VULCAN

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Story

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Vulcan generates stateful Ethernet traffic to analyze how firewalls, switches, routers, NAT routers, proxies. load balancers, bandwidth shapers and so on perform in a wide range of real-world scenarios.

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Applications

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QoS

Determining performance, responsiveness and stability of network devices.

- Gateway subnet to subnet routing
- Network Address Translation
- Traffic filtering and shaping
- Deep Packet Inspection
- Intrusion Detection and Prevention Systems

Functional tests

Verifying expected behavior of network devices.

- Gateway subnet to subnet routing
- Network Address Translation
- Traffic filtering and shaping

Service validation

Testing link performance complies with a Service Level agreement.

- Traffic throughput
- Traffic latency
- Traffic prioritization

Security testing

Ensuring that security measurements works as expected, also under significant workload.

- TLS/SSL
- Deep Packet Inspection
- Intrusion Detection and Prevention System

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Quality of Service

Measuring performance, capacity and responsiveness of network devices is important to determine the overall Quality of Service the users will experience.

Layer 1 throughput and application goodput measurements reveals bottlenecks causing retransmissions and loss that can help optimizing network devices and infrastructures. The responsive of a network device is characterized as sessions per sec. as well as application transactions per sec, and its capacity by how many simultaneous sessions/traffic flows it can handle.

Vulcan offers a solution that with minimum configuration effort can do measures within performance, capacity and latency for network devices providing functionality such as:

- IP routing, Network Address Translation
- Stateful and content based Traffic filtering
- Traffic shaping
- Intrusion Detection and Preventing Systems

Functional testing

Verifying correct implementation of network devices during development is crucial, but often overseen is validation of correct configuration during and after deployment.

Use VulcanManager to define test cases targeting specific functionality. With the built-in high performance TCP, UDP and application library XenaAppMix, simple to very complex traffic scenarios spanning over multiple test ports can be configured.

Vulcan offer a solution that with its TCP/UDP and XenaAppmix can verify network devices providing functionality such as:

- IP routing, Network Address Translation
- Stateful and content based Traffic filtering
- Traffic shaping
- Intrusion Detection and Preventing Systems

Service validation

Vulcan 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:

- End-to-end throughput and latency in a managed IP network
- Optimal Maximum Segment Size (MSS).
- Traffic prioritization using Differentiated Services (DS) and other QoS mechanisms.
- Verify guaranteed bandwidths according to SLAs.

WAN testing can also take place over large geographical distances requiring simultaneous control over multiple traffic generators. For that Vulcan offers a perfect solution to; in a centralized manner orchestra separated test ports all over the world.

Security testing

The increasingly demands for security in terms of both privacy, trust as well as protecting systems from data leak and intrusion requires means for both performance and functional testing.

With Vulcans TLS features and application replay, performance and behavior of security devices can be verified. In focus for such test are both the ability to detect security breach, but also to verify that the implemented security means works as expected under high load.

This includes network functionality such as:

- TLS encryption /decryption
- Deep packet inspection
- Content based traffic filtering
- Intrusion detection and preventing systems.

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Hardware

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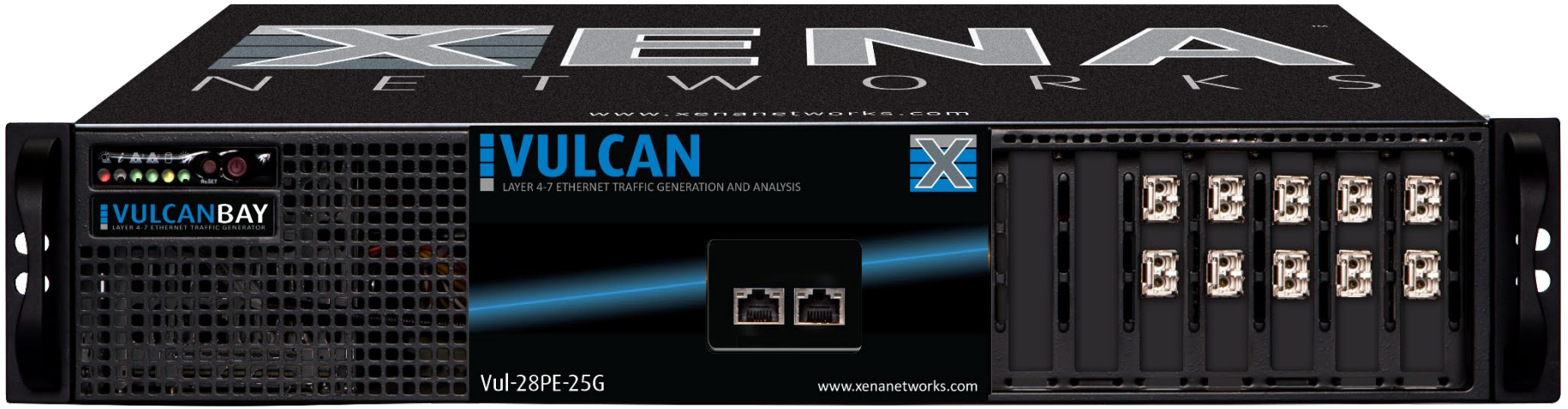
- 14 million Concurrent Connections (CC)
- 5 million Connections Per Second (CPS)
- 2.8 million Transactions Per Second (TPS)
- 500.000 Concurrent TLS Sessions

19” Rack size, 1U.

C-Vul-28PE-10G Throughput 20Gbps
2 x 2-speed 10GbE/1GbE SFP+ interfaces.

C-Vul-28PE-10G CU Throughput 20Gbps
2 x 4-speed 10GbE/5.0GbE/2.5GbE/10GbE RJ45 interfaces

C-Vul-28PE-25G Throughput 40Gbps
2 x 3-speed 25GbE/10Gbe/1GbE SFP28 and SFP+ interfaces



- 28 million Concurrent Connections (CC)
- 10 million Connections Per Second (CPS)
- 800.000 Concurrent TLS Sessions
- 5.7 million Transactions Per Second (TPS)

19” rack size, 2U.

Vul-28PE-10G-CU Throughput 120Gbps
Up to 12 x 4-speed 10G/5G/2.5G/1G BASE-T interfaces.

Vul-28PE-25G Throughput 140Gbps
Up to 12 x 3-speed 25G/10G/1G SFP28 interfaces.

Vul-28PE-40G Throughput 140Gbps
2 x QSFP+ 40GBase.
Up to 8 x 3-speed 25G/10G/1G SFP28 interfaces.

