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IT & DATA MANAGEMENT RESEARCH,
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# Network Observability:

## *Managing Performance Across Hybrid Networks*

**January 2025 EMA Research Summary Report**

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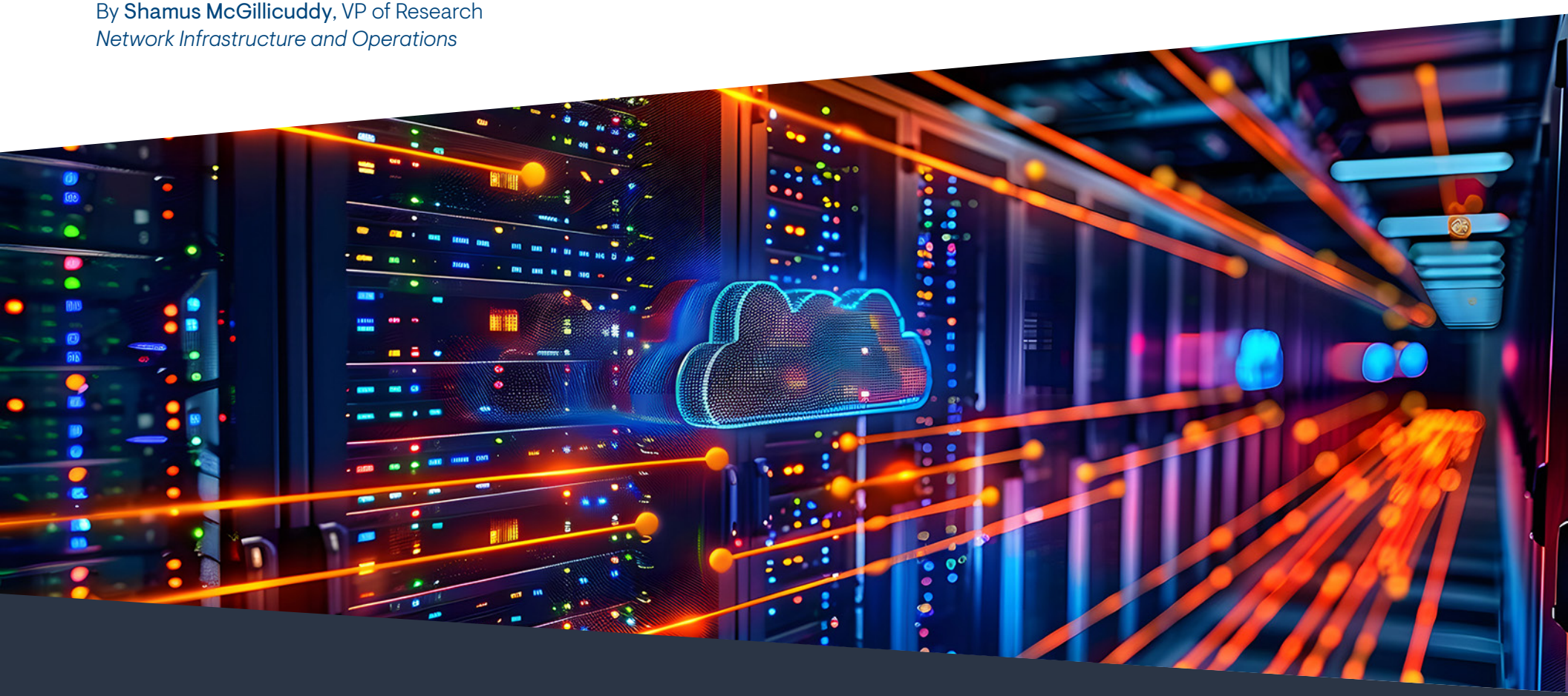
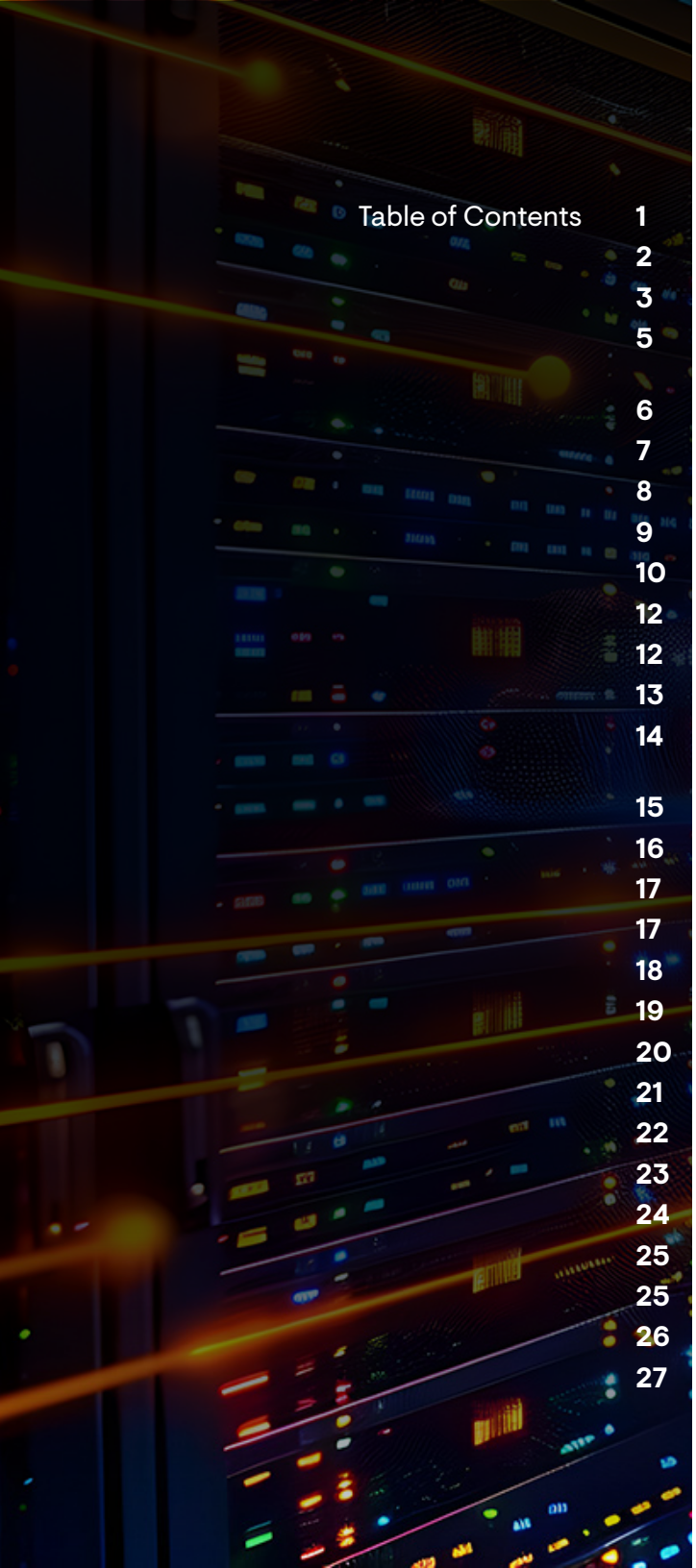




## Table of Contents

# Introduction

Performance and availability are essential missions of any enterprise network infrastructure and operations teams. To succeed in these missions, network teams need tools that can monitor, troubleshoot, and optimize networks by collecting and analyzing a variety of network data. Historically, Enterprise Management Associates (EMA) described such tools as network monitoring or network performance management solutions. Over the last four years, tool vendors have embraced a newer marketing term: network observability.

EMA has been tracking this market for decades. More recently, our research sought to define the novel term network observability more concretely for buyers. In 2022, we published the market **research report** "Network Observability: Delivering Actionable Insights to Network Operations." This report identified how buyers perceived the concept of network observability and explored product requirements and tool challenges. In 2024, EMA published a **buyer's guide**, the "EMA Radar Report for Network Operations Observability," which evaluated the capabilities of fourteen leading vendors.

This summary of new research updates and expands on EMA's exploration of network observability. It aims to identify how an IT organization can best select a toolset for managing the performance, availability, capacity, cost, and compliance of an enterprise network. For this research, EMA surveyed 351 IT decision-makers and conducted in-depth interviews with several network engineers and architects who are experts on their company's network observability tools. EMA conducted the survey and research interviews in November and December of 2024.

# Demographics

**Figure 1** reveals the demographic details of the 351 people EMA surveyed for this research. To qualify, survey participants had to have experience with evaluating, implementing, and/or using the tools that his or her organization uses to monitor and troubleshoot networks. Alternatively, they had to be managers of individuals or teams who had such experience.

The chart shows a broad mix of perspectives in terms of job seniority, IT groups, company size, and industry, as well as a transatlantic perspective, with respondents from the United States, the United Kingdom, France, and Germany.

**Figure 1. Demographics**

## Job titles

- **13.4%** Network engineers/architects/analysts
- **10%** IT project/program managers
- **52.2%** IT managers/supervisors/directors
- **24.5%** IT executives (VPs/CIOs/CTOs)

## Company size (employees)

- **23.1%** Midsized (1,000 to 2,499)
- **59.2%** Enterprise (2,500 to 9,999)
- **17.7%** Large enterprise (10,000+)

## Region

- **66.7%** United States
- **33.3%** Europe (UK/France/Germany)

## Top industries

- **22.5%** Manufacturing
- **20.5%** Banking/Finance/Insurance
- **11.4%** Retail
- **8.5%** Health care
- **5.4%** Higher education
- **5.1%** Professional services (not related to IT)

## Functional groups/departments

- **30.2%** Network/IT operations
- **20.5%** IT executive suite
- **16.2%** IT project/program management
- **15.7%** Network engineering
- **8.8%** IT asset and financial management/ IT business analysis
- **4.6%** Cloud/DevOps
- **4.0%** IT architecture

# Key Findings

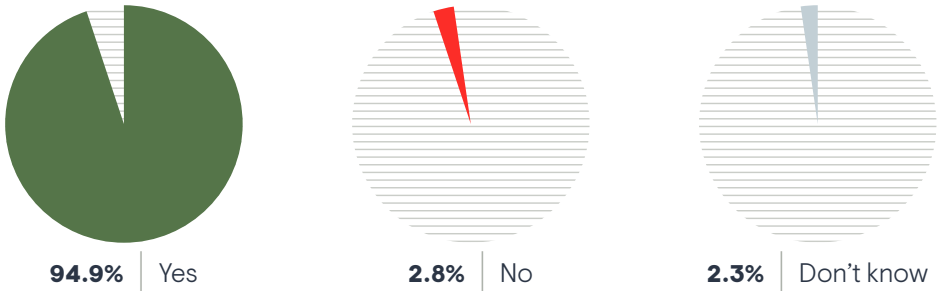
- Network observability is emerging as the preferred term for describing network monitoring and troubleshooting solutions
- Only 43% of enterprises are completely successful with these tools
- The top four complaints that IT organizations have about their network observability tools are:
  1. Limited scope ("I can't monitor everything I need to monitor")
  2. Too expensive
  3. Lack of customizability
  4. Difficult to implement/maintain
- 87% of enterprises use multiple network observability tools, and they strive to integrate and consolidate these tools as much as possible
- Nearly 59% of organizations are likely to replace their incumbent network observability tools over the next two years
- The volume and diversity of data that network teams collect with these tools are increasing
- Tools must be able to observe complex environments. Most organizations believe their tools must provide:
  - Observability of multi-vendor networks
  - End-to-end visibility and insights across multiple network domains (e.g., wide-area, local-area, cloud, etc.)
  - Observability of unmanaged networks (i.e., networks to which the IT organization does not have administrative access and control)
  - Observability of network experience of individual users, not just networks
- Tools must leverage AI to optimize and automate network management. IT organizations expect AI will enable:
  - Operational efficiency
  - Proactive problem prevention
  - Network optimization

# The Concept of Network Observability: More than Monitoring

Network observability emerged a few years ago as a term to describe the tools IT organizations use to monitor, troubleshoot, and optimize their networks. As a marketing buzzword, it is slowly displacing network monitoring and network performance management.

