squire technologies

Whitepaper

Managing Multi-Generation Network Transformations

How to optimise VoLTE networks to interwork with 5G SA and 5G NSA

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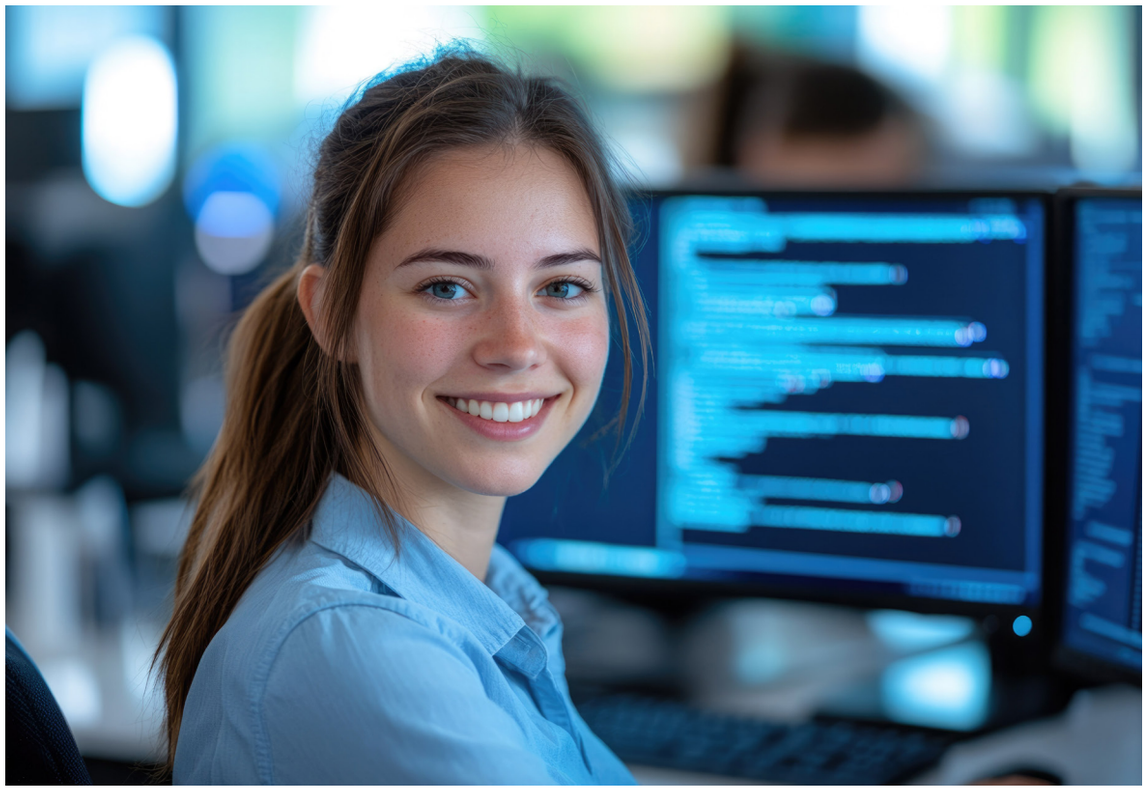
Introduction

The complexity of networks and the need to leverage technologies, such as standalone and non-standalone 5G (5G SA/5G NSA), make the effectiveness of network transformations a priority.

Network transformations can be daunting, and multi-generation networks with customised features can hamper integrations.

Standard solutions are no longer enough for communications service providers (CSPs) to guarantee cost savings, competitiveness, and maximum revenue.

