What Network Transformation Means in 2020

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Beginning about 10 years ago (give or take a few years), telecom carriers finally capitulated and accepted the reality that they needed to begin **reinvesting in their networks** and transforming them into the next-generation networks of the future. Initially, many carriers were reluctant to make these investments. Sure, these networks—and the associated technologies—offered new capabilities, but carriers had spent the last 50+ years perfecting and refining their voice networks.
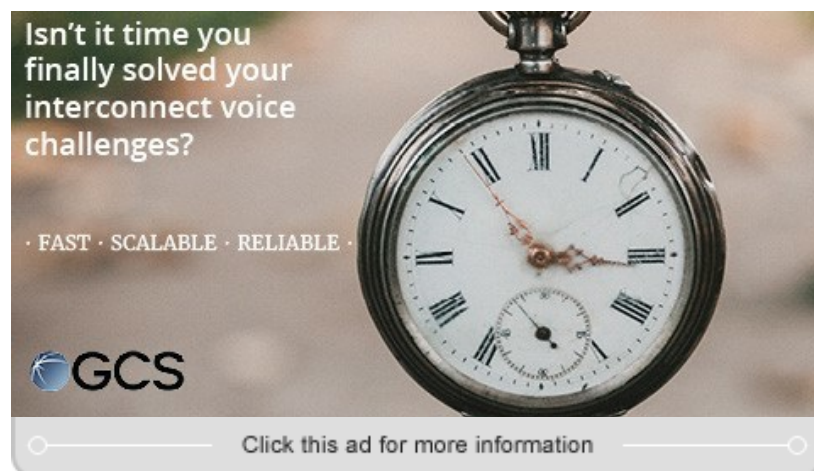
The Public Switched Telephone Network (PSTN) did its job well and many of the investments had already been made. Why change?

This reality provided quite an impediment to the bevy of new solution providers who were touting the advantages of IP—and VoIP in particular. Why pursue this massive forklift upgrade of core network infrastructure when the PSTN seemed to be doing not just an adequate but an excellent job of supporting voice communications? Why fix something that isn't broken?

Revolutionary, not evolutionary benefits

As with all new technological revolutions, VoIP didn't offer just evolutionary benefits, it offered revolutionary benefits. These technologies could greatly reduce the sophistication required to operate voice networks. Despite their reluctance to make these investments, carriers knew that voice was rapidly approaching commoditization on a global scale. Gone were the days where Sprint, AT&T, and others could claim superior quality over their competitors and command premiums and continued customer loyalty because of this quality. Carriers knew that their voice business would be shifting to a commodity market that would be governed by low differentiation and dynamic market demands. The questions were no longer "if" and "how" it would happen, but "when" it would happen and "how" carriers would respond.

Some carriers—the early movers—made these investments immediately, while others chose the wait-and-see approach (as if they were trying to time the market). But what became clear was the inevitability of IP/VoIP and what that meant to the carriers. They

clearly needed to invest in their voice business, choose to sell it off or—in some cases—let it die.

IP networks and highway systems

What was it about IP technologies, and VoIP in particular, that contributed to this inevitability? IP network technologies are data-based networks. They are analogous to interstate highway systems. On the highway, you have cars transporting passengers, trucks transporting freight and packages, police cars transporting criminals, ambulances transporting patients, buses transporting tourists, construction vehicles… you get the point. The highway wasn't designed to support transportation of one particular type of package. The engineers who designed it did not care what was being transported. Its purpose was transportation regardless of the package. IP data-based networks have been similarly designed. Similarly, if one can "data-fy" their package, one can use the IP network to transport it.

Contrast this with the 20th-century world of the PSTN and one can see that's not how it worked. PSTN networks and their associated infrastructure were purpose-built and designed to support voice traffic only. That specialization meant they were great at performing this task, but incapable and inefficient at performing non-voice tasks. In fact, the Signal System Seven (SS7) network was designed to improve the efficiency of voice networks but, because the package was data and not voice, engineers had to design and build a separate network so that the data packages could traverse it. This investment required hundreds of millions of dollars by carriers over the years. Some of the old-time PSTN voice engineers will tell you that the PSTN network of the 20th century was one of the most over-engineered capabilities ever built. It did its primary job exceptionally well, but without any consideration of cost, efficiency, or future use.

IP/VoIP eliminates all of that complexity, sophistication, specialization and, of course, cost. IP/VoIP allows carriers to operate their networks in a way that is significantly easier and cheaper than the voice networks of the 20th century. And, in a commoditized, highly competitive industry where scale and reliability were going to become the attributes of success, easier and cheaper are equivalent to "manna from heaven" for telecommunications carriers.

Embracing IP/VoIP technologies

That brings us to today, where the world has clearly embraced IP/VoIP technologies. Carriers that haven't yet made these investments and sunset their PSTN infrastructure are facing external and internal challenges that may prove to be insurmountable without massive investments.

