Successful Network Operations in a Cloud-Centric, Software-Defined World with CA Performance Management

EMA™

IT & DATA MANAGEMENT RESEARCH,
INDUSTRY ANALYSIS & CONSULTING

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Executive Summary

The advent of cloud computing and software-defined data center architectures for modern application delivery has made networking more sensitive than ever before. Applications in the digital age require networks that can expand and contract dynamically based on consumer demand. Enterprises are implementing software-defined networking (SDN) to deliver the automation required by these new environments, but the dynamic nature of SDN makes network management and monitoring fundamentally more challenging. Network infrastructure teams need monitoring tools that can provide visibility into these new and constantly changing networks. This white paper explores the importance of SDN monitoring and examines a leading example of a solution, CA Performance Management with CA Virtual Network Assurance integration.

Digital Transformation Requires SDN-Based Network Transformation

Digital transformation is all about agility. Enterprises need to compete with digital competitors, which means they must rapidly innovate new business models. This innovation requires IT infrastructure that can facilitate and support rapid and continuous deployment of new applications. Enterprises are adopting hybrid cloud architectures and software-defined data centers (SDDCs) to deliver on this demand for agility. In such an environment, the network is critical to success, but it's also much more sensitive. IT organizations find that they must rapidly provision network connectivity and services according to application demands. They are adopting SDN to support these initiatives.. And because the failure of a single application component can have ripple effects across the network, they will also need network management capabilities that can provide visibility into the complex webs of dependencies that exist in these architectures.

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The network infrastructure world is feeling the effects of digital transformation. Recent Enterprise Management Associates (EMA) research has found that 44% of traffic on enterprise networks originates from external cloud services such as infrastructure-as-a-service (IaaS) and software-as-a-service (SaaS). Furthermore, of the four top IT initiatives that are impacting network infrastructure team decision-making, two are directly related to these trends: internal cloud services transformation (with 37% of all enterprises engaged in this type of initiative) and SDDCs (35%).
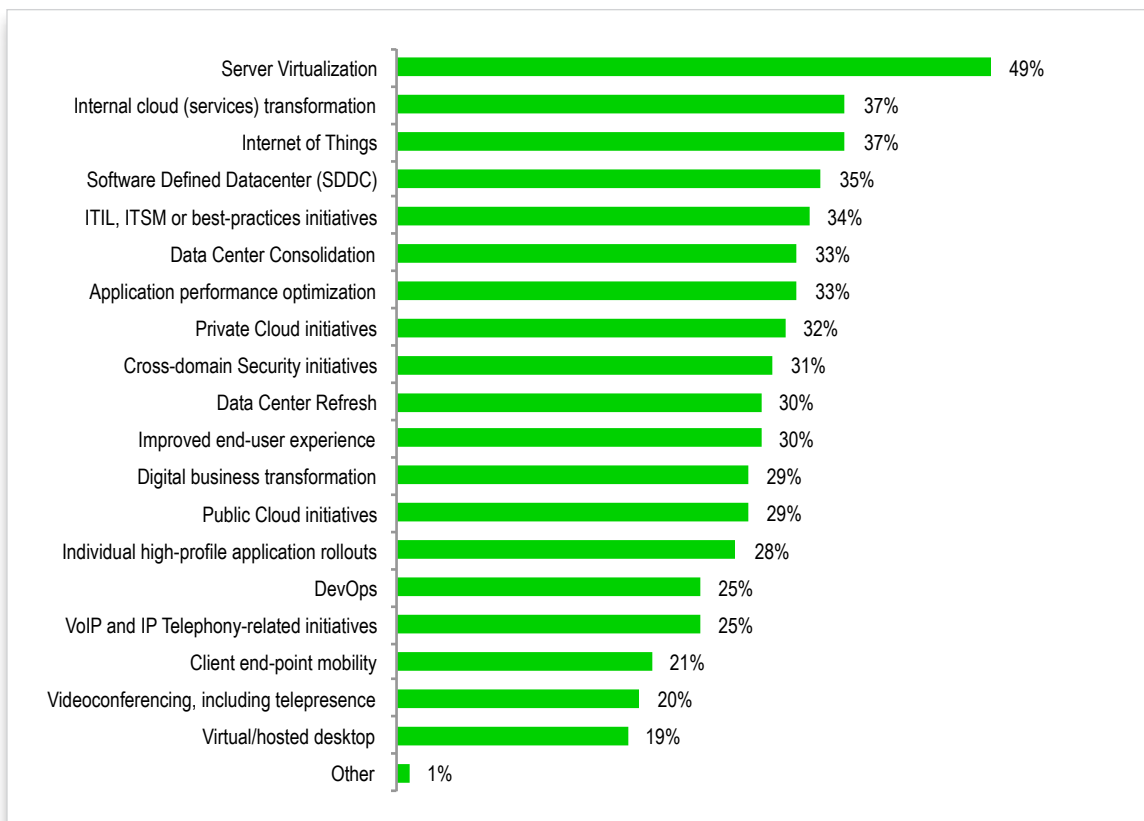
Figure 1. The top IT initiatives that drive current priorities in monitoring/
managing networks and networked application performance

SDN and network virtualization overlays are the foundation of the new architectures that support digital transformation. Fifty-five percent (55%) of enterprises that have deployed a hybrid cloud or plan to do so in the next 12 months will adopt a network virtualization overlay from vendors like Nokia Nuage or VMware. Furthermore, among all enterprises (not just adopters of hybrid cloud) 26% say they have deployed a data center SDN underlay like Cisco Application Centric Infrastructure (ACI) or OpenFlow-based solutions. These technologies transform networking, but they also drive enterprises to change how they manage their networks. SDN introduces unprecedented levels of automation and dynamism to the network. When networks are this dynamic, they become highly sensitive to individual component failures. Traditional network monitoring tools are not designed to provide visibility into a constantly changing network.