EMA's 2022 report on this topic investigated the disposition of IT professionals toward the concept of network observability. At that time, 90% of 400 respondents told us that they considered "network observability" to be a useful term to describe the tools they use to monitor and troubleshoot their networks. **Figure 2** reveals that today, that number has risen to 95%. IT executives were the most convinced of the term's utility.

**Figure 2. Do you believe "network observability" is a useful term for describing the tools you use to understand and manage the health and performance of your network?**

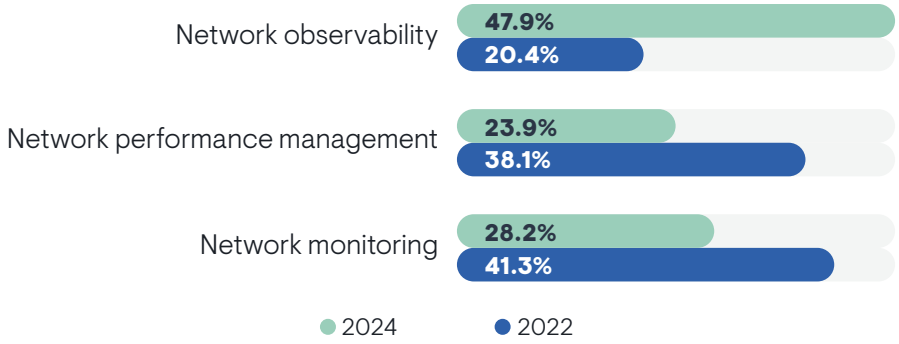



Sample Size = 351

# Network Observability is Mainstream

Not only is the concept of network observability seen as a useful term, it is also taking over as the preferred way to describe the tools network operations teams use. **Figure 3** reveals that in 2022, only 20% of IT professionals chose "network observability" as the preferred term for describing their tools. Today, nearly 48% of respondents prefer it.

**Figure 3. Which of the following terms do you prefer when describing the tools you use for monitoring and troubleshooting your network?**




Mindshare for network monitoring and network performance management has eroded significantly. Clearly, network observability is catching on with IT personnel. From a group perspective, cloud, network engineering, network operations, and IT architecture groups have all embraced network observability as the preferred terminology. Network performance management still resonates with the IT executive suite, the IT asset and financial management group, and project management.

> In 2022, only 20% of IT professionals chose "network observability" as the preferred term for describing their tools. Today, nearly 48% of respondents prefer it.

2024 Sample Size = 351 2022 samples size = 400

# Defining Observability for NetOps

We know that network observability is growing in popularity as a concept, but what does it mean? Observability entered the vernacular of the IT industry via DevOps, whose practitioners use observability to describe their monitoring tools. DevOps professionals describe observability as the comprehensive collection of metrics, logs, and traces for establishing a full understanding of the state of an application environment.

The data that can be extracted from networks is more diverse than what DevOps teams typically collect and analyze, ranging from metrics and logs to flows, packets, DNS queries, routing information, configuration data, and more. Also, the actual network environment is more complex, stretching across multiple domains such as data center networks, cloud networks, wide-area networks, campus/office networks, branch offices, and even remote workers' home offices. Forming an end-to-end understanding of network state is much more challenging.

Thus, the definition of network observability requires investigation. EMA asked research respondents to select words and phrases that they associate with the concept. **Figure 4** shows that five terms most resonate with them, suggesting the foundation of a standard definition. Network observability is a subset of network monitoring solutions that can comprehensively collect and visualize network data and present actionable insights. It is also about more than performance. More than half of respondents think network observability should also offer security insights.

Monitoring was selected less often by respondents who were more successful with their tools, emphasizing that network observability is about moving past monitoring and focusing on insights and advanced use cases. Monitoring resonated more with the IT executive suite, IT asset and financial management, and project management. It resonated less with the teams most responsible for network management, such as network engineering and operations personnel.

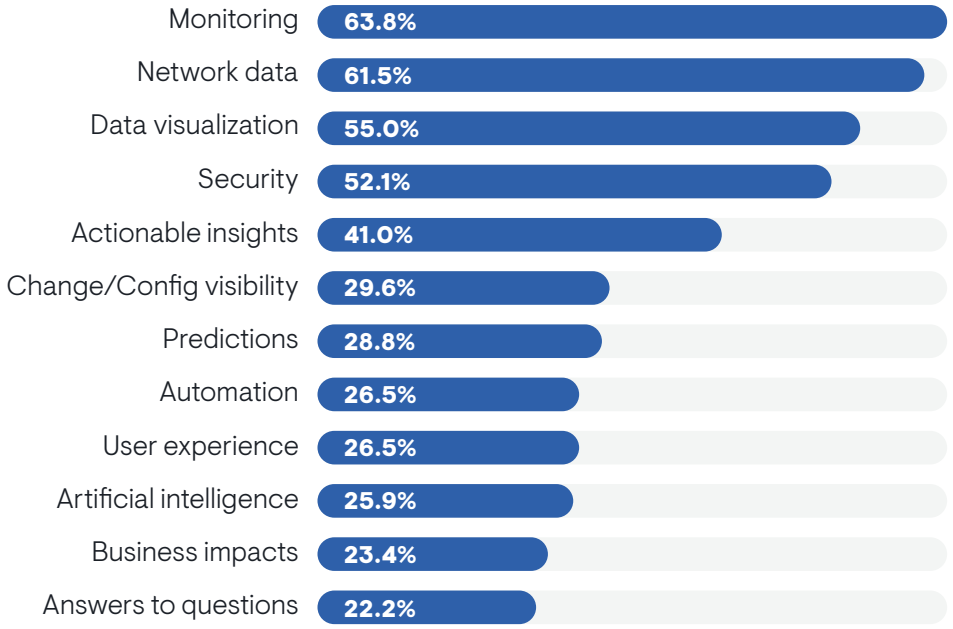
"I think monitoring is a very specific collection of certain data and metrics and identifying issues within that. It's a reactive approach to operations. As you expand, observability is a more holistic approach where you are collecting a lot more data and finding patterns of anomalous behavior," said a monitoring tool architect with a Fortune 500 media company. "It's more proactive, where you try to detect issues ahead of time."

"Network observability refers to your awareness and ability to have eyes on the network and how it's actually performing and functioning and being utilized," said an infrastructure manager with a Fortune 500 energy utility company.

"I would say it's the practice of gaining deep insight into performance and behaviors and health," said a network engineer with a health care company that operates more than 40 hospitals.

"Network observability means having that holistic view of the network, being able to see all your endpoints and nodes and what's going on with them," said a network management tool architect with a $30 billion bank.

**Figure 4. Which of the following words and phrases do you most associate with the concept of network observability?**

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# Tool Requirements

This section of the research explores the evolving requirements that IT organizations have for network observability solutions. It reviews architectural and functional needs, and it identifies next-generation capabilities that vendors should be emphasizing as they develop their products.

# Network Troubleshooting Features

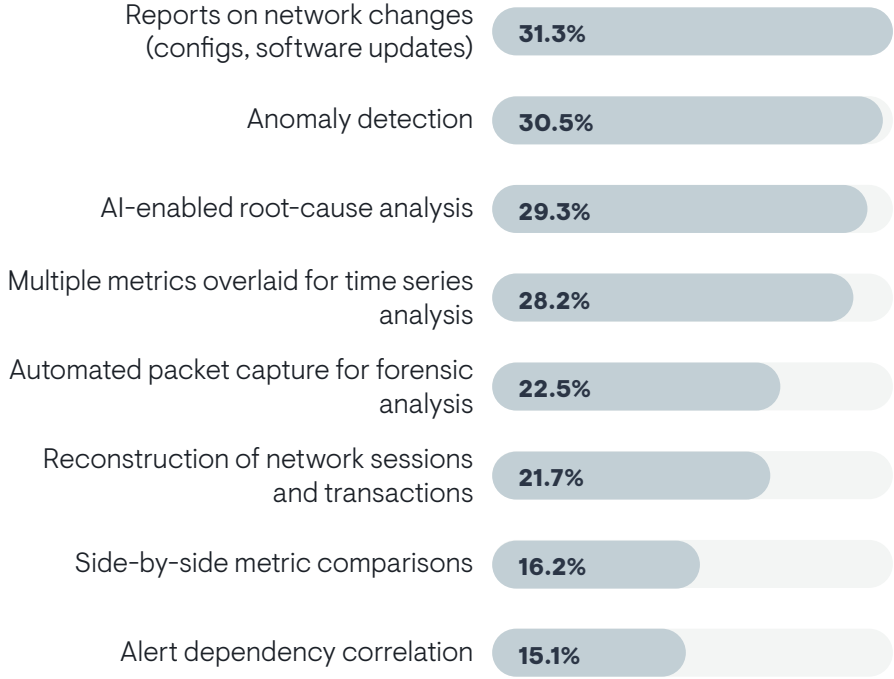
**Figure 5** explores what makes a network observability solution effective for troubleshooting. First, IT organizations need reporting on network changes, such as config changes or software updates. The next two capabilities are commonly enabled via artificial intelligence and machine learning (AI/ML) technology. EMA found that anomaly detection is one of the first features that network observability vendors deliver via AI/ML investment. Organizations that are less successful with network observability placed more emphasis on anomaly detection, suggesting its value is overblown. Also, members of the IT executive suite were more interested in it than network engineering personnel. Very large enterprises (10,000 or more employees) were especially focused on anomaly detection. Respondents who use open source network observability reported less interest than customers of commercial solutions in anomaly detection.

Automated root-cause analysis is not as widely available, but many vendors are developing capabilities in this area. Members of network engineering and network operations teams were less interested in it than the IT executive suite.

Multiple metrics overlaid for time series analysis is the fourth most valuable troubleshooting capability. It requires very little analytical capability and is more about presentation of data in dashboards and reports. It allows networking personnel to contextualize patterns in disparate types of network data in context with each other. A good example is plotting a config change on top of a change in latency and interface utilization to understand whether that config change is related to network performance.

"A good troubleshooting tool should be able to visualize data easily, and you should be able to add multiple metrics into an ad hoc dashboard so you can put things on a single graph," said a monitoring tool architect with a Fortune 500 media company. "It should also tell me if there are any active alerts on a device."

**Figure 5. What kinds of troubleshooting capabilities are most valuable in a network observability solution?**




Alert dependency correlation was the least valuable troubleshooting capability, but midsized enterprises (1,000 to 5,000 employees) were more likely to seek it.

"A good troubleshooting tool should be able to visualize data easily, and you should be able to add multiple metrics into an ad hoc dashboard so you can put things on a single graph," said a monitoring tool architect with a Fortune 500 media company.

