

VMware's Cable Cloud Solutions

Accelerate the Path to Next-Generation Cable Services

The Opportunity

With the continuous investment and innovations in the cable network, operators have enjoyed consistent returns from solid broadband growth over the past few years. This growth is expected to continue due to changing demand and usage patterns related to the increase in work-from-home and distant learning activities. The resulting amount of new and personalized video traffic will drive an exponential growth in bandwidth demand and network expansion for the next few years.

According to the Cisco VNI report¹, 71% of the total IP traffic will be from wireless, WiFi and mobile devices by the year 2022. With their large, existing residential subscriber bases, cable operators are in a unique position to capture new revenues and gain market share in wireless and mobile services, whether by offering mobile services via mobile virtual network operator (MVNO) agreements or their own wireless spectrum as mobile network operators (MNOs), backhaul services, private connectivity, or other 4G/5G services. In order to successfully capitalize on these growth trends, cable operators will need to architect their networks to run multi-services and operate efficiently in a multi-access network environment, while maintaining high levels of quality of service (QoS) and quality of experiences (QoE) for their customers.

Business services, including both B2B and enterprise services, continues to be an attractive, growing market opportunity for cable operators. Whether offering voice, broadband and/or surveillance services to small and medium size customers, or SD-WAN or private connectivity to large enterprises, cable operators will need to become more agile in order to provide highly reliable, scalable and secure enterprise-grade services at the scale and speed required from within their complex environments.

In addition to residential and business services, 5G capabilities and innovations will create a new wave of market opportunities, while fueling competition among a number of new players over the same residential and business customers. All communications service providers (CSPs), including telcos, MNOs and MVNOs, are racing to capture the market leadership position by offering immersive quality and differentiated services. Cable operators need a cohesive cloud strategy running horizontally and consistently from the datacenter to the edge, as well as an integrated, vertical operations plan that will dramatically decrease time-to-market so they can catch up and compete within their same residential and B2B markets. Additionally, cable operators need to establish an open and flexible platform, one that enables them to leverage service innovations from third-party developer communities and ensures that their popular apps are available instantly on-demand across any cloud and on any device, anywhere.

The Challenge

Many cable operators have begun virtualization trials in the labs and in the field, and some have deployed various levels of virtualization or software running on off-the-shelf servers for various kind of applications, most notably over-the-top (OTT) video streaming and cloud DVR for their video business, vCMTS on their broadband business, and also SD-WAN and managed security services in their business services. Despite all of these efforts, the journey of cable transformation is still in its early stages. There remain a number of near-term challenges that cable operators are or will be encountering:

- Fragmented and monolithic approaches that are vendor- and/or application-specific related to service delivery and operations management
- Costly and time-consuming transition to a distributed, multi-access, multi-services architecture
- Hard recruitment and training of technical expertise in both cloud and security, and the inefficient, hands-on management of daily or weekly software and services provisioning as well as software updates across the network
- Extensive integration and regression testing of every infrastructure component

- Orchestration and automation across the network and multi-cloud environments
- Lack of network visibility and serviceability to operate and manage proactively
- Limited agility and service innovations that are highly dependent on legacy vendors
- Continual struggle with limited rack space and power
- High cost-per-bit to keep up with the bandwidth demands that are consumed by other over-the-top providers

The Journey of Cable Cloud Transformation: Strategy and Framework

Cable operators need a cloud platform strategy and framework for virtualization, which anticipates multiple applications and software-driven technologies running from datacenters/headends to the hub sites, drives operational efficiencies across their service portfolio, expands to new markets and generates new revenue streams.

A cloud transformation is a necessary step towards a new operational and business model that modernizes the infrastructure with a high performance, data-plane technology coupled with both workload automation and integrated operations management.

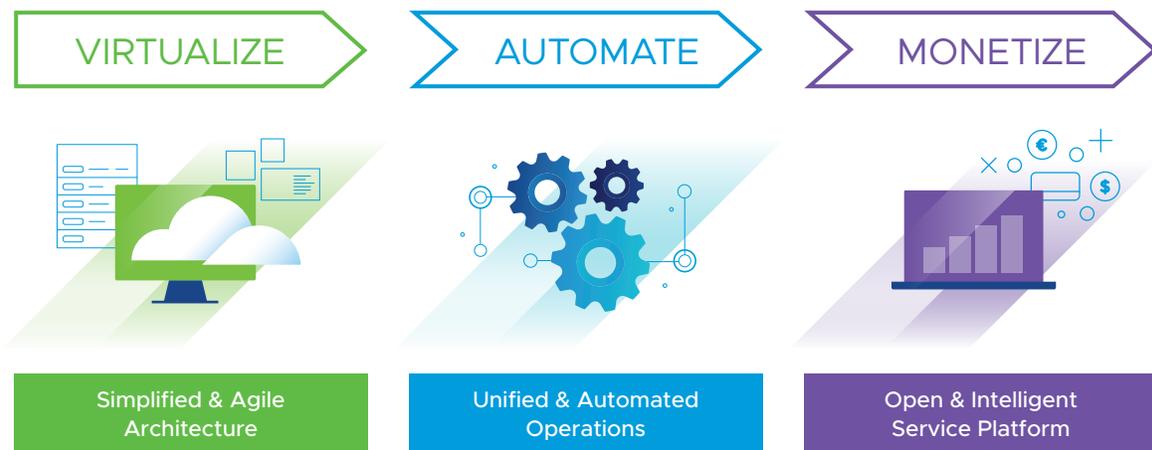


FIGURE 1: The Journey of Cable Cloud Transformation

To address these opportunities and challenges, many cable providers are turning to VMware's cable cloud solutions.

