Open Gateway Community Meeting 01
An Introduction to Open Gateway
25 May 2023

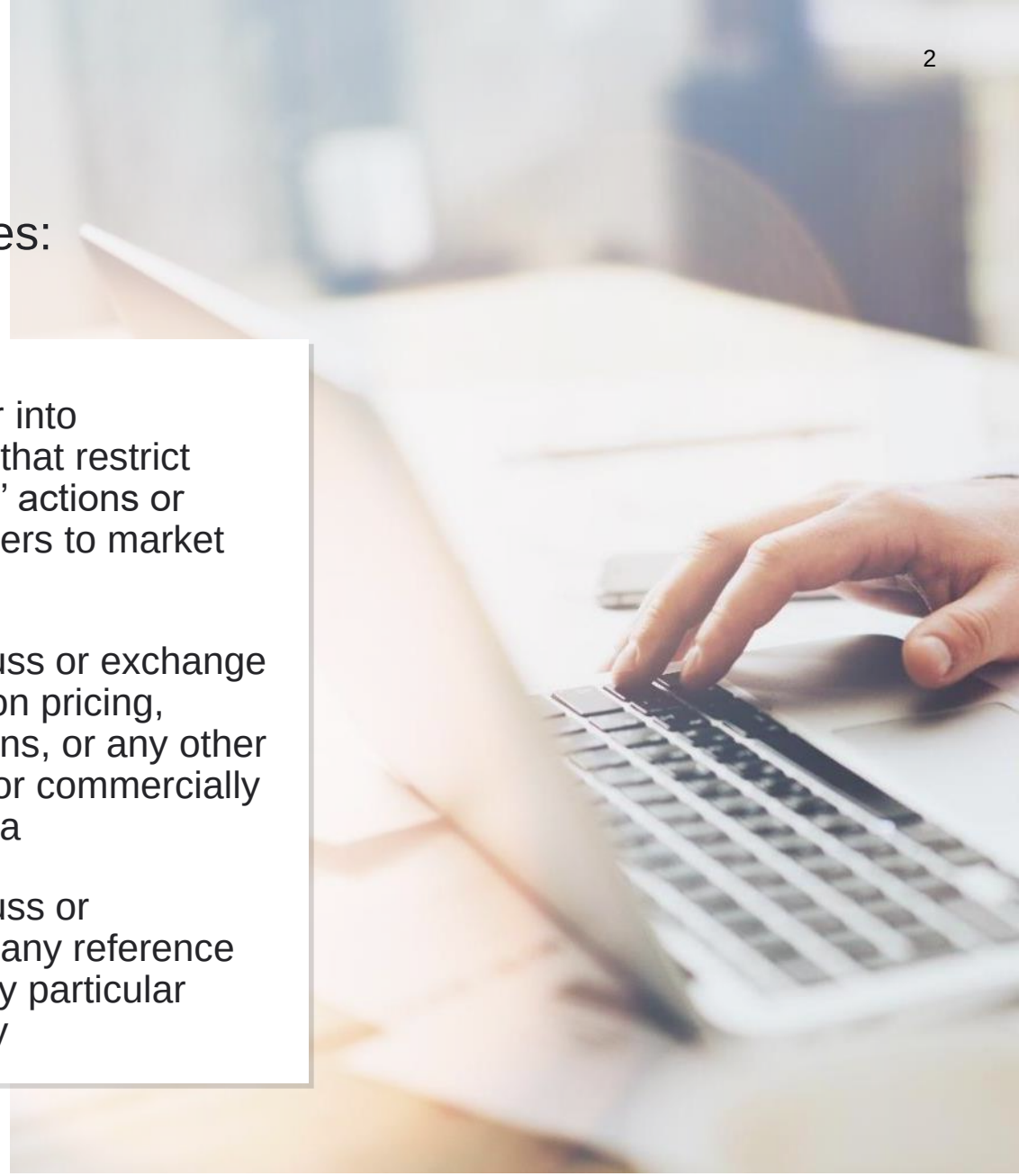
GSMA™

GSMA Antitrust Policy

All GSMA participants **must** abide by the following rules:

- **DO** clearly identify the positive purpose of each project and follow it
- **DO** consult with legal in areas where you are unsure

- **DON'T** enter into agreements that restrict other parties' actions or creates barriers to market entry
- **DON'T** discuss or exchange information on pricing, business plans, or any other confidential or commercially sensitive data
- **DON'T** discuss or recommend any reference prices, or any particular pricing policy



Agenda

- Welcome (5 min)
- Open Gateway initiative overview (30 min)
  - GSMA – Henry Calvert
  - CAMARA - Markus Kümmerle
  - TM Forum – W. George Glass
- Open Gateway use cases (40 min)
  - Telefonica – Warren Bowers
  - Deutsche Telekom - Markus Kümmerle
- Q&A

Open Gateway initiative overview

A common glue between Cloud Infrastructure and Earth Networks

Cloud Infrastructure

Enhancing virtual ‘Cloud’ applications & services to enable Web3.0

Open Service (Northbound) Common Network APIs

via CAMARA GitHub & GSMA Agreement Templates

Open Federation APIs (East West Federation & Interconnection)

via GSMA Operator Platform Specifications & Agreement Templates

GSMA™ Connect (N-E-W)

CAMARA THE TELCO GLOBAL API ALLIANCE Service (N)

tmforum Operate (N-E-W)

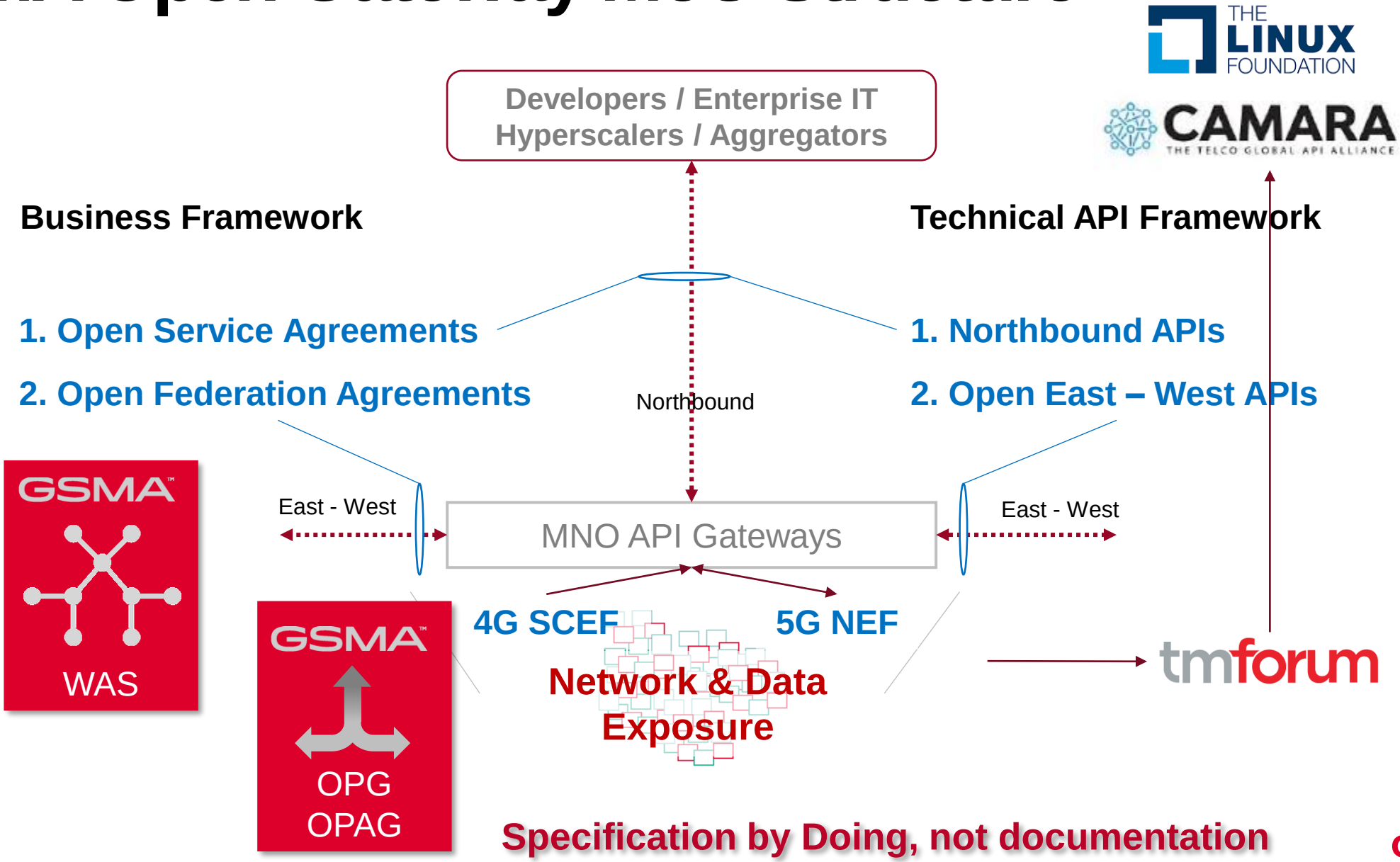
Exposing network capabilities: Identity : 5G Capabilities : AI/Data : Privacy : Security

Earth Networks

Specification by Doing Code, not documentation

GSMA™

GSMA Open Gateway MoU Structure



Specification by Doing, not documentation

GSMA

Open Gateway MoU

MoU Summary

Singed by Operators or any company providing 3GPP Network Capabilities

Northbound
- Use of Service API Commonalities as defined by the LINUX Foundation CAMARA Project
- Use of Open Service APIs maintained by CAMARA Project
- GSMA Open Service Agreement templates

Federation
- Use of Open Federation APIs maintained by GSMA
- GSMA Open Federation Agreement templates

GSMA Open Gateway Service Offering (MVP)
- By the end of 2023
- Launch of at least CAMARA API
- Federation of at least one CAMARA API with another Operator

MoU to MWCB 2023 Resource & Commitment

MEMORANDUM OF UNDERSTANDING ON THE IMPLEMENTATION OF A GLOBAL, OPEN, INTEROPERABLE, FEDERATED GSMA OPENVERSE BY 2023

26th September 2022

OPENVERSE MEMORANDUM OF UNDERSTANDING

Purpose of the Openverse MoU

The purpose of this Memorandum of Understanding **(Openverse MoU)** is to determine the commitment by the undersigned parties to launch the first **Openverse Services** in their respective markets in 2023. The Openverse Services are delivered by an interoperable and federated network with open standard interfaces to enable seamless universal connectivity and other technical capabilities within a common business framework for existing telco services (communications, connectivity, Web2.0), the emerging immersive virtual world (like Web3.0, Metaverse / 3D communications) and other advanced services.

The Acknowledgement

The undersigned parties recognise and acknowledge that:

- Monetisation of existing and future telco capabilities and next generation of digital services, like the embryonic Metaverses / 3D communications and Web3.0, represents significant traffic demand, new requirements on parameters (e.g., latency, jitter or high availability) and digital capabilities (e.g., identity, privacy and security management, data analytics, transactional capabilities).
- No single mobile network operator will be capable of providing global access to such Openverse Services. For wide adoption and scale, a common business and technical framework for an open service platform to digitally expose telco capabilities is needed i.e., one Openverse benefiting all. Time is of the essence and such an undertaking requires a clear commitment by multiple GSMA members to launch Openverse Services in 2023.
- The Openverse Services will be implemented by a network of open API gateways, that expose operator capabilities within a standardised commercial framework capable of connecting digital service providers and mobile network operators.
- Exposing APIs by different solutions, at different times, with incompatible implementations and without harmonisation between services could result in a higher chance of failure, to enable seamless global services and other technical capabilities.

