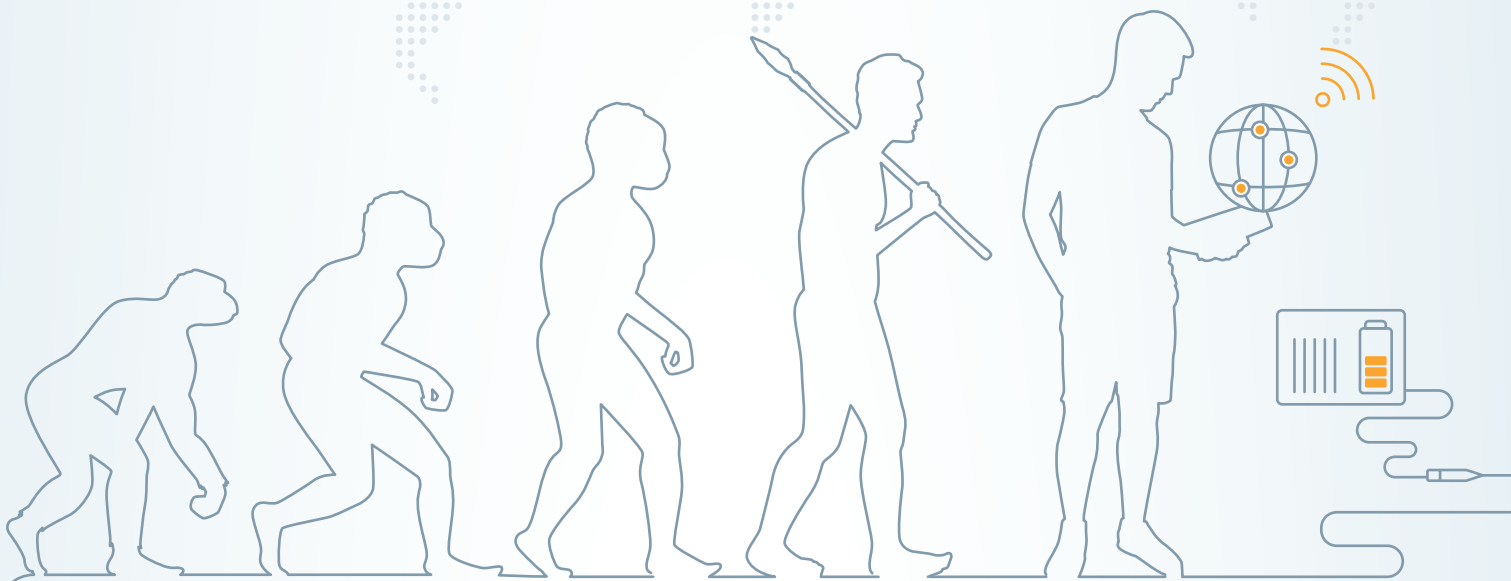




The Evolution of Global Connectivity



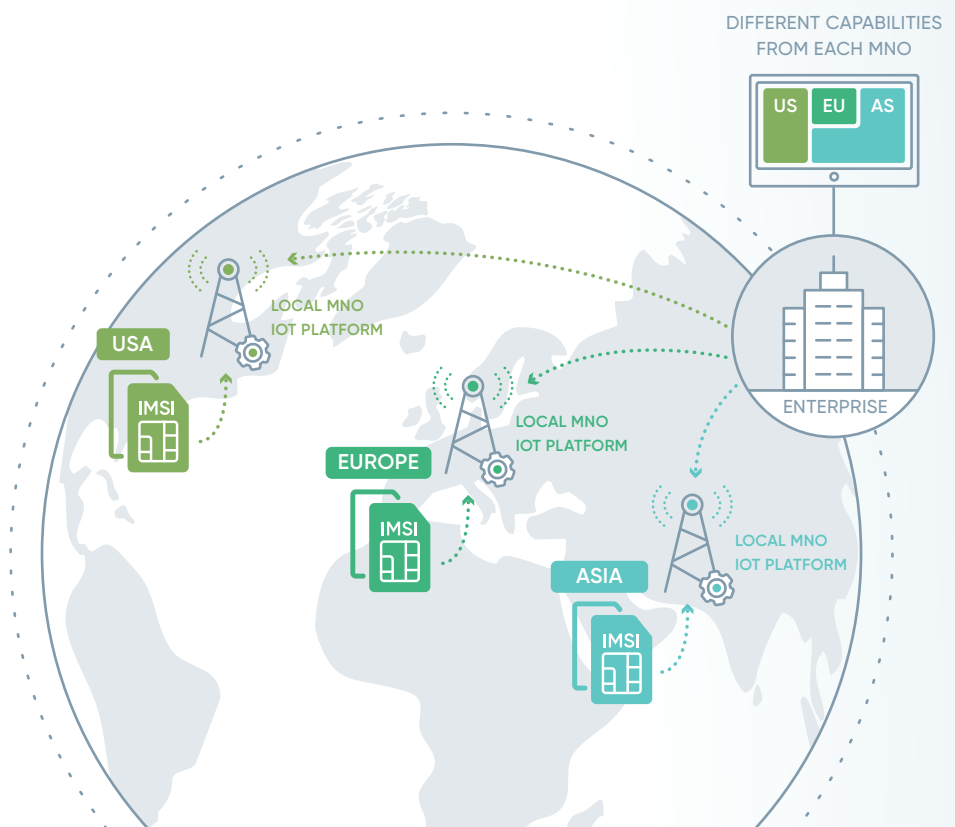
For enterprises entering the IoT industry, global connectivity is essential. But that doesn't make it easy. In fact, 41% of people call connectivity a top challenge when it comes to deploying IoT solutions¹. This white paper will look at the different methods for obtaining global connectivity and the challenges you'll need to address depending on which method you choose.

Local SIM

A local SIM does exactly what it says on the tin. It provides connectivity in a local area, be it a specific country or region. As IoT is a global business, to serve different geographies you'll need a local operator in every country or region. One of the main challenges with local SIM providers is that you are likely to experience coverage gaps. Remember that there is very unlikely to be a single mobile network operator who can cover the whole country, and that you can't roam freely inside the country with a local MNO. That means that where coverage is weak or non-existent, your IoT devices will be unable to connect. This is just the start, considering local coverage and reliability. Next, you also need to think about the logistics of handling a global IoT business, including shipping the SIMs, swapping them out where necessary and other practicalities. And we haven't even mentioned the integrations you will have to complete with each mobile operator in order to get a basic view of your SIMs and how they operate.

Multiple Local SIMs

- Multiple different integrations
- Operator lock-in
- Each profile will have its own view, parameters, actions, states and plans.
- Device manufacturing, shipping and inventory adds logistical overheads.



1. <https://www.iotworldtoday.com/2020/10/07/network-connectivity-paves-way-with-caveats-for-iot-adoption/>

Roaming SIM? Not any more

To overcome the many issues associated with multiple local SIMs, many enterprises have turned to large mobile operators, as the latter have global roaming agreements in many countries.

True, the use of a single, global roaming SIM has solved many of these issues.

However, as the global IoT business world has evolved, cracks have begun to show up for roaming SIMs. Roaming SIMs have many limitations mainly because they were created for mobile subscribers and not for IoT use cases. There are usually permanent roaming restrictions in place that dictate how long a device can roam for before it's service will be shut off by the visiting network. When it comes to IoT devices, a three-six month arrangement just won't cut it.

