Cloud-Based Network Management

Buyers Guide

Should You SaaSify?

Should your organization transition to cloud-based, Software as-a-Service (SaaS) network management? That's the question. It's the reason you're taking time to read this guide. Your company is likely using SaaS-based productivity apps, so why aren't you following suit with your network management solution? The trend to adopt cloud-based infrastructure management platforms has been described as the "SaaSification of IT". As the analyst firm IDC noted in a recent report, "**Just as the industry has seen with SaaS-delivered business applications, IT organizations are turning more and more to centralized service-based management solutions — not just across the network but across all of the digital infrastructure**." [1]

The network is critical to your business, and the responsibility for ensuring SLAs rests with you and your team. This paper will provide guidance on the issues and choices you should consider to help decide whether to SaaSify your network management and what to look for in a cloud-based network management vendor.

Why Cloud-Based Network Management?

For over a decade, enterprises worldwide have been transitioning to SaaS, because of the advantages these cloud services offer. In fact, a recent survey of IT and network operations staff by the analyst firm Enterprise Strategy Group (ESG) found that, **"…nearly three-quarters (73%) of respondents stated that their organization's preference is cloud-based solutions."**[2]

3 out of 4
IT organizations prefer cloud-based network management solutions

Organizations have realized that managing infrastructure from the cloud simplifies highly complex tasks, enabling them to deploy locations in minutes and providing unprecedented levels of centralized control and visibility. It also allows for seamless growth without bottlenecks and end-to-end visibility. Cloud-based network management facilitates efficient lifecycle management for devices across headquarters, remote locations, remote workers, and Internet of Things (IoT). As a result, industry analysts predict growing investment in cloud-based infrastructure management offerings to achieve greater efficiencies and business outcomes facilitated by these SaaS offerings. **The market is forecasted to grow from $10.6B in 2020 to $31.4B in 2025, a 24% CAGR.**[3]

$31.4B
market
by 2025,
24% CAGR

SaaSifying network management facilitates a simpler, more efficient way to deploy and manage networks. It delivers enterprise-class network management capabilities for Wi-Fi access points, switches, routers, network access control (NAC), and software-defined wide area networks (SD-WAN) as a hassle-free, easy to consume service. The survey cited above identified the top three reasons why cloud-based network management solutions are preferred[4]:

1. Lifecycle management
2. Ability to leverage AI/ML technologies hosted in the cloud
3. Ability to easily access when working remotely

Another driver of the move to SaaS services is the elimination of the capital expense (CapEx) and operating expense (OpEx) costs of deploying and managing the data center infrastructure required to host on-premises network management.

[1] Enterprise Strategy Group, "Research Report: End-to-end Networking Visibility and Management", Apr-23, page 11
[2] ibid., page 12

Benefits of Cloud-Based Network Management

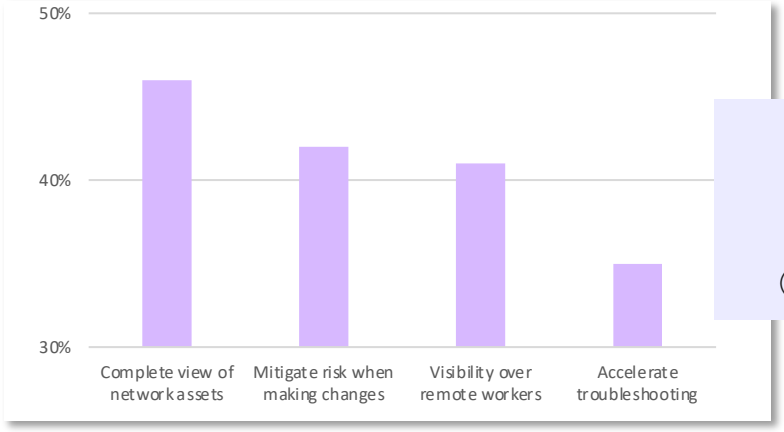
Cloud-based network management services offer **a common set of benefits: simplicity, reduced cost, and faster time-to-value**. AIOps and business insights solutions deliver capabilities that provide additional benefits to other organizations within the business as well as IT. We'll examine these capabilities along with the differentiating features of true SaaS network management solutions. An understanding of the following characteristics will help identify what to look for in different vendor solutions to decide if they are a good fit.

Simplicity and Efficiency

Arguably the greatest benefit of cloud-based network management is its simplicity, due to the ability to centrally manage wired and wireless networks, SD-WAN, NAC, and zero trust network access (ZTNA). However, there are additional characteristics that will further enhance cloud management capabilities and increase operational efficiency.