Generic vendors vs focused vendors

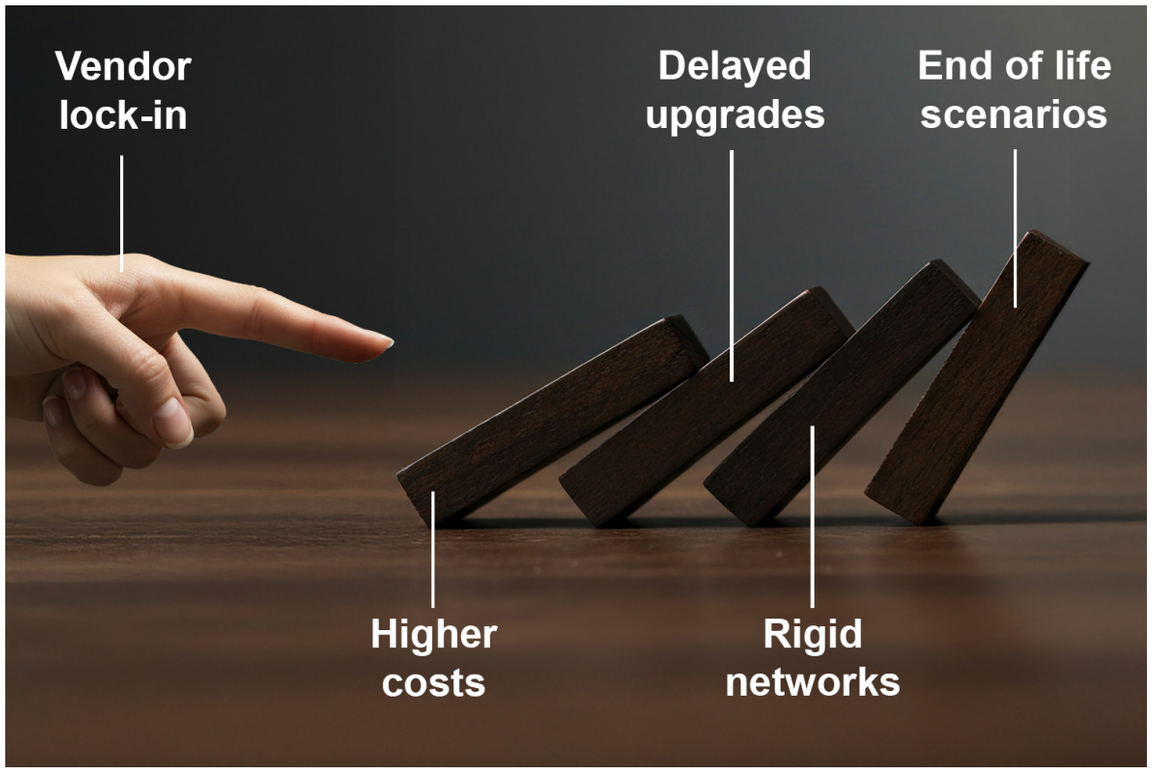


“Generic Vendors” like Huawei, Nokia, and Ericsson provide everything from user equipment (mobile devices) to radio equipment (Radio Access Network nodes) to core network elements. While they become a single shop for all network needs, they compromise on specialisation, which is crucial in specific parts of a network.

“Focussed Vendors”, on the other hand, are vendors that are specialists in specific network functions. They are highly beneficial for network elements that need more flexibility and richer features. For example, elements required for roaming/signalling interconnects (signalling hubs), voice interconnects (Session Border Controllers), and messaging interconnects (Short Message Service Controllers).

The problem of generic vendor network transformations

Generic vendor solution bundles create lock-in, putting operators at the mercy of their chosen solutions provider. It becomes expensive to respond to market demands, and can force operators to delay network investments, risking end-of-life scenarios.



These generic vendors will exploit new legislation and regulations, knowing operators must pay their high prices or risk fines. Combined with the encroachment of over-the-top service providers, MNOs' profit margins have diminished for years.

The restrictive contracts attributed to vendor lock-in can cause:

- Rigid networks
- Higher costs
- Limited innovation
- Delayed upgrades
- Declining products/services
- End-of-life scenarios

To create growth, operator networks need to adopt multi-vendor frameworks that:

- save money
- improve competitiveness
- enable faster market and regulatory responses
- integrate new technologies faster.

The challenges of complex multi-generation networks

Mobile network operators (MNOs) must manage networks with diverse configurations. Network configurations could include 3G, 4G and 5G components, and fixed, virtual, cloud and hybrid elements. Operations are threatened with further complications from AI and blockchain innovations.

As operators add more network capabilities, complexity grows and may lead to:

- Congestion
- Cyberattacks
- Interop failures

These issues result in revenue loss, subscriber erosion, and escalating costs. Solutions are required that go beyond simple features and address these wider ecosystem problems.

As more operators seek to optimise VoLTE networks to leverage 5G SA and 5G NSA, the need for the latest Diameter signalling solutions is crucial.

Utilising a DSC for seamless multi-generation network transformations

Continuous security, call quality, charging, and avoiding dropped calls are essential elements for successful network transformation. To achieve this, operators with complex networks can utilise Diameter Signalling Controllers (DSCs) to manage and secure data flows.

The DSC centralises routing to reduce complexity, enabling better control and management of a Diameter network. Additionally, it makes it easier to secure, manipulate and migrate data during network transformations.

The DSC combines a Diameter Routing Agent (DRA), a Diameter Edge Agent (DEA) and an Interworking Function (IWF). Together, they greatly enhance networks, making them more secure, efficient and versatile.

The Case of Vodafone

Vodafone, a leading global operator, deployed Squire Technologies' advanced DSC to solve a roaming issue and achieve a seamless network migration, replacing a generic vendor's legacy solution.

Throughout the project, clients were accurately charged, and client data was correctly managed. The project solved their roaming problem, enhanced coverage, broke them out of vendor lock-in, made their network future-ready, and maintained subscriber integrity.

