White Paper

Addressing the Need for Proactive Day 2 Datacenter Network Operations

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IDC OPINION

As the imperative of digital transformation continues to reverberate across the enterprise IT landscape, network operators find themselves under unprecedented pressure to leverage intelligent automation not only for provisioning but increasingly throughout the network life cycle, such as provisioning, configuration, and segmentation. That said, the benefits of intelligent automation can and should be extended to Day 2, addressing the more daunting tasks of keeping the datacenter network fully operational and running at peak efficiency.

Network operators must be capable of using automation and real-time intelligence to achieve a proactive posture that increases Day 2 operational agility, which includes making network changes in a frictionless and seamless manner, maintaining performance and availability across distributed environments, delivering faster troubleshooting and remediation, and preventing costly unplanned outages.

The challenge demands sophisticated tools that provide deep and actionable network intelligence that both identify the root causes of problems and quickly prescribe resolutions.

In this white paper, we explore how Cisco Network Assurance and Insights is suited to respond to these needs with a set of capabilities for proactive Day 2 network operations.

SITUATION OVERVIEW

In this period of increased digitalization, when all companies are recognizing the growing importance of applications to tangible business outcomes, success increasingly depends on an organization's ability to not only modernize its IT infrastructure but also make infrastructure changes quickly and accurately to speed the continuous delivery of new applications and services.

IDC's *IT Strategy and AI Adoption Survey,* for example, found that enterprises are looking to AI-enabled network automation to address several challenges, including optimizing and enhancing application availability and user experience, implementing advanced security policies, achieving effective and consistent operations across on-premise and cloud environments (multicloud), reducing the cost and complexity of network operations, and bringing greater simplicity to network, deployment, management, and ongoing operations (see Figure 1).

FIGURE 1

Top Priorities for AI-Enabled Network Automation

Q.   *What do you see as the most important aspects of an AI-enabled network automation solution? (Pick three.)*
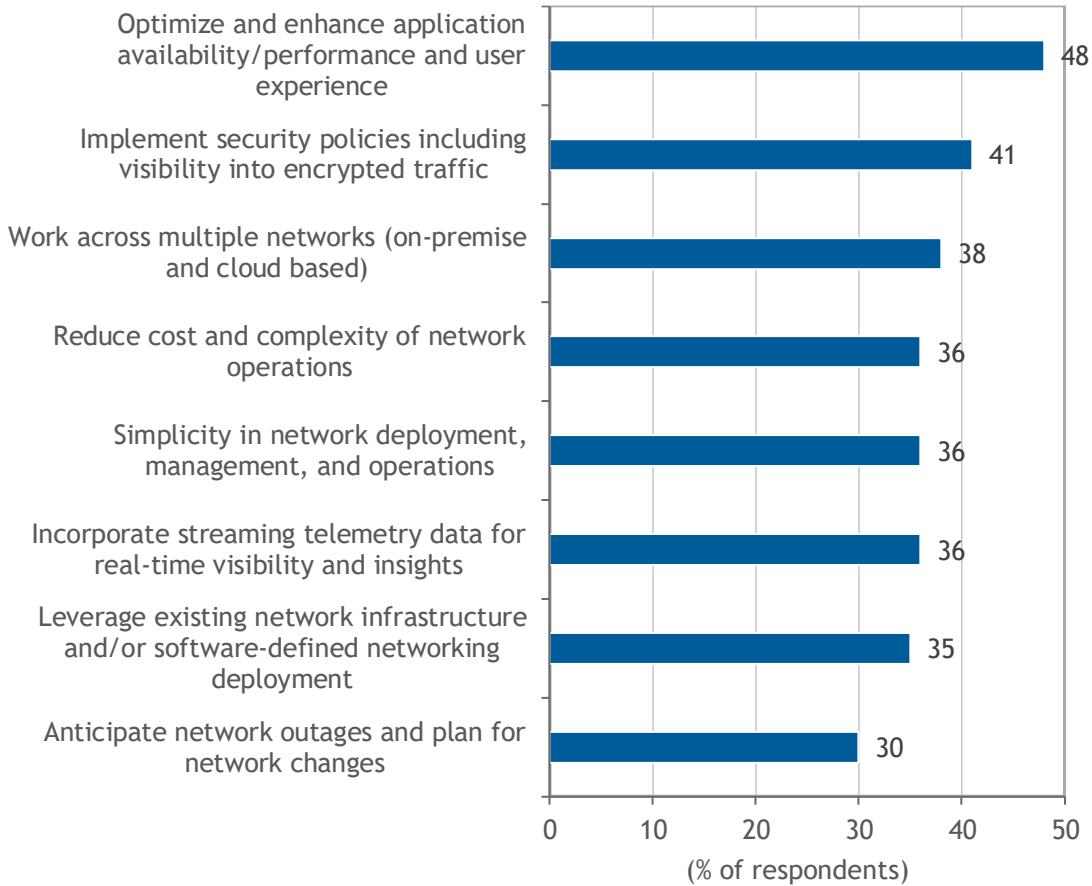
Source: IDC's *IT Strategy and AI Adoption Survey, 2019*

