

09.10.2015

XURA

Digital Communications

Network evolution and the IP-SM gateway



Network evolution and the IP-SM gateway

A simple IP-SM connectivity challenge may be a great opportunity to explore the evolution of messaging infrastructure

The data tsunami and the IP world

In the last decade, Mobile Network Operators (MNOs) have experienced significant erosion of their key revenue streams which for many years had been taken for granted. Voice brought the first stream of revenues, with healthy margins, followed by messaging and, later, access (Internet). In most operators, messaging alone ranked number two after voice revenues.

As MNOs moved from 2G to 3G networks, new entrants in the wireless space at the time – such as Apple and Google – created new ecosystems, initiating the transition from feature phones to smartphones. The new data “hungry” devices offered capabilities to customers never seen before, as MNOs were gladly offering unlimited data plans, cannibalising data revenues. This trend allowed the emergence of over-the-top (OTT) players, who saw the opportunity of leveraging 3G speeds, smartphones, and the data channel, flooding the market with applications that could communicate over IP, leveraging MNOs’ networks, and leaving operators wondering where all their voice and messaging revenues have disappeared to.

Even though MNO’s were anxious to capitalise on this new, lucrative market opportunity, it was not practical to pursue a full IMS and very expensive migration of their networks which would have enabled them to create their own response to OTT via a Rich Communication Suite (RCS) type approach. At the same time, voice revenues eroded due to applications such as Skype and Vibe.

As MNO’s networks continue their natural evolution to higher speeds and better quality, a fundamental question remains; how can operators differentiate themselves and maintain relevancy, especially in the context of VoLTE?

Network Evolution

In the early days, voice calling and texting were the only use cases for a mobile handset and operators differentiated themselves based on the quality of voice calls. With the rollout of LTE networks, operators hope that HD voice calls might again provide competitive differentiation. However, providing ubiquitous VoLTE services will likely be a technology evolution that occur naturally over many years. Not only do individual networks have to evolve, compatible consumer handsets will have to reach mass penetration, and device interoperability among various carrier networks will need to be proven.

While industry attention seems fixated on wireless operators rolling out 4G LTE networks, operators continue to rely upon the proven reliability and full penetration of the existing 2G infrastructure. The necessity and importance of the 2G network infrastructure will continue for the long transition period.

Network evolution and the IP-SM gateway

The Long Tail for 2G infrastructure

Most projections forecast full LTE service availability in 3-5 years. It is important to remember that service availability does not equal consumer adoption. These projections do not consider existing consumer behaviour, and there is no more ubiquitous behaviour among mobile users than SMS messaging. More than two decades of mobile users have made texting part of their everyday life. In fact Person-to-Person SMS traffic continues to increase year after year, growing from \$100+ billion in 2011 to a projected \$120 billion in 2016. That messaging behaviour will continue regardless of handset type or level of LTE network sophistication. Operators must ensure the ability to support that behaviour for many years to come with well-planned and thought-out IP-SM domain interconnectivity.

Operator choices for domain interconnectivity

There are two primary choices available to the mobile network operator facing a network technology evolution and wanting to continue supporting existing consumer behaviours while leverage existing assets. They may select IP-SM connectivity from an IMS vendor or a messaging vendor. That choice, when presented simplistically, might look like the following illustration:



However, the reality of IP-SM connectivity is far more complex. While IMS infrastructure is highly standardised and only recently deployed, messaging infrastructure has had decades of commercial development with countless numbers of projects, vendors, deployments and customisations. The reality of IP-SM connectivity looks more like the following illustration:



Network evolution and the IP-SM gateway

Selecting IP-SM connectivity from an IMS vendor has pros and cons. What many operators focus on is the initial cost. Many IMS vendors include basic messaging infrastructure connectivity either as part of their solution or at very low cost. The challenge here is that this generic component was typically designed using assumptions of messaging end points that are likely to be inadequate and not meet the real world needs of an operator's environment. Even if the generic component is provided at no cost, implementation, customisation and configuration will result in an enormous total expense.

If the IP-SM connectivity from an IMS vendor is implemented, the typical result introduces a new network element adding to the overall complexity of administration and maintenance and not adding any value to the messaging experience. In truth, approaching IP-SM connectivity from the IMS side may completely disrupt triggered VAS services such as personalised messaging, black or white lists, pre-paid charging or other existing subscriber impacting services. Additionally, the IMS vendor supplied solution may introduce new complexities with real-time charging dependencies, government mandated controls and aspects of spam or fraud security.

