VULCAN

LAYER 4-7 ETHERNET TRAFFIC GENERATION AND ANALYSIS

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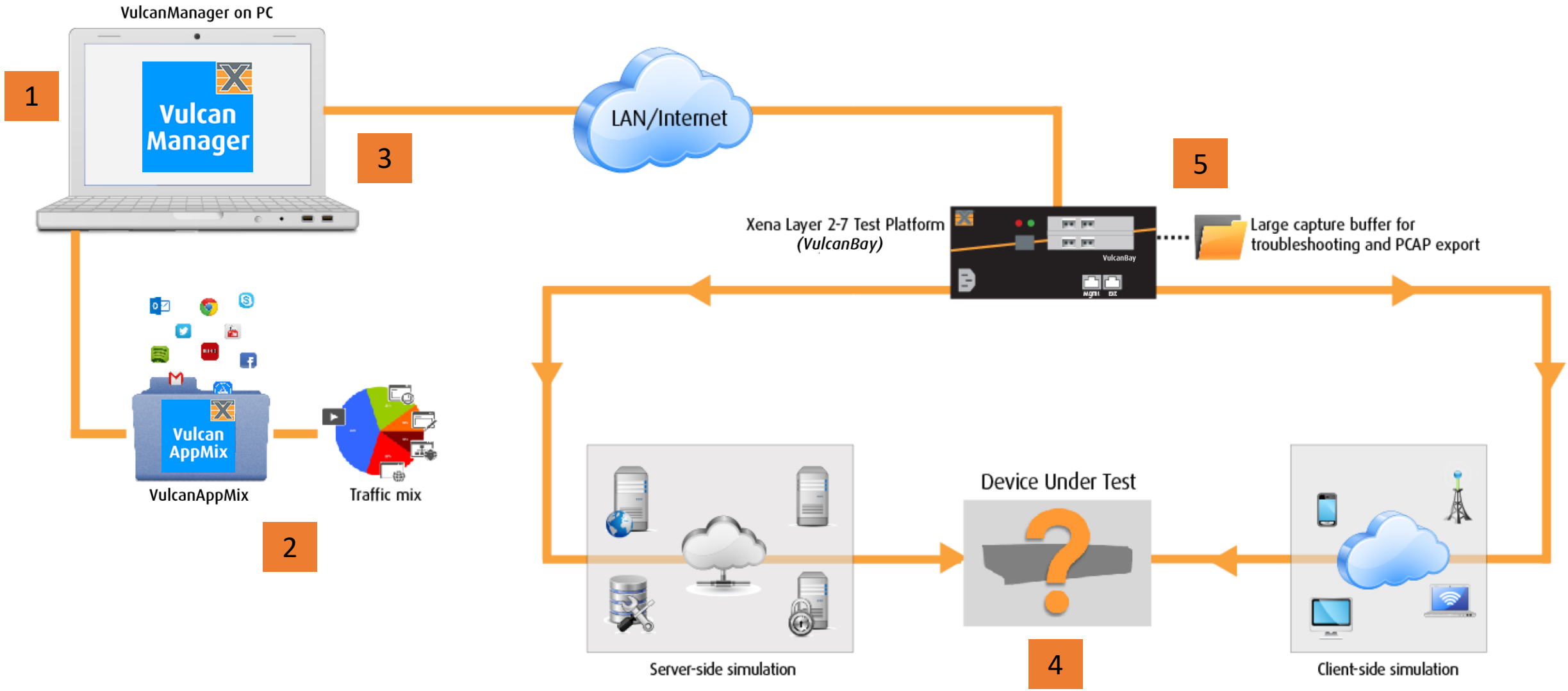
VULCAN LAYER 4-7

- OVERVIEW
- HARDWARE
- SOFTWARE
- KEY FEATURES
- APPLICATIONS
- ROADMAP

OVERVIEW


VulcanManager on PC
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Large capture buffer for troubleshooting and PCAP export
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VulcanAppMix
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Vulcan L4-7 Hardware

- VulcanBay Chassis
- Licensing

HARDWARE – VulcanBay extreme performance chassis

19” (49 cm)

17.6” (44 cm)

3.5” (9 cm)

Weight 50 lbs (22.7 kg)

- 28 million Concurrent Connections (CC)*
- 6 million Connections Per Second (CPS)**
- 1.4 million Concurrent TLS Sessions, 14,000 TLS Sessions Per Second
- 6 million HTTP Connections Per Second, 7 million HTTP Transactions Per Second (TPS)***
- Capture capacity: 40 million x 128 bytes buffers / 4 million full-size buffers

* 24M TCP Clients and 24M TCP Servers on one VulcanBay
** Measured at 1M CC per 10G port
*** Measured at 10 transactions per connection

- Stateful TCP traffic load generation
- Scalable performance via license upgrade
- Supports 1/2.5/5/10/25/40GE optical or copper Ethernet interfaces for L4-7

Pay for the speeds you need

There are three port/speed versions of the VulcanBay – and then you enable the ports and speeds you need with a simple license upgrade. You buy **Speed licenses** to enable the speeds you need.

Vul-V1G-P
Speed License

Enables 1G
on a Test Port

Vul-V10-P
Speed License

Enables 1GE/
2.5GE/5GE/10GE
on a Test Port

Vul-V25-P
Speed License

Enables 1GE/2.5GE/
5GE/10GE/25GE
on a Test Port

Vul-V40-P
Speed License

Enables 1GE/2.5GE/
5GE/10GE/25GE/
40GE on a Test Port

Vulcan L4-7 Software

- VulcanManager
- VulcanAppMix (VAM)

