



Sprint and Metaswitch:

Future-proof Services Thanks to Cloud Architectures

A Network Sourcing Case Study

February 2018



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Introduction: Service Provider & Network **Transformation Circa 2018**

To categorize the U.S. wireless market as hyper-competitive would be an understatement. While four major service providers dominate the landscape, competition between them has only intensified over the past few years. Price wars have seen service providers change up their tariff schemes on a nearly weekly basis, bringing down costs for the average consumer and taking the market from a focus on buckets of data to unlimited data plans in the process. And as portfolio pricing has evolved, so too have the portfolios themselves. Traditional voice, text and data offers, for example, have been augmented by unlimited content bundles and improvements on traditional services like Voice over LTE (VoLTE).



Mobile Service Plan Portfolio Changes: 2013 vs. 2018

Of course, competition is about more than wireless services and service pricing. Coverage and service reliability have always been hallmarks of wireless service marketing in the U.S. and high-profile advertising campaigns served to keep them that way going into 2018. And with new technologies like Gigabit LTE getting commercialized, price and coverage wars got joined by speed wars.

On their own, competing effectively on price, coverage, innovative new services and increased data speeds would lead to obvious cost pressures. But all of this is also taking place against the backdrop of a broader, industry-wide

Source: GlobalData

network transformation agenda. Aggressive adoption of IT-based technologies - like cloud and virtualization - is aimed at helping service providers operate efficiently, turn up customers more quickly and enable continuous innovation while giving them the flexibility to build their networks and services from a larger set of potential suppliers. In the near-term, however, this represents a seismic shift in the way networks are run and operated, potentially contributing to costs as new network solutions are sourced and deployed.

This dynamic - network, service and tariff transformation combined with the inevitable cost pressures – is not unique to any one service provider. It's not even unique to any one market. But as Sprint moved to navigate these waters and virtualize its core network, the service provider needed to embark on a strategy for sourcing new network capabilities and working with new suppliers. The detail behind this choice is instructive. In particular, Sprint's decision to deploy virtual IMS and session border controller (SBC) solutions from Metaswitch provides insights into how service providers are making their network sourcing decisions and yields recommendations for those still in the process.

Sprint: Operational vs. Network Challenges

In early September 2017, Sprint announced plans to collaborate with Metaswitch – deploying a suite of fully-virtualized products including the vendor's SBC, call session control function (CSCF) and border gateway control function (BGCF) as part of a broader IMS and VoLTE rollout.

When Sprint announced its "Network Vision" strategy at the tail end of 2010, the technology blueprint was designed to help the service provider make the most of disparate spectrum assets (800 MHz, 1.9 GHz and 2.5 GHz) that resulted from a series of acquisitions (Nextel and Clearwire) and the latest advancements in multi-



Source: Sprint

mode cellular network technology. More than anything, however, the goal was enhanced service – "coverage, quality and speed" – in order to improve results and build a solid customer base. And, indeed, the service provider ended 2010 with the biggest subscriber growth in nearly five years, serving almost 50 million wireless customers. Just a few years later, then, at the end of 2012, Sprint's customer base was more than 7% larger at 53.5 million subscribers.

Five years after that? In Q3 2017, Sprint's subscriber base had shrunk to just barely above 53 million.

An inability to grow the customer base over the long-term was symptomatic of larger difficulties within the wireless industry, including revenue growth and profitability challenges. But with a large part of 2017 occupied by Sprint's potential merger with T-Mobile, the pressure for Sprint to maintain profits while continuing to execute on network quality and speed improvements was at an all-time high. The core tenet from its original Network Vision blueprint was more important than ever.

Yet a focus on coverage, speed and efficiency would not obviate the need for service innovation and evolution. For Sprint it was not a case of "either/or." Network transformation needed to be accompanied by service transformation (and the requisite network infrastructure to support it). Case in point: VoLTE.

Despite improving network performance, and with nationwide LTE network and LTE-Advanced launched in more than 250 markets, Sprint had yet to launch VoLTE services at the start of 2017. In fact, it was the only national wireless service provider without it. But the lack of VoLTE was only one component of Sprint's network challenges. With an eye to the future, Sprint required a fundamentally new network architecture to support VoLTE, IoT-based services, managed security services or whatever new service capabilities would keep it at the forefront of customer demands.