Sample Size = 351

# Alert Management Features

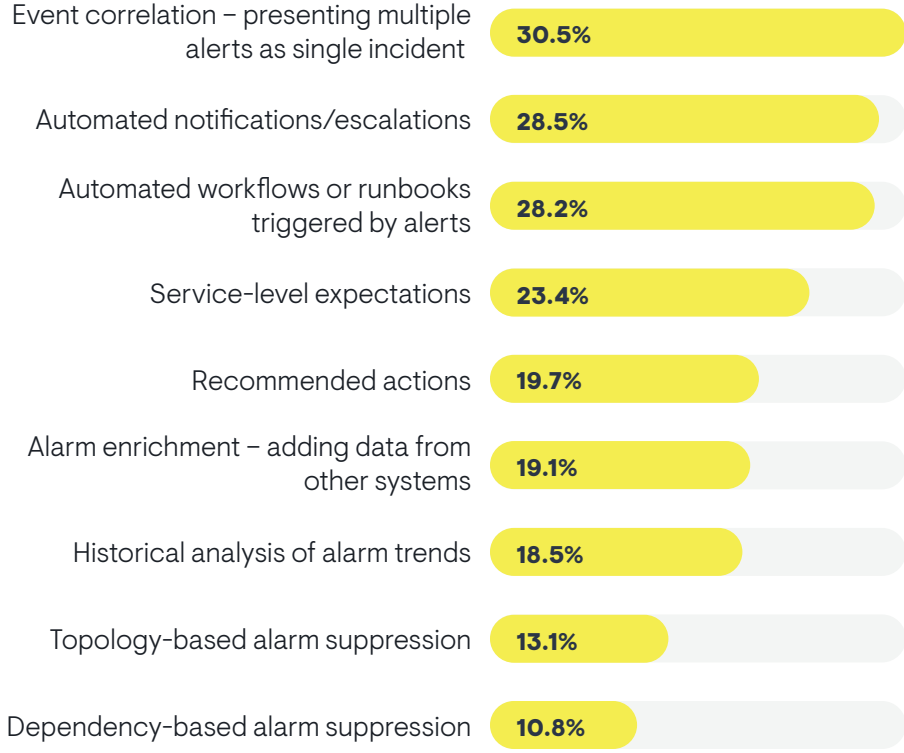
When EMA analysts speak to network engineering and operations personnel about their tools, they often cite alert management as a critical capability. Alerting is fundamental because alerts tell networking pros when something is going wrong, and they usually contain enough information to help them triage the issue. At the same time, network teams want to optimize alerting so that they don't get flooded with redundant or noncritical alerts that overwhelm their ability to prioritize and respond to events.

**Figure 6** identifies the alert management features that IT personnel consider most important in a network observability tool. The top requirement is an event correlation feature that presents multiple alerts as a single incident, which is critical to limiting the noise generated by a tool. IT middle managers were more likely than IT executives to see the value of this capability.

A network management tool architect with a Fortune 500 retailer said alert management features should leverage AI to make alerts more intelligent. AI can power things like event correlation and recommended actions (or whether an action is required at all). "Vendors should build an intelligence layer where you can easily configure different layers of filtration between action and ongoing monitoring," he said. "There should be intelligence where you can configure things so it will say, 'what does this alert mean?'"

IT teams are also seeking automated notifications and escalations, and they want workflows or runbooks that can trigger in response to alerts. Both features streamline how IT teams triage and respond to events. Respondents who reported less success with network observability tended to believe automated notifications and escalations were very important. It was also a higher priority for very large enterprises (10,000 or more employees). IT executives were more likely than middle managers to perceive the value of triggered runbooks and automated workflows.

**Figure 6. Which of the following alert management features are most important to have in a network observability tool?**




"I want a tool that can identify specific critical alarms, open a priority-one ticket, and notify specific groups who should respond to it," said an infrastructure manager with a Fortune 500 energy utility company. "Right now, we have administrators who are responsible for programming our tools to reduce white noise. Vendors should have the ability to do that for customers through smarter alerting."

Sample Size = 351

> "I want a tool that can identify specific critical alarms, open a priority-one ticket, and notify specific groups who should respond to it," said an infrastructure manager with a Fortune 500 energy utility company.

Service-level expectations are also quite valuable. This feature allows IT personnel to apply expectations for overall service performance to alerting, which provides a granular and more nuanced approach to setting alert conditions on the network. Very large enterprises were more likely than others to seek it.

Among less popular features, recommended actions were favored by respondents with less network observability success. On the other hand, successful respondents emphasized the value of dependency-based alarm suppression, suggesting that this venerable approach to noise reduction remains a viable and valuable feature. Large enterprises (5,000 to 10,000 employees) valued it more than midsized enterprises (1,000 to 5,000).

Historical analysis of alarm trends was selected more often by engineers and architects than by IT middle managers. Members of the network engineering team saw more value than others in topology-based alarm suppression.

# Data Diversity and Scalability

Data collection requirements for network observability solutions are becoming more robust. EMA research found that IT organizations are diversifying the classes of data they collect from their networks and the overall volume of data is increasing.

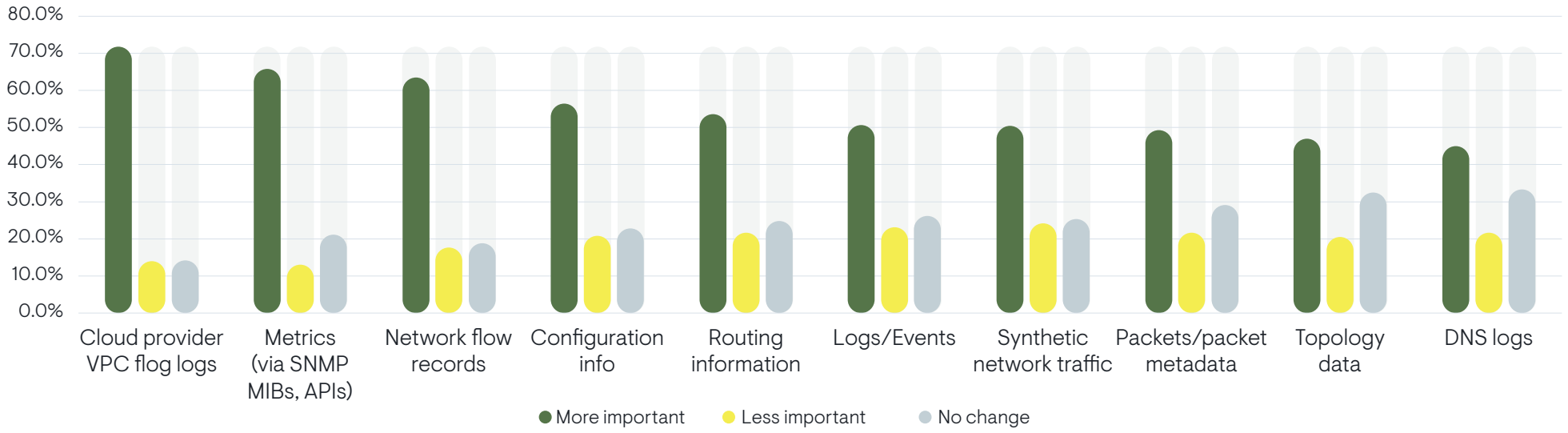
## Essential Observability Data

**Figure 7** reveals that IT organizations need to collect and analyze more kinds of data with their network observability tools. EMA listed 10 classes of network data and asked respondents whether any of this data was becoming more or less important to monitoring and managing their networks. In every example, respondents were more likely to say the data was becoming more important rather than less important.

Cloud provider flow logs experienced the biggest surge in importance, suggesting that network teams need better visibility into public cloud traffic. Most respondents also said that device metrics, network flow records, configuration data, routing information, logs and events, and synthetic network traffic were becoming more important.

"I consider the internet a part of our backbone now, and it's very important to monitor our traffic from on-premises to the cloud and back again," said a monitoring tool architect with a Fortune 500 media company. "So, it's really important to do tests with synthetic network monitoring."

**Figure 7. Have any of the following types of network data become more important or less important to the management and monitoring of your network over the last three years?**




Sample Size = 351

> "I consider the internet a part of our backbone now, and it's very important to monitor our traffic from on-premises to the cloud and back again," said a monitoring tool architect with a Fortune 500 media company.

"We need to get all the metrics so that we can monitor things like CPU load and memory usage. We also need to observe latency," said a network engineer with a health care company that operates more than 40 hospitals. "And right now, we would like to do deep packet inspection for application layer insights. That is where we need to go in the future."

"We're moving to a tool that can give us really good packet capture analysis in the cloud," said a network management tool architect with a $30 billion bank. "Having more advanced statistics through packets and good reporting is going to be huge for us."

Respondents who reported the most success with network observability were more likely to say device metrics, synthetic traffic, routing data, configuration information, and topology data are increasing in importance, while logs and network flows are less important.

The network engineering team was more likely than other groups to see the growing importance of device metrics, packets, DNS logs, configuration information, and topology data.

## Data Collection Volumes are Increasing

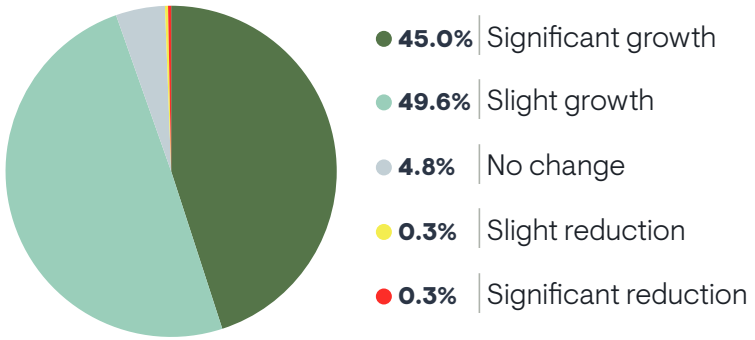
**Figure 8** reveals that nearly 95% of organizations have increased the volume of data they collect with network observability tools over the last two years, and 45% describe this volume increase as significant. IT organizations may need to increase the scalability of their observability platforms by upgrading the resources and licenses for on-premises tools. Many providers of SaaS-based network observability tools charge customers by the amount of data they collect, so IT organizations may see increased costs as data volumes go up.

Subject matter experts and project managers reported significant growth in data, while IT executives were more likely to see only slight growth. DevOps and network engineering personnel perceived the most growth in data.

"Data collection scalability is really important for us," said a monitoring tool architect with a Fortune 500 media company. "We have almost 700,000 interfaces, so it's a lot of data collection. Each interface probably has 20 different metrics or more, so scalability is a huge requirement for us."

Successful users of network observability tools were more likely to report significant growth in the amount of data they collect. More data suggests more comprehensive visibility into the network. However, it can also pose a challenge. In a later section, we will explore data-related challenges with network observability tools. That section will show that the biggest source of data trouble with tools today is scalability, with many organizations struggling with increased volumes of data.

**Figure 8. Over the last two years, to what extent has the overall volume of data that you collect with your network observability tools changed?**

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# Streaming Network Telemetry: Adoption Interest is Strong

Network monitoring and observability tools have relied on SNMP to collect device metrics and events for decades. This protocol polls devices at regular intervals for stats on resource utilization and device state. Tools typically alert on this information based on thresholds. More recently, vendors, industry consortiums, and standards bodies have developed various streaming telemetry mechanisms as an SNMP alternative. Streaming telemetry allows a tool to subscribe to device data, which is streamed in real time rather than in response to poll requests.

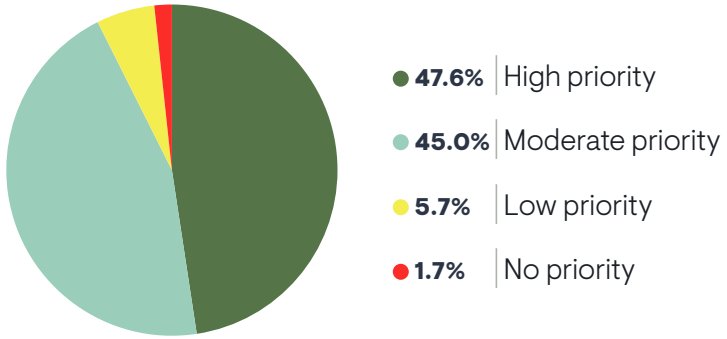
Advocates say streaming network telemetry is a superior option to SNMP polling, but adoption is low, due to a variety of reasons that we will explore here.