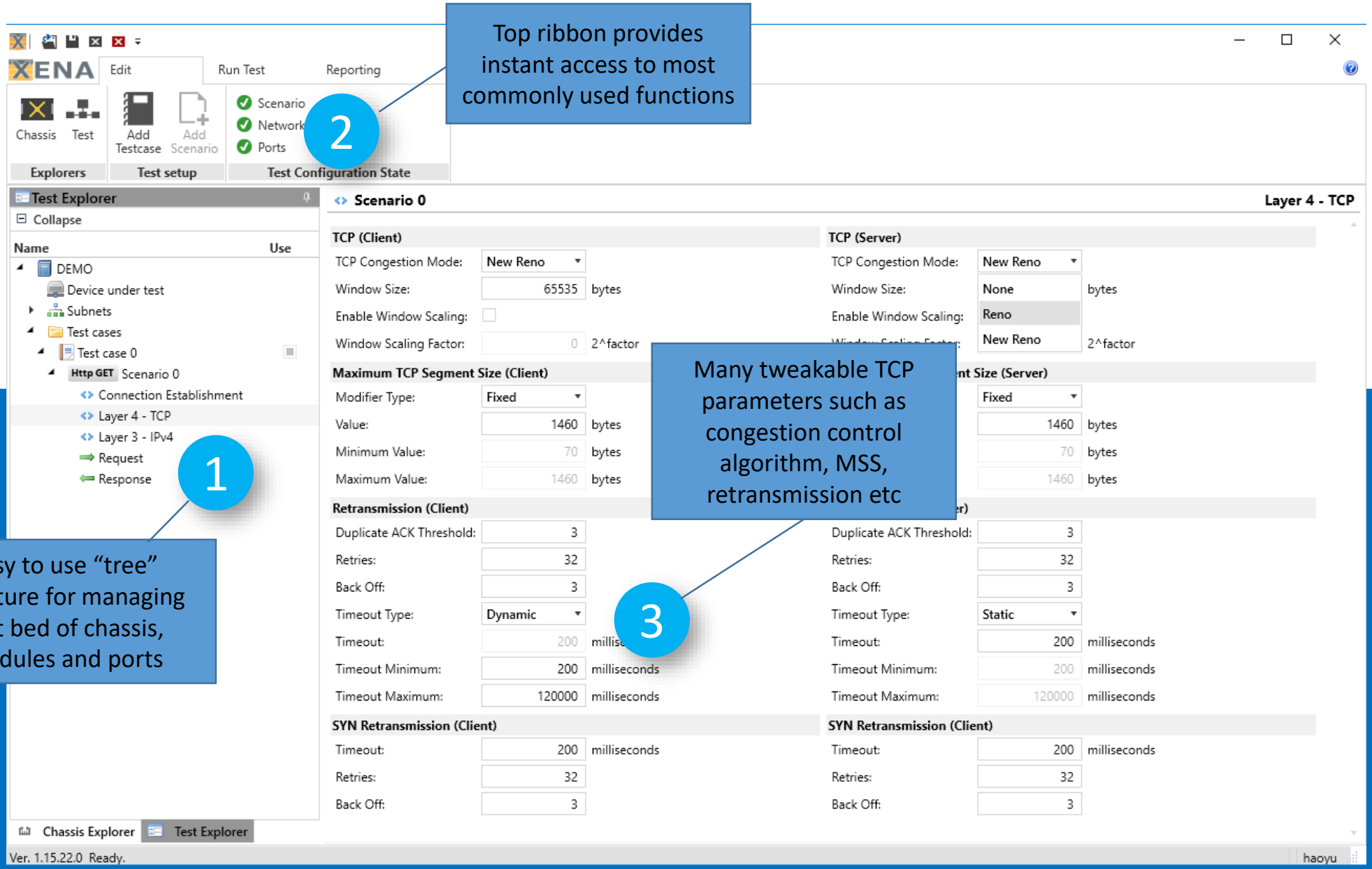
VulcanManager

The Vulcan L4-7 software you'll use most of the time

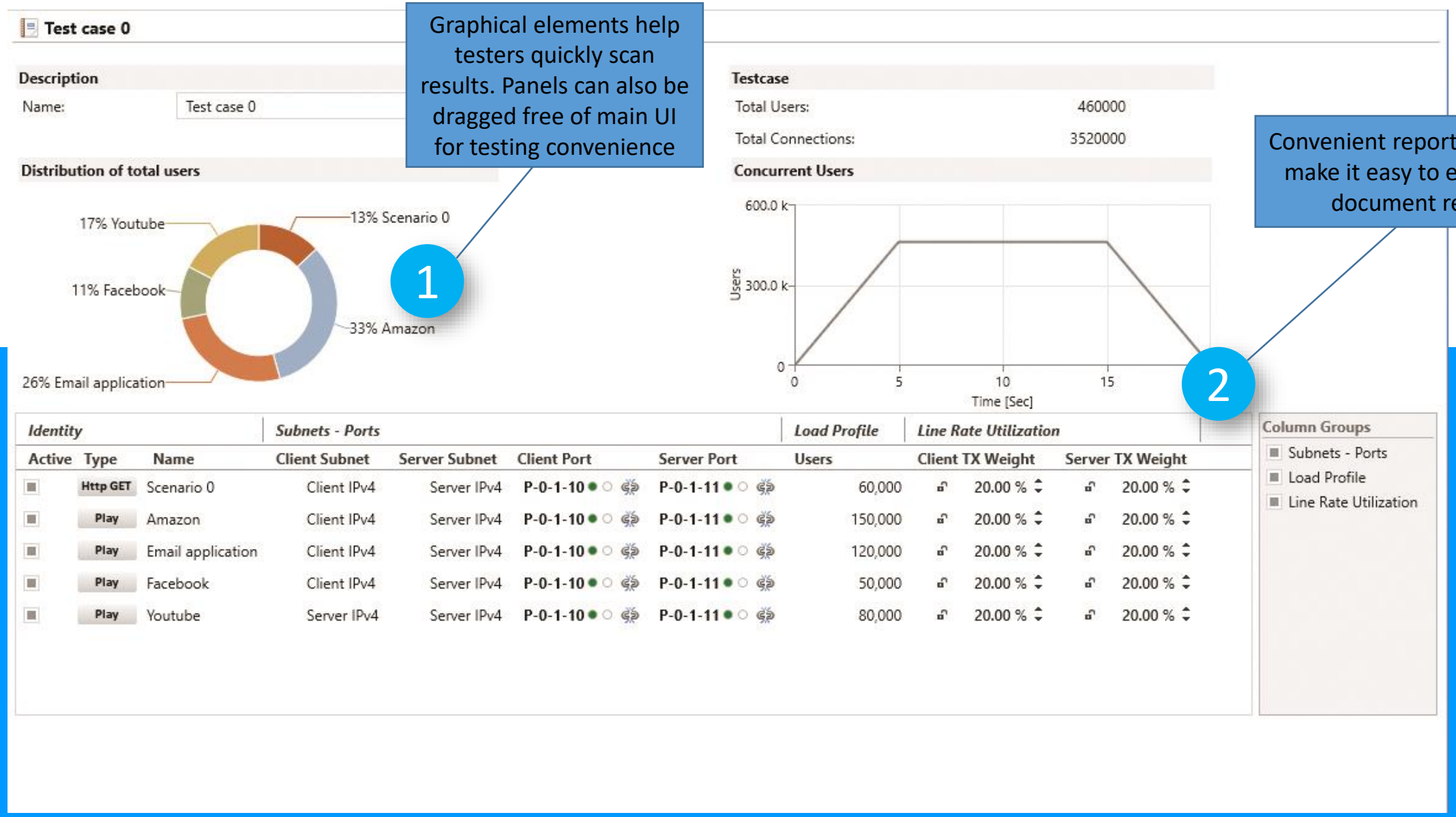
This is a Windows-based application used to configure and generate streams of Ethernet traffic between our Layer 4-7 test equipment and devices under test (DUTs) at all speeds up to 100 Gbps, and analyze the results.

It is included free with every system sold and the latest version can always be downloaded here: https://xenanetworks.com/l47-downloadsw/

USER-FRIENDLY GUI



USER-FRIENDLY GUI



VulcanAppMix (VAM)

Test your networks or devices with “real” traffic

VAM is a free library of application traffic and protocols in pcap format that makes it easy to set up large-scale realistic traffic from various applications, using pre-defined traffic and mix templates.

