What the evolution of 5G means for government

The leap to virtualization with 5G is spurring innovative advances in this network-essential technology

Greg Burrill
Dell Technologies

MANY 4G AND OLDER technologies were largely built on proprietary platforms, which required custom-built pieces of hardware specifically scaled for a certain area of deployment. By contrast, 5G is the first generation of cellular technology that's cloud native, which means it has the flexibility to be fully virtualized and deployed in several different architectural designs, hosted on commercial servers.

Agencies now have the ability to dynamically scale up or down depending on the network load at the moment. In addition, many large hyperscaler cloud vendors are exploring ways to provide 5G as a service and combine the virtualized network function with cloud-hosted workloads, integrating the telco workload into the traditional IT stack.

OPEN ECOSYSTEMS AND VIRTUALIZED RADIO ACCESS NETWORKS

Industry leaders are also seeking to adopt virtualization of the radio access network (RAN) itself. The RAN component is the portion of the network that encodes and decodes all the traffic and does all the "heavy lifting" with regard to managing the transmission of data between end-user devices and the host network.

A number of chip manufacturers are developing more efficient ways to handle those core compute tasks via innovative chipset architectures or accelerator cards. In the next several years, there will likely be a concerted effort to fully virtualize RAN deployments and fully integrate telco workloads into the edge stack, enabling the support of use cases with the help of multi-access edge computing.

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Another exciting advance is the development of open ecosystems underpinned by the expertise of organizations such as the O-RAN Alliance. The goal is to establish a universal standard that will allow customers to plug products from different vendors into a 5G network. This approach will provide agencies flexibility regarding deployment, price points and supply chain resiliency.

TAILORING 5G TO GOVERNMENT NEEDS

At Dell Technologies, one of our largest areas of specialization is network infrastructure. We maintain a multitude of reference architectures for cellular networks, supporting both public and private network deployments. Dell is focused on validating partner offerings and ensuring critical telco workloads perform flawlessly on commercial servers, from the RAN all the way back to the 5G core. We also have a fully ruggedized line that meets the Defense Department's MIL-STD 810 environmental standards, as well as meeting NEBS compliance.

In addition to providing a backbone for hosting virtualized network functions, we work with multiple vendors to build solutions tailored to the government's needs. 5G technology and associated standards were built for fairly straightforward deployments in public environments that don't have the additional concerns that agencies face — such as battlefield environments where cellular networks could be under attack or where troops don't possess spectrum dominance. We also fully support open ecosystems that allow our customers greater choice, flexibility, cost savings and resiliency.

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connectivity to data and workloads that 5G facilitates. As a result, those ecosystems are of strategic importance and must be securely designed from the ground up. Security is a key aspect of everything we do at Dell, which is why Dell has launched a center of excellence specifically... focused on enabling robust zero trust solutions — not just across 5G networks, but across all facets of our government customers' compute environments.

When it comes to the latest technologies, Dell stands ready to help government agencies adopt and implement the best solutions that address their unique challenges. ■

Greg Burrill is 5G/networking alliance manager at Dell Technologies.