**Figure 9** shows that interest in streaming network telemetry is strong. Nearly 48% say implementation is a high priority. Respondents who are more successful with network observability tended to make streaming telemetry a higher priority.

"I want to use it because traditional device APIs always have rate limits," said a network management tool architect with a Fortune 500 retailer. "You can't get all the data you need. Streaming telemetry is less performance-intensive on the hardware platforms. You can get more data."

Respondents who use open source network observability tools were the most likely to say streaming telemetry was a high priority. Members of network engineering teams were the most likely to name this a high priority, while the IT architecture group tended to say it was a low priority and the project management group labeled it a moderate one.

**Figure 9. To what extent is it a priority for your organization to apply streaming network telemetry to your network observability toolset today?**




Interest in streaming network telemetry is strong. Nearly 48% say implementation is a high priority.

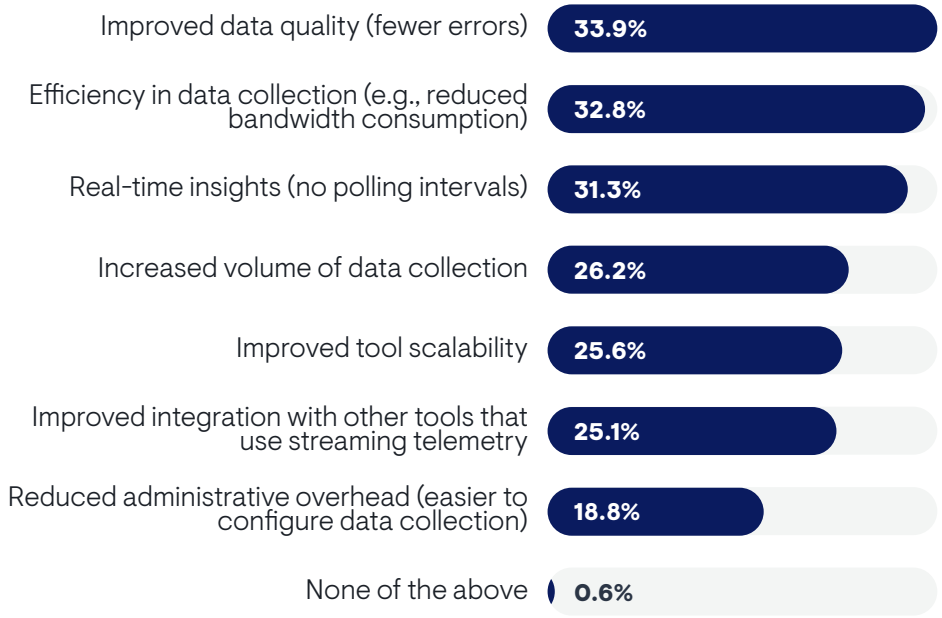
Sample Size = 351

## Potential Value

Three potential benefits primarily drive interest in streaming network telemetry, as **Figure 10** details. IT organizations believe it can improve data quality, make data collection more efficient, and enable real-time insights by eliminating polling intervals. The latter benefit reflects how many network observability vendors recommend five-minute polling intervals with SNMP. These intervals are too long for some network teams.

"You can get more data [from streaming telemetry], and it's more efficient," said a monitoring tool architect with a Fortune 500 media company. "You can do change detection and things like that."

**Figure 10. What do you perceive as the greatest benefits of adopting streaming network telemetry?**

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## Adoption Roadblocks

While interest in streaming network telemetry is strong, adoption is low. EMA rarely encounters anyone who is using it. **Figure 11** shows why this is the case. There are three primary roadblocks: network observability tools lack support for collecting such telemetry, industry standards haven't matured enough to support widespread adoption, and network equipment vendors don't fully support the technology.

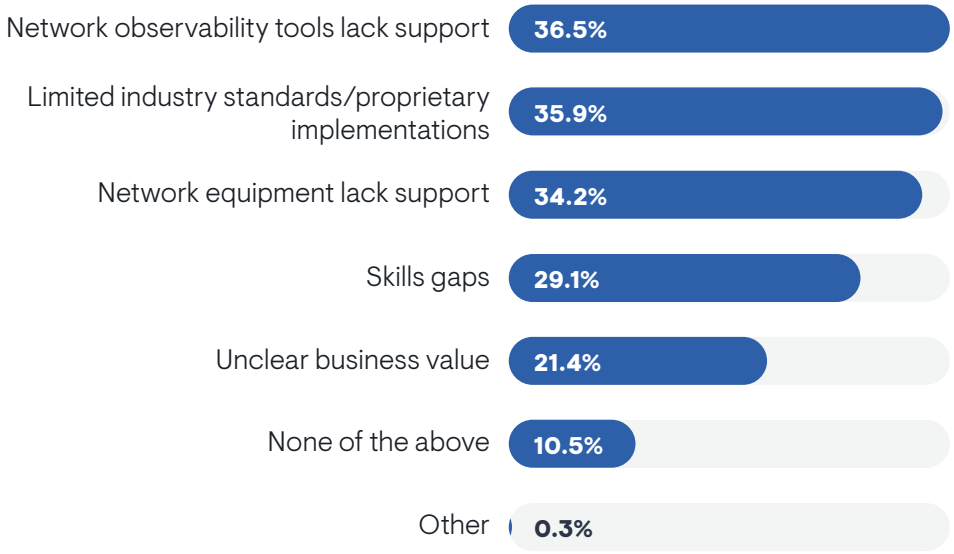
"Streaming has been around for a number of years, but it's still not mature enough where it's available in a consistent manner [across hardware vendors and tool vendors]," said a monitoring tool architect with a Fortune 500 media company. "The problem is that the device manufacturers haven't really standardized it, and the monitoring software vendors are waiting for them to do that."

Notably, only 20% cited unclear business value as a barrier to adoption, which suggests that most IT organizations perceive the value of streaming network telemetry.

Members of network engineering teams were more likely to cite limited industry standardization, network equipment support, and business value as problems, and they were less likely to worry about skills gaps. Thus, the experts know how to work with this technology, but they don't think the technology is mature enough. Very large enterprises (10,000 or more employees) were more likely to struggle with skills gaps.

"Streaming has been around for a number of years, but it's still not mature enough where it's available in a consistent manner [across hardware vendors and tool vendors]," said a monitoring tool architect with a Fortune 500 media company.

**Figure 11. What are the primary challenges to adopting streaming network telemetry with your network observability tools?**

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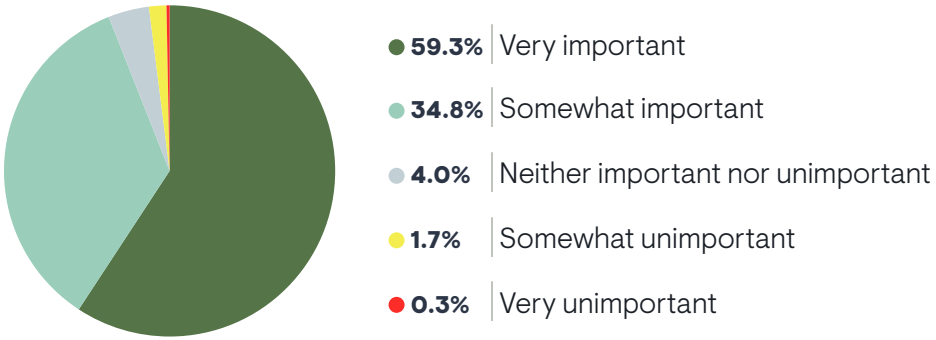
# Visibility into Unmanaged Networks

Traditionally, network observability tools have monitored the network infrastructure that IT organizations administratively own. This administrative ownership allows network teams to configure or instrument the network to allow tools to collect data. For instance, network teams have no control over an internet service provider's (ISP's) network, and they cannot configure that ISP's routers to export flow records or device metrics to a tool. The same goes for an employee's home office Wi-Fi and internet. As these unmanaged networks become more integral to an enterprise's overall end-to-end network, IT organizations need tools that can observe unmanaged infrastructure. **Figure 12** indicates that 96% of respondents believe it is at least somewhat important for this kind of observability, and most describe it as very important.

Frontline operations personnel are recognizing the need to close observability gaps with unmanaged networks.

**Figure 12. How important is it for your network observability tools to be able to monitor and troubleshoot unmanaged networks for which you have little or no administrative control (e.g., internet, home office, public cloud)?**

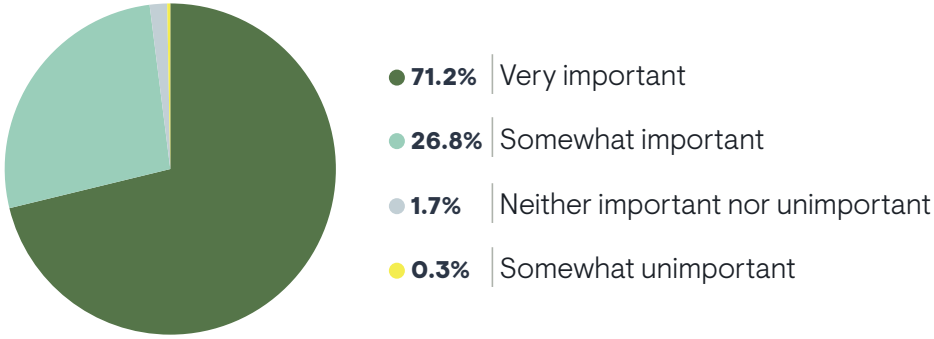



Subject matter experts, such as engineers and architects, were more likely than IT executives and middle managers to consider this a very important requirement. This highlights the fact that frontline operations personnel are recognizing the need to close observability gaps with unmanaged networks. In fact, members of the network engineering group were more likely to demand this capability than the IT architecture or project management groups. Respondents who reported more success with network observability placed more importance on having this kind of insight in their tools.

# End-to-End Insights

Given the complexity of today's networks, IT organizations sometimes struggle to understand the end-to-end state of infrastructure. Network teams manage data center networks, cloud networks, campus switching, Wi-Fi, internet connectivity, and managed WAN services, like MPLS. Their tools often specialize in subsets of these domains. **Figure 13** reveals that most network teams need solutions that can give them end-to-end visibility and insights across all these domains. In fact, 71% say it is very important to have end-to-end network observability.

**Figure 13. How important is it for your network observability tools to provide visibility and insights end-to-end across different domains, such as switching, Wi-Fi, data center, WAN, network security, and cloud networks?**

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"Troubleshooting of issues is very difficult because there are so many different domains," said a network management tool architect with a Fortune 500 retailer. "If you go into our tool, you're going to see different dashboards and reports for DNS, for Windows servers, for network devices. It's like all of them are in their own little world of data and everything is happening separately. Events are all being tracked separately and there is no correlation layer."

"It takes some tooling to figure out if there is an ISP or Wi-Fi issue in the environments of our remote users," said a network engineer with a billion-dollar fintech company. "We also serve a lot of external clients over the public internet, so we have challenges with managing paying customers too. There aren't a lot of off-the-shelf tools that do outside-in monitoring."

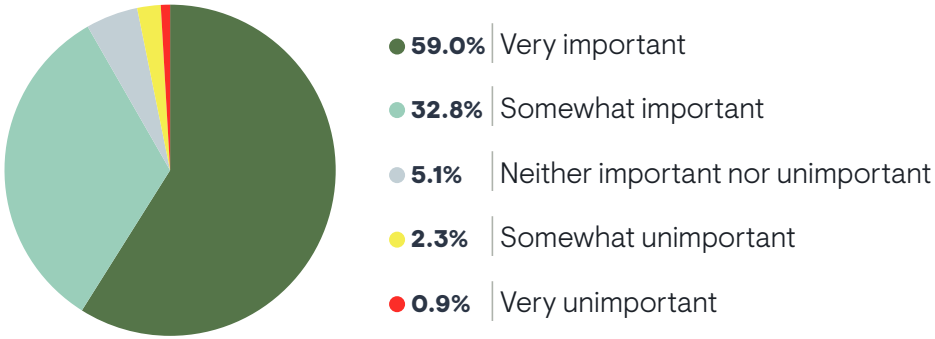
Respondents who reported more success with network observability said this end-to-end capability was more important to them. Organizations that most want this capability tended to have a larger network observability toolset, suggesting that they struggle to get this capability from a single tool. EMA also found that this capability is more important to organizations that have a larger number of network vendors installed.