Winner - VulcanAppMix

REAL TRAFFIC EMULATION

VAM Applications

Amazon
App Store App
Apple Map
AWS S3
Bing Search
BitTorrent
Bloomberg
Chrome
Chrome Incognito
CNN
DNS
Dropbox
eBay
Email application
Facebook
Facebook Messenger
Finance orders (FIX4.0)
Finance orders (FIX4.1)
Finance orders (FIX4.2)
Finance orders (FIX4.3)
Finance orders (FIX4.4)
Finance orders (FIX5.0)
Finance orders (FIXT1.1)
Firefox
Firefox Private
Flickr
Gmail Web
Google App
Google Calendar
Google Hangouts App
Google Search
Google Drive
Google Maps
Hotmail Web
Instagram
iOS Calendar
IoT Publish
IoT Publish over TLS
iTunes App
LINE App
LinkedIn
Mobile Bank
MySQL
MySQL over TLS
Outlook Web Mail
Paypal
QQ App
Reddit
Remote Desktop
RSS Feed
SIP VoIP
Skype
Slack App
Tumblr
Twitter
Video stream 1080p over HTTP
Video stream 1080p over RTP
WeChat App
Weibo
Wikipedia Search
Yahoo
Yahoo Mail Web
YouTube

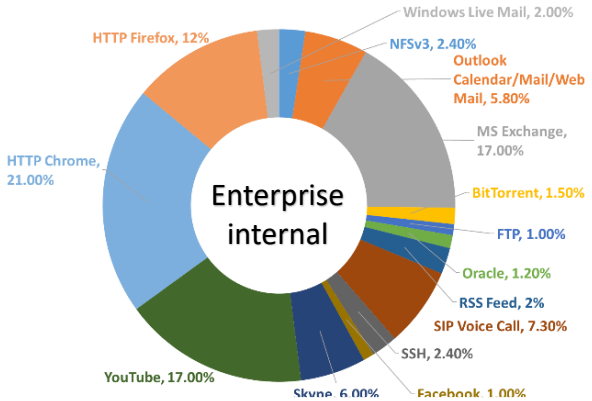
REAL TRAFFIC EMULATION

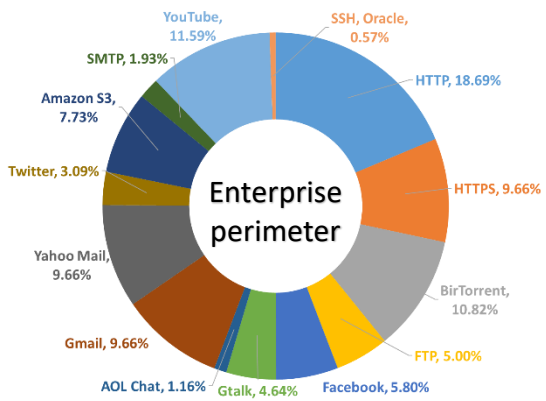
VAM Protocols

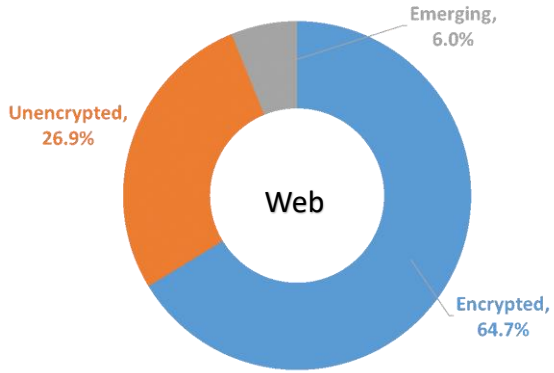
AFS
BitTorrent
DNS
Echo
FIX4.0
FIX4.1
FIX4.2
FIX4.3
FIX4.4
FIX5.0
FIXT1.1
FTP (active)
FTP (passive)
HTTP
HTTPS
IMAP
IMAPS
LDAP
LLMNR
MDNS
MQTT
MQTTS
MSExchange MAPI
NBNS
NFSv2
NFSv3
POP3
POP3 over TLS
QUIC
RDP
RTP/RTCP
RTSP
SIP
SMB2
SMTP
SMTP over TLS
SRTP
SSDP
SSHv2
TELNET (per-character)
TELNET (per-line)
TFTP Read Request
TFTP Write Request

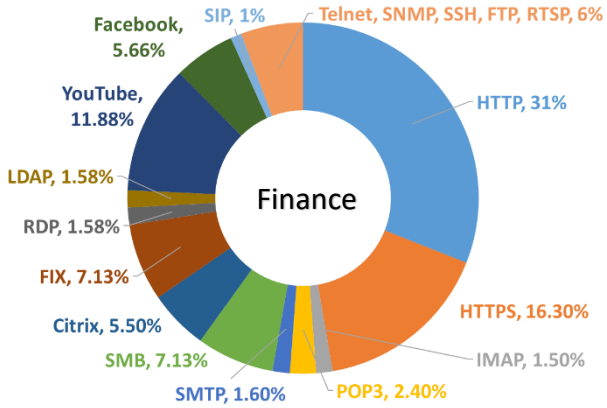
REAL TRAFFIC EMULATION

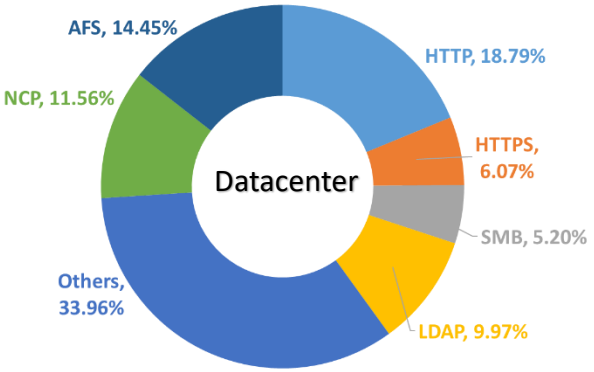
VAM Mixes

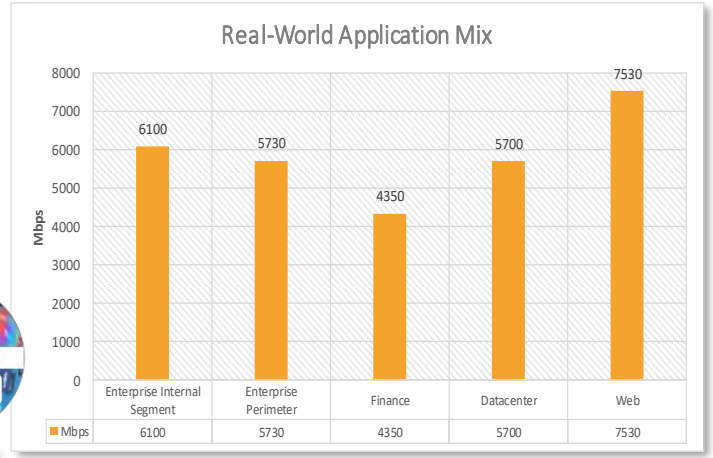




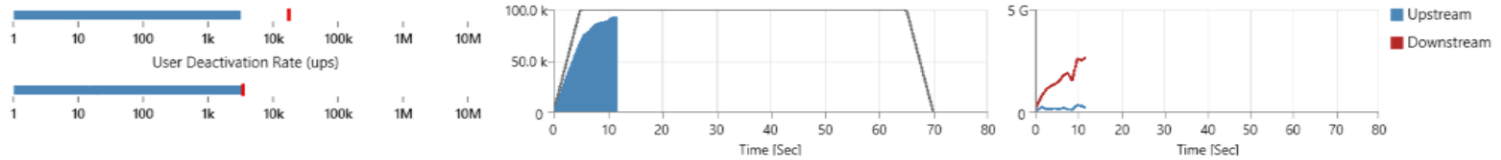








REAL TRAFFIC EMULATION



AppMix **Scenario 0**

Application Mix

Users

	Rate (ups)	Current	Total
Activated	3,148	92,561	123,430

Throughput (bps)