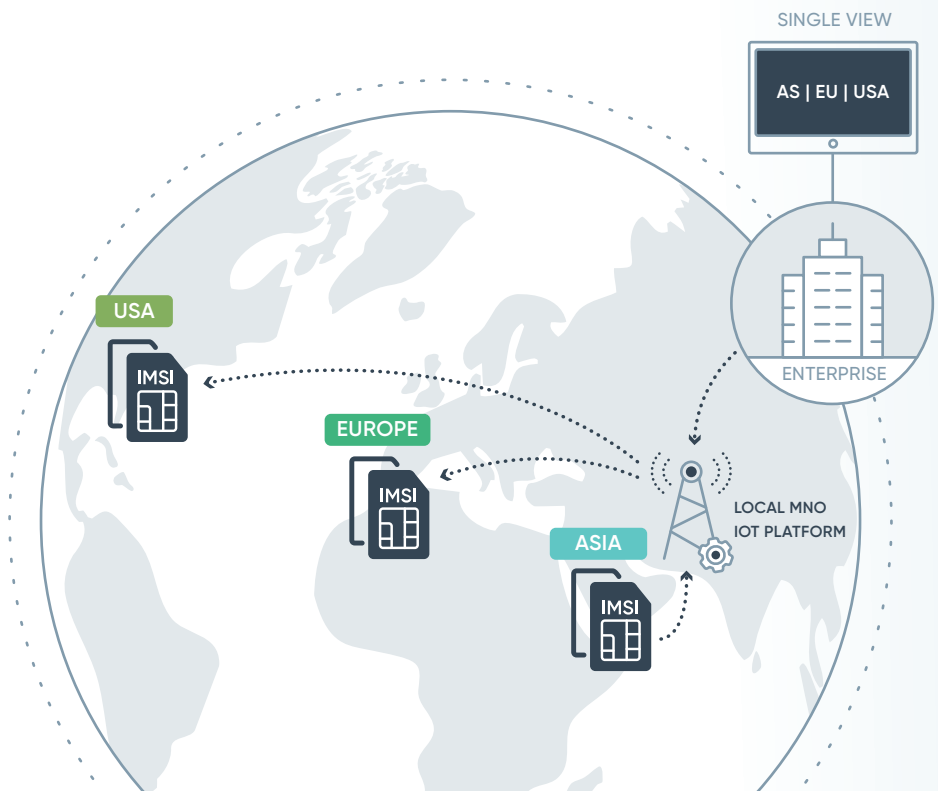
Another issue with a Roaming SIM is the impact on performance, especially latency. As data needs to travel to the home network, it has a negative impact on latency and throughput.

The emerging privacy acts such as GDPR pose another limitation on roaming SIMs as private information leaves the country it was originated in before reaching its destination.

Lastly, LPWAN is not an option for roaming SIMs, due to the inability of the mobile operators to make this happen profitably.

Roaming SIM

- Permanent roaming restrictions
- Operator lock-in
- Data privacy and compliance challenges
- Sub-par performance in terms of throughput and latency