## AI-Driven Network Observability

IT organizations increasingly recognize that their network observability solutions must leverage AI/ML capabilities. **Figure 14** shows that nearly 92% believe it is at least somewhat important for network observability vendors to optimize and automate network management with AI/ML technology.

92% believe it is at least somewhat important for network observability vendors to optimize and automate network management with AI/ML technology.

**Figure 14. How important is it for your network observability tools to offer features based on artificial intelligence and machine learning (AI/ML) to optimize and automate network management?**

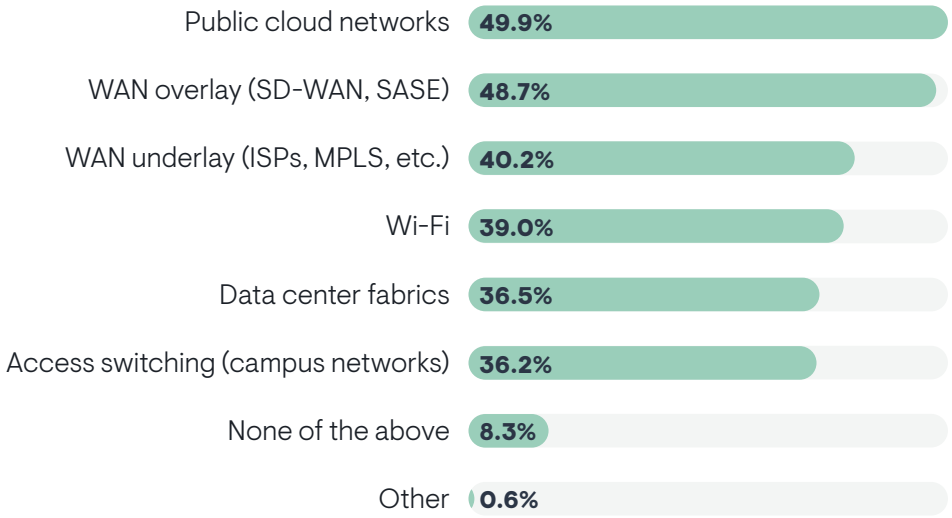



Organizations that are more successful with network observability are more likely to believe AI/ML capabilities are important. Members of network engineering teams were the most likely to say AI is very important, followed by the IT executive suite and the network operations team. IT architecture and project management were least enthusiastic. Organizations that operate multi-vendor networks placed more importance on AI.

Sample Size = 351

Vendors often train their AI/ML models to have specific domain expertise, especially network infrastructure vendors that offer hardware and software for specific network domains (e.g., SD-WAN, Wi-Fi). **Figure 15** reveals the types of domain expertise IT organizations are most interested in leveraging with AI/ML. Public cloud networks and SD-WAN overlays and underlays are the main priorities.

**Figure 15. Do you need network observability tools that have AI-driven domain expertise for any of the following parts of your network?**




Sample Size = 351

Wi-Fi expertise is a lower priority overall, but organizations that enjoy the most success with network observability were more likely to seek it in an AI solution.

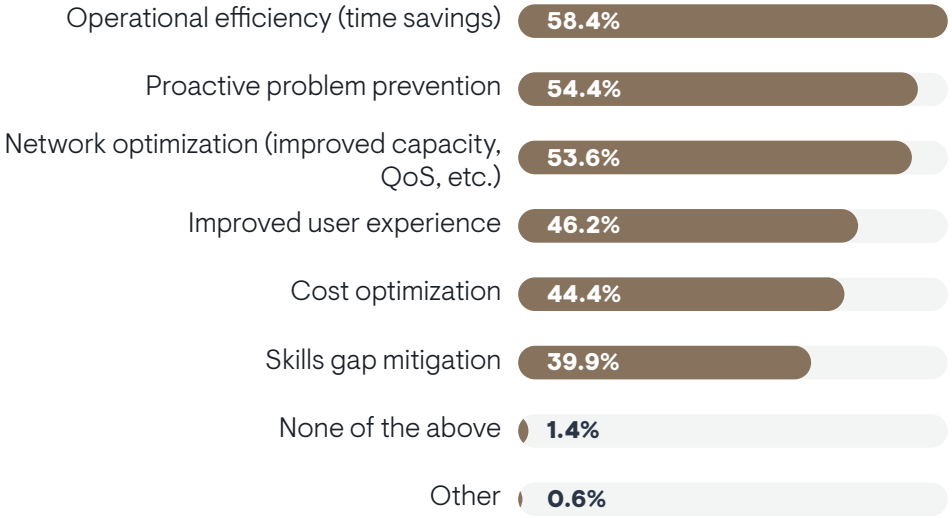
## AI/ML Benefits

**Figure 16** reveals why interest in AI/ML-driven network observability is so high. Most respondents believe it can deliver three key benefits: operational efficiency, proactive problem prevention, and network optimization. Organizations that are less successful with network observability are more likely to strive for proactive problem prevention.

Many also perceive that AI/ML will improve user experience and optimize costs. Subject matter experts (engineers, architects) are more likely to see an opportunity for cost optimization. Respondents overall were most skeptical about AI's ability to mitigate skills gaps.

Organizations that operate multi-vendor networks were more interested in AI that could enable proactive problem prevention, cost optimization, and skills gap mitigation.

**Figure 16. Which of the following potential benefits of applying AI/ML to network observability is most appealing to you?**




Sample Size = 351

# Current Toolsets

# Tool Sprawl is the Norm

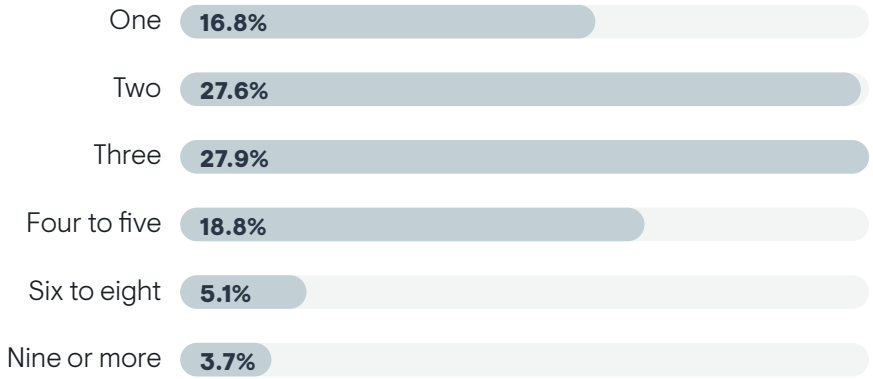
At the beginning of a typical conversation about network observability, network infrastructure and operations professionals will tell EMA analysts how many tools they use. As the conversations progresses, they will often say, "Oh, there's another tool that I forgot to tell you about."

In other words, tool sprawl is so common in network operations that networking pros struggle to provide a comprehensive list of them. **Figure 17** makes this situation clear. Fewer than 17% of IT organizations claim to have a single network observability tool. Typically, organizations have two or three, but more than 26% have four or more tools. Larger companies tended to have more tools. For instance, 44% of companies that have 10,000 or more employees had four or more network observability tools.

> Tool sprawl is so common in network operations that networking pros struggle to provide a comprehensive list of them.

"There isn't one thing in the market that can do all the things we need it to do," said a network management tool architect with a $30 billion bank. "We are still looking for something that can do everything, but right now, it's pieces. We have one synthetic monitoring tool for circuit monitoring, another for [metrics], and a third for topology. We also have another synthetic monitoring tool that does additional testing."

**Figure 17. How many network observability tools does your organization use today?**




Organizations that use open source network observability reported larger toolsets than customers of commercial tools. IT executives appear uninformed about the true state of tool sprawl in their organizations. More than 31% of them believe their organization has only one network observability tool. Meanwhile, engineers and architects perceive sprawling toolsets. More than 17% of these SMEs claimed their organizations use six or more tools. Additionally, members of the network engineering and network operations groups perceived more tool sprawl than other groups.

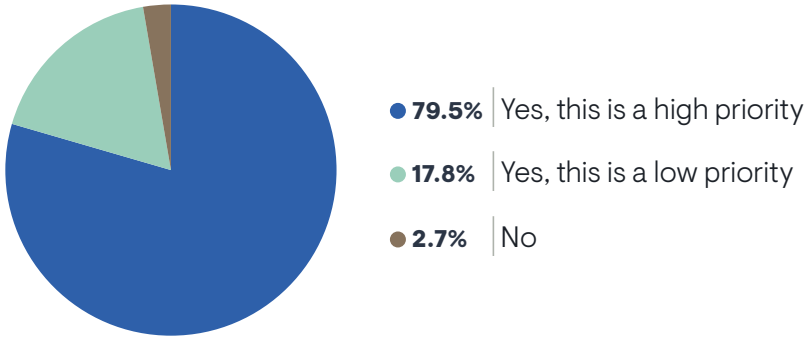
Organizations with larger toolsets tended to identify operational technology/IoT and network technology refreshes as drivers of network observability requirements. Larger toolsets also correlated with multi-vendor networks. The more network infrastructure vendors an organization had, the more tools they used.

Sample Size = 351

## Sprawl Consolidation

**Figure 18** reveals that 97% of organizations with multiple network observability solutions are looking for ways to consolidate tool sprawl. Nearly 80% identify this as a high priority.

**Figure 18. Given that you use multiple network observability tools, is your organization looking for ways to consolidate these tools?**




This consolidation won't be easy, as many IT professionals have told EMA. "No one tool does everything that I want," said a network engineer with a billion-dollar fintech company. "I need multiple tools. You have to look here to do X and look there to do Y."

The network team is on an island with this issue. Members of network engineering and network operations teams were more likely to describe this as a high priority, while DevOps, IT architecture, IT asset and financial management, and project management were less likely. Users of open source tools made tool consolidation a higher priority.

**Figure 19** shows why consolidation is so important. Most organizations think that a streamlined tool set will drive improved network resiliency and performance and overall operational efficiency. Most also think they can save money through consolidation. A smaller number are aiming at reduced technical debt. Technical debt is especially a motivation for organizations that use open source tools and organizations that have a large number of network infrastructure vendors installed.

Sample Size = 292

> Most organizations think that a streamlined tool set will drive improved network resiliency and performance and overall operational efficiency.

**Figure 19. What are the top drivers of your organization's interest in network observability consolidation?**


Organizations with larger toolsets were more likely to cite cost savings and improved network resiliency and performance as drivers. Cost savings motivates members of IT asset and financial management groups more than the IT executive suite. This is also a higher priority for organizations that use network observability tools provided by their network hardware vendors. The need for operational efficiency drives the IT executive suite and the network operations team, but network engineering is less motivated by this. Finally, the network operations team is more motivated by improved network resiliency than the IT architecture group.

