

# VMWARE TELCO CLOUD OPERATIONS

Automated Service Assurance for Virtual and Physical Networks

## AT-A-GLANCE

END-TO-END ASSURANCE TO HOLISTICALLY MANAGE YOUR COMPLEX, MULTI-VENDOR VIRTUAL AND 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

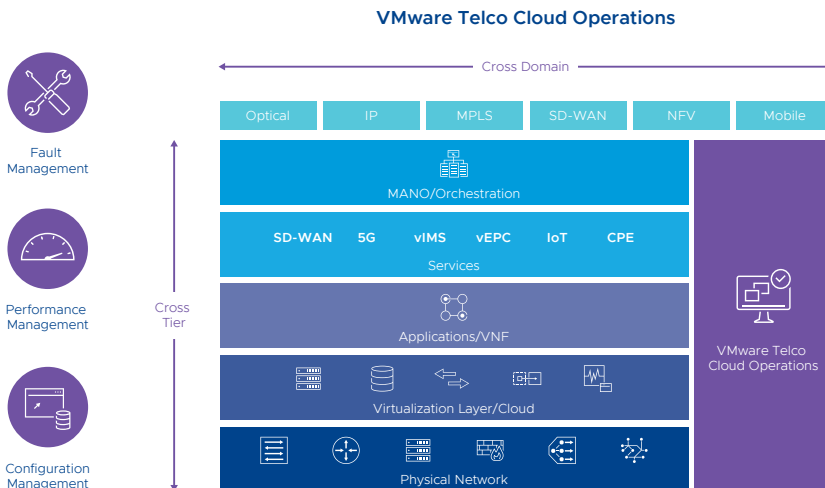
## VMware Telco Cloud Operations

Simplify the monitoring and management of your complex network with integrated performance analytics and automated fault analysis. Proactively avoid problems, increase agility and meet your business objectives.

## Next-Generation Operations Intelligence

More than ever before, networks are the lifeline for people to work, learn and stay connected. Operations teams must be able to adapt quickly to change, operationalize new services rapidly, and provide the best possible quality of service on the most reliable network. Yet, the complexity of networks continues to grow. Their scale and diversity, coupled with the real-time nature of tomorrow's 5G services, add new variables and environments can easily slip into a state of entropy.

VMware Telco Cloud Operations is a real-time assurance solution designed to simplify network operations through holistic monitoring and performance management, providing comprehensive visibility and automation. 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. Automatic topology discovery, cross-tier visualization and relationship mapping gives VMware Telco Cloud Operations the ability to rapidly identify the true cause of issues and see the services impacted. Advanced performance analytics, based on machine learning, detect performance deviations and quickly notify operators, often before end users are affected. This gives operations teams the rapid insights they need to move their operations from reactive to proactive.



**BENEFITS**

**Holistic view of network**

- Correlated fault and performance management across multiple tiers and domains
- Single view, multi-vendor monitoring and management
- Automatic discovery of network topology

**Integrated Performance Management**

- Performance analytics based on machine learning (ML) with dynamic thresholding
- Customizable dashboards
- Identification of anomalies often before the network service is affected

**Reduced spending in OPEX**

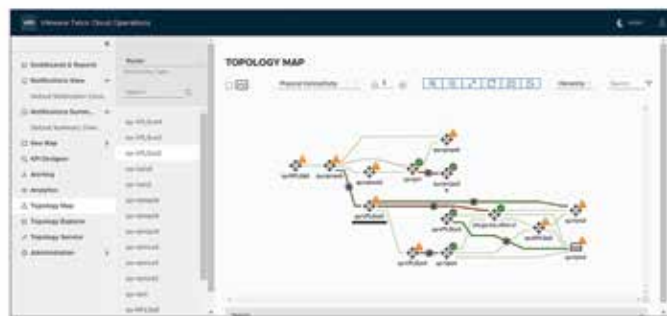
- Up to 92%+ auto-discovery of root cause
- Prioritization based on impact
- Automated actions and remediations
- Bulk configuration and compliance management

**Managed Enterprise Services Capabilities**

- Cohesive management of SD-WAN services alongside legacy LAN and WAN networks
- Multi-vendor SD-WAN support within one monitoring and management console
- Automated discovery of SD-WAN elements (edges, hubs, gateways, tenants and tunnels)
- Integrated performance analytics

