squire technologies

the signalling specialists to the telecoms industry

Whitepaper

Squeezing more from IMS, NGN and Legacy Networks

The Challenges

As the rapid pace of technological change drives the rise of OTT's, coupled with the relentless increase in cheap IP bandwidth across fixed and radio networks, the resulting decline in voice and SMS revenues dictates that operators of every kind are embroiled in a constant battle to retain and seek new revenue.

There are of course countless opportunities presenting themselves to every sector of the telecoms industry – VoLTE has matured and is now offers operators a tangible platform to deliver innovative services, IoT continues to grow and it's exciting to see as MVNE's/MO's partner with car manufacturers to offer in-car IoT.

A revival in SMS within A2P applications, 5G rollouts and the diversification of network functions all present us with reasons to be optimistic about the future.

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In order to survive this maelstrom telco's need to simultaneously deliver great service to existing subscribers whilst diversifying into new service provisions, if not addressing entire new market verticals.

The Solutions

The key is flexibility. In an ideal world you continue to support your existing subscribers on technology they're happy with while taking advantage of the best of the latest technologies. Sounds like a pipe dream? It shouldn't be, after all IMS, NGN and legacy networks all roughly break down to:

- The network elements that provide the access and the transport i.e. the controllers, the gateways, and the switches.

- The databases, HSS/HLR/EIR/NP that store all your subscriber details.

- The applications that control the delivery of services including SIP Application Servers, Service Control Points, Open Gateway etc.

- OSS/BSS – the operational and business support systems that sit above the network elements and allow operators to provision, manage and maintain their networks.
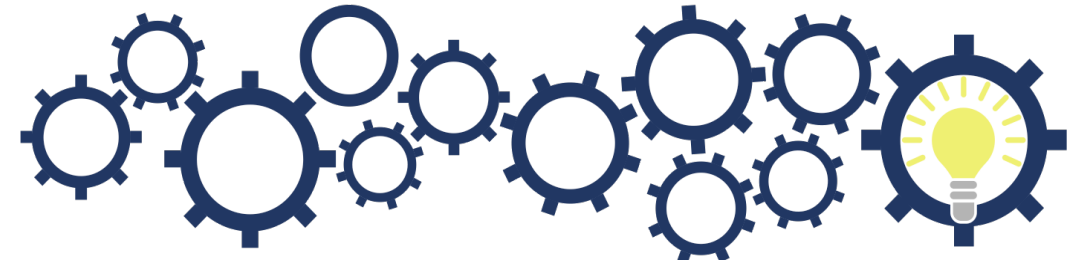
The application layer should be network agnostic. If there's been major advances in the technologies that manage, provision and store subscriber details can these only be applied to the very latest IMS based networks, and if so why not apply these changes to NGN or legacy networks?

If, for example an application server is delivering a shiny new NGN service and a key segment of information is only immediately available from a legacy network, the application server should be able to seamlessly reach out and retrieve it.