Sample Size = 284

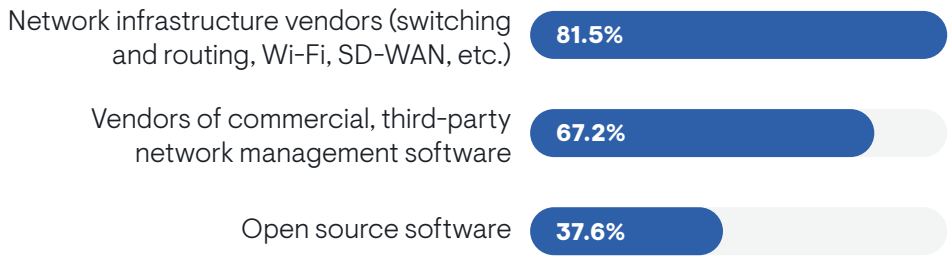
"We are trying to consolidate to fewer tools," said a monitoring tool architect with a Fortune 500 media company. "We are trying to get rid of three tools in favor of one so we can simplify our architecture and do more with less. It reduces our technical debt."

# Tool Providers

In EMA's view, there are two general types of vendors that provide commercial network observability tools. First, there are network infrastructure vendors that offer observability capabilities via the element management tools they bundle with their infrastructure products. The second group consists of third-party tool vendors that specialize in vendor-neutral observability of networks. There is a third source of observability tools, too: EMA finds that many IT organizations use open source software for network observability.

**Figure 20** shows how enterprises are sourcing network observability today. Nearly 82% have solutions that network infrastructure vendors provide, and more than 67% are using solutions from a specialist tool vendor. Aside from commercial solutions, nearly 38% are using open source observability software. Open source tools were more common in larger companies.

**Figure 20. Which of the following are sources of the network observability tools that your organization uses to manage its network?**




Sample Size = 351

"There is a lot of interest in my company to use open source," said a monitoring tool architect with a Fortune 500 media company. "Organizations get better control of their data and the workflows, but there's a cost associated with it in terms of having more development resources. So, we're in this hybrid approach, where we have some vendor solutions but we're also building internal tools with open source, not just for observability, but also configuration management."

"I like being able to customize solutions," said a network management tool architect with a Fortune 500 retailer. "That's why I like open source tools like Grafana."

"I'm not content with tools we can get off the shelf," said a network engineer with a billion-dollar fintech company. "That's why we go custom with Prometheus and other open source tools. You can customize them and make them as smart as you want to. I've never been limited by them, but It's a lot of work. I would like to go all customized and open source. You just need the time and the skills. I would do it, but other people don't have the same skillsets and right comfort level."

"I'm not content with tools we can get off the shelf," said a network engineer with a billion-dollar fintech company. "That's why we go custom with Prometheus and other open source tools.

The IT executive suite was more likely than other groups to perceive specialist tool vendors as a source of network observability solutions. Multi-vendor networks tended to rely more on tool vendors and open source for network observability, and open source was particularly common in companies that used six or more networking vendors. Organizations that had fewer networking vendors installed were more likely to use network observability solutions offered by those hardware vendors.

# Network Observability Outcomes

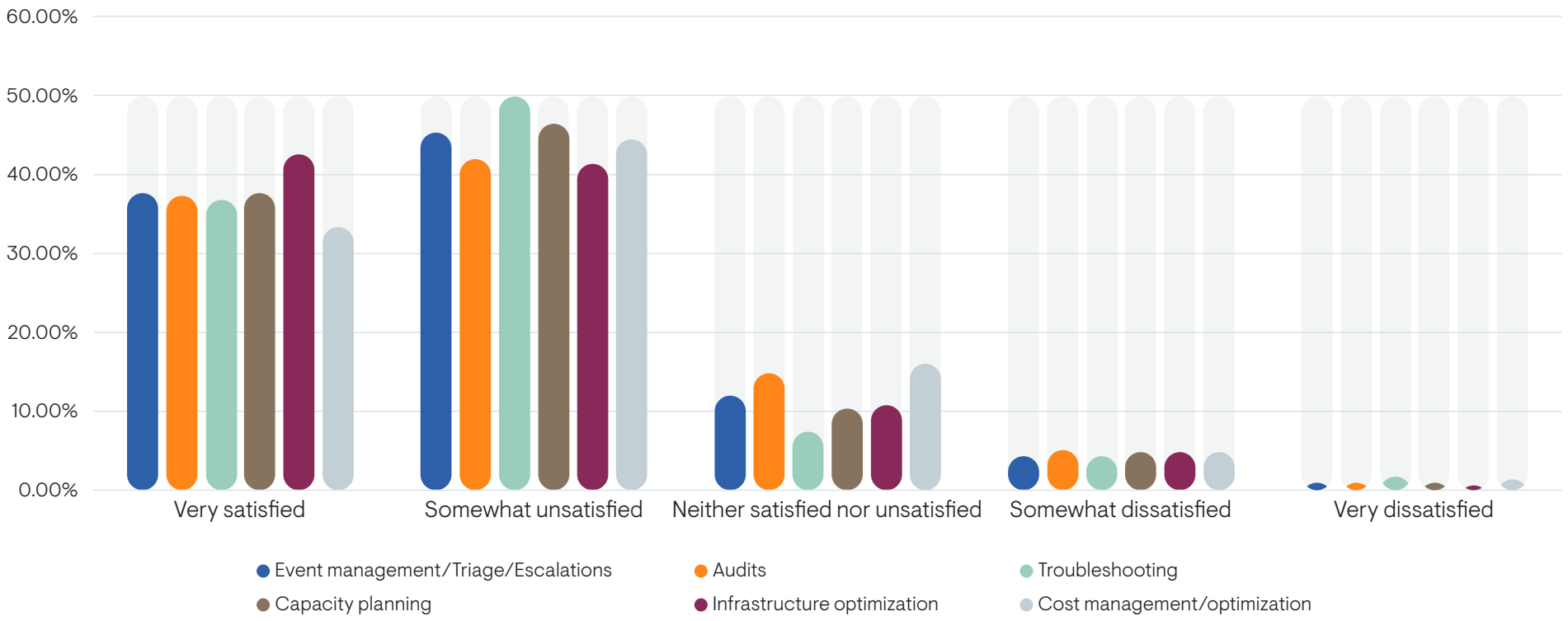
# Tool Satisfaction

## Use Case Support

**Figure 21** reveals how satisfied respondents are with how their network observability tools support six core use cases. Overall, respondents are mostly partially satisfied with each use case. Infrastructure optimization (tuning networks via observed insights) garners the most satisfaction. Cost management and optimization generated the least amount of satisfaction. IT executives tended to be more satisfied than others with cost management.

Event management, audits, troubleshooting, and capacity planning all received similar markets, with less than half completely satisfied. Respondents who reported the most success with network observability were more satisfied with support of all use cases, although even they tended to be only modestly satisfied with cost management support. Organizations that use open source network observability tools were more satisfied with event management support than customers of specialist tool vendors.

**Figure 21. How satisfied are you with how your network observability tools support the following use cases?**




Sample Size = 351

"The innovation in tools has been stagnant," said a network engineer with a Fortune 500 aerospace and defense company. "There hasn't been a lot of evolution that really wows us."

"Right now, our tools are lacking," said a network engineer with a billion-dollar fintech company. "Every couple years I look around and say there has got to be something better out there."

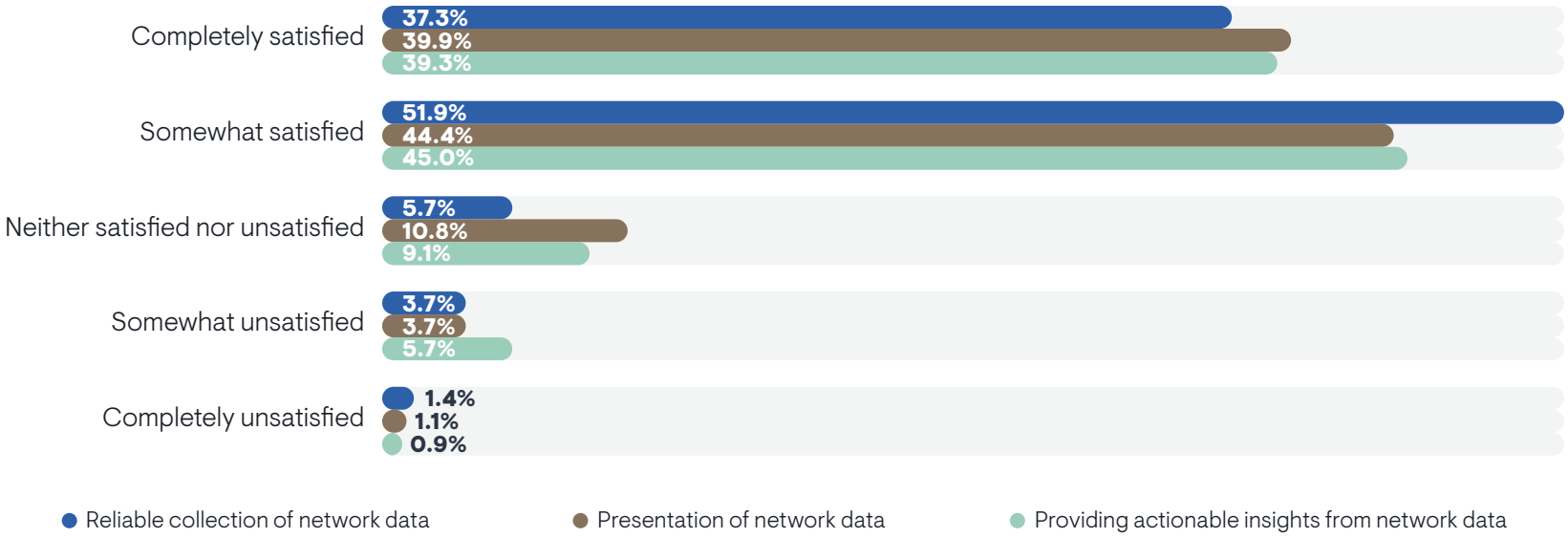
"Right now, our tools are lacking," said a network engineer with a billion-dollar fintech company. "Every couple years I look around and say there has got to be something better out there."

## Platform Requirements

**Figure 22** reveals how satisfied respondents are with how their network observability solutions reliably collect network data, present that data, and provide insights into that data. Overall, less than 40% are completely satisfied with how their tools fulfill any of these requirements. Data collection is the weakest.

"Our tools are solid. The data is accurate," said a network engineer with a Fortune 500 aerospace and defense company. "It gives us an excellent current and historical perspective."

**Figure 22. How satisfied are you with the ability of your network observability tools to fulfill the following requirements?**




Sample Size = 351

Tool sprawl (larger toolsets) correlated with less satisfaction with actionable insights. Respondents who reported more success with network observability were more satisfied with all three of these platform capabilities. Subject matter experts (engineers, architects) tended to be less satisfied than IT managers and executives with how their tools present data and provide actionable insights. However, from an organizational perspective, the IT executive's suite was less satisfied with data collection than the network engineering and network operations teams. Respondents who use open source network observability reported more satisfaction with their tools' abilities to provide actionable insights.

## Alert Noise

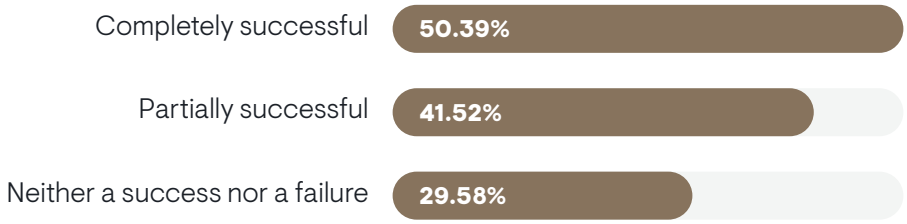
EMA asked respondents to tell us the percentage of the alerts generated by their network observability tools that are actionable and indicative of a problem that must be addressed. The mean response was less than 45%. In other words, more than 55% of the alerts network observability tools generate are false alarms or issues that don't require a fix.

> More than 55% of the alerts network observability tools generate are false alarms or issues that don't require a fix.

