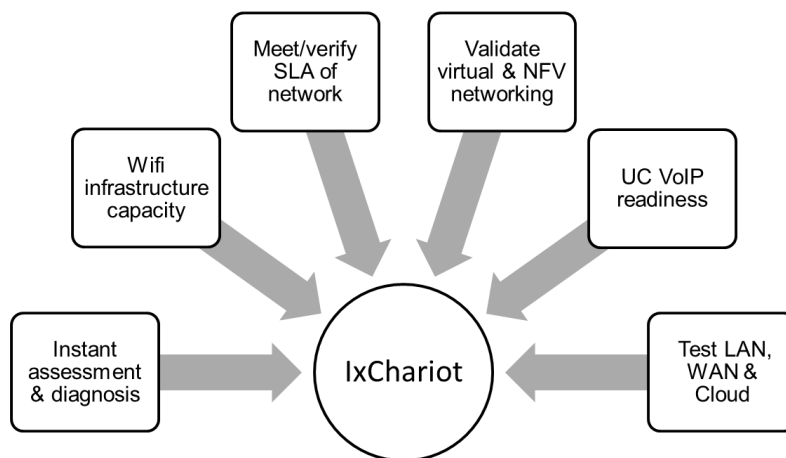


IxChariot®

Improving Application Performance with Network Assessment and Diagnostics

IxChariot offers an industry-leading tool for assessing and troubleshooting networks and applications. Trusted by thousands of enterprises and government agencies worldwide, IxChariot equips IT professionals to confidently assess the performance and reliability of applications running on wired and wireless networks.

IxChariot simulates real-world applications to predict device, system, and network performance under realistic load conditions. The solution consists of an IxChariot Server and performance endpoints distributed throughout multiple sites and data centers, end-user PCs, and mobile devices. Assessments can be conducted entirely from a standard web browser.

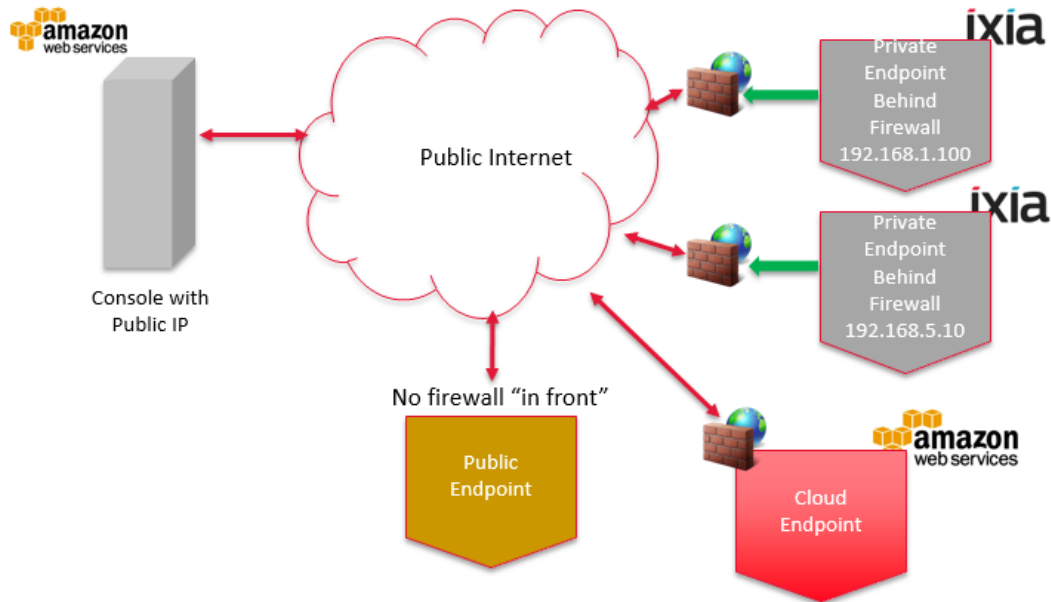


Key Features

- **Cloud capable console** – Runs on EC2 and private cloud
- **New HTML5-based web interface** – zero client installation; browser-based
- **Multi-user system** – create and run tests simultaneously
- **Test from behind firewalls** – no configuration required
- **100% software endpoints** – runs on “everything”
- **Setup your own public points** – endpoints on any VPS/cloud
- **Centrally manage endpoints** – verify connectivity before use
- **Measures throughput, jitter, packet loss, end-to-end delay** – per-user metrics
- **Create sophisticated traffic patterns** – AppMix, TCP, UDP, and RTP over IPv4 and IPv6
- **Manage test resources** – built-in resource manager to re-use test scripts
- **Download IxChariot Server** -- available as an open virtual appliance (OVA)
- **Available on Amazon EC2** - bring-your-own-license (BYOL)
- **Full REST API** – control and integrate with anything

Version 9.0: “IxChariot Anywhere”

Version 9 adds the ability to run IxChariot from the cloud with the main console hosted from one site or data center and exposed publicly for easy access by multiple teams. Patented Ixia technology allows endpoints to traverse company firewalls to deliver a seamless and elegant solution for assessing network performance between private and cloud networks—without compromising security.



