

# IXLOAD<sup>®</sup> VIRTUAL EDITION (VE) VIRTUALIZED MULTIPLAY SERVICES TESTING

DATA SHEET

## PROBLEM: WITH VIRTUALIZATION, EVERYTHING KNOWN AND PROVEN BECOMES UNKNOWN AND UNPROVEN AGAIN

Today's networks need to adapt quickly and facilitate change. Strategies like network functions virtualization (NFV) and software defined networking (SDN) provide powerful flexibility gains by moving functions like customer premises equipment (CPE), load balancing, firewall security, evolved packet core (EPC), and integrated management systems (IMS) off of dedicated hardware onto virtualized servers. Virtualized network functions (VNFs) need to deliver the same or better performance than the traditional network. Without a way to properly test these VNFs, customer quality of experience (QoE) is at risk.

## SOLUTION: A HIGHLY ELASTIC, PORTABLE, AND EASY-TO-USE SOLUTION FOR TESTING AND VALIDATION

IxLoad VE delivers comprehensive functional and performance testing to validate user QoE in physical and virtual networks. IxLoad VE emulates web, video, voice, storage, VPN, wireless, infrastructure, and encapsulation/security protocols to create realistic scenarios. A modular system design allows IxLoad VE to elastically scale with your infrastructure, while real-time QoE metrics let you drill down to quickly identify network degradations and isolate breaking points. Since IxLoad is as easy to use as it is effective, you don't have to be a protocol expert to achieve complete end-to-end service validation.

The IxLoad VE subscription model is aligned with enterprise project-based IT OPEX funding requirements. Acquire the tools quickly, scale up and scale down as project needs demand, and deploy anywhere with virtualization speed and simplicity.

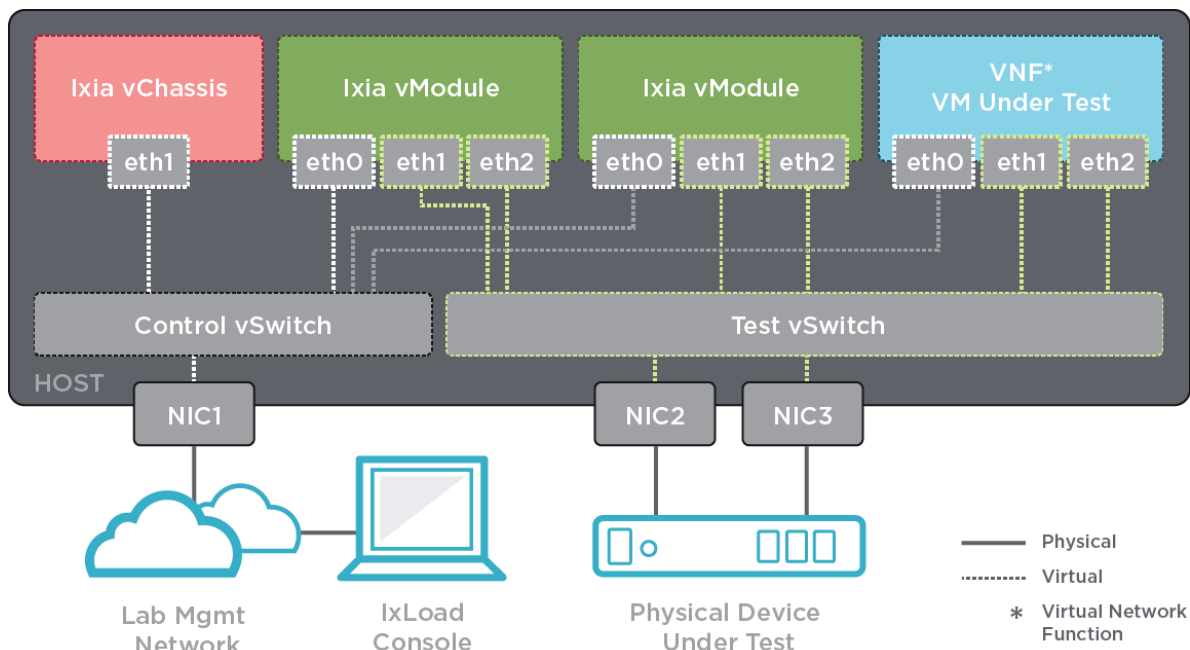
## HIGHLIGHTS

- Validate functionality of application-aware devices such as virtual firewalls, ADCs, storage servers, and other application servers — virtual and physical
- Test converged multiplay services and application delivery platforms
- Create realistic scenarios to validate subscriber QoE using unique and advanced subscriber modeling capabilities
- Assess how virtual machine (VM) mobility impacts application reliability and scalability
- Pinpoint and isolate application performance issues in the datacenter with flexible deployment of Ixia virtual test tools that can be easily moved, changed, or scaled up and down
- Validate NFV migration by testing within OpenStack-based private clouds
- Leverage subscription-based licensing for low startup cost and flexibility of pay-as-you-grow OPEX model



