# VMware Telco Cloud Automation: NFV orchestration for multi-cloud, virtual machine and Kubernetes environments

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VMware has announced the general availability of its NFV orchestrator product, Telco Cloud Automation, which was initially soft-launched as Project Maestro at VMworld Barcelona in November 2019. With this launch, VMware has entered the network orchestrators sub-segment of the network control and orchestration (NCO) market (see Figure 1). VMware is already a key player in the fast growing NCO market; according to Analysys Mason's latest market share reports, VMware was in fourth position in terms of revenue in 2018, when it led the virtual infrastructure managers (VIM) sub-segment, and was third in the WAN SDN sub-segment.[1]

*Figure 1: VMWare's role in the network control and orchestration software and services market*
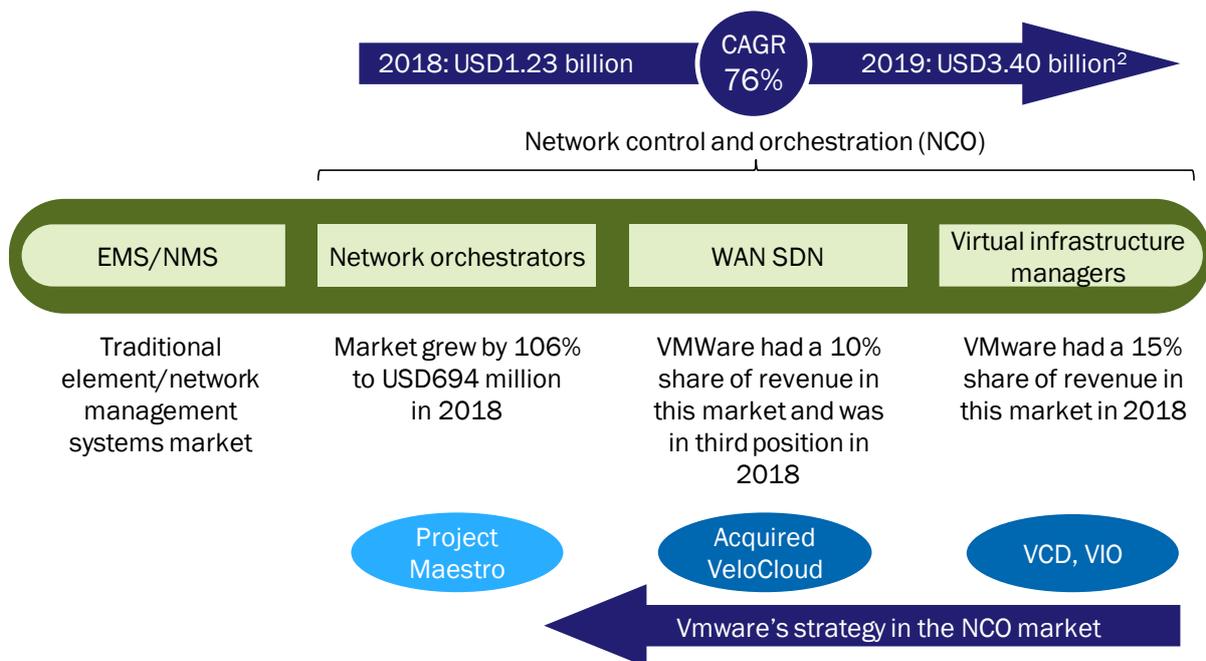


## CSPs are embracing a multi-cloud future as part of their digital transformation strategy

CSPs are adopting a multi-cloud strategy for several reasons, including the rapidly maturing container technology, increasing confidence in public cloud infrastructure to host business-critical applications, sustained

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[1]    For more information, see Analysys Mason's *Network automation and orchestration: worldwide market shares 2018*. Available at www.analysysmason.com/network-automation-orchestration-shares-rma07.

[2]    Estimate.

cost pressure on IT and operations, and the need to move compute resources closer to the point of demand to support low-latency use cases. The following are examples of CSPs' multi-cloud strategies.

- **5G cloud core and vRAN.** 5G will drive NFV deployments in the next 5 years. Specifically, CSPs will implement Kubernetes-based next-generation 5G core with container network functions (CNFs), and they will virtualise the RAN (Rakuten and Verizon are early examples) driven by industry initiatives such as TIP and O-RAN.