The 3GPP IMS specifications have defined the IM-SSF Service Switch Function 3GPP 23.278 which details a bridging function between the IMS network and legacy SS7 CAMEL.
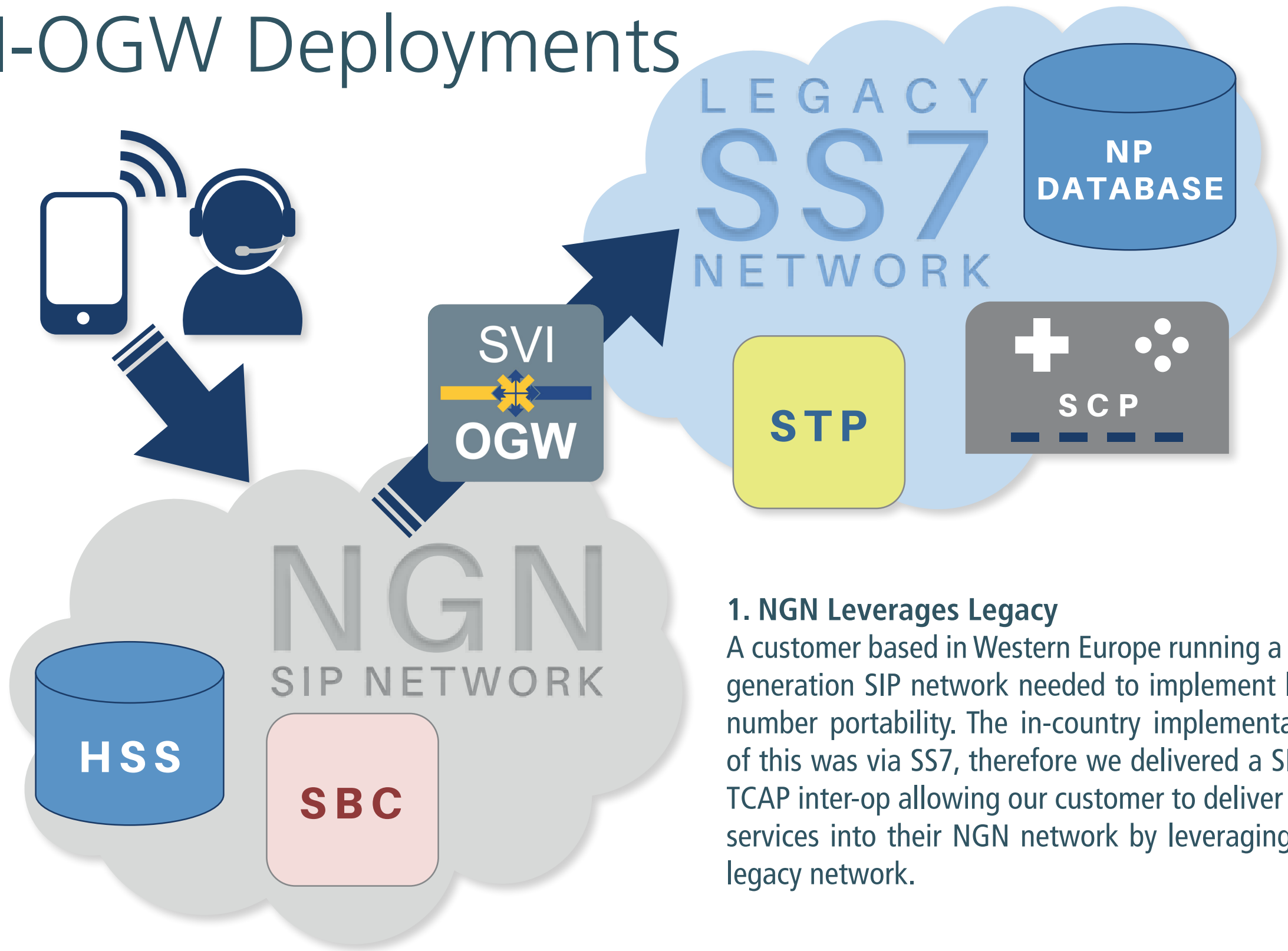
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Open Gateway