IxLoad <sup>VE</sup>

VISIT [IXIACOM.COM](http://IXIACOM.COM) FOR MORE DETAILS ON THE IXLOAD PRODUCT



**IxLoad VE deployment for both virtual and physical device testing**

## KEY FEATURES

- Emulates data, voice, and video subscribers and their associated protocols for high scale performance testing
- Delivers end-to-end testing of converged wireless and wired application delivery infrastructure and services
- Unique and advanced subscriber modeling enables users to create realistic scenarios to validate subscriber QoE
- Common IxLoad user interface across both Ixia hardware and virtual products enables end-to-end virtual- and hardware-based testing from a single pane of glass
- Seeks test objective goals automatically, including concurrent connections, connection rate, simulated users, and throughput
- Ixia VM components (virtual chassis, virtual load modules) are software optimized for stateful protocol emulation in virtual environments
- Comprehensive platform support including standalone hypervisors (VMware ESXi and KVM) and OpenStack-based private clouds
- Flexible all-inclusive subscription licensing model reduces startup cost
- Common licensing server shared among IxLoad VE, IxNetwork VE, and BreakingPoint VE
- Full automation capabilities with REST, TCL, Perl, Python, and Ruby API support

## SPECIFICATIONS

IxLoad VE features, functions, and capacities for the Ixia Virtual Chassis, Ixia Virtual Load Modules, and Ixia Virtual Test Appliance:

FEATURE	VIRTUAL CHASSIS	VIRTUAL LOAD MODULE	VIRTUAL TEST APPLIANCE
<b>Maximum # of Virtual Ports</b>	128	32 (depends on host system)	8
<b>Maximum # of Virtual Load Modules</b>	32	N / A	1
<b>Maximum # of Users</b>	32	1	1
<b>Guest OS</b>	Based on CentOS 7 / 64-bit / Linux 3.10 kernel	Based on CentOS 7 / 64-bit / Linux 3.10 kernel	Based on CentOS 7 / 64-bit / Linux 3.10 kernel
<b>vCPU</b>	2 vCPUs	2 vCPUs	2 vCPUs
<b>Memory</b>	4 GB RAM	4 GB RAM	4 GB RAM
<b>Disk</b>	8 GB	2 GB	8 GB

IxLoad VE distribution format and packaging for **Manual Deployment** Scenario (using the platform specific tools for deploying the Ixia Virtual Edition products):

PLATFORM	VIRTUAL CHASSIS	VIRTUAL LOAD MODULE	VIRTUAL TEST APPLIANCE
<b>VMware ESXi</b>	OVA	OVA	OVA
<b>VMware vCenter</b>	OVA	OVA	OVA
<b>KVM / stand-alone</b>	QCOW2	QCOW2	QCOW2
<b>KVM / OpenStack</b>	QCOW2	QCOW2	QCOW2
<b>Docker Container</b>	TAR	TAR	N / A

IxLoad VE distribution format and packaging for **Automatic Deployment** Scenario (using the Deployment Wizard within the Ixia client applications for creating large scale deployments with ease):

PLATFORM	VIRTUAL CHASSIS	VIRTUAL LOAD MODULE	VIRTUAL TEST APPLIANCE
VMware ESXi	SH	SH	N / A
VMware vCenter	OVA	OVA	N / A
KVM / stand-alone	SH	SH	N / A
KVM / OpenStack	N / A	N / A	N / A
Docker Container	N / A	N / A	N / A

## QUALIFIED AND COMPATIBLE ENVIRONMENTS

IxLoad VE is designed to work best when used in a qualified environment. Our recommendation is to always use one of the qualified versions of the virtualization platforms.

IxLoad VE is also compatible with different environments. In case there are issues encountered in these environments, Ixia will make reasonable efforts to address them, but cannot guarantee specific outcomes or results. In such rare cases, the proposed solution is to use the qualified environment.