IxChariot 9 Key Benefits

- Designed for IT teams – Leading pre-deployment assessment tool; access and run tests; multi-user out of box
- Console can be hosted in the cloud – provides a fast, cost-effective tool to wide range of users
- Verify SLA for networks – Instant end-to-end assessment
- Pre-assess LAN to cloud migration of servers and applications and compare quality of experience (QoE)
- Measure device performance over Wi-Fi and understand performance of access points under load
- Validate various NFV/SDN topologies – 100% software endpoints can be deployed anywhere

IxChariot 9 Quick Feature Overview

Securely Host and Run Tests from Any Browser

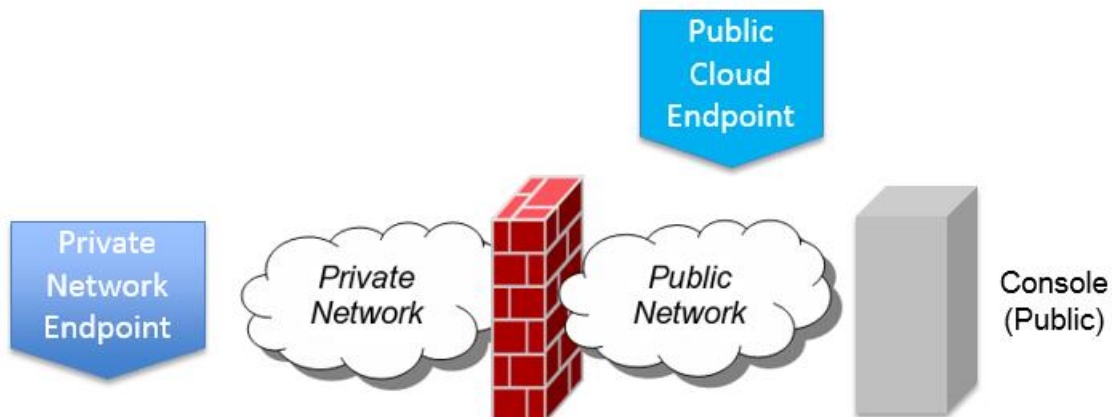
- Web-based platform, uses HTML5 for access from any modern browser; multi-user access
- Deploy web console on your LAN or private cloud
- Run on Amazon EC2 with bring-your-own-license (BYOL)

The screenshot shows the IxChariot 9 web interface. At the top, there's a navigation bar with 'CONFIGURATION', 'STATISTICS', 'SESSIONS', 'RESULTS', 'MY PROFILE', and 'HELP'. Below that, there's a 'START TEST' button and a timer showing '00:00:15 - 00:00:15'. There are also buttons for 'LOAD CONFIG', 'SAVE CONFIG', and 'MANAGE RESOURCES'. The main area displays a table of test flows with columns for 'On/Off', 'Src', 'Dir', 'Group Name', 'Topol', and 'Dest'. The first flow is 'UK TO AMSTERDAM' with source 'OCEANUK1' and destination 'OCEANEURO1'. Below this, there's a detailed view for the 'UK TO AMSTERDAM' flow, showing a table of flows with columns for 'Flow', 'Network Protocol', 'Source QoS', 'Destination QoS', and 'Users'.

Flow	Network Protocol	Source QoS	Destination QoS	Users
<input checked="" type="checkbox"/> TCP Throughput	TCP	None	None	1
<input checked="" type="checkbox"/> UDP Throughput	RTP	None	None	1
<input checked="" type="checkbox"/> G.711a (64 kbps)	RTP	None	None	1

Run Endpoints Anywhere – LAN, Cloud, Public

- Supports private endpoints running on devices/servers behind enterprise firewalls
- Public points of presence running on any cloud provider (AWS EC2, Rackspace, Azure)
- Endpoints auto-register and maintain heartbeat to the console/registration service



Performance Endpoints run on “Everything”

