

Solving the Revenue Challenges of 5G SA Roaming

Operators have an opportunity to boost revenue, reduce costs and retain customers by leveraging 5G SA roaming. However, there are challenges that MNO's need to address.

Monetisation worries, deployment costs and multi-generation network concerns present significant obstacles for mobile network operators (MNOs). The arrival of 5G standalone (SA) creates further complexity.

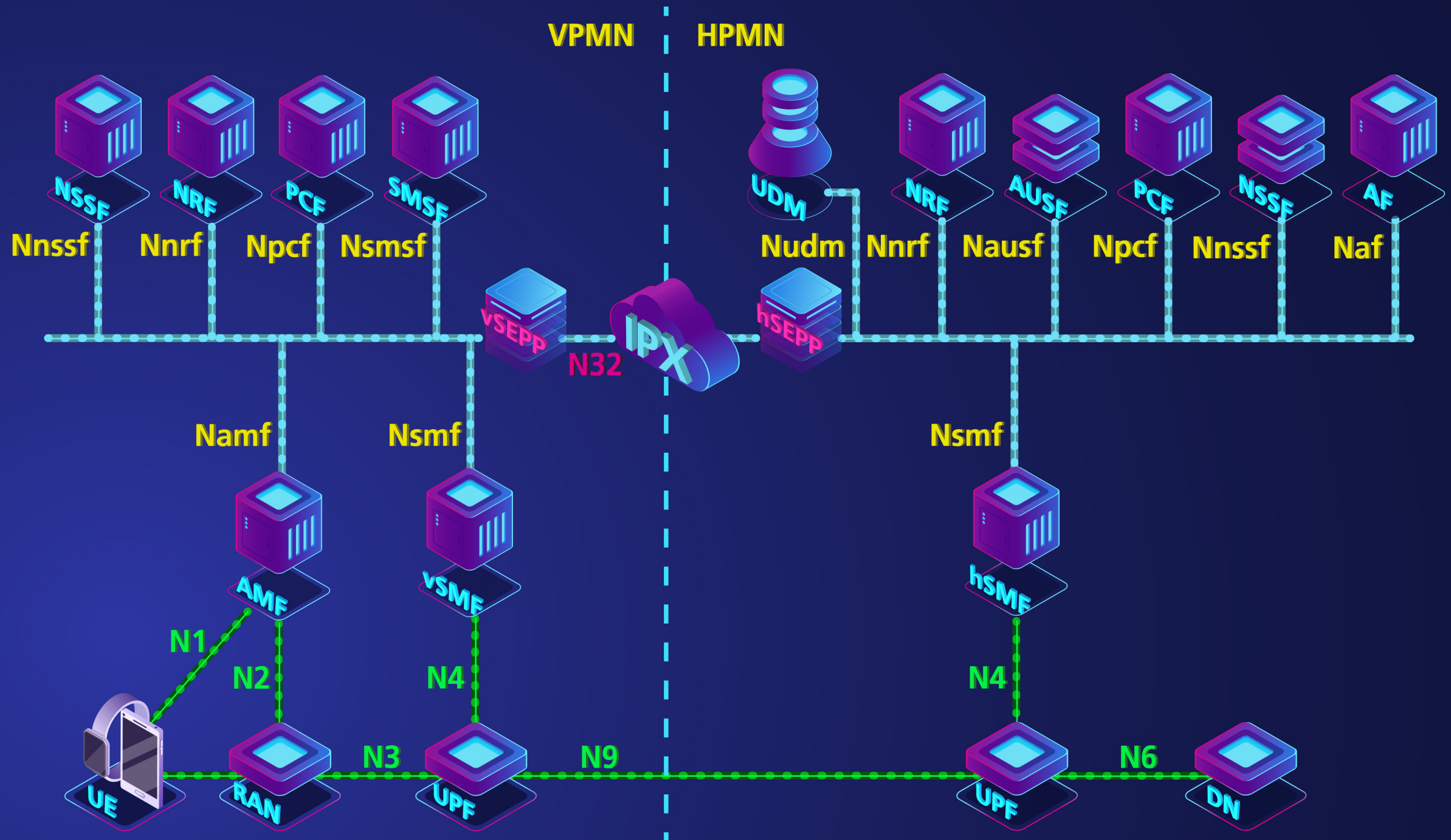
To protect their investments from market turbulence and other factors, MNOs need flexibility built into their networks. Doing so will enable easier deployment of new revenue-generating offers, efficiency savings and future-ready functionality.

Flexible 5G SA roaming components

For 5G SA roaming to work, MNOs will need:

- An [HTTP/2 Signalling Controller \(HSC\)](#) with:
 - » [Security Edge Protection Proxy \(SEPP\)](#)
 - » [Service Communication Proxy \(SCP\)](#)
 - » [5G Interworking Function \(IWF\)](#)
- A [Binding Support Function \(BSF\)](#)
- A [VoLTE network fallback solution](#)





5G roaming architecture

With 5G SA roaming, operators will manage 5G HTTP/2 protocol signalling via an HSC, routing with an SCP, and securing communications using Transport Layer Security via SEPPs. Unlike 4G, 5G is secure by design. SEPP's encrypt communications across a 5G core, limiting identity spoofing, information manipulation, snooping, and even minimising signalling storm damage.

