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## A Stormy 5G Transformation Forecast

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It's no secret that 5G would introduce a world of change to telecom networks. But it's safe to say it wasn't expected to come surging in all at once. Blame a pandemic, increasing competitive pressures and an urgency to capture new revenues for the latest whirlwind of complexity surrounding wireless operators. What's the solution to this onslaught of innovation pouring into networks? More innovation.



If 2020 was all about a rush to rollouts, 2021 will see a focus to keep them on track. For operators, that means sorting tech challenges, embracing operational efficiencies and lining up a parade of new partners to play important supporting roles. Behind the scenes, automation, continuous testing, active testing and managed solutions will be critical drivers of success.

### A 'perfect storm' showering opportunity

Consider the ascendant trends operators face in this moment. The sheer volume and velocity of software and configuration changes being propelled onto networks is explosive. Cloud players are positioned as partners but also competitors, constantly keeping operators on their toes. Unrealized consumer 5G demand is forcing a faster-than-expected pursuit of enterprise deals. A live 5G device ecosystem is introducing new capabilities, data traffic patterns and consumer behavior shifts. An intense focus on the 5G core is developing following the realization that 5G non-standalone (NSA) just won't cut it on performance. And speaking of performance, attention is shifting to the edge for lower latencies to meet vertical market needs.

It's enough to make your head spin. Yet, hidden within the 'perfect storm' of complexity lies unprecedented opportunity. Unlocking it though, will prove to be operators' greatest challenge.

Luckily, the pandemic's acceleration of trends around automation, assurance and managed solutions has positioned operators to meet this overly demanding moment. Suddenly, staff are at home, forcing teams to scour for remote solutions to routine network management requirements. Fast-evolving cloud trends require new expertise and skillsets that managed solutions could address. More virtualization, more endpoints, more third-party software and equipment are hitting networks, necessitating adoption of automation.

In many ways, operators don't really have a choice. While all these technologies have been on the roadmap, they're now requiring prime-time utilization, in some cases years ahead of what had been planned. The good news is that these new innovations are proving to be successful in helping to weather the perfect storm, a Pandora's box that can't be closed.

In the past year, we witnessed the dawn of the next generation of innovation that will guide operators on their 5G journeys. There appears to be no end in sight for the flurry of tech headed at operators. There's never been a time when they've faced so much that is so new: new radio capabilities, new frequencies, new delivery methods and new vendors. On the vendor front, compelling new Open RAN initiatives also introduce heightened risks. Interoperability will be a challenge. Security will demand excessive scrutiny. Operators are a far cry from when vertical hardware stacks from a single vendor ruled the day.

## A snapshot of next-gen network innovation

In our [second annual 5G report](#) exploring key market drivers, insights and considerations, we offer a snapshot of the data behind the more than 600 new 5G deals we struck. Eighty percent of our assurance business is now 5G-driven, with that part of the overall business increasing exponentially over 2019. 5G core testing (and all the aforementioned complexity that comes with it) is now a dominant part of our test and validation business. These trends showed only as blips in the tracking done for our 2020 report.

Emerging innovation from these developments and others discussed in this article represent a procession of next-gen innovations that will play significant roles in nascent 5G networks.

## Automation

Lab, test and field automation all got a boost from COVID-imposed physical limitations. In the lab, the question for teams restricted from access was, how can these environments be consolidated, managed remotely and quickly automated?

In test environments, how could efficiency be introduced to accelerate release cycles and create agile pipeline processes to streamline internal and external end-to-end digital supply chains? And how could it all be done effectively across silos?

Even drive testing saw automation-driven advancements. When it's no longer safe for crews to ride together in testing vans, what do you do? It turns out that you lean more heavily on automation to complete test drives in a process led by just one crew member supported by a remote team.

Automation is quickly becoming a priority, with an understanding that it cannot happen in silos. Seamless, holistic automation across the business is what will be required to meet performance and reliability needs.

## Continuous testing

Continuous integration and deployment (CI/CD), the foundation of continuous testing (CT), helps guarantee quality and performance throughout the lifecycle, from pre-deployment through activation, into live operations and ongoing change management. It all goes back to what it takes to move swiftly through those multi-vendor, high software volume, new processes environments.