1

MoU post MWCB Commitment

MEMORANDUM OF UNDERSTANDING ON THE IMPLEMENTATION OF A GLOBAL, OPEN, INTEROPERABLE, FEDERATED GSMA OPEN GATEWAY BY END OF 2023

GSMA OPEN GATEWAY MEMORANDUM OF UNDERSTANDING

Purpose of the GSMA Open Gateway MoU

The purpose of this Memorandum of Understanding **(GSMA Open Gateway MoU – aka Openverse MoU)** is to determine the commitment by the undersigned parties to launch the first "**GSMA Open Gateway Services"** in their respective markets by the end of 2023. The GSMA Open Gateway Services are delivered by an interoperable and federated network with open standard interfaces to enable seamless universal connectivity and other technical capabilities within a common business framework for existing telco services (communications, connectivity, Web2.0), the emerging immersive virtual world (like Web3.0, Metaverse / 3D communications) and other advanced services.

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The undersigned parties recognise and acknowledge that:

- Monetisation of existing and future telco capabilities and next generation of digital services, like the embryonic Metaverses / 3D communications and Web3.0, represents significant traffic demand, new requirements on parameters (e.g., latency, jitter or high availability) and digital capabilities (e.g., identity, privacy and security management, data analytics, transactional capabilities).
- No single mobile network operator will be capable of providing global access to such GSMA Open Gateway Services. For wide adoption and scale, a common business and technical framework for an open service platform to digitally expose telco capabilities is needed i.e., one GSMA Open Gateway benefiting all. Time is of the essence and such an undertaking requires a clear commitment by multiple GSMA members to launch GSMA Open Gateway Services by the end of 2023.
- The GSMA Open Gateway Services will be implemented by a network of open API gateways, that expose operator capabilities within a harmonised commercial framework capable of connecting digital service providers and mobile network operators.

1

Both allow for contribution, adoption and attendance at Workstreams or any GSMA Working Group as per GSMA AA.35

26 MoU Signatories enabling >50% of Mobile Connections

Telefónica
José María Álvarez-Pallete
Chairman & CEO

airtel
Gopal Vittal
CEO

América Móvil
Daniel Hajj
CEO

vodafone
Nick Read
CEO

axiata
Hans Wijayasuriya
Joint Acting Group CEO

du

e&
Hatem Dowidar
e& Group

Singtel
Kuan Moon Yuen
Group CEO

verizon
Rima Qureshi
EVP, Chief Strategy Officer

T
Dominique Leroy
Board Member Europe

AT&T
John Stankey
CEO

MTN
Saad Syed
MD Chenosis

VEON
Kaan Terzioğlu
CEO

عمانتل Omantel
Talal Said Marhoon Al Mamari
CEO

orange
Christel Heydemann
CEO

TIM
Pietro Labriola
CEO

kt
Hyeonmo Ku
President & CEO

Vicki Brady
CEO

LIBERTY GLOBAL
Michael Fries
CEO

kpn
Joost Farwerck
CEO & Chairman

stc
Olayan AlWetaid
Group CEO

KDDI
Makoto Takahashi
CEO

telenor
Sigve Brekke
CEO

中国移动 China Mobile
Gao Tongqing
EVP

swisscom
Christoph Aeschlimann
CEO

telecom
Roberto Nobile
CEO

GSMA

GSMA Open Gateway Workstreams

- Customer Networking -> Requirements
- Showcase & Outcome Demonstration
- Dissemination, Feedback, ecosystem collaboration

GSMA Board

OpenGateway PMO
GSMA Lead: Kate Whitehead
GSMA: Olu Omobitan

Open Gateway Steering Group (20)
(GSMA + *Founding* MOU signatories)
GSMA: Henry Calvert

Open Gateway Community (100s)
GSMA Lead: Olu Omobitan

Open Gateway (20) Product WorkStream
GSMA Lead: Helene Vigue

- Product development (portfolio and roadmap management)
- Northbound API Categorisation
- Requirements for in-app management APIs
- Lessons Learnt
- Outside In / Beyond Connectivity Growth

Product topics: API roadmap guidelines and priorities…

Technical topics

Open Gateway (20) Technical WorkStream
GSMA Lead: Mark Cornall

- API Technical Drive
- Coordination with SDOs on network and cloud capabilities
- Coordination with TMForum on management capabilities

Requirements to OPG/OPAG*

- Architectural framework
- Assessment of availability of telco capabilities (roadmap, opportunities)
- Federation (EWBI)
- PoC / Certification Repositories

Open Gateway (20) Business WorkStream
GSMA Lead: Julia Gullstrand

- Business models and agreements
- Interoperator agreements
- Operator on-boarding playbook
- Channel Partner on-boarding playbook

CAMARA (Linux Foundation)

- API Repository
- Northbound API Prioritisation (Joint with product workstream)

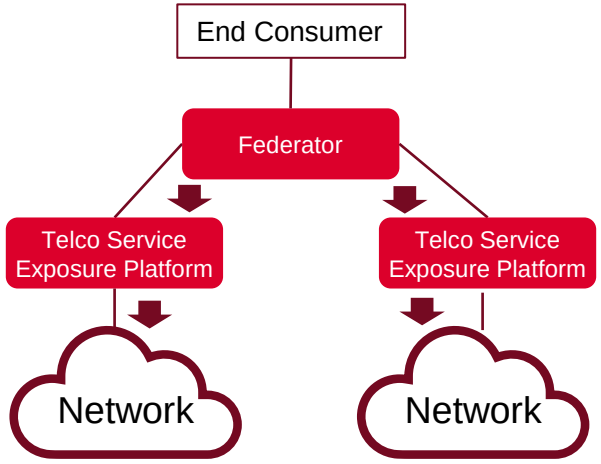
Open Gateway (20) Communications WorkStream
GSMA Lead: Colin Bareham

(Max Attendance Size)
*AA.35 Working Group

GSMA

Technical Alignment for Federation

Industry Alignment

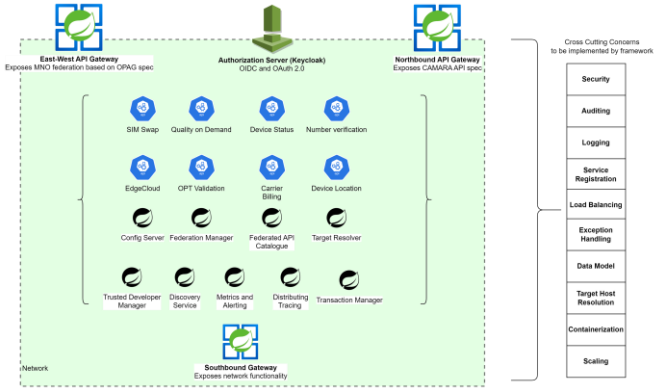


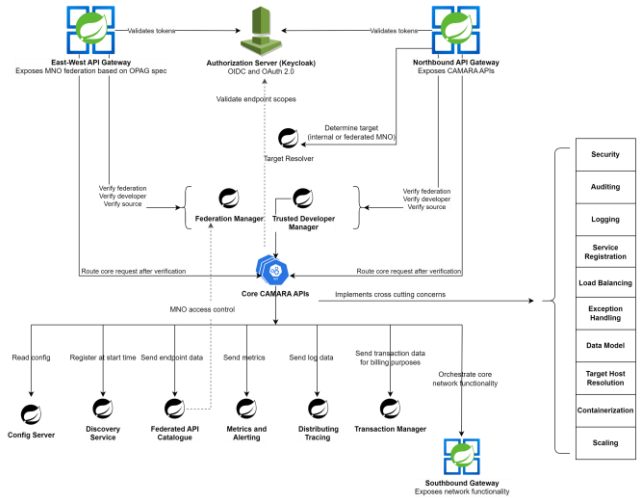
Federator:
Operator, Hyperscaler or Aggregator
API Forwarding : N-E-W-Service API / N-E-W-Operate API
Telco Finder Distributed Function : Identity / Routing / Discovery

Operator Control Points

- Identification
- Routing
- Discovery

GSMA Federation POC Development





GSMA

GSMA Open Gateway Project Timeline

Mexico
26 Sept 2022

MWC Barcelona
27 Feb 2023

MWC Las Vegas
26 Sept 2023

Dec 2023

Barcelona
27 Feb 2024

Phase 1:
Initial Deployment of 8 APIs

Phase 2: Federation of APIs

Phase 3: Beyond MWC Ingredients for Success

Initial MoU Signatories

Open Gateway Service Launch / Demonstrations

Northbound API Release

Northbound Service Agreement Template

East-West Technical Implementation

East-West Federation Agreement Template

Federation PoC

Phase 2

25 APIs Launched

Market Sizing

CSP Engagement

API Prioritisation

Discovery

Developer Community Engagement

Phase 1

Phase 3

CAMARA

THE TELCO GLOBAL API ALLIANCE

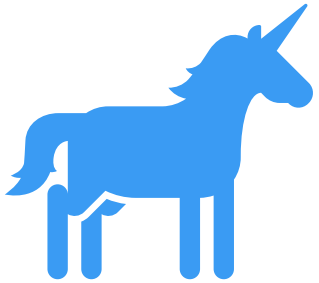
CAMARA Project Overview

Markus Kümmerle – Deutsche Telekom
Program lead Magenta API Exposure / CAMARA

Open Gateway Community 25th of May 2023

CAMARA Project
Key problems we are trying to solve

CAMARA
THE TELCO GLOBAL API ALLIANCE

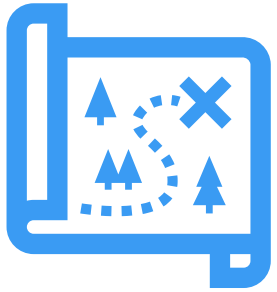


Scale

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 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.

CAMARA Project
Where we started...

CAMARA
THE TELCO GLOBAL API ALLIANCE

- Launched at MWC Barcelona 2022
- 22 Launch Partners
- Supported by GSMA and Linux Foundation
- Simple idea to “standardize” developer facing APIs

CAMARA Project
… and where we are now

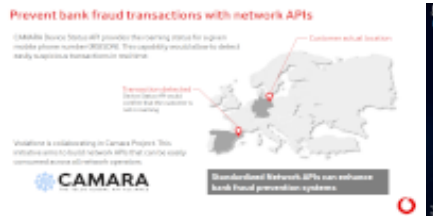
CAMARA
THE TELCO GLOBAL API ALLIANCE

- 77 Named Partners
- 214 (+105) companies participating in CAMARA
- 12 (+2) Active API development repos
- 130+ regular participants in Open Steering Calls
- 625 (+624) people joined CAMARA
- Development ”home” for GSMA Open Gateway

CAMARA Project
Network API Showcases

CAMARA
THE TELCO GLOBAL API ALLIANCE

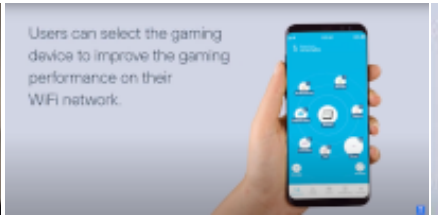
Showcases available at: https://camaraproject.org/resources/