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

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Software

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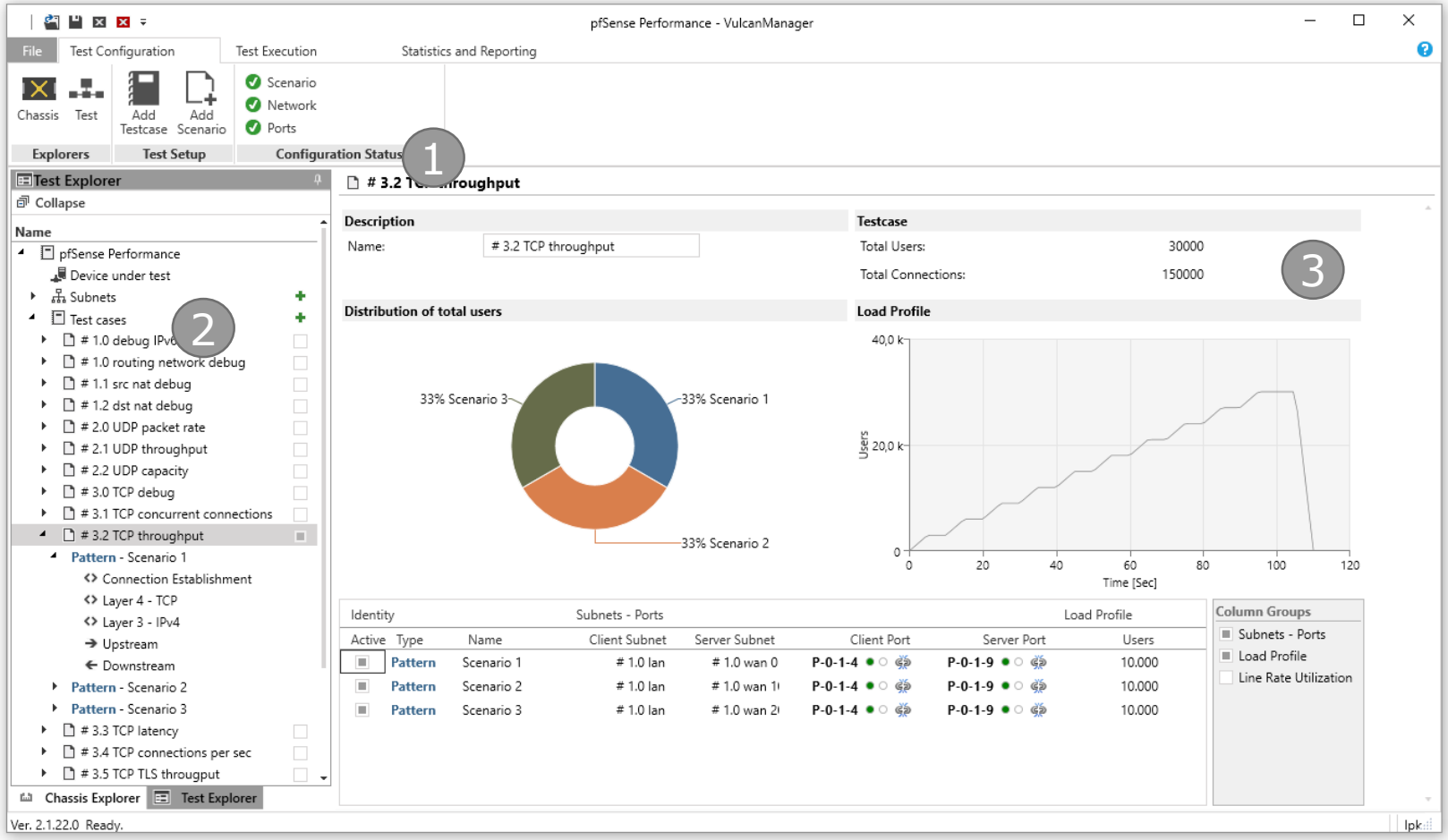
VulcanManager

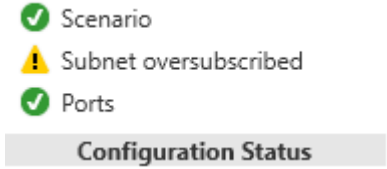
The Vulcan software you'll use most of the time

A MS Windows application used to configure and generate streams of Ethernet traffic between our stateful test equipment and devices under test (DUTs) at port speeds up to 40 Gbps, and analyze the results.

Test Configuration



1 'Tool bar' with most common actions and configuration 'Traffic Light'.