SVI OGW
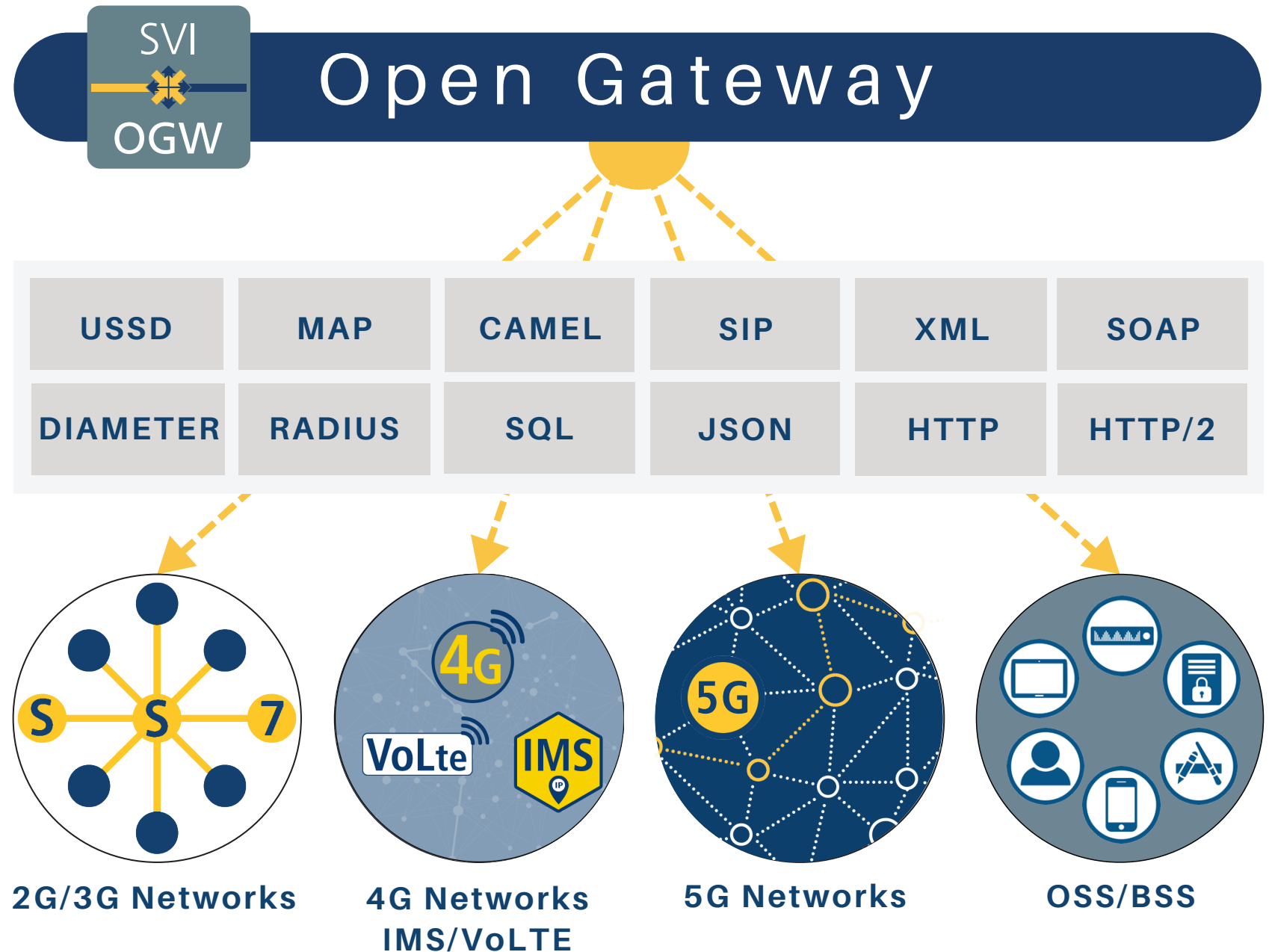
Here at Squire Technologies we have taken this a step further by supporting not only the IM-SSF, but interworking between HTTP/2, IMS, NGN and legacy networks, plus a host of standard IT technologies - SOAP, XML, REST, SQL etc.

This flexibility is delivered through the SVI OWG Open Gateway platform. Following are a handful of examples explaining how the SVI-OGW is being utilised within our customers' networks.

USSD	MAP	CAMEL	SIP	XML	SOAP
DIAMETER	RADIUS	SQL	JSON	HTTP	HTTP/2

2G/3G Networks

4G Networks IMS/VoLTE

5G Networks

OSS/BSS

SVI-OGW Deployments

LEGACY SS7 NETWORK

NP DATABASE

SVI OGW

STP

SCP

NGN SIP NETWORK

HSS

SBC

1. NGN Leverages Legacy
A customer based in Western Europe running a next generation SIP network needed to implement local number portability. The in-country implementation of this was via SS7, therefore we delivered a SIP to TCAP inter-op allowing our customer to deliver new services into their NGN network by leveraging the legacy network.