The BSF links sessions together across the network. It correlates Diameter and HTTP/2 sessions and enables Policy Control and Charging Function scaling. A network needs a BSF as soon as it has more than one Policy Control Function (PCF) and a Voice over NR or AF/NEF use case.

Naturally, MNOs must establish new roaming agreements with other 5G SA carriers. Additionally, VoLTE is a prerequisite for deploying a 5G SA core, as 5G SA cannot use a Circuit Switched Fallback of 2G/3G systems.

All these criteria make 5G SA roaming a significant investment for any operator. However, it might be a necessary investment.

Why is 5G roaming critical for operators?

Highly competitive markets, thin margins and 5G monetisation issues are challenging for operators. Simultaneously, governments and industries are looking to telcos to deliver the communications infrastructure necessary for Industry 4.0.

Additionally, good-quality connectivity is a high priority for customers. Up to 20% of roaming customers will change networks or use a local SIM card to ensure they have a good quality connection. Research from [OpenSignal](#) also shows that roamers will spend disproportionately longer on WiFi than local citizens in their search for better connectivity than their mobile service.

There are also financial incentives for operators to implement 5G roaming facilities. The market for [5G roaming is expected to boom](#). [Juniper Research](#) anticipates 5G roaming connections to jump from 53 million in 2023 to 526 million by 2027.

Standing in the way of grasping these opportunities are two overarching challenges that mobile network operators face. The first concerns revenue. The second concerns the complexity of legacy networks.



Revenue challenges of 5G SA roaming

There are substantial revenue challenges for mobile network operators to deal with, beyond the cost of deploying 5G SA roaming.

MNOs that don't integrate 5G roaming into their existing networks, will:

- Fail to retain subscribers if the moment they step out of their home networks their service no longer works.
- Lose revenue if they're unable to successfully charge prepaid subscribers dynamically credit-checked over legacy protocols.
- Find it hard to maintain existing price points as customers will increasingly expect 5G SA roaming to be standard with their contracts. Already this is an issue for operators who don't offer 5G subscriptions.

- Lose subscribers unless they can seamlessly roll out new services that work as they roam outside of their home network.
- Existing multi-generation networks also pose a significant challenge for MNOs.



Network complexity challenges of 5G SA roaming

Though operators are turning off 2G/3G, it's wise not to do so before 5G is deployed in their network. Otherwise, in nations without full 4G coverage, subscribers face a loss of connectivity. As such, many operators face the complication of having to interop several protocols.

Added to the complexity of multi-generation network interop is the versatility and functionality of 5G. Massive IoT, AI and network slicing are just some of the ways that 5G will diversify mobile networks creating evermore convoluted systems.

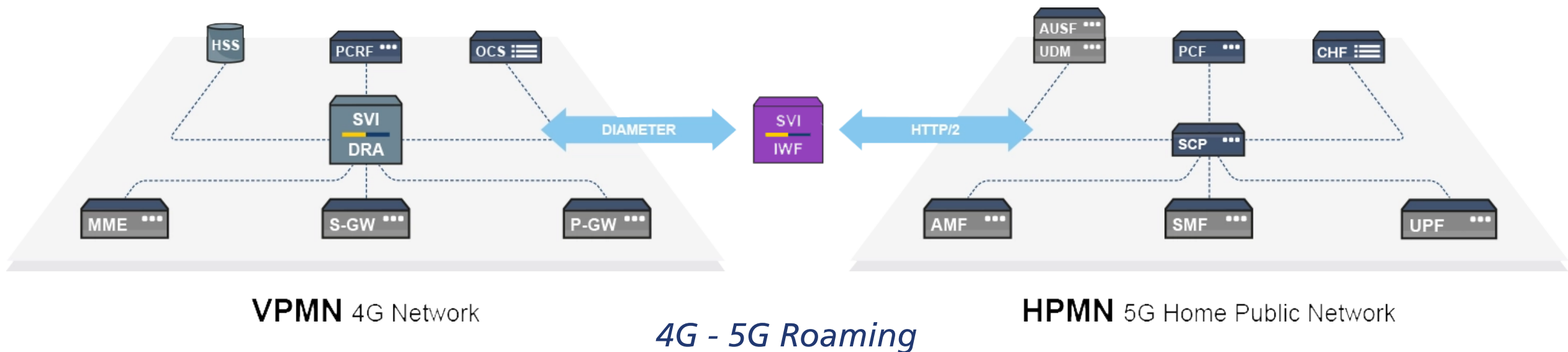
Save money by reusing existing infrastructure

The existing products and functions of 3G and 4G networks, like welcome messages and billing, can still be used on 5G networks. So, MNO's and MVNO's can generate 5G roaming revenue without large new investments.

This is possible thanks to Squire Technologies' HTTP/2 Interworking function (IWF).

In the case of iMobility, an MVNO specialising in telecoms service provision, customers are able to break into the 5G services market by reselling 5G Roaming SIM's, even if they have a legacy Online Charging System (OCS) that uses SS7 or Radius protocol.