CATEGORY	QUALIFIED	COMPATIBLE
<b>Hypervisor and Host OS</b>	<ul style="list-style-type: none"> <li>VMware vSphere ESXi 6.X</li> <li>KVM over CentOS 7.X</li> <li>KVM over Ubuntu 16.04 LTS</li> </ul>	<ul style="list-style-type: none"> <li>VMware vSphere ESXi 5.X</li> <li>KVM over CentOS 6.X</li> <li>KVM over Ubuntu 14.04 LTS</li> <li>KVM over Ubuntu 18.04 LTS</li> <li>KVM over RHEL 6.X</li> <li>KVM over RHEL 7.X</li> </ul>
<b>Management and Orchestration</b>	<ul style="list-style-type: none"> <li>VMware vCenter 6.X</li> <li>OpenStack Newton (vanilla distribution)</li> </ul>	<ul style="list-style-type: none"> <li>VMware vCenter 5.X</li> <li>Other OpenStack-based platforms (vanilla distributions)</li> <li>Other OpenStack-based platforms (vendor-specific distributions)</li> </ul>

CATEGORY		QUALIFIED	COMPATIBLE
Network Connection and vNIC Driver	Virtual Switch	<ul style="list-style-type: none"> <li>• VMXNET3 (VMware)</li> <li>• VIRTIO (KVM)</li> </ul>	<ul style="list-style-type: none"> <li>• N / A</li> </ul>
	PCI Pass-Trough	<ul style="list-style-type: none"> <li>• Intel 1G / 10G - IGB / IXGBE (all platforms)</li> <li>• Intel 10G / 25G / 40G - I40E (all platforms)</li> <li>• Mellanox 10G / 25G / 40G - MLX4 / MLX5 (all platforms)</li> </ul>	<ul style="list-style-type: none"> <li>• Cisco 10G ENIC (all platforms)</li> </ul>
	SR-IOV	<ul style="list-style-type: none"> <li>• Intel 1G / 10G - IGBVF / IXGBEVF (all platforms)</li> <li>• Intel 10G / 25G / 40G - I40EVF (all platforms)</li> <li>• Mellanox 10G / 25G / 40G - MLX4 / MLX5 (all platforms)</li> </ul>	<ul style="list-style-type: none"> <li>• Cisco 10G ENIC (all platforms)</li> </ul>
Virtual Switch Model		<ul style="list-style-type: none"> <li>• Virtual Standard Switch (on VMware)</li> <li>• Virtual Distributed Switch (on VMware)</li> <li>• Linux Bridges (on KVM)</li> <li>• Open Virtual Switch (on KVM)</li> <li>• Open Virtual Switch (on OpenStack)</li> </ul>	<ul style="list-style-type: none"> <li>• Linux Bridges (on OpenStack)</li> </ul>
Performance acceleration for encrypted traffic (SSL)		<ul style="list-style-type: none"> <li>• Intel AES-NI / AVX / AVX2 instruction sets</li> </ul>	

