ANALYST REPORT

The connectivity revolution is upon us but how should connectivity leaders approach the market?

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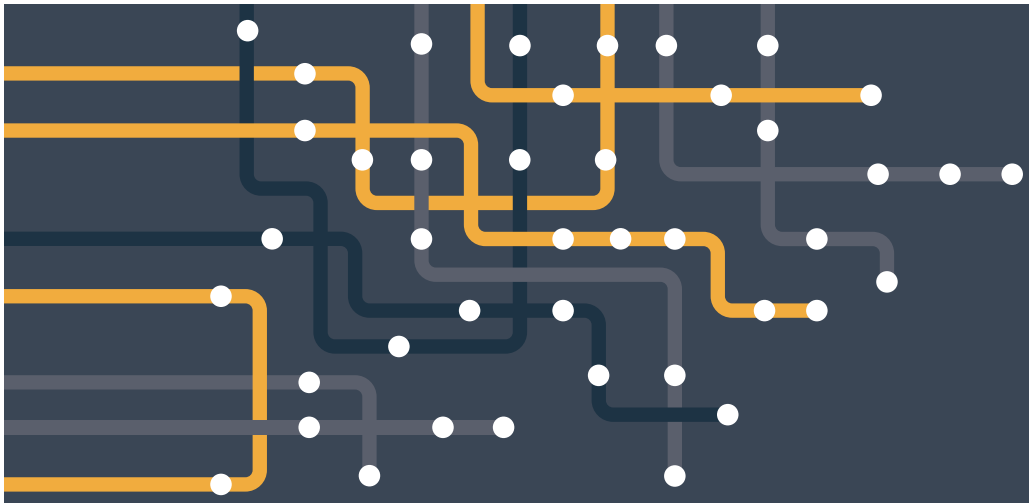


The connectivity revolution is upon us but how should connectivity leaders approach the market?

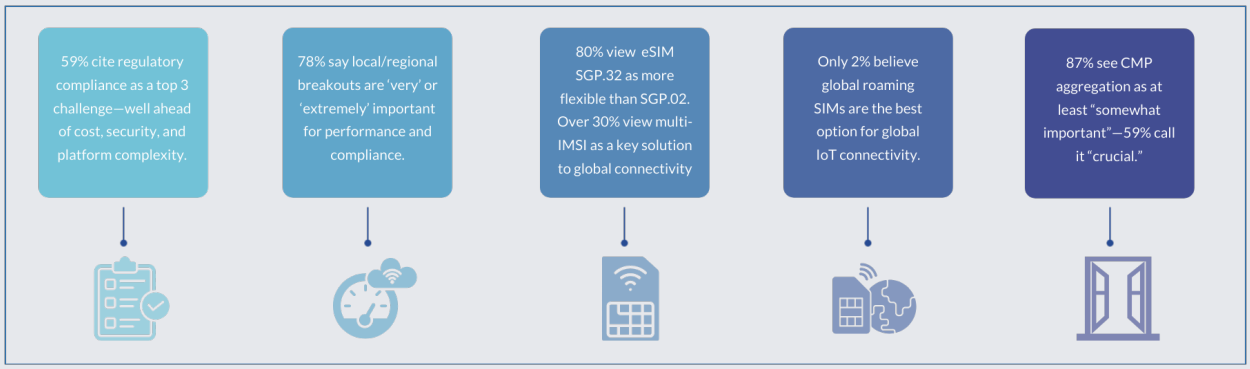
In Kaleido's recent H2 2025 survey, sponsored by floLIVE, of over 200 mobile network operators (MNOs) and connectivity service providers, it is evident that survey respondents are facing significant challenges in how to approach the market to deliver solutions to customers that need multi-regional if not global coverage while also remaining compliant, while at the same time ensuring a seamless, secure and reliable service

What do end customers require?