VMware's Cable Cloud Solutions

VMware's cable cloud solutions enable cable operators to transform the network and unify operations across any network in any cloud for any application running on any device. It expedites innovation cycles, reduces operational complexities, and generates substantial TCO savings over other approaches, further accelerating the cable transformation journey to next generation clouds.

With VMware's cable cloud solutions, cable operators accelerate their network transformation and services deployment with a consistent cloud platform that extends throughout the infrastructure, automation and operations, across the network from the core to the edge, and in multi-cloud environments. Using a cloud-first approach, VMware's cable cloud solutions deliver a new level of operational agility for virtual, cloud-native, and edge network functions.

VMware's cable cloud solutions are powered by a field-proven VMware Telco Cloud Infrastructure, coupled with VMware Telco Cloud Automation, that is further enhanced with VMware Telco Cloud Operations.

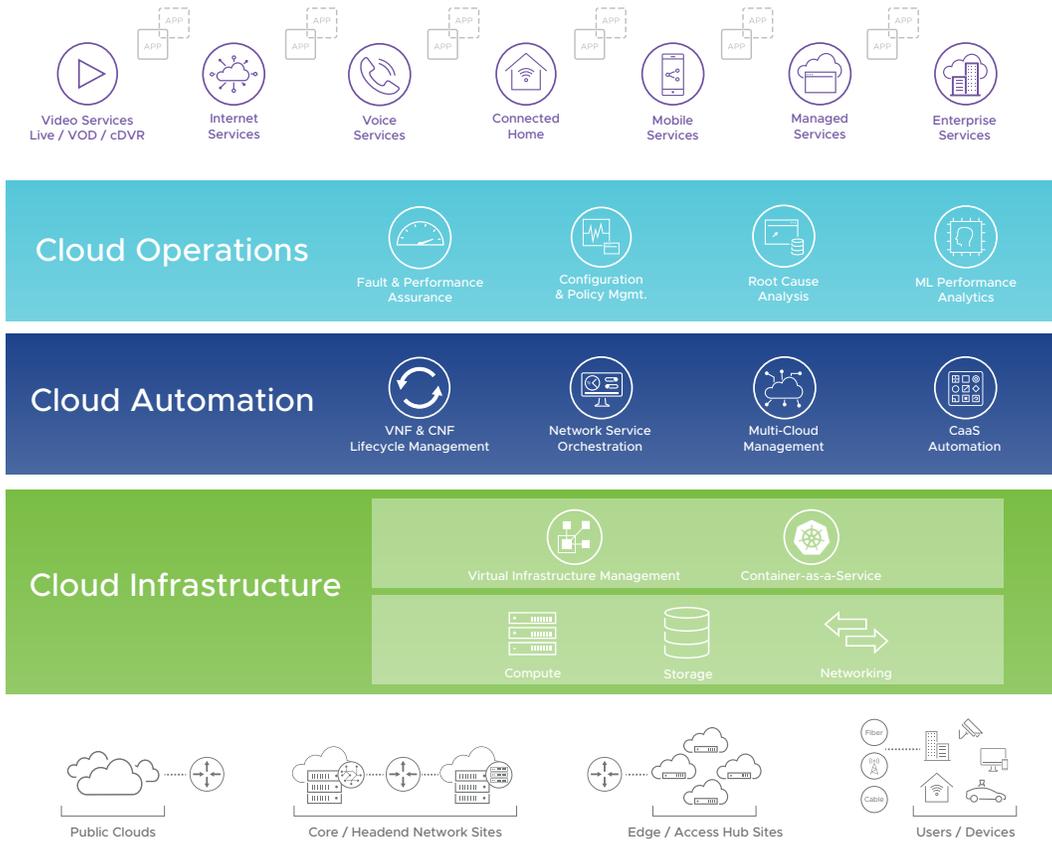


FIGURE 2: VMware's Cable Cloud Solutions

Future-ready Virtualization with VMware's Cloud Infrastructure

Continuing to build on the success of VMware vCloud NFV in global CSP networks, VMware Telco Cloud Infrastructure is the latest evolution of the VMware vCloud NFV. It supports both the ETSI-compliant NFVI functionality as well as the latest cloud-native technologies, bringing in a broad set of VNFs and cloud-native network functions (CNFs).

With extensive experience deploying NFV infrastructure in CSP networks, VMware is best positioned to provide a flexible and future-readied virtualization path for cable operators.