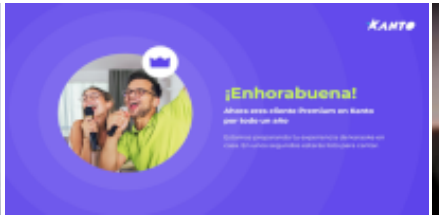







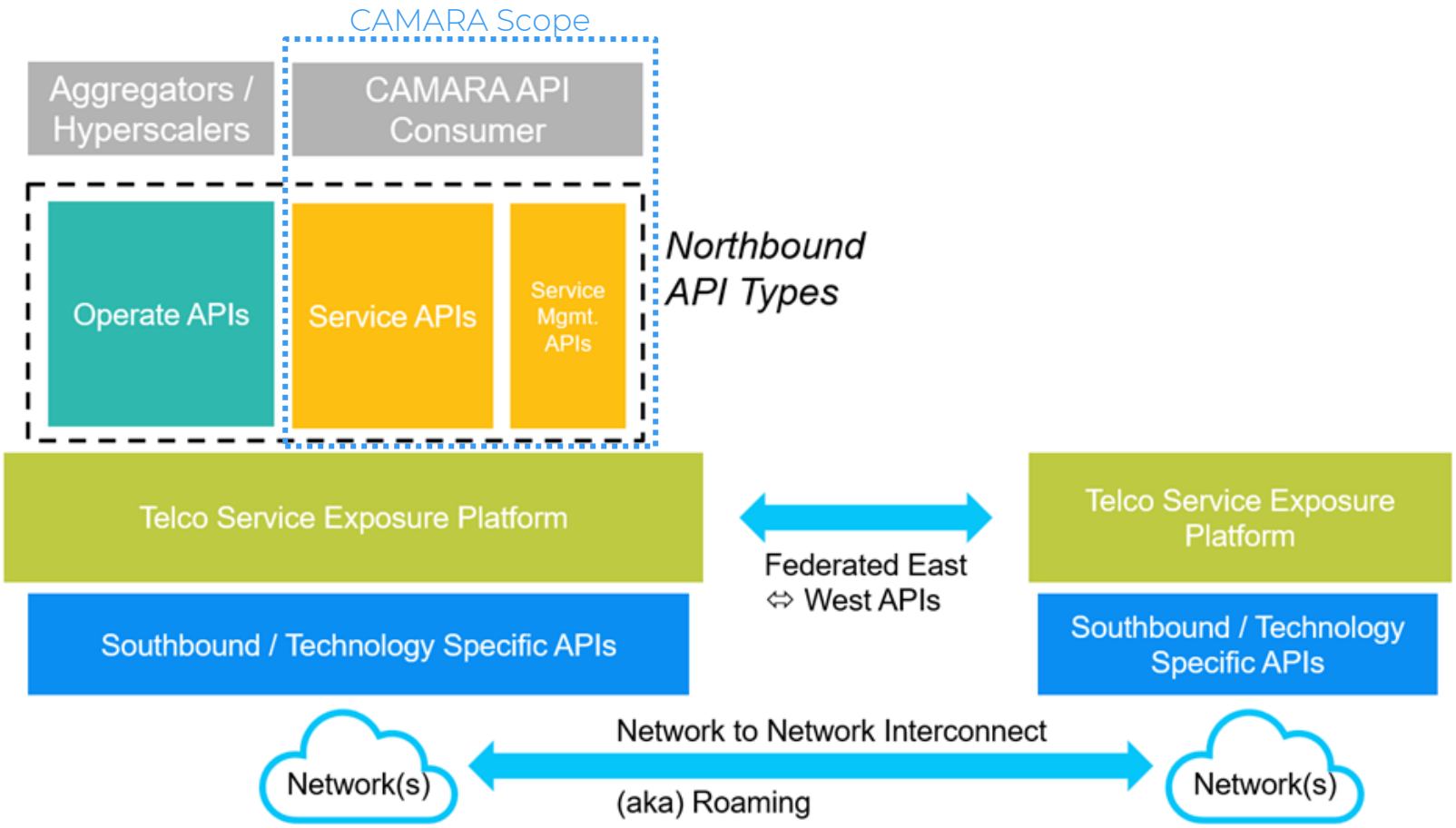






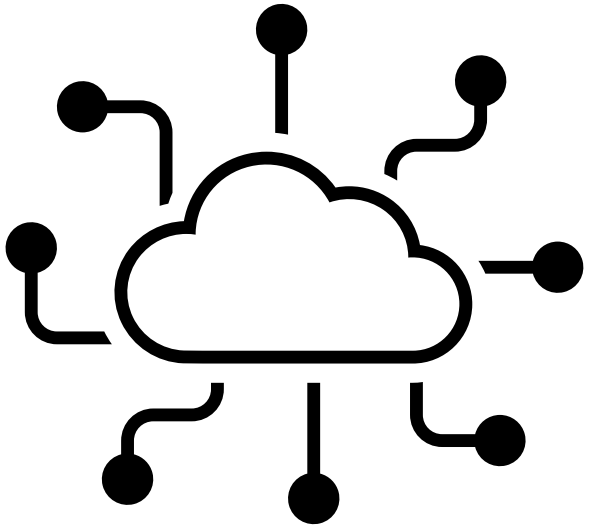
CAMARA Scope



CAMARA Scope

The scope of the CAMARA Project is:

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

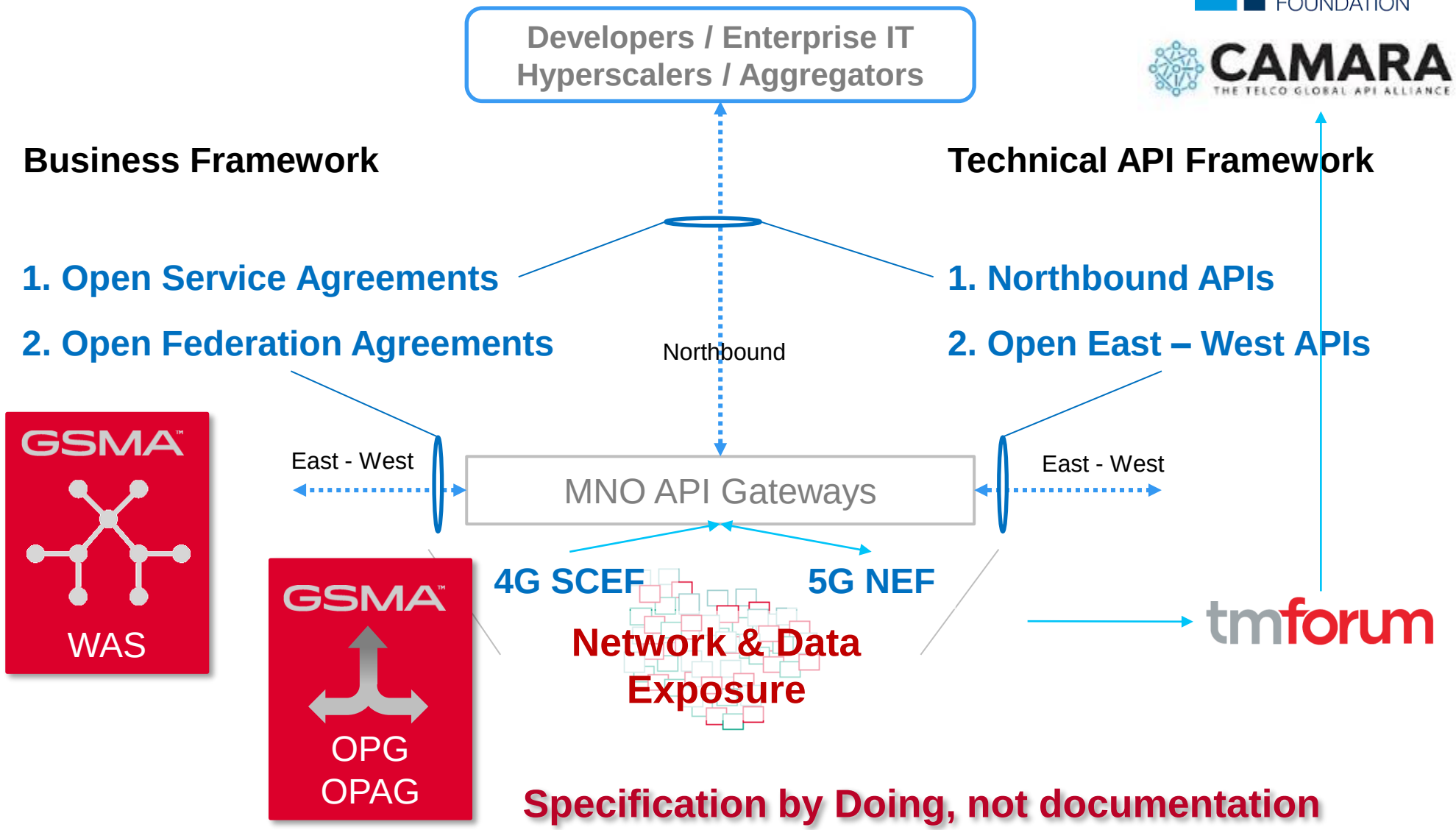


The following deliverables are provided by the CAMARA Project:

- **Service API definitions, code and documentation**
- Test plan, cases and tools for Service APIs both contained in deployment packages.

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

GSMA Open Gateway MoU Structure



Specification by Doing, not documentation

CAMARA Project
Where are we going next...

CAMARA
THE TELCO GLOBAL API ALLIANCE

1	Additional APIs and roadmap sync across CSPs and Hyperscalers
2	Creation of Technical Steering Committee (TSC) and strengthening of project governance
3	API lifecycle management consistency Documentation of API versioning and availability globally
4	Ensuring federation through GSMA and OAM through TM Forum

CAMARA Project
Where are we going next...

CAMARA
THE TELCO GLOBAL API ALLIANCE

camaraproject.org

- Join the mailing list
- Contact us for more information

github.com/camaraproject

- Join the working groups
- Attend the calls
- Contribute to the codebase


Thank you!

TM Forum Catalysts using TM Forum and CAMARA APIs

W. George Glass
CTO, TM Forum

25th May 2023

tmforum

Background and introduction

TM Forum and CAMARA APIs interworking to accelerate time to market for new services

Based on our mature API customer base, we were approached by some of the TM Forum Board members to see if we could help them and the industry understand how existing TM Forum APIs and CAMARA APIs could work together.

We kicked off a Catalyst (TM Forum rapid proof of concept project) in November 2022 with the objective of demonstrating TM Forum APIs interworking with CAMARA APIs and learning how this could be practically managed.

At that time, the only available CAMARA API was the QoD API, so we assembled a team and built a demonstration to showcase a solution that would utilize the QoD API.

As we built the solution, a real estate 3D model capture application, we learnt a lot about the interworking of TM Forum APIs and CAMARA APIs.