	Downstream	Upstream	Total
Load	2,660,971,039	252,144,780	2,917,637,171
Forwarding	2,660,948,210	252,164,271	2,917,633,711

Layer 5-7 Volume (Bytes)

	Downstream	Upstream	Total
Load	2,350,348,629	339,857,496	2,695,858,941
Forwarded	2,350,348,176	339,857,454	2,695,858,446

Application Mix

	Current Sessions	Total Sessions	Throughput (bps)
HTTP III-1	7,142	7,259	396,927,560
HTTPS III-3	7,142	7,142	361,403,532
BitTorrent	6,923	10,552	393,878,182
FTP (passive)	4,665	17,636	8,756,203
Facebook II	7,142	7,142	264,913,800
Facebook Messeng	7,142	7,142	247,734,721
Google Hangout	7,142	7,142	53,468,472
Gmail Web	7,142	7,142	47,724,215
Yahoo Mail II	7,142	7,142	380,351,925
Twitter	7,142	7,142	279,306,745
AWS S3	7,142	7,142	4,085,649
SMTP	7,142	7,142	174,820
Youtube II	7,142	7,142	475,623,129
Oracle MySQL	2,411	16,563	3,284,758

TCP Events

TCP Retransmit - Client

TCP Retransmit - Server

TCP Errors - Client

Segments Not Sent 0 seg

TCP Errors - Server

AppMix **Scenario 0** — **Enterprise Mix (Perimeter**

Description

Name: Scenario 0

Is Active:

Comment: Application Mix

Application Mix Configuration

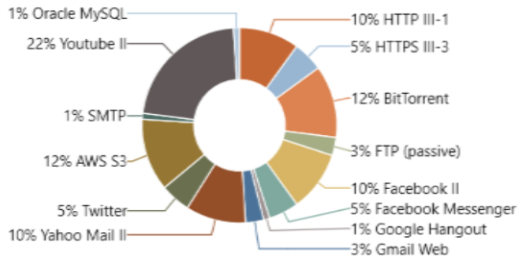
Test Objective: Layer 5-7 Volume (Bytes)

Concurrent Users: 100000

Ramp Duration: 5 sec

Traffic Duration: 60 sec

Layer 5-7 Volume (Bytes)



Identity	Content				
Name	Connections	TCP	UDP	Payload Size	Payload Distribution (Up - Down)
HTTP III-1	1	✓		110 kB	0.5 % 99.5 %
HTTPS III-3	1	✓		298 kB	4.8 % 95.2 %
BitTorrent	5	✓		72 kB	3.2 % 96.8 %
FTP (passive)	3	✓		733 B	15.1 % 84.9 %
Facebook II	8	✓		17 MB	0.7 % 99.3 %
Facebook Messenger	14	✓	✓	281 kB	14.9 % 85.1 %
Google Hangout	2	✓		59 kB	26.5 % 73.5 %
Gmail Web	50	✓	✓	991 kB	6.3 % 93.7 %
Yahoo Mail II	14	✓		4 MB	1.9 % 98.1 %
Twitter	6	✓		457 kB	4.1 % 95.9 %
AWS S3	1	✓		4 MB	0.0 % 100.0 %
SMTP	1	✓		45 kB	99.4 % 0.6 %
Youtube II	4	✓	✓	24 MB	1.6 % 98.4 %
Oracle MySQL	1	✓		287 B	61.3 % 38.7 %

Column Groups

Identity

Content

Application Mix

Reset to default

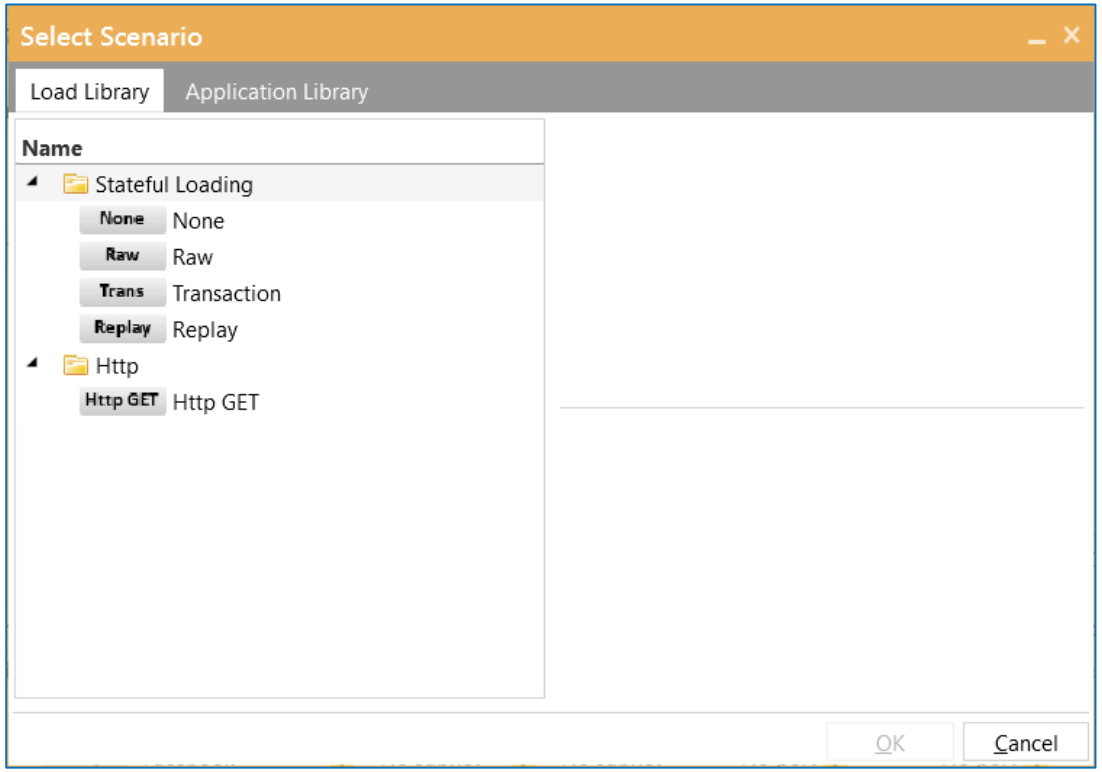
KEY FEATURES

- Stateful TCP for Extreme Load Performance Testing
- TLS performance testing with different cipher suites and certificates
- Stateful Layer 4 Payload Replay
- Scalable Application Emulation
- Wired-speed Traffic Capture
- Connection-oriented Traffic Generation
- Transaction-based Traffic Generation
- Ease of Use & Debug

KEY FEATURES

Stateful TCP for Extreme Load Performance Testing

- TCP stack handles connection establishment, retransmission, and connection tear-down
- Support TCP congestion control: Reno, New Reno
- Support dynamic and static RTO (retransmission timeout)
- Support RTT (round-trip time latency) measurement
- TCP CPS (connection per second) up to 6 million
- TCP CC (concurrent connections) up to 24 million