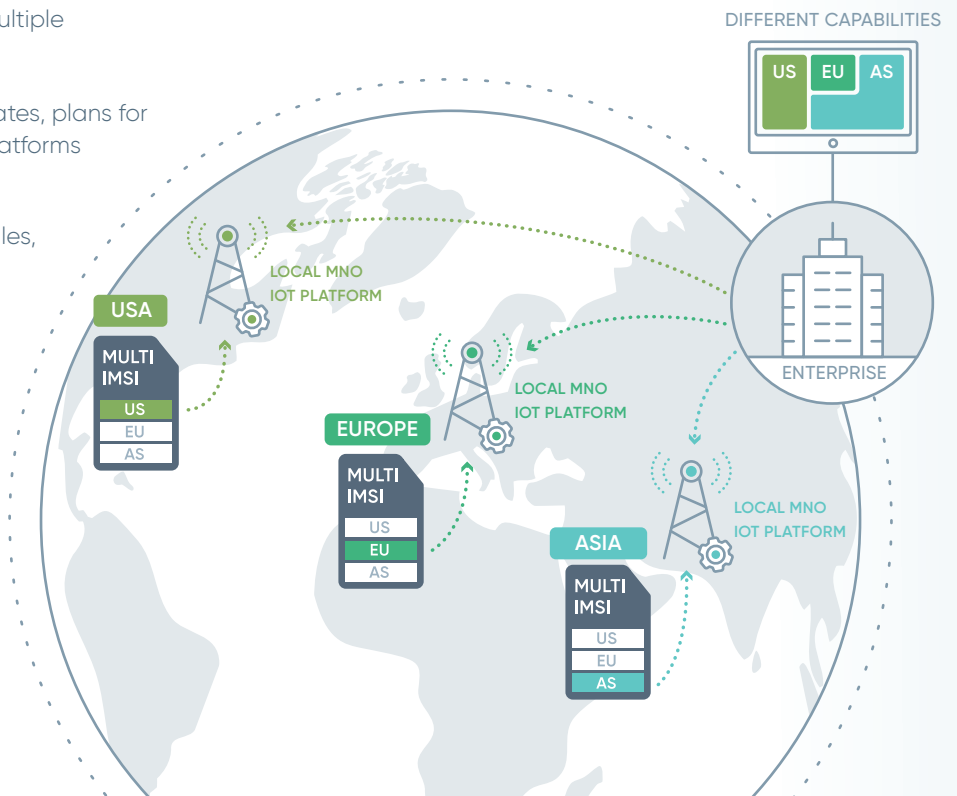
How About SIM Profiles?

Up until recently, "SIM Profiles" were the ultimate solution for obtaining global connectivity, as they offered a virtualized solution to a lot of the challenges associated with local SIMs and roaming SIMs. Here's how it works: a SIM Profile allows multiple IMSI profiles to be stored on a single SIM, allowing multiple operator coverage in a single SIM. This includes the flexibility of switching profiles to achieve optimal pricing and coverage without having to manually remove the SIMs themselves from your devices. Have all our problems gone away? We hate to break it to you, but not really....

As the IMSIs are still being hosted on the MNOs core network, BSS and OSS, all aspects of operation, billing and support are handled by the local MNO who provides the SIM Profile in every country. When managing a global IoT operation, this just isn't enough! Not only are you required to integrate with each and every MNO to receive basic information about your devices, you have simply no control over the device, and you have to rely on the MNO's customer service every time you face an issue with one of your devices. In some cases, such as with Massive IoT, you will have hundreds of thousands of unattended devices deployed in the field, and with this complexity, decent service is not something you can provide to your customers.

SIM Profiles

- Integration with every MNO (multiple integrations)
- Different views, parameters, states, plans for each profile due to different platforms
- If you work via an IoT Service Provider who relies on SIM profiles, you will have:
 - Less flexibility
 - Reduced visibility
 - Lack of control over security and support
 - Negatively impacted Quality of Service.



Today's enterprises need a modern solution built for IoT

Each of these solutions has their own challenges, but the biggest challenge of all might be that they are not suitable for new IoT use cases. In a fast-growing industry, certain requirements are essential, and global connectivity is just step one. Let's look at some of the features that enterprises are demanding from their operators, before signing on the dotted line.



Real-time usage presentation

With the above methods, you have to wait until the end of each month to see what charges you've incurred. You'll get an invoice that says: *here's what your device has used this month in terms of data, including the cost of data in a new location for example, and this is what your bill is for this month.* This either comes from local operators, or arrives once the information has been aggregated from the different MNOs.

In contrast, organizations are recognizing that they need to have control and visibility over the whole technology, from core network to billing, so that they can gain real-time insight into every single device, answering questions such as whether it's in session, what the consumption is, and more. This current, up to date information can be acted upon immediately, for example when you see a spike in behavior from a single device or an entire location, you can automatically put actionable recommendations into place, such as topping up, blocking service, or changing a plan.