"Alerting is usually not a tool problem. It's a human problem," said a network engineer with a billion-dollar fintech company. "Every tool allows you to create an alert and configure how you want it to notify you. I think maybe tools could make it easier to tune alerts, but every tool has something."

**Figure 23** reveals that success with network observability tools correlates directly to a higher percentage of alerts being actionable. Efficient and effective alert management is essential to successful network observability.

**Figure 23. Percentage of alerts generated by network observability tools that are actionable and indicative of a problem that must be addressed, cross-tabbed by success with network observability tools.**




Members of the network engineering team perceived a higher percentage of actionable alerts (57%) than network operations (44%), project management (43%), and the IT executive suite (43%).

Sample Size = 351

# Observability Challenges and Pain Points

## Data Problems

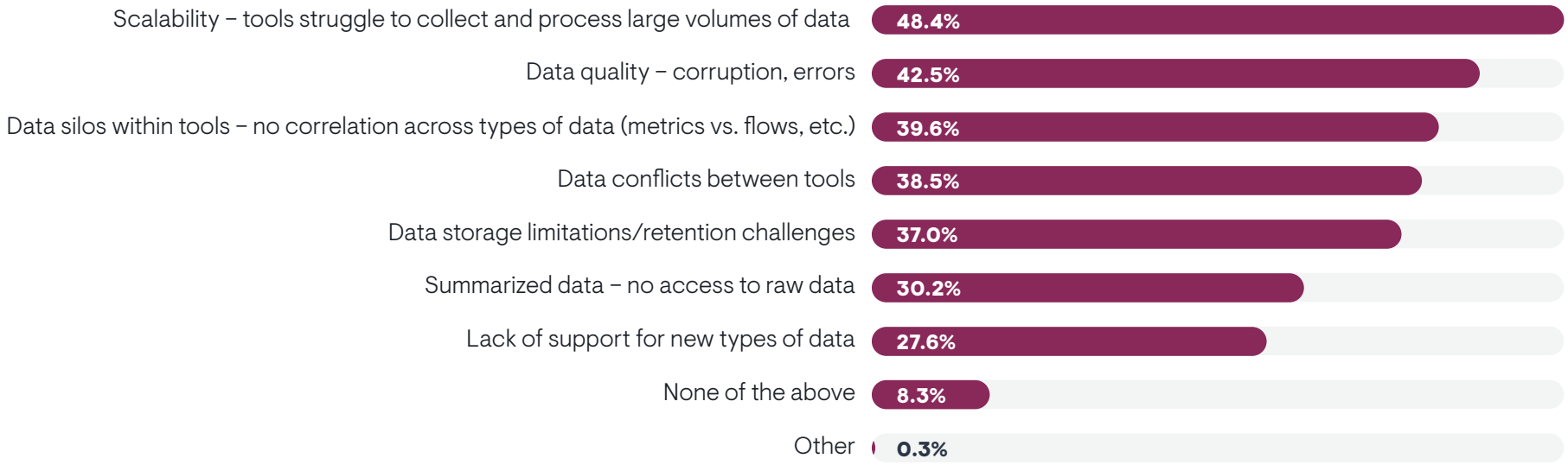
**Figure 24** explores the most challenging data-related issues that organizations have with their network observability tools. Scalability is the biggest source of pain. Their tools are struggling to collect and process large volumes of data. This issue affects large and very large enterprises (5,000 or more employees) more than midmarket enterprises (1,000 to 4,999 employees).

"Scalability seems to be a problem even with SaaS tools," said a network management tool architect with a Fortune 500 retailer. "We were deploying a few thousand devices with our [SaaS-based network observability vendor]. I kept having to add more and more collectors into the platform to onboard more devices, but all the data collection was delayed because there is a huge queue."

Respondents identified data quality, data siloes within tools, data conflicts across multiple tools, and data storage or retention as their secondary problems. Respondents who are less successful with network observability were more likely to report problems with data silos within tools. Respondents who were uncertain about their success with tools cited a lack of support for new types of data. Overall, lack of support for new data was a minor issue, but it still affects more than one-quarter of companies.

"Many network vendors are lacking APIs or have totally crap APIs, so I have to go through a lot of effort to build custom tooling to get structured data from every device in the format that I want," said a network engineer with a billion-dollar fintech company.

**Figure 24. Which of the following data-related issues present the most significant challenges when using your organization's network observability tools?**




Sample Size = 351

"Back in the day, everything was simpler," said a network management tool architect with a Fortune 500 retailer. "There were network devices and servers. Now, data can be in any shape and form and from anywhere. Trying to onboard data that isn't supported out of the box is too much work."

Organizations that use open source network observability were more likely to struggle with data retention limits, data quality problems, and a lack of support for new types of network data.

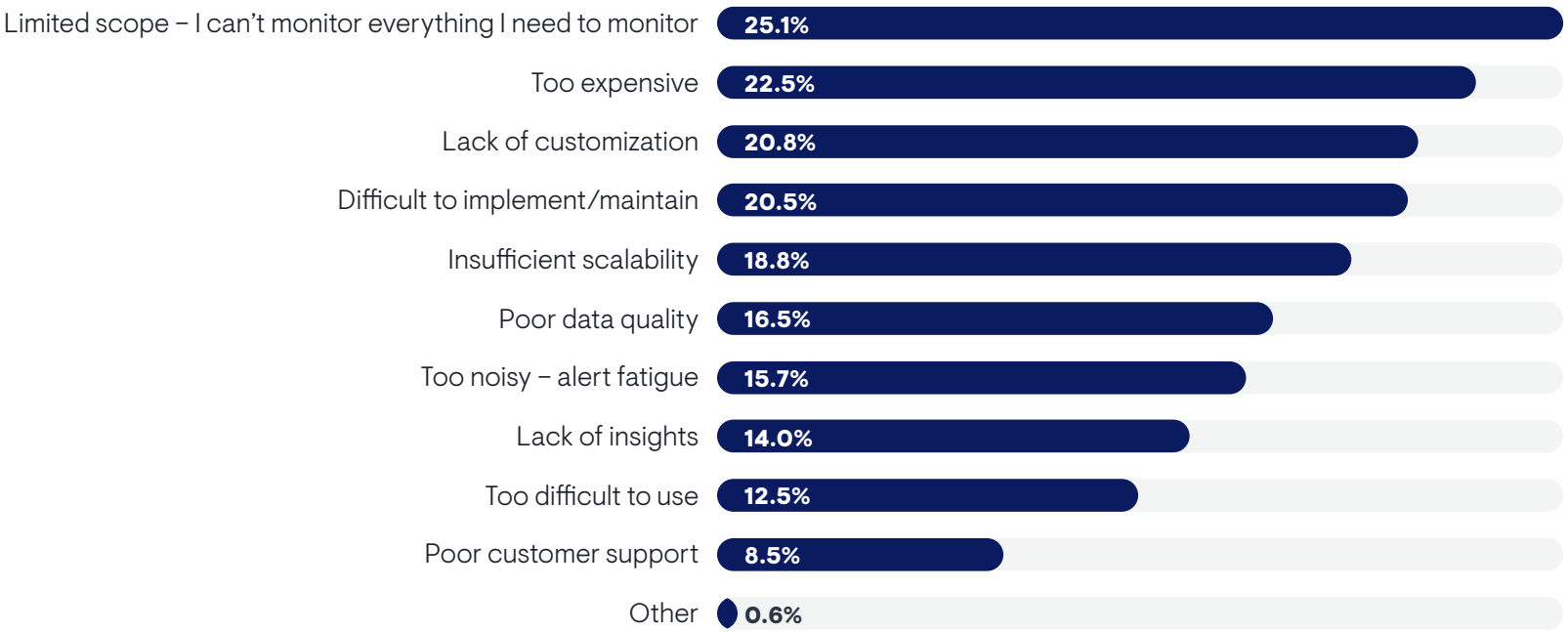
Tool sprawl correlates with data pain. The smaller a toolset, the more likely a respondent was to select "none of the above." On the other hand, respondents with larger toolsets tended to report problems with data conflicts between tools, issues with summarized data, and scalability problems.

Respondents with larger toolsets tended to report problems with data conflicts between tools, issues with summarized data, and scalability problems.

## Overall Tool Complaints

**Figure 25** explores what most dissatisfies respondents about their network observability tools. The top issue is scoping of tools. Users find that they can't monitor everything they need to monitor. For instance, perhaps their core network observability solution doesn't support public cloud monitoring. Project managers were twice as likely as subject matter experts (engineers, architects) to consider this a problem. Respondents who tackle more complex issues or have a broader scope of responsibilities were more likely to struggle with this issue. For instance, members of the IT executive suite, the network engineering team, and project management team were more likely to cite this issue than the network operations team.

**Figure 25. Which of the following are your biggest complaints about your network observability tools?**




Sample Size = 351

Next, organizations are unhappy with the cost of their tools. "Everyone is trying to get rich quick," said a network management tool architect with a Fortune 500 retailer. "Vendors are more focused on price than value. These vendors are heavily focused on marketing and sales, trying to grow their company without improving their products."

After that cost, a lack of customization options offered by tools and the difficulty of implementing and maintaining them round out the top complaints. Implementation and maintenance were bigger issues for subject matter experts than IT middle managers and executives. Members of the network engineering team were the most likely to cite implementation and maintenance. This issue was cited by larger companies in general, suggesting that the complexity of larger networks comes into play.

Customization is as a big issue in many of the one-on-one conversations that EMA analysts had with IT professionals.

"Nothing does what I want it to do. Anything you want to customize around correlations and grouping, it's very proprietary," said a network engineer with a billion-dollar fintech company. "You have to go on user forums and figure out how to do it, or you have to make feature requests and wait a year."

"The biggest thing for me is the ability for users to customize how they want to see the data," said a monitoring tool architect with a Fortune 500 media company. "I want to use different visualizations. I want more flexibility in visualization engines. As a system architect, I can come up with multiple use cases and build them into the tool, but I can't predict everything that users will need. So, tools need customization features to personalize user experience."

"The biggest thing for me is the ability for users to customize how they want to see the data," said a monitoring tool architect with a Fortune 500 media company. "I want to use different visualizations. I want more flexibility in visualization engines.

"One of the main problems with our vendor-provided tools is the customization of dashboards," said a network management tool architect with a Fortune 500 retailer. "A lot of things are hard-coded. Let's say you want an inventory report, there is an out-of-the-box report. But if you want to add labels for filtration and other customizations, it doesn't work. It doesn't allow you to customize its dashboards and reports enough."

Insufficient scalability is also a major problem for that network management tool architect. "I've seen so many different tools where you open a dashboard, change the data retention from one day to one month, and the dashboard takes two or three minutes to load. It's really slow. These are things that a lot of vendors are struggling with, basic fundamental issues."

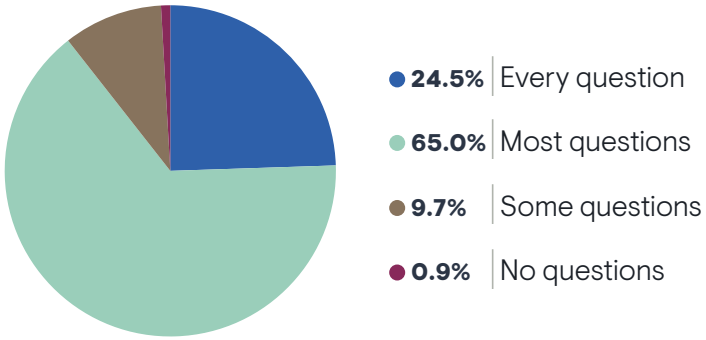
Organizations that use open source network observability were more likely to struggle with a lack of insights and ease of use issues. Poor data quality was also a bigger issue for subject matter experts than middle managers and executives. Insufficient scalability was a relatively minor issue, but members of network operations and IT architecture groups named it a top issue.

