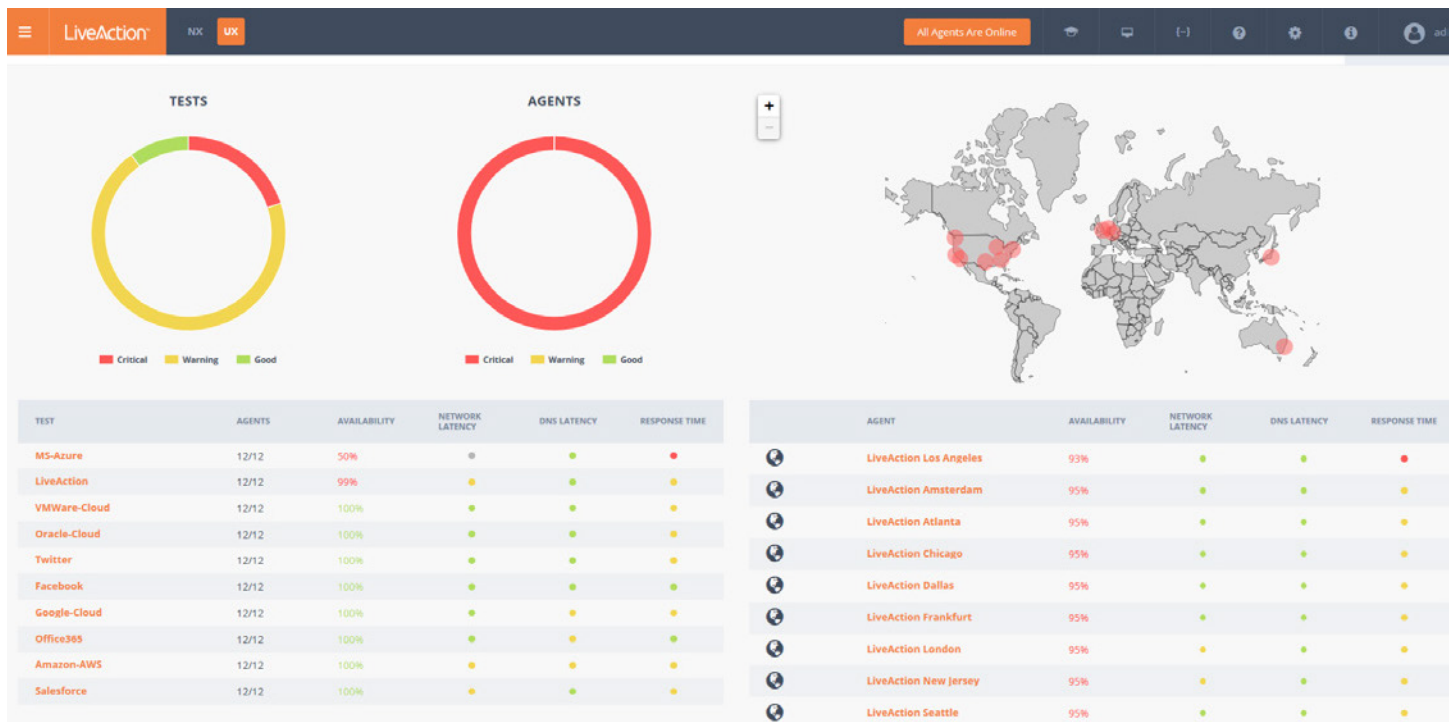


## UX - User Experience monitoring



### User Experience dashboard summary – application performance

User Experience is a software module available with the LiveNX Performance and Analytics platform. User Experience proactively monitors end user-experience of cloud based, or on-premise web applications by performing periodic active tests to collect data about your network and application performance.

You can gain insight into the availability and performance for any web-based application anywhere to address issues before they impact users. Correlating end-user experience and network information through integration with LiveNX Application-aware Network Performance Monitoring accelerates problem resolution and significantly simplifies your application performance monitoring challenges.