Unified Network Management

Cloud-based networks can manage both local area network (LAN) and wide area network (WAN) access, from deployment to management and troubleshooting, thereby eliminating the need for different management systems. Most networking environments are heterogeneous with products from more than one vendor. Expansion of services to the edge adds even more complexity. Therefore, **a unified SaaS network management solution should support a wide range of APs and switches from multiple vendors as well as IoT devices**. The integration of fabric, network security, and SD-WAN technologies is also essential to ensure consistency across environments. The ability to provide end-to-end visibility and deliver centrally managed, secure network access with consistent access policies from HQ to remote branches and remote workers delivers a variety of advantages. The survey referenced earlier identified the top benefits to IT organizations:[5]



Why do organizations prefer end-to-end network visibility?

(Multiple responses accepted)

Efficient Lifecycle Management

During deployment, cloud-based network management enables centralized configuration and onboarding of devices for all or part of the network using consistent policies. This greatly simplifies the deployment process. Network devices only need to be plugged in and then each will automatically discover, download, and install the configurations. Once deployed, network administrators can easily monitor, troubleshoot, and update the network. Troubleshooting tasks are especially simplified due to the ability to diagnose and resolve issues for central and remote locations alike.

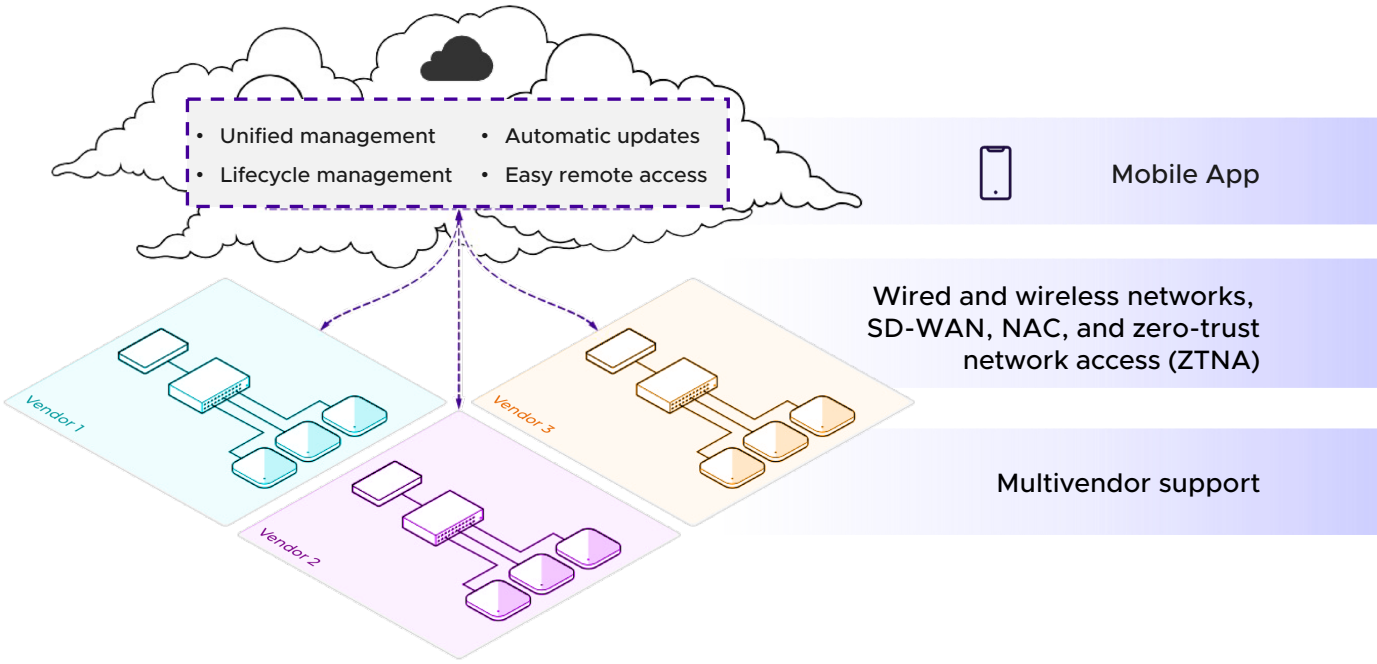
[5] Enterprise Strategy Group, "Research Report: End-to-end Networking Visibility and Management", April 2023, page 14.

Automatic Updates

Cloud-based network management vendors can also support the process of upgrading the management functionality and the networking device firmware. Customers should always have the latest features available, without having to use in-house resources to perform the upgrades – just like in a SaaS model. As the market becomes more competitive and vendors look to differentiate themselves by driving additional value and functionality with new Wi-Fi, switching, and routing features, managing the upgrade process in a legacy on-premises model can become challenging for IT departments and delay the availability of new features for users and the operations team.