In the same survey, 43% of respondents indicated they had implemented AI-enabled network automation to some degree, while another 34% indicated that they planned to implement AI-enabled network automation. Respondents reported they were doing so to achieve lower costs, increased agility, higher availability, and better security. Major drivers were the need for improved performance and the desire for reduced complexity.

Avoiding downtime is a perennial concern. IDC estimates that the mean cost of enterprise downtime is $250,000 per hour. The number applies across all industries, organizational sizes, and geographies. Depending on the organization, the actual cost of downtime can vary widely. Large financial institutions (e.g., those that have heavy transaction loads) can incur downtime losses measured in millions of dollars per hour. That said, an "average" organization experiencing a relatively short eight-hour outage would lose approximately $2 million as a result of downtime.

There are many causes of downtime, of course, but, as this white paper explains, a proactive approach to Day 2 network operations can result in faster remediation of network outages and can also establish best practices that can help prevent downtime.

Day 2 Datacenter Network Operations Challenges

Enterprises increasingly recognize the unprecedented importance of applications and data. As applications become the digital lifeblood of modern enterprises, the datacenter network serves as the digital nervous system that enables and supports them. In turn, network administrators are expected to make network changes accurately to support business requirements and proactively prevent network problems and recover quickly from them when they occur. An inability to do so can result in lengthy downtime, involving significant organizational impact and substantial business costs.

Unfortunately, the extensive set of tools that network operators currently use to address these Day 2 issues are fragmented, reactive rather than proactive, outdated, and only capable of providing limited insights.

Benefits of Successfully Addressing Day 2 Operations

Meeting these challenges successfully, with tools fit for the purpose, can result in both business and IT benefits, which include the following:

- Improved customer experience, which is reflected in three key capabilities:
    - The ability to guarantee reliability by predicting datacenter network behavior
    - Increased uptime through avoidance of outages and assurance of SLAs
    - Greater customer satisfaction through quality of service
- Increased revenue, which is enabled in three ways:
    - Faster time to value and greater agility
    - Increased focus on business strategies rather than on troubleshooting with inefficient tools
    - Reduced change windows, yielding increased availability
- Decreased cost, achieved by the following:
    - Prevention of lost revenue, costly compensations, and lawsuits caused by service impact outages
    - Capex savings through increased resource efficiency and performance
    - Opex savings through enabling systematic approaches to problem resolution
- Business continuity and compliance:
    - Ensuring network security and compliance
    - Achieving greater confidence in change impacts by modeling changes
    - Reduced risk associated with network operations

HOW CISCO ADDRESSES DAY 2 DATACENTER NETWORK OPERATIONS

Cisco's approach to Day 2 network operations is represented by Cisco Network Assurance and Insights, an integrated set of tools that provides network assurance, proactive advisories, and intelligent analytics (see Figure 2). This enhanced offering extends the Cisco datacenter intent-based network (IBN) to transform the network operation model and enables IT operations to align closely with business objectives and outcomes as well as operational requirements across both ACI and NX-OS datacenter fabrics.

