



Test
Measure
Verify

**Delivering Successful
IP-Based Services
Using **Optixia** and
Ixia's Device,
Network, and
Service Testing
Software**



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Ixia, the leader in communications infrastructure testing, partners with our customers to build profitable businesses and ensure their applications, services, and network components operate at maximum performance, capacity, and reliability.

With IP-based applications and services becoming an ever more critical part of business, network equipment manufacturers, service providers and enterprises must deliver products with superior reliability, interoperability, and performance. Ixia's Optixia hardware platform and industry-leading test applications provide our customers with a single platform that delivers unprecedented power and flexibility for executing a broad range of data, signaling, voice, video, and application testing.

Ixia's award-winning, integrated platform is used worldwide by:

- Network Equipment Manufacturers to assess the performance and compliance of their equipment under Real World Traffic™ conditions
- Carriers and Service Providers for both pre-deployment and post-deployment testing
- Enterprises to confirm that equipment performs to specification, and to assess network performance metrics both before and after installation.

Run Comprehensive Tests

Ixia's test solutions cover the range of technologies used in today's modern networks, including triple play delivery, IPTV, broadband, wireless, both TDM voice and VoIP, as well as a range of data networking and security protocols.

Accelerate Delivery

Ixia's test solutions accelerate time-to-market for our customers by reducing the learning curve and execution time of the testing process.

- Automation tools eliminate manual testing procedures.
- Pre-built test suites verify conformance to RFCs and ensure interoperability between devices.
- Optixia hardware generates consistent traffic patterns every time a test is run, thus simplifying the process of reproducing and troubleshooting problems.



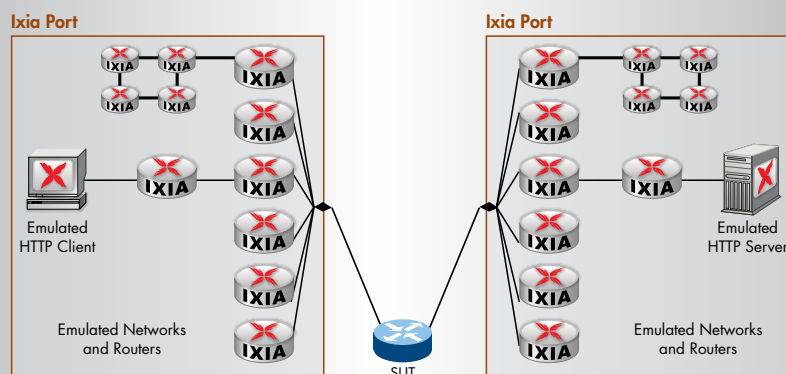
Reduce Development Time

Ixia's ICE (Ixia Custom Engineering) and Professional Services teams offer scripting and customization tools, as well as customer-specific support for integrating the Ixia test platforms into a test bed and for automating tests. In addition, ICE helps in-house script developers deploy pre-existing test scripts onto Ixia test equipment, reducing your set-up and development time. ICE also maintains a substantial library of scripts and help files.

Reduce Risk

Optixia and Ixia's network and service testing applications give you confidence that your new service or product will conform to industry standards, as well as interoperate with new elements within the network. As networks scale to 10 Gigabit and higher speeds and as deployments of VoIP, and IPTV become ubiquitous, it is important for NEMs, ISPs, and Carriers to test these devices and solutions prior to deployment. Ixia provides award-winning products that can test the end-to-end performance of these networks to ensure function and Quality of Experience for the end user.

Switch Router Performance Testing



Scenario

With advances in microcode and silicon design, today's IP-based network devices provide unprecedented performance and capabilities. Manufacturers of switches and routers need to verify the scalability, stability, and performance of their designs. Service Providers and Enterprise Network Operators who deploy the networks that consist of these devices, need to characterize performance bottlenecks of their networks before deployment.

Solution

Ixia solutions test the performance and scalability of network devices. Optixia hardware emulates large numbers of routers and switches and simulates network changes to test the ability of devices to operate successfully in a dynamic network.

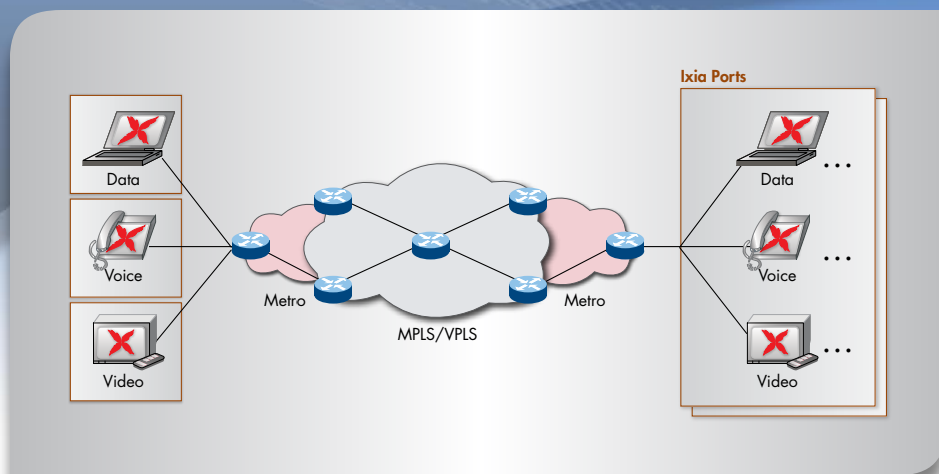
Wire-rate traffic is generated to characterize the performance and reliability of data forwarding. Emulated enterprise applications, such as FTP, e-mail, HTTP, Voice and Video realistically stress the data plane of the devices and verify that applications will continue to work as the network changes.