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2. NGN leverages IMS

A mobile operator in West Africa running an existing enterprise service for SME's using VoIP & ISDN PBX's has recently deployed a new 4G IMS network. The enterprise subscribers are managed by a legacy OSS system and the customer wants to consolidate subscriber management by administering all the subscribers via the IMS HSS.

We interconnected the client's SIP-based PBX's (ISDN PBX's first convert to SIP) into their IMS infrastructure with all subscribers registered in the HSS and managed from a single point.

IMS NETWORK

HSS

SVI OGW

P-CSCF

SIP APPLICATION SERVER

NGN SIP NETWORK

PBX

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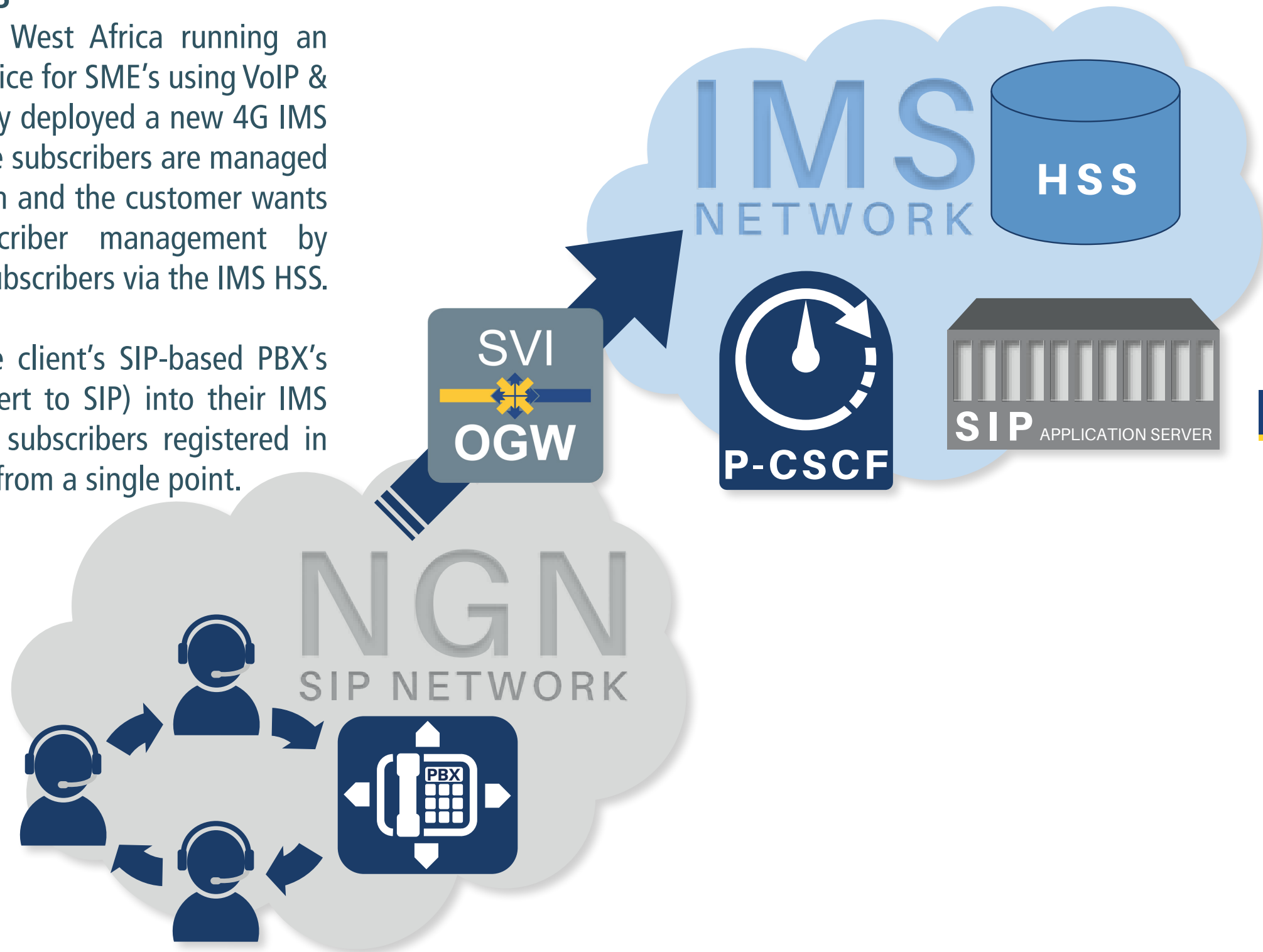
3. Flexibility with fraud