## User Experience Components

The key components are:

- Agents – takes measurements while behaving as a virtual user.
- Controller in the cloud – the control and collection point for all the data acquired by the agents during measurements and tests.
- User Experience in the cloud or on-premise

Agents are deployed in your Enterprise network or the public Internet. There are two different types of Agents:

**Global vs. Private**—Global agents live outside of your enterprise network whereas private agents live inside your network allowing you to quickly filter problems pertaining to your network or outside of your network.

### Private Agents

The software-based private agent is lightweight and easy to deploy on-premises in your Enterprise locations. It is distributed as an Open Virtual Appliance (OVA) package and is an archive containing files conforming to the Open Virtualization Format specification. The agent OVA contains everything needed to install the platform. In addition, it hardens the Agent by installing firewall policies to restrict unauthorized external access.

### Global Agents

Global agents are deployed in the public cloud to perform availability and performance tests outside of your enterprise. Global agents are managed by LiveAction and located in major points of presence around the world. These agents are shared among LiveAction customers.

### Collection

As part of the measurement of the service, the agent collects various latency, load, connect, wait times for the web page, including its enclosed resources. These measurement results are sent to the controller. The process is repeated at the next interval.

Agents are designed to perform continuous measurements. A supervisory function is embedded in every agent. The agent's principle responsibility is to monitor the application performance local to its environment

## User Experience Overview

### Summary Dashboard of Web Services

**Performance:** – Get a view of your website's performance and availability and know if there are any problems with your applications.

**Network Data Integration:** User Experience integrates with LiveNX. For the “managed” part of your network, you can drill down to retrieve NetFlow, QoS and interface related metrics.

**Baselining:** LiveAction collects metrics over time and learns the normal behavior of the website performance including network latency, DNS latency and response times.

**Alerting:** Alerts are based on rules such as availability, network latency, DNS latency and response time's threshold crossing alerts of tests.

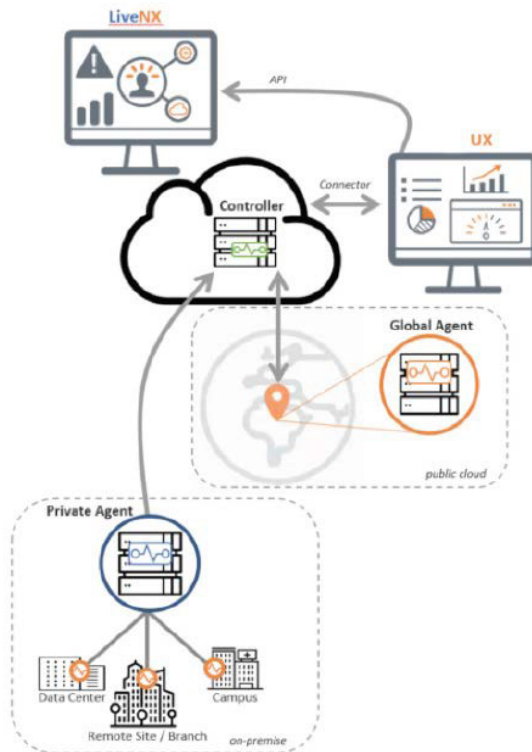
**Path Analysis:** Private and Global agents perform traceroute tests to analyze the performance and latency of each hop. You can discover the domain names of the hops in the communication path along with the detailed response time analysis of each hop.

**Time Series Report:** A historical view and a near real-time detailed breakdown of each test. You can select any time range or location to compare and go as far back as you want.

**Distribution Report:** Histograms show the distribution of the data giving you a sense of whether performance is an issue. You can compare your test results among multiple agents and services. You can select any time range and go as far back as you want.

**Waterfall Chart:** With a browser embedded into the agent, User Experience can provide performance data of each resource of your website for insight into the user experience of your website.

## User Experience Integrations and Component Architecture



### LiveNX

User Experience integrates as a software modules directly with LiveNX, the LiveAction network performance and analytics platform. Using User Experience with LiveNX, enterprises gain real-time and continuous insight into application and user level activity.