- **Solutions that mitigate risks associated with traditional roaming connectivity.** In this context, data sovereignty is important, as some markets require specific handling of IoT device data. Meanwhile, some markets prohibit permanent roaming at a regulatory level (such as Turkey) or on a wholesale agreement level (such as Australia). In an H2 2024 survey of enterprises and OEMs conducted by Kaleido, these issues were cited among the top five key concerns among respondents.
- **Performance needs are diverse and customers need solutions to be able to adapt to these.** High latency or low throughput capabilities, commonly associated with traditional roaming architectures, are not suited to a significant portion of IoT applications. Only 14% of survey respondents see roaming as applicable to more than 70% of use cases from a performance standpoint.
- **Global coverage is desirable, in a manner that is both seamless and reliable.** Survey respondents view this as the second most pressing challenge related to connectivity today.

Achieving this requires a very high level of flexibility on the part of the service provider. The ability to meet today's regulatory and customer requirements is not possible through a pure reliance on roaming agreements, which means that strategies must be adapted to remain competitive. ▶

Key survey results: summary



Source; Kaleido H2 2025 survey of 211 MNOs and Connectivity Service Providers

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What did we learn from the survey?

Global coverage is viewed as a key challenge by nearly half of all connectivity service providers. IoT has long been an internationally-focused market, with over half of all enterprise and OEM cellular IoT connections reported (in the aforementioned H2 2024 survey conducted by Kaleido) to require international connectivity support. For end customers, the need to scale IoT programmes globally has often required engaging with multiple service providers, which in turn realises complexity in terms of platform capabilities, service agreements and billing as well as diverse touchpoints and processes.

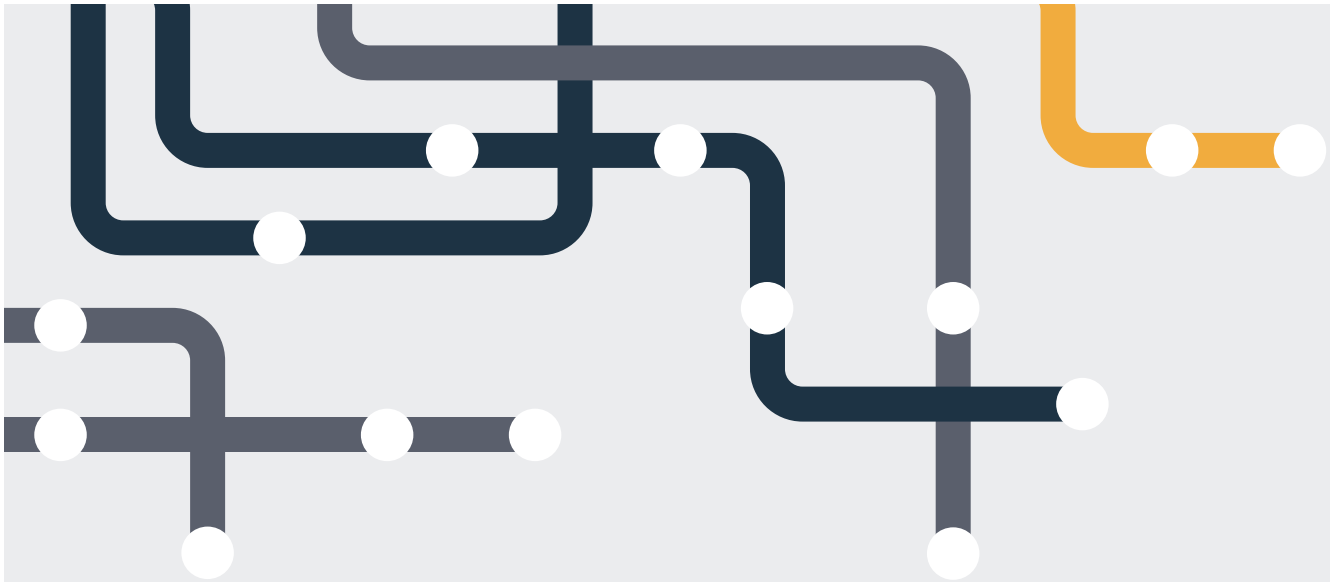
Infrastructure expansion and programmable SIM technology are core strategies