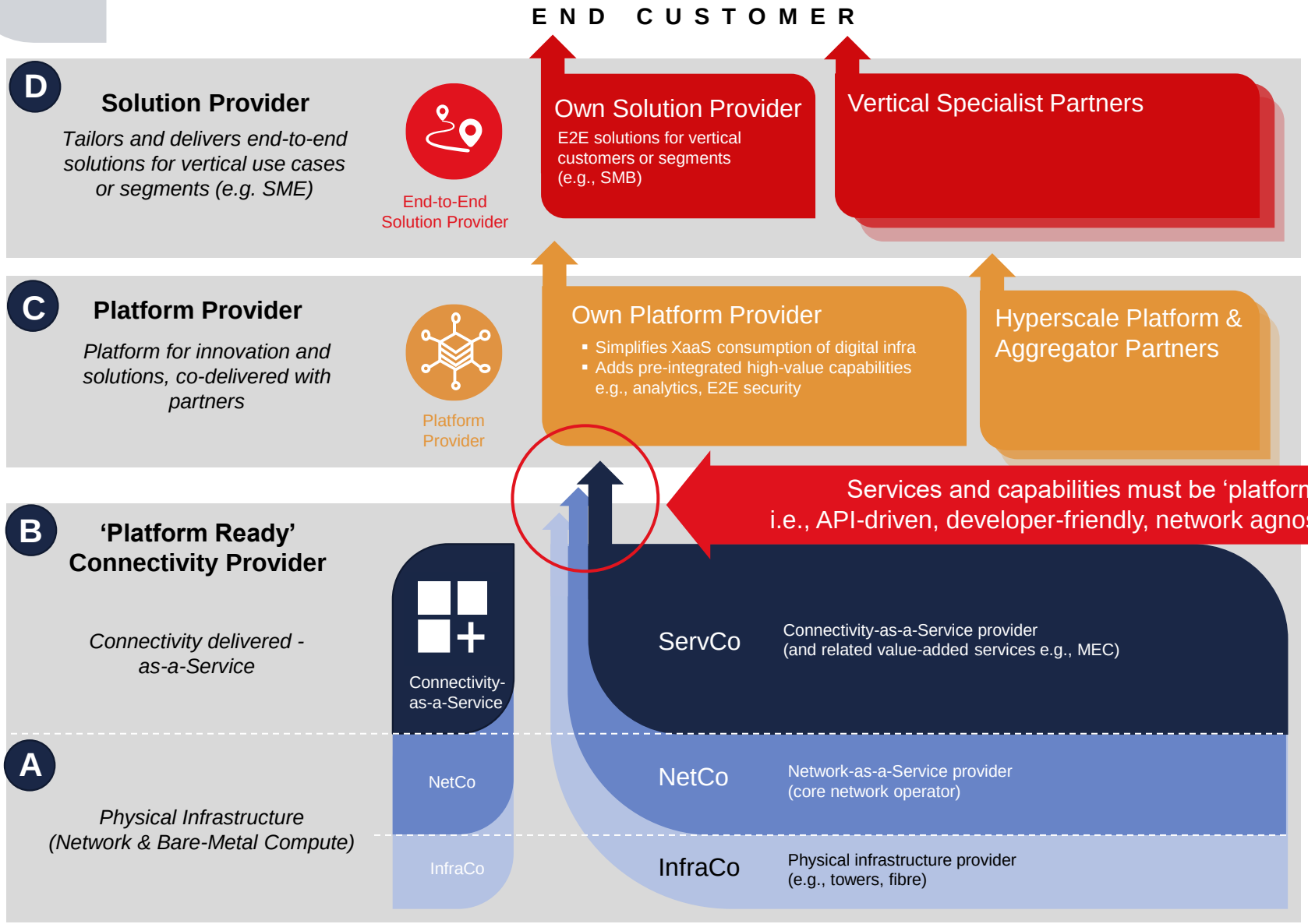
CHAMPIONS

AT&T, axiata, China Telecom, Dialog an axiata company, Ncell, orange, XL axiata, TIM, Telefónica, telenor, Telstra, verizon, vodafone

PARTICIPANTS

accenture, Axiata Digital Labs, Ericsson, Mavenir, Nokia, NTT DATA, TCS Tata Consultancy Services

ODA is a componentized, API enabled architecture for ‘platform ready’ services



TM Forum APIs used by developers and solution providers to build end customer solutions

TM Forum APIs exposed into Marketplaces to be used by developers to build solutions.

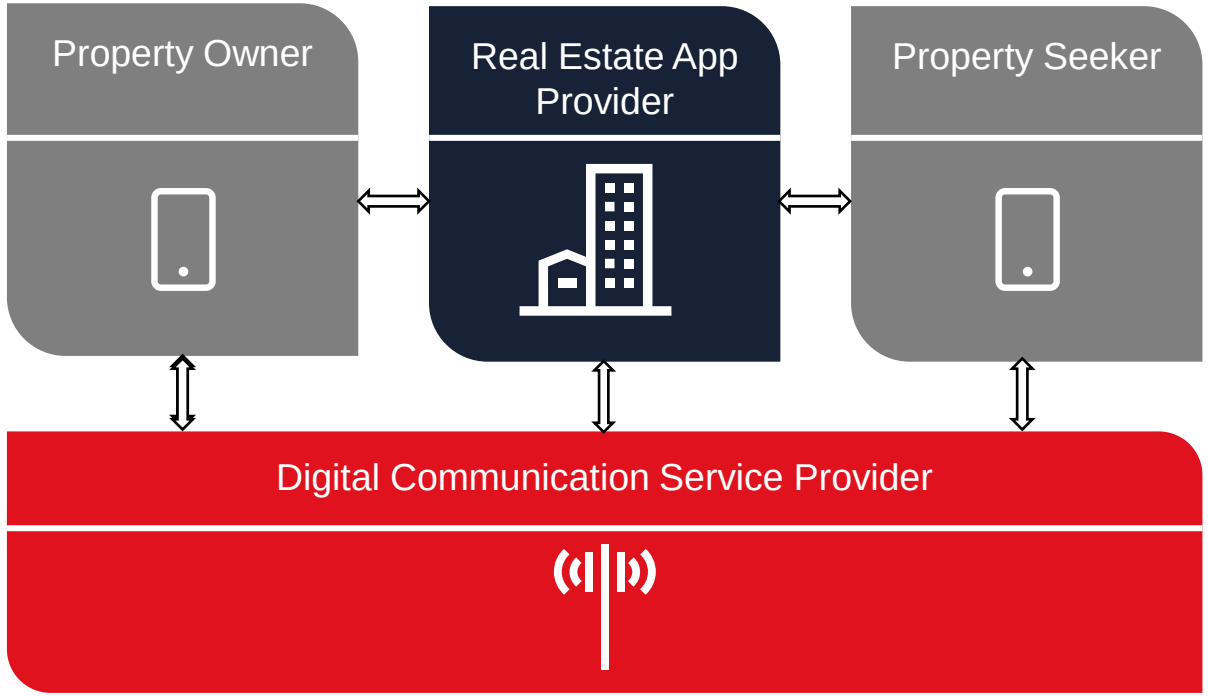
The initial set of TM Forum APIs were developed by Telcos in the OSS/BSS space to simplify and standardize the exposure of business capabilities via industry standard Open APIs.
Network APIs were not available, so we constructed NaaS APIs

Catalyst solution - Real Estate Digital Twin

Solution Overview

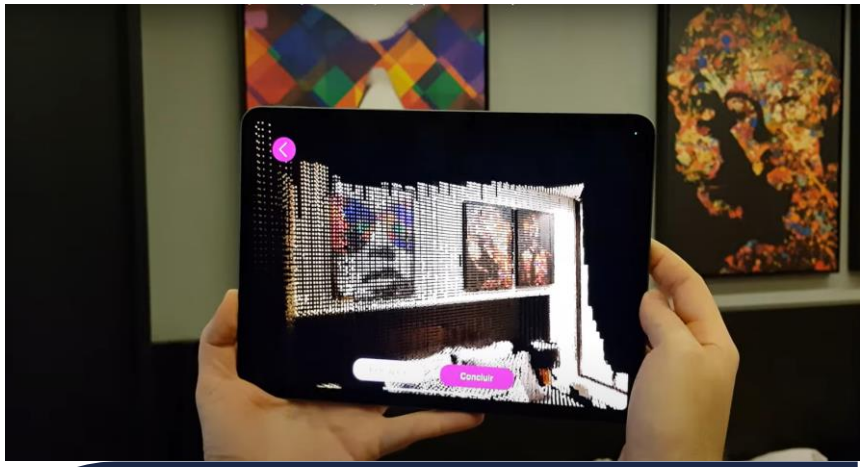
- Our solution relies on latest advancements in end-users devices (LiDAR Sensors) enabling the clients (Property Owners) to capture 3D models of their properties. Such models are uploaded to the real-estate provider application (Application Service Provider), where targeted clients (Property Seekers) can view the 3D created real models of the properties. More elaboration can be found in this video .

- The captured models need to be uploaded in real time with high bandwidth. This would allow the capture of higher quality model which is essential for the optimum customer experience.



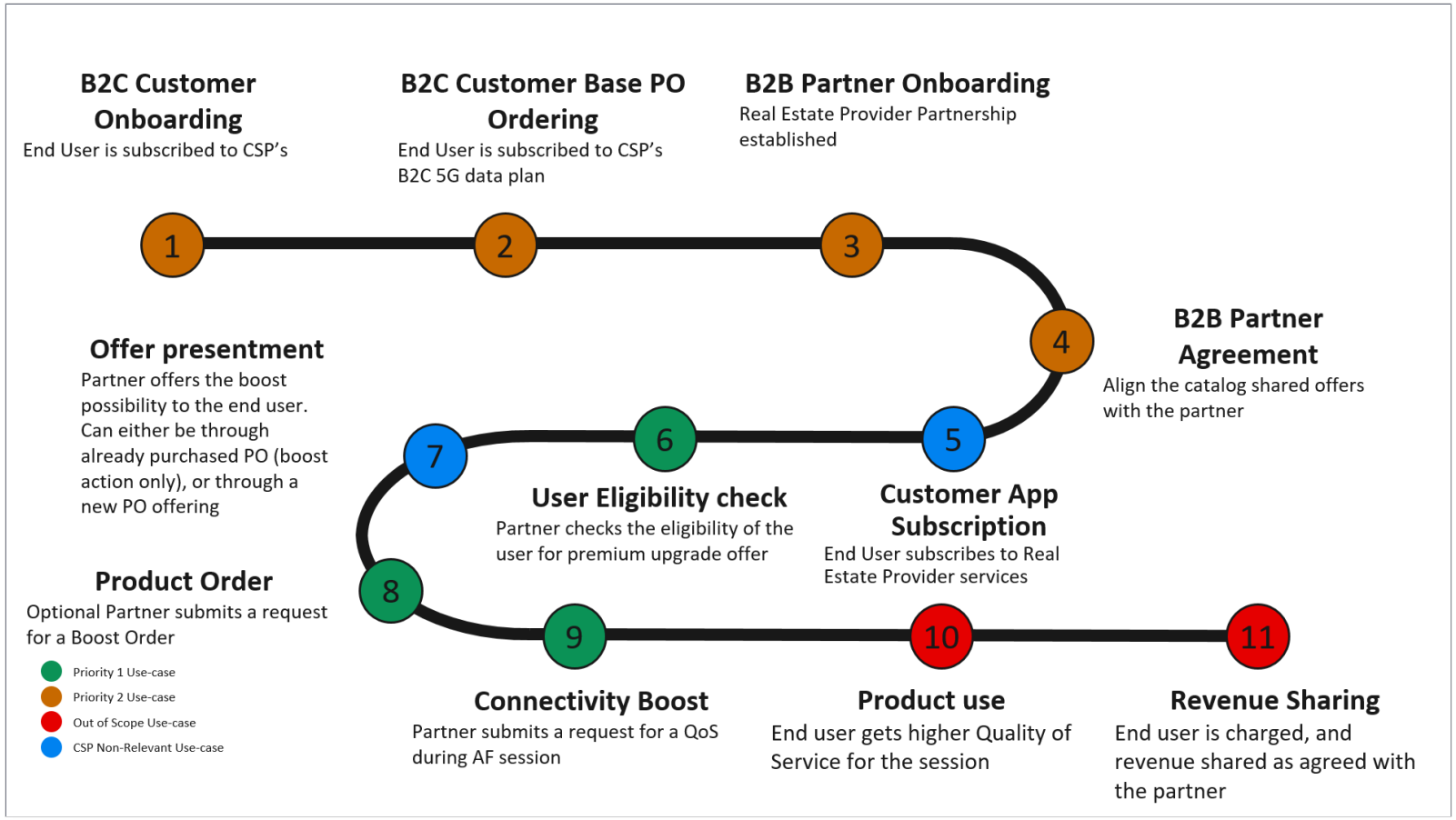
Real Estate Digital Twin

(Property Owner – ASP – CSP) Journey



Scenario:

Operators can provide a QoS capability enabling partner real estate app to boost traffic for its customers for better capture of real Digital twin of the end users' properties