- Integrated LiveNX and User Experience dashboard for instant visibility of site health, network devices, application usage and application performance.
- Quickly identify the sites that are experiencing performance degradation and the applications impacted.
- From the site, drill down to examine network conditions including bandwidth utilization, link errors, QoS metrics and applications that are competing for the bandwidth.

### LiveNX Monitor of Monitors

LiveNX Monitor of Monitor provides a single-pane-of-glass for server settings, system health, sites and configuration aggregating multiple geographical or organizationally segmented LiveNX domains. Through an aggregation layer, each LiveNX server domain instance injects relevant data for summary dashboard views and management by way of a north bound REST API.

### LiveSensor Integration (optional purchasable module)

NetFlow generation to provide application visibility and application recognition in the absence of flow-exporting devices.

- Software-based packet analysis
- Deep Packet Inspection
- Application layer visibility (e.g. Skype, BitTorrent, Citrix)
- Supports multi-vendor environments

### Deployment Models:

- Single Server/Node deployed as single system
- Multi -Server with nodes deployed anywhere there is IP connectivity

## User Experience System Requirements

### Deployment Options

User Experience components can be deployed :

Component	On-premise Private Agents	Public cloud Global Agents
Image type	OVA	AMI
Monitor of Monitors	LiveNX MoM OVA	LiveNX MoM AMI
Platform	LiveNX Server & Platform OVA	LiveNX Server & Platform AMI
Server	All-in-one	All-in-one
LiveNX Node	LiveNX OVA	LiveNX AMI
LiveNX Analytics Node	LiveNX Analytics OVA	LiveNX Analytics AMI
Endpoint Agent	Endpoint Agent OVA	Endpoint Agent AMI
LiveSensor	LiveSensor OVA	LiveSensor AMI

### Server/Node

- Windows 64-bit Operating System – Server 2008 or 2012 R2, Windows 7 (Professional or Ultimate) with .NET framework v3.5.1+
- Linux RHEL 7.1 or 7.2 /CENTOS 6.7 or 6.8 with GNOME UI installed
- For less than 100 devices or less than 100K flows/sec:
  - 8 Core 2+ GHz CPU
  - 8 GB RAM
  - 2-6 TB 7,200 RPM HD1
- For 100-500 devices or less than 200K flows/sec
  - 12 Core, 2+ GHz CPU
  - 16 GB RAM
  - 3-10 TB 7,200 RPM HD1
- For 500-1,000 devices
  - 2x12 Core, 2+GHz CPU
  - 16 GB RAM
  - 5-10 TB, 7,200+ RPM HD1

- Virtual Machine
  - Adequate core and storage allocation
  - Store: local store preferred, virtual thick disk setting
  - VMware ESXi 5.1 or later, recommended for production environments
    - vMotion Supported
  - Compatible with most VM systems
    - VMware products, Oracle VirtualBox, Microsoft Hyper-V 6.0+, Citrix Xen

<sup>1</sup>Disk usage depends on network traffic pattern. For higher performance use RAID 10 or RAID 0 if redundancy is not required.

### All-in-One Server & Platform OVA, Node OVA

- Custom—Less than 25 devices or less than 25k flows/sec; targeted at small laptop deployments or starter platform (size not available for Node OVA)
  - 2 vCPU Xeon or i7
  - 4 GB RAM
  - 250 GB data disk
- Small—Less than 100 devices or less than 100k flows/sec
  - 8 vCPU Xeon or i7
  - 16 GB RAM
  - 4 TB data disk
- Medium—100 to 500 devices or less than 200k flows/sec
  - 16 vCPU Xeon or i7
  - 32 GB RAM
  - 6 TB data disk
- Large—500 to 1,000 devices or greater than 200k flows/sec
  - 32 vCPU Xeon or i7
  - 32 GB RAM
  - 8 TB data disk

### LiveSensor OVA (Optional)

- Monitor 1Gbps
- Virtual Hardware
  - 4 vCPU
  - 8GB of RAM
  - 50GB Disk
- Virtual Platform
  - VMware ESXi v5.0+
  - VMware Hardware Version 8 (vmx-8)
- Network Hardware
  - At least 2 Physical NICS on ESXi
    - Support up to 10Gbps

**NOTE:** Virtual NICs on OVA are utilizing VMXNET

## LiveNX 7.0 Network Device Support

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### LiveNX Flow

LiveNX Flow provides advanced end-to-end system level flow visualizations for multi-vendor networks. The following devices have gone through flow-analysis testing with LiveNX.