2 Explores to easily navigate through test configuration and statistics.

3 Configuration and detail views with graphical elements.

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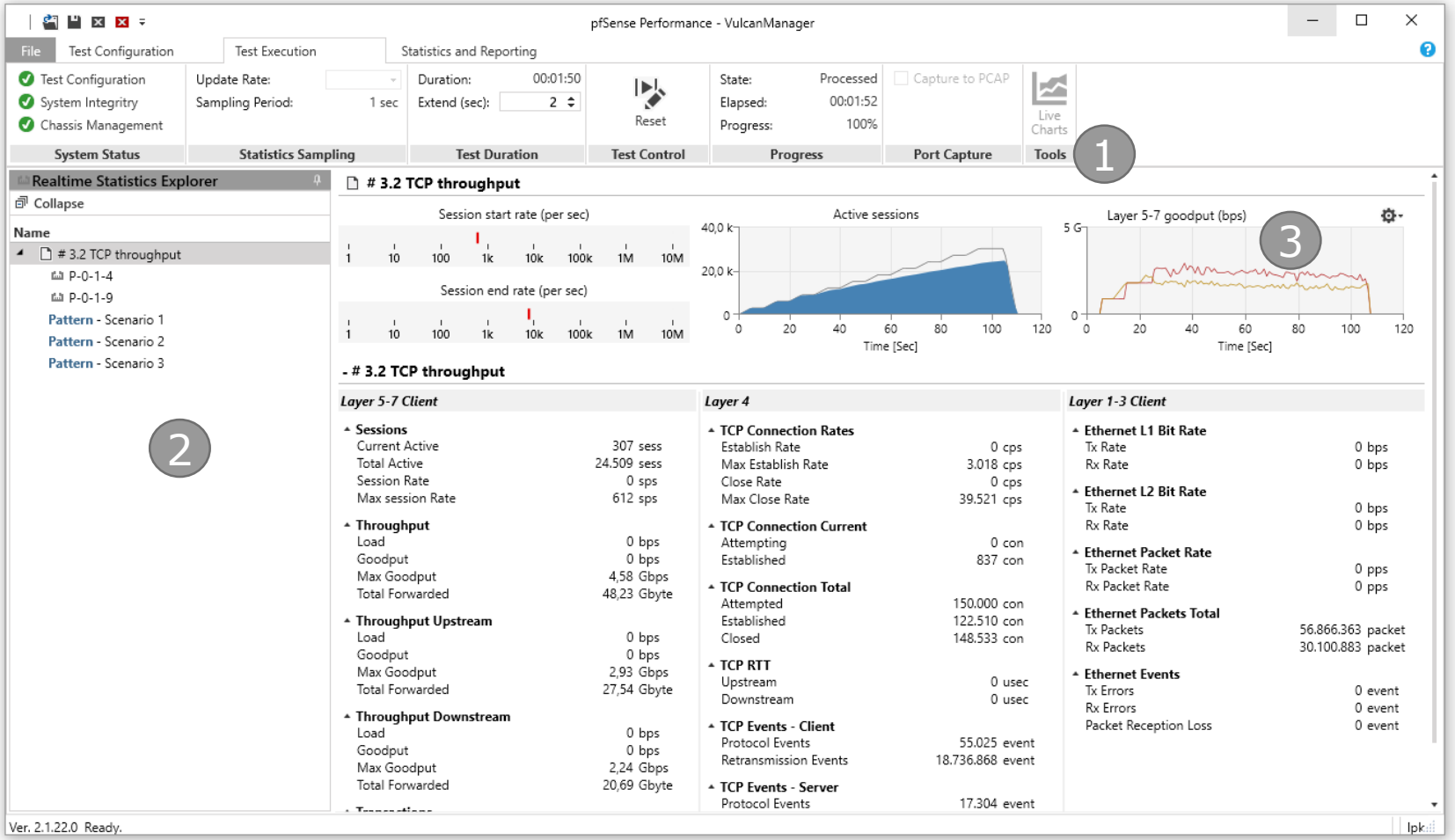
Test Execution



1. Easily setup, control and monitor test execution.
2. Use Realtime Statistics Explorer to easily navigate through the hierarchy of live statistics counters and charts.
3. View extensive set of real-time statistics and monitor test progression with real time updated gauges and charts.

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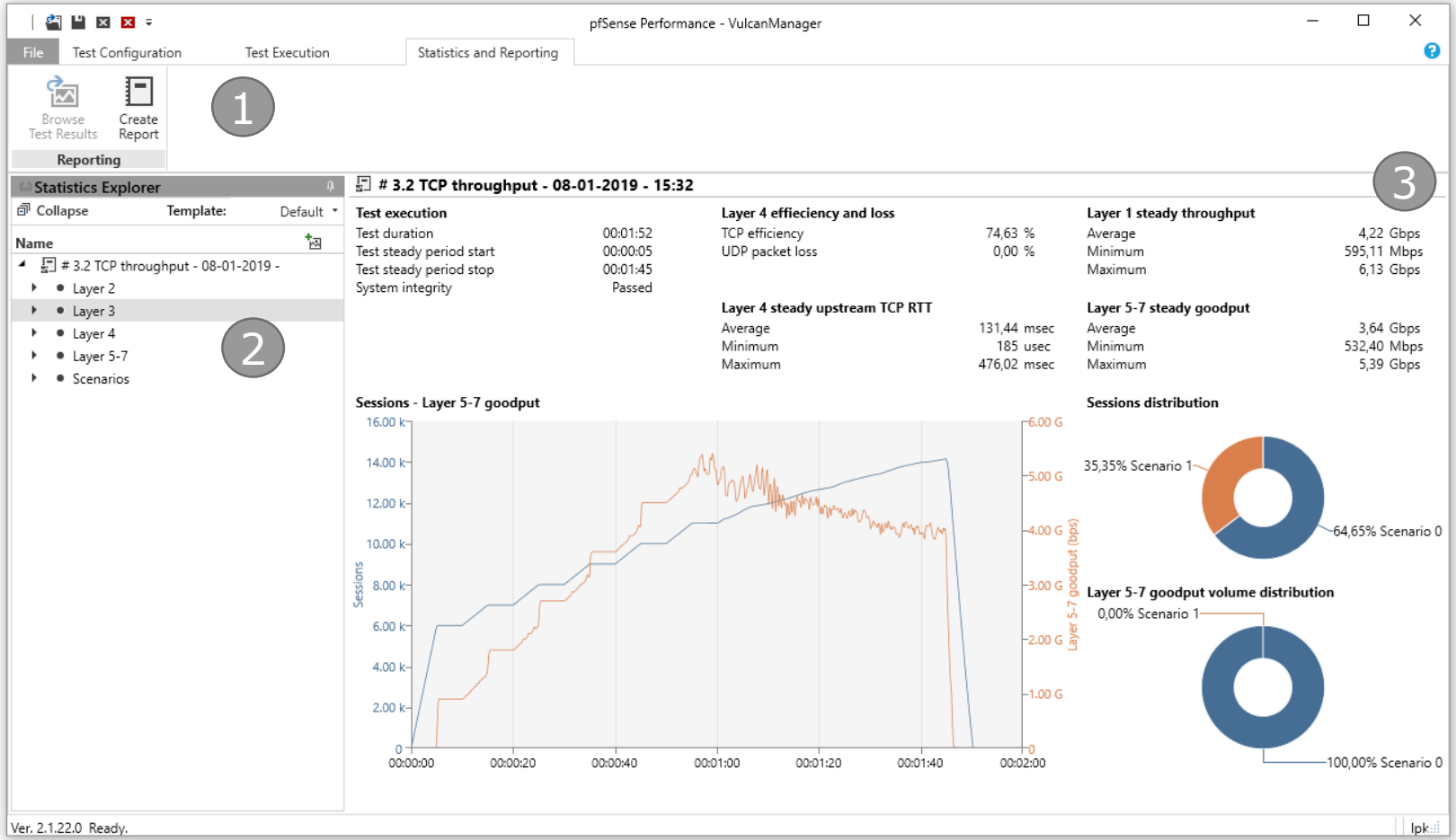
Statistics and Reporting