Added bonus? You have real-time credit control, shining a light on possible instances of fraud or misuse.



End-to end security enforcement

Go to any of the large Telecom providers in the world and they'll tell you that they have the most secure core network available. They're not wrong! However, what happens when their global roaming SIM roams somewhere outside of their footprint? They simply won't have the same level of visibility and control over what security means in that region by that specific MNO.

End to end security enforcement can only happen when you have control over the whole technology stack. This is a unique capability that isn't included with any of the three options above. If you own the whole stack, you can ensure that your device has the same level of security anywhere it operates.



Innovative features to ensure reliability and availability

Gain control over how flexibly you can use devices for mission-critical use cases. Let's say that you lose connection to one network. Set up policies so that you can autonomously switch to another carrier, and ensure that devices never miss a beat. If there is a problem with one device, or you have security or latency constraints, use this control to choose the network devices connect to for how long, and under what circumstances you switch to a different connection.



Cutting Out the Middleman

All existing global connectivity options, from roaming, to using local providers, or leveraging 'modern' SIM profile-based solutions will include multiple extra stakeholders – the MNOs. Here are just four of the main benefits of sidestepping this extra layer:

Troubleshooting

With the best will in the world, an MNO is not going to give an enterprise the same level of visibility into their core network. When something goes wrong, enterprises will need to pick up the phone, sit on hold and wait to be told what's occurred. In the case of connectivity via roaming SIMs for example, there could be multiple layers of communication needed before you get the answers and resolution that you need.

Ease of Operations

The more MNOs you're dealing with, the more complexity you're adding to your overall solution. Each time you add a new region to your footprint, you're dealing with another MNO and their own service models, SLA, time zone and even language. Managing this complexity is more than just an operational headache, it has a measurable impact on your Total Cost of Ownership. One vendor – one relationship.

Scale

Massive IoT requires the support for millions of devices. If you go to a large operator and ask for 1 million IMSIs, and then another 2 million a few months later, you're going to be met with reluctance, or a seriously lengthy implementation cycle. If you don't own the core network and the SIMs themselves, this is a huge operational feat, and you'll be expected to pay for all of your IMSIs from day one.

Business Models

MNOs typically have to pay licenses to their core network and billing vendors for every registered IMSI that they own, and they will need to pass this cost on to you as an enterprise. If you don't yet know if you're going to make a success of your IoT endeavors, this can be prohibitive. In contrast, a single vendor has the flexibility to charge per active device rather than any registered device. It doesn't make commercial sense for core network vendors to change this status quo, so although a shift might be coming to make IoT lucrative for all, it's slow.



Top questions to ask your connectivity service provider

- Which method do you use to achieve global IoT connectivity?
- Do you provide compliant and permanent local connectivity in the countries I need?
- Do you provide a single bill in a single currency that covers all countries?
- How do you provide visibility into my devices' real-time data consumption and connectivity information?
- What are the terms of your SLA? Do you have a back-to-back agreement with the MNOs?
- What is your proposed business model? Do you charge for devices in transit?
- Do you offer cross-carrier pooled billing plans?
- How do you ensure best-in-class availability?

Make it simple with the **ONLY** truly Global Connectivity Service for IoT

Your global connectivity solution is the very heartbeat of your IoT business, and may be the difference between success and failure. Make no mistake. Roaming SIMs are targeted at mobile phones, and local SIM providers can only cover their footprint. While SIM profiles might go some way to addressing the challenge of global connectivity, they are still dependent on the MNOs core networks, and therefore two steps behind in terms of visibility, security and control.