Today, SIM technology to remotely administer network access capabilities is available in the form of multiple international mobile subscriber identities (multi-IMSI) and embedded SIM (eSIM), which allow dynamic configuration of credentials over-the-air (OTA). The commercial release of eSIM's SGP.32 (IoT specification) during the latter portion of 2025 promises to add enhanced flexibility in how connectivity is provisioned and administered OTA by utilising the relative technical simplicity of the SGP.22 (the consumer specification) and combining it with the remote management paradigm that was utilised for SGP.02 (the M2M specification) eSIMs.

Here, nearly 80% of survey respondents view SGP.32 as more flexible than SGP.02 and, importantly, 61% believe the new specification will see coverage options for customers improve. Historically, support for SGP.02 among MNOs was roughly one-third that of SGP.22, which reduced the number of eSIM-based connectivity options for customers and made the technology difficult to scale. Connectivity service provider onboarding for SGP.32 is now much simpler than previously, while existing investments into SGP.22 can be used for SGP.32 use cases, reducing any perceived risk in ecosystem participation. We can thus infer that coverage options, from the standpoint of which network accesses will be available via eSIM, will indeed be greatly improved as the new eSIM specification matures on the market.

eSIM is not necessarily a panacea for the market, however. The technology will continue to generate friction in terms of elevated pricing versus legacy universal integrated circuit cards (UICCs), which is unavoidable due to the hardware. Meanwhile, an OEM selecting connectivity from a larger pool of providers than was previously possible means managing connectivity across multiple platforms. As ever, the market is shifting to reduce customer complexity in this regard, which will be explored shortly.

Ultimately, the loss of the business relationship with the customer is naturally a key concern for MNOs and connectivity service providers. Indeed, this is why the ability to extend coverage and meet compliance requirements in response to customer demand is so ▶



important. It is certainly the case that MNOs and service providers view connectivity break-outs, as well as multi-IMSI, as viable alternatives.

For example, 78% of the survey audience view local or regional break-outs as either very or extremely important to their organisation. The need for this type of infrastructure ties heavily into the increasing maturity of IoT projects. On the one hand, break-outs can aid in data sovereignty compliance by ensuring that payload traffic is routed within a specific country or region, rather than to the home network and back, as is the case in traditional roaming architectures. Meanwhile, the notion of breaking traffic out closer to the device offers obvious latency benefits compared to home-routed roaming, and means that more demanding IoT applications can be supported with the connectivity remaining as a first-party offering from the MNO. Thus, it is not surprising to see that more MNOs place a slightly higher importance on break-outs than non-MNO counterparts.

Around one-third of survey participants stated that multi-IMSI is an important technology to help achieve global coverage, with a surprising number of MNO respondents in favour of the technology. Traditionally eschewed by MNOs as a connectivity mechanism, the increasing acceptance of multi-IMSI among this cohort highlights how traditional walled-garden approaches are being eroded. Once again, customer relationship retention plays an important role here: the rise in shared infrastructure resources from telecoms service providers offering seamless access to off-footprint network resources, while allowing the primary serving operator to retain the billing relationship with the customer has been instrumental in this shift.

Rather than the static dual-IMSI approaches that might have been used in the past, access to a multitude of potentially accessible IMSI ranges means that OTA offers a rather dynamic solution to the connectivity problem. The proprietary nature of the technology in addition to the fact that some countries demand a fully-local solution, does mean that, in most cases, it is more appropriate to combine multi-IMSI with local break-out or eSIM to deliver compliance, better performance and flexibility.