1. Open previous stored test results and create reports.

2. Use Statistics Explorer to easily navigate through the hierarchy of statistics counters and charts.

3. Analyze counters and charts in details.

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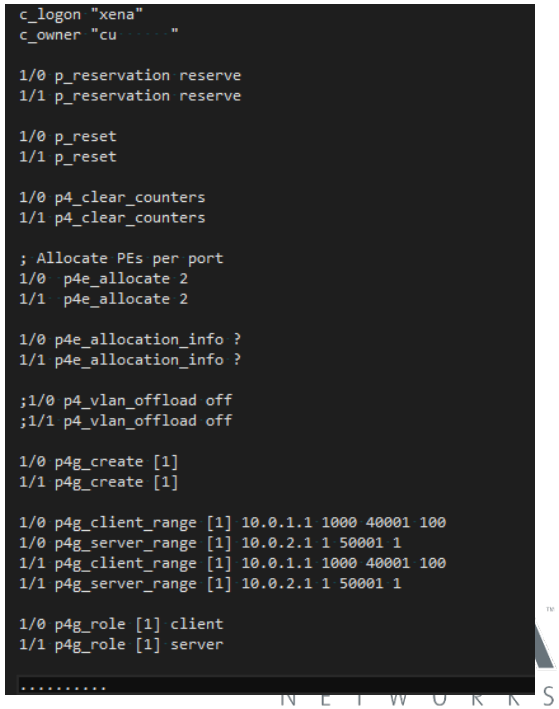
Vulcan Command Line Interface

Vulcan CLI is a command-line-interface (CLI) scripting API which supports multiple concurrent scripting sessions. This makes it easy for different users – in different locations – to work on the same Vulcan chassis simultaneously.

Any client platform that can establish a TCP/IP connection can be used to send and receive CLI commands as lines of text. Typical client platforms include Tcl*, Perl*, Python*, Java*, and VBA.



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Key Features

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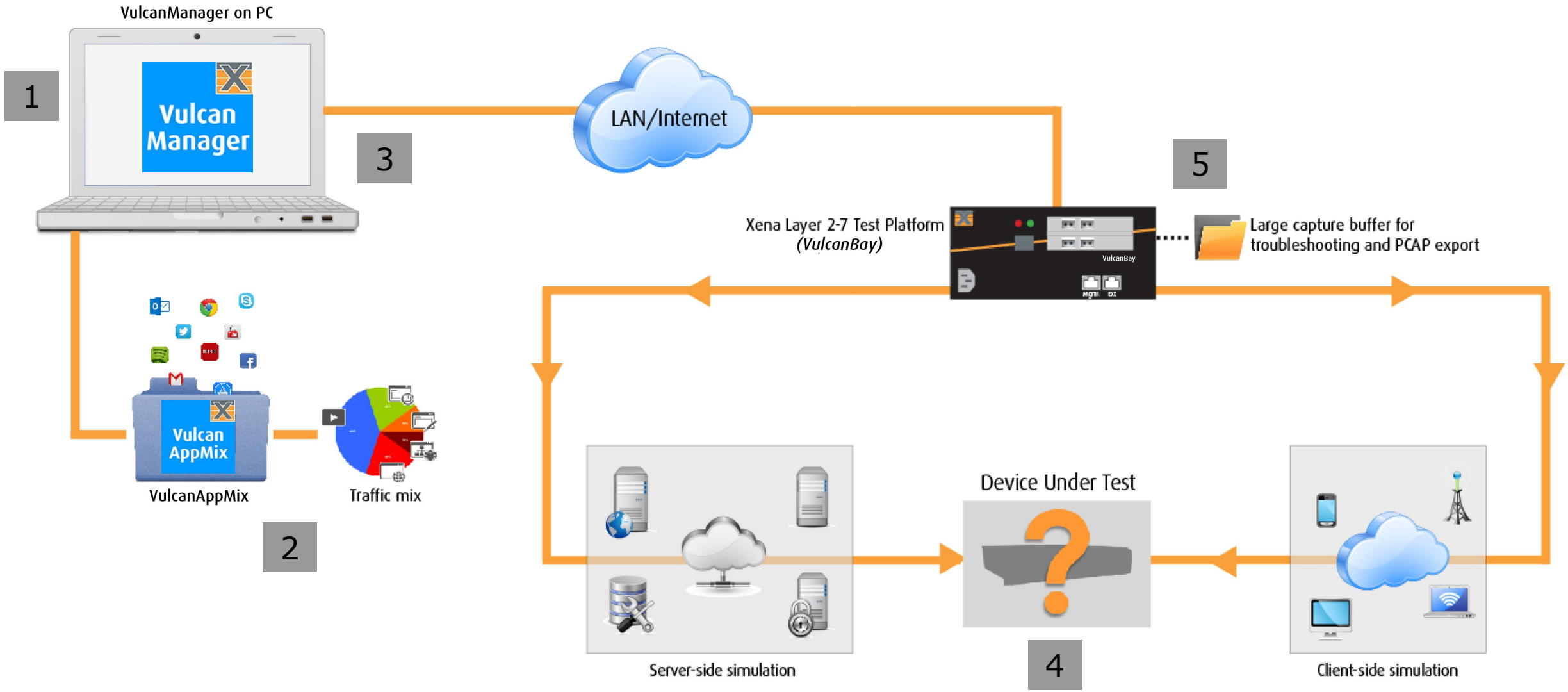

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Stateful TCP for extreme load performance testing.

TCP stack handles connection establishment, retransmission, and connection tear-down.