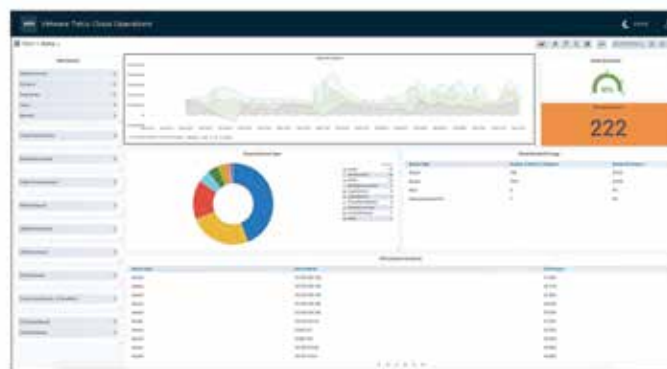
**Auto-Discovery Capabilities**

VMware Telco Cloud Operations automatically discovers the topology of a complex, multi-vendor network—including the transport, physical, virtual and services layers—and presents the user with a comprehensive, graphical topology view. As changes happen, the topology and relational map automatically update. Over 4,000 physical and virtual devices are supported today.



**Performance Analytics Based on Machine Learning**

VMware Telco Cloud Operations integrates performance analytics and vivid reporting dashboards for proactive assurance. Using machine learning, VMware Telco Cloud Operations automatically establishes dynamic performance baselines, identifies anomalies and alerts operators when anomalous behavior is detected. Because VMware Telco Cloud Operations has contextual view of both the underlay and overlay network, operators can accurately triage situations and take proactive actions to prevent serious impacts to application performance.



**Automated Root Cause Analysis with Service Impact Correlation**

VMware Telco Cloud Operations provides operators with the ability to immediately identify real problems rather than symptoms for rapid remediation. Instead of presenting thousands of separate alarms and alerts from a plethora of tools to the user, VMware Telco Cloud Operations correlates all of the active, inactive and unknown alarm statuses together with the network topology to rapidly identify the root cause of the problem. It then relates the root cause to both the services impacted and the tenant and customers affected, issues notifications and triggers actions. This allows the operator to prioritize their responses, in real-time, according to the business impact and prioritize those tenants who have contracted higher-value services and SLAs.

**BENEFITS CONTINUED**

**Increased uptime and reduced MTTI and MTTR**

- Cross correlation of relationship between services, protocols and infrastructure
- Prescriptive diagnosis of root cause of problems
- Integration with orchestration tools (e.g., SD-WAN, OSS, VNF-M, NFV-O)
- Proactive configuration management of underlying hardware for maximum stability

**Rapid operationalization of new services**

- Rapid topology discovery of physical devices and virtual functions mapping to services
- Decreased change management cycle times

**Improved customer experience**

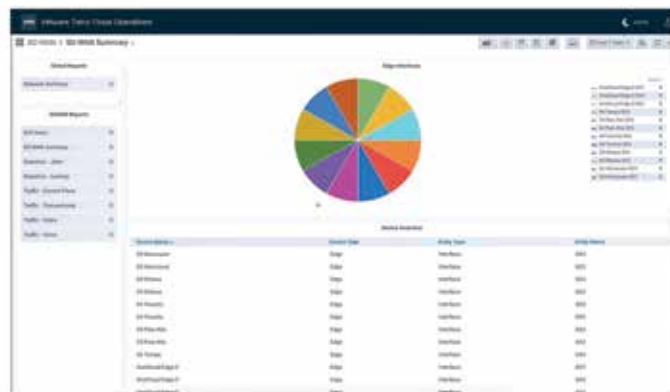
- Proactive discovery of performance anomalies and incidents
- Prioritization based on business requirements
- SLA management with historical and real-time views, trending and adaptive alerting

**Managed Enterprise Services Multi-tenant Support**

VMware Telco Cloud Operations provides the holistic visibility managed service providers (MSPs) need to manage their customers’ entire networks—LAN, SD-WAN, IP and MPLS— from a single pane of glass. They can automatically discover customer network topologies across multiple domains and vendors and abstract away the complexity of manually integrating standalone tools. Operators can prioritize VIP customers and tenants based on characteristics such as SLAs.

**Multi-Vendor SD-WAN Assurance**

VMware Telco Cloud Operations supports the monitoring of multi-vendor SD-WAN enterprise services, including VMware SD-WAN by VeloCloud and Cisco Viptela. It is fully integrated for multi-tenant support and fault management and provides the auto-discovery of tenants and services along with issue isolation and impact assessment across central and branch sites, gateways, and networks.