- Endpoints are ready to run several off the shelf small board PCs
- Support for Raspberry Pi B+, BeagleBone Black, and others
- Runs on virtual servers, real – Windows, Mac, Linux



Servers and Workstations



Tablets and Cell Phones



Virtual machines



IoT Hardware

Centrally Manage Endpoints

- Endpoints automatically register to the console
- Supports endpoints that are private “behind a firewall” or publicly deployed
- Quickly check with endpoints are available for use

ENDPOINTS MANAGER

Search Endpoints

<input type="checkbox"/>	Status	Type	Name	Management IP	Test IPs	Network Location	Operating System	Version	Description
<input type="checkbox"/>	●	Automatic	ip-10-191-175-92	ip-10-191-175-92		Public / Cloud	Linux x64 (64-bit)	9.0 EA build 314	
<input type="checkbox"/>	●	Automatic	doceantryout1	doceantryout1		Public / Cloud	Linux x64 (64-bit)	9.0 EA build 314	
<input type="checkbox"/>	●	Automatic	raspi1-calabasas	raspi1-calabasas		Private / Enterprise	Linux ARM	9.0 EA build 312	
<input type="checkbox"/>	●	Automatic	OCEANNY1-ts	OCEANNY1		Public / Cloud	Linux x64 (64-bit)	9.0 EA build 314	
<input type="checkbox"/>	●	Automatic	OCEANEURO1	OCEANEURO1		Public / Cloud	Linux x64 (64-bit)	9.0 EA build 314	
<input type="checkbox"/>	●	Automatic	OCEANASIA1	OCEANASIA1		Public / Cloud	Linux x64 (64-bit)	9.0 EA build 314	
<input type="checkbox"/>	●	Automatic	OCEANUK1	OCEANUK1		Public / Cloud	Linux x64 (64-bit)	9.0 EA build 314	
<input type="checkbox"/>	●	Automatic	OCEANSFO1	OCEANSFO1		Public / Cloud	Linux x64 (64-bit)	9.0 EA build 314	
<input type="checkbox"/>	●	Automatic	piLAXuverse1	piLAXuverse1		Private / Enterprise	Linux ARM	9.0 EA build 312	

ADD ENDPOINT REFRESH DELETE

CLOSE

Voice over IP Call Emulation and Quality Assessment

- Create real bi-directional peer-to-peer call flows across the network
- Select from codec G711, G729, AMR codec, and others
- Assess true voice quality with MOS, R-value, and impact of delay, jitter, and packet loss on calls flows
- Scale to hundreds of real-time conversations without effort

FLOW LIBRARY

<enter search criteria>

- NetShowu
- Realaud
- Realmed
- VoIP
 - G.711a (64 kbps)
 - G.711u (64 kbps)
 - G.723.1-ACELP (5.3 kbps)
 - G.723.1-MPMLQ (6.3 kbps)
 - G.729 (8 kbps)
 - G.726 (32 kbps)
 - AMR-NB (4.75 kbps)
 - AMR-NB (5.15 kbps)

Parameter	Current Value	Default Value	Comment
Codec	G711a	G711a	Codec used
Packet Loss Conceal...	Disabled	Disabled	Enable or disable the ...
Voice Activity Rate	100	100	Specifies a voice acti...
Delay Between Voice ...	20	20	Delay between voice ...
Initial Delay (ms)	0	0	Delay before starting ...
Additional Fixed Dela...	0	0	Delay from a known, ...
Jitter Buffer Size (ms)	40	40	Size of the jitter buffer...
Source Port	Auto	Auto	What port to use for ...
Destination Port	Auto	Auto	What port to use for ...

SELECT SAVE AS NEW CLOSE

Application Emulation

- Configure mixes of applications based on number of users or based on generated throughput
- Ready to run popular applications (~100) – see detailed list later in this datasheet