On the other hand, the pros and cons of selecting IP-SM connectivity from a trusted messaging vendor may be much more sensible for the operator. This is primarily because messaging vendors long ago solved the complexity challenge of having multiple messaging servers running that require handover and fall-back activity for seamless delivery or notifications, OSS/BSS integration and performing logic for individually triggered services. For messaging vendors, it is far simpler to bridge platforms or bearer technologies from a solution already integrated with billing, reporting, customer care, spam and fraud controls or other rules based decision triggering than it would be to integrate these capabilities into an IMS vendor based solution. Additionally, a messaging vendor supplied solution is likely to provide a more flexible streamlined path of evolution to offer new services such as RCS, M2M or A2P.

What is an IP-SM Gateway?

An IP-SM Gateway is a 3GPP standards based networking element that provides interworking for SMS messages to be transported over IP networks such as LTE or Wifi using IMS with the SMSC in the CS/SS7 network. This can either be done for a 3GPP SMS message transported within a SIP message (i.e. Transport level interworking) or as a RCS/CPM standard Text message. This is then presented via the IP-SM GW as an SMS to the SMSC for delivery to other devices able to handle the SMS over IP/CS or converted into a RCS/CPM standard Text message to be sent to a user or feature device. Components of an Ideal IP-SM GW Solution

Multi-functional

Ideally, an IP-SM GW solution should provide advanced, multi-functional messaging capabilities including a range of smart routing functions and sophisticated message handling abilities. The solution should offer not only an IP-SM gateway that can be implemented today but also provide the foundation for supporting other, future IP based services as desired. A key differentiator for solution providers will be their ability to ensure continuity. Those will allow operators who are migrating to LTE the ability to sustain existing Person to Person SMS revenues as a foundation for future IP messaging revenue streams. Future handsets are expected to come with native support for VoLTE and RCS functions. Subscribers may not even be aware of the messaging/bearer technology a message is sent or received with (2G/3G/4G(LTE), Wifi, SGS, CS, SMS-over-IP, SIMPLE-IM Session, CPM Session/Standalone). For that reason, having the capability of seamless fallback to messaging/bearer technologies currently available plus those to become available on newer VoLTE/RCS Smartphones will be important.

Network evolution and the IP-SM gateway

Flexible deployment

Operators in any stage of evolution require solution flexibility in both deployment and utilization. With a fully virtualized offering, the operator can implement the platform in a manner that best suits overall strategic goals. Important capabilities include the efficient exchange of SMS messages between SIP-enabled devices, (dual mode) handsets and standard phones through translation of SMS messages into the proper format for delivery to the appropriate domain (SS7 or IMS). The required level of interworking may be determined based on a subscriber profile as well. For messages coming from foreign users, the IP-SM Gateway should provide a 'home routing' function that can determine, based on the subscriber profile, if the message must be intercepted for delivery to the SIP-enabled device.

Operational efficiency

Another important consideration should be given to operational ease. If the IP-SM GW can share a uniform operational environment with other network components, it would make administration much simpler. For example, alarm, configuration, provisioning, and performance management could be managed with single web-based GUI. Last, the IP-SM GW should be an integral component of a larger solution designed to have no single point of failure. Any hardware or software functions that fail will immediately be taken over by an alternate function. Through this approach, the entire system availability is very high and can be considered carrier-grade.

Summary

While VoLTE presents challenges it undoubtedly also presents unparalleled potential revenue. Fortunately, solutions are becoming available that both offer the capabilities MNOs need now, as well as provide a launching pad for future IP based services. These solutions provide advanced, multi-functional messaging capabilities with a huge range of smart routing functions and sophisticated message handling abilities. By choosing a solution that integrates effectively within the operator's overall networking ecosystem, complexity and flexibility can be optimized to provide differentiation, efficiency, and greater ROI. What seems to be a simple IP-SM connectivity challenge may actually be a great opportunity to explore the evolution of messaging infrastructure and future subscriber services.

Why Xura

Based on its unparalleled experience in messaging, Xura is uniquely equipped to deliver the future of mobile messaging services. Xura's messaging solutions power innovation and profitable growth for operators and service providers across the globe: Xura's messaging solutions power innovation and profitable growth for operators and service providers across the globe:

- The No. 1 enabler of the world's leading messaging service
- SMS Powering more than 2 billion subscribers around the world
- Delivering over 1 trillion text and multimedia messages annually

XURA

For more information

Please visit our website xura.com
or email contactxura@xura.com