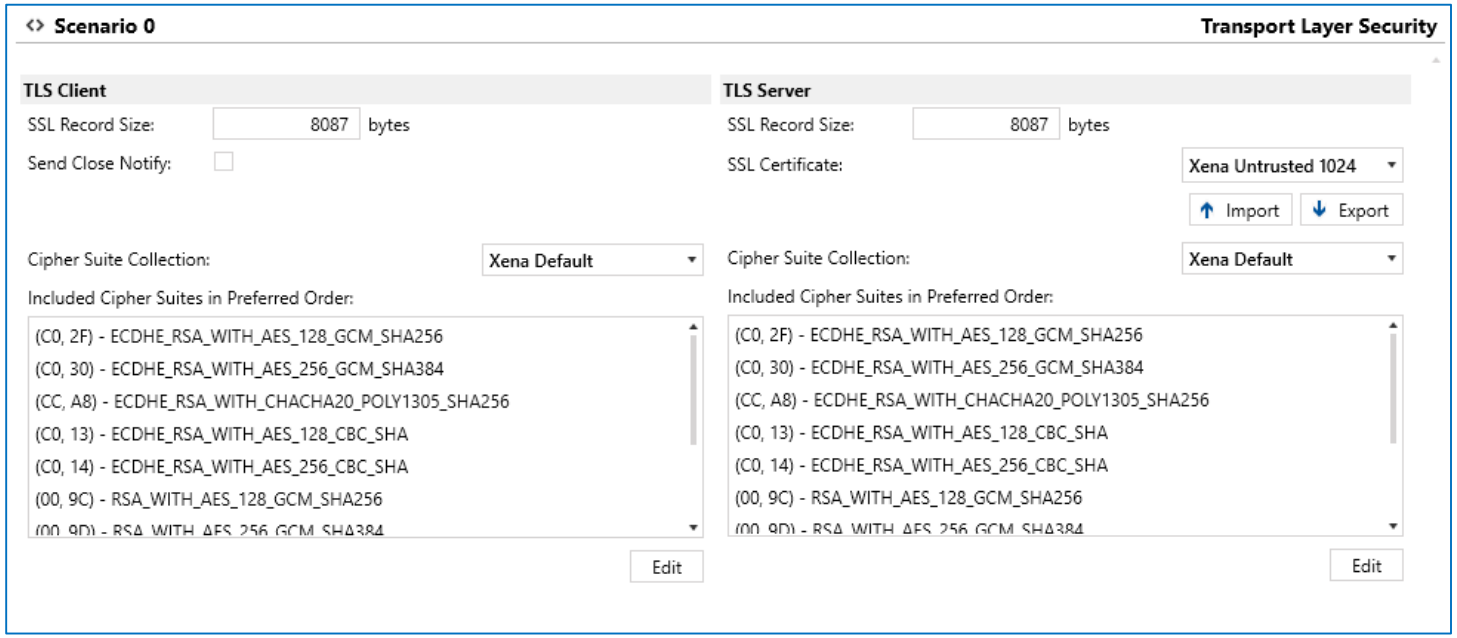
KEY FEATURES

TLS Performance Testing

VulcanManager supports TLS 1.2 performance testing e.g. handshakes per second, TLS throughput, concurrent TLS connections, etc.

Users can specify different cipher suites and certificate key sizes.

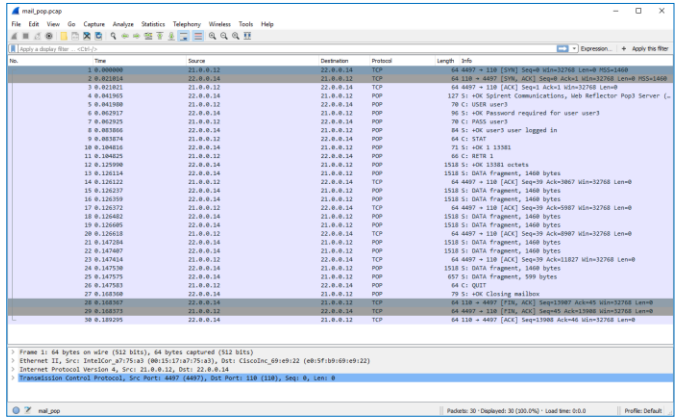
In Xena's native TLS, this lets you test a device that acts in TLS proxy mode, where the device decrypts traffic on one side and encrypts on the other.

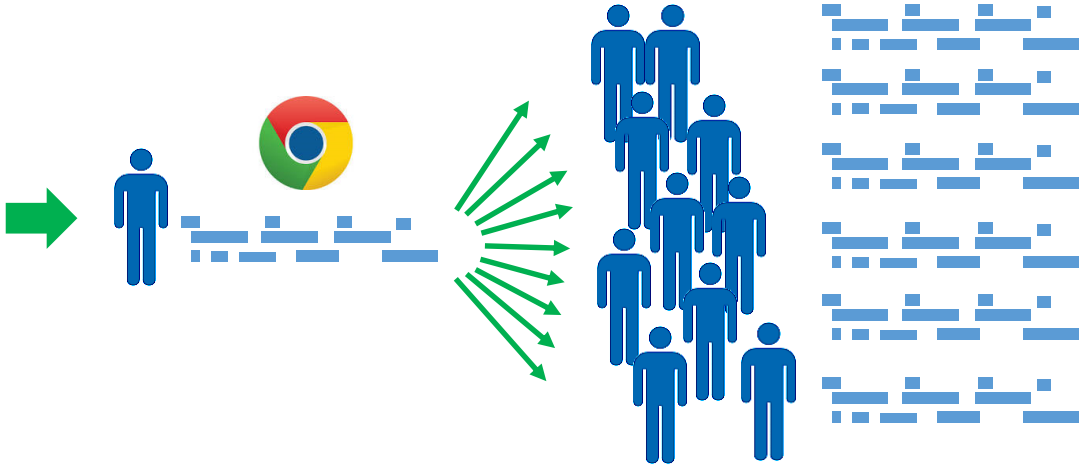


KEY FEATURES

Stateful Layer 4 Payload Replay

- Importing PCAP for Replay scenario
- PCAP files are parsed and payload extracted for replay
- Replay on top of TCP stack
- Support one-to-many communication pattern in PCAP
- Capable of scaling from one user to millions

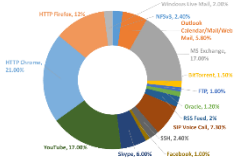


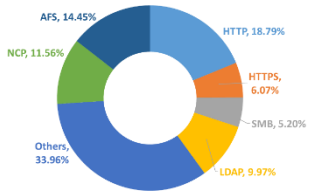


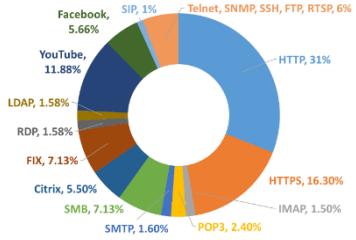
KEY FEATURES

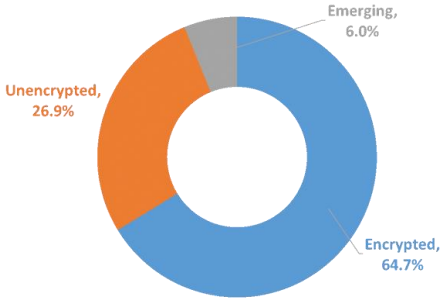
Scalable Application Emulation

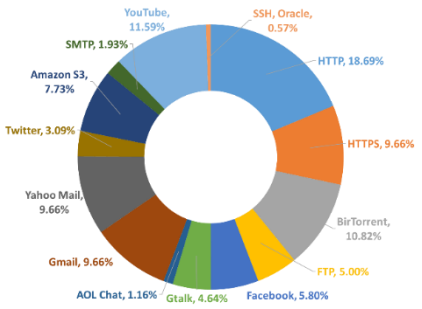
- Real-world traffic for application emulation via VulcanManager & VAM
- Pre-defined protocol-oriented, application-oriented, and traffic profile mixes of different network scenarios
- Replay up to 200 pre-defined application scenarios can be simultaneously, each covering one-to-many communication scenarios that can scale up to millions of concurrent connections, connections per second, transactions per second, users and throughput with real-world traffic







