IxLoad® on Microsoft® Azure — Cloud Application Performance Testing

Problem: Restricted View of Cloud Performance Puts QOS at Risk

Moving IT infrastructure to public clouds creates a model of shared responsibility between the customer and the cloud provider. This shared model eliminates the operational burden on the organization using cloud services, however, they are still responsible for the availability, performance, and management of all the controls and processes associated with operating over the cloud infrastructure. The move to the cloud needs to deliver the same or better performance than the on-premises infrastructure. Without a way to properly validate these cloud application workloads, customer quality of experience (QoE) is at risk.

Solution: A Flexible Application Testing Ecosystem for Cloud Infrastructure
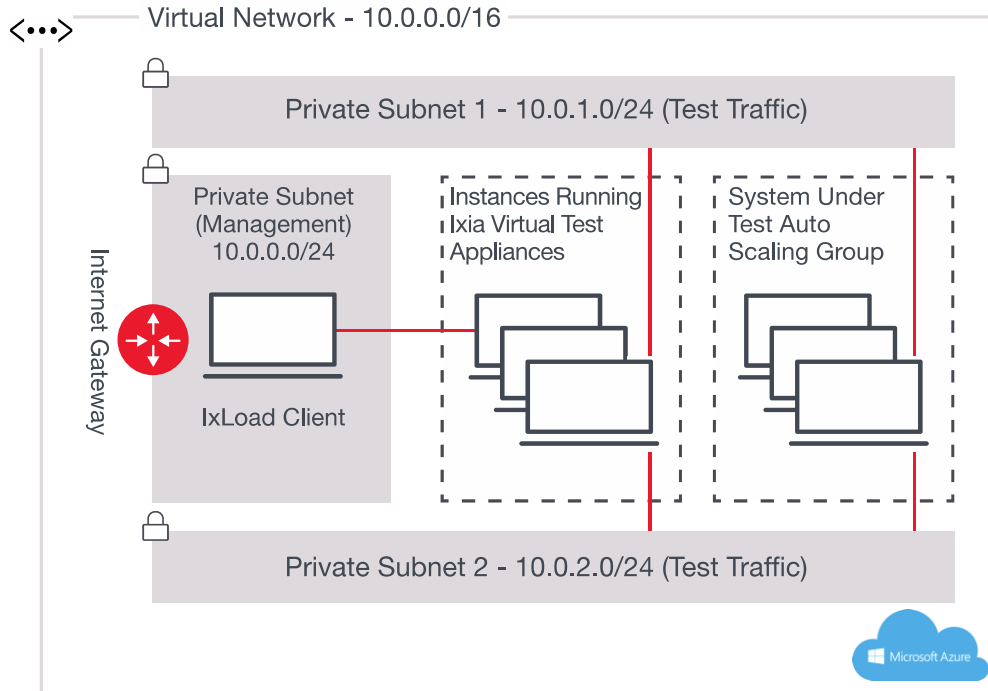
Ixia's IxLoad on Azure provides scalable real-world application performance testing in the public cloud. Build resilient cloud infrastructure you can rely on by using IxLoad to stress-test cloud architectures. Now cloud-enabled, the market-proven IxLoad application offers cost-effective, elastic, and sharable virtualized test capabilities that you can quickly deploy and scale across Microsoft public clouds.

Realize the savings of cloud without compromising performance by excising the unknowns that come with the elastic scalability, multi-tenancy, and high-availability characteristic of a cloud infrastructure.

Highlights

- Validate functionality of virtual and physical application-aware devices such as firewalls, ADCs, storage servers, and applications

- 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 data center with flexible deployment of Ixia virtual test tools that you can easily move, change, or scale 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

Virtual Network - 10.0.0.0/16

Private Subnet 1 - 10.0.1.0/24 (Test Traffic)

Private Subnet
(Management)
10.0.0.0/24

Internet Gateway

IxLoad Client

Instances Running
Ixia Virtual Test
Appliances

System Under
Test Auto
Scaling Group

Private Subnet 2 - 10.0.2.0/24 (Test Traffic)

Microsoft Azure

IxLoad deployment for testing elastic application performance

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 display

- 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

- Flexible all-inclusive subscription licensing model reduces startup cost

- Common licensing server shared among IxLoad VE, IxNetwork VE, and BreakingPoint VE

- Simple and fast deployment and orchestration using Ixia's CloudFormation Templates

- Visit keysight.com for more details on the IxLoad product

Specifications

Feature	Virtual Test Appliance		
Maximum # of Virtual Ports	Up to 8 test interfaces		
Maximum # of Virtual Load Modules	1		
Maximum # of Virtual Test Appliances per Test	16		
Recommended Azure VM Sizes	Instance Type	HTTP	HTTPS AES128-SHA:SSLv3
	Standard_F8s	1 Gbps	1 Gbps
Guest OS	Based on CentOS 7.0		
Distribution / Packaging	Microsoft Virtual Hard Disk (VHD) available via Azure storage copy using bash script on Ixia support site.		