By dynamically flapping emulated topologies, IxNetwork can measure a network's ability to converge.

Real-time presentation of results means that analysis can be carried out immediately, minimizing troubleshooting times.

Sample Ixia Configuration

	Hardware
941-0002-01	Optixia XM12, 12-Slot XM Form Factor Chassis
944-0008-01	LSM1000XMV16, 16-Port Gigabit Ethernet Load Module
	Software
930-1999	IxNetwork, Base Software
930-2001	IxNetwork, IPv4 Software Bundle
930-2002	IxNetwork, IPv6 Software Bundle
930-2003	IxNetwork, MPLS VPN Software Bundle
930-2004	IxNetwork, Optional Software, Multicast Emulation
930-2021	IxNetwork, Optional Software, Application Traffic Support
930-2022	IxNetwork, Optional Software, RFC 2544 and Custom Integrated Tests over Advertised Topologies



Triple Play Performance Testing

Scenario

Enterprise and consumer networks are not just used for email and web surfing any more. Service providers and enterprises are using their IP networks to deliver high performance multi-service applications such as voice, video on demand and broadband TV.

There are multiple challenges associated with the delivery of Triple play due to the different characteristics of voice, video and data traffic.

- Voice traffic consumes fairly low bandwidth but is highly sensitive to network jitter
- Video services require a steady stream of high bandwidth traffic, but are severely impacted by packet reordering or loss
- Data services such as web browsing, file uploads & downloads and other end-user interactions have application-specific requirements.

Ensuring the delivery of these services with proper Quality of Experience requires testing of these networks to and beyond their expected in-service load conditions.

Solution

Ixia solutions test Triple Play performance by emulating video servers and subscribers, VoIP callers/callees, and a variety of Internet clients and servers. Millions of subscribers can be emulated to provide an accurate assessment of the ability of a network to withstand high user loads.

Key technologies supported include:

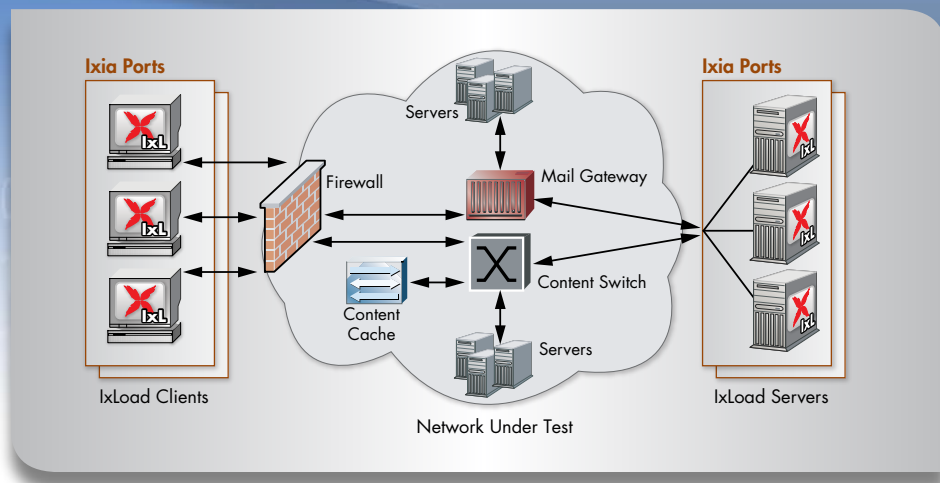
- **Video** – MPEG, IGMP, and RTSP
- **Voice** – SIP and MGCP
- **Data** – Web, FTP and email

In addition, Ixia tests critical aspects of the infrastructure such as DNS, DHCP, and AAA services, and generates malicious traffic to test for security.

Sample Ixia Configuration

	Hardware
941-0002-01	Optixia XM12, 12-Slot XM Form Factor Chassis
944-0008-01	LSM1000XMV16, 16-Port Gigabit Ethernet Load Module
	Software
925-3320	IxLoad Triple Play Bundle
925-3310	IxLoad Data Bundle

Data Center Performance



Scenario

Bringing a new data center online requires the successful installation, configuration and interoperation of multiple network components. Not only do servers and networks need to be set up, but many other network elements, such as firewalls, server load balancers and content caches need to work effectively together. The failure of any one element may impact the functionality of the entire data center.

In addition, data center consolidation is leading to increased complexity, and greater demands on devices and the network. Consolidations mandate careful planning and assessment of the effects of any network changes on data center performance.

Solution

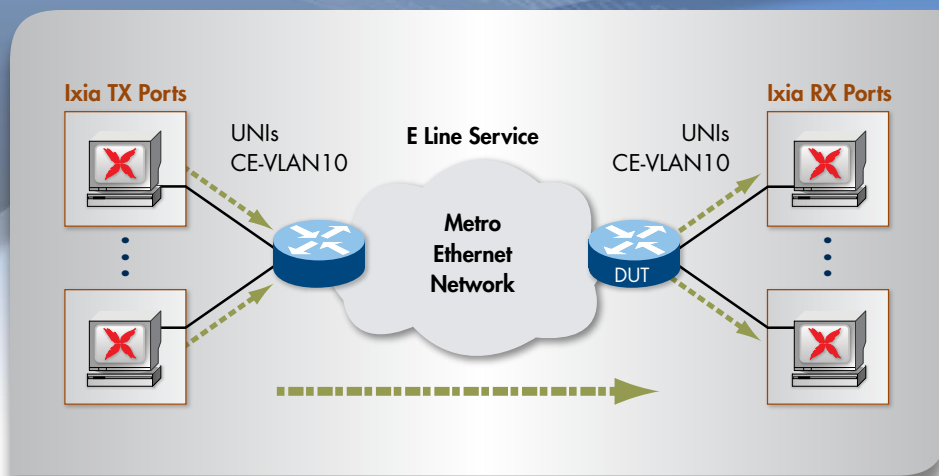
Ixia products verify that a data center is ready for prime-time by measuring the performance delivered by the entire system. Individual components, such as email, gateways, server load balancers, VoIP gateways and video servers are benchmarked. Interactions between these network elements is characterized using Real World Traffic.

