

GSMA Response

BEREC Call for Input on Interfaces for Mobile Networks for Developers and Third-Party Services

The GSMA welcomes the opportunity to provide input into BEREC's call for input on interfaces for mobile networks for developers and third-party services and welcomes BEREC's focus on network APIs and the GSMA's Open Gateway initiative.

Introduction

GSMA Open Gateway

Open Gateway, developed in collaboration with the CAMARA open-source project, allows telecommunications networks to become programmable platforms that support innovation in digital services, improve security, strengthen connectivity performance and contribute to Europe's digital competitiveness. CAMARA is an open-source, vendor-neutral platform bringing together mobile operators, cloud providers, developers and other technology partners to collaboratively define and develop the technical specifications of standardised APIs.

GSMA provides a neutral platform to support the evolution of an open and interoperable network API ecosystem. Through GSMA Open Gateway and its Market Champions¹ initiative, and operating within a robust antitrust framework, GSMA facilitates essential industry collaboration on common priorities, supports necessary alignment around CAMARA-standardised APIs and enables the development of technical and implementation best practices. By fostering essential cooperation while preserving independent commercial decision-making by operators and ecosystem participants, this approach aims to reduce technical fragmentation and support interoperability across markets and networks, allowing developers to integrate once and scale across multiple operators and markets, supporting a more seamless digital single market across the European Union.

European operators are actively engaged in the GSMA Open Gateway initiative, accounting for 34% of APIs commercially launched worldwide². However, the uptake and scaling of these APIs requires a regulatory environment that provides legal certainty and supports the deployment of innovative API-based services.

Demand is likely to remain concentrated in vertical sectors with clear business needs, particularly financial services, healthcare, media, retail, aviation, transport and manufacturing.

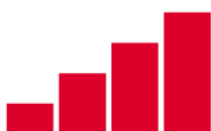
Initiatives such as GSMA Fusion³ demonstrate that enterprises are actively engaging with the ecosystem to define their current and future requirements, while the Open Gateway Demand Index⁴ indicates that network APIs that address measurable business problems will create genuine commercial value.

¹ The Market Champions initiative is a go-to-market mechanism. In each market, GSMA convenes and leads a cross-operator group to identify demand, prioritise APIs and commit to commercial launch.

² GSMA Open Gateway, State of the Market H1 2026, GSMA Intelligence
<https://www.gsmaintelligence.com/research/gsma-open-gateway-state-of-the-market-h1-2026>

³ GSMA Fusion is a program that connects industries with mobile operators. GSMA Fusion amplifies enterprise needs, translating real-world challenges into actionable insights shaping the Open Gateway framework <https://www.gsma.com/solutions-and-impact/gsma-open-gateway/gsma-fusion/>

⁴ Network API Demand Index: a vertical sector view, GSMA Intelligence
<https://www.gsmaintelligence.com/research/network-api-demand-index-a-vertical-sector-view>



Enabling the network API market to scale

For the development of the network API market to accelerate, operators must have confidence that their investments in advanced network capabilities and API-based services can be successfully commercialised. A proportionate and technology-neutral regulatory framework is essential to support continued investment, enable innovation and facilitate the development of new API-based services that deliver benefits for consumers, enterprises and the wider digital economy.

Many use cases depend on the secure exchange of data between trusted parties, underpinned by appropriate privacy, security and accountability safeguards. Support from policymakers for industry-led, globally interoperable and open standards, like CAMARA, reduces the risk of fragmentation, lowers barriers to deployment and enables network API services to scale across operators and markets, making network capabilities accessible to a wider developer community.

From a competition perspective, this open, standards-based model lowers barriers to participation: access is increasingly provided through multiple aggregators and marketplaces, developers can choose among several distribution channels, and mobile operators compete on network capabilities, coverage, quality, support and commercial terms. However, the market is still developing and differences in API availability, implementation, onboarding, legal requirements and service levels remain across countries and mobile network operators, making pan-European coverage and deployment complex for enterprise customers. The ecosystem includes operators, developers, cloud providers, systems integrators, CPaaS providers, vendors and new intermediaries, promoting innovation throughout the value chain.