## APPLICATION LAYER PROTOCOLS

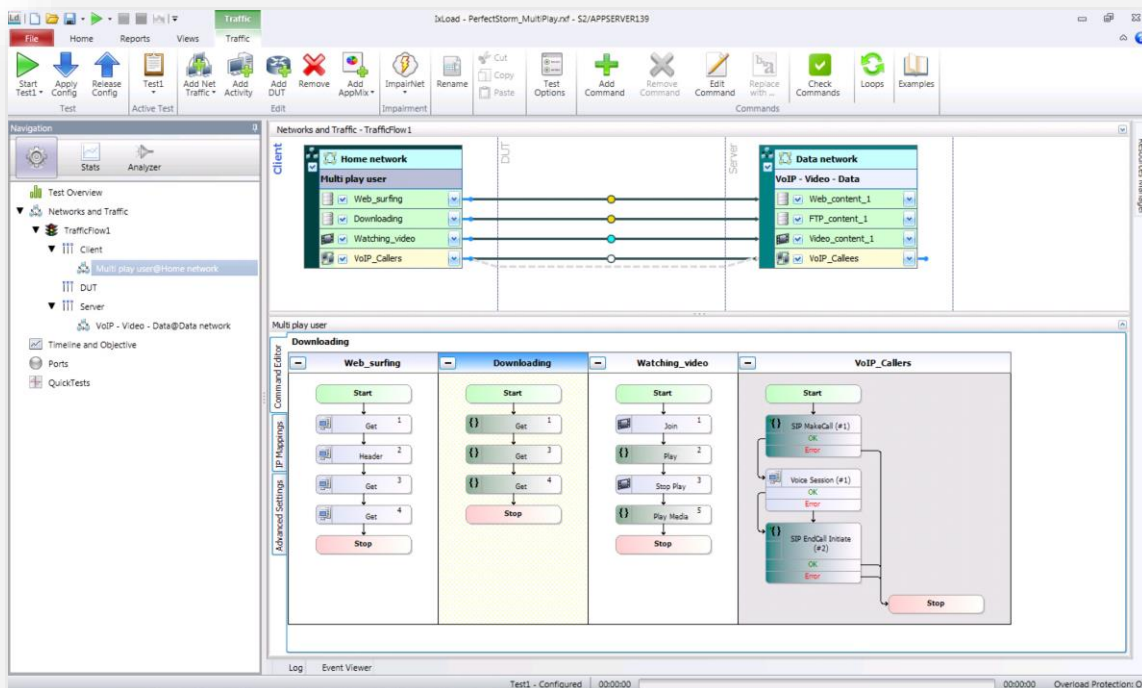
IxLoad delivers a wide variety of fully stateful protocols to emulate a complete multiplay user environment. It delivers a sophisticated subscriber modeling capability that enables users to replicate the dynamic nature of subscriber behavior. Ixia's virtual chassis and load modules empower IxLoad to generate city-scale traffic. This, along with comprehensive network support, advanced test timelines, and automatic goal-seek fine-tuning to meet test objective, enables users to comprehensively assess the performance of their service delivery networks and determine application-level performance with a single integrated solution.

TECHNOLOGY	PROTOCOLS
<b>Web</b>	HTTP (1.0 / 1.1), HTTP/2, SSLv2 / SSLv3, TLSv1 / TLSv1.1 / TLS 1.2 / TLS 1.3 Client and Server emulations
<b>File Transfer</b>	FTP / TFTP Client and Server emulations
<b>Email</b>	SMTP, POP3, IMAP Client and Server emulations
<b>Storage</b>	SMB1, SMB2, SMB3 Client and Server emulations; NFSv3, NFSv4, NFS 4.1 Client emulations; iSCSI Initiator and Target emulations; Cloud Storage OpenStack Swift Client emulation
<b>IPTV / VOD</b>	IGMPv2 / IGMPv3, MLDv1 / MLDv2, RTSP, RTP / UDP
<b>Over the Top (OTT)</b>	Adobe Flash Player, Microsoft Silverlight Player, Apple HLS Player, Adobe HDS, MPEG DASH Client emulations
<b>Voice</b>	SIP, WebRTC, RTP / SRTP, Audio, Conversational Video
<b>Network Access</b>	DHCPv4 / DHCPv6, PPPoE, IPsec, GTP / eGTP, Diameter
<b>Security</b>	Published Vulnerabilities and Malware, IPsec VPN
<b>TCP / UDP and Replay Traffic</b>	TCP Client / Server emulation and Stateless Peer for UDP
<b>Application Mixes</b>	AppLibrary – A continually expanding and updated library of pre-defined application flows and application mixes of the most current internet applications

## SOPHISTICATED SUBSCRIBER MODELING

To closely model real-world device and network load, IxLoad uses a unique approach called subscriber modeling that enables users to:

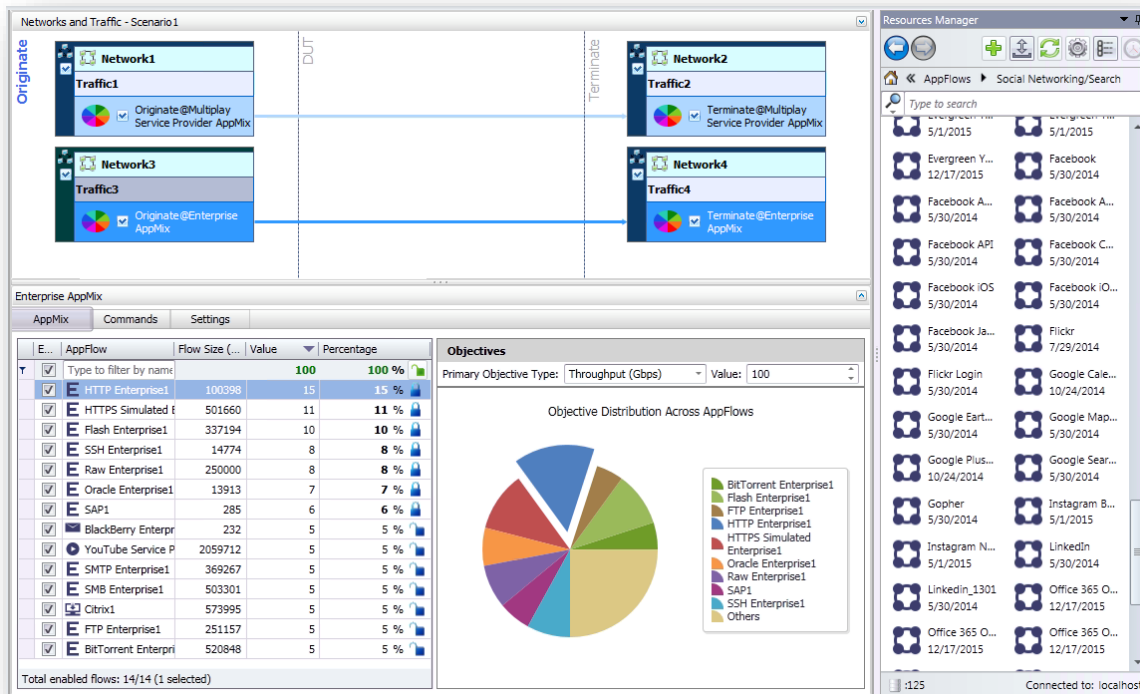
- Emulate multiple application services per subscriber or user, including service sequencing
- Model traffic usage over time for each application, with advanced timelines
- Simulate the temporal nature of subscribers connecting and disconnecting from the network in a dynamic manner
- Completely control usage profile—particular websites visited, e-mail servers used, transfer sizes, channel-changing behavior, streaming content, protocol options, etc.



Emulates a complete multiplay user environment with realistic subscriber modeling

## APPLIBRARY

In addition to the fully stateful protocol emulations, IxLoad includes AppLibrary, an extensive library of pre-defined application flows that simulate end-user interactions and devices. It speeds and simplifies testing application performance with blended application mixes. AppLibrary uses Ixia's Application and Threat Intelligence (ATI) research center to ensure the flows are current and are updated on a monthly basis.



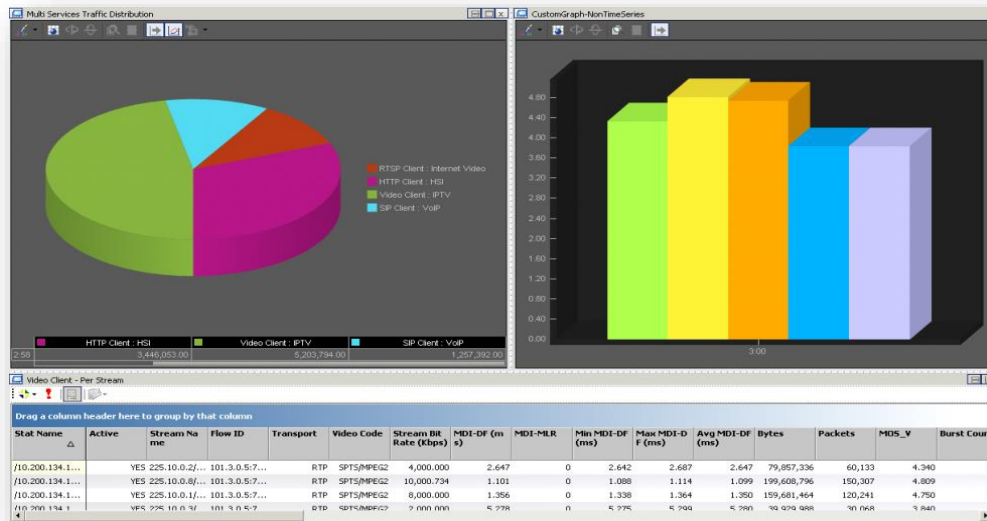
### IxLoad AppLibrary Traffic Wizard

## QUALITY OF EXPERIENCE METRICS

IxLoad delivers an extensive real-time statistics viewer with pre-defined, customizable views.