Required API Operations for to boost a 5G connection

UC	Required Operation	Scope Description	Comment	CAMARA Coverage	
B2B Customer Onboarding	OnboardCustomer	• Onboard hierarchy of a B2B customer creating the Demographic /contact/billing/Payment information	• Although full hierarchy creation will be probably managed through assisted channels, adding a full individual hierarchy to an existing organization is required for zero touch simplified onboarding	• NA	• TM… OR • …chestration of TMF632 POST /party TMF629 POST /customer TMF666 POST /billingAccount TMF670 POST /paymentMethod
B2B Customer Base PO Ordering	CreateProductOrder	• Validate, fulfil and assure payment for customer connectivity capabilities. Activated offering is basic connectivity at minimum, but can included 5G enabling service.		• NA	• TMF622 POST /productOrder
B2B Partner Onboarding	Onboard Partner	• Onboard hierarchy of Partner creating the Demographic /contact/billing/Payment/Partnership information	• Although Partnership can be established in detail through assisted channels, CSPs planning to interact with -or further more provide- an ecosystem requires API managed zero touch simplified partner onboarding	• NA	• … • … TM… OST /party …669 POST /partyRole TMF666 POST /billingAccount TMF666 POST /settlementAccount
B2B Partner Agreement	Inquire Agreements	• Inquiring preexisting Agreement templates linked to preexisting product offerings	• Although agreements can be tailored in an assisted mood, planning to interact with -or further more provide- an ecosystem requires API managed zero touch Agreement management	• NA	• TMF651 GET /agreement
	Create Agreements	• Creates an agreement between Partner and CSP		• NA	• …
User Eligibility Check	CheckUserEligibility	• Check if the End-user is elegible to do the boost action. If not eligible then operation should return the applicable offerings required to make enduser eligible for the boost action	• Having a seperate call for the eligibility eliminates presenting the customer a non-eligible choice, hence enhancing customer experince. • Eligibility can be done as an initial part of the boost	• NA	• … • Or… …ation of …637 GET /product TMF679 POST /productOfferingQualification
Product Order	CreateProductOrder	• Validate, fulfil and assure payment for customer connectivity capabilities enabling Boost Action	• Boost action can be enabled by default on (UC B2B Customer Base PO Ordering) hence this step can be optional	NA	• TMF701 as elaborated in section 1.4 of Order • … TMF… …ST / payment
Connectivity Boost	BoostConnectivity	• Validate and fulfil boosting of specific end-user session		• QualityOnDemand API : POST /sessions	• TMF 640 PATCH /service

TBD as part of Catalyst

Operate APIs (not part of CAMARA)

CAMARA Service Mgmt. APIs

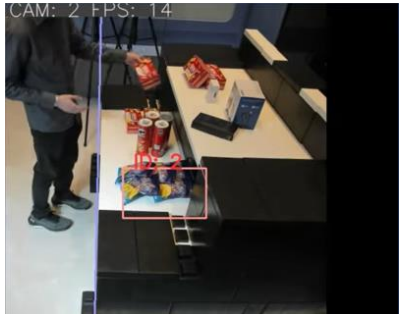
CAMARA Service APIs

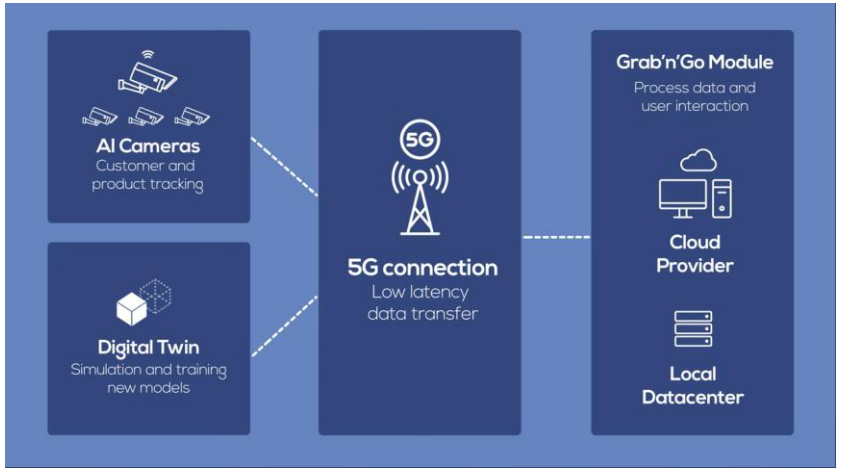
Catalyst Phase II - Grab and Go

VR Variant

- On the Go stores, Amazon like experience using AI Cameras
- CAMARA APIs
  - Location for security
  - QoD for optimum experience
  - Carrier billing Checkout for payment
- TMF APIs
  - Partner Onboarding (TMF 632, 666, 669)
  - Agreement Management (TMF 651)
- Challenges
  - Camera Setup @DTW Booth
  - CAMARA API readiness

If you are interested in participating, we would love to have you on board – please drop me an email!





Learning from phase 1 - Alignments & Challenges

As an outcome of the Catalyst Project

Aligned On

- TM Forum assets will be utilized for CAMARA Operation, Administration & Management APIs
- TMF guidelines can be used for abstraction and simplification of APIs to meet CAMARA targets best serving application developers
- TMF APIs -in some cases- can be granular and would require an added layer of composite APIs to orchestrate multiple APIs defined by TMF
- Exposure of CSPs external APIs is better served and governed by a unified layer following the same exposure guidelines

Challenged On

- TM Forum guidelines of exposure are not yet aligned with CAMARA guidelines. This hinders the direct exposure of TMF APIs as CAMARA APIs
- TMF APIs extended using (Domain Context Specialization) approach are flexible to define any capability. When and how to use of the approach is yet to be agreed by the CSPs.
- Assessment of readability and measure of abstraction of the data models to be exposed to Application developers is unclear. No defined set of principles exists for assessment.

Thank you

tmforum

Together, the GSMA, CAMARA, LF Networking and TM Forum have put together a white paper to introduce some of the concepts of a GSMA Open Gateway NaaS architecture and to shed light on the intended demarcation points, so that stakeholders can know the scope and touchpoints of the participating organizations and understand how each of them contribute.

Download it from:

GSMA

GSMA Open Gateway use cases

Making Open Gateway Happen

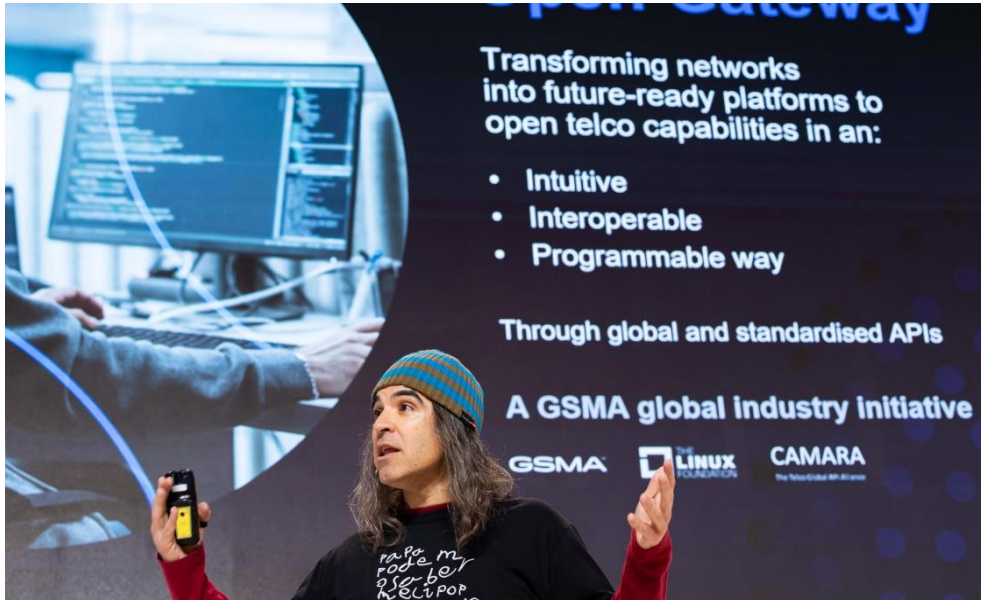
Warren Bowers

01

Introduction to MWC23

Telefónica introduced the GSMA Open Gateway initiative at MWC23

Telefónica and GSMA Chairman, José María Álvarez-Pallete, introducing Open Gateway at the opening session of the Mobile World Congress 2023



Chema Alonso, Telefónica's Chief Digital Officer, showed the first Open Gateway use cases at MWC, developed internally and in collaboration with Partners

Key Objectives at MWC23

- Open Gateway is a collaborative initiative
- Powerful real life use cases
- Developer-First approach
- Early Adopters Program

Telefónica Open Gateway Stand at MWC23

Early Adopters
Program Presentation

LIVING APPS DEMO

- Kanto: Gaming & Entertainment

USE CASE VIDEOS

- Daycoval: Antifraud & Fintech
- Cinfo: Industry 4.0
- apoQlar: Health & Wellness

INTERACTIVE DEMOS

- BlackNut: Gaming & Entertainment
- Zoom: Unified Comms

02

MWC23 Use Cases

As of today, 8 advanced APIs are available in Telefónica Open Gateway

Traditional APIs

- Voice
- SMS
- OTT messaging
- Best effort data

Current Open Gateway APIs

- Device status
- Device Location
- SIM Swap
- QoD Mobile
- QoD WiFi
- SMS based Authentication
- Checkout
- Number Verification

…but Telcos have the potential and will expose many more capabilities

USE CASE EXAMPLE

Antifraud & Fintech

Banco Daycoval

Secure transactions

Daycoval Bank is one of Brazil’s most respected financial institutions, and a reference in credit, investments, exchange products and resource management.

Challenge

Verifying a user's location is key for preventing fraud when conducting transactions and other banking operations from infrequent or unknown locations.

Solution

Alongside Vivo, Telefónica's Brazilian operation, we utilized network location verification, as the most secure and accurate solution.

This allows the bank to validate the location of its customers in real time, making transactions more secure.

vivo

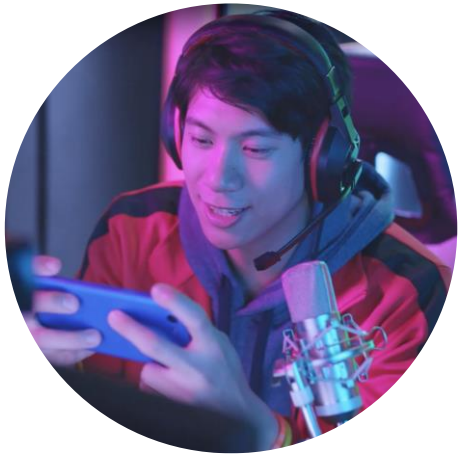
Open Gateway API

Device Location

USE CASE EXAMPLE

Gaming & Entertainment

Blacknut



Cloud Gaming

Blacknut is a cloud gaming service that provides subscribers unlimited access to 500+ games and cross-device capability for any connected device.

Challenge

Gamers need stable connectivity in key moments, and lag, jitter and buffering are substantial issues that Blacknut wanted to erase from their gamers experience.

Solution

With Vonage, we implemented Quality on Demand to activate higher quality gaming.

Now Blacknut's users can enjoy a solid speed, super-fast response times, ultra-low latency and unwavering connectivity, providing a superior experience.

Partner

VONAGE

Open Gateway API

QoD Mobile

USE CASE EXAMPLE

Unified Comms & Collabs

Online Video training

Zoom is a video room service that provides different comms services for work meetings, simultaneous virtual rooms and webinars.

Challenge

Zoom is exploring charging users for higher network quality and/or offering premium services solutions with higher quality to increase the number of paying customers.

Solution

Integrating Quality on Demand with Vonage, we were able to vastly improve the virtual education experience

Our solution enables webinar hosts to activate HD mode to ensure the quality of presentations automatically and stabilize connectivity.

Partner

VONAGE

Open Gateway API

QoD Mobile

USE CASE EXAMPLE

Industry 4.0

cinfo

AI Video production

Cinfo is a company specializing in artificial intelligence, 5G, video technologies with a vision to democratize the production of all kinds of events.

Challenge

Cinfo wanted to create an affordable system for high quality broadcasting, using AI in order to simplify workflow and reduce errors and costs. These solutions are highly sensitive to connectivity, quality parameters latency and jitters.

Solution

In collaboration with AWS, we deployed our QoD API for their AI to process the frames at the capturing stream FPS rate, during a live event.

The result is a live sports broadcast, captured using AI, with no video freeze and no pixel or frame loss.

Partner

aws

Open Gateway API

QoD Mobile

USE CASE EXAMPLE

Gaming & Entertainment

Shopping on TV

Kanto is a karaoke service that offers high quality content and a multiuser, multidevice experience through an exclusive subscription only available for Movistar Plus+ customers.

