

In this hyperconnected digital world, the network functions as the central hub for all business and consumer electronic exchanges. Complete network visibility and control — from end to end — are vital to delivering the service quality, accessibility, and protection necessary for success now and into the future.

Network Analytics: Present Advantages and Future Advancements

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Questions posed by: Comcast Business

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Q. What are the greatest challenges for organizations moving to a digital business model?

A. According to a global IDC survey of IT executives in 2021, the top challenges to building out a resilient digital infrastructure are performance and security issues across many critical workloads, cost and complexity of using and managing cloud services, and difficulty in updating IT staff levels and skills. These challenges point to the need for more advanced management systems that not only provide for more precise monitoring of and control over workloads and cloud services but also serve — and even supplement — technical staff by gathering comprehensive intelligence, developing in-depth insights, and directing needed management actions.

Within the network, advanced network analytics solutions enable detailed visibility into and complete control over network conditions and components. These solutions help bolster network integrity, efficiency, and responsiveness. During times of network slowdowns or failures (or threats), network analytics solutions speed up problem identification and resolution. When looking to add new sites, users, or applications, the heightened network visibility and control offered by these solutions enable the IT staff to better predict network service levels. In this hyperconnected digital era, engineering and operating network infrastructure that delivers consistent services and service levels is vital to both technical and business success.

Q. What role do network analytics and automation solutions play in accelerating digital transformation and driving targeted business outcomes?

A. There are three critical functions to consider when examining network analytics and automation solutions. The first — **data acquisition** — drives all follow-on analysis and actions. Information detailing network conditions and components is available from a variety of sources, including logs, polls, telemetry, and synthetic transactions. Each provides a unique contribution to complete the network picture. The more complete the picture, the more precise and accurate the subsequent **deep analysis** of the network can be. Here, the "analysis engine" targets many key management tasks such as performing complex correlations, determining root causes, detecting traffic anomalies, and extrapolating network trends.

Once fully developed, these in-depth insights trigger **directed automation** — management actions that are recommended to the IT staff or executed by automated systems (e.g., CLI scripts, Python programs, or Ansible playbooks). These actions may resolve a problem, mitigate a threat, optimize traffic flow, or update network configurations.

The three core advanced network management functions work together to deliver a resilient network infrastructure — one that performs reliably and can be accessed easily, repaired quickly, secured, and adapted readily. These are all hallmarks of a network supporting a digital business model.

Q. Where are organizations seeing significant returns for the improved network visibility and control provided by network analytics and automation?

A. The returns linked to network analytics and automation solutions can be placed in two categories: tactical and strategic. Tactical gains focus on more immediate and often more readily apparent improvements in network service levels, resource utilization, and staff productivity. The detailed visibility and control presented by these solutions enable faster problem identification and, ultimately, resolution. Here, network-related mean-time-to-repair times can be lowered significantly, boosting network uptime, user satisfaction, and IT staff efficiency. The heightened visibility and control also allow organizations to operate closer to full capacity for on-premises systems and public services. This improved resource utilization avoids the extra costs associated with executing upgrades before they are necessary or operating an infrastructure that is underutilized.

Examining strategic gains, we see even greater, longer-lasting returns from network analytics and automation. Time savings across tactical duties (e.g., problem resolution, system deployments, and services oversight) enable the networking staff — and even broader IT staff — to be redirected to such high-impact activities as predictive modeling, infrastructure automation, and digital innovation. Improved network service levels boost the credibility of the IT organization and strengthen the belief that IT can lead digital transformation efforts. And with detailed knowledge of the state of the network at any given moment in time, the networking team and the broader IT organization can readily adapt to new business and user requirements. In essence, the network can be made ready for anything. And in the digital business model, "anything" seems to always be just around the corner.

When we look at the keys to realizing these tactical and strategic benefits, certain focal points stand out. Network views and analysis are shared across the IT organization. NetOps, SecOps, DevOps, and more benefit from network information and insights. This sharing also enables the streamlining of management toolsets. Yes, there will always be role-specific tools that serve their respective groups (e.g., networking, security, development, cloud). However, broader use of common tools that support multiple management functions and ease integration with specialized tools increases both efficiency and effectiveness — for networking systems, staff, and spend. Network and IT automation is another area of emphasis for IT organizations looking to improve service levels, staff productivity, and digital readiness. Automation promotes both speed and accuracy in such areas as system deployments, service activations, and network enhancements. Beyond the network itself, more and more IT organizations are judging network success by examining both the operating condition of individual network segments (e.g., datacenter network, wireless network, WAN services) or devices (e.g., routers, switches, WLAN access points) and the digital experience delivered by all digital infrastructure components working in concert. This combination of overarching user view and underlying network view enables an even more complete picture to be presented to the IT staff. In essence, they see the forest and the trees!