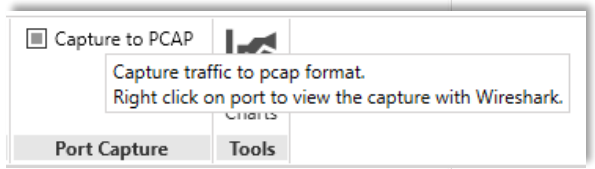


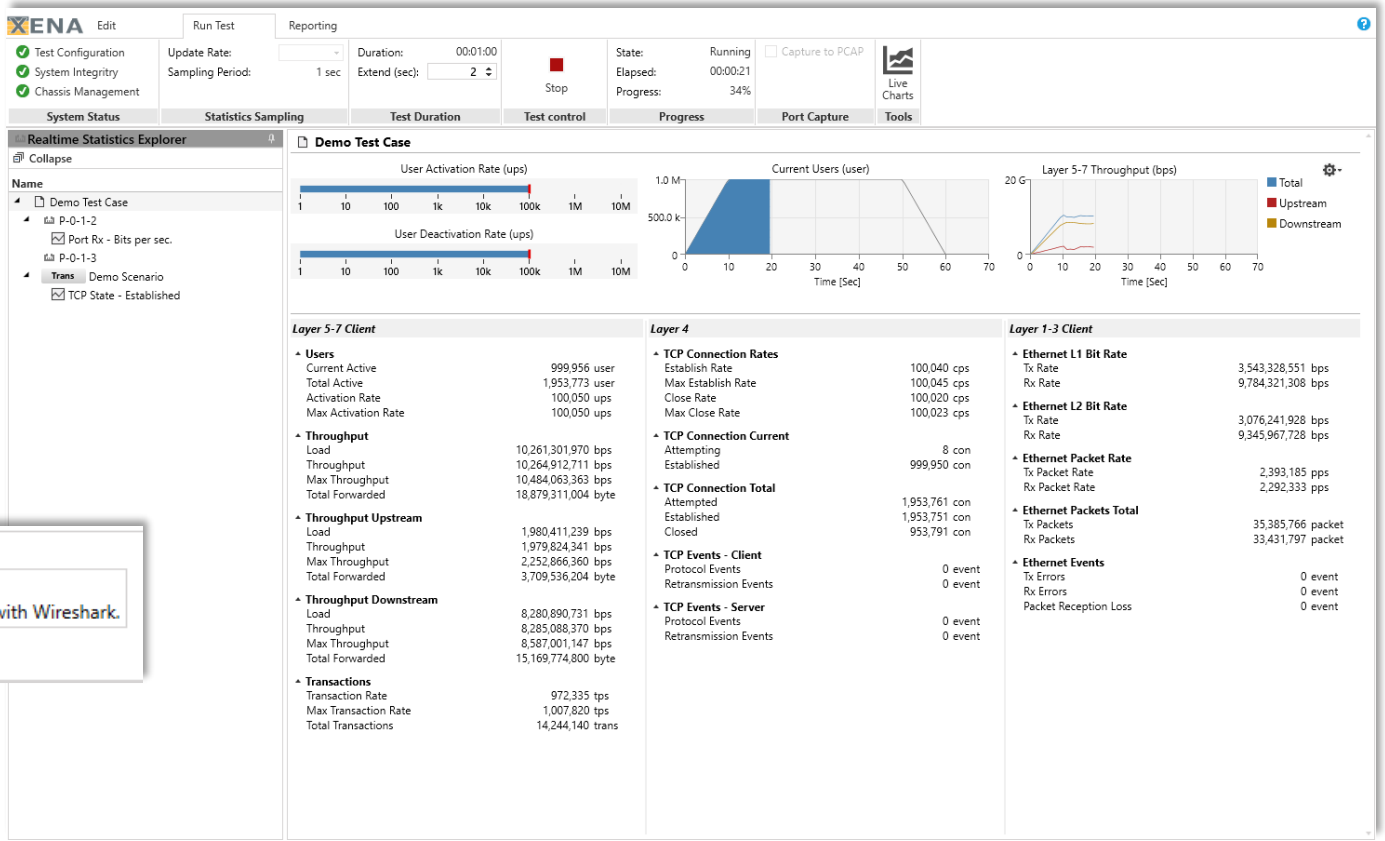


KEY FEATURES

Wired-speed Traffic Capture

- Capture network traffic into industry standard PCAP format
- Excellent for debug and traffic analysis
- Up to 40M capture entries





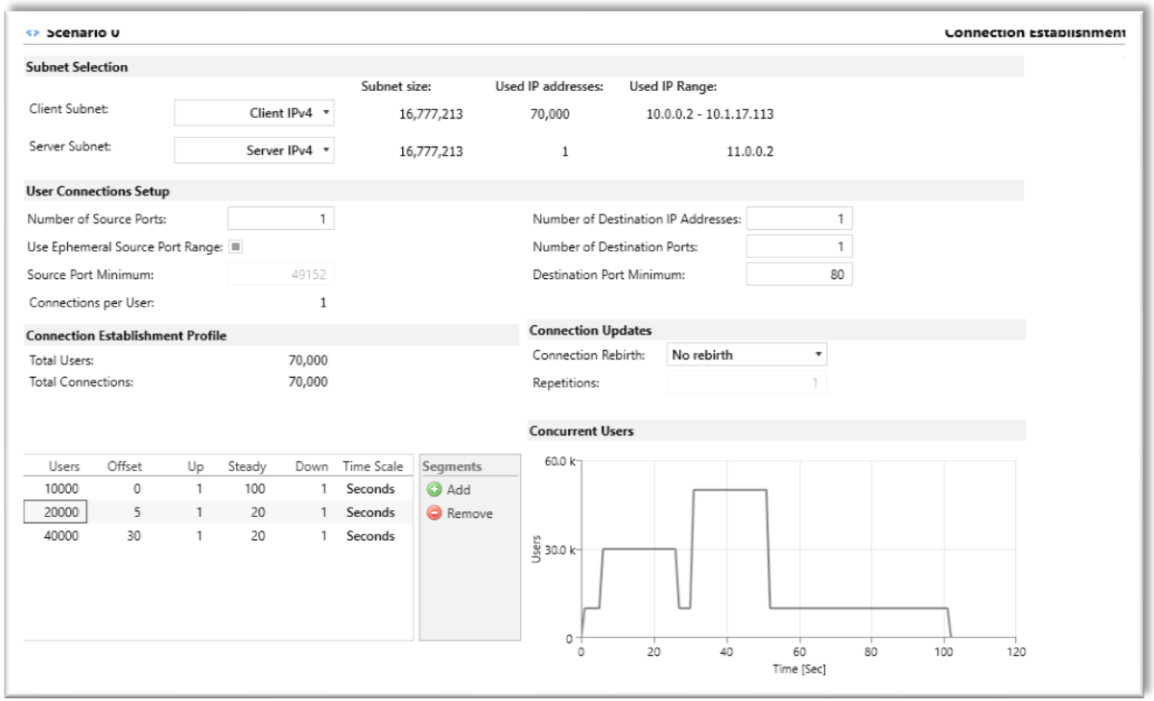
KEY FEATURES

Connection-Oriented Traffic Generation

TCP connections can be customized by modifying the MAC/IP/TCP headers to create variations in the generated packets.