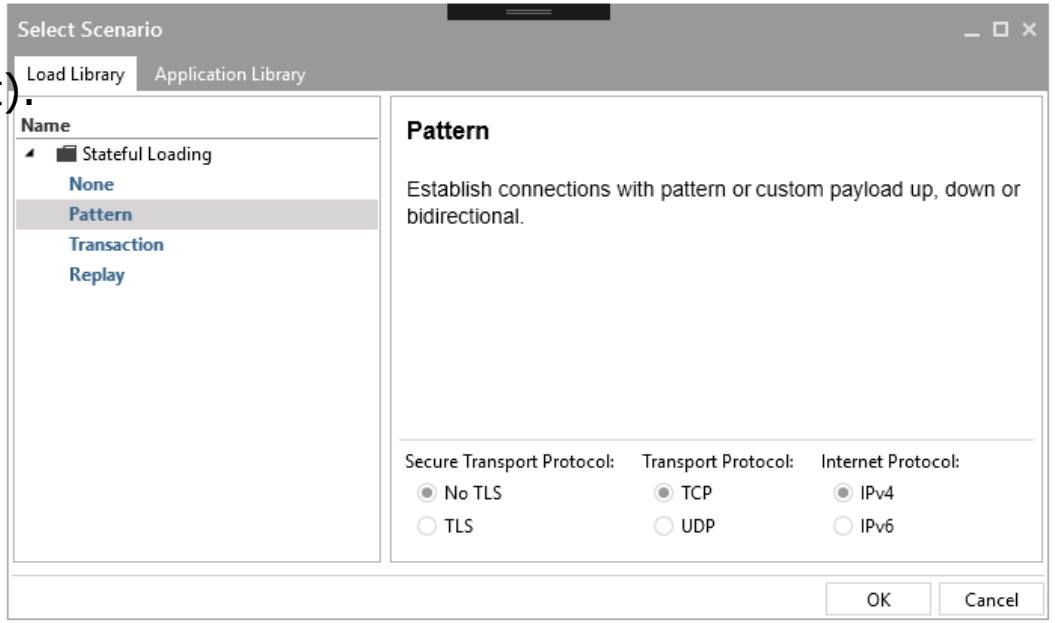
Support TCP congestion control: Reno, New Reno.

Support dynamic and static RTO (retransmission timeout).

Support RTT (round-trip time latency) measurement.

TCP CPS (connection per second) up to 10 million.

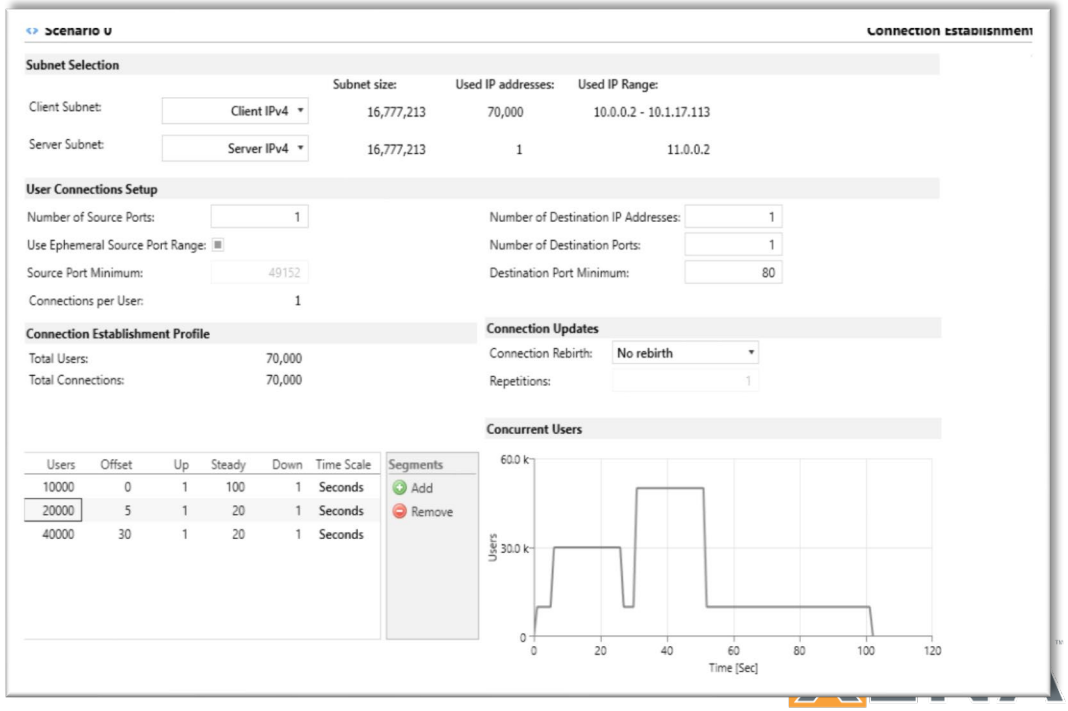
TCP CC (concurrent connections) up to 28 million.



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.

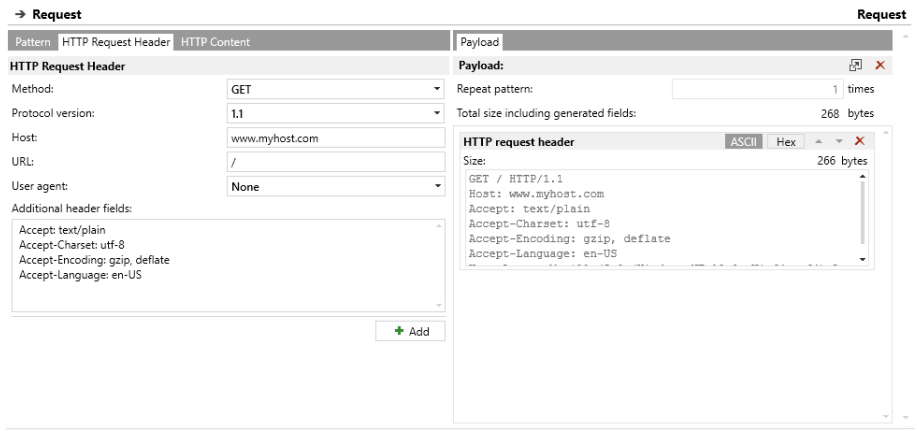
The TCP payload can be automatically generated (random, incrementing) or customized. Payloads can also be loaded from files and different congestion control algorithms can be used to test network behavior.

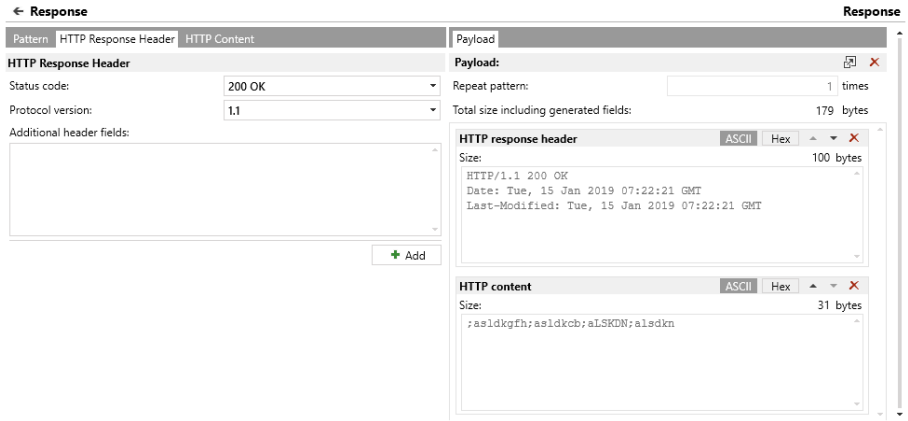


Transaction based traffic generation

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.