FIGURE 2

Cisco Network Assurance and Insights
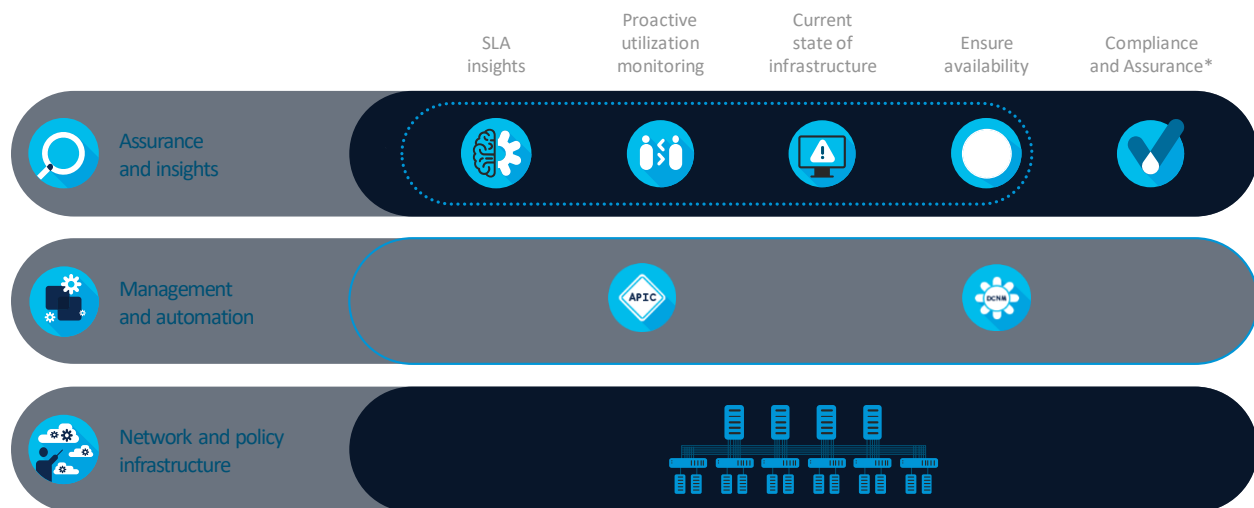
* Roadmap for NXOS Fabrics

Source: Cisco, 2020

These features give the network operator the means of providing the following capabilities:

- **Business intent assurance.** This provides operators with the confidence that the network can continuously meet business intent. Through prechange analysis, an operator can verify the impact of changes before they are implemented in the fabric. Cisco Network Assurance and Insights can also identify potential security breaches that are at risk of occurring in the network, enabling operators to take corrective measures to preclude vulnerabilities that could result in outages.

- **Guaranteed reliability.** This enables operators to be notified of known issues that may affect the integrity of the network. It is achieved through gathering and analyzing system-level data and the configuration of each switch in the fabric. Upgrade impact analysis allows operators to make business-critical decisions with confidence regarding how and when changes should be made.

- **Intelligent troubleshooting.** When problems arise, operators can use real-time telemetry data to identify the root cause and solve issues quickly. Intelligent analytics provides deep understanding of the fabric and delivers advice that helps operators ensure that service-level agreements are met through having insights into traffic and application patterns, latency, and packet drops.

These core capabilities of Cisco Network Assurance and Insights come together to help enable the transformation of datacenter operations by giving operators a set of tools that allow the network to keep pace with the speed of business in the cloud era. In this respect, Cisco Network Assurance and Insights offers policy compliance, the ability to make changes with foresight and accuracy, proactive outage prevention, efficient resource allocation in service to capacity planning, and the ability to detect issues and misconfigurations on network devices such as routers.