Easy Remote Access

Users need to be able to access the cloud-based network management solution from anywhere. A mobile application (app) should be available on app stores that can be downloaded and used from a variety of mobile devices. **The app should be very intuitive and easy to use. It should facilitate the on-premises onboarding of devices using barcodes and location services.** The app should also include diagnostic tools to facilitate troubleshooting without needing to use a PC or laptop.



Flexibility and APIs

SaaS management platforms are based on a cloud-native architecture that is highly scalable, resilient, and deployable across a variety of cloud and on-premises environments.

> *"Moving to cloud-based management solutions delivers the flexibility, agility, functionality, accessibility, and security that matches a network environment that is under constant pressure to heighten service integrity and capability in response to fast-moving business requirements and technology advancements."*[6]

Mark Leary, Director,
Network Observability and Automation at IDC

Scalability—Up and Out

Network management, like networks, scales along two dimensions. The first dimension is network size, which allows customers to grow their networks seamlessly by as few or as many devices as needed. The second dimension is functionality. Scalable functionality lets customers add further features and upgrade to a higher solution tier with more capabilities, without impacting the current network and the existing configurations and policies. The ability to quickly add capacity is a significant benefit – the process is sometimes as fast as a few minutes. IT organizations can add capacity in small or large increments, from only one or two devices to bringing up one or more new locations.

Seamless Upgradability

Cloud-based network management is designed to adapt to new technologies and support integrations. It does not require underlying infrastructure, like having to purchase new hardware and software platforms, and having to train personnel on the new services and applications. In other words, the management software lets customers scale the network exactly as needed and greatly simplifies network expansions.

APIs

Cloud-based network management data can be used with a wide range of applications for a multitude of business and IT use cases. As a result, vendors need to offer different categories of APIs to support a comprehensive range of use cases. These should include APIs for presence and location analytics, identity management, and network configuration. A developer program enables partners to successfully work with the APIs and shortens time-to-deployment of their applications and integrations. The program should include a portal for access to the APIs, documentation, and support.

Transferable Licensing

SaaS network management allows vendors to facilitate transferable licenses. Management licenses no longer need to be permanently tethered to a specific device, and forward-looking vendors allow network admins to allocate licenses to devices through the cloud-based management systems. Ultimately, this facilitates cost-effective network refresh and change.

Deployment Choices

Each organization has different needs. While many customers today opt for public cloud deployments with their many advantages, other customers choose on-premises deployments due to organizational, industry or legal requirements. Depending on the requirements, an organization may be forced into one deployment model. Operations teams must also understand how these solutions address the full range of security, compliance, performance, and business requirements of their organization. There will be an ongoing need for on-premises or air-gapped solutions, and cloud-based or hybrid deployments, so network management tools must support a variety of options.

Cloud-Native and Cloud Agnostic

The best cloud-based management applications feature cloud-native architectures and containerized microservices to increase platform flexibility and scale. With containerization, a vendor's cloud-based network management platform becomes agnostic to the underlying Infrastructure as-a-Service (IaaS) platform. **This flexibility provides organizations with greater portability between Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP),** and other services as their commercial and technical needs change. Vendors should offer a range of deployment options in the regional data centers (RDCs) and virtual private clouds of the major cloud providers and local managed service providers.

Flexibility and Consistency

Cloud-based network management solutions with a single underlying platform are an exception rather than the norm. While evaluating different solutions, be sure to research if they can address the security, performance, and compliance requirements, regardless of location, to facilitate seamless network growth over time. **The solutions and the associated applications, such as fabric, SD-WAN, NAC, and ZTNA, should support an upgrade path without needing replacement of the management system** or networking hardware.

The solution should provide the required management features with support for the networking vendor and third-party devices. **The vendor should be committed to making new features available on all deployment options to ensure consistent functionality across options in the future.** This capability provides IT organizations with optimum flexibility to transition to SaaS network management as they deem necessary.

A cloud continuum that spans from the public cloud to the network edge should address the complete spectrum (from basic to advanced) of where customers may be in their cloud journey.

Support for a Cloud Continuum

As new applications and business services are implemented in edge environments, the requirements for the network infrastructure and the cloud-based network management that supports them are changing. Edge computing and distributed cloud architectures fall short by not accounting for networking. This gives rise to the need for a cloud continuum that spans from the public cloud to the network edge. A cloud continuum addresses the complete spectrum (from basic to advanced) of where customers may be in their cloud journey, offering:

- Cloud sovereignty: data residency, privacy, and control
- Low latency performance that comes from computing and data management at the edge
- Control of what data goes to the cloud by allowing for options from airgap to share all

IDC, "AIOps: Growing Adoption and Best Practices", Doc # US49753122, October 2022.