Supported Azure Locations

Azure Region Name	Azure Region API Name
(US) East US	eastus
(US) East US 2	eastus2
(US) South Central US	southcentralus
(US) West US 2	westus2
(US) Central US	centralus
(US) North Central US	northcentralus
(US) West Central US	westcentralus
(US) West US	westus
(Africa) South Africa North	southafricanorth
(Africa) South Africa West	southafricawest
(Asia Pacific) Australia East	australiaeast
(Asia Pacific) Australia Southeast	australiasoutheast
(Asia Pacific) Australia Central	australiacentral

| Azure Region Name	Azure Region API Name
(Asia Pacific) Australia Central 2	australiacentral2
(Asia Pacific) Southeast Asia	southeastasia
(Asia Pacific) Central India	centralindia
(Asia Pacific) South India	southindia
(Asia Pacific) West India	westindia
(Asia Pacific) East Asia	eastasia
(Asia Pacific) Japan East	japaneast
(Asia Pacific) Japan West	japanwest
(Asia Pacific) Korea Central	koreacentral
(Asia Pacific) Korea South	koreasouth
(Canada) Canada Central	canadacentral
(Canada) Canada East	canadaeast
(Europe) North Europe	northeurope
(Europe) UK South	uksouth
(Europe) UK West	ukwest
(Europe) West Europe	westeurope
(Europe) France Central	francecentral
(Europe) France South	francesouth
(Middle East) UAE Central	uaecentral
(Middle East) UAE North	uaenorth
(South America) Brazil South	brazilsouth

Application-layer protocols

IxLoad delivers a wide variety of fully stateful protocols to emulate a complete multiplay user environment. Its sophisticated subscriber modeling capability 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
Web	HTTP (1.0 / 1.1), HTTP/2, SSL (TLSv1.1 / TLS 1.2 / TLS 1.3) client and server emulations
Data Protocols	DNS, LDAP, RADIUS
File Transfer	FTP / TFTP client and server emulations
Email	SMTP, POP3, IMAP client and server emulations
IPTV / VOD	RTSP, RTP / UDP
Over the Top (OTT)	Adobe Flash Player, Microsoft Silverlight Player, Apple HLS Player, Adobe HDS, MPEG DASH client emulations
Voice	VoIP SIP, WebRTC, RTP / SRTP, audio, conversational video
Security	Published vulnerabilities and malware
TCP / UDP and Replay Traffic	TCP client / server emulation and stateless peer for UDP
Application Mixes	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 use 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 use profile—particular websites visited, e-mail servers used, transfer sizes, channel-changing behavior, streaming content, protocol options, etc.
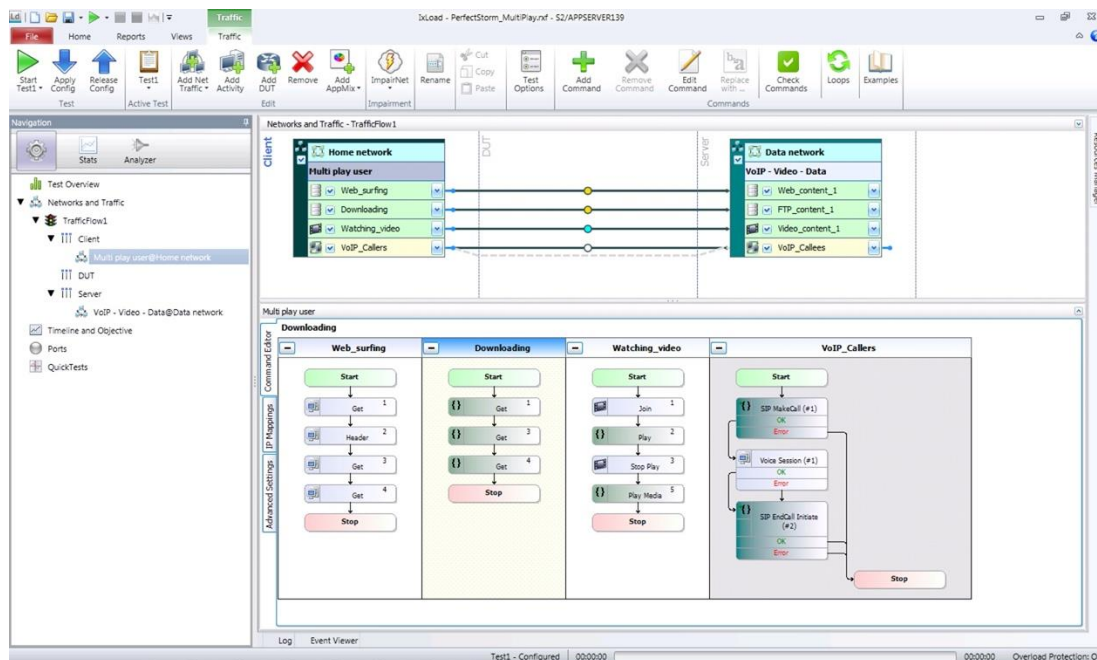
Emulates a complete multiplay user environment with realistic subscriber modeling