VMware Telco Cloud infrastructure is a consistent, horizontal hybrid infrastructure running across any network in any cloud for any application. It enables cable operators to simplify their architecture, reduce silos, and optimize their network resources to scale. By sharing underlying infrastructure resources with zero-touch provisioning, it reduces total cost of ownership (TCO) from both CAPEX spent on equipment and also OPEX spent for all the facility-related costs such as rack space, power and personnel resources at the headend and hub sites, accelerating the path to Distributed Access Architecture (DAA).

- Hybrid IaaS and CaaS Infrastructure for simplifying and future-readying cable network transformation. A consistent, horizontal hybrid infrastructure to deploy both VNFs and CNFs side-by-side across the network, from the core to the edge.
- Zero-Touch Provisioning for simplifying operations by automating the provisioning and expansion of new sites from Telco Cloud Infrastructure up to network functions and services.
- Popular and proven vRealize suite used by thousands of IT professionals for consistent operations and also reduces the need for training.

- Carrier-grade networking with complete multi-tenant service separation across NFVI functions (virtual compute to networking) and enhanced network resiliency and distributed stateful firewalling
- Carrier-grade Kubernetes: in addition to performance and management enhancements, CaaS enhancements on utilizing microservices with resource-optimized carrier-grade Kubernetes runtime.

VMware Telco Cloud Infrastructure includes industry leading virtualization products — vSphere for compute, vSAN for storage, NSX for networking, vRealize Suite for operations, along with vCloud Director and VMware Integrated OpenStack as virtual infrastructure manager (VIM), and Tanzu Kubernetes as CaaS.

Unified Orchestration and Automation Across Any Network in Any Cloud with VMware's Cloud Automation

As cable operators are building towards a highly distributed, multi-access, multi-service- edge network architecture, transitioning from physical appliances to multi-cloud and cloud-native operations, they require an open and extensive orchestration and automation platform. Addressing this new management complexity while increasing operational efficiencies demands a platform capable of bringing together all of the multi-vendor components seamlessly, such that operators can build, run, manage, connect, and protect network services across any cloud.

VMware Telco Cloud Automation provides multi-layer automation for consistent operations across any network including cable and Radio Access Network (RAN) environments in a converged, multi-access architecture. It provides cable operators with the scalability, repeatability, velocity and operational efficiency needed to serve hundreds or thousands of remote edge sites. Cable operators can deploy, redeploy, and upgrade new services, as well as add, remove, and reallocate capacities and capabilities for specific service groups, or a new service group, in a reliable and automated fashion.

VMware Telco Cloud Automation also automates the placement and lifecycle management of network functions over VM- and container-based infrastructure. The platform is designed to comply with ETSI and CNFC industry standards to simplify integrations and facilitate continuous multi-vendor interoperability.

- Network Function Management to unify and standardize network function management across both VM and container-based infrastructures
- Virtual Domain Orchestration to simplify the design and management of centralized or distributed multi-vendor network services
- Multi-Cloud Infrastructure and CaaS Automation to ease multi-VIM/Kubernetes Clusters registration, enable CaaS management, synchronize multi-cloud inventories/resources and collect faults and performance from infrastructure up to network functions
- Policy and Placement Engine to enable intent-based and multi-cloud workload/policy placements from the network core to edge, and from private to public clouds
- Standard-compliant architecture to integrate with multi-vendor implementation and pre-certification of 3rd party network functions via the VMware Ready for Telco Cloud program to reduce integration efforts and risks
- Native integrations to VMware Telco Cloud platform and VMware Cloud portfolios to streamline the cable operator orchestration journey with faster product-based deployment and simplified maintenance

Intelligent Operations Insights for Superior QoS and QoE with VMware's Cloud Operations

As cable operators continue digitizing their networks to the edge in a multi-access, multi-services DAA architecture, their networks become increasingly challenging to operate. Such challenges make it more difficult to respond to changing market dynamics quickly, operationalize new services rapidly, and maintain the highest quality of service delivery across the network.

VMware Telco Cloud Operations is a real-time assurance solution designed to simplify your network operations through holistic monitoring and performance management, providing comprehensive visibility and automation. It proactively avoids problems and increases agility to meet your business objectives. It simplifies the monitoring and management of your complex network with integrated performance analytics based on machine learning and automated fault analysis. Its reach spans across multiple layers of the network, correlating the virtual services with the underlying infrastructure, breaking down the barriers between the virtual and physical worlds.

- End-to-end assurance to holistically manage your complex, multi-vendor virtual & physical networks.
- Performance management, fault management and business impact management in one.
- Single pane of glass network management that correlates service health to virtual and physical network infrastructure
- Performance analytics based on machine learning reveal actionable insights, detect performance anomalies and trigger alerts
- Multi-vendor SD-WAN monitoring including VMware SD-WAN by VeloCloud and Cisco Viptela
- Multi-tenant monitoring of multi- vendor cloud, LAN and WAN solutions in a unified view
- Automated root-cause analysis of issues across multiple network layers including SD-WAN, SDN and NFV environments
- Prioritization of issues based on business priorities and impact
- Closed-loop actions and remediation of problems via integration with orchestration and OSS tools

Learn more

To learn more about VMware's cable cloud solutions, please visit www.vmware.com/cablecloud or contact your VMware representative.