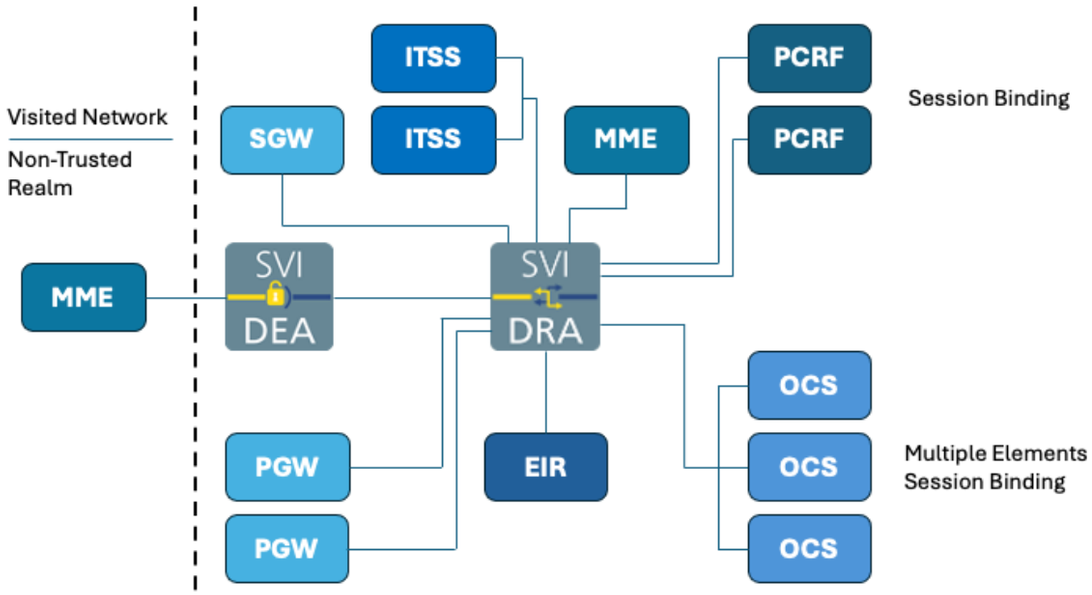
Utilising a DSC for seamless multi-generation network transformations (cont)

Squire Technologies' DSC delivered:

- **Signalling harmonisation** between legacy signalling protocols and proprietary signalling protocols, used by some core elements, while successfully migrating from the solution of the generic vendor to Squire Technologies'.
- **Signalling normalisation** to overcome compatibility issues between the existing solution and the new DSC by handling all Diameter traffic between these elements.
- **Routing and interworking** to ensure that, as the migration proceeded, all roaming transactional data routing went to the correct Online Charging Solution, depending on where the subscriber was residing at the time.

The project demonstrates the outstanding agility of Squire Technologies' DSC. While maintaining security, charging, and call quality and services, the DSC converts legacy and proprietary protocols to the latest industry standard protocols.

Leveraging a multi-vendor framework to unlock extra network value



CSPs need unlimited flexibility and control of their network functions to adapt to market and economic forces. The ability to add new vendor solutions is paramount for success, and operators can do it with the right DSC.

DSCs can improve network management, but not all DSCs are equal.

First-generation DSCs provide static traffic management for control of core network functions. These original DSCs are limited in the value they can extract from networks.

Since their introduction, DSCs have acquired more features. Unfortunately, many still lack the functionality and flexibility operators need for full network leveraging.

