Hawkeye – Active Network Monitoring Platform

Problem: Preventing Network Latency and Ensuring a Consistent User Experience

Network services — such as voice over IP (VoIP), unified communications (e.g. Skype for Business), cloud migration of business services, and streaming video — are critical to an organization's survival in today's highly competitive environment. However, bottlenecks, latency, Wi-Fi issues, and other hard-to-pinpoint network issues can seriously compromise a company's network performance and brand reputation. Network managers and operators need a simple, reliable way to continuously verify network performance and ensure hassle- free application delivery.

Solution: Proactively Monitor Network Performance with Active Monitoring

Hawkeye quickly and effectively validates network performance, isolates problems, and proactively detects issues by running scheduled verification tests on any site using wireline or wireless connections. Using a combination of hardware and software agents called performance endpoints, Hawkeye simulates application traffic and sends key performance metrics to a central console for fast action. The agents provide both remote-site end-user perspectives on network performance — offering network managers a proactive way to detect, diagnose, and fix issues. Measurements range from network quality to user experience, enabling network operators to improve overall uptime and detect network performance issues before they impact end users.

Easy to deploy and simple to use, Hawkeye helps IT ensure peak network performance with proactive insight.

Highlights

- Get superior visibility into your live networks with Hawkeye's advanced network and application testing technology.

- Save IT staff time by leveraging industry-leading library with 100's of application tests that enable assessment of network throughput, class of service, unified communications, WI-FI connectivity tests, and much more.

- Understand the performance of your entire network and services with cost-effective endpoint probe distribution that delivers expansive network coverage.

- Green light your service with pre-launch assessments by emulating real application traffic up to line rate for any network scenario over wired and wireless devices to see how it performs.

- Be a troubleshooting wonder by firing off quick validation tests with clear demarcation points and advanced WI-FI expert tools to almost instantly find network and application issues.

- Proactively detect problems with by continuously monitoring QoE and QoS, so you always know that your network is meeting SLA and quality standards.

KEYSIGHT TECHNOLOGIES

Key Features

- Web-based platform for multi-user access, test scheduling, data storage, and real-time analysis.

- Deploy endpoints with turnkey hardware or software endpoints.

- Verify your virtual infrastructure with software and VM endpoints.

- Generate synthetic monitoring traffic on up to 10G links.

- Verify, monitor, and diagnose your user experience on wireline and wireless network.

- Take control of your last mile thanks to innovative IxProbe solution.

- Verify fixes put in place in your network in real-time with pass / fail metrics.

- Proactively detect network or application faults quicker with continuous interval testing throughout the days/weeks/months.

- Leverage machine learning to quickly pinpoint outliers and prioritize fixes.
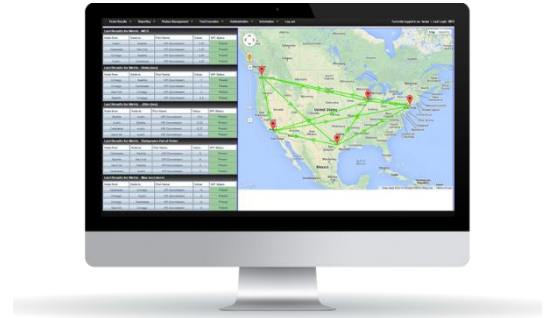
| **Hawkeye Console**		• Provided as a virtual appliance (Linux Operating System) • Web-based, deployed in NOC, data center, or cloud • North-bound interfaces, APIs for easy integration
Hardware Endpoints	XRPi IxProbe	• Completely turnkey, lightweight, portable • Autodiscovery and registration, automatic upgrades • Dual-band Wi-Fi monitoring on XRPi with advanced Wi-Fi connectivity test and scanning capabilities
Software Endpoints	Windows vmware Linux iOS Max OS Android	• Low-footprint software, load into any device • Fully compatible with virtual environments • Ethernet or Wi-Fi and mobile