Challenge

TV shopping can be complicated if payment is not integrated into the TV ecosystem. Kanto required a simple and safe way to charge a customer, through the TV, without ruining the user experience.

Solution

With Movistar Plus+, we integrated the Checkout API, adding the charges to the customer's phone bill, instead of them entering credit card details,

This approach helped to maximize conversion rate, meaning more users can effectively complete the transaction.

Partner

Open Gateway APIs

Checkout

USE CASE EXAMPLE

Health & Wellness

apoQlar

XR remote surgery

Apoqlar’s VSI HoloMedicine is a medical software platform with a feature that constructs a volumetric 3D image based on real world patient scans, which a physician can remotely view using the HoloLens.

Challenge

ApoQlar required solid connectivity as the rendering of the volumetric 3D model relies on a highly reliable connection with stable latency and bandwidth.

Solution

Utilizing Microsoft's HoloLens hardware, we integrated our QoD API in order to guarantee the quality of rendering of the 3D images.

This improves the video, with no image freeze and better resolution, providing a consistent experience for the doctor preparing for surgery.

Partner

Microsoft Azure

Open Gateway API

QoD Mobile

Possible future use cases are numerous

Antifraud & Fintech

- More secure transactions and purchases
- Smarter Banks
- Customer centric

Gaming & Entertainment

- Faster and more stable connectivity
- High-capacity gaming experiences
- New content possibilities

Unified Comms & Collaborations

- High-quality video and audio
- Uninterrupted content feed
- Improved online services

Industry 4.0

- Capitalize on new AI capabilities
- Rethink industry norms
- Integrate new tech into processes

Health & Wellness

- Prioritize patient care
- Reshape healthcare industry
- Consult and intervene remotely

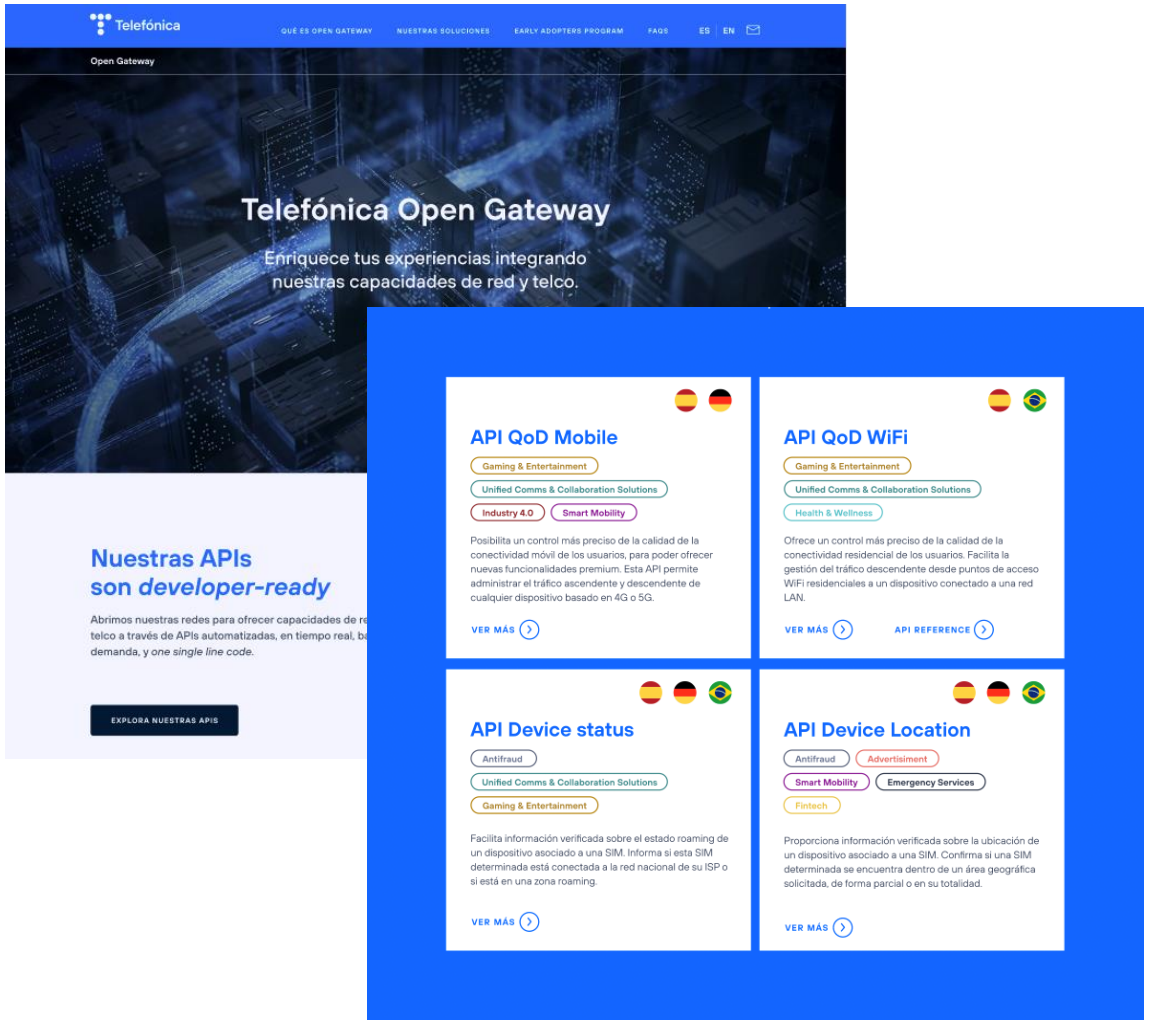
03

Telefónica
Early Adopters Program

Early Adopters Program (EAP): Accelerating Developer Engagement

Telefónica Open Gateway EAP was launched in MWC'23 and is now live in our production platforms to:

- **Mobilize** the developer community
- Identify **new and innovative use cases** and make them a reality for millions of Telefónica customers
- Create a **continuous feedback** loop for APIs definition and evolution.



[Telefónica Open Gateway Early Adopter Program (telefonica.com)]

Benefits for the developer

Free Access

Free access to the pre-commercial APIs of Telefónica Open Gateway

Test Use Cases

Test and validate selected use cases to generate end-to-end services for end customers (B2B or B2C)

Experiment

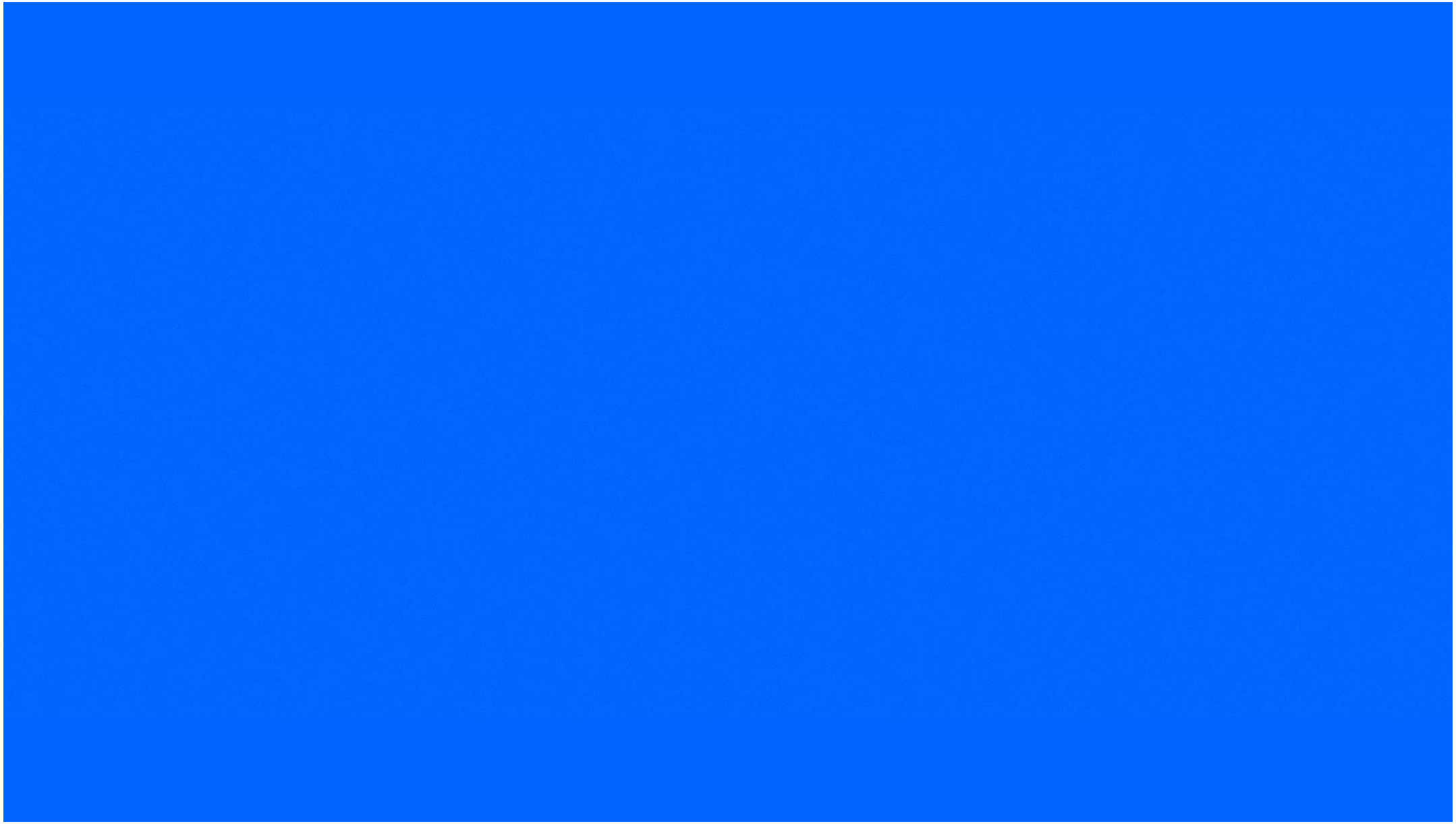
Experiment with high-performance network capabilities to create valuable end user-geared applications. POC generation

Dev Kit

Get access **complete kit for developers** with all the tools: SDK, code samples, docs and user guides

Support

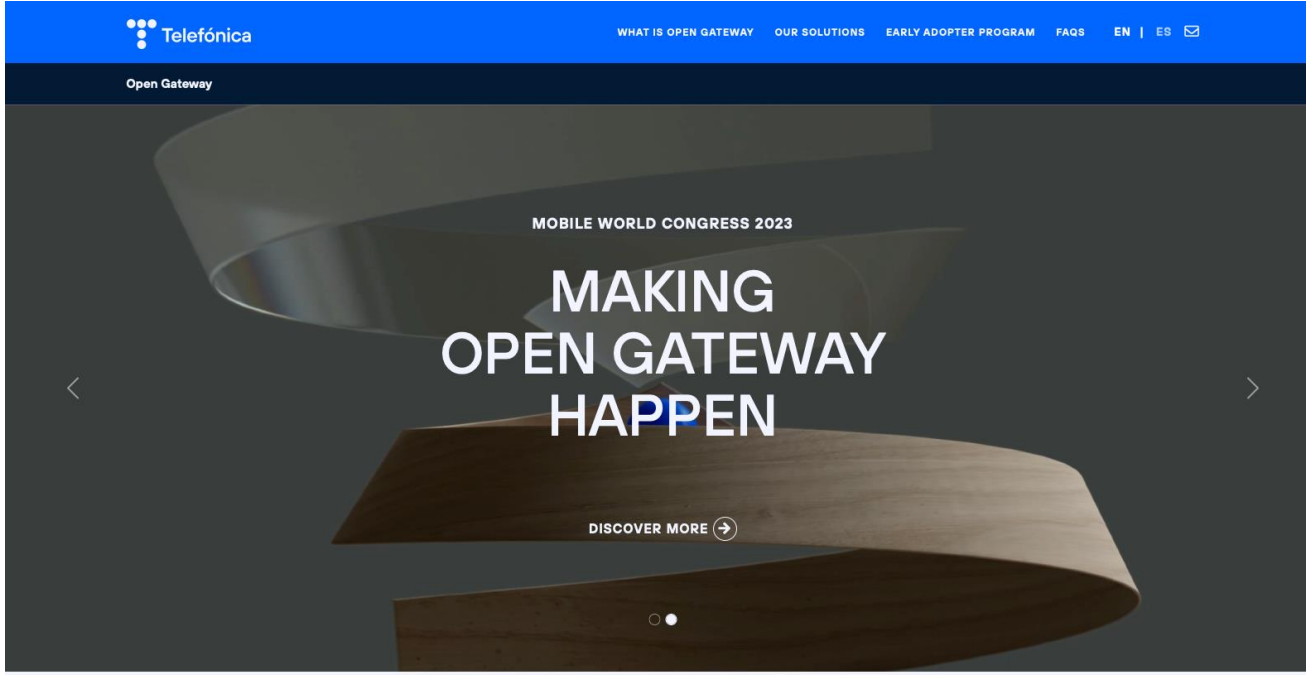
Receive **full support** in the resolution of queries and incidents during the entire process



Enhance your users' experiences, join us!

opengateway.telefonica.com

Telefónica



We're turning our networks into a *developer-ready* platform

We're opening up our networks to offer **telco capabilities** through **global and standardised APIs**. Create new experiences and features by integrating the power of the network.

