Communications service providers (CSPs) are transitioning from physical to cloud networks to gain operational agility, network resiliency and lower operating costs. This shift marks a radical departure from the traditional single-purpose hardware appliance model, especially as CSPs must now design and operate services across a web of data centers and clouds while enabling interoperability across competing software vendors.

Given the complexity of coordinating new cloud technologies and network functions and managing multiple services, CSPs want an automated approach that removes complexity and error-prone manual processes. To address these challenges and improve operational efficiency, CSPs are turning to VMware Telco Cloud Automation.

**What is VMware Telco Cloud Automation?**

VMware Telco Cloud Automation is a multidomain automation platform that accelerates time to market of communication services while igniting operational agility through unified automation across network domains and clouds. It offers consistent multi-cloud operations (Days 0, 1 and 2) for each layer of the telco cloud, from infrastructure to services, and it streamlines the CSPs’ orchestration journey with native integration to VMware Telco Cloud. VMware Telco Cloud Automation is grounded in compliance with standards and a broad ecosystem of certified partners, limiting implementation risks and enabling an open, best-of-breed modern network architecture.

VMware Telco Cloud Automation applies a cloud-smart approach to abstract the cloud evolution complexity and delivers network resources on-demand, thereby lowering operating expenses, optimizing infrastructure investments and bolstering the delivery of revenue-generating services.
VMware Telco Cloud Automation core management and automation modules

- **Centralized multidomain, multi-cloud network management** with distributed control offers a single pane of glass and consistent experience to provision, monitor and manage telco cloud NFV and cloud-native software for radio access network (RAN), edge and core domains over private and multi-cloud infrastructure. VMware Telco Cloud Automation also provides APIs to act as a single point of integration to CSPs’ existing DevOps practices and continuous integration, continuous deployment (CI/CD) tools.

- **Domain orchestration** simplifies the design and management of single to multi-vendor network services in a centralized or distributed network architecture using NFV and cloud-native network functions.

- **Unified network function automation** standardizes multivendor network functions onboarding, instantiation and lifecycle management over virtual machine (VM) and container-based infrastructure. Combining the network function layer with the underlying infrastructure management allows for better placement and resources allocation.

- **CaaS automation** reduces the complexity to deploy and operate Kubernetes at scale in a distributed and multi-cloud network architecture. CaaS automation facilitates the registration of existing Kubernetes clusters or the provisioning of new ones and their lifecycle management, including post-deployment customization and Kubernetes version upgrades.

- **Infrastructure automation** focuses on accelerating the network expansion by automating the provisioning software at new sites or adding compute capacity to existing ones.

**Operational efficiency and multi-cloud agility**

VMware Telco Cloud Automation delivers operational efficiency at scale to accelerate time to market for new services, adapt existing services to meet customer demands, mitigate the cost of managing more complex networks and ultimately improve the customer experience. VMware Telco Cloud Automation enables multi-cloud operational agility through simplified design, onboarding, placement and management of network functions and services, across data centers and tenants of the telco cloud. Below we outline some key features associated with Telco Cloud Automation:

**Automate the network expansion**

VMware Telco Cloud Automation centrally manages the provisioning and configuration of the telco cloud software stack / software-defined data center (SDDC) using pre-defined templates for the various site types of each telco cloud domain. The provisioning can be extended beyond the SDDC stack to include Kubernetes clusters and nodes in addition to network functions and services.

**Unified automation for NFV and cloud-native networks**

VMware Telco Cloud Automation aligns the process for managing network functions and services over container and VM-based infrastructures while abstracting differences through underlying integrations and automation capabilities. The network functions are managed with the same user interface or through standard-based APIs utilizing shared catalog, inventory and frameworks for Days 0, 1 and 2 operations.
Multilayer automation for the telco cloud
VMware Telco Cloud Automation delivers lifecycle management automation for network service, network function, Kubernetes cluster and virtual infrastructure onto the same platform, typically requiring various separate tools offered by diverse vendors. Each module is self-contained, and the combination of modules enables advanced automation capabilities to optimize placements and customize infrastructure to support network function requirements. This suite of customizations to the Kubernetes clusters/nodes, OS and VM drastically reduces the time to deploy network functions in the core, edge and RAN while maximizing resource utilization at each site.

Proactive management of telco cloud software
VMware Telco Cloud Automation’s centralized management enables observability on fault and performance indicators of the applications’ virtual resources and instantiated software. This information coupled with automated Day 1 and Day 2 operations (healing, scaling, etc.) enables closed-loop action for issue remediation. The platform also extends to integrate with CSPs’ AIOps or VMware Telco Cloud Operations platform through standard interfaces for end-to-end root-cause analysis and the application of custom resolution workflows.