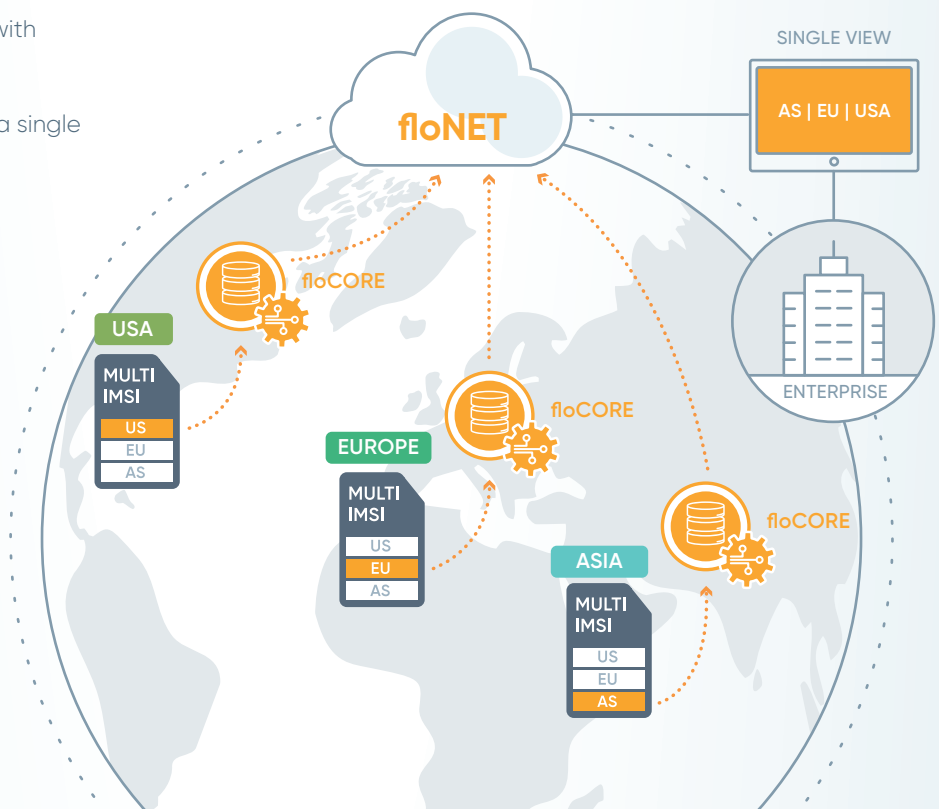
Introducing floNET

At floLIVE, the floNET solution is based on distributed core networks around the globe, allowing devices to connect locally, and switch as needed, all from a single SIM. The reason why floLIVE can offer a much more robust solution for IoT is because we own the whole technology stack. We have our own core network, our own BSS that includes a flexible rating engine, and our own floSIM suite, and we can pass on those benefits of visibility and control to you as an enterprise.

With full access to the entire technology stack, you have all the support, flexibility and control that you need. Think network-level troubleshooting without turning to anyone else for help, flexible business models that you can use to facilitate IoT projects anywhere, scaling to as large a customer need as necessary without added costs, and full, real-time visibility and control over a global IoT landscape.

floNET (local core networks)

- **One SKU:** A single integration with floNET, cover the world.
- **One View:** One provider gives a single view of all your deployments.
- **One level of performance:** 5* security and service, with low latency and high throughput. Optional local breakouts optimize performance.
- **One governance strategy:** Local connectivity everywhere beats data privacy and compliance issues.



Ready to talk about floNET, and how we can enable your IoT journey?

Let's schedule a call.

floLIVE offers advanced 5G network solutions and a full suite of global cellular connectivity services for IoT use cases. We're disrupting traditional networks and IoT solutions, and getting IoT up and running faster, more flexibly, and with more control. The platform comprises local core networks that provide local connectivity while being centrally managed and controlled over the cloud. This unique approach enables enterprises to benefit from high performance, secure and regulatory-compliant local connectivity on a global scale with all the flexibility and elasticity of a cloud-native platform.

floLIVE's solutions are offered as-a-service and support a pay-as-you-grow business model.



Let's connect

Get in touch to discuss how we can meet your IoT requirements. We're sure to surprise you.

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