Luckily, the continuing evolution and development of network function virtualization (NFV) and cloud-based deployment architectures provided the ideal foundation for Sprint's network and service transformation, and Sprint proved that it was up to the task of leveraging them.

Buying Criteria:



How Sprint Proceeded with Sourcing

As Sprint moved to source new network capabilities and roll out VoLTE services, the operational and strategic challenges it faced would naturally have informed its strategy. But larger network transformation trends and visions were more important.

The service provider needed to roll out VoLTE in order to be competitive. It also needed a foundation for delivering new services in the future – services it might not have even envisioned – while maintaining a focus on cost efficiency and service stability. To be fair, no service provider can afford to ignore service reliability or the costs involved with rolling out services and the infrastructure to support them. For Sprint, facing a need to strengthen its market position and finances, costs and reliability were particularly important aspects in the vendor selection process.

This isn't to say that Sprint didn't have specific service demands guiding its choice of IMS, VoLTE and SBC suppliers. Call prioritization and SIP message manipulation,



for example, were critical requirements. A broader network transformation agenda, however, played a more prominent role in how Sprint would think about its core network transformation and the vendors who could support it – an agenda further signaled by Sprint leadership and its core reference solution.

Formally announced in May 2017, Sprint's Clean CUPS Core for Packet Optimization (C3PO) is a mobile core reference solution based on open source and SDN/NFV technologies. As noted by Sprint VP of Technology, Dr. Ron Marquardt, the goal was to, "make our traditional mobility architectures and software designs more

Source: Sprint

streamlined, efficient and scalable as we move to a virtualized environment." Looking at the future of the network, the conclusion was that this future requires a disaggregated control and user plane capable of supporting massive increases in data volumes, the possibilities of elastically scaling capacity and the promise of certain 5G use cases. More than any technical specifications or protocols, however, the thinking behind the development of C3PO points to larger Sprint network transformation buying criteria and supplier requirements.

- **Holistic Virtualization.** Rather than looking to virtualize individual physical network functions, Sprint looks to end-to-end virtualization across functions, with multiple functions (VNFs) on the same physical server where appropriate.
- Interoperability. Inherent to the notion of any end-to-end architecture is an
 expectation of interoperability across network functions, including the vendors
 supplying the technology.
- **Intelligent Disaggregation.** Separating processing from state storage elements, or control from user plane, where it makes sense to do so, allows

independent scaling of each and the most cost-effective utilization of the underlying compute hardware.

 Scale. With a call out in its C3PO launch to testing that focused on solid user, throughput and function support, Sprint's focus on scale was evident – user plane scale, data plane scale and function scale. With a requirement to roll out varied services cost efficiently – with a limited amount of infrastructure up to the task of delivering quality services – this focus is understandable.

Sprint & Metaswitch:



Network Architecture in Support of New Services

In early September 2017, Sprint announced plans to collaborate with Metaswitch – deploying the vendor's SBC, CSCF and BGCF as part of a broader IMS and VoLTE rollout.

Based on GlobalData's Competitive Landscape Assessments, the decision was not surprising: Metaswitch's Perimeta offer is rated as the SBC market leader based on



architectural flexibility, performance that surpasses competitors and a company focus on cloud-native deployment. The ability to meet Sprint's specific requirements around message manipulation and call prioritization built upon this foundation.

Ultimately, however, Sprint's decision to work with Metaswitch can be traced to a handful of higher order factors driven by its requirements, technology trends and the capabilities of the potential suppliers.

Cloud Native. Metaswitch's focus

Source: GlobalData

on cloud native technologies and architectures – turning a "software telco strategy" into a portfolio that is mostly virtualized along with a cloud-based IMS offer – aligned with Sprint's requirements for a flexible, scalable service core – and the cost efficiencies that follow.

