LiveNX is an application-aware network performance management solution with QoS control, designed to simplify network management.

**Real-time, End-to-end Flow Visualizations Across the Network**

The interactive network topology displays a wide variety of network devices: routers, switches, wireless devices, firewalls, WAN Optimization Controllers, Network Packet Brokers, etc. Drill down to individual devices or interfaces for more detailed analysis. Clicking on a flow highlights its entire path hop-by-hop. Additionally, examine historical views to analyze flows at any date and time in the past with the Flow DVR feature.

**Application Performance and Troubleshooting**

Gain a deep understanding of application traffic with full visibility of protocol and application type including video, voice, instant messaging, file-transfer, etc. Identify how the network is being used and how applications are performing.

**Intuitive Graphical Interface for QoS Control**

Create, edit and apply QoS policies for Cisco routers and Layer 3 switches on live networks consistently and confidently. QoS wizard and built-in templates are available to apply policies based on Cisco best practices or use the QoS GUI editor to build custom policies. LiveNX generates a QoS audit report to show QoS policies in detail including configuration settings, performance issues, drops, and policy errors.

**Software-Defined WAN Management**

Application and path visualizations to effectively validate WAN Return-on-Investment (ROI) for traditional MPLS, hybrid, or software-defined WAN (SD-WAN). When a network element makes a path change to protect the applications due to an Out-Of-Policy (OOP) condition, LiveNX renders the end-to-end path changes graphically. Visualize the path from the branch-office, through the service provider(s) to the data center where the applications reside, for meaningful and actionable information.

**Capacity Planning Simplified**

Identify the most heavily used resources such as bandwidth, CPU utilization and memory usage. Drill down views provide details such as interface statistics and errors. Additionally, pivot to other reports to view pertinent data like top applications and top conversations to identify heavy bandwidth usage to align bandwidth consumption with business policies.

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**What's New in LiveNX 5.3.1**

**LiveSensor Integration**

LiveSensor is an optional component for packet capture and NetFlow generation to provide application visibility and application recognition in the absence of flow-exporting devices.

**Updates to WebUI**

Continued improvements in LiveNX Web UI provide new features in reporting, dashboards, and topology views. Additional updates to stories make it even easier to get more done faster.
• Dashboards with real-time data indicate current network health
  • Network-wide and site-based Dashboards
  • Application Dashboard provides instant application performance visibility
  • Customized Dashboards

• Alerts to monitor real-time and threshold conditions around the clock. Alerts can be sent via e-mail for remote notification.

• Reporting of real-time and historical data to see trends over a quarter or a year. Includes the ability to share, customize, schedule, and export in CSV and PDF format.

• Topology maps (both geographical and logical) provide visual representation of your site(s) and health maps of network devices, from a single physical device to multi-layer topological information on connections, interfaces, traffic, and routes. Color cues and graphic images indicate status and alarms of network elements.

• Search and Filter across real-time and historical data to investigate relevant information across hundreds of reports and millions of flows.

• Stories with Built-in Best Practices for guided Workflows to simplify network management tasks such as capacity planning and device inventories.

• Network Discovery to automate device discovery via an IP address range, a list of individual IP addresses, a seed device, or imported lists

• Access Control & Single Sign-On provide role-based access control and user authentication with LDAP directory and single sign-on integration
  • Administrator Role controls all aspects of LiveNX
  • Full Configuration Role allows configuration and monitoring control.
  • Monitor Only Role can view allowed devices in reports, dashboard, topology, alerts, search and device

• API (REStful) for developing your applications or create your own reports. OAuth2 protocol for authentication with built-in Swagger-based interactive documentation.


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LiveNX Software Versions

<table>
<thead>
<tr>
<th>LiveNX Enterprise</th>
<th>LiveNX WAN</th>
<th>LiveNX Professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Multi-server, Multi-user with unlimited historical</td>
<td>• Multi-server, Multi-user with 14-day historical (Flow, QoS Monitor, and QoS Configure)</td>
<td>• Single Server, Single User with 5-day historical</td>
</tr>
<tr>
<td>• Ideal for organizations with more than one network administrator or engineers</td>
<td>• Ideal for organizations with the need for Flow Monitoring, QoS Monitor and Control (no IP SLA and LAN)</td>
<td>• Ideal for a small organization with network operations &amp; up to 200 devices</td>
</tr>
<tr>
<td>• Full-feature functionality</td>
<td>• 14-day historical data storage</td>
<td></td>
</tr>
</tbody>
</table>

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Licensing Options

<table>
<thead>
<tr>
<th>Subscription License Model</th>
<th>Perpetual License Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offered as 1yr, 3yr, or 5yr Term</td>
<td>Offered with 1, 3 or 5yr Maintenance &amp; Support Term</td>
</tr>
</tbody>
</table>

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1. Tabbed views for QoS, Flow, Routing, LAN, or IP SLA. Each tab provides a different overlay and user options specific to the selected view.

2. Search quickly to find specific information with an easy keyword search approach across hundreds of reports and millions of flows.

3. Devices and interfaces in a hierarchical view.

4. Status indicators for CPU, memory, flow buffers, alerts and more. Alerts can also be sent via e-mail for remote notification.