But what about tomorrow and beyond? What does the future of network transformation look like? What are the benefits carriers are seeking to realize from their initial investments in IP/VOIP, and what are some of the additional investments they need to make to continue to exploit the benefits that IP/VoIP?

Actually, it's exciting what the next phase of this IP/VoIP revolution will provide to the industry. While the initial benefits of switching to an IP/VoIP-based infrastructure are easily calculated (cost reduction, efficiency, etc.), the real return on these investments are going to be realized in the next decade and will be enormous by comparison to the initial returns. Think of WhatsApp, Skype, or all the other voice messaging apps. Think of how easy it is to port your number from AT&T to Verizon. That's all possible because of the IP network and how telecommunication companies have been able to exploit the inherent capabilities of this all-purpose, data-based network.

Interconnect Voice Management

One area of real value that is starting to be exploited with massive benefits is the interconnect voice management portion of a voice carrier's operations. This insular world is not known to many individuals outside of voice telecommunications. It's a

complicated, critical aspect of every company that provides voice communication services. Whether you are Verizon, BT, Vodafone, Vonage, Twilio, Facebook, or Google, if you offer voice services to your customers you must have a system (or systems) to manage the hand-off/receipt of voice calls between carriers, because no carrier is connected to every landline, IP address, mobile phone or messaging application. As a result, carriers interconnect with each other and hand off calls to each other in real-time so that callers can be connected. This is the world of interconnect voice and it is a highly commoditized, hyper-competitive, dynamic, and complex component of the telecommunications industry.

Because of the invention and adoption of IP/VoIP technologies, the world of interconnect voice has undergone massive change and disruption. The cost of voice calling has plummeted around the world in every country. Today in the US, carriers can pay each other as low as $0.0005 per minute for each phone call. This is why carriers can offer unlimited voice calling plans. The costs for voice calling have dropped to a point where they are almost free—almost. Actually, as it turns out, people in aggregate still make a lot of phone calls and spend significant time talking. In fact, voice calling—often referred to as voice traffic in the industry—has stabilized over the last few years. Despite the increase in text-based messaging, people aren't talking less.

Voice calls remain, for the foreseeable future, one of the primary methods of communicating person-to-person.

In order to have these calls interconnected and completed, carriers need to share massive amounts of data and have to inform each other of changes in network, costs, capacity, etc. The longer it takes to share this information among the interconnected carriers, the less efficiently the industry and carriers can operate. This leads to higher costs and less quality. Here's one example where IP/VoIP technologies step in to help.

Because of the data-based design of the IP network, application providers and solution vendors are able to design and build applications that can interact, in real-time or near real-time, with the voice calls as they traverse the IP network. Now, for instance, applications can assess quality, network capacity, and other network-related attributes and adjust the call management in real-time or near real-time. It's easy to see the impact that this has on call quality, capacity management, and cost. Also—and maybe more importantly—new products can be created because there are almost no constraints. This is why companies like Twilio (and others) have flourished: They can integrate business applications into real-time voice communications networks without worrying about the underlying network technology or the interactions between networks and the carriers that manage them.

Realizing the benefits

Global Convergence Solutions, Inc. (GCS) has been at the forefront of the industry since the company was founded in 2006. Comprised of industry veterans, it has been exploiting the advantages that IP/VoIP provides to carriers and helping carriers capitalize on them. Currently, GCS platforms manage approximately 150 billion unique call attempts annually, which translates to more than $4B (US) in voice termination costs. GCS customers, including iBasis, Vonage, Windstream, Bell Canada, and more, are exploiting the benefits of VoIP beyond just greater efficiencies and lower per-minute termination costs. They are creating new products, new business models and even new businesses in the voice communications industry.

These are the real benefits of IP/VoIP technologies that were promised back in the 1990s when Vocaltec and others were experimenting and challenging the status quo. GCS has furthered this effort and developed the premier OSS/BSS platform in the industry. Because of the GCS Interconnect Command Platform, carriers can now manage every call uniquely or in the context of different products or business models. In real time, they can change the interconnect path, determine the qualified interconnect partners, identify and prevent fraud, optimize the call for quality, cost, revenue, margin or whatever the business need is for the carrier.

The network change was just the beginning. Now OSS/BSS systems, new applications, and new management capabilities will improve the efficiency of voice carriers. This will

lead to more investment in voice—not less. The OSS/BSS portion will predominate during the next few years, and then it will be surpassed by the applications the next inventors create.

As carriers look forward to the next decade and consider where voice communications will fit in their product and service portfolio, the industry that embraces the next phase of IP/VoIP benefits and leverages them will be able to rapidly enter new markets, change business paradigms, and revolutionize their voice businesses. Those that don't will not only miss out on the opportunities that will be created but may inadvertently cede these to their competitors and new entrants. Let's face it: Facebook, Google, Amazon, Apple, Netflix, will look to see how and where voice communications fit into their value propositions. In fact, they are already starting. They are obviously experts at how to leverage the IP network—and they move fast.

Start investing in this next phase of IP/VoIP technologies. The returns on these investments will far exceed what many carriers expect.