In the APAC region, the pursuit for enterprise is in full gear, whereas in the west, efforts on this front are just ramping up. Successfully serving the commercial markets will demand operators have agile network environments that can adapt to the needs of the moment. In this regard, CI/CD is the linchpin. It entails testing and validating through every phase, continuously, whether it is pre-deployment or monitoring configuration changes in the field.

There is a big push for operators to embrace CI/CD now as the multivendor 5G core network becomes a reality, bringing with it a requirement for virtualization and third-party, multi-vendor support in multiple environments.

## Active testing

Passive monitoring had a major role in keeping tabs on performance at important locations within the previous generation of mobile networks. Passive assurance relies on statistical analysis conducted on a deluge of real traffic flowing through the network. It is relatively expensive to deploy and relies on live traffic to produce insights about where problems may exist.

5G is increasing focus on active monitoring, where synthetic traffic is injected into the network 24-7 to understand how the network performs at any given moment. It offers several benefits over passive testing. First, it is less expensive to deploy, making it easier to roll out across the network instead of just at key locations. Second, with traffic relatively light on 5G networks today, active testing's synthetic traffic approach ensures that operators always have a sense of how networks are performing, whether they're under heavy use or any use at all. Third, it's far more cost-effective to deploy, especially in cloud environments where storage, processing and bandwidth all run up the price of testing, monitoring and crunching data around actual traffic.

Active and passive testing play a starring role in active assurance and passive assurance efforts that will ensure networks meet stringent performance requirements. Active testing already began making a name for itself in 5G networks. In 2020 alone, we saw over-the-air user experience tests from fixed field locations, progressive active tests to rapidly isolate issues across domains and paths, and 5G non-standalone pre- and post-launch performance testing, laying the foundation for eventual standalone 5G upgrades

## Managed solutions

As touched on throughout this article, operators are seeking new partners at every turn to offload burdensome demands, when they don't have the people, expertise or time to manage themselves. Networks are just too distributed and too diverse. There's too much software from too many vendors, all with different release schedules. There are too many security risks threatening performance, data loss or worse.

In recent Test-as-a-Service (TaaS) engagements with operators, major network releases accelerated threefold, from six months per release to one every six weeks. In recent Lab-as-a-Service work, operators saw 300x faster testbed setup and a 320 percent increase in test capacity due to automation, which minimizes manual test hours.

Yes, it seemed to happen overnight, but being stuck between a rock and a hard place tends to accelerate innovation and market trends. Whatever the next normal is, we know it will represent significant change. Telecom network management and testing will be no exception. Recognizing this reality compels operators to rethink their validation strategies and to aggressively reshape and redeploy operations and teams as the market demands.

## An innovation pipeline

The developments discussed here aren't just about moving fast or keeping up with the competition. They're about building an enduring business that can pivot on a dime—a feat not currently within reach for legacy telco networks. Operators won't have many months to stand up and build out services or purpose-built networks when enterprise customers come knocking. Instead, they'll need to look a lot more like cloud providers: at the ready when the need arises.

On the journey, telcos will meet new and old competitors alike. They too will have positioned themselves in their own way to be agile with a robust service set. While the competition will be formidable, telcos making the necessary moves today will find themselves ready to compete effectively, staking out dominant positions in the markets they're targeting.

Thriving in this new environment means transforming telecom innovation pipelines, from design and development all the way through to deployment of new network-based products and services. The ultimate goal is for organizations to move from a handful of waterfall-style network

releases each year, to a steady stream of continuous network development and integration. This means new test infrastructure, new labs, new experts, new processes and new training.

Consider the recent success of a global top-five operator in its quest to rapidly deploy a new cloud-native 5G core and ongoing releases. It faced steep challenges collaborating efficiently with multiple network vendors. Despite considerable experience and capabilities, the operator still lacked the time, resources and tools to move as fast as it needed to hit ambitious goals. The collaboration transformed the operator's ability to release new features quickly.

## **Forecast for 5G remains stormy**

Our current forecast suggests that we will not see the clouds break in this perfect storm anytime soon. But with a full pipeline of innovation ready to provide cover, operators should be more confident than ever in global 5G pursuits. Driven by rethinking their strategies, the transition to a new way of working will surely unleash the unexpected, but operators have demonstrated a resilience this past year that makes it clear they're ready to stand up to any challenge. By this time next year, processes may look vastly different, but the vision of what's possible for 5G will be clearer than ever.