Squire Technologies' IWF integrated iMobility's 5G Charging Function (CHF) with the legacy protocols of its customers' OCS's allowing billing to continue despite the legacy infrastructure challenges.



The flexibility solution

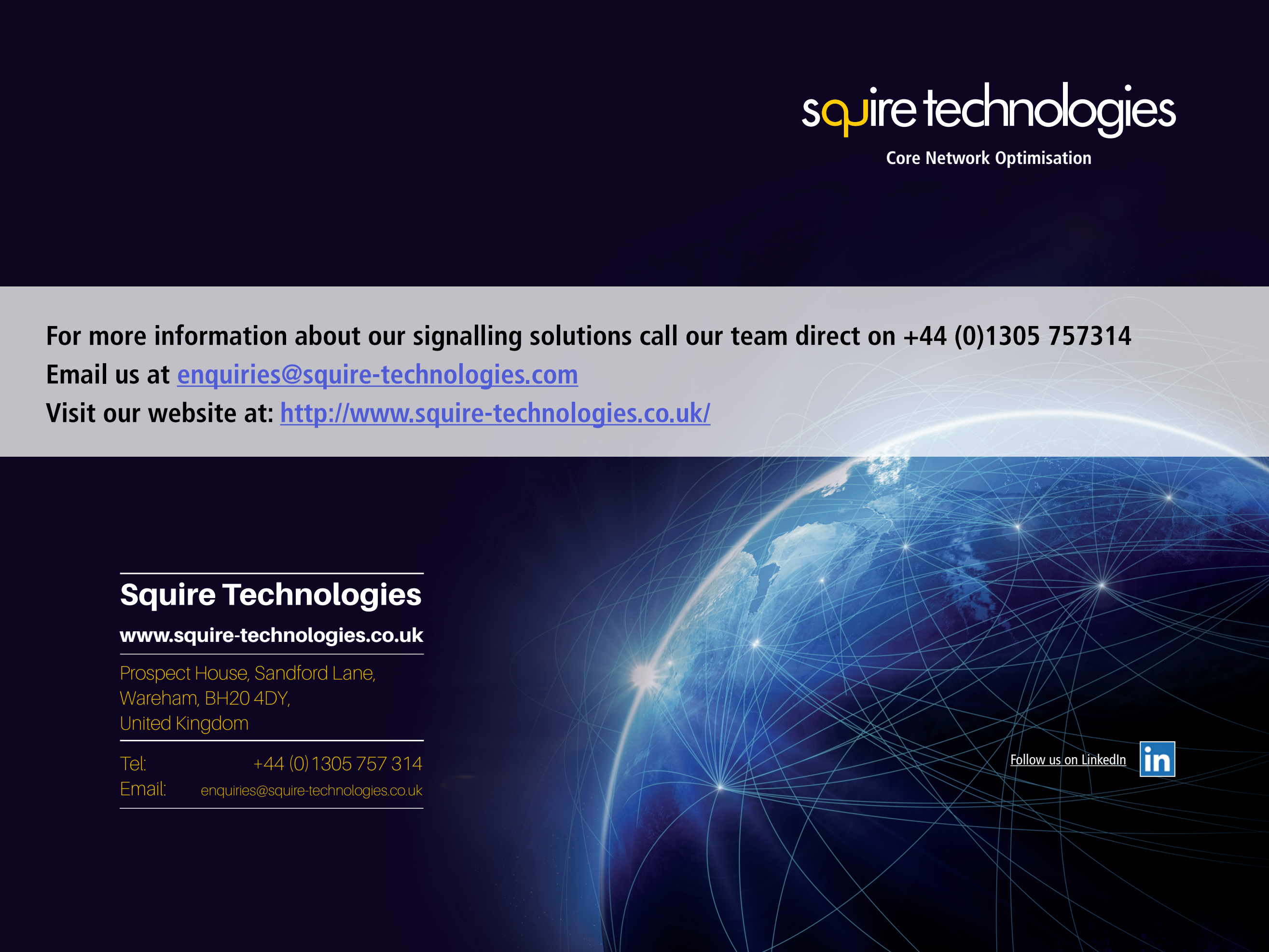
Operators need flexible, future-ready networks that can adapt to market changes.

At the heart of the problem is that a bridge is needed between SS7 and Diameter protocols of 2G/3G/4G LTE networks and the HTTP/2 protocol of 5G. Bridging the protocols will enable seamless sharing of policy, charging and authentication information while allowing easy integration of future network components.

The industry has developed a set of standard [HTTP/2 signalling-based network products](#). Included in this product set is the [5G SVI-IWF \(HTTP/2 Interworking Function\)](#), a sub-component of the HTTP/2 Signalling Controller.

The 5G SVI-IWF provides 3GPP specified HTTP/2 to SS7 CAMEL, MAP, and Diameter interworking. So, you can leverage 5G SA roaming and other new revenue streams while extending network functionality and lifespan.



The background of the slide features a stylized image of the Earth from space, with a network of glowing blue lines and nodes overlaid, representing global connectivity and network technology.

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Core Network Optimisation

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