



Application Performance Insight Requires Deep, End-to-End Network Insight

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Executive Summary

This eBook explores how enterprise network operations teams can optimize application performance by implementing a network analytics solution with deep, end-to-end visibility into the network. Such a solution can complement and enhance application performance management solutions that primarily deliver narrow visibility into application infrastructure.

Today's economy is more technology-driven than ever before. Enterprises must embrace digital transformation to innovate rapidly. This transformation is about the digitization of business models, and digital business models are driven by applications.

Digital transformation is about enabling a business with applications

These applications will enable and support:

- Business processes
- Transactions
- Service delivery
- Collaboration



Application performance optimization is critical to digital businesses

When applications are the business, suboptimal application performance is an existential threat.

- Business processes freeze
- Revenue-generating transactions fail
- Users reject or abandon critical applications
- Employee productivity erodes
- Customer satisfaction and retention suffer

The Network Determines Application Performance

All application transactions traverse the network, and network health and performance can influence application performance in multiple ways.

1. Network infrastructure health can affect application connectivity and performance
2. Network traffic patterns can introduce inefficiencies that add latency to applications
3. Network traffic volume creates bottlenecks, packet drops, and jitter that degrade applications



Network operations teams must focus on application performance

Thirty-three percent of enterprises say application performance optimization drives their network monitoring and management strategies,¹ according to industry analysts. These analysts also found that improved end-user experience is the number-one benefit achieved via a successful network operations team.

33% of enterprises say application performance optimization drives their network monitoring and management strategies, according to industry analysts.

Thus, network managers must have solutions that give them application intelligence. This is especially important for digital enterprises in which coordinated, cross-silo operations are best practice. Pockets of visibility are unacceptable. An NPM solution with application intelligence allows network operations to understand how the network affects application performance.

Industry analysts have found that network operations teams are increasingly seeking monitoring solutions that enable cross-silo collaboration.² With an understanding of the interplay between network performance and application performance, network managers collaborate with the application team to solve problems together. This eliminates silos between network operations and application operations.

¹ Enterprise Management Associates, "Network Management Megatrends 2018: Exploring NetSecOps Convergences, Automation, and Cloud Networking," April 2018.

² Enterprise Management Associates, "Network Management Megatrends 2018: Exploring NetSecOps Convergences, Automation, and Cloud Networking," April 2018.

The NetOps Team Must Evolve Toolsets for Application Performance Optimization

Network managers need to modernize their tools because outdated methods for monitoring and optimizing application performance are insufficient for digital enterprises.

Legacy approaches to managing application performance with network tools aren't enough

For years, network managers have used legacy tools to measure packet loss, latency, and jitter for application flows. These statistics reveal symptoms of a problem, but not their nature. The network operations team must manually correlate this information with other network-layer monitoring tools. This method is unsustainable, given that a shortage of skilled personnel is the number-one challenge to network operations.³