Poor customer support and poor ease of use are the least problematic aspects of today's tools. The network engineering team was more likely than the network operations team to complain about customer support.

# Observability Insights and Answers

When EMA discusses the differences between network monitoring and network observability with IT professionals, they often suggest that network observability tools should be able to provide insights and answers to questions about the network. **Figure 26** looks at how well today's tools can answer questions. Fewer than 25% of respondents have tools that can answer all their questions about their networks. Most told us that their tools can answer most questions.

**Figure 26. Tell us how well your network observability solutions support this by selecting an option to fill in the blank in the following sentence: "Our tools can quickly and easily answer ____ that we have about our network."**

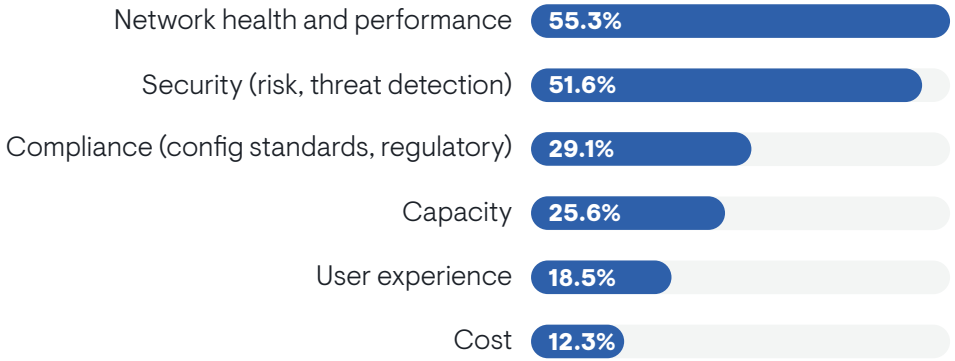



Tool sprawl worked against this outcome. Respondents with larger toolsets got fewer answers to their questions from their tools. Network expertise of research participants influenced this question. The network engineering team was most likely to say that their tools can answer every question. This team typically has the most knowledge about networks and its personnel is capable of extracting answers to questions that other groups would struggle with. For example, the DevOps team and the cloud team were able to answer the fewest questions with network observability tools.

Sample Size = 351

**Figure 27** reveals the answers and insights that today's toolsets are best capable of providing. Most organizations' tools can provide answers about network health and performance and security state. Answers about compliance and capacity are less readily available. The network operations team and the IT executive suite were the most confident in tools' answers to questions about network health and performance. The network engineering team was twice as likely as other groups to be able to find answers to compliance questions.

**Figure 27. Which types of questions about your network are your tools best capable of answering quickly and efficiently?**



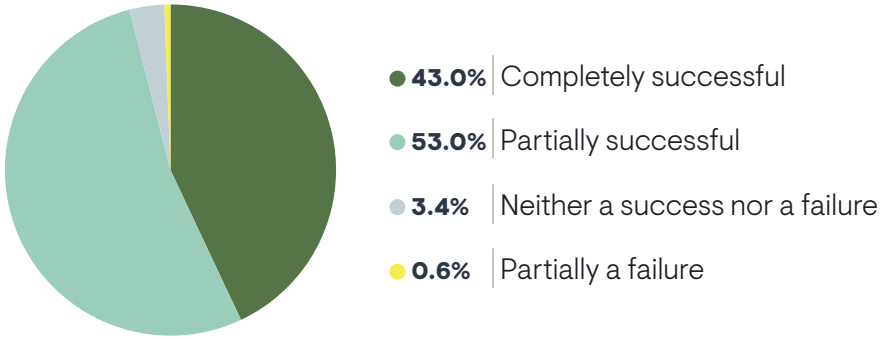

User experience and cost information are hard to find. Organizations that have the most success with network observability are more likely to have tools that can answer questions about both. Organizations with larger network observability toolsets were less likely to get answers to questions about costs and compliance.

Sample Size = 351

# Success with Network Observability

**Figure 28** reveals that 43% of respondents believe their organizations are completely successful with their use of network observability tools. Most only feel partially successful. Heavier users of these tools reported more success. For instance, members of network engineering and network operations teams were more successful than the project management team.

**Figure 28. How successful do you think your organization is with its use of network observability tools?**




43% of respondents believe their organizations are completely successful with their use of network observability tools.

Sample Size = 351

"I'm about 80% satisfied with my tools," said a network management tool architect with a Fortune 500 retailer. "I think we have the best possible setup we can have, but there are still things I'm not happy with."

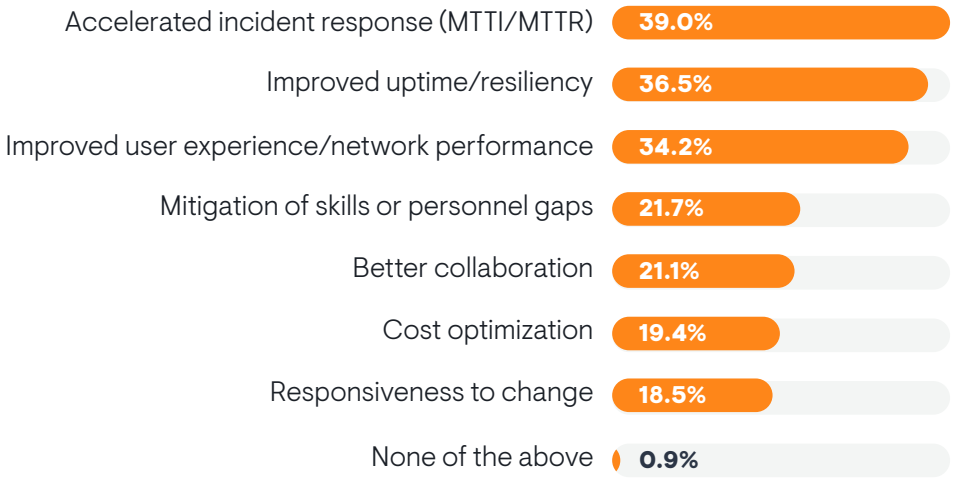
EMA found that organizations experience more success with network observability when they:

- Prioritize resources and budget for tools
- Require support for multi-vendor networks
- Require end-to-end visibility and insights across network domains
- Require insight into unmanaged networks (e.g., internet, cloud, remote users' connections)
- Collect higher volumes of data with their tools
- Tightly integrate multiple network observability tools
- Are aggressive with streaming network telemetry adoption and perceive it as an SNMP replacement
- Have efficient and effective alert management (noise is minimized)
- Prioritize tools that can monitor and troubleshoot the network experience of individual users
- Prioritize and trust AI/ML-driven network observability capabilities

## Benefits of Effective Solutions

**Figure 29** reveals the benefits that IT organziations usually experience when they are successful and effective with network observability. The top benefit is accelerated response to network incidents. Network teams can understand and resolve problems faster. This benefit was perceived more by IT middle managers and project managers and less by subject matter experts.

**Figure 29. Which of the following are the top benefits that your organization currently experiences from the effective use of its network observability tools?**




Sample Size = 351

The other top benefits are improved resiliency or uptime and improved user experience and network performance. The project management team was more likely to perceive improved resilience than the network engineering team.

Skills and personnel gap mitigation was an infrequent benefit, but members of the network engineering and IT asset/financial management teams were more likely to experience it than network operations and project management teams.

Cost optimization is an infrequent benefit, but larger companies tended to select it more often.


50%
80%
55%
75%
80%
20%
A
B
C
D
Level_1
Level_2
Level_2
Level_3
5371
Day
Week
Month
Year
All

# Conclusion

Over the last two years, IT organizations embraced the concept of network observability to describe the tools they use to monitor and manage their networks. This reflects a desire for next-generation capabilities from incumbent vendors and emerging solution providers.

Network operations teams need tools that can collect increasingly diverse network data at greater volumes than ever before. For instance, device metrics remain as important as ever, and network teams need tools that can scale to collect more of them. However, they also need to collect VPC flow logs from their cloud providers and synthetic network traffic. At the same time, they want to explore alternatives to legacy data collection methods, like SNMP, by embracing streaming network telemetry, which remains too immature for mainstream adoption.

Still, it's not just about data collection. Network operators need actionable insights, which demand innovation. IT professionals recognize that AI is a potential path toward actionable insights, but they also expect innovation in how tool vendors deliver dashboards and reports, both out of the box and via highly customizable features.

This innovation will occur in an industry in which network complexity and tool sprawl remain the norm. Network teams recognize that no single tool will deliver end-to-end network observability that addresses all their requirements. Tool vendors must strive to provide as much capability as possible while also enabling customers to tightly integrate their solutions into a multi-vendor suite that includes tools from network management solution specialists, network infrastructure vendors, and open source communities. Flexibility, openness, and customizability are the keys to network observability success.


# Case Study: Manufacturer Accelerates Troubleshooting with NETSCOUT Observability in Remote Factories

# Plant Operational Technology Challenges

As a global manufacturer expanded the amount of automation in its plants and had production lines expand over the last decade, it recognized the need to ensure consistent performance levels in order to meet daily production quotas and avoid slowdowns or shutdowns. Fortunately, the manufacturer's IT organization had the right tool for the job. The network operations team implemented NETSCOUT observability solutions across its data centers, cloud environments, and factories worldwide to safeguard performance, user experience, and manufacturing line objectives.

Recently, the manufacturer discovered slowdowns with the custom application that powered automated assembly lines in a few of its factories. The IT team was responsible for helping the manufacturer meet company objectives in the areas of performance monitoring and observability, troubleshooting, capacity planning, and maintaining predictable quality of service levels. It quickly recognized the need to identify the root cause of the slowdowns and fix them before they negatively impacted production levels, which could delay downstream operations that relied on the components built at these factories. Knowing that this could become a very costly problem, the IT organization quickly jumped into their troubleshooting processes.

# Importance of Ecosystem-Wide Observability

As the network operations team responded to this issue, they applied the NETSCOUT nGenius Enterprise Performance Management solution to the problem. The team began its investigation of the slowdown by leveraging the NETSCOUT Remote InfiniStreamNG (ISNG), which was deployed onsite for continuous deep packet inspection (DPI) at scale from the WAN edge of the factories. The network operations team combined their analysis of this packet data with metadata from the InfiniStreamNG instances that were monitoring the manufacturer's data centers and public cloud. NETSCOUT'S nGeniusONE monitoring and analytics component revealed several service dependencies for the custom manufacturing automation application—one of which was the database. The troubleshooting effort swiftly revealed an issue in how transactions were flowing between the custom application server and database servers, resulting in slowdowns in certain routes.

Using evidence from the nGenius Enterprise Performance Management solution, which detailed the factory and servers involved, the network operations team corrected the transaction paths and restored service levels and user experience for the application.

# Avoiding Costly Outages with Observability

By leveraging NETSCOUT's observability solution, the network operations team immediately improved overall performance for the factory's production line. This had a clear financial benefit because it reduced production cycles. It also avoided a protracted troubleshooting process that would have likely involved a time-consuming war room session, with contentious exchanges between stakeholders over which vendors or service providers were at fault. For example, without proper observability, some may have pointed fingers at the WAN provider.

The value of observability from NETSCOUT's nGenius solution was demonstrated through its unique ability to continuously analyze the custom manufacturing application, identify service dependencies, and provide visibility into the communication paths across the manufacturer's ecosystem using DPI. Collaboration was quick, accurate, and efficient, and reduced the time to resolution. Ultimately, the bottom-line benefit was that the factory's service level and user experience requirements were met and the company avoided a costly production outage due to this critical observability throughout their environment.

## About Enterprise Management Associates, Inc.

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