**NFV Assurance**

VMware Telco Cloud Operations integrates with VMware’s extensive Telco Cloud portfolio for an intelligent, comprehensive approach to NFV Assurance, providing real-time root cause analysis of issues across virtualized and legacy environments. It integrates with VMware Telco Cloud Infrastructure, supporting virtual compute (vSphere®), virtual networking (NSX-T), and both of VMware’s Virtual Infrastructure Managers (VIMs): VMware Integrated OpenStack (VIO) and vCloud Director™ (vCD). It automatically discovers NFV services and VNFs, correlating and isolating faults and performance issues. In addition, VMware Telco Cloud Operations fully supports other OpenStack distributions such as Red Hat OpenStack.

**Software-Defined Networking (SDN) Assurance**

VMware Telco Cloud Operations integrates with VMware NSX-T and Cisco ACI for monitoring and management. It has an awareness of east–west and north–south overlay and can relate impacts to tenants. This gives network operators unprecedented cross-domain visibility and integrated management. As new devices or virtual functions are added, the relationship mapping is automatically updated.

**ADDITIONAL FEATURES**

**MPLS monitoring**

- Discovery, monitoring and analysis of Layer 2 and Layer 3 VPNs
- Multi-VRF (virtual routing and forwarding) and customer edge (CE) routers
- LSP management capabilities

**Virtual EPC Monitoring**

- Common information model for vEPC supporting network services for 4G LTE and VoLTE
- Issue isolation across VNF components, VIM tenancy, cloud infrastructure, and physical networks

**Virtual IMS Assurance**

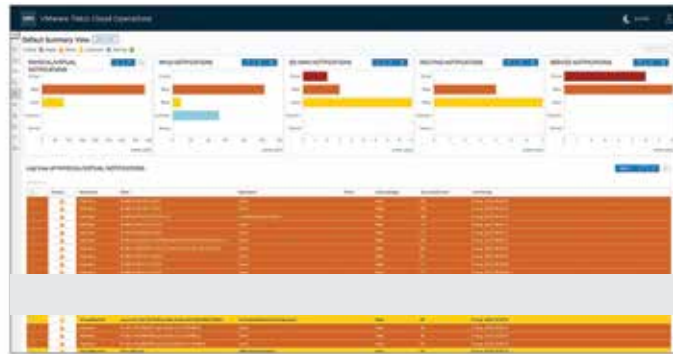
- Service-centric common information model for vIMS for VoLTE
- Cross-tier correlation across virtual and physical infrastructure
- Performance management analytics

**LEARN MORE**

For additional information about VMware Telco Cloud Operations: 1.877.VMWARE

(Outside North America, dial +1.650.427.5000)

<https://telco.vmware.com/>



**Self-Adapting Engine**

Rather than using a rules-based engine that needs to be continuously updated, VMware Telco Cloud Operations uses an advanced multi-dimensional deterministic model-based engine that intelligently and automatically adapts to managed systems. Collecting up to thousands of events and alarms per minute, VMware Telco Cloud Operations correlates these with auto-generated computer signatures and immediately identifies where the root of the problem lies. Operations teams do not need to manually update rules or scripts each time new devices or services are added.

**Network Configuration Manager**

VMware® Network Configuration Manager (NCM) is an automated configuration, change and compliance management solution. As part of the Telco Cloud Operations family, it allows you to do bulk configuration changes and verify controlled change processes. It provides network device and service configuration transparency and helps on meeting compliance with corporate and regulatory requirements.

In addition, NCM adopts a unique hybrid approach with a layer of abstraction—including a common information model, a common user interface and end-to-end visibility—to handle both vendor-neutral managing and modeling information and vendor-specific configuration information. By doing this with one system, NCM supports IT diversity while reducing cost and complexity, simplifying management and increasing visibility into the network.

**Today and Tomorrow**

The transformation to cloud-native networks and services will not happen overnight. CSPs need a comprehensive management tool that encompasses the many networks they manage to ensure the best possible quality of service for their customers. With VMware Telco Cloud Operations automated root cause analysis, advanced performance analytics, multi-tenant capabilities and unification framework of the virtual and physical worlds, CSPs have the visibility and automation they need to offer the most reliable network possible, today and tomorrow.