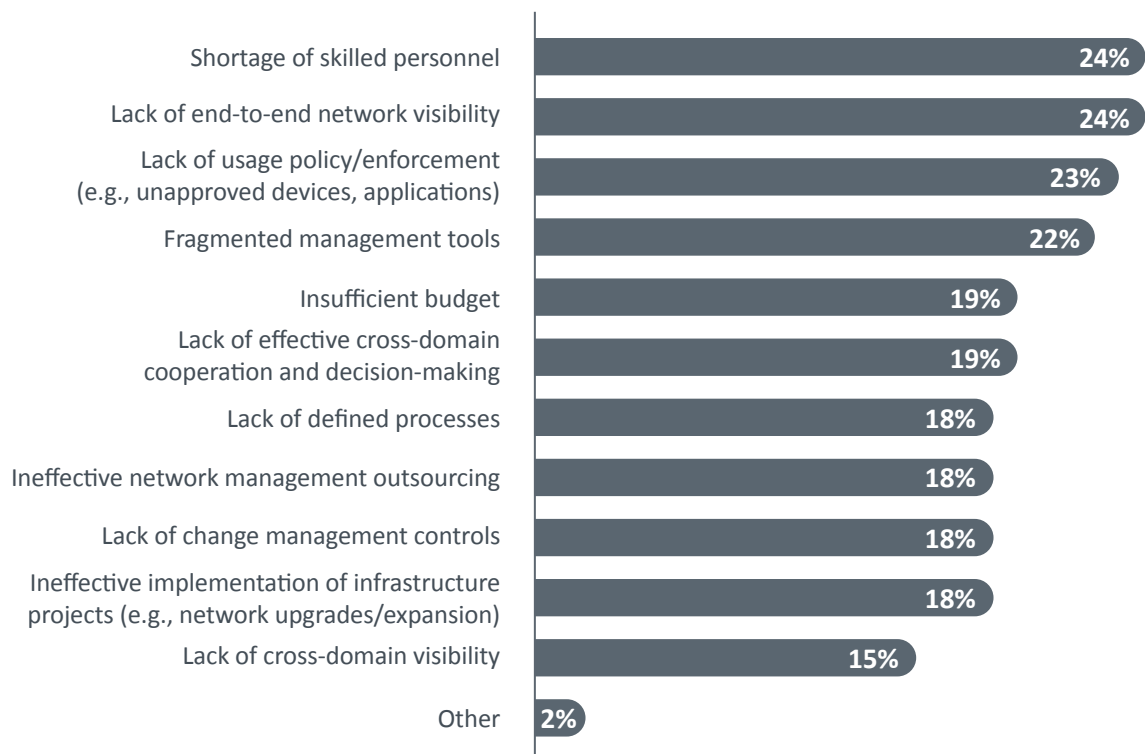


Figure 1. What are the greatest challenges to success for network operations in your organization?

To answer questions that network management tools can't answer, network operations teams ask the application operations team to provide context with their code-level APM tools.

This entire process is inefficient and relies on network engineers to do the heavy lifting.

³ Enterprise Management Associates, "Network Management Megatrends 2018: Exploring NetSecOps Convergences, Automation, and Cloud Networking," April 2018.

Network managers need a network operations solution that takes a top-down approach to application performance

A network analytics solution must combine application context with network infrastructure metrics and traffic. With this context, network managers can manage performance from the top down. Any changes made to the network to optimize application performance must also be done through NPM solutions within an application context.

As one Managing Director of Infrastructure at a large financial service companies put it:

A network analytics solution

must combine application context with network infrastructure metrics and traffic.

“My mindset is, I don’t manage the network. I manage the applications that run on it. I need to look down the stack into the network itself. We take a top-down approach, rather than a bottom-up approach. When I have a network with 4,000 ports down, I don’t care about [those ports] unless there is [application] traffic running on them.”⁴



Managing Director of Infrastructure
Large North American financial company

⁴ Enterprise Management Associates, “Network Performance Management for Today’s Digital Enterprise,” May 2019.



Application performance management tools offer limited visibility to some silos

DevOps and application operations teams have their own tools for managing application performance.

Code-level application performance management solutions monitor the components of an application for key performance indicators

These tools do not provide a full picture of application performance. They reveal the performance of application components and computing systems. They do not provide visibility into a network that moves application traffic.

Selecting the Right NetOps Solutions for Application Performance Optimization

A NetOps team needs a solution that performs three basic functions

- Application visibility
- Application performance assessment
- Network optimization

Application visibility

Network traffic data holds the key to application visibility. Network managers should look for NPM solutions that can analyze data from the latest generation of network flow record technology, such as IPFIX and NetFlow v9. These technologies support flow record extensions that carry application metadata, such as network-based application recognition (NBAR) and application visibility and control (AVC). This data allows a flow monitoring solution to map and analyze global traffic flows within an application context.

Network traffic data

holds the key to application visibility.

Packets also provide application visibility, and application-specific packet metadata can also support this first step. However, packets become more relevant in the next step.

The key is to find ways to collect this data across a network to gain end-to-end visibility into application traffic. This visibility should extend from the data center to a corporate LAN and WAN. It should also include visibility into the public cloud. This total visibility also be essential to the other key pillars below.

Application performance assessment

Application performance assessment requires deep insight into multiple classes of network data. Network flows with IPFIX/NetFlow v9 extensions are helpful to application performance assessment because they can carry reports specific to application performance, depending on the extension fields supported by network infrastructure vendors.

IPSLA and agent-based synthetic monitoring solutions can test the health and performance of the paths that application traffic traverses.

Deep packet inspection (DPI) can provide Layer 4-7 insight into application traffic, providing the ultimate truth about what's happening on the network. It supports the deepest analysis of application performance. Some infrastructure vendors can embed DPI metadata in extensible flow records.

