SOLUTION BRIEF

How QCT MANO Opens the Door to 5G Data Center Success

Automation and Open Source Go Hand-in-Hand for 5G Networks

"It offers a quick view for mobile operators to understand the status of hardware and NFVI, and the resource utilization on each one. The more data and the more details they have, the more consideration mobile operators can put into planning their infrastructure to fulfill their customers' demands."

— Rachel Chu, product manager at QCT

Key Features

- All the information users need on a single dashboard
- Dynamic site mapping of all 5G data centers
- Physical hardware monitoring for a quick overview of data center status
- Easier virtual infrastructure management
- VNF and 5G core visibility and management
- Automation mechanism from baremetal introspection to solution deployment
- An open, flexible, expandable framework to build up a comprehensive MANO system

As 5G becomes more complex, managing it from end-to-end becomes a time-consuming task for telecom and mobile operators in charge of the network. With the right management and orchestration (MANO) platform, telecoms can leverage virtualization and network granularity to fine-tune their control over the network and uphold 5G's promises of connection quality and capacity.

5G is a highly distributed network, relying on distributed data centers in order to bring users closer to the edge. While this enables low-latency use cases and ensures better connection performance, it also means that network operators have more deployment sites to manage.

"Mobile operators need to have a single-pane-of-glass dashboard provide telemery and management for 5G infrastructure and service," said Rachel Chu, product manager at QCT. "[However], in those single clusters or even a single rack system, [telcos] will end up with multiple dashboards to do the management."

Multiple dashboards lead to complications. True end-to-end management requires a single pane of glass on which network operators can truly see and take control of the 5G network across multiple regions.

QCT's MANO solution brings everything mobile operators need to know about their 5G data centers onto one dashboard. This includes site maps, to physical infrastructure status, to virtual infrastructure, to VNFs in the data center and throughout the network.

QCT embraces open source technologies to bring end-to-end automation and visibility into the data center. It also continues to work with the open source community in order to foster a continuous ecosystem that helps support this goal.

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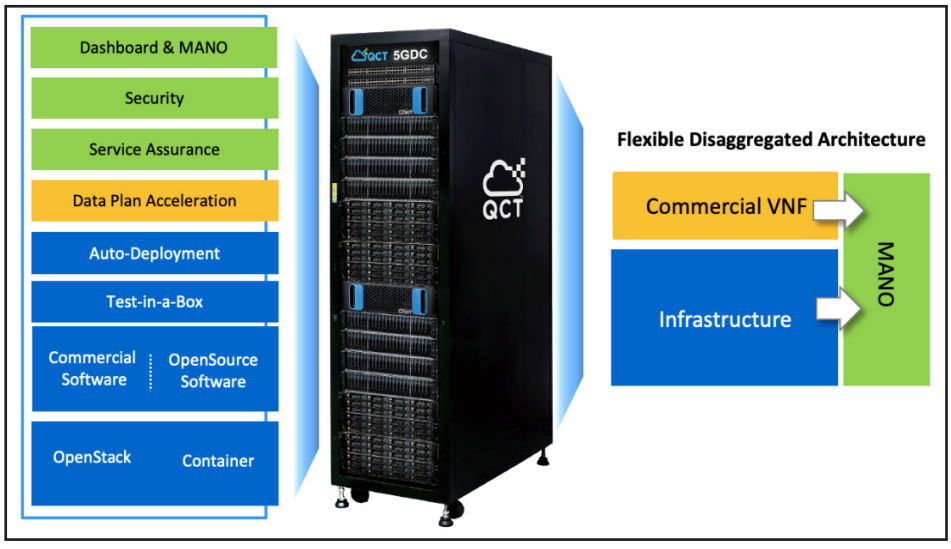


QCT's cloud solution architecture. (Provided by QCT)

resource utilization on each one," Chu said. "The more data and the more details they have, the more consideration mobile operators can put into planning their infrastructure to fulfill their customers' demands."