Delivering benefits to consumers

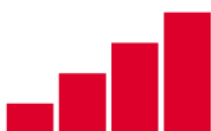
The development of new services facilitated by the Open Gateway initiative benefits consumers by making digital services more secure, seamless and reliable. For example, network APIs support banks, payment providers and online platforms to prevent fraud and scams, enable consumers to access digital services more efficiently by providing seamless and faster authentication methods and can improve application performance by ensuring stable latency, resulting in enhanced user experiences.

Regulatory challenges

The ePrivacy Directive casts limitations on the adoption of the large-scale innovative services such as the authentication APIs under the GSMA Open Gateway initiative, that could otherwise add significant benefits to enhancing consumer protection against fraud and scams. In particular, the current provisions on Article 6 (traffic data) and 9 (location data) of the ePrivacy Directive significantly restrict providers from analysing traffic and location patterns. These provisions impose unique legal requirements exclusively on telecommunications operators that do not apply to other digital service providers. This creates regulatory asymmetries that limit mobile network operators (MNOs) from carrying out the fraud and scam preventive work that consumers in Europe deserve.

Furthermore, the implementation of the ePrivacy Directive has varied significantly across EU Member States, resulting in a fragmented regulatory landscape that generates legal uncertainty across markets. The creation of single market for API-based services based on interoperability across the EU requires regulatory consistency. This need is driven by growing demand from global enterprises for standardised APIs that can be deployed at scale across markets and work consistently across mobile networks worldwide.

In addition, the outdated Open Internet Regulation (OIR) framework does not reflect how modern networks operate; it creates legal uncertainty for innovative services requiring guaranteed performance, ultra-low latency, or differentiated and assured quality of service,



such as the Quality on Demand (QoD) and Quality of Service (QoS) APIs under GSMA Open Gateway.

Moreover, as stated in the GSMA response to the public consultation on the draft BEREC Further Guidance on 5G Network Slicing, the draft guidance offers limited clarity for broader categories of innovative services, particularly network API-based services. As a result, operators continue to face uncertainty when assessing compliance under the OIR. This is especially problematic given the growing role of network APIs in enabling more dynamic, programmable and efficient connectivity, and for the growing demand from enterprises for such solutions, as identified through GSMA Fusion. The guidance does not provide sufficiently clear or future-proof principles to support the deployment of these emerging services.

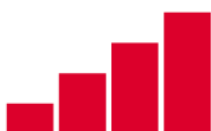
Guidance by BEREC is needed addressing the asymmetries resulting from more stringent regulation in respect of traffic and location data. Also, guidance by BEREC is needed to enhance legal certainty which is instrumental to innovation and investment, and ultimately consumer welfare.

The considerations above provide important context on the development of the Network API ecosystem, the benefits it can deliver and the policy challenges that may affect its growth. Building on these observations, the GSMA's responses to BEREC's questions are set out below.

Question 1: Ecosystem roles: MNOs, MVNOs, MVNEs, Aggregators, CPaaS providers, Channel providers, Developers, cloud providers, end users

The Network API ecosystem is a complex, multi-layered value chain in which each actor plays a distinct and complementary role.

- **Mobile Network Operators (MNOs)** are the foundational layer: they own and operate the network infrastructure (4G/5G), expose standardised network capabilities through CAMARA-compliant APIs (via a Network Exposure Function or equivalent), and bear the primary responsibility for ensuring that APIs are reliable, secure, and compliant with applicable regulations. MNOs also determine the commercial conditions under which APIs are made available and bear the costs of network upgrades required to support programmability (e.g., 5G standalone cores for advanced QoD or network slicing features).
- **Aggregators and Channel Partners** act as intermediaries between MNOs and developers, providing a single point of access to APIs across multiple operator networks and geographies. They simplify developer integration by abstracting network heterogeneity and offer harmonised commercial interfaces. CPaaS providers similarly aggregate and re-package network APIs into higher-level communication services (e.g., messaging, authentication), reaching a broad developer ecosystem.
- **Developers and application service providers** are the demand-side of the ecosystem. They integrate Network APIs to build services in verticals such as anti-fraud and identity (using SIM Swap, Number Verification, KYC APIs), connected mobility and IoT (using QoD, Device Location), smart cities (using Population Density Data), or industrial automation. Their adoption of Network APIs is a key indicator of ecosystem maturity.
- **Cloud providers** (hyperscalers) play an increasingly significant role as distribution channels and integration partners for Network APIs. Platforms such as Microsoft Azure Programmable Connectivity have already integrated operator QoD APIs into cloud-



native developer workflows, thereby extending the reach of Network APIs to a vastly larger developer community.