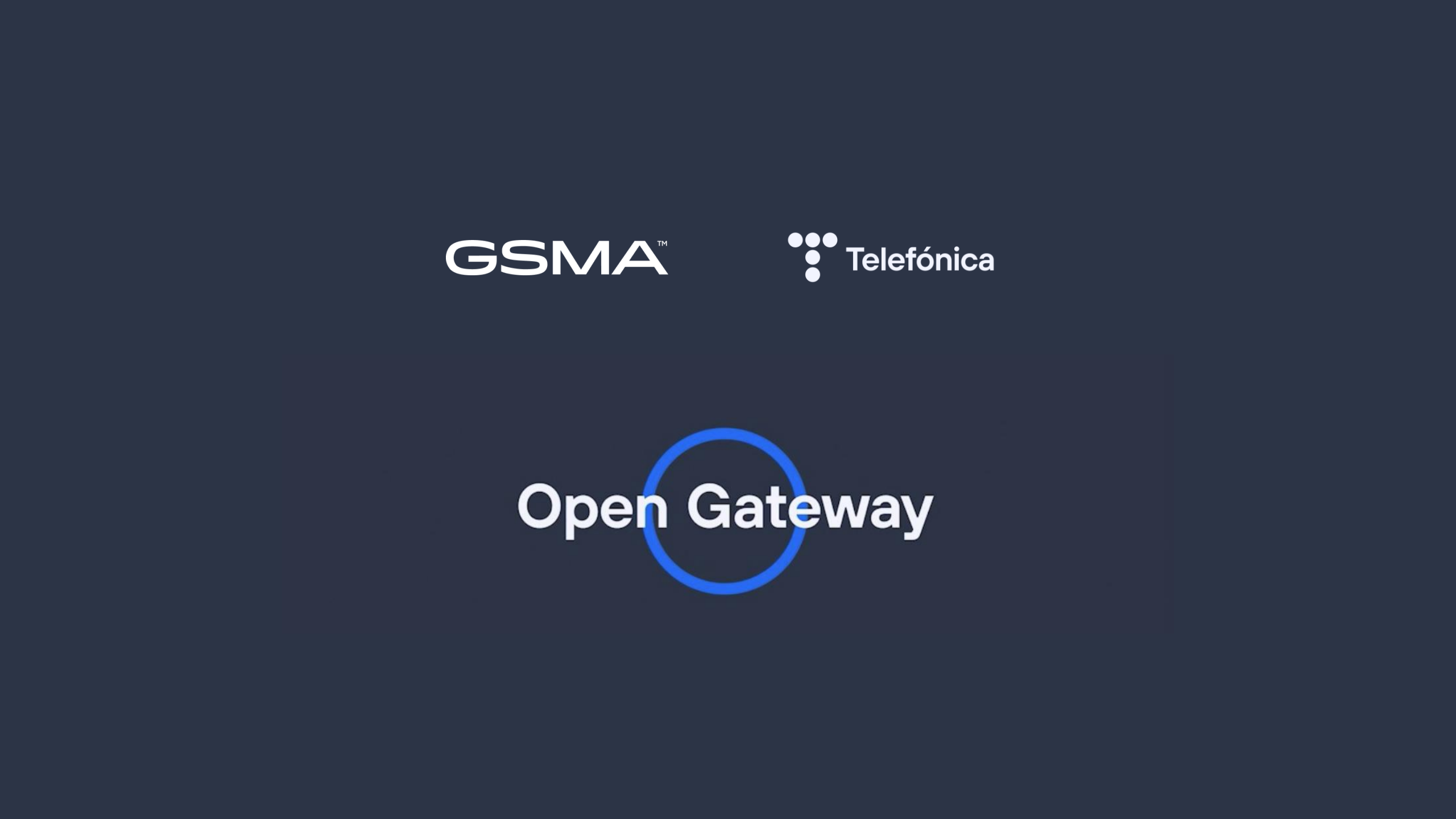
EXPLORE OUR APIS

Our APIS are available in partnership with:

aws · Google Cloud · Microsoft Azure · VONAGE

Go to Telefónica Open Gateway Early Adopter Program

A program developed together with AWS, Google Cloud, Microsoft Azure and Vonage to define, create and test our new network and telco APIs.


GSMA
Telefónica
Open Gateway

DEUTSCHE TELEKOM

API EXPOSURE

Open Gateway Community 25th of May 2023

TELCO CAPABILITIES

Network Functions

(defined by 3GPP)

- Quality on Demand
- Location Reporting
- Roaming Status
- UE Reachability
- # of UE in region
- Loss of connectivity
- Managed Latency
- Mulitpath Connectivity
- Background Data Transfer
- Network-Congestion-status
- **+40**

Reachability and Location of UEs

Identify (last known) location of drone

Wake up UEs

Support low energy IoT devices

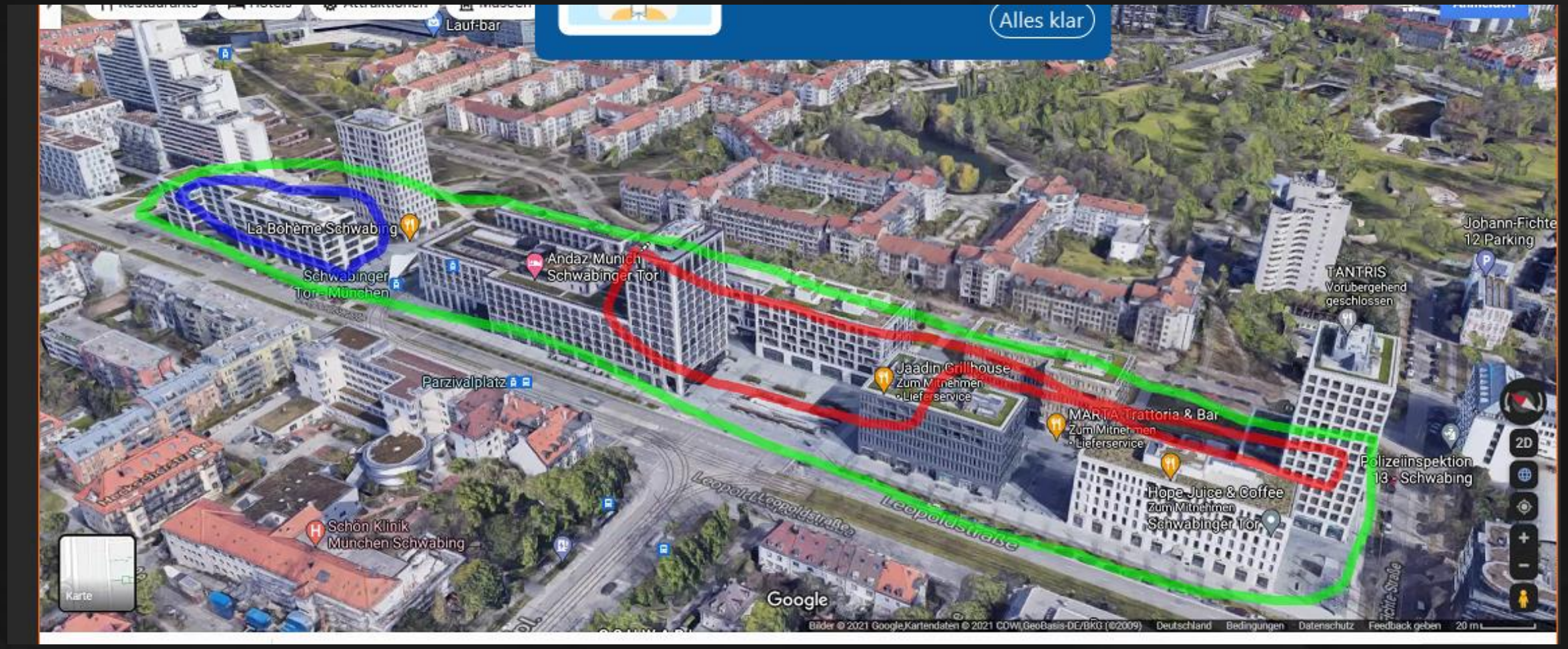
Number of UEs in geographic region

Traffic jam or Corona warning

Quality on Demand / Traffic influence

AUTOMATED VALET PARKING

AUTOMATED VALET PARKING



AUTOMATED VALET PARKING

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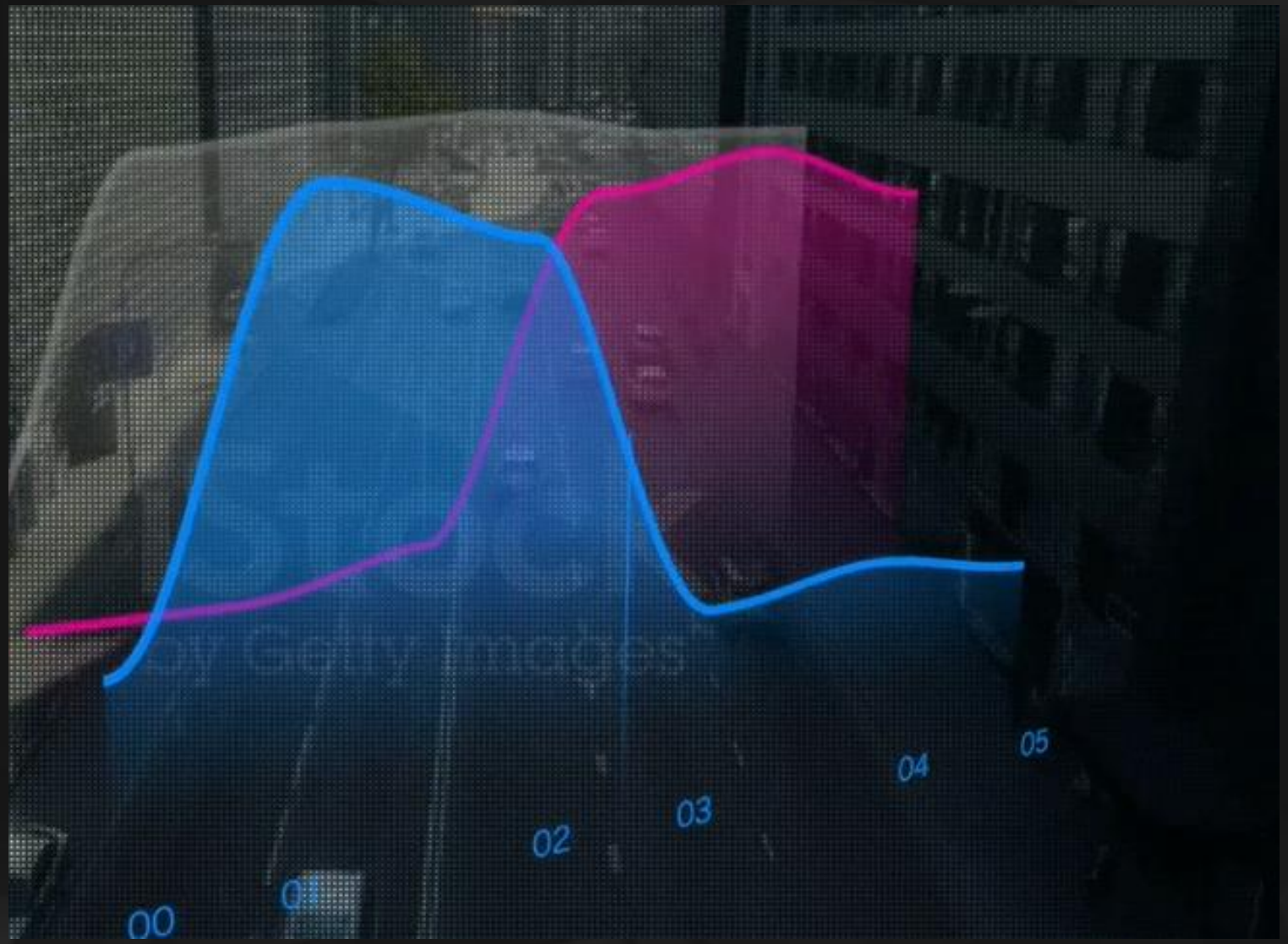