Hawkeye Solution Components

Deploy Hawkeye Solution

- Deploy Hawkeye on premise web server in central location (NOC, data center, etc.)
- Strategically-deploy software and hardware endpoints to cost-effectively reach any network location:
    - o Customer premises
    - o Mobile devices – Wi-Fi or Cellular
    - o Remote sites and head offices
    - o Network aggregation points (PEs)
    - o Core network, MPLS routers
    - o Data centers
    - o Virtual machines and servers
    - o In cloud locations (Amazon, Azure…)
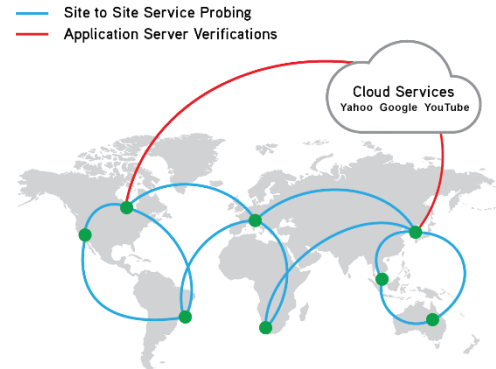
Plan and Design Your Monitoring Capabilities

- Define locations network performance requirements toward data-centers, private or public cloud, software-as-a-service
- Define synthetic monitoring scenarios (IP transport performance, Speedtest, web server performance, Voice/Video, etc.)
- Build large topology test (full mesh) with one click

Hawkeye Endpoints

	HARDWARE			VIRTUAL		SOFTWARE
	Vision E1S	**IxProbe**	**XRPi**	**VM**	**Docker**	**Software** **Windows Linux** **Android iOS**
CORE CAPABILITIES						
Network Monitoring	√	√	√	√	√	√
Application & Web Monitoring	√	√	√	√	√	
Cloud Monitoring	√	√	√	√	√	
Inline Monitoring		√				
Fail to Wire		√				
Wifi Monitoring			√			√
Packet aggregation, filtering	√					
NetFlow	√					
Packet Capture	√					
SPECIFICATION DETAILS						
	4*10G (SFP+), 6*1G BASE-T, 2*1G BASE-T for management	2*1G	1*FE, 1 Wi-Fi 2,4Ghz, 5Ghz, AC	OVA, QCOW, AWS AMI, Ethernet and virtual interfaces	Ethernet, Virtual	

Select Test Types Among Pre-Calibrated Tests in Hawkeye Library

Hawkeye supports a variety of service level agreement (SLA) and quality of experience (QoE) objectives, including:

- Speed test from site to site with advanced configuration on traffic profiling
- Advanced Bandwidth availability or verification with bit blasting or TCP-based testing
- Class of service (COS) implementation validation with oversubscription scenarios
- IP network SLA verification (one-way delay, jitter, loss)
- Unified communications tests (Teams, Zoom)
- Office 365 applications
- Real-time streaming verification
  - o Mean opinion score (MOS) for voice – G711, G729, AMR …
  - o Media delivery index (MDI) for video streaming
- Echo tests (ICMP, TCP, UDP) and path discovery to any interface on the web
- User experience tests (downloading web pages, etc.)
- DNS response time
- Netflix, YouTube, and any Dash/Adaptive streaming test
- Multicast video
- Remote destination port opening verification
- Wi-Fi monitoring

Create Target Thresholds for Different Tests

- Adjust applications, test variables, and thresholds based on trial data to match expectations of the network and its performance
- Auto-learn baseline thresholds based on machine learning algorithms
- Thresholds are the baseline to decide if tests are passing or failing