The whole system is loaded with multiple traffic types to ensure the scalability and functionality of the devices within the system. Web services can also be verified at the functional level.

The overall Quality of Experience for end users is analyzed to ensure the data center will effectively deliver the required performance, and therefore provide customer satisfaction and the expected return on investment.

Sample Ixia Configuration

	Hardware
941-0002-01	Optixia XM12, 12-Slot XM Form Factor Chassis
944-0008-01	LSM1000XMV16, 16-Port Gigabit Ethernet Load Module
	Software
930-1999	IxNetwork – Base software
930-2003	IxNetwork – MPLS Bundle
930-2021	Application traffic support for IxNetwork
925-3310	IxLoad Data Bundle
920-0003	IxChariot, Node Locked pairs, 200 pairs



Metro Ethernet Testing

Scenario

Carrier Ethernet is a rapidly growing technology in which Service Providers can utilize the benefits of Ethernet across WAN topologies to deliver services to subscribers. In this architecture, Metro Ethernet Networks (MENs) address the delivery of Ethernet, transport and application layer services to the end user. In order to deliver such services, both vendors and service providers need to verify that their equipment and architecture meet the functional criteria.

MEF9 defines test procedures that determine the readiness of a Metro Ethernet Network (MEN) to deliver various Ethernet Services, such as Ethernet Line (E-Line) and Ethernet LAN (E-LAN) services.

MEF14 defines test procedures for Service Performance and Bandwidth Profile Service Attributes that may be specified as part of a Service Level Specification (SLS) for an Ethernet Service.

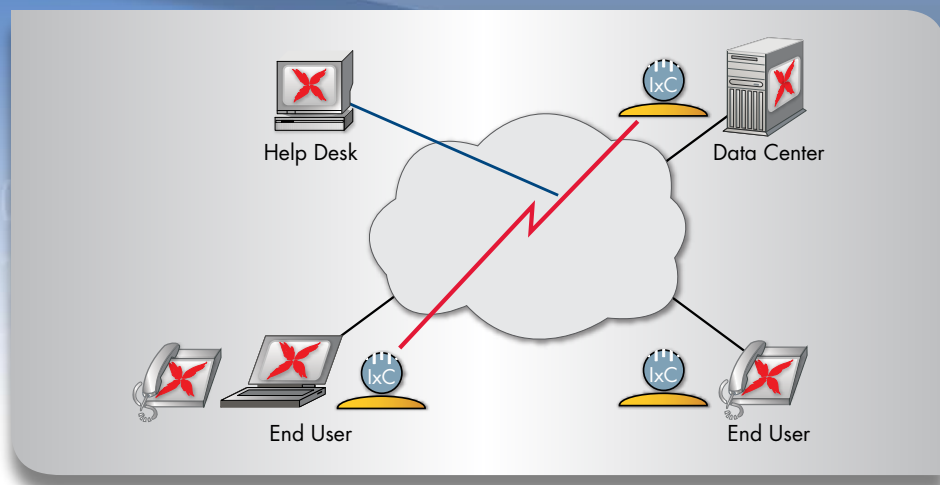
Solution

Ixia offers test suites which meet both Metro Ethernet Forum test requirements. Using IxANVL for MEF9 testing and IxAutomate for MEF14 testing, customers can now verify both conformance to Carrier Ethernet requirements and performance of a carrier Ethernet network, enabling them to guarantee SLAs and QoS.

Sample Ixia Configuration

	Hardware
941-0002-01	Optixia XM12, 12-Slot XM Form Factor Chassis
944-0008-01	LSM1000XMV16, 16-Port Gigabit Ethernet Load Module
	Software
924-001-10B	IxANVL, Windows Framework, Binary License
924-030-70B	IxANVL, Interface Support, Binary License; Ixia's Virtual NIC Driver licensed up to 6 Ixia ports; Supports Ethernet, ATM, and POS
924-199-10B	MEF9 Metro Ethernet Conformance Test Suite, binary license
928-0200	IxAutomate, Base Software, Framework GUI
928-0101	IxAutomate, Optional Software, MEF14 Metro Ethernet Test Suite; Includes Delay, Jitter, Frames loss

Network Assessment



Scenario

ISPs and enterprises are increasingly reliant on solid backbone network performance. As branches are added to a network and new services are implemented, it is necessary to verify network and application performance.

Troubleshooting problems in an existing network requires a tool that accurately generates and measures realistic traffic flows, and verifies there will be sufficient capacity for thousands of users.