Ease of Management Through MANO

QCT's MANO solution offers day 0 to day N management, from bare metal automatic deployment to end-to-end network orchestration, and visibility that leads to mature insight throughout the data center's entire lifecycle.

Visibility is key when ensuring stability and performance across a complex network. It enables automation, which is a requirement for managing the shifting workloads in the 5G network. It also allows operators to get an across-the-board view of resource usage and data flows, informing future infrastructure decisions and creating a straightforward way to find where bottlenecks are.

This is also key to telecoms leveraging the best performance possible from their data centers.

QCT's solution follows ETSI's standard for management and orchestration, which relies on an NFV architectural framework that's flexible and disaggregated. Both the data center infrastructure and VNFs feed into the MANO platform, providing a cohesive overview of the network in its entirety, and eliminating the need to flip between different dashboards and handle different data formats in order to gauge network performance.

"How to manage and monitor complex end to end infrastructure or multiple platforms and dynamic resource utilization will be significant for mobile operators," Chu said. "What QCT MANO offers is telemetry and orchestration, which operators will need on a single panel dashboard in order to monitor and manage their infrastructure and services."

Key Features

QCT's MANO solution offers a one-stop shop for 5G data center visibility. This doesn't mean that the overview it gives is simplistic; instead, it offers a detailed report of the network without creating an overload of information. Here are some of the key metrics it displays.

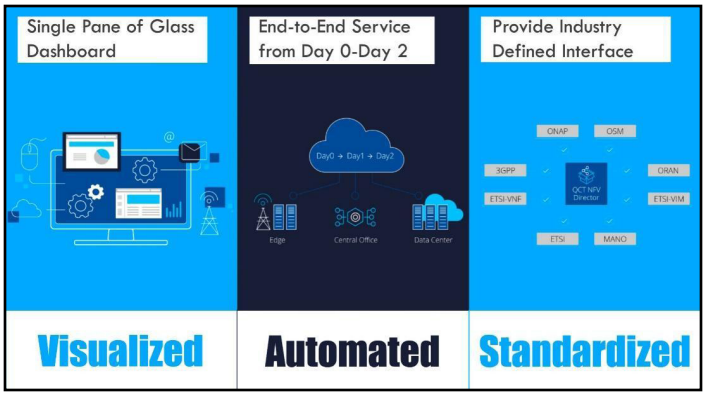
Site Mapping

With 5G's global distribution range, QCT's dashboard provides a mapped view of active data centers that the monitoring telecom has deployed. These can be drilled down into for metrics such as server and rack status, device health, and device temperature.

The dashboard also offers a physical view of the racks themselves, so remote managers can know the rack unit capacity and direct repairs and additions without the need to be physically present.

Physical Hardware Monitoring

Drilling down further into hardware management, the MANO dashboard gives granular control and visibility into the hardware of a telecom's 5G data centers.



QCT's MANO solution key features. (Provided by QCT)

Besides general server metrics like those mentioned above, operators can also get a rack-by-rack breakdown of the NFVI used on the server. They can also view compute, controller, storage nodes statuses, devices disk info, and switch port information in detail. Moreover, mobile operators can do baremetal BMC, BIOS, and firmware updates and upgrades via in-band and out-of-band management.

Virtual Infrastructure

Network operators can view all their virtualized compute, storage, and network components from a single location, tracking CPU, memory, and network capacity from any given location, and for any given point in the network.

QCT partnered with infrastructure independent software vendors (ISVs) in order to build this solution. For example, QCT MANO solution uses Red Hat OpenStack and Red Hat OpenShift as the NFV infrastructure, which is part of its NFVI management system.

The solution supports VMs and containers in the network and the cloud. This is also viewable through the dashboard and can display the servers, network nodes, the number of containers, as well as other virtual network metrics.