Streamline the orchestration journey
VMware Telco Cloud Automation delivers a cloud-smart solution where all layers—from infrastructure to domain orchestration—are coupled for consistency, optimized deployment and workload management across clouds. VMware Telco Cloud Automation supports hybrid networks and is the management pane of the VMware Telco Cloud Platform for 5G, RAN and edge.

Centralized management for cross-domain and multi-cloud modern networks
VMware Telco Cloud Automation is a cross-domain orchestration and automation platform supporting core, edge and RAN virtual domains over a distributed and multi-cloud infrastructure. For each domain, and through the same management plane, the platform delivers multilayer automation of the cloud components, including network service, network function, container and VM-based infrastructures. Furthermore, the platform extends its multi-cloud capabilities to hyperscaler clouds and other upstream Kubernetes distributions.

Product and cloud-smart approach to automation
VMware Telco Cloud Automation integrates natively with the VMware Telco Cloud products, and these integrations are maintained for each new version. CSPs do not need to worry about planning and rebuilding all the integrations for every release. VMware Telco Cloud Automation deploys a control-plane function at each cloud integrated with VMware infrastructure to automatically enable the proper placement and operations based on ubiquitous knowledge of the available multi-cloud resources and capabilities, avoiding rollbacks and misuse of the infrastructure.
BUILT FOR A THRIVING OPEN MULTIVENDOR ECOSYSTEM

While many vendor ecosystems inherently restrict interoperability, VMware Telco Cloud Automation follows the ETSI guidelines. The network function manager and domain orchestrator are used as combined or standalone modules interfacing ETSI SOL-compliant components of the MANO framework—operating support system (OSS), business support system (BSS), element management system (EMS) / VNFM, etc. The solution xNF composer, coupled with the VMware Ready for Telco Cloud program, bolsters innovation and interoperability—providing ready access to new capabilities.

LEARN MORE
Visit telco.vmware.com/products/telco-cloud-automation.html to learn more about how VMware Telco Cloud Automation can help you leverage the telco cloud to its full potential.

Call 877-4-VMWARE (outside North America, +1-650-427-5000) or visit telco.vmware.com.

INTEROPERABILITY

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<tr>
<th>Standard interfaces</th>
<th>Open architecture</th>
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<tbody>
<tr>
<td>• Ve-Vnfm-vnf: ETSI NFV IFA008/SOL002; VNF and NS descriptors compliant with IFA011/SOL001; VNF and NSD package format of IFA014/SOL004</td>
<td>• Modular NFVO / G-VNFNM architecture, interacting through REST APIs and utilizing ETSI-MANO SOL003/IFA007 API standards</td>
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<tr>
<td>• Ve-Vnfm-em: Third-party EMS per ETSI NFV IFA008/SOL002</td>
<td>• Pre-built integration with VMware telco and cloud technologies (including VMware HCX, vRealize® and Telco Cloud Operations)</td>
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<tr>
<td>• Or-Vnfm: ETSI NFV IFA007/SOL003</td>
<td>• Support Ansible Playbooks and ConfigMaps for commissioning</td>
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<tr>
<td>• Os-Ma-nfvo: ETSI NFV IFA013/SOL005 and TM Forum</td>
<td>• Simplified integration with third-party OSS, VIM, VNF, SDN-C and S-VNFNM</td>
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VMware actively cooperates with multiple network function vendors including all key NEPs, having them certify in the VMware Ready for Telco Cloud program. This is a comprehensive certification program that ensures interoperability and operational readiness between third-party-developed network functions and the ETSI-compliant VMware Telco Cloud platform. The program helps ensure that CSPs can rapidly onboard and deploy multivendor network functions with the VMware Telco Cloud platform. VMware Telco Cloud Automation leverages this program to certify interoperability with network function vendors, offering a neutral and pre-tested end-to-end solution.

Standard-compliant and open automation platform

VMware Telco Cloud Automation was designed from the infrastructure up to initially bridge CSPs to the cloud and now the multi-cloud. The platform supports telco standards, including 3GPP, ETSI-MANO, TMF and O-RAN. Any network function compliant with ETSI-MANO standards can be onboarded onto the platform catalog. The product offers a composer that quickly aligns network function vendors with the required standards along with support through the VMware Ready for Telco Cloud certification team. Specific extensions are also added to support CNFs. VMware’s Ready for Telco Cloud program already offers hundreds of network functions for deployment on the VMware Marketplace™. The CSP networks’ east/west/northbound systems interacting with VMware Telco Cloud Automation can also use ETSI, TMF and O-RAN standards, moving complex integrations into simplified validation. VMware Telco Cloud Automation also plays a key role to enforce CSPs’ cloud-native automation ecosystem by providing a set of interfaces and libraries to quickly integrate continuous development, delivery, testing and integration pipelines for all telco cloud software.