Leverage Path Discovery for Troubleshooting

- Advanced Topology discovery from Ixia endpoints to any remote location

- Hop-by-hop discovery

- Path discovered based on specific application settings

- Powerful and intuitive result display

- Quick troubleshooting tools – identify nodes with loss or long delay

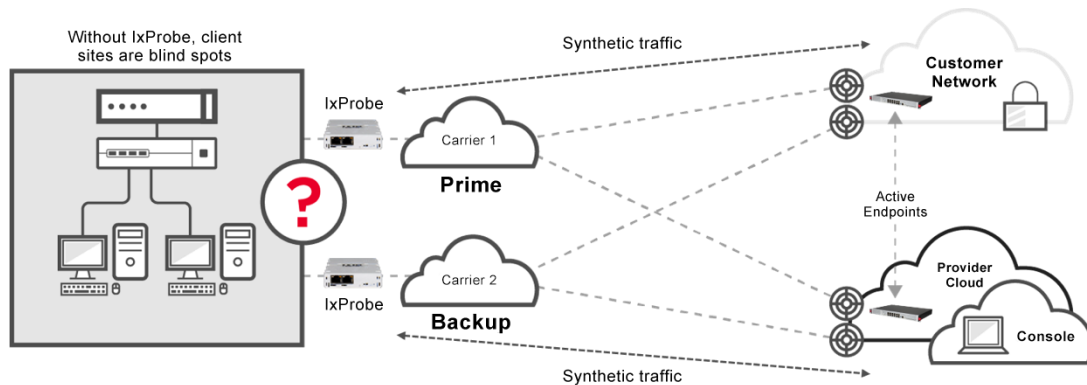- Geolocalization on each identified public node
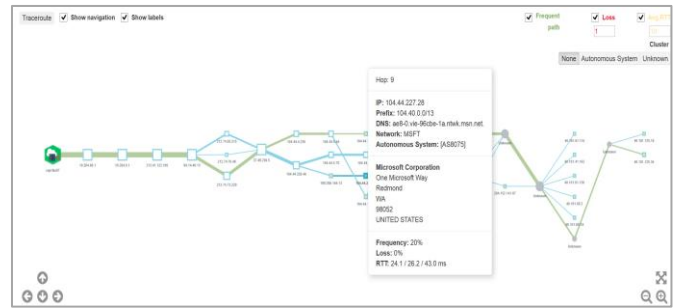
Path discovery

Keep a Finger on Your Network's Pulse with IxProbe

- Deploy Keysight IxProbe hardware endpoints in line at remote sites to keep track of inline metrics while generating synthetic monitoring traffic

  o   SNMP heartbeats

  o   Real-time traffic and link status reporting

IxProbe

IxProbe deployment

Manage Packets at Remote Sites with Vision E1S

- Deploy Vision Edge 1S probe, centrally managed with SPAN ports or copper TAPs to see packets and

  o   Generate metadata information on the flows, and send it via Netflow or IxFlow (IPFIX) to flow collectors

  o   Aggregate, deduplicate, filter, and backhaul to central tools for APM/NPM or security forensic analysis

  o   Perform local packet capture snapshots


Vision Edge 1S

Analyze Results

- Use different result levels and granularity to get quick and efficient results and understanding

- Ensure every team member can get to required data with simple pass/fail metrics and detailed test reports

- See results in real time in geographic dashboards

- Quickly spot network problems with outlier dashboard

- Run tests and look at single instance results or group of tests results

- Run trend reports on historical data and analyze network behaviors

- Export and send reports via email to share results between teams

- Activate alarms on critical paths

- Get notified by email, SNMP traps, customized notifications

- Reporting engine creates reports and dashboards based on the results stored in the database

- Schedule daily automatic reports to follow critical networks

- Receive automatic emails with comprehensive reports
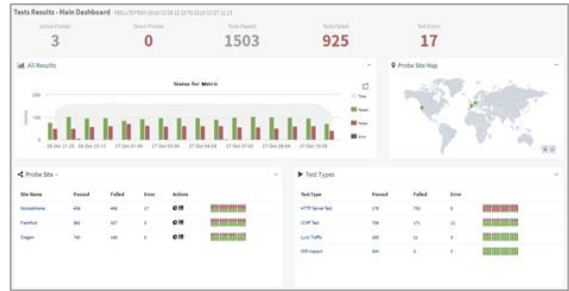
Main dashboard
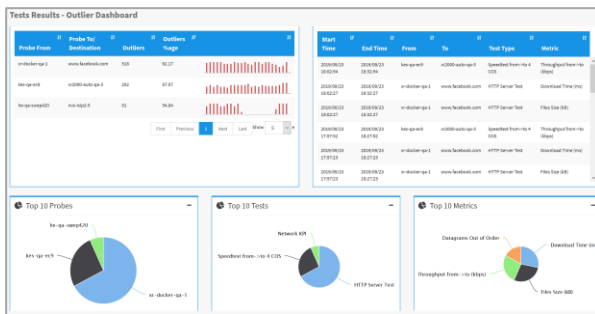
Outliers dashboard
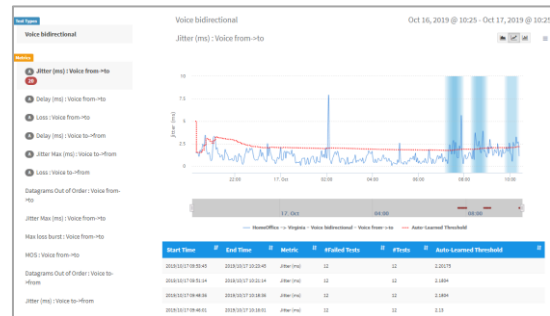
Time series analytics