Traffic rates are specified as a percentage of line rate, frames per second or bit-rate, and traffic generation is controlled by a load profile specifying the speed with which connections are established and terminated.

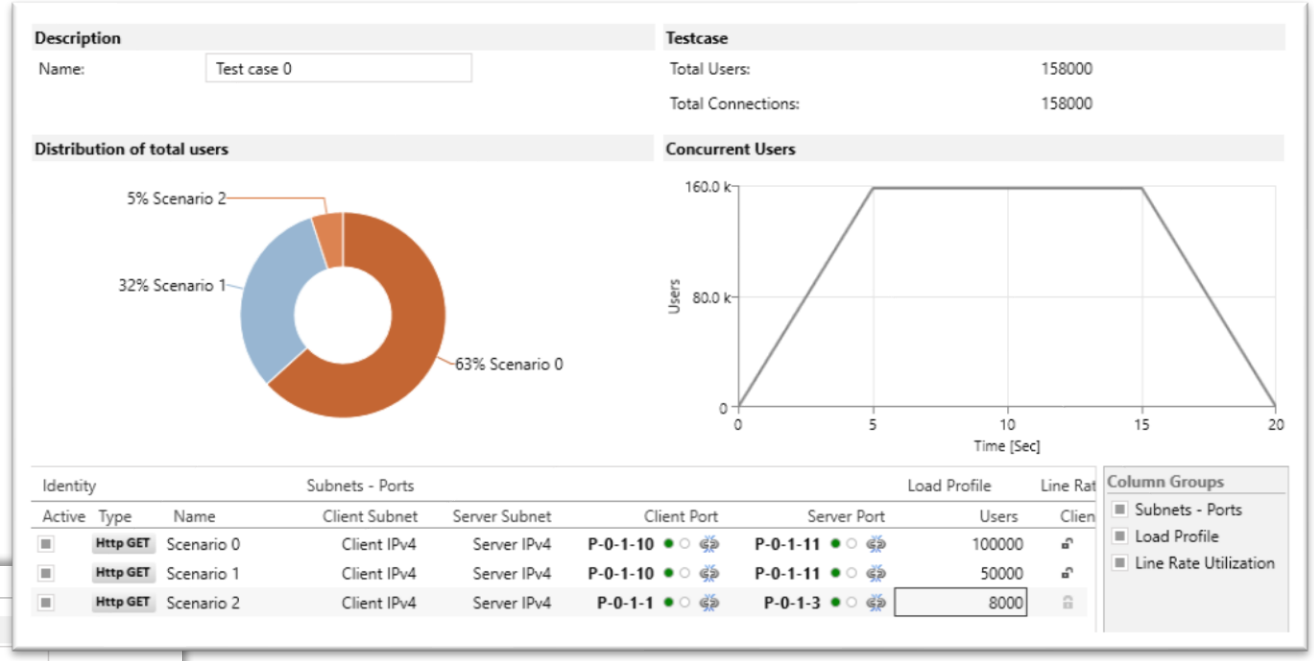
The TCP payload can be automatically generated (random, incrementing) or customized. Payloads can also be loaded from files and different congestion control algorithms can be used to test network behavior.

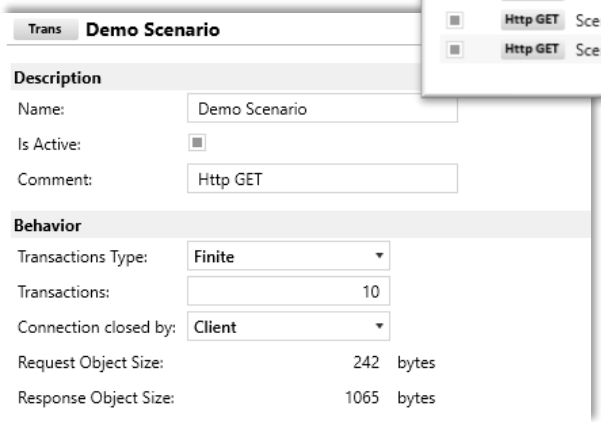


Transaction-based Traffic Generation

Makes it easy to emulate transaction-based traffic based on the request-response communication model.

With the customizable HTTP template and configuration transactions per TCP connection, users can create millions of HTTP transactions for HTTP capacity testing, e.g. HTTP connections per second, HTTP transactions per second, and HTTP throughput at various response sizes.