Solution

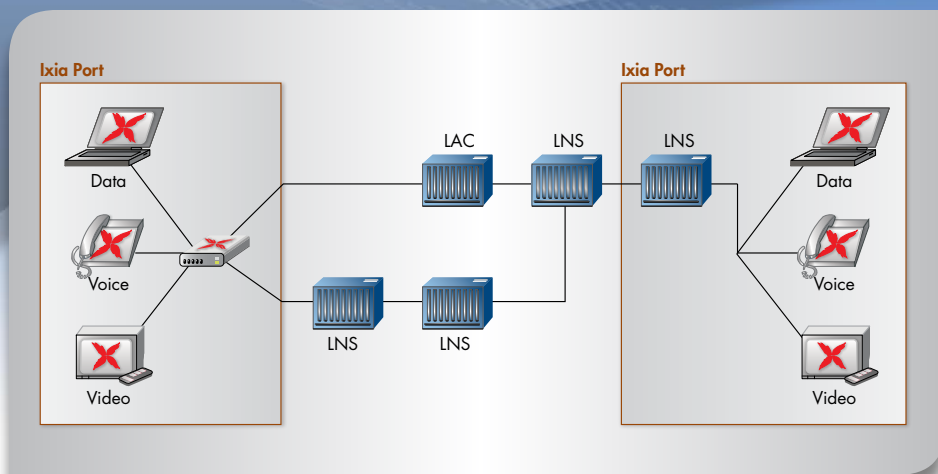
Ixia provides high-precision analysis of application performance across network backbones. Thin endpoint clients can be deployed at key nodes within a network and a mixture of Real World Traffic profiles, including Triple-Play services, is used to characterize network behavior.

When problems are reported, tests can be run from a central management point, such as the network operations center, and results analyzed to identify network bottlenecks and degraded services.

A pair of Optixia chassis synchronized to the global GPS network using Ixia's AFD1 device can perform full pre-deployment verification of a distributed network infrastructure. WAN links can be tested to verify key metrics such as latency, failover time, packet loss, and throughput. Network devices can be put to the test so that new services can be deployed with confidence.

Sample Ixia Configuration

	Hardware
941-0003-01	Optixia XM2, 2-Slot Medium XM Form Factor Chassis
942-0002	AFD1, Auxiliary Function Device, GPS standalone unit
944-0001-01	LSM1000XMS12, 12-Port Gigabit Ethernet Load Module
	Software
920-0003	IxChariot, Node Locked License, 200 pairs



Broadband Access Performance

Scenario

ISPs need to characterize and test their broadband access networks under realistic traffic conditions.

In order to verify the capacity of the network, the performance limits of their L2TP switched networks must be determined using combinations of voice, video and data traffic.

Functionality and performance testing needs to be carried out for PPPoE, PPPoA and PPPoEoA connections.

Solution

Ixia solutions determine the performance characteristics of the core, L2TP switching network by emulating PPPoX clients and L2TP tunnels.

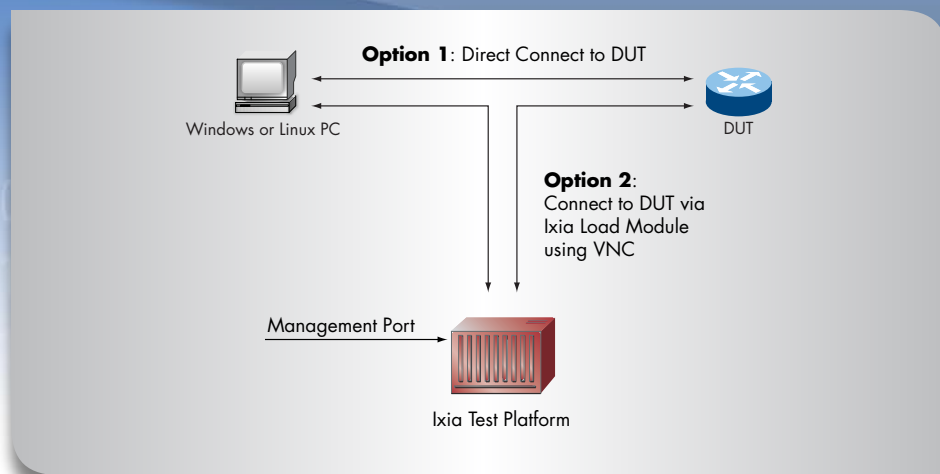
Tens of thousands of IPv4, IPv6, PPPoX and L2TP clients can be simulated by Ixia ports connected to LACs, LNSs and other broadband access devices. Full control of set-up rates and session longevity is available. DHCP is supported both for IPv4 and IPv6.

Data plane performance is validated through the use of uni-directional or bi-directional traffic at multiple frame sizes. A No Drop Rate test allows measurement of maximum performance for multiple frame sizes. Triple-Play traffic is emulated using multiple multicast streams.

Sample Ixia Configuration

	Hardware
941-0002	Optixia XM12, 12-Slot XM Form Factor Chassis
944-0008-01	LSM1000XMV16, 16-Port Gigabit Ethernet Load Module
	Software
931-1010 931-1012	Test Conductor with 5 console licenses
749-0018-01	IxAccess, Broadband Test application for PPPoX/L2TP
920-0003	IxChariot Software, Node Locked License, 200 pairs

Conformance



Scenario

Today's communication protocols are complex, and new protocol specifications and RFCs are rolling out at a record pace. Service Providers want to be assured that the devices they are deploying will perform correctly and scale properly when added to the network. Network Equipment Manufacturers want to ensure their products will conform to industry standards and perform successfully.

Solution

IxANVL increases confidence in product quality by enabling extensive and thorough testing to be performed automatically, without supervision. IxANVL's test results allow users to:

- Determine exactly where a device's protocol software does and does not meet the specification
- Observe how well the device will handle traffic from non-complying network components
- Determine what effects new features have on existing code through regression testing

