

The most important thing we build is trust

Benefits

- Highly scalable: 1 Gbps to 1 Tbps
- Performance validation for physical and virtual network functions
- Supports all major hypervisors: VMware ESXi, Microsoft Hyper-V, Citrix XenServer and KVM
- Support for AWS and OpenStack: Ubuntu and RHEL
- Delivers 100% of capabilities with over 10+ years of development
- Rapid expansion and contraction of validation platforms
- Utilizes industry standard hardware
- Offers the most cost effective method for validation

Features

- Emulation and real-time measurement of millions of unique application flows
- Fully stateful application flows, validate live application servers

TeraVM is a flow based real world IP traffic emulation solution used to validate the performance of network functions and application services. TeraVM provides comprehensive measurement and performance analysis on each and every application flow with the ability to easily pinpoint and isolate problem flows.

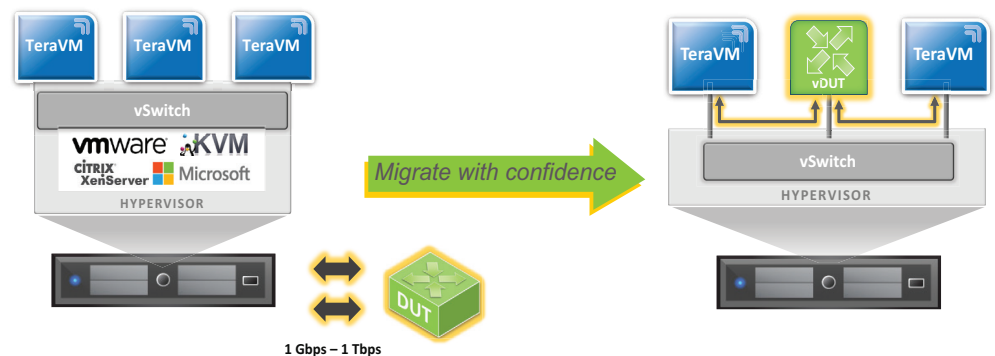


Figure 1: Migrate to virtualization with confidence, validation for proprietary and virtual functions

Validation for Proprietary Hardware and Virtual Network Functions

TeraVM is delivered as a software only or as a physical appliance solution which is ideal for validating the performance of proprietary hardware/virtual network functions and application services. The flexibility to validate both the physical and virtual function provides the confidence and assurance necessary to deliver application services in the age of Network Function Virtualization (NFV).

Proven Scalability

TeraVM enables unprecedented scale; from a gigabit or less to a terabit of stateful layer 4 to 7 traffic. By simply adding more TeraVM it's possible to rapidly scale to meet test needs. Alternatively, build a large scale test bed and then break it out for multiple test beds, enabling greater utilization of testing resources.

Proven Portability

TeraVM is packaged as a virtual machine which is easily deployed on any industry-standard hardware and only requires a software license to operate. For geographically dispersed organizations moving a test bed between locations is as simple as checking out a license from a centrally deployed license server that is installed in the user's network.

Comprehensive Validation Suite

TeraVM provides a comprehensive validation suite covering key network segments such as access, mobile network backhaul and security. TeraVM provides validation for key application services such as video, voice and data. TeraVM's cybersecurity threat library enables performance validation with both good and bad flows.

TeraVM

Flow based Real World IP Traffic Emulation -
Performance validation for virtualization
lifecycle testing

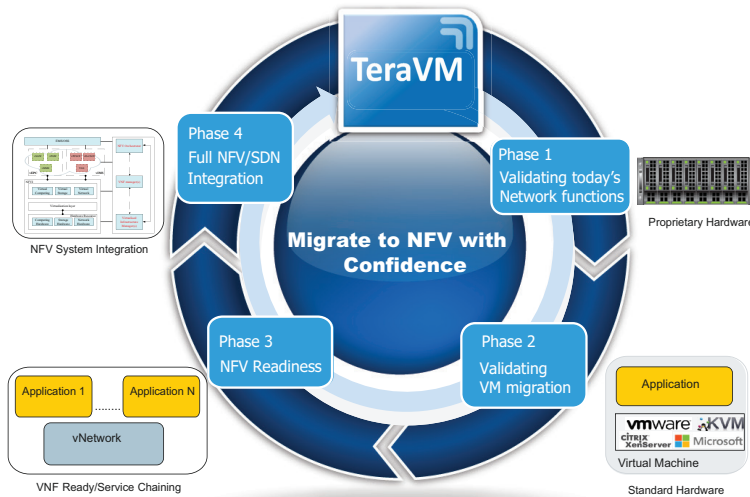


Figure 2: TeraVM performance validation for virtualization lifecycles

Virtualization Lifecycle Testing with TeraVM

Phase 1 and 2: Use TeraVM to assess and characterize the performance of the physical network function, migrate to a virtual machine and assess the impact that standard hardware and hypervisor settings has on operational performance.

Phase 3: Assess performance on platforms where there is limited control on configuration. Determine the impact that orchestration and network management has on the performance of the virtual function e.g. assess for performance loss when networks are under software defined network (SDN) control.

Phase 4: As the virtual function evolves to be more inclusive of NFV system integration recommendations, validate the performance of the virtual function as part of a service delivery chain. Assess performance of the application service with dedicated quality of experience performance metrics.

TERAVM FEATURES AND FUNCTIONALITY

GENERAL

Real-time isolation of problem flows

DATA

TCP / UDP, Teraflow
HTTP (headers, substitution, attachments)
SMTP / POP3 (incl. file attachments)
FTP (Passive/Active), P2P applications, DNS

ADDRESS ASSIGNMENT

Configurable MAC
DHCP, PPPoE (IPv4 & IPv6)
Dual Stack (6RD, DS Lite)

ETHERNET SWITCH

VLAN and Double VLAN Tagging (Q-Q)
ACL, 802.1p, DSCP

DATA CENTER

VxLAN, SR-IOV

REPLAY

Replay large PCAP files - TCP, UDP and raw data playback

Amplify and dynamically substitute data into PCAP files

VIDEO

Multicast: IGMP v1/v2/v3 & MLD v1/v2
Automatic Multicast Tunelling (AMT)
Video on Demand (VoD)
Adaptive Bit Rate Video (HLS, HDS, Smooth)
Video conferencing

SECURE VPN

Clientless VPN (SSL/TLS/DTLS), IPSec (IKEv1/v2), Generic remote access
Cisco AnyConnect SSL VPN Client, Cisco AnyConnect IPsec VPN
Cisco ScanSafe
Juniper Pulse, Juniper Network Connect
Dell SSO, Fortinet Fortigate and F5
802.1x EAP-MD5

SECURITY ATTACK MITIGATION

Spam / Viruses / DDoS
Cybersecurity threat library

VOICE

voIP: SIP & RTP (secure & unsecure), SMS
Dual Hosted UACs, SIP Trunking
Voice & Video quality metric (MOS)

LTE/4G

GTP tunnel support

SLA

TWAMP, PING

AUTOMATION

CLI, Perl, TCL, XML, Java API
Python, Jython
Qualisystems (CloudShell)