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.
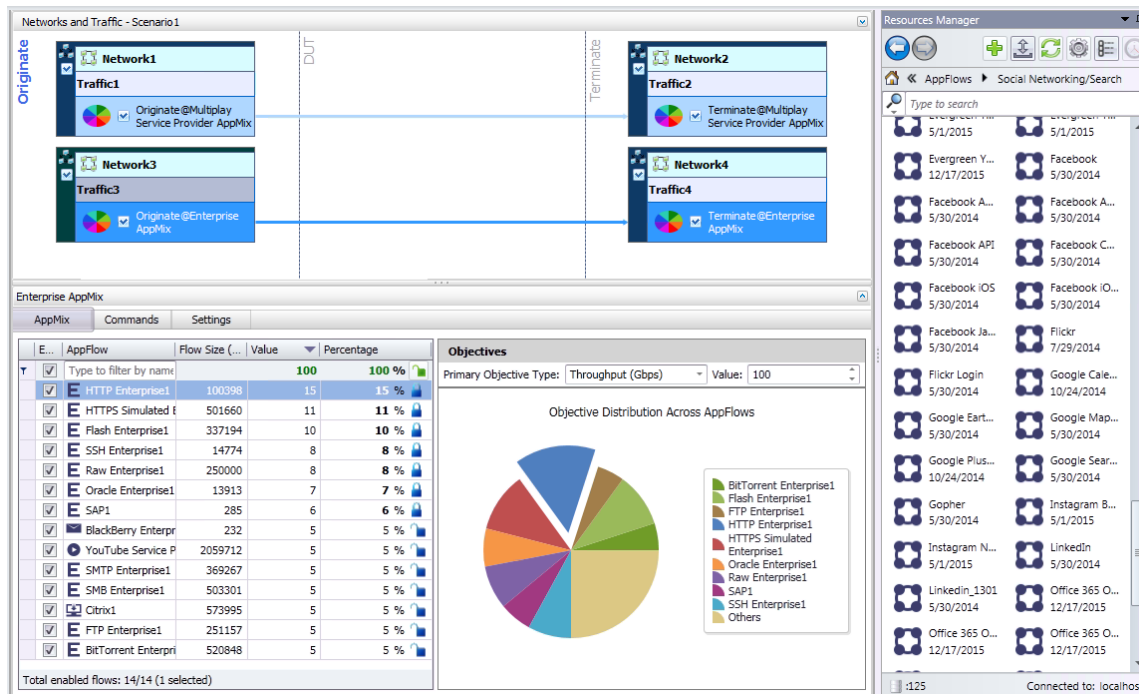

IxLoad AppLibrary Traffic Wizard

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
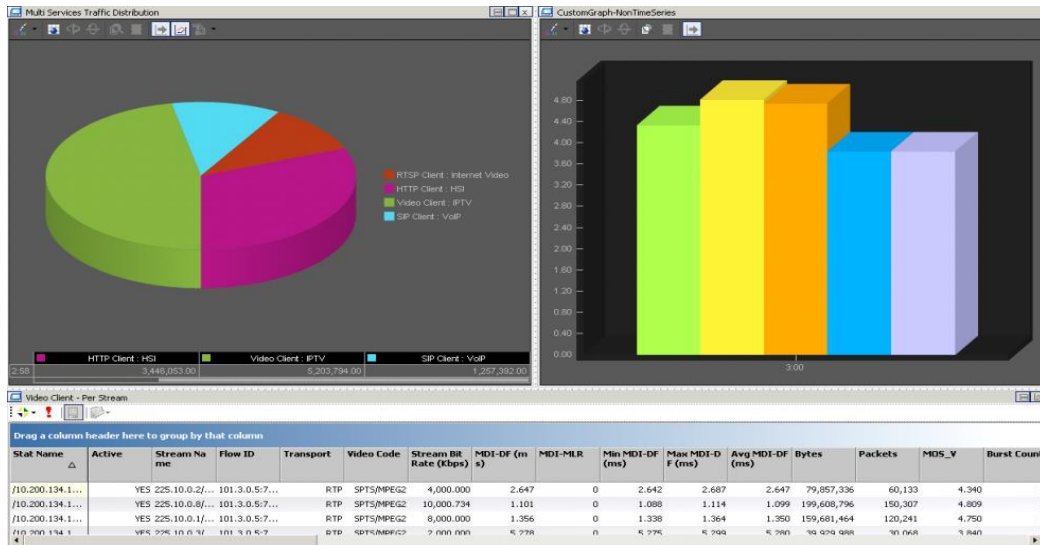
Highly visual statistic viewer

