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Simplifying Network Transformation

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There's an adage about dealing with complex things in life: "Keep it simple." Coined by Lockheed Martin engineer Clarence Johnson, who oversaw the development of the SR-71, the world's first "stealth" plane, the "KISS principle" has become a guiding principle for project development the world over. Whether the project is as simple as writing an article or something as complicated as designing a jet aircraft, this mantra is a great reminder of the constant need to eliminate complexity wherever and whenever possible.



Telecom network transformation can be a lot like redesigning and rebuilding a plane while it's in flight. From decisions about which chipsets and antenna to select to discussions around use cases and plans to future-proof their networks, operators face multiple complex decisions—all needing to be made while delivering uninterrupted services to customers. As demands on networks—especially the Radio Access Network (RAN)—have increased, while the average revenue per unit (ARPU) is steadily dropping, operators across the world are looking to reduce the cost of production while increasing software programmability and flexibility of the network—while still allowing them to offer superior services to end customers.

How can an enormous task like the fundamental redesign of operator networks be simplified? What can operators do to apply the KISS principle to their network transformation efforts?

Automation first

One of the best ways to simplify network transformation is to prioritize automation from the beginning. Intelligent automation powered by AI/ML-based software can not only simplify network operation but also create greater efficiency as the network scales. For example, a Tier One operator in South Asia has embraced automation, enabling intelligent automation of every

single antenna in its network. These antennas are remote tilt-enabled and are controlled by AI bots that make configuration changes throughout the day to adapt to changing network traffic patterns and to address issues at that point in time.

Intelligent automation can also help operators deal with system alarms more effectively. For example, the same operator uses intelligent automation to deal with day-to-day network operations. In a network that serves over 430 million subscribers through 340,000+ cell sites and half a million small cell sites, it is not uncommon for their network to generate over a million alarms daily. Through intelligent automation, however, most of these issues are quickly resolved by software bots, and only about 10,000 of them require an individual to intervene, and those tasks are also automatically assigned with very minimal manual or supervisory intervention with the concept of “Direct to Doer” assignments.

By committing to automation early in the network transformation process, operators can ensure success while keeping day-to-day operations simple, effective and efficient.

Open RAN - product integration, not systems integration

The Radio Access Network (RAN) is the last frontier in the network transformation movement to virtualize, disaggregate and make networks based on open standards. The RAN is complicated because of the multitude of variables involved from band support, antenna configurations, chipsets, TDD/FDD, numerology, deployment conditions, use cases and much more. Operators need to consider approaching Open RAN untraditionally. They should no longer approach it as a systems integration problem in which they are essentially trying to integrate the new network functions as black boxes. Instead, they should adopt a product integration approach that treats the network functions as white boxes.

This open product integration approach to network transformation allows operators to begin to select individual products that meet their current needs, as opposed to a one-size-fits-all solution that delivers very few customization opportunities. An open ecosystem gives operators access to a variety of hardware and software vendors that they can choose to roll out based on their own use cases. Open RAN in particular gives operators the flexibility in their RAN networks to split various functions like the Antenna, Radio Unit (RU), Distributed Unit (DU) and Centralized Unit (CU), all of which used to be integrated into a single black box base station.

While this approach can increase the complexity as operators aim for a mix and match of vendors across these subnetwork functions, the biggest advantage is operators’ increased ability to control their networks from Day 0 (lab phase), Day 1 (deployment) and Day 2 (operations). As we noted earlier, the inherent automation of the site configuration and integration across these stages is what makes this possible. Just six or seven years ago, major operators in North America did not have access to the configuration tools used to integrate their cell sites.

The increased complexity and relative maturity of the technology and standards can mean the introduction of an Open RAN-based RAN will face integration issues and product performance tuning issues. This is when adopting a product integration approach (white box) as opposed to a

systems integrator (black box) is necessary for faster integration. In general, Open RAN ensures operators have more visibility into their own networks and in turn, allows them to be much nimbler and more responsive and able to roll out services to their customers more quickly.

The simplification playbook

One of the challenges with a transition to an open network can be about tackling many different variables ranging from addressing workload and payload applications based on use cases, to determining the radio chipset and the processor chipset for the hardware platforms. Depending on the use case, operators may also need to determine antenna configurations and whether to deploy massive MIMO versus regular antennas.

Having a well-defined playbook based on real-world experience in transforming traditional networks into digital networks is essential to achieving network transformation success. An effective playbook helps simplify and reduce the number of variables and address network transformation in a stable, yet customizable manner. Operators need to ensure they have a playbook that is capable of helping them reduce the variables and can walk them down a clear path based on the deployment scenarios. A well-defined playbook enables the operator to limit the above-mentioned variables and work together with their vendors to choose the kind of hardware and software needed, which in turn allows them to choose the kind of DU, CU, and RU, which then helps dictate the chipsets, the radio, and antenna. For example, the aforementioned South Asian operator is now rolling out its 5G network based on Open RAN standards using its playbook to focus on form factors for outdoor small cells, indoor small cells, and CU/DU located to cell sites based on three use cases.

While traditional vendors may have done this for operators in the past, the operator rarely had a say in the composition of the various hardware and software elements in the solution, or the visibility into the solution to make the customizable changes open networks offer today. A truly effective network transformation playbook puts the operator in the driver's seat, empowering them to make the choices to tailor their networks to meet a variety of use cases.

Operators should look for someone who has developed a playbook based on a deep history of understanding the various protocol layers as well as real-world large operator deployment experience and scars from learnings—and who has a deep understanding of how to integrate the various control and management planes across the RU to the DU to the CU, and then fine-tune the underlying hardware and be able to allocate the workloads across different CPUs.

The choice is simple

Network transformation in and of itself is not simple. However, by thinking automation first, adopting a product integration mindset, and identifying a system integrator with a playbook developed from real-world experience driven by operators themselves, network transformation can be simplified.

The mantra must be “keep it simple.” Anything else is just, frankly, silly.