https://youtu.be/WBmGQoeH2RE

QUALITY ON DEMAND – API OVERVIEW

- Network boost
- On demand
- T-Shirt sizes
- Auto user identification

CHECK DEVICE – API OVERVIEW

- Roaming status
- On demand
- Uniform implementation
- More to come: Subscription, connectivity status …

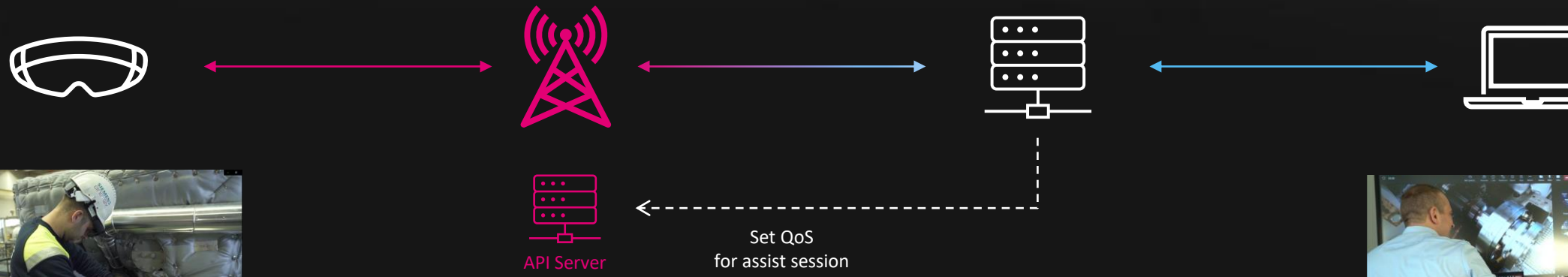
LOCATION – API OVERVIEW

- Verify location
- On demand
- Uniform implementation
- More to come: Subscription, area entered, area left …

REMOTE MAINTENANCE

Remote Maintenance

REMOTE MAINTENANCE



A Siemens Energy field engineer is fixing a machine and requires real time technical assistance over mobile network

DT/TMUS network assigns the IP flow a higher priority to ensure better and steadier latency

Cloud application calls DT/TMUS API to request QoS on the mobile connection.

The remote assistant server receives high-quality pictures with low latency, significantly increasing service quality

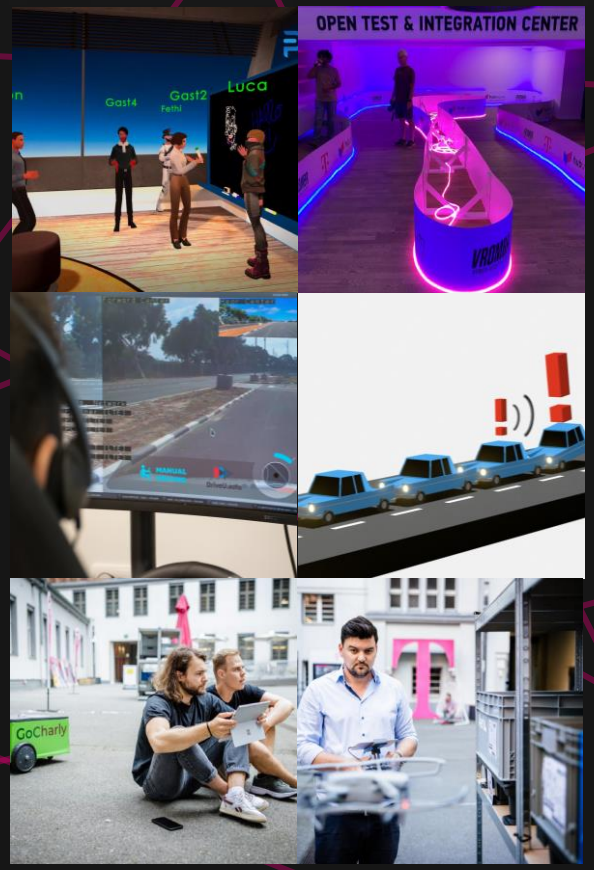
Siemens Energy technical experts remotely assists the field engineer

REMOTE MAINTENANCE

with Quality on Demand

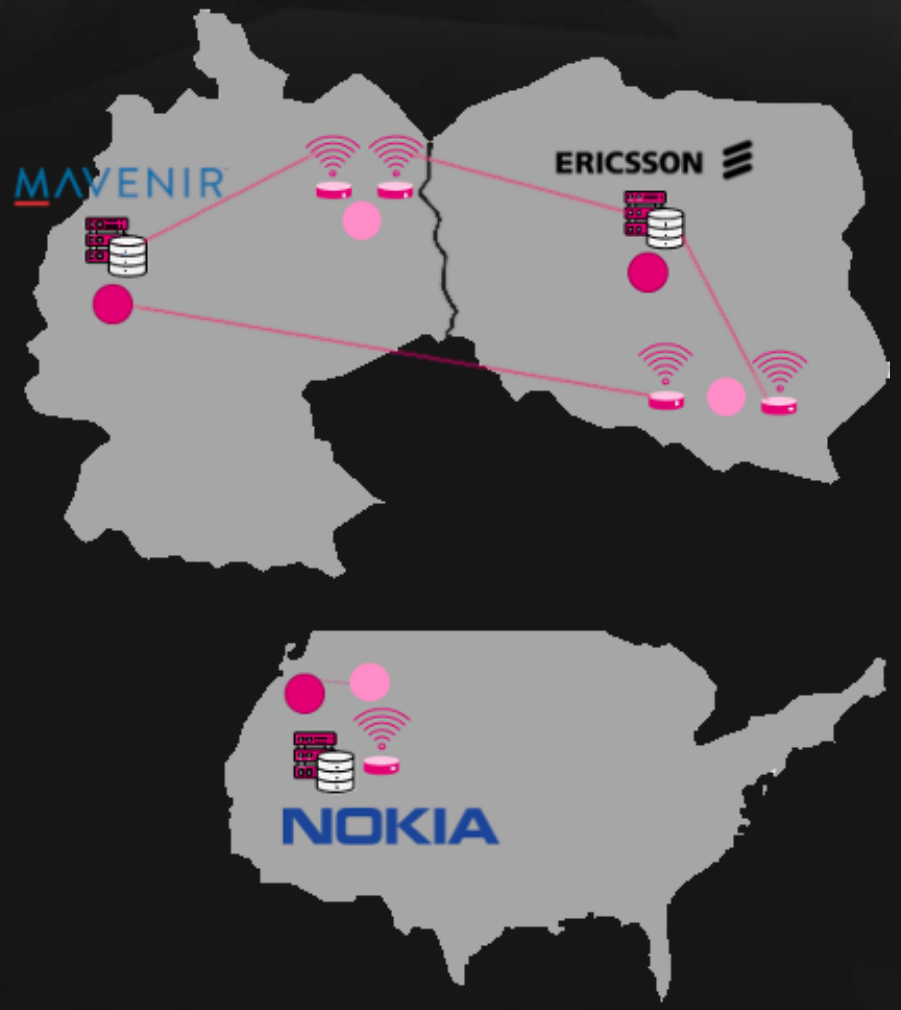
https://www.youtube.com/watch?v=_nAYCeOsfLg

EARLY ACCESS PROGRAMS



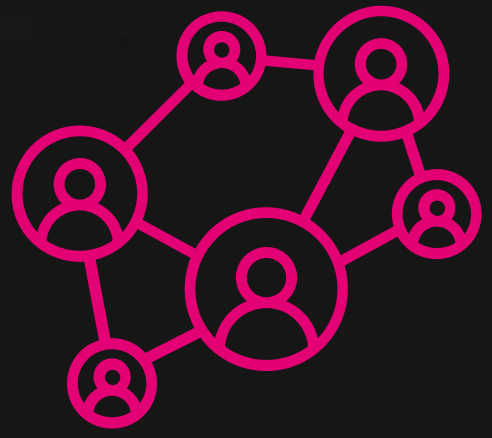
hub:raum
tech incubator of

LABS



Deutsche Telekom and T-Mobile PL and T-Mobile US

WHAT WE DO

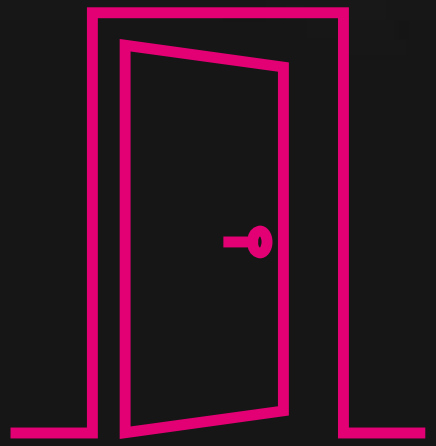


Programs

With hyperscalers, startups, developers

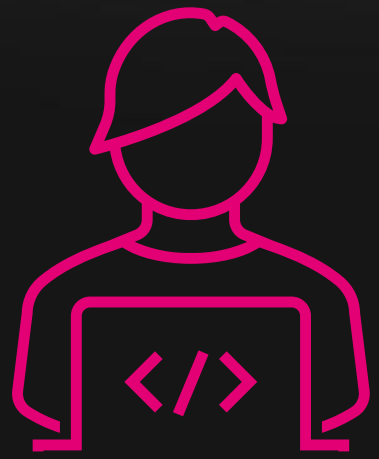
Events

Hackathons, meetups, conferences and talks



Open Door

Feedback, ideas, use cases, partnerships and investments



On Eye Level

Developer ecosystem, sample Code, slack Community

INDUSTRIES

Entertainment

- Gaming
- Streaming
- Metaverse
- Consumer apps

Moving Objects

- Cars
- Drones
- Automated guided vehicles

Production

- Smart factory
- Automatic production lines
- Video producing

https://www.youtube.com/watch?v=LW1ubGTSW9Q


NETWORK APIs

HOLOGRAPHIC TELEPHONY

https://www.youtube.com/watch?v=mBLXaK6OEic

Way forward

- **New APIs and API features – in CAMARA**
- **Productization – together with Open Gateway**
- **API federation - together with Open Gateway**

Q&A

GSMA

Find out more at:

https://www.gsma.com/futurenetworks/gsma-open-gateway/

Next Open Gateway Community call will take place in September 2023.

GSMA