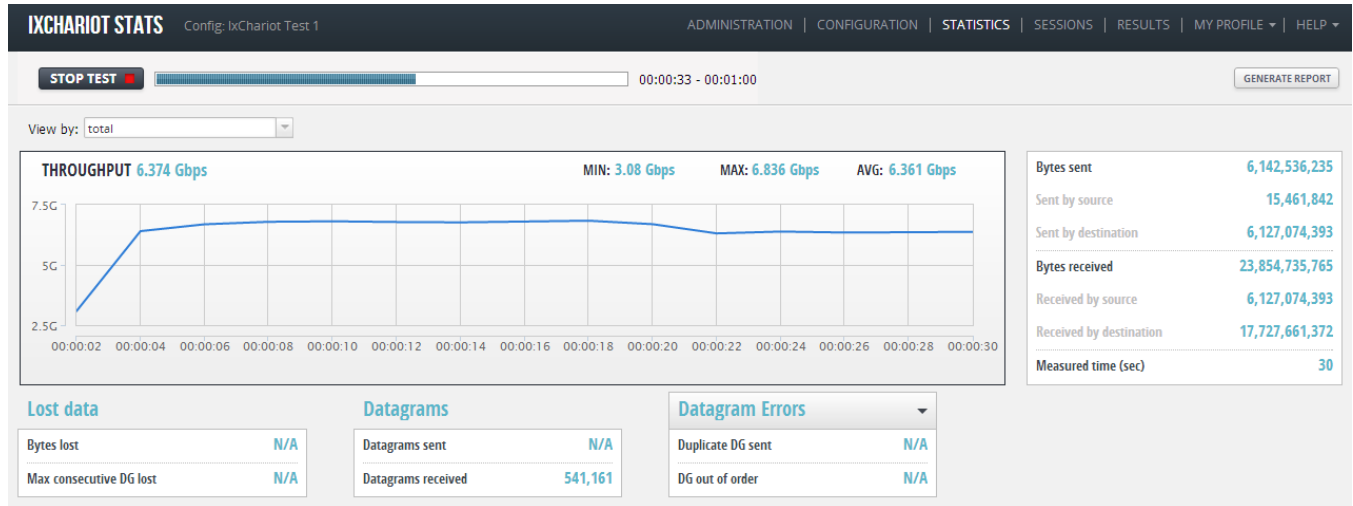
AppMix 1 [Icons] ADD APPLICATION

Distribute Percentage: Throughput No. of Users Total No. of Users: 10

Application	% Distribution	Lock	Users
Facebook	20	🔒	10
Gnutella	13.4	🔒	10
Google Search	13.4	🔒	10
Bandwidth HTTP	13.3	🔒	10
Google Mail	13.3	🔒	10
MS-SQL Server	13.3	🔒	10
Outlook Web Access	13.3	🔒	10

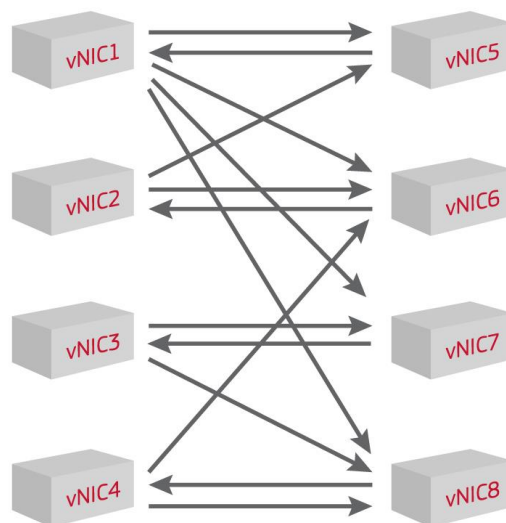
Interactive Real-Time Statistics

- Inject real traffic into the network to measure the impact of new applications
- View test results in real-time; measure all critical network metrics including up/down bitrate, loss, jitter, delay



Assess Performance of NFV/Virtual Infrastructure

- 100% software Performance Endpoints run on any hypervisor that supports Linux or Windows guest O/S
- Validate the performance of VM-to-VM traffic; throughput, latency, and loss for a various TCP and UDP apps
- Create ad-hoc traffic topologies between different servers in the VM infrastructure



Detailed Product Specifications

Specifications	
Scalability	Supports up to 100,000 connections (endpoint pairs) representing hundreds of thousands of end-users
Protocols	TCP, UDP, RTP, IPv4, IPv6
Management	<ul style="list-style-type: none"> • Supported on IPv4 and IPv6 networks • Handles test failures in error prone networks including Wi-Fi for management • Support in-band and out-of-band management and traffic paths
API Support	<ul style="list-style-type: none"> • REST API • python
System Requirements (Server)	<ul style="list-style-type: none"> • OVA deployment: VMware ESXi 5.x or newer, VMWare Player 6.x or newer • Minimal VM provisioning: 1Gb RAM, 1 VCPU • Support for multiple simultaneous tests and user sessions
Performance Endpoints	<ul style="list-style-type: none"> • Requires IxChariot 9.0 version of performance endpoints – not compatible with older endpoint versions • Microsoft Windows: 2008 R2, 2012, 7, 8 • Linux (x86, x86_64) • Several others, look for “Endpoint Library” on Ixia’s website
Mobile Device endpoints	<ul style="list-style-type: none"> • Android – on Google Play Store • IOS – on Apple Store • Search for “endpoint”
XR2000 Hardware Endpoint	<ul style="list-style-type: none"> • Supported • Upgrade to latest free 9.0 endpoints