- Protocol-level statistics for in-depth functional testing, as well as real-time test-level statistics ideally suited to scale testing
- Aggregate statistics are displayed hierarchically, with the ability to drill-down to network groups, application/activity-level, and port-level statistics
- Analyze the QoE impact of services on per-user, per-IP, or per-VLAN basis
- Set filters on statistics by specifying conditions to isolate errors and failures
- Use CSV files to capture a single results view or at the global level to capture all results in real-time; an integrated CSV viewer enables viewing of large-result files



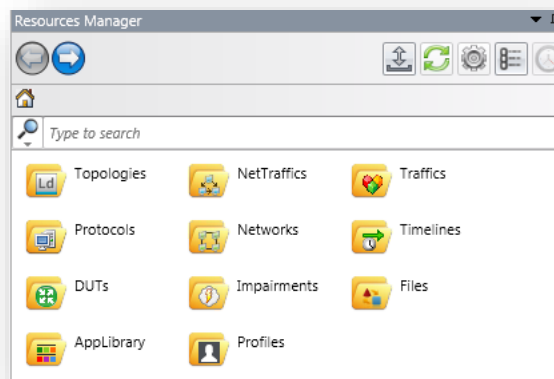


Highly visual statistic viewer

## RESOURCE MANAGER

A common pain-point for users was the lack of a collaboration tool to aid in incrementally building configurations and sharing the expertise of different team members. IxLoad Resource Manager is a central repository used to save, store, and reuse the various components of an IxLoad test. This allows multiple users and teams to share the different components of a test like network, traffic, activity, and protocol settings, full configuration files, external files, and more.

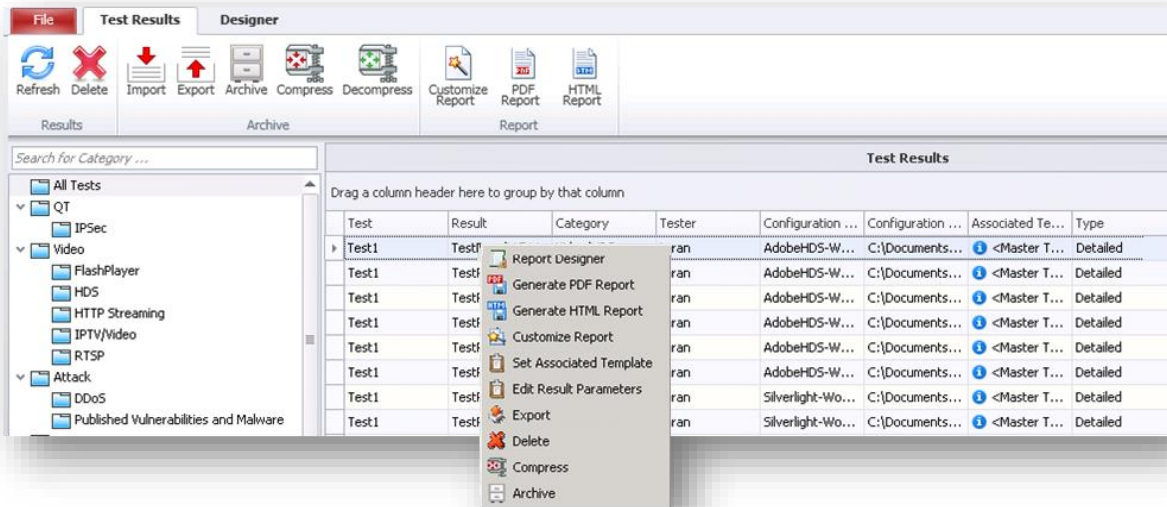
Sharing of resources between teams increases productivity and saves precious time. You can even use Resource Manager as a light-weight version control system, storing external files like DUT configurations and topology diagrams so others know where to access the latest (or even an earlier) revision.



Resource Manager

## REPORTS

IxLoad provides built-in reports that are visually rich and contain concise performance metrics at test, protocol, and port level. Any report template can be customized, or create your own templates that can be shared. It also includes IxReporter Designer Studio to create new charting and analytics using all the raw metrics from IxLoad rest results as well external sources.



