Powering the Autonomous 5G Core

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To compete in the 5G marketplace, communications service providers are moving beyond consumers and on to enterprise customers as their target audience. In order to deliver services and experiences tailored to enterprises, however, providers are challenged to glean even more from their 5G networks.

We are beginning to reach a point in the communications industry where the fabric of the network is not just programmable, but intelligent. Today, we are partnering with communications service providers (CSPs) to transform data center strategies and ultimately automate operations across the core. The cloud-native core of the network will evolve into 5G core network function automation, with capabilities eventually able to feed insights into the network and support optimization of policies and

applications through predictive analytics. Achieving this level of analytics mastery will empower CSPs to answer the most important business questions, and identify insights critical to developing new 5G- enabled business opportunities.

Laying the foundation

Regardless of the ultimate goals with automation, the data architecture needs to be prepared. To achieve this, CSPs must rethink their automation strategy, from the infrastructure to the core network, as well as to the applications layer. Integrating cloud-native principles into the network is one of the major areas of investment CSPs must make in their transformation journey. Establishing the foundation with cloud-native technology will be imperative for service providers to refine their 5G

Core automation strategy and ultimately deliver innovative 5G services. A highly automated, agile networking fabric will provide the foundation for a scalable, reliable network experience. If the network is built properly, then a flow of data moving from the acquisition stage through the analytics stage can be created. Facilitating that full flow through the cycle is critical and can enable an insight-driven system similar to that of the hyperscalers. Over time, this flow will become a web of insights that has the potential to inform business decisions.

A recent survey conducted by Analysys Mason identified that the majority of CSPs are not ready for the automation, programmability, and agility requirements of 5G, edge, and new enterprise service opportunities. Yet, they are motivated. The top three drivers of CSP data center strategies include supporting new enterprise managed service opportunities (87%), supporting telco cloud (such as 5G Core) deployments (60%), and supporting edge computing deployments (47%). The findings of the survey deduce that CSPs know they need to modernize and automate to succeed in the 5G era. In this article, we will define how to achieve network automation.

Step 1: Data driven

With data becoming a key component in the digital economy, CSPs must first understand what type of data they have and its value. As the 5G network opens up CSPs to the enterprise opportunity, it will be critical for operators to harness the massive amounts of application and network data being generated to understand which of the new revenue streams—and industry verticals—to pursue. Providers will be constantly tasked to make decisions regarding these opportunities—what they want to optimize, and how to differentiate themselves in the market. To do so, service providers are employing network analytics, but as a first step they are embracing the data available to them.

As one of the initial steps of transformation, operators will embrace data-driven insights to make more informed business decisions based on trusted network data. As tools are leveraged to increase pattern detection with machine learning, operators will be able to determine predictions and make strategic decisions based on network and service behavior. A CSP who is making informed decisions using trusted historical network data is improving upon core elements of their business—namely, customer experience and operational efficiency.

Step 2: Analytics driven

Data and analytics are bringing incredible opportunity to the telecommunications industry—and they are only growing in scope. According to global consulting firm McKinsey, AI and analytics could make

an estimated total impact of $174.2B on the telecom industry. To embrace holistic automation, we must employ analytics, telecom industry. To embrace holistic automation, we must employ as it plays a significant role in understanding the performance of the network and identifying critical problem areas or gaps.

Utilizing network analytics tools, such as Oracle's Network Data Analytics Function (NWDAF), enables CSPs to make strategic decisions with all relevant data and unbiased predictions leveraging AI and ML. In turn, this improves network security and compliance, and enables closed-loop, pre-packaged business use cases. Insight-driven analytics can marry customer data with operational and network data to answer the most important questions, such as identifying the best business park location to lay

fiber, or what the next offer should be for a specific subset of customer. Data can be used across different lifecycles of the network, and it can be mined to support nearly any business objective. Data Director, the latest solution available in Oracle's Network Analytics portfolio, enables providers to flexibly integrate their 5G core into their existing operations tools—even for network functions that are not provided by Oracle. In building the solution, we embraced cloud-native principles for accessing data in a secured 5G network environment, making it ideal for those who have already adopted next-generation analytics frameworks—as well as for those who still rely on traditional operational tools and platforms.

Step 3: Analytics mastery

Lastly, with analytics mastery, carriers will be optimizing operations by using trusted data pervasively and enriching analytics with services that drive automation. Driving service innovation with insights from trusted data and enriched analytics will lead to greater cost efficiency, and the ability to carve out new revenue streams, driving business into the future.

At this point in the carrier journey, mastering analytics will not only provide valuable business insights, but will also facilitate the recommendation of actions to higher level management tiers such as service orchestration or a service assurance platform. Ultimately, network operations will be fully automated.

Automating the core network

Automating the core network is particularly critical as operators deploy 5G standalone core networks. Different than previous generations, 5G is designed to operate in an ecosystem, rather than simply support voice messaging and broadband internet. 5G is built for the industrial IoT and can plug into an existing ecosystem to support a variety of current and future monetization opportunities.

Additionally, as 4G and 5G will coexist for some time, automation will perform a significant role in ensuring seamless interworking between the two technologies. Automation of the 5G core will

optimize the service experience of users across 4G and 5G—positively impacting end users' experiences. Automation will empower faster and more efficient testing and detection. Through automation, operators will be able to adapt rapidly based on new use cases and network changes.

Automation creates a more agile approach for the business and can shape strategy. As telcos begin to compete in the larger enterprise space, automation will be critical. At Oracle, we work with our CSP partners to automate the network by releasing our Network Functions on a quarterly basis—complete with all new features. To help CSPs keep pace with innovation and the rising need for instant gratification in the consumer space, we support end-to-end automation across their networks. It is possible for service providers to innovate the same way the rest of the world does—with a cloud-native, open-source foundation—but they must first get the architecture and data right within the network, creating a stable place from which to identify new opportunities and unlock business value.

The future of 5G

The communications industry is moving into a new era—one with enterprises as customers rather than consumers, new technologies in 5G and cloud, and entirely new approaches to working in order to deliver agile, fast service through analytics and data science. While this precipice of change can seem daunting, the outlook suggests it will be well worth the journey.

As we think about 5G and all of the new abilities, experiences, and revenue streams it will bring in the coming years, it's very clear that automation is at the heart of taking advantage of these opportunities. With the right strategies in place, operators will be able to conquer the complexity, scale, and diversity of the fifth-generation network.