XRPI

- Field-ready: robust and fan-less, lightweight and highly portable
- Proven platform – powered by Raspberry Pi
- Wi-Fi interface, dual band
- Automatic and remote management out of the box with Hawkeye

Feature	Description
CPU Type	Quad core 900Mhz ARM processor
RAM	1GB
Storage	8GB micro SD with operating system and data
LAN	One (1) 10/100Mbps Fast Ethernet port
Wi-Fi	One (1) Wi-Fi dongle with dual band 2.4/5Ghz, 802.11a/b/g/n
Power	On-board DC +5V 2A Micro USB ~650 mA, (3.0 W)
International Use	Power unit ships with various country-specific adaptors
Console Access	HDMI port for video, USB for keyboard
Remote Access	Enabled with secure telnet (ssh)
Size and Weight	92mm x 29mm x 67mm 3.63" x 1.13" x 2.63" 100g
Performance	
TCP Throughput	Up to available line rate with built-in 10/100 Ethernet or Wi-Fi dongle
UDP Throughput	Up to available line rate with built-in 10/100 Ethernet or Wi-Fi dongle
Voice Calls	Up to 100 simultaneous calls
Streaming Traffic (UC)	Up to 100 simultaneous mixed voice/video calls
Streaming Traffic (Video)	Up to 85Mbps video traffic (best case)

Streaming Traffic (Lync, Unified Communications)	Up to 200 simultaneous mixed voice/video calls
Streaming Traffic (Video)	Up to 700Mbps of video traffic

IxProbe

- Verify SLAs with synthetic QoS testing
- Monitor branch site uptime with heartbeats and SNMP polling
- Deploy at scale with fast, simple instillation
- Avoid adding extra ports and management interfaces with purely inline design
- Prevent disruptions with built in fail-to-wire
- Improve operational efficiency with single-pane-of-glass management
- Lightweight, robust, fan-less, and field-ready

Feature	Description
CPU Type	1 GHz (dual core processor)
RAM	512 MB
I/O Interfaces	Network ports: (2) RJ45, 8-pin connectors Management port (1): RJ45, 8-pin connectors Console port (1): 1 micro USB connector ACCS port (1): 1 USB3.0 type A connector
Power	AC power input: 100-240VAC, 50-60 Hz, 0.5A Max • DC output: USB-C 5V @ 3A • Power dissipation less than 34 BTU/Hr 10W
Dimensions	0.9" high x 9.4" deep x 4" wide
Weight	HDMI port for video, USB for keyboard
Operating Temperature	Operating: 0ºC to 40ºC Non-operating: -10ºC to 70ºC
Operating Humidity	Operating: 10% min, 95% max, noncondensing Non-operating: 10% min, 95% max, noncondensing
Performance	
TCP Throughput	Up to line rate (1G)
UDP Throughput	Up to 600M

Vision Edge 1S

- Keysight's most affordable network packet broker, Vision E1S is designed for easy deployment in distributed edge sites
- Application intelligence enables you to detect flow and applications, generate enriched NetFlow (IxFlow) to collectors, and perform remote packet capture
- Up to 10G traffic generation
- Remote controlled, easy-to-use web interface enables efficient provisioning and remote management
- Comprehensive wizards make deployment fast and easy