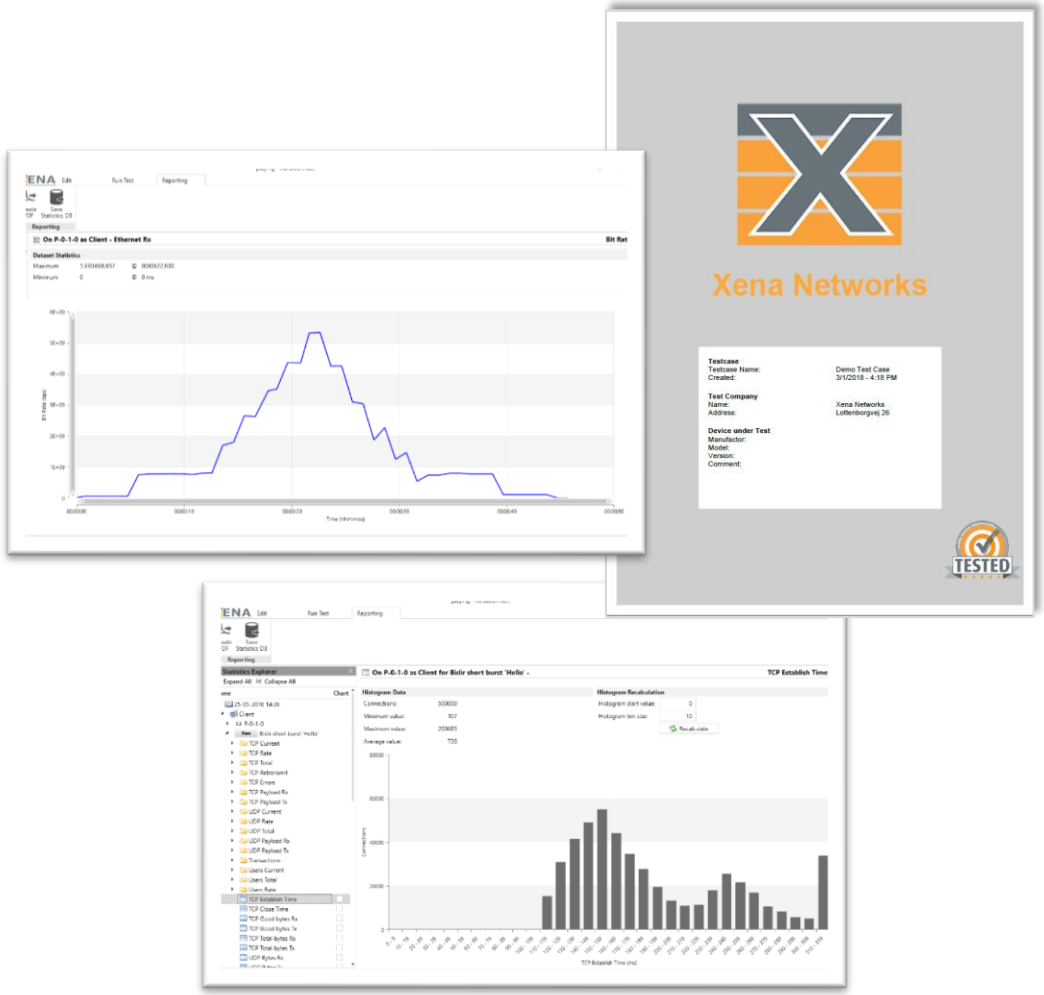
KEY FEATURES

Ease of Use & Debug

Vulcan L4-7 test platform is scalable and can be used to quickly and easily generate millions of TCP connections with specified load profiles and configurable IP/TCP/Payload parameters. Real time stats and test reports provide an in-depth overview of the DUT/SUT characteristics.

Xena's L4-7 test modules are suited for multi-user environments at the level of per-port reservation. Packet Engines (PE's) mean performance can be allocated individually depending on the test scenario, for full operational flexibility.

Enabling the capturing function, users can record communication traffic between test ports as a pcap file for in-depth analysis of the network behavior of the DUT/SUT.



APPLICATIONS

- TLS Middlebox Performance Testing
- Firewall Performance Testing
- Lab-based Performance Testing
- WAN Testing

TLS Middlebox Performance Testing

Testing TLS performance is vital for balancing security and performance. It is essential that the test equipment can get the encrypted TLS traffic through the DUT that is operating in the TLS middlebox/proxy mode. Otherwise, the test will be invalid.

Adopting the latest encryption standard, Xena TLS gives users high-performance test solutions that can reveal the performance bottleneck of their TLS/HTTPS middleboxes/proxies, address security performance testing requirements, and optimize their security parameters.

Key test parameters are:

- TLS handshake per second
- TLS throughput
- HTTPS connection per second
- HTTPS transactions per second
- TLS record size optimization
- TLS cipher suites and key size impact

Firewall Performance Testing

Vulcan L4-7 platform can validate four phases of firewall deployment

1. **Choice of vendor**
   Test how different products perform under real-world conditions to find the one that best matches your needs and budget
2. **Pre-deployment**

   Make sure your firewall is ready to handle the real world traffic loads - before it goes live
3. **Firmware update**

   Confirm that new firmware hasn't deprecated your firewall's capabilities and performance
4. **Network re-design**

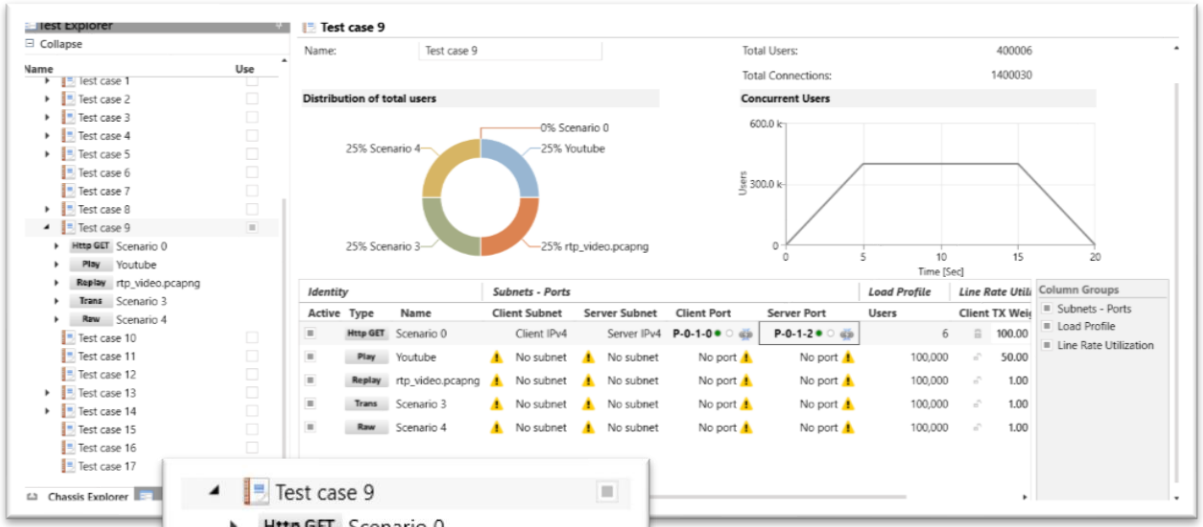
   Test your firewall as your network evolves to ensure it still provides the performance needed

Lab-based Performance Testing

Ideal for validating network device performance in development and production environments.

High port density means large port-count test beds can be set up at a fraction of the cost of existing test solutions with test topologies ranging from L2 forwarding such switches, over packet routing, to caching and network application servers. These can be tested individually or combined into functional networks.

Lab-based testing during development is used to load routers and other forwarding devices with large-scale, realistic stateful TCP sessions to verify forwarding performance.



APPLICATIONS

WAN Testing

L4-7 makes it easy to test the capacity and performance of WANs (& SD-WANs) of service providers and large enterprise networks – where the focus is more on system-wide performance.

Relevant test parameters are:

- Optimal MSS,
- Traffic prioritization using Differentiated Services (DS) and other QoS mechanisms,
- End-to-end TCP Throughput in a managed IP network (RFC6349)
- Verify guaranteed bandwidths according to SLAs.

For carriers, testing can qualify performance before service roll out.

WAN testing can also take place over large geographical distances requiring simultaneous control over multiple traffic generators.

ROADMAP

Coming up…

- Enhanced payload editor
- TLS Server Name Indication (TLS SNI)
- HTTP statistics
- One-way latency

Firewall testing for Enterprises

- Automated performance testing of enterprise class firewalls

ALWAYS INCLUDED WITH EVERY SYSTEM

Great value for money

All SW included for free

- VulcanManager, VulcanAppMix

Free 12 Months of Software Maintenance subscription included

- All future SW applications and features covered under 3 year maintenance agreement

Free technical support

- Free technical support for lifetime of products
- E-mail, web-based training sessions

Free RMA (3 years' HW warranty)

- Ship to US or Europe for repair
- Inbound and outbound shipping paid by Xena

FOR MORE INFORMATION

Layer 4-7 Landing page	Visit now
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Install Guide	Visit now
User Manuals	Visit now
Tech Support	Visit now

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