AIOps

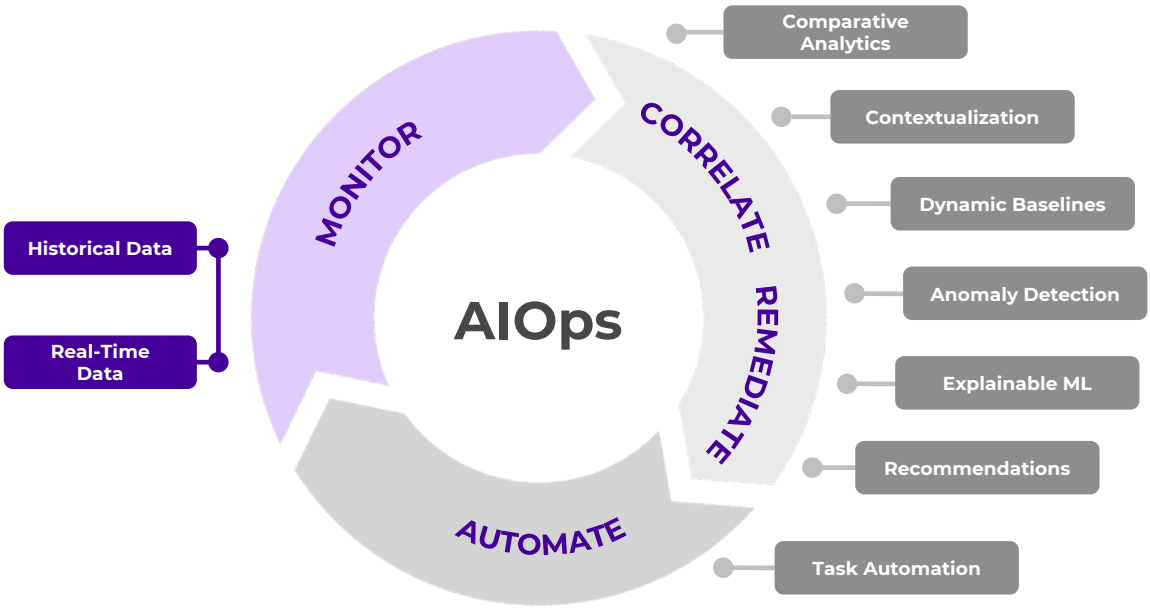
The collection of telemetry data from the network, devices, and supported applications facilitates artificial intelligence (AI) and machine learning (ML) capabilities. These solutions are categorized as artificial intelligence for operations (AIOps). SaaS network management platforms can collect valuable information about the devices, clients and applications running across the network. The analyst firm Forrester Research noted in a recent report, "Flexibility to deploy in dynamic environments, as well as to monitor diverse technology stacks in real time, is essential for AIOps implementations to deliver value."[7] This telemetry information can be aggregated into a data pool (or data lake) that can be accessed through APIs, so that vendors and service providers can extend the platform's functionality.

> *"Flexibility to deploy in dynamic environments, as well as to monitor diverse technology stacks in real time, is essential for AIOps implementations to deliver value."* **(Forrester Research)**

Comparative Network Analytics

Comparative analytics provides greater context and facilitates more effective observability capabilities. Effective ML includes algorithms and data inputs that allow users to compare the performance of their own network with the averaged performance of other deployments. They can generate dynamic baselines and proactively troubleshoot issues before they become noticeable to end users. Advanced cloud-based network management solutions can leverage an anonymous network telemetry data pool available in the cloud. The vendor must implement strict processes to ensure that the data is anonymized, and users are unable to view or access data from other customers. They also must be certified to be in compliance with any legal and security requirements.

Anomaly detection (aka outlier analysis) requires the ability to compare patterns over time with data from a broader base of devices. Within this dataset are data patterns that represent business as usual. They help establish what is normal at a location, across a network, at certain times, and so on. An unexpected change within these data patterns, or an event that does not conform to the expected data pattern, is considered an anomaly.