Protocol Validation

Routing: RIP/ng, OSPFv2/v3, BGP4/4+, IS-ISv4/v6, VRRP

MPLS: LDP, RSVP-TE, MPLS, L2 VPN, L3 VPN, VPLS

Multicast: IGMPv2/v3, MLDv1/v2, PIM-SMv4/v6, PIM-DM, DVMRP, IGMP/MLD Snooping

HTTP/TCP/UDP/IP: IPv4/v6, TCP, UDP, HTTP, Telnet

Layer 2: STP, RSTP, MSTP, VLAN, GRE, EAPOL (802.1x), PPP, MLPPP, IPCP, LACP (802.1ad), LLDP

Security: PPTP, L2TP, L2TPsec, IPsec

Voice: SIP

Metro Ethernet: MEF9

Storage: iSCSI

Mobile IP: Mobile IP: Home Agent, Correspondent Node, Mobile Node

Sample Ixia Configuration

	Hardware
941-0002-01	Optixia XM12, 12-Slot XM Form Factor Chassis
944-0001	LSM1000XMS12-01 12-Port Gigabit Ethernet Load Module
	Software
924-001-10B	IxANVL, Windows Framework, Binary License
924-030-70B	IxANVL, Interface Support, Binary License; Ixia's Virtual NIC Driver licensed up to 6 Ixia ports; Supports Ethernet, ATM, and POS
924-196-10B	Bridging Bundle: STP, RSTP, MSTP, & VLAN, binary license



Optixia Chassis

The Optixia chassis family provides an ultra-high density, highly flexible testing platform. Operating in conjunction with Ixia's test applications, the Optixia XM12 and Optixia XM2 provide the foundation for a complete, high performance test environment.

Each chassis supports an integrated test controller that manages all system and testing resources. Resource ownership down to a per-port level coupled with hot-swappable interface modules ensure a highly flexible, multi-user testing environment. Backward compatibility is maintained with existing Ixia interface modules and test applications to provide seamless migration from and integration with existing Ixia test installations.



Optixia XM12

The 12-slot Optixia XM12 modular chassis provides an ultra-high density, highly flexible testing platform. This is the ideal test solution when maximum port density is required, while rack space needs to be kept to a minimum.

The Optixia XM12 features:

- 12 slots compatible with all XM form factor Load Modules
- Hot swap capabilities, allowing interface cards to be actively swapped in and out of the test bed without disrupting ongoing testing
- A high speed backplane and system controller to support the high bandwidth requirements of large-scale application tests
- Support for daisy-chaining Ixia chassis in a single test with synchronization accuracy to within 10 nanoseconds
- Modular sub-components: power supplies, fans, system controller (CPU, memory, hard drive)

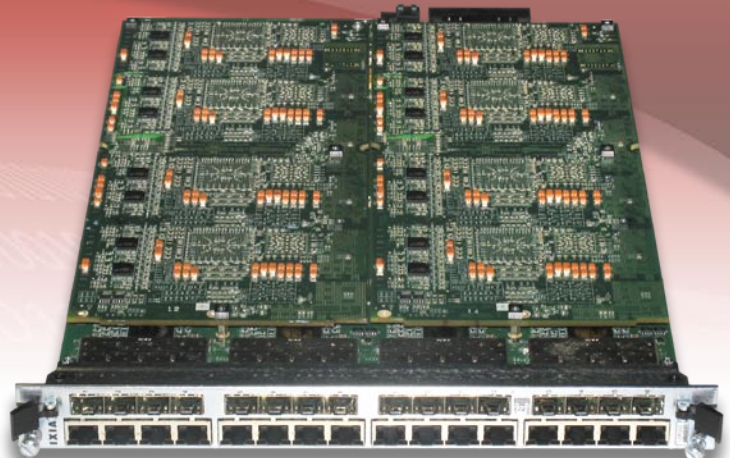


Optixia XM2

The Optixia XM2 provides the same benefits as the XM12 in a portable chassis. This reduces space requirements and simplifies management.

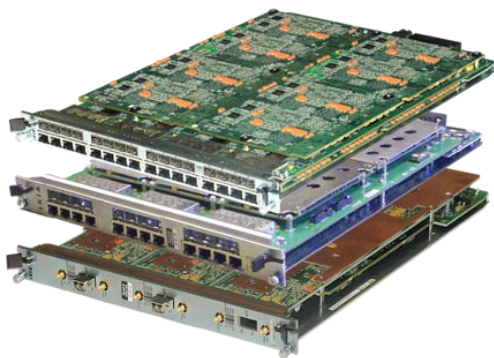
The XM2 is the perfect solution for desktop-based testing, smaller scale tests, and for scenarios where rack space is limited.

Optixia Load Modules



A wide array of interface modules are available for the Optixia family of chassis. These modules provide the network interfaces and distributed processing resources needed for executing a broad range of data, signaling, voice, video, and application testing from Layers 2-7.

Each port on a load module contains a powerful RISC processor running Linux and a full, testing-optimized TCP/IP stack. This architecture provides unprecedented performance and flexibility for testing routers, switches, broadband and wireless access devices, web servers, video servers, secure gateways, firewalls, and many other networking and application-aware devices.



a) 16 port 10/100/1000 Mbps Copper/Fiber Ethernet Layer 2-7 Load Module for Optixia XM12/XM2

b) 12 port 10/100/1000 Mbps Copper/Fiber Ethernet Layer 2-7 Load Module for Optixia XM12/XM2

c) 3 port 10 Gigabit Ethernet XFP Layer 2-7 Load Module for Optixia XM12/XM2

A single Optixia XM12 chassis supports up to 192 Gigabit Ethernet ports, 36 - 10 GE ports, and 24 Packet over SONET (POS) or Asynchronous Transfer Mode (ATM) ports. With daisy-chained chassis, many thousands of ports can be used in a single test.

