

Product Brief

VIAMI

TeraVM

Ethernet over GRE (EoGRE) validation for WiFi-offload.
Per UE stateful application performance assessment.

TeraVM™ supports validation of WiFi-offload scenarios using Ethernet over GRE (EoGRE) and/or IPsec, providing performance visibility on each and every tunnelled user endpoint's (UE) encapsulated application traffic. This highly scalable solution enables emulation of thousands of wireless access points and millions of tunnelled endpoints.

TeraVM's stateful per flow architecture enables functionality such as transparent ethernet bridging with configurable tunnel options such as keep-alive and failover scenarios.

TeraVM supports validation of the two key GRE headend encapsulations:

- L3 IPv4 encapsulation (GRE): Static IP address assignment
- L2 IPv4 encapsulation (EoGRE): DHCPv4 over GRE

Validation for WiFi-offload scenarios

TeraVM provides for validation of untrusted WiFi access points of evolved Packet Data Gateways (ePDG) and/or trusted WiFi access gateways (TWAG).

Understanding the performance and reliability of the wireless LAN gateway is key to ensuring a seamless user experience that is, that the UE does not lose connectivity and continues to have access to a range of application service types.

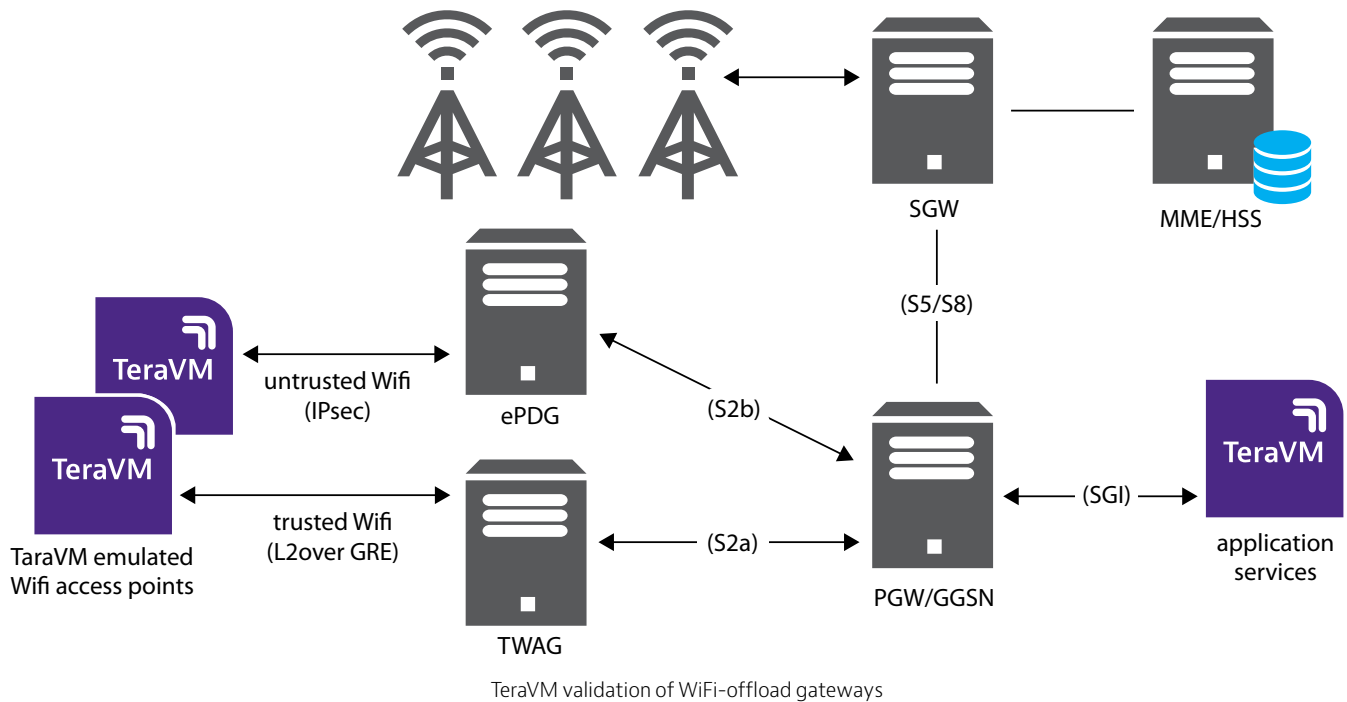
TeraVM as a stateful emulation solution, supports tunnel failover: where each tunnel may select to use keepalives, move from UEs from primary to secondary flows with unique measurements for failed pings.

Advantages

- Emulate millions of GRE encapsulated tunnels
- Measure per tunnelled endpoint, per application performance
- Dedicated metrics, including tunnel endpoint failovers & ping failures

Features

- Support for L2 and L3 GRE encapsulation
- Unique MAC address assignment per EoGRE Tunnel
- Stateful voice/video applications
- Cloud platform enabled support for AWS, Azure, OpenStack
- Out of millions of UE sessions, easily pinpoint and isolate UEs experiencing poor application quality inside GRE tunnels



Introducing TeraVM

TeraVM is an application emulation and security performance solution, delivering comprehensive test coverage for application services, wired and wireless networks.

TeraVM is offered as a virtualized solution enabling the flexibility to run anywhere—lab, datacenter, and the cloud, with consistent performance coverage, ensuring that highly-optimized networks and services can be delivered with minimal risk.

EoGRE emulation with the most realistic load scenarios

Using TeraVM users can emulate the most realistic load scenarios for performance validation of throughput, connections, and latency for unique UE traffic being encapsulated in GRE tunnels.

TeraVM enables emulation for both IP over GRE and/or Ethernet over GRE use cases. TeraVM's flexible configuration enables users quickly assess performance of the various headend encapsulation options. TeraVM's stateful application emulation and per-flow performance validation is ideal for assessing the end-users quality of experience in the GRE tunnel.

TeraVM can be deployed to cloud services such as Amazon Web Services (AWS), Azure, and/or OpenStack, providing for flexible assessment scenarios and cost efficiencies.

TeraVM EoGRE use cases

EoGRE service validation

Validate EoGRE gateway functionality to provision UEs with static/dynamic IP and assess for tunnel failover scenarios that is, allocate secondary tunnels

UE application performance validation over GRE

Validate the performance of unique UEs accessing and making real calls through EoGRE enabled gateways, determine performance for both normal and extreme load conditions.

TeraVM Capability Overview	
General	Real-time isolation of problem flows
	Elastic Test Bed (up to 1Tbps)
Network interface support	Support for 1/10/40 Gbps I/O
	Mellanox ConnectX-4 support for 56/100Gbps
Data	TCP / UDP, Teraflow, Ookla speed test
	HTTP (v1/2, incl. stateful response parser)
	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 Tagging (up to 8 concurrent tags)
	ACL, 802.1p, DSCP
Data Center	VxLAN, GRE, 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, MPEG-DASH, Smooth)
	Video conferencing, Webex
Secure Access / 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
	SAML (F5, Citrix SSO), Dell SSO
	802.1x EAP-MD5
Security attack mitigation	Spam / Viruses / DDoS
	Cybersecurity Databas
Voice	VoIP: SIP & RTP (secure & unsecure), SMS
	Dual Hosted UACs, SIP Trunking
	Voice & Video quality metric (MOS)
LTE/4G	EPC and RAN (Rel.8, 10, 11)
	VoLTE (secure/unsecure), ViLTE
	WiFi Offload (EoGRE)
SLA	TWAMP, PING
Automation	CLI, Perl, TCL, XML, Java API
	Python, Jython
	Qualisystems (CloudShell)
	OpenStack