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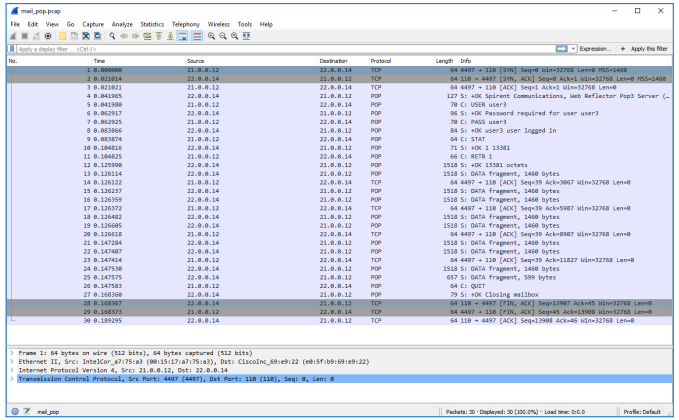
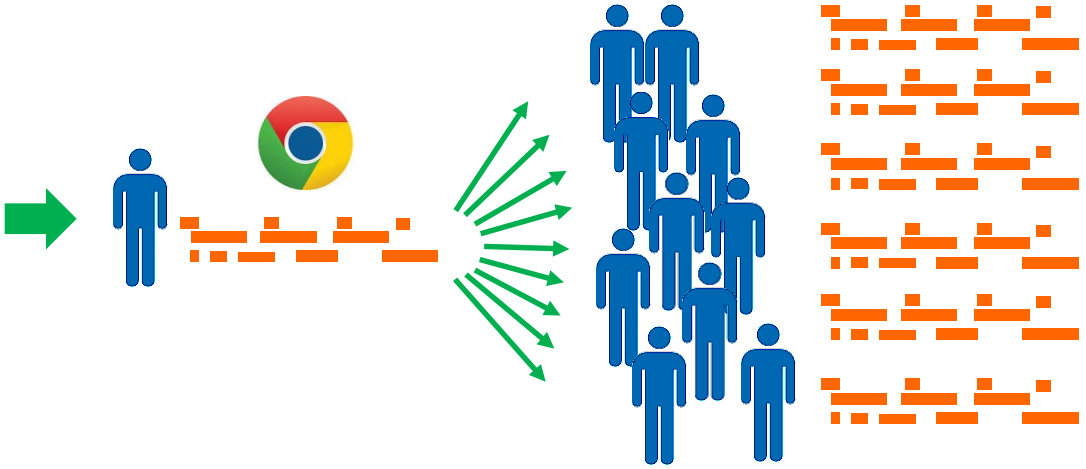
Stateful Application Payload Replay

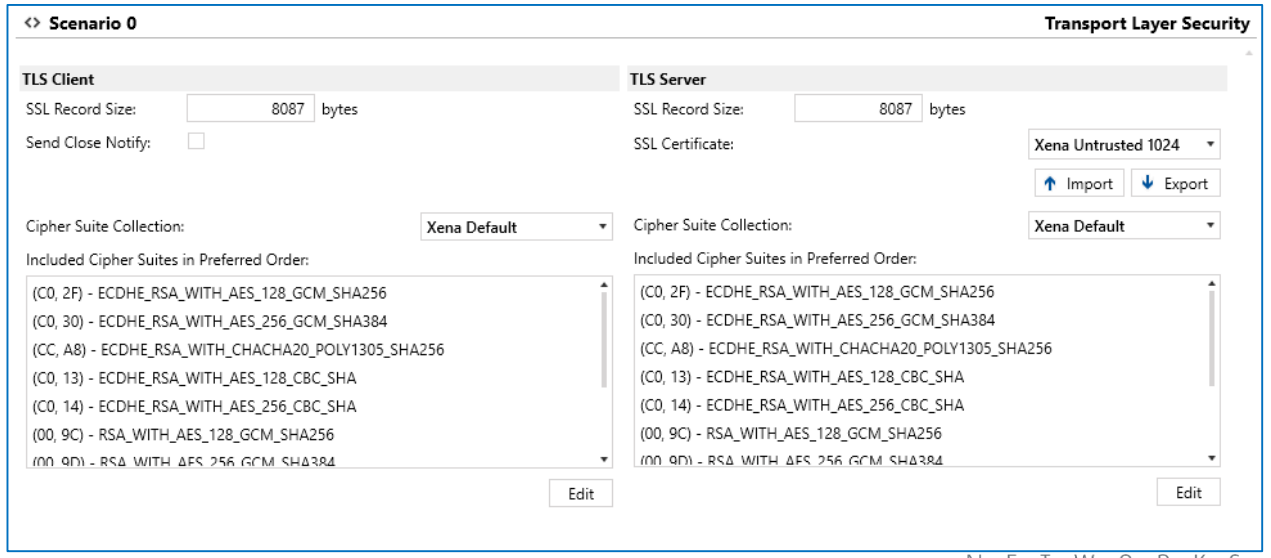
Importing PCAP for Replay scenario
PCAP files are parsed and payload extracted for replay
Replay on top of TCP stack
Support one-to-many communication pattern in PCAP
Capable of scaling from one user to millions





SSL / TLS Performance Testing

VulcanManager supports SSL 3.0, TLS 1.0, 1.1, 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.
With 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.



Real Traffic Emulation - VulcanAppMix

Test your networks or devices with “real” traffic.