- **Edge clouds.** In December 2019, KDDI, SK Telecom, Verizon and Vodafone announced that they will offer AWS's Wavelength at their 5G network edge, enabling developers to build end-user applications that require ultra-low latency in the order of single digit milliseconds. This followed a similar joint announcement by AT&T and Microsoft that the Azure instances will be co-located in AT&T metro data centre locations. Some CSPs may decide to build their own edge clouds, or use third-party edge cloud solutions such as the MobileedgeX, Mutable or Ericsson's Edge Gravity.

- **Public clouds.** Many CSPs are also embarking on public cloud strategies, migrating their business critical non-network applications to public cloud environments (AT&T with Microsoft, Verizon with AWS). Some CSPs have decided to use public cloud providers for their enterprise services, potentially deploying VNFs such as SD-WAN in these environments (AT&T and Vodafone with IBM).

A common theme among these market developments and the cloud infrastructure market at large is the emergence of Kubernetes as the de-facto 'cloud-native' container orchestration technology foundation for these NFV and cloud environments. For example, the 5G cloud core is being built using Kubernetes and most public cloud providers support Kubernetes environments.

CSPs that are already implementing their private network clouds are predominantly using OpenStack technology, but the 5G cloud core will be based on container technology (eg: Kubernetes). Therefore, CSPs not only have to contend with a multi-cloud environment as discussed above, but they also need to manage OpenStack and container environments (initially Kubernetes in VMs using OpenStack) of the NFV infrastructure within their private network cloud.

## VMware has pivoted towards Kubernetes

Throughout 2019, VMware made several strategy and M&A announcements that shifted the company in the direction of Kubernetes. In August 2019, VMware announced Project Tanzu, a suite of products that will enable enterprises to build, run and manage applications on Kubernetes alongside virtual machines, and across multi-cloud environments.

To make Project Tanzu a reality, VMware acquired Bitnami, Heptio and Pivotal to enable rapid Kubernetes-based application development and deployment. Reaffirming its commitment to Kubernetes, VMware announced Project Pacific to embed Kubernetes into vSphere, enabling enterprises to manage both VM and container workloads using a unified management platform. VMware also announced Tanzu Mission Control to enable enterprises to manage Kubernetes clusters irrespective of where they are hosted – on vSphere private cloud, public clouds or edge clouds.

## Telco Cloud Automation for unified multi-cloud orchestration

VMware Telco Cloud Automation combines the best bits of VMware Kubernetes portfolio with vCloud NFV (VMware's telco offering), to bring to market an NFV orchestration product that is built from the ground up to

solve the highly complex issue of orchestrating virtual network function and container network function workloads across VM and container-based multi-cloud environments (private network clouds, edge clouds and public clouds).

VMware also claims that its Telco Cloud Automation product supports open APIs and integrates with VMware's other NFV products such as VMware Integrated Openstack (VIO), VMware vCloud Director (VCD), VMware Smart Assurance. Additionally, it supports VMware integration with public clouds such as VMware Cloud on AWS, Azure and Google Cloud, complies with industry standards/specifications such as ETSI and TMForum and interoperates with adjunct software systems such as service orchestration, OSS/BSS, and third-party automated assurance systems.

## The Telco Cloud Automation product propels VMware into a high-growth market segment that is currently dominated by NEPs and ISVs

CSP spending in the network orchestration software and professional services market more than doubled in 2018, growing by 106% to reach USD694 million, and was on target to exceed USD1 billion in 2019.[3] The market is dominated by network equipment vendors (NEPs) such as Ericsson, Nokia and Huawei; OSS/BSS and IT vendors such as Amdocs, Netcracker and IBM; and systems integrators such as Accenture and TechMahindra.

The ability to automate NFV orchestration across multi-cloud VM and container environments combined with the ability to use standards-based open APIs to integrate with adjunct operational systems to enable network automation is going to be critical for CSPs to succeed in their multi-cloud strategy in the 5G era. VMware Telco Cloud Automation's cloud-first approach for NFV orchestration, supported by the company's broader vCloud NFV offering and an ambitious Kubernetes strategy, puts VMware in a strong position to compete in the NCO market.

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[3]  For more information, see Analysys Mason's *Network automation and orchestration: worldwide forecast 2019–2023*. Available at www.analysysmason.com/nao-forecast-2019-2023-rma07.