### 1-click report generation in PDF and HTML

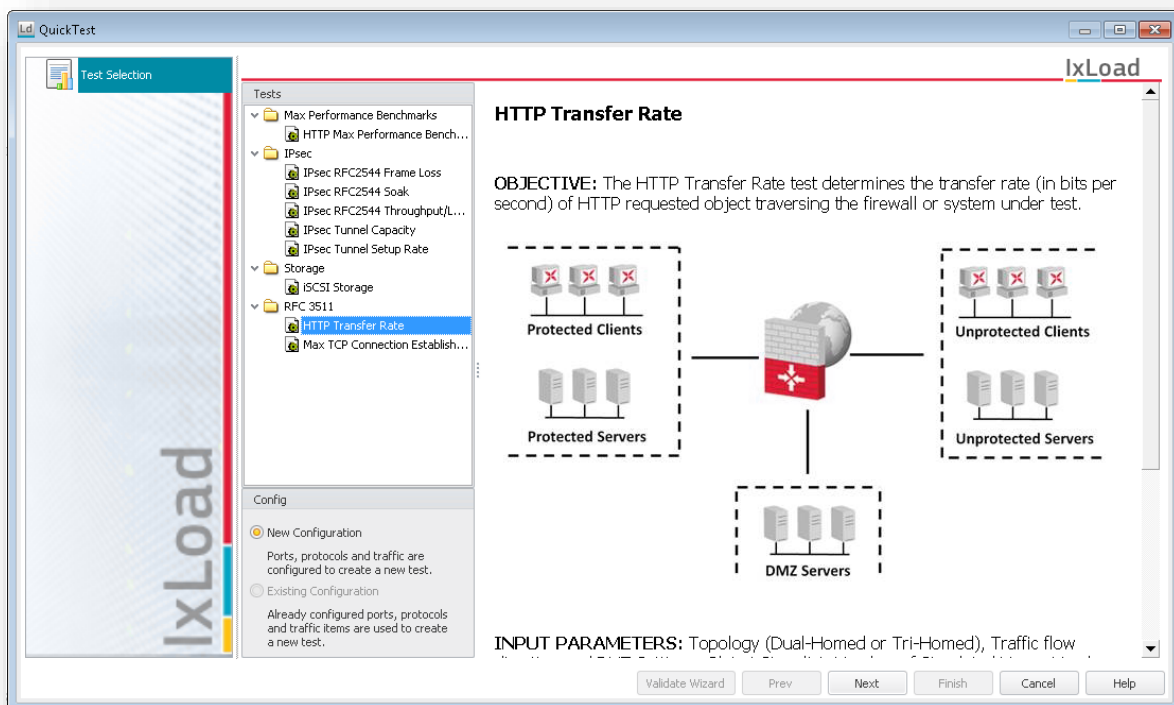
## BUILT-IN DATA CAPTURE AND ANALYSIS

Internet IP protocols are complex—multi-protocol emulations even more so. IxLoad includes a built-in capture analysis tool, called Analyzer. The Analyzer module is a sophisticated network analyzer, with the ability to display protocol ladder diagrams. IxLoad allows you to trigger and filter control- and data-plane packet captures based on user-defined packet fields. It also supports circular buffers that enable users to see the most recent packets, even if the test is configured to run for a very long duration.

## AUTOMATION

IxLoad provides powerful GUI-based automation with the Test Composer and QuickTests components. It also has a robust feature set for GUI-to-script and API-based automation. Test scenarios are set up using IxLoad's step-by-step GUI, and then a single button-press generates TCL, Python, or Perl test scripts. Scripts may be modified and combined in any fashion. When the script is run, the IxLoad GUI watches the execution—providing real-time statistics and state information.

FEATURE	DESCRIPTION
<b>QuickTest</b>	<ul style="list-style-type: none"> <li>• Easy-to-use, configurable, pre-packaged tests</li> <li>• Generate detailed reports of results</li> <li>• HTTP, SSL, and IPsec performance test only</li> </ul>
<b>Test Composer</b>	<ul style="list-style-type: none"> <li>• GUI-based solution to automate test actions</li> <li>• Detailed control over test execution without Tcl expertise</li> <li>• Complete access to the Tcl API with easy UI</li> </ul>
<b>ScriptGen</b>	<ul style="list-style-type: none"> <li>• Provides an easy, one-click GUI-to-script generation</li> </ul>
<b>APIs</b>	<ul style="list-style-type: none"> <li>• One-click GUI to Tcl script conversion available (Scriptgen)</li> <li>• Complete access to and control over test configuration</li> <li>• Tcl, Python, Perl, RESTful APIs</li> </ul>