- **Tests and More Tests.** Sprint's reputation demanded a focus on performance testing as a proof point for solution credibility. Several rounds of tests to prove out Metaswitch's claims preceded the decision to move forward with deployments.
- **Partner Friendly.** Sprint's interest in securing the best network implied a solution architecture built around multi-vendor sourcing. A specialist vendor, Metaswitch would not be expected to deliver end-to-end network solutions but, rather, be comfortable working within a multi-vendor framework.
- Licensing Costs. Metaswitch's IMS licensing model includes support for network-wide, subscriber-based licensing, distributed capacity management, and logically centralized license tracking. All of this lends itself to a flexible cost structure for Sprint as it rolls out – and scales – new services.

Alongside these central capabilities – and their alignment with Sprint's buying criteria – a number of other solution components and capabilities played into Metaswitch's favor. The vendor's Service Assurance Server provided cloud based tracing, providing Sprint with visibility into what is essentially a new technology - keeping operators costs down and customers satisfaction high in the process. And, as a smaller vendor (compared to large incumbents), Metaswitch did not have an interest in supplying far-reaching system integration alongside its gear. For some service providers, that may have been troublesome. Given Sprint's in-house integration capabilities, it was not an issue for them. And where credibility – of Metaswitch and its technology – was potentially in question, an extensive history of testing (and earlier selection by AT&T as a part of its Domain 2.0 sourcing) helped move Metaswitch from "potential vendor" to "trusted advisor."



Conclusion & Recommendations

When Sprint announced its work with Metaswitch as a part of its broader network virtualization efforts, it was big news; it's not every day that a major, established service provider integrates a new vendor into its network. It's even rarer to have that new vendor be a smaller specialist vs. an end-to-end vendor supplying base stations and mobile backhaul, core routers and optical gear, plus everything in between.

In light of Sprint's network and service requirements, the decision is not surprising.

Sprint's commitment to NFV, with a focus on cloud architectures, was well known; it was messaged to the public, throughout Sprint's leadership and embodied in actions such as the C3PO launch. With a cloud-centric product portfolio, and the advantage of real world virtualized deployments, Metaswitch was a strong candidate to support Sprint, particularly following a win at AT&T which spoke to its ability to support large, Tier 1 network requirements. And where end-to-end networking vendors are often chosen for the integration expertise and capabilities they bring, Sprint took on much of this work itself, driving costs of the network and paving the way for work with a broad array of suppliers.

Beyond any specific vendor-service provider engagement, then, the work between Sprint and Metaswitch also implies a set of recommendations for other service providers as they embark on their network transformation and service expansion journeys.

- **Source Broadly.** While larger, end-to-end network vendors may be a comfortable choice, service providers cannot afford to be myopic in sourcing decisions; enhanced vendor selection was core to the original NFV standardization and industry efforts. Network specialists that can flexibly deliver on strategic service provider priorities need to be considered in procurement processes. At a minimum, they can serve to set an agenda that other vendors must then respond to.
- Integration Planning. The potential danger of working with multiple network infrastructure and software vendors – especially those without significant support and operations businesses – is that the pieces of the "network puzzle" may not actually fit together well. Sourcing from suppliers who are committed to integration within a multi-vendor environment is key.
- Architecture vs. Service and Business Requirements. In upgrading their network infrastructure or introducing completely new network capabilities, service providers will inevitably have specific business and service requirements they want to support. Vendors will, doubtless, be ready to support those requirements. In Sprint's case, the decision to focus on both, balancing broader architectural considerations with feature-centric considerations, sets the stage for on-going network transformation along with service specific demands.

- Follow the Leader. It is not always easy to judge the credibility of vendors that haven't previously been linked to high-profile, public, deployments of service provider network infrastructure. It's even more difficult when the technologies being deployed are also relatively new. Against this backdrop, customer references particularly with known innovators are important to track.
- Lead the Followers. Where aggressively innovative service providers may get lauded for their transformation efforts, those who move later must take advantage of the opportunity to be more comprehensive as new technologies mature and their ecosystems come together. Sprint's strategy to renovate its core network with cloud native technologies, for example, may not have been possible a few years earlier. But as the technologies became commercially viable, it was incumbent on Sprint to seize an opportunity to lead the market and move quickly. When Sprint moves to launch VoLTE services later this year, service providers – large and small – should all be watching to see how the end-to-end virtualized VoLTE fares in the real world.