Leveraging a multi-vendor framework to unlock extra network value

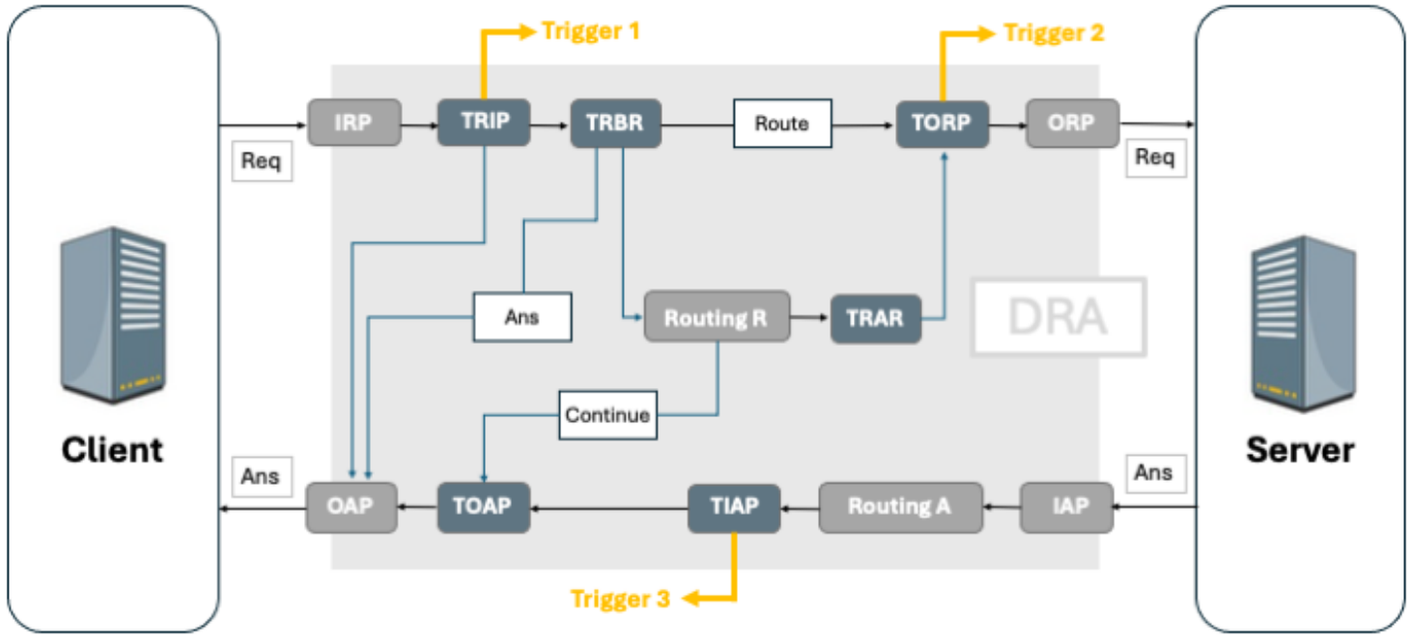
How to solve extremely complex mediation requirements

Squire Technologies' advanced, dynamic DSC offers:

- Unmatched flexibility
- Outstanding security
- High availability
- Easy scalability
- Futureproofing
- Reduced operating costs

The true value of the DSC is in its highly configurable Diameter Signalling Manipulation Engine (DSME).

The DSME enables the creation of enhanced mediation polices to solve complex mediation requirements. An unlimited number of policies can be triggered at points during the flow of a message through the DSC.



Using the powerful DSME, operators can more easily introduce new vendor solutions and ensure interoperability between multiple devices and device vendors. Additionally, it prevents overload and congestion through sophisticated load balancing and routing algorithms, whilst delivering scaling to match network demand.

The case of Roshan

Vendor lock-in is an expensive hindrance to network upgrades. Roshan sought to avoid this scenario, requesting a solution compatible with multiple existing and future vendor components. Adopting a focused, multi-vendor framework simultaneously avoids vendor lock-in, enhances telecommunications connectivity, and futureproofs networks.

To achieve this, the project involved replacing a generic Chinese vendor's end-of-life signalling transfer point (STP) and implementing a DSC. Squire Technologies' versatile, forward and backwards compatible DSC and STP, improved 3G and 4G services across two locations, enhancing connectivity and solidifying geo-redundancy in a region vulnerable to ecological disasters.

Roshan is now able to leverage the flexibility of their DSC-enhanced Diameter/SS7 network to take advantage of new opportunities. The DSC also enables Roshan to reduce congestion, to ensure call quality and services, reduce operating costs and rejuvenate legacy systems.

Ben Teversham, Sales Manager at Squire Technologies, said:

"The importance of mobile networks for Afghans cannot be stressed enough, following the crippling of fixed-line services. Despite the sorts of challenges that most people cannot begin to imagine, Roshan's team has delivered an expert mobile service while using community projects to lift citizens out of difficult situations.

"Their foresight in choosing a solution that reduces vendor lock-in also sets a great example for other mobile network operators facing challenging times.

"Roshan's commitment to the people of Afghanistan is inspiring. It's an honour to work with such a great team, and we look forward to more opportunities to help citizens in the region through core network optimisation."

Squire Technologies' advanced DSC

Squire Technologies' advanced, carrier-grade DSC, part of the Sigla platform, combines a start-of-the-art DRA, DEA, and an Interworking Function (IWF) to offer:

- core network optimisation
- total Diameter network control
- high-volume traffic management
- high availability
- scalability
- security
- flexibility
- centralised routing
- redirects
- dynamic load balancing
- configurable throttling
- session binding
- message manipulation (Diameter Signalling Manipulation Engine DSME)
- message filtering/screening
- Deny/Allow listing
- Diameter dictionaries
- complex policy building
- multi-vendor support through onboard mediation.
- routing and interworking
- topology hiding
- DOS/DDOS protection

The superior capabilities of Squire Technologies DSC enable CSPs to address direct needs and overcome wider system challenges.

Next steps

For over twenty years, Squire Technologies has been solving network problems for CSPs in over 150 countries. Our ability to create solutions that overcome unique network configurations is a reason why customers value us.

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- Download our DSC presentation
- Contact us to arrange a free trial

For more information on Managing Multi-Generation Network Transformations
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