QuickTest end-to-end wizards

## TECHNOLOGY SOLUTIONS

### VISIT IXIACOM.COM FOR MORE INFORMATION ON IXLOAD AND IXIA VIRTUALIZATION SOLUTIONS

- IxLoad Overview—Converged Multiplay Service Validation
- IxLoad Virtual Edition (VE)—Virtualized Multiplay Services Testing
- IxLoad Data Test Solution
- IxLoad Video Test Solution
- IxLoad Voice Test Solution
- IxLoad IPsec and Network Access Test Solution
- IxNetwork Virtual Edition (VE)—Virtualized Network Performance Testing
- BreakingPoint Virtual Edition (VE)—Virtualized Application and Security Testing

## ORDERING INFORMATION

### 939-9511

IxLoad VE Tier-1 FLOATING Subscription license. Includes the following IxLoad protocols supported on IxLoad VE for a duration of 1-Year: Data (HTTP, HTTPS, FTP, TFTP, DNS, LDAP, RADIUS), Mail (IMAP, POP3, SMTP). Supports 1 Gig throughput per unit.

### 939-9512

IxLoad VE Tier-2 FLOATING Subscription license. Includes the following IxLoad protocols supported on IxLoad VE for a duration of 1-Year: Data (HTTP, HTTPS, FTP, TFTP, DNS, LDAP, RADIUS), Mail (IMAP, POP3, SMTP), Storage (SMB, NFS, iSCSI, Storage I/O). Supports 1 Gig throughput per unit.

### 939-9513

IxLoad VE Tier-3 FLOATING Subscription license. Includes the following IxLoad protocols supported on IxLoad VE for a duration of 1-Year: Data (HTTP, HTTPS, FTP, TFTP, DNS, LDAP, RADIUS), Mail (IMAP, POP3, SMTP), Storage (SMB, NFS, iSCSI, Storage I/O), Voice (VoIP SIP, VoLTE), Video (DASH, Flash, HDS, HLS, IPTV VoD, MS IPTV, Silverlight), IPsec, IxLoad-Attack and IxLoad-AppLibrary. Supports 1 Gig throughput per unit.

### 939-9514

IxLoad VE Tier-4 FLOATING Subscription license. Includes the following IxLoad protocols supported on IxLoad VE for a duration of 1-Year: Data (HTTP, HTTPS, FTP, TFTP, DNS, LDAP, RADIUS), Mail (IMAP, POP3, SMTP), Storage (SMB, NFS, iSCSI, Storage I/O), Voice (VoIP SIP, VoLTE), Video (DASH, Flash, HDS, HLS, IPTV VoD, MS IPTV, Silverlight), IPsec, IxLoad-Attack and IxLoad-AppLibrary. Includes EPC and WiFi Offload protocols. Supports 1 Gig throughput per unit.

### 939-9533

IxLoad VE Tier-3 FLOATING 10G Subscription license. Includes the following IxLoad protocols supported on IxLoad VE for a duration of 1-Year: Data (HTTP, HTTPS, FTP, TFTP, DNS, LDAP, RADIUS), Mail (IMAP, POP3, SMTP), Storage (SMB, NFS, iSCSI, Storage I/O), Voice (VoIP SIP, VoLTE), Video (DASH, Flash, HDS, HLS, IPTV VoD, MS IPTV, Silverlight), IPsec, IxLoad-Attack and IxLoad-AppLibrary. Supports 10 Gig throughput per unit.

### 939-9534

IxLoad VE Tier-4 10G FLOATING Subscription license. Includes the following IxLoad protocols supported on IxLoad VE for a duration of 1-Year: Data (HTTP, HTTPS, FTP, TFTP, DNS, LDAP, RADIUS), Mail (IMAP, POP3, SMTP), Storage (SMB, NFS, iSCSI, Storage I/O), Voice (VoIP SIP, VoLTE), Video (DASH, Flash, HDS, HLS, IPTV VoD, MS IPTV, Silverlight), IPsec, IxLoad-Attack and IxLoad-AppLibrary. Includes EPC and WiFi Offload protocols. Supports 10 Gig throughput per unit.

Learn more at: [www.ixiacom.com](http://www.ixiacom.com)

For more information on Ixia products, applications, or services, please contact your local Ixia or Keysight Technologies office.

The complete list is available at: [www.ixiacom.com/contact/info](http://www.ixiacom.com/contact/info)

© Keysight Technologies