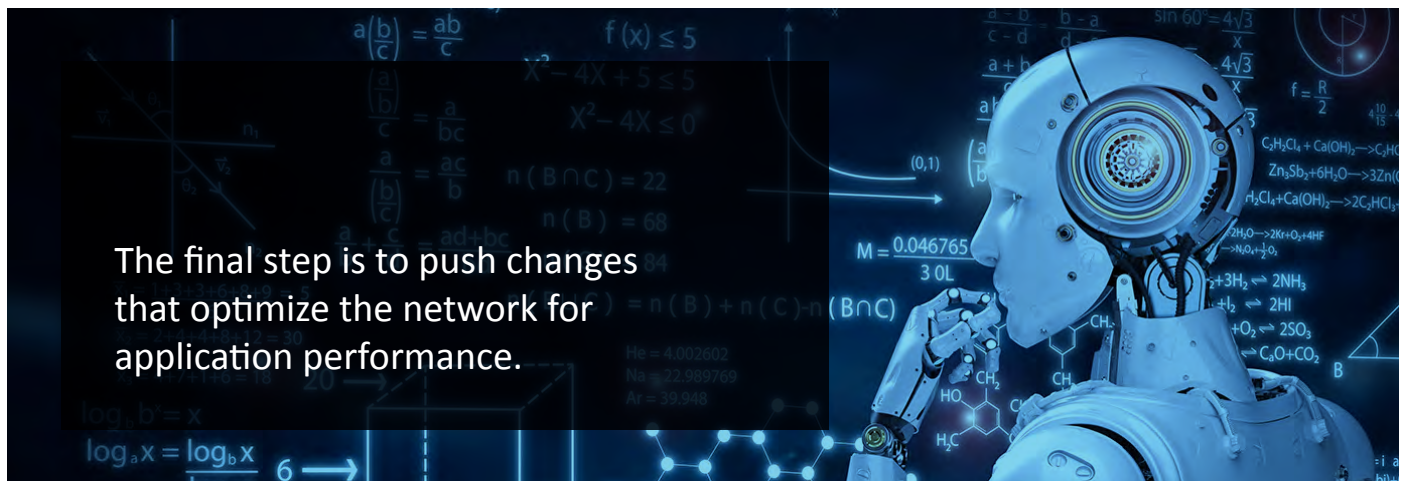
The key requirement here is a network analytics platform that can correlate and analyze this disparate data with application performance. Industry analysts have found that network performance management solutions that can correlate multiple classes of network data are extremely valuable. In fact, 93% of enterprises say this correlation enhances their visibility into network performance.⁵

⁵ Enterprise Management Associates, "Network Performance Management for Today's Digital Enterprise," May 2019.

Network optimization

AIOps-driven technology can connect insights with recommended actions. Machine learning, big data, and predictive analytics technology can reveal how the network is impacting application performance and how changes can resolve potential problems. Automated capacity management is one of the most popular use cases for AIOps-driven NPM technology, according to industry analysts.⁶ It can highlight capacity issues that will impact application performance and recommend changes to the network to avoid trouble.

These NPM solutions should have the ability to reconfigure the network. They can leverage SNMP or integrate with a network element management system to adjust quality of service (QoS) settings. They can integrate with an SD-WAN platform to adjust policies and QoS settings.



The final step is to push changes that optimize the network for application performance.

Your Application Performance Optimization Mission

As a network operations professional, you must recognize that your company will ultimately become a digital business, if it isn't one already. This is empowering. The network is a strategic platform for delivering the applications that power digital enterprises.

You must recognize that your company will ultimately become a **digital business.**

With application performance now paramount, legacy approaches to network operations no longer support your mission. You cannot optimize application performance simply by tracking packet loss, latency, and jitter, and application teams cannot rely on their application performance management tools alone. The network team must empower itself with deep application intelligence to support digitization.

Enterprises need an end-to-end network analytics platform that provides application visibility, assesses application performance across the network, and facilitates optimization of the network for maximum application performance. Let this eBook serve as your guide.

⁶ Enterprise Management Associates, "Network Management Megatrends 2018: Exploring NetSecOps Convergences, Automation, and Cloud Networking," April 2018.

About LiveAction

LiveAction provides end-to-end visibility of network and application performance from a single pane of glass. This gives enterprises confidence that the network is meeting business objectives, offers IT administrators full visibility for better decision making, and reduces the overall cost of operations. By unifying and simplifying the collection, correlation and presentation of application and network data, LiveAction empowers network professionals to proactively and quickly identify, troubleshoot and resolve issues across increasingly large and complex networks. To learn more and see how LiveAction delivers unmatched network visibility, visit www.liveaction.com.