Feature	Description
Power	Redundant (2) AC power supplies
	Input AC: 110 to 240 @ 50/60 Hz
	Power: 300W
	System Cooling: 2 x PWM fans, supports smart fan
Dimensions	WxLxH: 442 x 298.25 x 43.6 mm
Weight	3.08 kg
Operating Temperature	0ºC to 40ºC
Operating Humidity	20% to 90%
Storage Temperature	-20ºC to 70ºC
Storage Humidity	5% to 90%
Country of Origin	Taiwan
Interfaces	(4) 10G SFP+ (Active monitoring or packet monitoring)
	(6) 1G BASE-T copper (packet monitoring)
	(2) 1G BASE-T copper (Management + Active Monitoring)
	(1) USB 3.0 port
	(1) RJ45 serial console port
Performance	
TCP Throughput	Up to 10G
UDP Throughput	Up to 6G for standard IP, up to 10G with jumbo frames

Ordering Information

Hardware

940-0040

XRPi Active Hardware Endpoint; integrated hardware endpoint powered by Raspberry Pi (940-0040), for use with either IxChariot OR Hawkeye. Includes 10/100 LAN interface and Wi-Fi Dongle with dual band (2,4/5Ghz). 5V AC unit. Requires adjunct or previous purchase of IxChariot OR Hawkeye software licenses.

IXPR-CU3

IXIA IxProbe Copper - 10/100/1000M. 1G Intelligent in-line probe with auto speed negotiation, CLI, Web GUI or SNMP management, and Hawkeye endpoint software. (2) front facing in-line RJ45 network ports. Managed in band via network link IP adoption or via rear management port. Includes: (1) RJ45 Cat5 cable, (1) wall mount clip, and (1) power supply and 2m power cord. Wall, desktop, or rack mountable. Pre-loaded Hawkeye Endpoint software requires license and activation via Hawkeye server.

SYSE1S-AC

IXIA Vision E1S System AC Chassis with fixed (4) 10G SFP+ ports and (6) 1G RJ-45 ports; Contains two redundant AC power supplies and integrated redundant fan units. Includes (1) license for NetStack, PacketStack, AppStack and (3) user seat license for central management with Hawkeye. Seats are not additive (max 3 users per Hawkeye server). Synthetic monitoring is not included. Optional licenses available for additional user seat licenses and synthetic monitoring.

991-0135

IXIA, Vision Management Appliance, AC power; Supports running IFC-CM and Hawkeye; Adjunct or separate node license for either IFC-CM (954-4005 to 954-4009) and/or Hawkeye (920-2401 to 920-2406) is required in order to operate the management software; redundant fans and power supplies and 2-post rack install included. RSA Regulatory Model # E39S.

Software licenses

920-2401

Hawkeye, 10 Endpoint Solution Bundle Includes: Hawkeye central management system (920-2410), 10 endpoint (sw or hw) registration & use (920-2421), 30 pairs node to node test license (920-2429), and 1 user seat license (920-2411)

920-2402

Hawkeye, 25 Endpoint Solution Bundle Includes: Hawkeye central management system (920-2410), 25 endpoint (sw or hw) registration & use (920-2422), 75 pairs node to node tests license (920-2430), 5 real services tests (requires XRPi) 920-2451, and 2 concurrent user seat licenses (920-2412)

920-2403

Hawkeye, 50 Endpoint Solution Bundle Includes: Hawkeye central management system (920-2410), 50 endpoint (sw or hw) registration and use (2x 920-2422) 150 pairs node to node test license (2x 920-2430) 10 real services tests (requires XRPi) (2x 920-2451), and 2 concurrent user license (920- 2412)

920-2404

Hawkeye, 100 Endpoint Solution Bundle Includes: Hawkeye central management system (920-2410), 100 endpoint (sw or hw) registration & use (920-2423), 300 pairs node to node tests license (920-2431), 25 real services tests (requires XRPi) (920-2453) and 5 concurrent user licenses (920-2413)

920-2405

Hawkeye, 200 Endpoint Solution Bundle Includes: Hawkeye central management system (2x 920-2410), 200 endpoint (sw or hw) registration & use (920-2424), 1200 pairs node to node tests license (2x 920- 2431), 50 real services tests (requires XRPi) (920-2454) and 5 Concurrent user license (920-2413)

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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