Choose the Right Network Management Tools to Support SDN

When an IT organization implements SDN, network virtualization, and cloud networking technologies, it must carefully re-evaluate its existing network management tools. In doing this, many organizations will discover that their tools are not ready to support SDN-based network transformation.

EMA research has found that network performance monitoring tools have an SDN problem. Approximately two-thirds of data center SDN adopters say their network performance monitoring tools do not fully support SDN. Among those who didn't consider their monitoring tools capable of supporting SDN, some were modifying their existing tools while others were acquiring new tools.

Because very few enterprises will perform a wholesale rip-and-replace of existing infrastructure, SDN and legacy network technologies will coexist for years. This means that network infrastructure teams will be managing SDN and legacy networks simultaneously. Rather than buy a new and separate set of tools to support SDN, network infrastructure teams should take an integrated approach to SDN operations. If possible, they should modify or extend their existing monitoring tools to support SDN. By using their existing, standard tools, network teams will be able to manage SDN from within a familiar operational user experience with dashboards, reports, analytics and thresholding that they already know how to use.

A comprehensive and integrated network management approach is essential because network operations teams tend to be less effective when they use a larger set of siloed network monitoring and troubleshooting tools. EMA research has found that network operations teams that use just one to three network monitoring and troubleshooting tools on average catch 73% of network problems before users detect and report them. But organizations that use 11 or more network monitoring tools typically catch only 48% of network problems. Furthermore, IT organizations that fail to take an integrated approach to network management have very unstable networks. For instance, 34% of network teams that use 11 or more monitoring tools experience several network outages per day. Only 6% of IT organizations that were using just one to three tools reported experiencing multiple network outages per day. Instead 21% of these more-efficient tool users experienced outages just once or twice per year, and 18% said they almost never have an outage.

CA Delivers Comprehensive and Scalable SDN-Ready Monitoring Solution

Leading infrastructure management vendor CA Technologies offers one of the most scalable and comprehensive approaches to monitoring the performance of SDN, and SDDC. And it delivers this capability without requiring network operations teams to adopt and learn a new management tool.

CA Performance Management 3.0 is a highly scalable and adaptable network availability and performance monitoring system. It can monitor up to 4 million items at one-minute intervals. In fact, one communications service provider uses the tool to monitor 3.9 million metrics every minute and 43,000 metrics every second. CA Performance Management can normalize this enormous amount of data into a standard format and present it to network administrators on a customizable dashboard.

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CA Virtual Network Assurance (VNA) 2.0 is CA's SDN and network virtualization monitoring engine. It serves as a gateway that integrates with other CA management products to provide visibility into SDN and network virtualization technologies. VNA normalizes SDN monitoring data and provides relationship monitoring among SDN elements. VNA integration with Performance Management automatically adds SDN and network virtualization tabs to Performance Management's dashboards for easy monitoring and troubleshooting of next-generation networks. Because VNA is an SDN gateway for Performance Management, not a new tool, administrators never interact with VNA. They can manage and monitor new networks through the existing Performance Management tool, which allows them to simplify management and avoid the pitfalls of having too many tools.

With the new VNA 2.0 release, CA has added support for Cisco ACI and Nokia Nuage network virtualization overlay solutions. Prior to this product update, VNA already enabled monitoring of VMware NSX, Juniper OpenContrail, OpenDaylight, and OpenStack. By expanding its support to include Cisco and Nuage's SDN solutions, CA now offers one of the most comprehensive solutions for monitoring SDN, network virtualization, and cloud networking.

CA Performance Management enhanced by VNA allows network operations to monitor and troubleshoot the networks that underpin the hybrid cloud and SDDC architectures enabling today's digital transformation initiatives. The CA platform can monitor application service chains along with individual network nodes and endpoints. And since SDN technologies offer logical constructs, such as application profiles and endpoint groups, CA's solution is built to monitor these constructs and present them to administrators with an intuitive dashboard view.

CA enables easy management of complex, dynamic, automated networks. Traditional networks are static, and there is often no need to adjust monitoring. However, SDDC enables cloud networks to expand and contract dynamically based application demand. This automation comes at a price. The dynamic nature of this new automated networks makes managing and monitoring SDN fundamentally more challenging and demands monitoring tools need to understand and adapt to these changes.