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

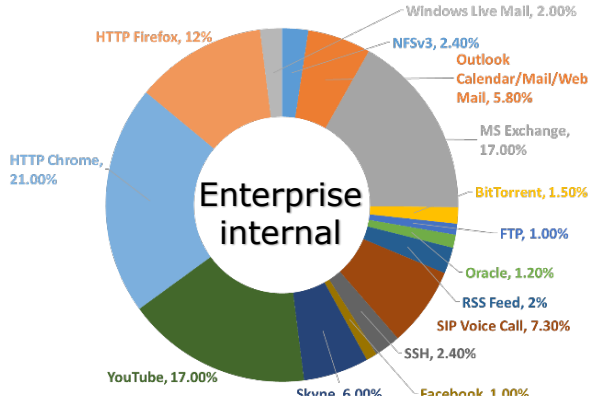
Vulcan AppMix - Applications

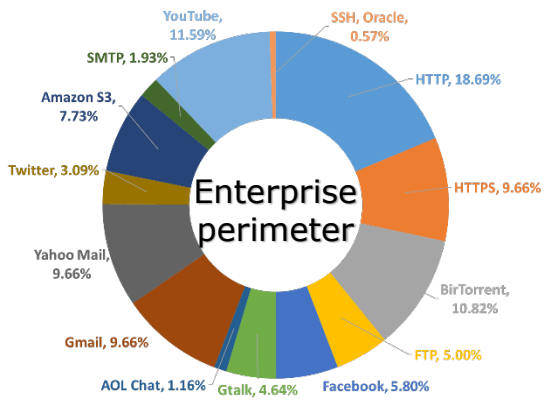
Amazon
App Store App
Apple Map
AWS S3
Bing Search
BitTorrent
Bloomberg
Chrome
Chrome Incognito
CNN
DNS
Dropbox
eBay
Email application
Facebook
Facebook Messenger
Finance orders (FIX4.0)
Finance orders (FIX4.1)
Finance orders (FIX4.2)
Finance orders (FIX4.3)
Finance orders (FIX4.4)
Finance orders (FIX5.0)
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

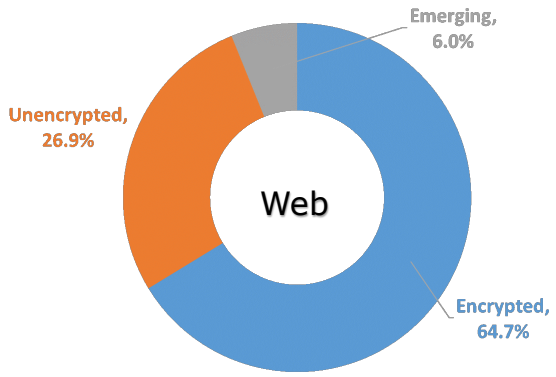
Vulcan AppMix - Protocols

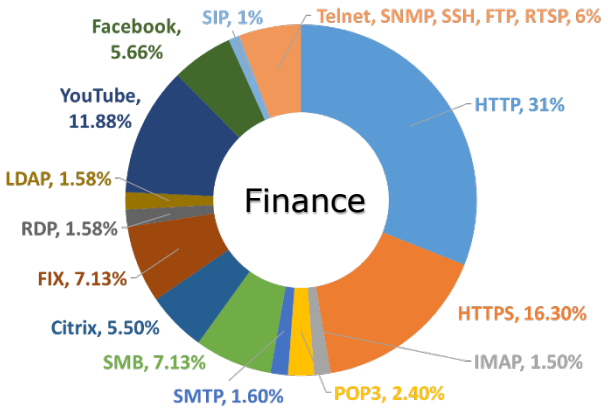
AFS
BitTorrent
DNS
Echo
FIX4.0
FIX4.1
FIX4.2
FIX4.3
FIX4.4
FIX5.0
FIXT1.1
FTP (active)
FTP (passive)
HTTP
HTTPS
IMAP
IMAPS
LDAP
LLMNR
MDNS
MQTT
MQTTS
MSExchange MAPI
NBNS
NFSv2
NFSv3
POP3
POP3 over TLS
QUIC
RDP
RTP/RTCP
RTSP
SIP
SMB2
SMTP
SMTP over TLS
SRTP
SSDP
SSHv2
TELNET (per-character)
TELNET (per-line)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