- **Network equipment vendors** (e.g., Ericsson, Nokia, Huawei) are critical to API standardisation and deployment at the network layer, as they implement the NEF and API exposure functions within their network equipment. The degree to which vendor implementations are truly CAMARA-compliant and interoperable is a key challenge (see also Question 9 below).
- **End users** for both consumers and enterprises are the ultimate beneficiaries of the services enabled by Network APIs. They do not typically interact with APIs directly but experience their benefits through improved authentication, fraud prevention, quality of service, or location-based services.

Question 2: Market demand, prediction, and development

The market for Network APIs is developing quickly, but its maturity differs by API, use case and geography.

As stated in BEREC's consultation document, GSMA Open Gateway is supported by 86 operator groups representing more than 300 networks and around 80% of global mobile connections. BEREC also reports that 20 APIs had been commercially launched, and that 228 API deployments were supported by operators in Europe at the time of publication. Because availability changes over time, the GSMA Open Gateway availability map⁵ provides the most useful current view of geographic and operator coverage.

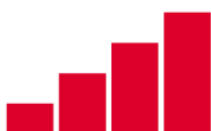
Based on the experience of GSMA members, demand is currently most visible in three broad areas:

- **Identity and anti-fraud APIs.** SIM Swap, Number Verification and Know Your Customer APIs are among the most mature commercial use cases, with demand from financial services, e-commerce and digital platforms. Other capabilities, such as branded calling and number-alias services, can also help reduce fraud and improve trust.
- **Location APIs.** Device location retrieval and verification, as well as geofencing, can support logistics, mobility, fraud prevention and public-safety use cases, subject to applicable privacy and consent rules.
- **Quality and programmable connectivity APIs.** Quality on Demand and more advanced connectivity APIs are at an earlier commercial stage. They are attracting interest in media, gaming, healthcare, mobility and industrial use cases. However, demand also depends on broad operator coverage. Many customers will only invest if an API can be used across several operators and countries. At the same time, operators may wait for stronger demand before investing further. This creates a coordination challenge that industry initiatives such as GSMA Open Gateway are designed to address.

Question 3: Business models and pricing models

GSMA observes that the market is currently experimenting with several models, and that no single dominant commercial model has yet emerged at European level.

⁵ Current availability: [GSMA Open Gateway availability map](#)



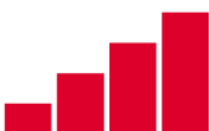
- Direct B2B models: MNOs offer APIs directly to enterprise customers, typically under usage-based pricing (per API call or transaction), with tiered pricing depending on volume and service level. This model suits large enterprise customers with dedicated integration resources.
- Aggregator/channel model: via platforms or CPaaS providers, developers access APIs under simplified commercial terms from a single intermediary, with the aggregator managing the revenue-sharing arrangements with underlying MNOs. This model dramatically reduces developer friction and is likely the primary driver of mass-market API adoption.
- Embedded model: hyperscalers and cloud platforms (e.g., Microsoft Azure Programmable Connectivity, Amazon AWS) integrate Network APIs as a native feature of their developer platforms, charging developers as part of a broader cloud service consumption model. This creates a powerful distribution channel for operators but also raises questions about competitive dynamics and the relative negotiating position of operators vis-à-vis large cloud providers.
- Marketplace / developer portal model: operators offer self-service access to APIs via developer portals typically for sandbox testing and pay-as-you-go for production use.

GSMA considers that pricing transparency across the value chain is an important condition for a well-functioning market. Developers should be able to understand the full cost of API usage, regardless of the distribution channel through which they access the API.

Question 4: How can Open APIs enable or support a dynamic and well-functioning European market?

Open APIs can support a dynamic and well-functioning European market in several ways.