Cisco innovations that enable these capabilities are as follows:

- **Automated root cause analysis.** Continuous assurance allows correlation and analysis of policy and dynamic network state information to ensure accuracy and intent. Cisco Network Assurance and Insights rapidly determines the root causes of problems. It also provides prescriptive and proactive actionable next steps that can help operators remediate issues before they evolve into serious problems.

- **Compliance.** Automated audit verification ensures that network security SLAs, IT governance rules, and configurations remain in compliance.

- **Connectivity visibility.** Cisco Network Assurance and Insights provides answers to questions about connectivity and associations among objects, including virtual routing and forwarding (VRF), bridge domains (BDs), encapsulations, endpoint protection services (EPS), interfaces, and contracts. Operators get a clear view of state, real-time traffic patterns, and network flow analytics, including data relating to latency and packet drops. This full visibility helps identify potential "black holes" and blind spots in the network that can result from misconfigurations. Furthermore, network operators can take advantage of forensics capabilities to go back in time to perform root cause analysis and take corrective action based on suggested remediation.

- **Powerful subject matter expertise.** Cisco Network Assurance and Insights provides continuous verification and analysis of the entire datacenter network. It utilizes the knowledge base of Cisco Advanced Services, TAC, and Engineering escalation teams to help operators ensure that the network aligns with intent and simplifies troubleshooting and remediation. That result is akin to having network subject matter expertise embedded into the network fabric. Accordingly, Cisco Network Assurance and Insights can detect network outages and security policy vulnerabilities before they impact the business, reduce risk by performing continuous bug scrubbing and PSIRT analysis, predicting change impact, and rapidly determining the root cause of potentially debilitating problems.

- **Capacity planning.** This is supported through full visibility of resource utilization across the network and all the way to individual switches. The result is that network operators benefit from early detection of resources.

CHALLENGES/OPPORTUNITIES

One major challenge, for Cisco customers as well as for Cisco itself, is enterprise acceptance of comprehensive full life-cycle automation. Some traditional network operators are culturally resistant to network automation, partly because they, in many cases, remain relatively unfamiliar with it. Such automation, including adoption of proactive Day 2 operations, represents change, which is perceived as both a risk – a leap into the unknown – and a potential threat to the status quo, including established procedures and processes and even job security. To overcome this challenge, Cisco will have to demonstrate that the considerable benefits of proactive Day 2 network operations easily outweigh the perceived risks. Besides, organizations pursuing digital transformation, by moving to become more agile and cloud forward, ultimately must modernize not only infrastructure but also

operational processes. In that context, proactive Day 2 network operations become essential to the success of digitally transformed organizations.

The opportunity for Cisco takes the form of helping these organizations make the operational transition to an agile, cloud-era operational approach that delivers enhanced customer experiences and heightened customer engagement, faster time to revenue, greater operational efficiency, and improved business continuity.

CONCLUSION

Digital transformation means that applications have gained unprecedented value, but multicloud makes the challenge of operating the networks that support and deliver those applications increasingly complex. While significant progress has been made to bring intelligent automation and intent-based provisioning to modernized datacenter networks, network operators also need intelligent automation that extends to Day 2 operations so that the network can avoid costly outages and continue to run at optimal efficiency.

Cisco Network Assurance and Insights is designed to help network operators achieve those benefits for their organizations. An integrated set of intelligent tools that provide analysis, ensure intent, and identify network performance issues, Cisco Network Assurance and Insights gives network operators a means of enhancing Day 2 operations with deep analysis, intent assurance, and identification of network performance issues. By automating and modernizing Day 2 operations, network operators can align better with the strategic objectives and business outcomes of their organizations and deliver ongoing benefits such as enhanced customer experience, increased revenue, lower costs, and assured business continuity and compliance.

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