CA Performance Management monitors the dynamic relationships introduced by SDN rather than just individual device metrics, so network administrators can understand things such as the relationships between virtual machines (VMs) and application profiles, VMs and virtual switches, and individual switches and the entire network fabric. This visibility is important because it allows an administrator to understand how suboptimal conditions with one network element impacts other elements in the application service chain.
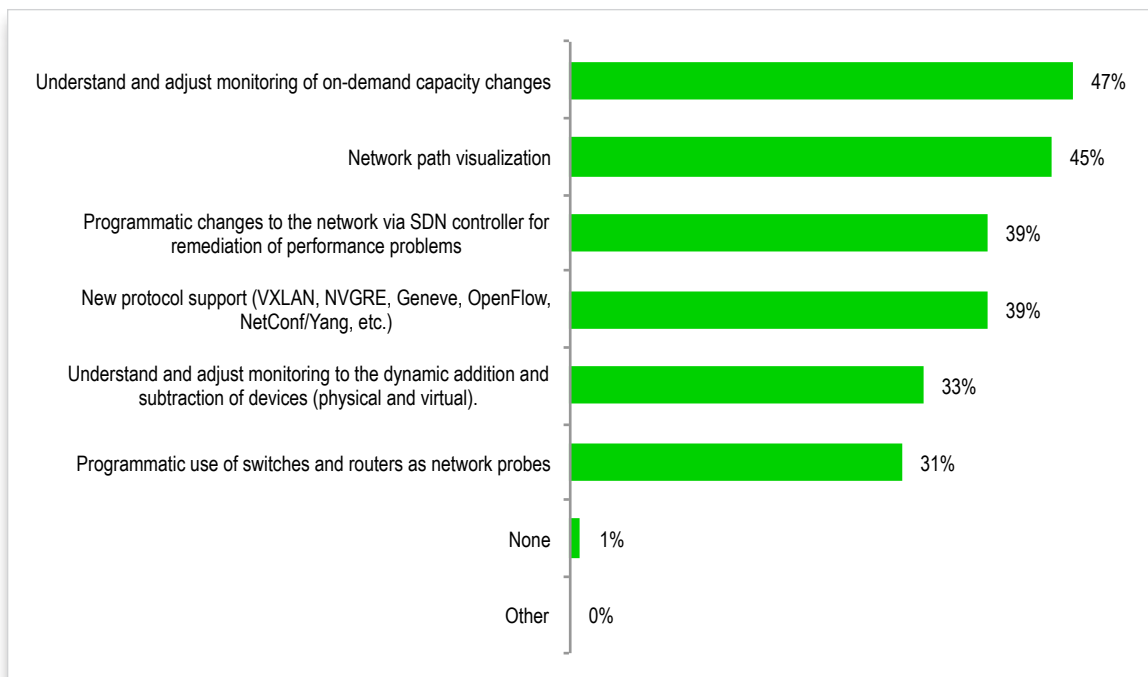
Figure 2. Early adopters identify top new feature requirements for SDN performance monitoring

Also, when new applications and services emerge on the infrastructure, relationship-based monitoring is essential. The CA platform enables network operations insight into how all the elements of a new application environment affect each other. In fact, EMA research found that the top two new requirements for SDN performance monitoring were the ability to "understand and adjust monitoring of on-demand capacity changes" (47%) and new "network path visualization" of SDN flows (45%).

EMA Perspective

Enterprises are transforming their networks with SDN and network virtualization to support digital initiatives like cloud and SDDCs. While these transformations allow the IT organization to better serve the business, they also come with operational challenges. Existing network management tools are typically not ready to support these new networks.

Enterprises need monitoring tools that can fully support SDN and legacy environments without adding operational complexity. EMA recommends that network operations teams take a strategic approach to evolving their management toolkits. Rather than adding to the number of monitoring tools that they use on a daily basis, network teams should find comprehensive management tools that can monitor both existing networks and SDN networks.

With Performance Management 3.0 enhanced by Virtual Network Assurance 2.0, CA offers a comprehensive and highly scalable solution for next-generation network management.

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About CA

CA Technologies (NASDAQ:CA) creates software that fuels transformation for companies and enables them to seize the opportunities of the application economy. Software is at the heart of every business in every industry. From planning, to development, to management and security, CA is working with companies worldwide to change the way we live, transact, and communicate – across mobile, private and public cloud, distributed and mainframe environments. Learn more at www.ca.com.

About Enterprise Management Associates, Inc.

Founded in 1996, Enterprise Management Associates (EMA) is a leading industry analyst firm that provides deep insight across the full spectrum of IT and data management technologies. EMA analysts leverage a unique combination of practical experience, insight into industry best practices, and in-depth knowledge of current and planned vendor solutions to help EMA's clients achieve their goals. Learn more about EMA research, analysis, and consulting services for enterprise line of business users, IT professionals and IT vendors at www.enterprisemanagement.com or blogs.enterprisemanagement.com. You can also follow EMA on Twitter, Facebook or LinkedIn.

Corporate Headquarters:
1995 North 57th Court, Suite 120
Boulder, CO 80301
Phone: +1 303.543.9500
Fax: +1 303.543.7687
www.enterprisemanagement.com
3464.102816