- Adtran NetVanta Series Routers
- Alcatel-Lucent Routers
- Brocade Series Routers
- Cisco Series Routers (ISR Series, CRS-1, ASR 1000 & ASR 9000 Series Routers)
- Cisco Catalyst Switches
- Cisco Nexus Switches (Nexus 3000, 7000 & 9000 Series)
- Cisco ASA 5500 Series Firewalls
- Cisco AnyConnect Network Visibility Module on Windows and Mac OS X Platforms
- Cisco Meraki MX Security Applicant
- Cisco NetFlow Generation Appliance
- Extreme Network Switches
- F5 BIG-IP Application Delivery Controller Platforms
- Gigamon GigaSMART Hewlett-Packard
- Enterprise Procurve Series Switches
- Ixia's Network Visibility Solution
- Juniper MX Series Routers
- nTop nProbe
- Palo Alto Networks Firewalls
- Riverbed SteelHead WAN Optimization Controllers
- Silver Peak WAN Optimization Controllers
- Viptela vEdge Routers
- Ziften ZFlow

### LiveNX QoS Configure

LiveNX QoS Configure provides for configuring and troubleshooting Quality of Service for Cisco routers and switches.

- Cisco Series Routers: 800, 1700, 1800, 1900, 2600, 2600XM, 2800, 2900, 3600, 3700, 3800, 3900, 4300, 4400, 7200, 7600, ASR1000, CSR 1000V

Recommend IOS versions 12.3 or higher or 15.0 or higher for use with the software (IOS XE 2.6.0 or higher for ASR 1000 series). Earlier IOS versions may also work but are not officially supported. General-release IOS versions are recommended, although early- and limited-release versions will also work with LiveNX.

- Cisco Catalyst Series Switches: 3850 & 4500-X

Limited LiveNX QoS Monitor support on Layer 3-routable interfaces and VLANs depending upon Cisco hardware capabilities.

- Cisco Nexus Series Switches: 7000 Series are partially supported

### LiveNX QoS Monitor

LiveNX QoS Monitor provides quality of service monitoring and troubleshooting for Cisco router and switches.

- Cisco Series Routers: 800, 1700, 1800, 1900, 2600, 2600XM, 2800, 2900, 3600, 3700, 3800, 3900, 4300, 4400, 7200, 7600, ASR1000, CSR 1000V
- Cisco ASR 9000

Recommend IOS versions 12.3 or higher or 15.0 or higher for use with the software (IOS XE 2.6.0 or higher for ASR 1000 series). Earlier IOS versions may also work but are not officially supported. General-release IOS versions are recommended, although early-and limited-release versions will also work with LiveNX.

- Cisco Catalyst Series Switches: 3650, 3850 & 4500-X

Limited LiveNX QoS Monitor support on Layer 3-routable interfaces and VLANs depending upon Cisco hardware capabilities.

- Cisco Nexus Series Switches: 7000

### LiveNX IP SLA

Cisco Series Routers: 800, 1700, 1800, 1900, 2600, 2600XM, 2800, 2900, 3600, 3700, 3800, 3900, 4300, 4400, 7200, 7600, ASR1000, CSR 1000V are supported.

### LiveNX LAN

Cisco Catalyst Series Switches: 2960, 2960-X, 3560, 3650, 3750, 3850, 4500, and 6500 are supported.

### LiveNX Routing

Cisco Series Routers: 800, 1700, 1800, 1900, 2600, 2600XM, 2800, 2900, 3600, 3700, 3800, 3900, 4300, 4400, 7200, 7600, ASR1000, CSR 1000V are supported.



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