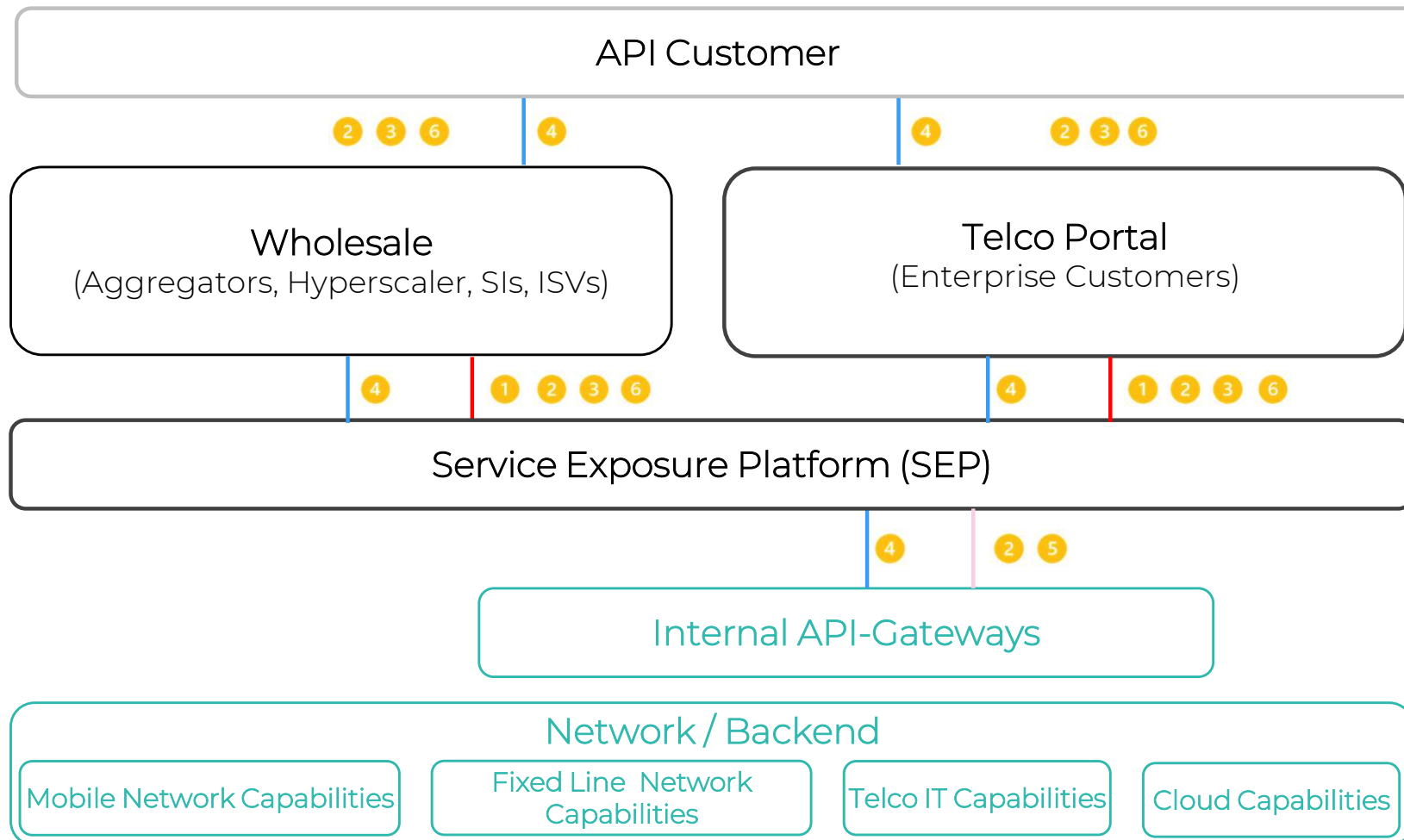
What have operators to do to implement Network APIs?



- Implement CAMARA APIs based on the network capabilities
- Implement an exposure infrastructure, with TMForum Operate APIs
- Define commercial products
- Sell it



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 and rating.
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 who are application developers / API consumers (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.

Operators Getting Started with CAMARA



Why Organizations Join CAMARA?

Aside from having a seat at the collaborative table to shape the future of the open telco API ecosystem, organizations join CAMARA as a sponsoring member to:



Influence strategy and direction of the open telco API ecosystem

CAMARA sponsor organizations play a pivotal role in shaping the open telco API ecosystem by participating in the CAMARA governing board to influence strategic decisions and prioritize marketing activities. Sponsors contribute financial and technical resources to accelerate development, support testing initiatives, and enhance developer tools and documentation for broader usability.



Accelerate time to market

IDC recently projected revenues for telecom and network APIs to reach \$6.7 billion in 2028, up from just \$700 million in 2023. Be part of the ecosystem from the ground up! Together with partner organizations GSMA Open Gateway and TM Forum, CAMARA APIs help operators monetize high investments in areas like spectrum licenses and infrastructure.