- First, by reducing fragmentation: historically, the lack of standardised network interfaces meant that developers building pan-European services were required to integrate separately with each operator, creating a significant barrier to scale. The CAMARA standardisation initiative, by defining common API specifications applicable across operators, helps to reduce technical fragmentation by providing common API specifications. However, using the same technical standard does not yet mean that customers receive the same service from all operators. APIs may not be available everywhere, and onboarding, legal checks, implementation and service quality may differ between operators and countries. This distinction between technical standardisation and genuine service-level convergence is directly relevant to the Digital Single Market objective, and GSMA encourages BEREC to frame Network APIs within that broader single-market ambition.
- Second, by enabling new revenue streams for telecom operators: Network APIs provide a credible monetisation pathway for the significant infrastructure investments operators have made in 4G/5G networks. By allowing third parties to access network capabilities on a commercial basis, operators can transition towards a *Telco-as-a-Service* model that creates value beyond traditional connectivity services.
- Third, by stimulating innovation in the broader digital economy: the availability of standardised, programmable network capabilities unlocks entirely new categories of applications from identity and anti-fraud services to connected mobility, smart cities,



and industrial automation that could not be economically built on proprietary or fragmented interfaces.

- Fourth, Open APIs support the Digital Single Market objectives articulated in the BEREC Strategy 2026-2030 and the *EU Competitiveness Compass* (2025), by enabling application developers to build services that work consistently across EU member states, thereby reducing barriers to entry and supporting pan-European digital service providers.
- Fifth, aggregators can provide a single access point and simplify technical integration. However, they cannot fully solve differences between operators regarding API availability, legal requirements, onboarding, implementation, and service levels.

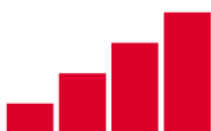
Question 5: How can adoption of network APIs be accelerated?

GSMA identifies the following key levers to accelerate adoption:

- Pan-European aggregation: the availability of a single commercial and technical access point covering multiple European operators is critical to reducing the integration burden for developers. Regulatory support for interoperability of aggregation platforms would reinforce this.
- Sandbox availability: operators should invest in robust sandbox and testing environments to allow developers to prototype and validate integrations before production deployment.
- Simplified onboarding: removing commercial and contractual complexity (e.g., lengthy negotiation cycles, KYC requirements) for smaller developers and start-ups is essential to building a vibrant developer ecosystem.
- Developer education: awareness of available APIs and their use cases remains limited beyond large enterprises. Investment in developer communities, hackathons, and technical documentation is a prerequisite for broader adoption.
- Regulatory certainty: clear and proportionate regulatory guidance on the conditions under which Network APIs can be offered, particularly regarding data protection (GDPR), end-user consent, and the application of Open Internet rules to network programmability services will reduce legal uncertainty and facilitate investment by both operators and developers
- Priority should be given to making APIs available across more operators and to simplifying and aligning processes such as customer onboarding, consent management and incident handling. Necessary controls should reflect the level of risk of each API, while avoiding the same checks being repeated by each operator where possible. BEREC could help identify these obstacles, support dialogue with the relevant data protection authorities and encourage cross-border and multi-operator trials. This soft, facilitative role is fully consistent with the approach of the Digital Networks Act, which seeks to reduce administrative burden and fragmentation rather than to add layers of sector-specific ex ante obligations. At this stage, this would be more useful than new obligations on access, supply or prices.

Question 6: Main drivers for successful adoption of Open APIs in Europe

GSMA considers the following to be the structural drivers:



- Strong industrial alignment: the GSMA Open Gateway/CAMARA framework enjoys broad operator support (86 operator groups, 80%+ of global mobile connections), providing a credible and durable standardisation infrastructure. This is a prerequisite for developer confidence.
- 5G network deployments: the rollout of 5G SA (standalone) networks is unlocking advanced API capabilities such as network slicing, ultra-low latency QoD, and edge computing integration that were not feasible on 4G or 5G NSA. The pace of 5G SA deployment in Europe is therefore a direct driver of API capability richness.
- Hyperscaler integration: the integration of CAMARA APIs by major cloud platforms dramatically extends the developer's addressable market and provides powerful distribution infrastructure that operators alone could not replicate.
- Strong demand from high-value verticals: financial services (fraud prevention), automotive (connected vehicles), healthcare (remote monitoring), and media/gaming (quality optimisation) represent anchor verticals with clear and immediate use cases for Network APIs, providing the commercial pull needed to justify operator investment in API infrastructure.