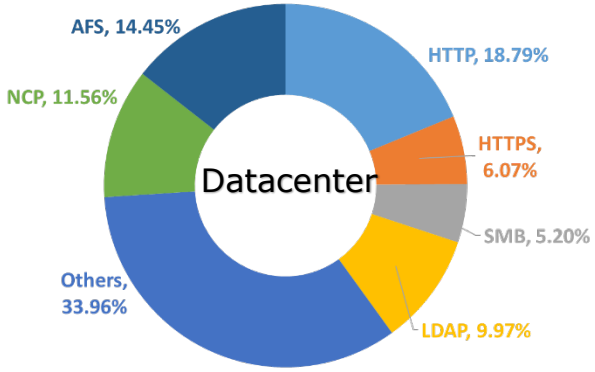
Vulcan AppMix – Application Mixes

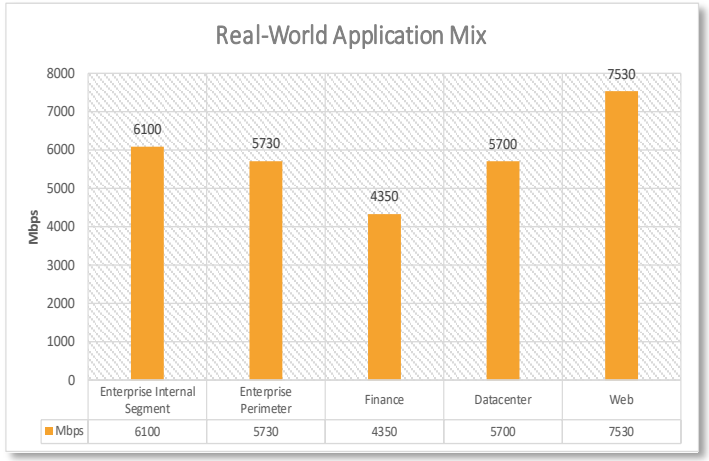












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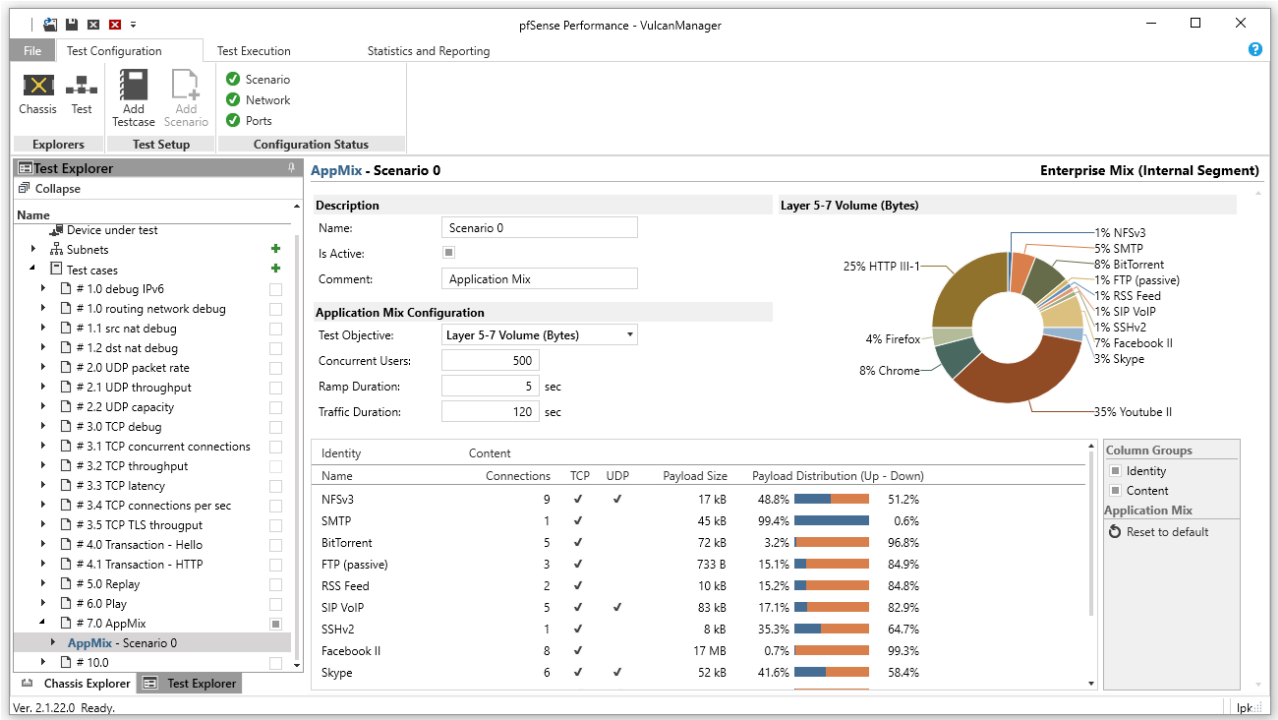
VulcanManager

Test Configuration – Test Execution – Statistics and Reporting



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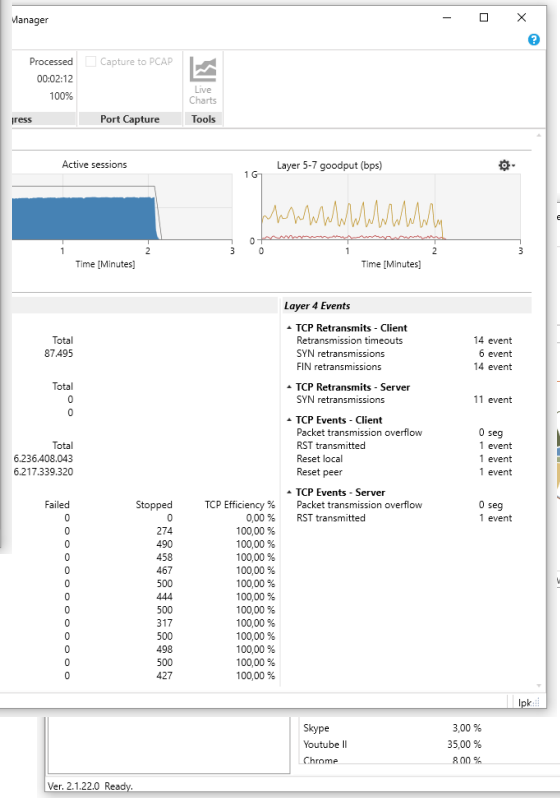

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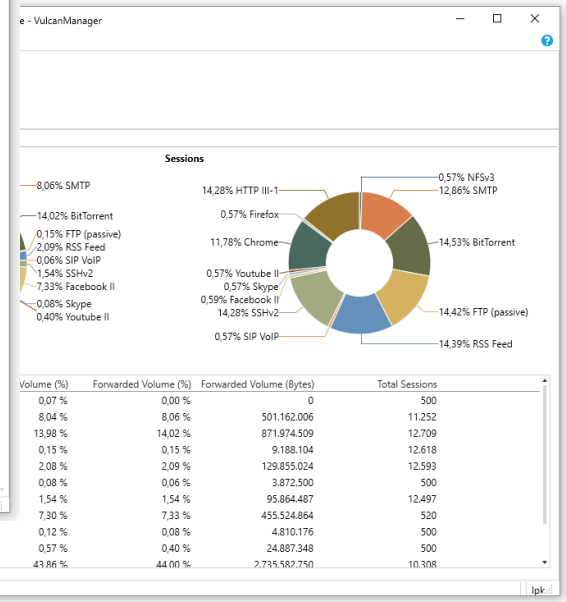


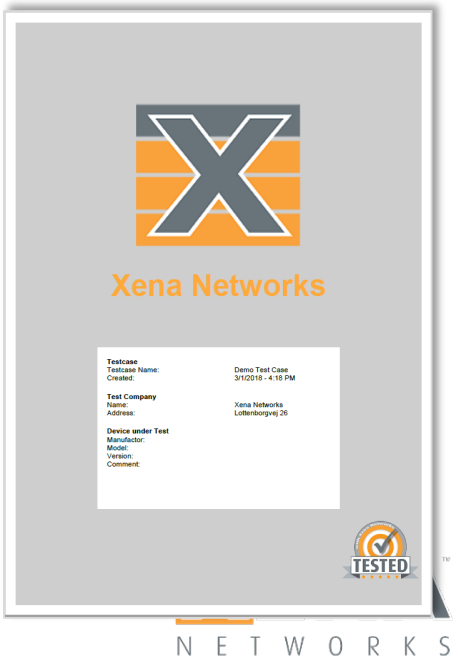
3

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.



VULCAN

Roadmap

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Future features releases:

Stay up to date
follow https://xenanetworks.com/comingsoon

VULCAN

Summary

XENA NETWORKS

What?
Stateful ethernet traffic generation and analysis platform

For who?
- Network equipment manufactures – firewalls, packet brokers, security platforms,
- Infrastructure – Subscriber edges, service providers, etc.
- Enterprise customers – firewalls, security platforms etc.

Top issues Vulcan solves:
- Quality of Service, performance, what if analysis.
- Functional testing, security rules, validation etc.
- Service validation, traffic throughput, latency, prioritization
- Security

Why Vulcan?
- Compact, Scalable
- Low total owner cost
- Simple and easy to use

VULCAN

Thank you

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