VNF Management

Users can view the performance of the VNFs like the 5G core through the VNF management tab. Operators can assess individual VNFs in this way.

For the 5G core, operators get an overview of network throughput, forwarding rate, average packet size, subscriber attachment rate, and real-time power consumption.

This data can be used for real-time assessments and decisions during periods of high demand, as well as informing QCT's automated scaling function for power and bandwidth efficiency, which is expanded on below.

Leveraging Automation Through Open Source

QCT has been working with several open source groups and communities. This, says Karl Chiang, director of QCT's telecom division software development team, enables interoperation and opens the door for automation and machine learning.

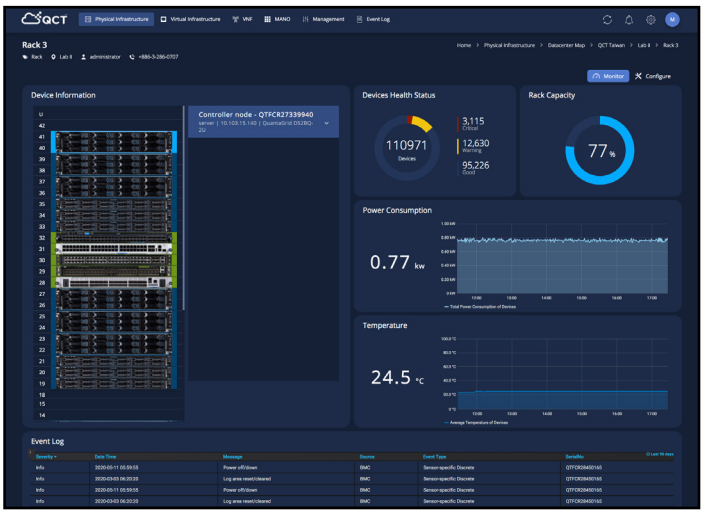
"We created a uniform interface to monitor all the components inside the system. We based it on providing performance metrics in order to meet the requirement of the telecoms' solution," Chiang said. "We work with the [open source] community, like ONAP and OSM. Meanwhile, QCT also works with our commercial partners to integrate their commercial products into QCT MANO in order to provide our customers with an all-in-one management portal."

QCT MANO is an open, flexible, and expandable system. QCT worked with Intel, integrating the MANO system with open source platforms including Open Network Automation Platform (ONAP), TensorFlow, Kubernetes, and Intel technology. It applies 2nd Gen Intel Xeon Scalable Processors with add-on features, including Intel Enhanced Platform Awareness (EPA), Intel Data Plane Development Kit (DPDK), and integrated Intel Quick Assist Technology (QAT) with Intel C620 chipsets to satisfy telco market demand.

To improve the performance of network-sensitive workloads, Intel innovates "N" SKU series CPUs for NFVI to improve system workload performance and services.

Intel power management displays and manages the frequency and configurations of Intel CPUs. Moreover, the gRPC interfaces of frequency servers enable remote-control abilities to remotely control CPU frequency of a service cluster. It showcases the machine learning-driven elastic scaling and power management on top of QCT's 5G Data Center solution.

The optimization feature parses out resources as they're needed, bypassing the power wastage that comes with a standard, non-predictive system. Using open source holds several advantages. It can create a more standard way to monitor 5G network performance across different data centers.



A panel from the QCT MANO dashboard. (Provided by QCT)

This is relevant, as vendors start to rely more on commercial off-the-shelf (COTS) hardware for their network infrastructure.

"As infrastructure becomes open, so will the management and the interface," Chu said. "[Telcos] will have a standard interface, and all the management platforms will be following that integration in combination with the mobile operators, so there will be no vendor lock-ins."

QCT plans to continue their involvement with not only the open source community, but also include third party commercial product integrations as they expand their platform and extend new monitoring capabilities to all aspects of 5G mobile network infrastructure.

For more information, visit https://go.qct.io/telco/5gdc-solution/

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