a) 4 port 10/100/1000 Mbps Copper/Fiber Ethernet Layer 2-7 Load Module

b) 1 port 10 Gigabit Ethernet LAN/WAN XFP/XENPAK/X2 Layer 2-7 Load Module

c) 8 port 10/100/1000 Mbps Copper Ethernet Layer 4-7 Content Processing Module

d) 2 port 10/100/1000 Mbps Copper/Fiber Ethernet IPSec/SSL Encryption Load Module

e) 4 port Power over Ethernet Powered Device Emulator Module

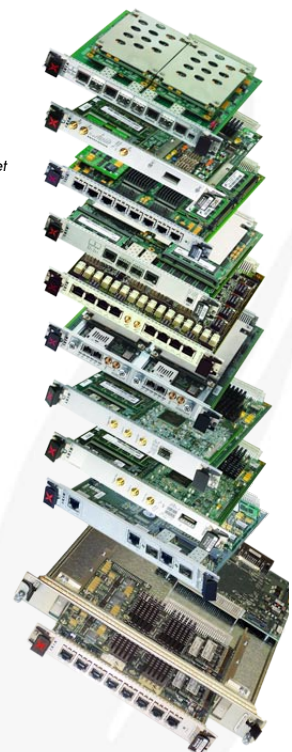
f) 2 port OC-3/OC-12 ATM and Packet over SONET Load Module

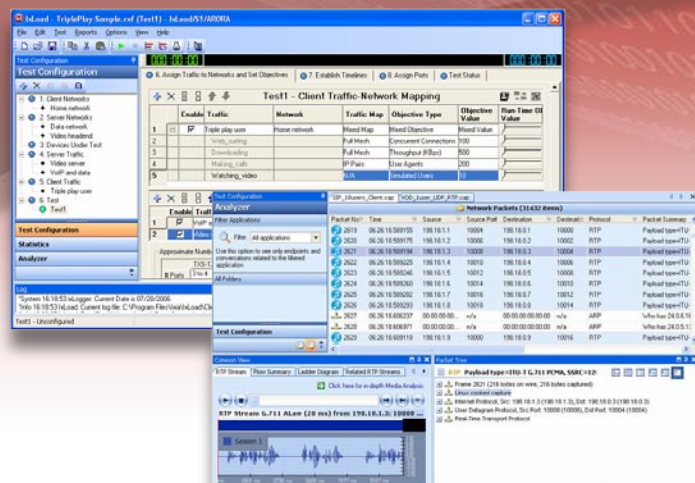
g) 1 port OC-48c Packet over SONET Load Module

h) 1 port 10 Gigabit (10GE LAN/WAN, OC-192c Packet over SONET) Load Module

i) 10/100/1000 Stream Extraction Module

j) Adaptor board for XM Chassis Family





IxLoad is a highly scalable, integrated test solution for assessing the performance of Triple Play networks and devices. IxLoad emulates IPTV and Triple Play subscribers and associated protocols to ensure subscriber Quality of Experience (QoE). Protocols supported include video protocols: MPEG, IGMP, and RTSP; voice protocols: SIP and MGCP; and data protocols: HTTP, FTP, and SMTP. In addition, IxLoad is used to test critical aspects of the infrastructure like DNS, DHCP, and AAA services, as well as to generate malicious traffic to test for security.

Key features

- Support for running Data, Voice, and Video protocols simultaneously to emulate a complete triple play user environment
- Flexible framework offering in-depth functionality and integrated automation capabilities
- Support for video quality metrics (MDI, VQMon/SA-VM) and voice quality scores (MOS) per session
- Built-in impairment - ability to introduce latency, jitter, packet drops and apply fragmentation at source
- Built-in packet analyzer - ability to play media packet payloads in a media player
- Traffic mapping – ability to configure the IP addresses and VLANs that will send and receive traffic to and from each other
- Support for real-time packet captures with filtering and ladder diagrams for analysis

- Capture file replay – ability to replay user-specified packet captures from Ixia test ports
- Support for IPv4 and IPv6
- Link layer protocols like PPPoE, IPsec and DHCP
- Automatic goal seeking of test objectives. Goal seeking metrics include concurrent connections, connection rate, simulated users and throughput
- Real-world network configurations - multiple sub-networks, unique MAC addresses, 802.1q, 802.1p and emulated router support
- Real-world user behavior using think- times, configurable responses, impairment etc.
- Standard Linux TCP stack
- Ramp-up, ramp-down user sessions – linear, step and adaptive modes
- Extensive statistics and reports
- Fully customizable statistics viewer, with advanced real-time graphing capabilities
- Option to automatically log all collected statistics
- Integrated report generation

Protocols Supported

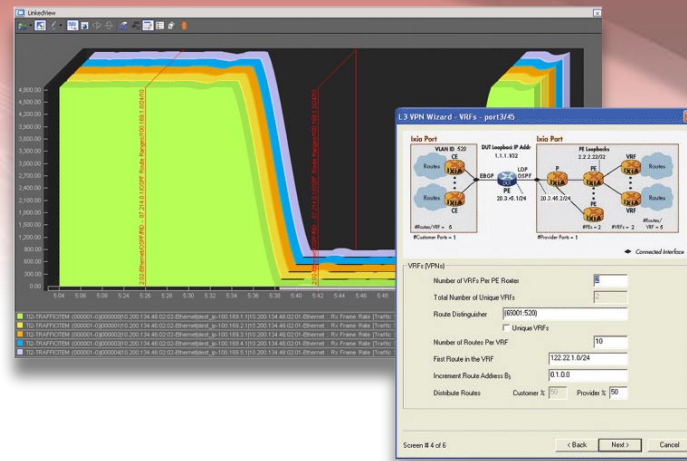
Video: Multicast TV and Video on Demand, MPEG2, MPEG4, H.264 and Windows Media 9, IGMPv1, IGMPv2 and IGMPv3

Voice: SIP and MGCP

Data: HTTP, FTP, SSLv2, SSLv3, TLSv1, SMTP, POP3, IMAP, RTSP/RTP, Telnet, DNS, DHCP and LDAP