Q. What is the impact of network analytics and automation on the IT organization, and how do these solutions bolster technical staff productivity and teamwork?

A. Over the past decade, the budget for networking staff has declined as a percentage of IT staff. This has come at a time when the network has grown more critical and complex under the digital business model. Networking pressures and staff numbers are moving in opposite directions. Network analytics and automation solutions serve to bridge this widening gap between networking staff requirements and capabilities. The detailed network intelligence and insights supported by network analytics save staff time when diagnosing problems, identifying threats, making changes, and tracking trends. The proper and proactive management actions supported by network automation save staff time by performing repetitive tasks, proliferating network changes, and boosting infrastructure integrity. Time saved on these tactical duties can be redirected to responsibilities that drive even greater strategic impact across IT and the business.

Modeling a new digital workload guarantees a timely and successful rollout. Matching line-of-business service requirements to network capabilities ensures a positive outcome. Moving to a forward-looking network management approach accelerates network and digital innovation. This movement of networking staff focus to strategic projects offers the added benefit of increasing IT staff satisfaction and retention. With value comes validation.

Network analytics and automation solutions also serve staff and teams across IT. IDC surveys consistently indicate that IT executives want to promote IT teamwork across technology areas. Specifically, a 2021 IDC survey about network operations asked respondents to identify permanent changes resulting from actions taken during the COVID-19 pandemic. The permanent change cited by most respondents was network and security teams working more closely together. Using network information as a single source of truth, leveraging common tools for analysis and actions, and developing shared responsibilities and practices certainly promote cross-IT teamwork — not just between networking and security but also between networking and development, networking and computing/cloud, and operations and engineering.

Q. What does the future hold for network analytics and automation technologies?

A. For decades, network management systems and staff were principally focused on two fronts: facilitating moves, adds, and changes within the network and signaling alerts when failures or slowdowns were noted. As the digital business model has taken hold and as networks have grown more critical, the industry has been pushing toward a more predictable and dynamic network defined by software, driven by intent, and directed by autonomics. Advancements are coming fast and furious along each of the three previously mentioned critical network management functions: data acquisition, deep analysis, and directed automation.

The collection of network intelligence has moved closer to offering real-time (e.g., packet telemetry) and real-world (e.g., simulated user transactions) views. And the intelligence itself is being standardized (e.g., OpenTelemetry) to ease cross-tool data exchanges, unified data presentation, and more comprehensive data processing. Further data acquisition advancements are now targeting network blind spots such as cloud services and home networks. In a networked world

where detailed end-to-end visibility and control are vital for success, there can be no blind spots. And with all this additional network information comes the need for even more comprehensive and immediate data analysis.

Enter artificial intelligence and machine learning. Complex data sets, adaptive logic, pattern recognition, anomaly detection, and more are bolstered by solutions that learn and improve on their own. Shortfall in networking staff? The network performs its own analysis and takes actions. Shortfall in networking skills? The network identifies needs, know capabilities, and adapts accordingly.

Automation, while serving as the ultimate network management function, lags acquisition and analysis when one examines solution availability and capability. Key automation advancements in such areas as analytics-driven triggers, low- or no-code development tools, open source, and strengthened governance techniques should accelerate as network and IT automation efforts heat up within both enterprises and service providers.

About the Analyst



Mark Leary, Research Director, Network Analytics and Automation

Mark Leary is responsible for worldwide technology market research and analysis. Mark's core research coverage focuses on network performance management solutions, network automation projects and products, and related predictive analytics, AI/ML, digital experience management, and "programming" technologies as they apply to a resilient, dynamic, and secure network infrastructure. Based on his current work and background, Mark's research also examines the evolution of enterprise network infrastructure; adoption of cloud services and software-defined systems; buildout of professional services and partner ecosystems; fortification of network management best practices; and the reformation of IT staff roles and skills in this hyperconnected digital era.

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