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, and external files.

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 device under test (DUT) configurations and topology diagrams, so others know where to access the latest (or even an earlier) revision.
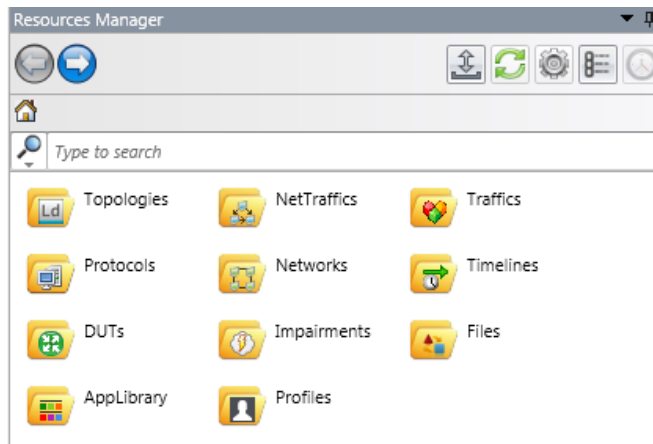
Resource Manager

Reports

IxLoad provides built-in reports that are visually rich and contain concise performance metrics at the test-, protocol-, and port-level. You can customize any report template or create your own. Templates can be shared. With the included IxReporter Designer Studio, you can create new charting and analytics using all the raw metrics from IxLoad test results as well external sources.
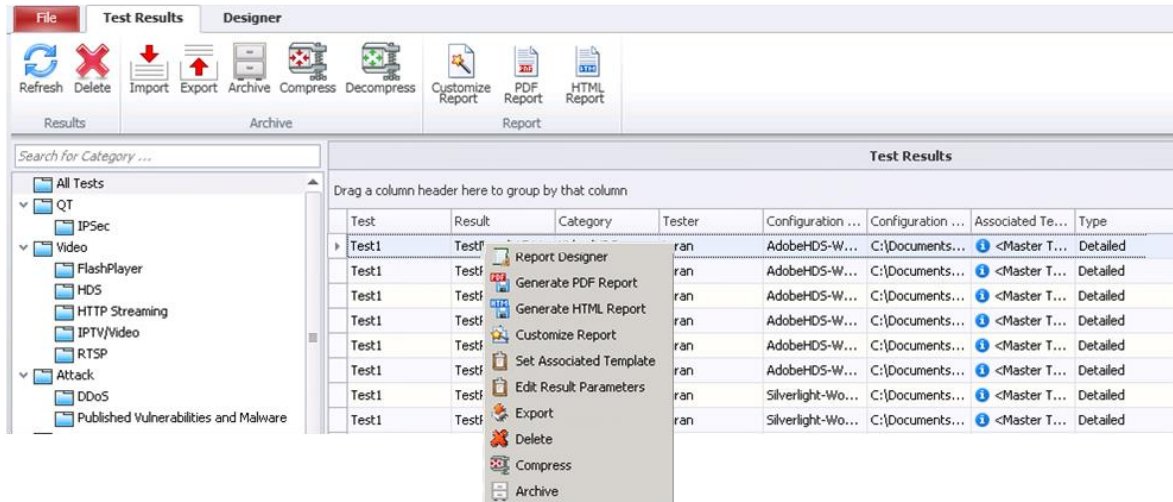
1-click report generation in PDF and HTML

Built-in data capture and analysis

Internet 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.

Technology Solutions

Visit www.keysight.com for More Information on IxLoad and Ixia Virtualization Solutions
• IxLoad—Converged Multiplay Service Validation
• IxLoad Virtual Edition (VE)—Virtualized Multiplay Services Testing
• IxLoad on AWS—Amazon Web Services Edition of IxLoad for Cloud Application Delivery QoS
• 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.

939-9533

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.

Learn more at: www.keysight.com

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

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