Infrastructure: DNS, DHCP, PPPoE, IPsec and AAA

IxNetwork



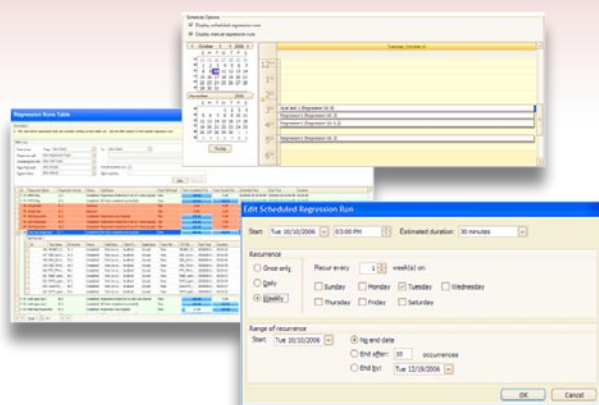
As networking devices become increasingly complex, so must the analysis equipment designed to assess their performance. Such sophisticated analysis systems must support powerful routing/bridging protocol emulations that are flexible, highly scalable, and easy to use. In addition, the analysis systems must be able to generate wire-rate traffic and automatically analyze thousands of traffic flows with comprehensive QoS analysis. Ixia meets these requirements with IxNetwork, an application specifically targeted to test the performance and functionality of high-speed, high-capacity routers, switches and application servers.

IxNetwork can be customized by users to meet a wide range of requirements for testing complex network topologies consisting of thousands of network devices. Millions of routes and reachable hosts can be emulated within the topology. IxNetwork also provides users with the ability to customize millions of traffic flows to stress data plane performance. Sophisticated configurations can be created using powerful wizards and grid controls in the graphical user interface. With its enhanced real-time analysis and statistics, IxNetwork is capable of reporting comprehensive protocol status and detailed per-flow traffic performance metrics.

Key Features

- Emulation of Internet-scale routing topologies to determine scalability limits
- Simulation of network instabilities to characterize the performance of network convergence
- Easy-to-use Protocol Wizards to quickly and precisely set up complex topologies
- Powerful Traffic Wizard to rapidly and efficiently create millions of traffic flows for validating emulated networks and hosts reducing test configuration time.
- Comprehensive protocol and per-flow traffic statistics for detailed troubleshooting and analysis
- Flexible Test Scheduler to dynamically flap emulated topology on-the-fly
- Realistic emulation of enterprise application traffic, including stateful TCP, HTTP, E-mail, Video, RTSP, Telnet and FTP
- Use of industry standard RFC-based data plane tests, along with other automated testing

Test Conductor

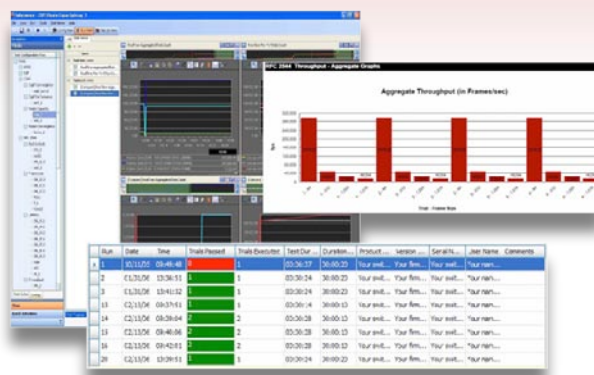


Test Conductor is a comprehensive regression scheduling harness that is both easy to use and highly scalable. Compatible with key Ixia test tools, Test Conductor imports tests, associates them with a named regression and allows detailed scheduling attributes to be defined. Tests can be scheduled in series or in parallel based on an Outlook-like calendar tool. At-a-glance logs and summary reports allow the user to see color-coded pass/fail criteria, and the progress of the tests within the regression. Automated Device Under Test (DUT) configuration scripts can also be scheduled in synchronization with individual tests or with complete regression runs.

Key Features

- Simple GUI-based tool with an intuitive workflow design
- "Outlook" -like scheduling tool to define date and time parameters
- Highly scalable to perform large test suites
- Comprehensive Pass/Fail and baseline test criteria
- Automatic email distribution of regression reports

IxAutomate



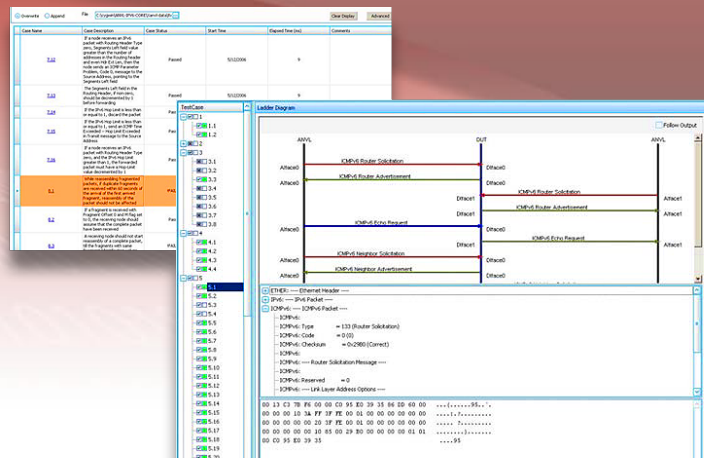
The IxAutomate application offers a powerful, customizable test tool to automate the performance, scalability, and functional testing of network devices. IxAutomate provides a rich suite of pre-built tests based on industry standard RFCs and customer requirements. Utilizing the capabilities of Ixia test hardware, test results are collected and presented with a flexible set of functions, including real-time graphs, formatted reports, color-coded indications of test trial pass/fail outcomes, and detailed test execution logs.