Elevate your brand

Those participating in cross-industry collaboration to evolve open APIs have the chance to showcase their efforts broadly and gain visibility as a pioneering expert in the openTelco API space. CAMARA members have access to multiple industry platforms, including speaking and networking opportunities (both virtually and in-person); authoring white papers, blogs, and other publications; press and analyst engagement; and so much more, including access to Linux Foundation channels that reach developers, operators, hyperscalers, enterprises, vendors, and other from around the world.



Collaborate with global thought leaders

Access to a varied community of leading industry organizations across Telecom, Cloud, hyperscalers, aggregators enterprises, start-ups, and vendors, all collaborating to shape the ecosystem for more accessible and aligned open APIs. Connect with individuals and companies from across the globe, learn from peers and technical entrepreneurs while fostering new partnerships and business opportunities.



Communicate commitment to ensuring the availability of accessible, quality open APIs

Aligning with CAMARA signals your commitment to ensuring broad accessibility of open Telco APIs. Let your customers, partners, and shareholders know you support!

CAMARA Membership Benefits Overview



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Collaborate for Impact

- **Shape the future:** Influence marketing & event strategies
- **Lead the way:** Access thought leadership opportunities
- **Exclusive events:** Attend and plan member-only events
- **Collaboration with major players:** Work alongside telcos, hyperscalers, and developers in a neutral, open-source environment
- **Visibility:** Feature in research reports and the speakers' bureau
- **Amplify your brand:** Get broad exposure across CAMARA and ecosystem

Drive Business Growth

- **Lead the industry:** Secure a seat on the Governing Board
- **Drive global interoperability:** Help ensure your organization's needs are considered in the push toward standardized, interoperable APIs across networks and regions
- **Early access to new APIs and features:** Stay ahead of the market by testing and deploying APIs before general release
- **Strategic planning:** Shape long-term goals on the Strategic Planning Committee
- **Expand ecosystem reach:** Position your company at the center of a global developer and network provider community

Exclusive Access & Privileges

- **Priority input on policies and licensing:** Help define the rules and frameworks that govern CAMARA's operations and contributions
- **Strategic seats:** Join Outreach, Governing Board, and other committees as a voting member
- **Shape API development:** Gain a voice in defining, prioritizing, and evolving the CAMARA APIs that align with GSMA Open Gateway and network operator needs
- **Member discounts:** Save on LF events, training, and more
- **Access to roadmap discussions:** Participate in strategic planning and early access to upcoming features and initiatives

Collaborate for Projects

- **Engage with the community:** Participate in TSC calls, Zulip channels, and other community forums
- **Collaborate on code projects:** Contribute to and innovate within various API Working Groups and Sub Projects
- **Workstream participation:** Get involved in workstreams to drive development forward

Free to All Organizations
(Code Involvement)

Member-Only Benefits
(Non-Code Focus: Collaboration & Growth)

Top 10 Reasons to Join as a Member



Influence Global API Standards: Shape the development of open, telco-exposed APIs aligned with the GSMA Open Gateway initiative - ensuring your business needs are reflected in global standards.

Accelerate Service Innovation: Leverage standardized APIs to unlock network capabilities (e.g., QoD, device location, slicing) and build differentiated digital services faster.

Collaborate with Industry Leaders: Develop personal relationships with thought leaders (including executives, architects, program manager, engineers, and more) from a global community of telecom operators, hyperscalers, and aggregators, and enterprises all working together to bridge networks and applications through open source.

Set the Open Telco API Development Strategy: Participate in building an ecosystem that makes it easier for developers to consume network capabilities - growing adoption and monetization of your services.

Gain Early Access to APIs and Roadmaps: Stay ahead of the market with insider access to early-stage APIs, technical roadmaps, and experimental features.

Top 10 Reasons to Join as a Member



Expand Business Opportunities: Enable cross-operator, cross-border deployment of your services by building once and scaling globally with consistent APIs.

Boost Visibility and Brand Recognition: Access co-marketing opportunities, including event participation, case studies, webinars, and blog posts - highlighting your leadership in telco innovation.

Participate in Governance and Leadership: A voting membership on the CAMARA Governing Board enables you to influence the direction of the open telco API ecosystem align with your business strategy.

Align with Other Open Source Projects and Industry Initiatives: Collaborate easily and directly with other Linux Foundation projects such as LF Networking, CNCF, Sylva and more, as well as major industry bodies like GSMA, TMForum, MEF, CPaaS (and more) - position your organization at the center of the open telco API movement.

Elevate Your Organization's Industry Perception within the Telco API Ecosystem: Joining the CAMARA Board sends the message that you are a technology leader within a technology on the precipice of unlocking new monetization opportunities. Your absence could be perceived as reluctance to adopt this new technology disruption.

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 (application developers and operators)

CAMARA Contacts



CAMARA
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Individuals and organizations from application developers / API consumers (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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