A client in Eastern Europe identified a specific fraud issue with traffic being illegally routed through their network. The solution combined monitoring and identifying suspect traffic and blocking it from traversing the network.

As spurious calls are identified an HLR lookup is performed to check its authenticity. Any offending lookup then resulted in the call being torn down by interfacing to the GMSC over its MML interface. This ability to perform incremental steps by monitoring, interrogating and interfacing across disparate network elements is what makes the SVI-OGW so powerful.

4. Taking the sting out of "End-of-life"

Vendors announcing end-of-life on their equipment is a continual trial for operators. We are working with an operator in the Middle East whose Equipment Identity Register (EIR) has become end-of-life. The customer has identified a suitable replacement and now needs to interface this into their existing 3G network. The deployment of the SVI_OGW enables seamless access to the database over a SOAP interface at the network level over SS7 MAP. As the customer looks forward to deploying an IMS network in the near future Squire Technologies look at providing a DIAMETER interface into the EIR.

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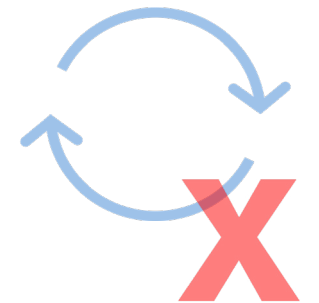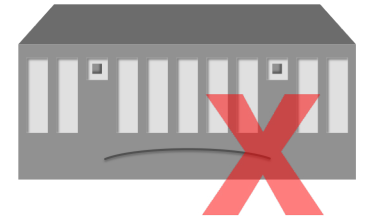
4. Unstructured Supplementary Services Data (USSD)

is a session based protocol used in 2G/3G networks to send text between a mobile phone and an application program in the network. Unlike SMS there is no store and forward as USSD transactions only exist for the length of a session. USSD applications are generally menu driven and push text in menu format to subscriber handsets.