<p>Simulated Applications</p>	<ul style="list-style-type: none"> • AOL Instant Messenger • AOL Webmail • Bandwidth HTTP • Bandwidth Raw • BitTorrent Cisco EMIX • BitTorrent Enterprise • BitTorrent File Download • BitTorrent RMIX 5M • BitTorrent Service Provider • Facebook • Facebook Android • Facebook Android Chat Session • HTTPS Simulated Financial • IMAPv4-Advanced Financial • POP3-Advanced Financial • SMB Client File Download Financial • SMBv2 Auth Session Financial • SMBv2 File Download Financial • SMTP Email Financial • Flash Enterprise • FTP Small download • FTP Active mode • FTP Cisco EMIX • FTP Enterprise • Gnutella • Google Mail • Google Play LTE Mix • Google Play Search View and Download • Google Search • Google GTalk Chat • HTTP Audio • HTTP Cisco EMIX • HTTP Compressed • HTTP Enterprise 	<ul style="list-style-type: none"> • HTTP Flash Video • HTTP Flash Video Service Provider • HTTP GET - Android42 to Apache Server • HTTP GET - BlackBerry10 to Apache Server • HTTP GET - Chrome25 (Windows 7) to Apache Server • HTTP GET - Firefox19 (Windows 7) to Apache Server • HTTP GET - IE9 (Windows 7) to Apache Server • HTTP GET - Opera11 (Linux) to Apache Server • HTTP GET - Opera12 (OS X) to Apache Server • HTTP GET - Safari6 (OS X) to Apache Server • HTTP LTE Mix • HTTP Mobile Europe • HTTP Mobile North America • HTTP RMIX 30K • HTTP RMIX 130K • HTTP RMIX 25K • HTTP Service Provider • HTTP Text • HTTP Video • HTTP Video Enterprise • HTTPS LTE Mix • HTTPS Simulated • HTTPS Simulated Enterprise • HTTPS Simulated Service Provider • ICQ • IMAP Cisco EMIX • IMAP LTE Mix • IMAP RMIX 4K 	<ul style="list-style-type: none"> • IMAP RMIX 16K • IMAP RMIX 90K • iTunes Desktop App Store • Jabber Chat • MS-SQL Server • MySQL Database Update • Netflix Service Provider • Oracle Database • Oracle Enterprise • Outlook Web Access • Pandora LTE Mix • Pandora • POP3 LTE Mix • POP3 RMIX 4K • POP3 RMIX 16K • POP3 RMIX 90K • PostgreSQL • Raw Enterprise • Raw LTE mix • Raw Service Provider • Raw Wireless • RTMP • SMB Client File Download • SMB Enterprise • SMTP Cisco EMIX • SMTP Email • SMTP Enterprise • SMTP RMIX 4K • SMTP RMIX 16K • SMTP RMIX 90K • SSH • Twitter Json • Webex • Windows Live (MSN) Messenger v15 • Yahoo IM Chat v10 • Yahoo Mail • YouTube Enterprise • YouTube LTE Mix • YouTube Service Provider
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Product Ordering Information***License Bundles**

920-0056	IxChariot Software, Floating Bundle 50; includes Floating License Server for 50 pairs/virtual users and single user console seat license
920-0057	IxChariot Software, Floating Bundle 200; includes Floating License Server for 200 pairs/virtual users and single user console seat license
920-0058	IxChariot Software, Floating Bundle 500; includes Floating License Server for 500 pairs/virtual users and single user console seat license
920-0059	IxChariot Software, Floating Bundle 1250; includes Floating License Server for 1250 pairs/virtual users and single user console seat license
920-0060	IxChariot Software, Floating Bundle 2500; includes Floating License Server for 2500 pairs/virtual users and single user console seat license
920-0061	IxChariot Software, Floating Bundle 5000; includes Floating License Server for 5000 pairs/virtual users and single user console seat license
920-0021	IxChariot Console Seat for License Server, five concurrent users
920-0043	IxChariot Optional Software, AppLibrary support for single user; REQUIRES previous or adjunct purchase of Console Seat licenses
920-0044	IxChariot Optional Software, AppLibrary support for 5 users; REQUIRES previous or adjunct purchase of Console Seat licenses

*Most popular options shown – see current price list for more information