5. Network devices (large circles), interfaces (small circles), interconnections, flows, interface bandwidth, congestion, and more. Click on a device, interface, or flow for more details. Click and drag to rearrange or resize items for even better visibility. Devices can also be logically grouped or auto-collapsed to streamline management of larger networks.

6. Curved lines indicate traffic flows.

7. Interfaces
   Top half indicates ingress. Lower half indicates egress. Numbers indicate bandwidth:
   • Green=active
   • Dark green=QoS policy applied
   • Amber=congested
   • Gray=down

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LiveNX 5.3.1 Key Capabilities
Flow Visualization for Network Troubleshooting
Visualize trouble spots on the network for a better understanding of traffic patterns.

- Application and Flow path analysis
- Multivendor Support – NetFlow v5/v9, IPFIX, sFlow and JFlow
- Jitter, delay, packet loss metrics for voice and video
- Application Response times, Round Trip Time, server delay and client delay metrics
- NetFlow Secure Event Logging (NSEL)
- Wireless information including user identity
- Firewall High Speed Logging
- End system (device type, OS) and end user information
- Integration with Network Packet Brokers
- Flow DVR for playback of historical data
- Built-in Domain Name System (DNS) name resolution
- Topology export to Visio

Software Defined WAN Monitoring
GUI-based management for SD-WAN monitoring for path control and application performance optimization

- Path control visualization
- SD-WAN dashboard and trending
- PFRv3 multiple Data Center support
- Shows what Out-of-Policy reason triggers path change(s)
- Reports on traffic class/application associated with path change(s)

Cisco IWAN Support

- PFR configuration of multiple Master Controllers
- Automatically learn semantic settings for PFRv3 monitoring to simplify monitoring setup
- PFRv3 multiple Data Center support

QoS Monitoring
Track QoS performance on a per-class basis. Monitoring and alerting of priority queue drops provides proactive notification of potential voice quality issues.

- NBAR2 application visualization
- Custom NBAR definitions
- Pre and post-QoS graphs
- Detailed graphical display of interface & CBQoS statistics
- 95th / 99th percentile, quarterly, yearly and collated reports

LiveNX 5.3.1 Integrations and Component Architecture

LiveSensor Integration
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 multivendor environments

LiveUX Integration
LiveUX monitors end user experience of web applications. By combining the end user experience metrics with the network performance monitoring information, you can quickly triage performance issues.

- Integrated LiveNX and LiveUX dashboard for instant visibility of the 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 5.3.1 System Requirements

Deployment Options

LiveNX 5.3.1 components can be deployed via two options:

<table>
<thead>
<tr>
<th>Component</th>
<th>Installer Option</th>
<th>Virtual Appliance Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client</td>
<td>MacOS, Win 32/64</td>
<td>Installer: MacOS, Win 32/64</td>
</tr>
<tr>
<td>Server</td>
<td>Win64/Linux</td>
<td>All-in-one</td>
</tr>
<tr>
<td>Platform</td>
<td>All-in-one</td>
<td>Server &amp; Platform OVA</td>
</tr>
<tr>
<td>Node</td>
<td>Win64/Linux</td>
<td>Node OVA</td>
</tr>
<tr>
<td>LiveSensor</td>
<td>LiveSensor OVA</td>
<td>LiveSensor OVA</td>
</tr>
</tbody>
</table>

**Client**
- Windows 7, 8, 10 or Mac OS X 64 bit OS
- 4 Cores
- 8 GB RAM
- Web browser: IE (> Version 8), Firefox, Chrome and Safari

**Server/Node Installer**
- Windows 64-bit OS - Server 2008 or 2012 R2, Windows 7 (Professional or Ultimate) with .NET framework v3.5.1+
- Linux RHEL 7.1 or 7.2 /CENTOS 6.74 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, vmotion supported
  - 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

1 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**
- Tiny-server—Less than 25 devices or less than 25k flows/sec; targeted at small laptop deployments (Size not available for Node OVA)
  - 2 vCPU Xeon or i7
  - 4 GB RAM
  - 250 GB data disk
- Small-server—Less than 100 devices or less than 100k flows/sec
  - 8 vCPU Xeon or i7
  - 16 GB RAM
  - 4 TB data disk
- Medium-server—100 to 500 devices or less than 200k flows/sec
  - 16 vCPU Xeon or i7
  - 32 GB RAM
  - 6 TB data disk
- Large-server—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**
- Virtual Hardware
  - 4 vCPU
  - 8GB of RAM
  - 50GB Disk
- Virtual Platform
  - VMware ESXi 5.0.5+
  - 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 VMXNET3

LiveNX 5.3.1 Network Device Support

**LiveNX Flow**
LiveNX Flow provides advanced end-to-end system level flow visualizations for multivendor 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 NetFlow Generation Appliance
- Extreme Network Switches
- Gigamon GigasMART
- Hewlett-Packard Enterprise
- Procurew 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

**LiveNX QoS Configure**
LiveNX QoS Configure is a software application 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-routing 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-routing 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, 3650, 3850, 3570, 3750, 3580, 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.