No one-size-fits-all solution to optimising the deployment

The survey underlines the fact that several choices exist on the market today to deliver connectivity that is positioned to meet increasingly complex and stringent demands across various customer and regulatory environments. Perhaps what is less clear – although not surprisingly in the world of IoT – is that there is no one-size-fits-all solution for connectivity.

Local or regional break-outs are deployed as an extension of the serving operator's own network infrastructure and in most cases will use that operator's own network access agreements to support a global roaming initiative. Extending the network infrastructure footprint is no simple matter and requires a strong focus towards IoT if an in-house route is taken or a partnership with an appropriate third-party network-as-a-service provider. Meanwhile, 'roaming' is key here: while compliance may be achieved from a data sovereignty standpoint, markets that prohibit permanent roaming from a regulatory or commercial standpoint mean that static IoT devices cannot be deployed using a combined roaming-only and break-out model. Localisation in some fashion thus becomes an important consideration.

Multi-IMSI technology can serve as a mechanism for localised connectivity if appropriate ranges are available to the connectivity provider. This requires that the serving operator has made the necessary commercial agreements and technical integrations to access IMSIs, either via their own infrastructure or via a shared infrastructure concept provided by a third party. Nevertheless, multi-IMSI is not always compliant with local regulations, while it is not an industry-standard solution to connectivity.

eSIM offers a fully-compliant route to global connectivity, particularly when combined with multi-IMSI. By the end ▶

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of 2025, commercial solutions will be on the market that greatly reduce the technical complexity associated with eSIM deployments for IoT use cases thus far, although in practice, eSIM retains a relatively high level of friction that will require innovative solutions to simplify. Most importantly, where eSIM from various providers is selected as the route to global connectivity, the multi-vendor sourcing challenges outlined at the beginning of this article rear their head once again.

Managed alone, a complex scenario of platform integrations and workflow processes arises which ultimately mean that scaling is extremely challenging. It is therefore not surprising to see a rising trend in the market for connectivity aggregation solutions, which allow customers to manage connectivity across a multitude of disparate management platforms via a single-pane-of-glass interface. Notably, 87% of survey respondents see this concept as at least somewhat important, while 59% view it as crucial.

As ever, maintaining a direct relationship with the end customer is of primary importance here, with billing and invoicing via a single point in addition to typical connectivity management and orchestration capabilities. It should be noted, however, given the various differences between connectivity management platform interfaces and capabilities, single-pane-of-glass aggregation solutions will support common denominators across integrated platforms, with more complicated functionality requiring direct access to the platform.

Each of the approaches discussed in this report are viewed as valuable according to Kaleido's survey results, with benefits and drawbacks dependent on the needs of both the end customer and the service provider. It is thus evident that ultimate flexibility is realised through a combination of these solutions. Indeed, a combination of local and regional break-outs alongside a combined multi-IMSI and eSIM solution delivers optimisation in terms of performance as well as compliance. While this approach may not always enable end-to-end delivery of connectivity via a serving operator, an important factor – the customer relationship – is retained. Perhaps most important of all is that new business, as well as ongoing opportunities are not missed as a result of a lack of performance or access capabilities.

About floLIVE

floLIVE designed and developed an elastic, robust core cellular infrastructure that is the largest connectivity infrastructure in the world. Through this powerful infrastructure, the company offers numerous services to mobile operators, IoT MVNOs and global enterprises seeking seamless, compliant, high performance and regulatory compliant connectivity, anywhere in the world.

With a global carrier library that is based on interconnected local core mobile networks, floLIVE ensures low latency, high performance and full compliance with privacy acts, data regulations and roaming restrictions. As of today, more than 20 mobile operators are on board the platform, giving companies multi-tier connectivity access.

Through direct access to our network, customers can monitor their devices, access real-time network events and usage, switch operators remotely, and troubleshoot failures ahead of time, providing a seamless experience that keeps devices connected at all times. Through one integration, one stock-keeping unit (SKU) and one platform, customers have a world of connectivity and endless possibilities. www.flolive.net