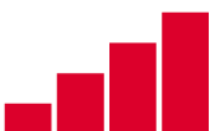
Question 7: Main technical and commercial challenges

Technical challenges identified by GSMA include:

- Interoperability across vendor implementations: despite CAMARA standardisation, the actual implementation of APIs varies significantly across network equipment vendors, creating de facto interoperability gaps even where operators nominally support the same API. This is particularly acute for more complex APIs such as QoD or Network Slice Booking, where vendor-specific interpretations of the standard can lead to inconsistent developer experiences across networks.
- Legacy infrastructure: not all network elements support the Network Exposure Function (NEF) required for CAMARA API exposure, particularly in older 4G networks. Upgrading network infrastructure to full API-readiness involves substantial investment.
- Scalability and reliability: API infrastructure must be able to handle production-scale call volumes with the reliability and latency that enterprise use cases require. This is a non-trivial engineering challenge at scale.

Commercial challenges identified by GSMA include:

- Chicken-and-egg dynamic: without sufficient developer adoption, operators struggle to justify the investment in API infrastructure; but without broad API coverage, developers cannot build scalable services. Breaking this dynamic requires industry investment and market-based coordination. Any public policy support should remain facilitative (e.g. supporting trials, standardisation and legal clarity) rather than prescriptive.
- Fragmented commercial landscape: the co-existence of direct operator access, aggregator-mediated access, and hyperscaler-embedded access creates commercial complexity for developers seeking pan-European coverage.
- Operational fragmentation. Even when operators use the same CAMARA API, differences in product definitions, onboarding and legal requirements may require additional work for each operator or country.

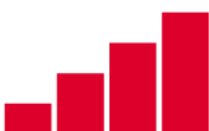


- Commercial accessibility. Network APIs must be easy for customers and developers to access and use. Long onboarding, legal, security and contracting processes, even when justified, can make operator APIs less attractive than other digital solutions.
- Time-to-market. If customers must wait several months to obtain sufficient operator coverage, they may choose another solution or give up the use case. The risk is that the market develops around alternative solutions before Network APIs are fully available at scale.
- Willingness to pay. Customers will only pay if an API delivers a clear and measurable benefit. This value is currently easier to show for APIs such as SIM Swap and Number Verification than for some QoD or connectivity APIs.
- Business case uncertainty: for many advanced APIs (e.g., QoD, Network Slice Booking), the revenue potential remains uncertain, and the investment required to deliver commercial grade reliability is substantial.

Question 8: Regulatory challenges

GSMA identifies the following regulatory considerations:

- **Data Protection and End-user consent:** many Network APIs process personal data (location, device identifiers, behavioral signals). The applicable legal bases and consent mechanisms under GDPR must be clearly understood and consistently applied across member states. Regulatory divergence in GDPR interpretation across EU jurisdictions, coupled with differing national approaches and implementation of the ePrivacy Directive adds complexity for pan-European API deployment. Additionally, as mentioned in the Introduction, the ePrivacy Directive significantly restricts operators from analysing traffic the Data protection is currently a major source of fragmentation. Operators and national authorities may take different views on the legal basis, consent requirements, proof of consent, and the responsibilities of each party. This makes it difficult to offer the same API service across operators and Member States. BEREC could support discussions with the relevant data protection authorities to promote a more consistent operational approach, while respecting their respective responsibilities. A more consistent, cross-border application of data-protection requirements would also serve the single-market objectives, and GSMA sees value in BEREC acting as a facilitator between the telecoms and data-protection communities.
- **OIR / Net Neutrality:** While Specialised Services under Article 3(5) of Regulation (EU) 2015/2120 provide a basis for offering enhanced quality services, regulatory clarity is needed particularly in the context of the Digital Networks Act (DNA), (proposed by the European Commission on 21 January 2026 and currently under negotiation by the co-legislators) which is expected to review and clarify the treatment of specialised/innovative services under the Open Internet framework to ensure that QoD and similar APIs can be offered lawfully and without undue legal uncertainty. Some Network APIs, in particular QoD and Network Slice booking, may raise questions under the OIR, depending on the specific characteristics of the service. The GSMA supports a clear business-to-business (B2B) carve-out for services, which would help remove unnecessary uncertainty for many QoD-related use cases. Their assessment under Article 3(5) should be technology-neutral and take account of how each service works in practice. Greater clarity and consistent application of the existing rules would help



reduce legal uncertainty. However, the OIR should not be presented as the main obstacle to the development of Network APIs more generally.