IxAutomate provides a simple to use Graphical User Interface to manage DUT configuration, configure custom automated test scenarios, and analyze test results.

Key Features

- Over 90 pre-defined tests including routing protocol scalability and performance testing, RFC-based data plane throughput and latency testing, and Layer 4-7 application performance testing.
- Test results include real-time graphing, formatted PDF reports, multiple csv reports, detailed test logs, and a color-coded pass/fail test analysis tool.
- Batch scheduling of configured tests based on time-of-day and day-of-week to provide scheduled test runs with no manual intervention.

IxANVL



Ixia's IxANVL (Automated Network Validation Library) is the industry standard for automated network/protocol validation. Developers and manufacturers of networking equipment and Internet devices rely on IxANVL to validate protocol compliance and interoperability. Many customers have chosen IxANVL for its ease-of-use, enhanced GUI, and flexible test automation capabilities. In addition, IxANVL offers a veritable universe of protocol libraries and utilities.

IxANVL allows vendors to verify designs during the entire product life cycle. Problems can be identified earlier in order to prevent costly last-minute reworks. IxANVL can emulate large, multi-node networks that were previously cost prohibitive. The result is more efficient tests and quicker product release times.

IxANVL provides conformance, negative, and regression testing on a vast selection of protocols including Bridging, Routing, PPP, TCP/IP, IPv6, IP storage, RMON, VPN, MPLS, VoIP, Metro Ethernet and Multicast.

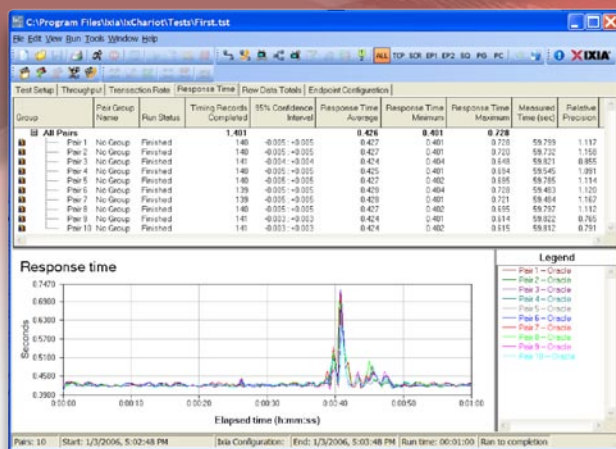
IxANVL is particularly well-suited to operate on Ixia's powerful test and analysis platform via a VNIC (Virtual Network Interface Card) driver. This enables IxANVL to support industry standard test interfaces including 10/100/1G/10G Ethernet, ATM and POS.

IxANVL is also able to run on minimal hardware, a PC with Linux or Windows operating system and an Ethernet card. This allows it to test specialized interfaces, such as Serial, Async and T1/E1.

With a source code license, users can easily add new interface types, protocols, and/or tests to their IxANVL system.

Key Features

- Comprehensive protocol coverage: Routing, MPLS, Multicast, TCP/IP, IPv6, Layer 2, Security, Voice, Metro Ethernet, and Storage
- Integrated DUT configuration and control
- Operates over Ixia hardware interfaces via VNIC
- Operates on standard PC's with Linux or Windows interfaces.



IxChariot

IxChariot® is the industry's leading test tool for predicting end-to-end device and system performance by emulating real-world applications. IxChariot assesses the performance characteristics of any application running on wired or wireless networks. Comprised of the IxChariot Console, Performance Endpoints and IxProfile, the IxChariot product family offers thorough performance assessment of a variety of networks including enterprise, service-provider, and even Triple-Play networks. Tests are run on PC's and embedded devices such as set-top boxes, PDA's, cell phones, and video game consoles.

Key features

- Over 150 pre-programmed scripts capable of emulating all common protocols and Triple-Play services including VoIP, multicast video, enterprise desktop, and ERP applications running as many as 100,000 endpoint pairs
- Real-world application behavior at the transport layer (Layer 4) including the creation of separate control plane connections and data plane activity for Triple-Play traffic using Application Groups. For example, data (FTP - active and passive), voice (SIP control plane followed by RTP stream and teardown) and streaming media (HTTP - get traffic triggering a media stream)
- Tailored scripting capabilities using IxProfile and the IxChariot SDK
- Create sophisticated traffic patterns with and without QoS for IPv4 and IPv6 to measure throughput, jitter, packet loss, MOS (Mean Opinion Scores) for VoIP, and MDI (Media Delivery Index) for video over IP using Performance Endpoints running on all popular operating systems

- Seamless correlation of performance measurements with 802.11 client statistics such as RSSI (Received Signal Strength Index)
- Capable of measuring the impact of new technologies such as IPv6 and multicast video to assess the readiness of upcoming network changes
- Able to embed custom payloads to test specific data content across the network
- Troubleshoot critical performance issues through isolation of deteriorating network segments and devices
- Configurable buffer sizes (send and receive) for TCP connections to test bandwidth-delay product (BDP) sensitive networks such as satellite links, dial-up links, 10 Gigabit Ethernet-based networks, etc.
- Leverages Ixia's hardware test platform and Ixia Performance Endpoints to create wire-speed Layer 2-3 traffic, including Denial of Service attack traffic running in conjunction with application traffic patterns created by IxChariot

Performance Endpoints run on the following platforms

- Ixia Load Modules
- Microsoft Windows (including Vista qWAVE)
- UNIX (Linux, Solaris, and others)
- Windows CE and Embedded Linux
- and many more...

Protocols Supported

- TCP, UDP, RTP, IPX, SPX
- IPv4, IPv6
- IP Multicast

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