APPLICATIONS

- Pre-Paid Roaming - USSD used in the network to check in real-time subscriber has enough credit for call
- Pre-paid subscribers use USSD to manage and top-up their accounts
- Mobile Money - subscribers able to make payments and purchases via their phone's menu-driven USSD interface.
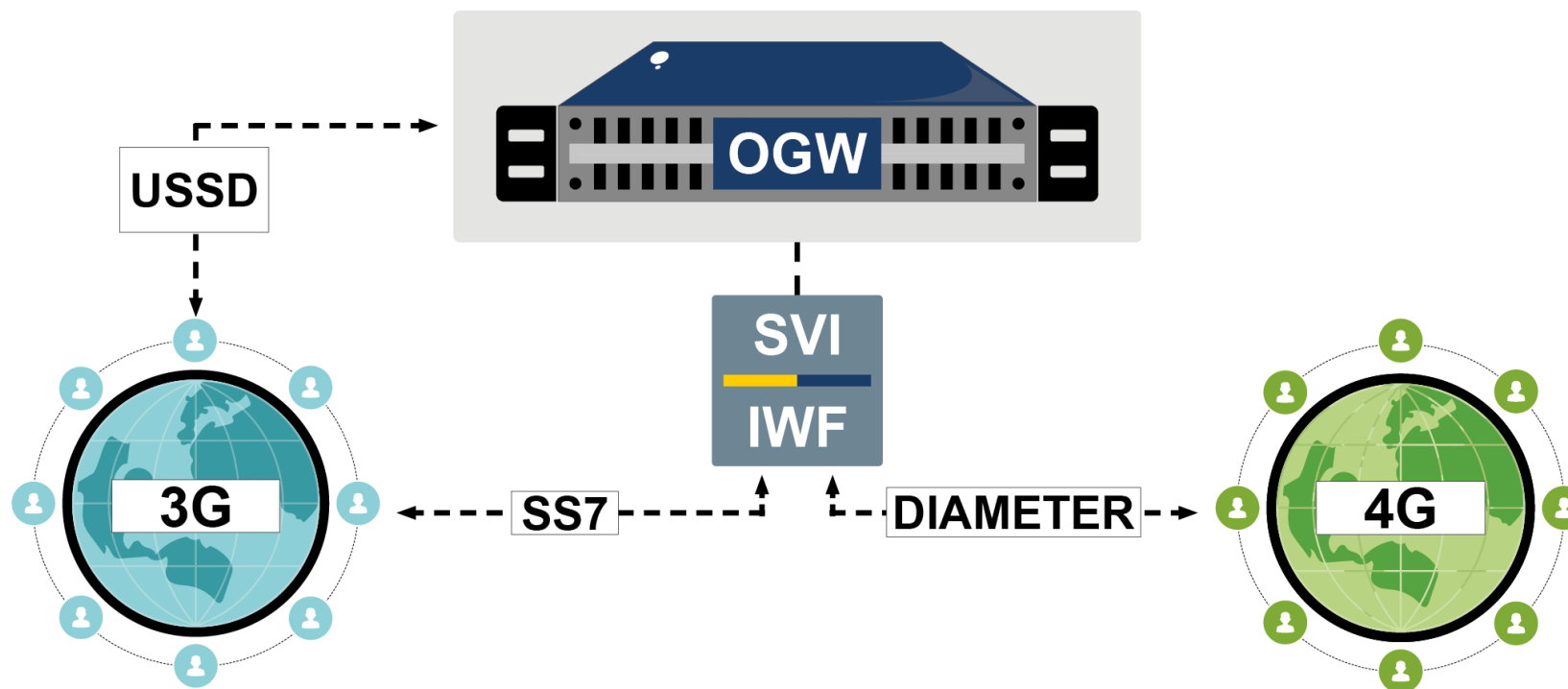
Working with a 4G mobile operator rolling out roaming services who needed to ensure that pre-paid subscribers credit checks operate correctly in 3G networks.

Some 3G networks perform credit checks via USSD. The SVI-OGW integrated with a DIAMETER SVI-IWF product is deployed in the 4G network to deliver the required USSD to DIAMETER messaging inter-operability. In a subsequent phase of the project the client decided to provide their subscribers with a full USSD-driven menu application. This was interfaced and configured using the SVI-OGW to provide the HTTP interface to their OCS platform. This flexibility and ease of deployment allows our clients to rapidly evolve and extend functionality according to their requirements.

Summary

As illustrated in the previous examples the SVI-OGW makes it possible to leverage different network components across disparate networks, lean on existing legacy networks to deploy services into next generation networks, and take advantage of new database technologies.

The SVI-OGW provides a powerful combination of flexibility and speed, where new services can be formulated, tested and deployed, problems fixed and consistency of services retained. This high degree of flexibility allows operators and service providers to thrive in an industry in a state of flux, allowing them to adapt, innovate and support incumbent technology.

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