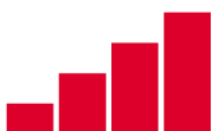
- **Wholesale access and non-discrimination:** GSMA considers that Network APIs are commercially negotiated services offered in a nascent, competitive and rapidly evolving market, and should not be treated as a new category of regulated wholesale access. There is no evidence of a market failure that would justify ex ante access, pricing or non-discrimination obligations at this stage. On the contrary, imposing such obligations prematurely would undermine the commercial incentives that operators need in order to invest in and open up their networks, and would run counter to the deregulatory, investment-oriented and pro-competitiveness objectives of the DNA. Should any concern arise in the future, it should be addressed on the basis of clear evidence and, where appropriate, through general competition law rather than through sector-specific ex ante regulation.
- **Data Act:** BEREC's work programme 2026 also references the Data Act implementation (section 2.1). GSMA notes potential intersections between the Data Act framework and Network API data governance, particularly regarding access to data generated through API interactions.
- **Level playing field vis-à-vis large digital players:** as noted under Questions 1 and 3, cloud providers and other large digital platforms are becoming major distribution channels for Network APIs. GSMA invites BEREC to remain attentive to the relative bargaining position of operators vis-à-vis these players, and to ensure that the emerging Network API market develops on a fair and balanced basis, consistent with the level-playing-field objectives pursued in the context of the DNA. This is an area where the risk to a well-functioning market lies in imbalances between operators and very large platforms, rather than in the conduct of operators themselves.
- **Gatekeeper Behavior:** operating systems have evolved to enable end-user devices to connect to network slices. As a result, certain network APIs, such as QoD, could use slicing to deliver content to devices over slices with specific quality parameters. At present, however, operating systems retain control over how applications are assigned to predefined "categories" and how those categories are mapped to different network slices. Operators are also not yet able to access application identifiers at the operating-system level, which currently limits their ability to offer network slicing-based services. BEREC should continue to monitor developments in this part of the market and consider how regulatory measures, such as the Digital Markets Act, could support network operators in developing and offering network APIs.

Question 9: Interoperability across operators and vendors in Europe

GSMA members' experience across its operating markets highlights that interoperability remains a work in progress, even among operators nominally supporting the same CAMARA API specifications.

Key observations include:

- **Vendor implementation divergence:** the same CAMARA API specification may be implemented differently by different network equipment vendors (e.g., differences in error handling, authentication flows, notification mechanisms), resulting in inconsistent



developer experiences. This is particularly pronounced for APIs that depend on core network functions (NEF/SCEF) where vendor-specific optimisations are common.

- Authentication inconsistencies: CAMARA is standardising on OIDC/OAuth 2.0 flows for API authentication, but the specific implementation of device-level authentication (e.g., CIBA: Client Initiated Backchannel Authentication) varies across operators and networks, creating integration friction.
- Geographic coverage gaps: even within a single operator group, API availability may vary significantly between national markets due to differing network infrastructure maturity, regulatory contexts, and commercial priorities.
- Sector-specific differences: interoperability challenges are most acute for APIs that require deep integration with the 5G core (e.g., Network Slice Booking, Optimal Edge Discovery), as opposed to more mature APIs such as SIM Swap or Number Verification, which are simpler to implement consistently.

GSMA supports BEREC's interest in this area without necessarily resorting to regulatory mandates at this stage of market development.

Conclusion

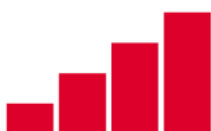
GSMA considers the BEREC Call for Inputs on Network APIs to be a timely and well-framed initiative. The Network API ecosystem holds significant potential for European digital competitiveness, innovation, and the achievement of Digital Single Market objectives. GSMA encourages BEREC to adopt a market-facilitative approach supporting standardisation, developer adoption, and regulatory certainty while remaining attentive to the investment dynamics and commercial incentives that underpin operator participation in the Open API ecosystem.

Open standards have created the technical foundation. The next priority is to turn them into accessible, reliable, and genuinely multi-operator services. BEREC can support this emerging market by reducing legal and operational uncertainty, while preserving operators' ability to invest and test different commercial models.

GSMA remains available to provide further information or to participate in workshops or bilateral exchanges with BEREC in the context of this initiative.

About the GSMA

The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.





GSMA Open Gateway

GSMA Open Gateway is a global framework of common network APIs that simplifies access to mobile operator networks and helps expose core capabilities of the open network to developers and cloud providers. For more information, see [here](#).