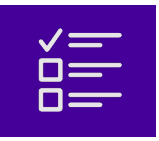


Trusting the Recommendations

AI and ML provide many advantages, but users have some significant concerns. How was a recommendation derived? What algorithms were used to correlate and detect anomalies? There needs to be transparency to foster trust. An AIOps tool must provide explainable ML and AI, so users can trust the analysis and recommendations from the application. As IDC noted in a recent report, "Explainable AI systems allow for the understanding of how models are created; interpretable AI systems facilitate the understanding of the output of AI systems."[8]

Implementing AIOps

AIOps solutions can help drive decision-making for IT departments. Utilizing these capabilities in cloud-based network management makes networks increasingly more intelligent and focused on defining common behaviors, which can decrease workload and increase efficiency. The ability to upgrade to AIOps capabilities should be included in the product requirements criteria, but it is not essential to the core requirements when deciding to transition to SaaS network management.



Cost Efficiencies

Switching to cloud-based network management can significantly reduce the cost of deploying and operating networks, compared to hosting them in-house. Organizations will be able to save cost in the following areas:

- ✓ Capital expenditures for redundant hardware and software infrastructure for the network management system and centralized hardware controllers
- ✓ Forced upgrades as the network grows in scale may necessitate the purchase of a new network management application once the network reaches a certain size
- ✓ Associated personnel-related expenses (salaries, benefits, training) for management and support, and the potential requirement for additional hires when expanding the network
- ✓ Ongoing operational expenses for local intervention required for deployment and troubleshooting at remote offices and locations

The cost of moving to SaaS network management should have minimal impact on your investment in existing networking hardware and software. Vendors should offer a variety of subscription licensing and migration paths that allow organizations to transition cost-effectively based on their requirements and schedule.

Another benefit is the subscription fees from Managed Service Providers (MSPs) are treated as an operating expense by accounting. The IT organization can consume the management service as required. Treating network management as OpEx is ideal for a largely hybrid or remote workforce that requires greater flexibility. Organizations avoid incurring the upfront capital expenditures required for hosting their network management in-house. Vendors should offer the ability to select different tiers of subscription licensing by device to provide flexibility and cost efficiency.

Considerations When Moving to Cloud-Based Management

If your company is moving to SaaS for Office and CRM apps, why aren't they thinking of a SaaS network management application? Cloud-based network management is being adopted by IT organizations of all sizes, and the starting point for every business should be to determine their network strategy and priorities. The following are some additional issues an organization should bear in mind.

Security and Privacy

There are two main considerations that concern security and privacy:

- Perceived loss of control over customer network data
- Dependence on the cloud-based network management provider

Several potential security and legal implications need to be taken into account. They are related to infrastructure and identity management, physical and digital access control, risk management, regulatory and legislative compliance, auditing and logging, integrity control, as well as to provider-dependent risks. However, cloud-based network management providers are very conscious of the severity of these risks, and they are taking highly effective measures to address them. When evaluating cloud-based network management providers, confirm that measures for all above concerns have been implemented, and that their effectiveness is reviewed regularly.

Availability and Reliability

When moving to cloud-based management, many customers are concerned about system availability and reliability, due to a perceived loss of control. However, cloud-based network management providers are experts in infrastructure management with availabilities of 99.99% or more. With this, customers can rest assured that their network will be available continuously.

SaaS network management providers are also able to minimize downtime for updating the network, and schedule updates well in advance so that the business impact to customers' networks is minimized. Providers must also clearly state their resiliency plans, including redundancy and backup measures to ensure continued availability of networking services in case of outages and disasters. Advanced cloud-based network management solutions will continue to provide connectivity for end users, even if the connection to the cloud-based management is interrupted.

System Performance

Customers expect their cloud services and applications to be always available, and with the same speed and responsiveness as if they were hosted on-premises.

Again, trusted cloud-based network management providers will be able to supply their key performance metrics on service availability to review ahead of any decision. While cloud-based network management platforms are available almost anywhere via internet access, a globalized cloud infrastructure is a must-have. A global cloud infrastructure with regional data centers is a prerequisite for ensuring the best possible system performance, and it also offers redundancy.

Compliance

Many organizations must meet regulatory compliance requirements such as HIPAA (Health Insurance Portability and Accountability Act). Network management solutions should conform to ISO/IEC 27017 and be certified by DQS to ISO/IEC 27001 and ISO/IEC 27701, the International Standards Organization (ISO). SaaS network management providers typically implement compliance with regionally applicable regulations and will be transparent in sharing details about their compliance level, the capability to let customers generate audit reports, and the locations of their data centers. They should also address data privacy and GDPR-related obligations to the right to be forgotten, by enabling administrators to search, download, and delete personal data within their network management platform. Global data center presence therefore not only impacts system performance, but also offers organizations simplified compliance with regional data privacy requirements.

Checklist

Cloud-based network management is a powerful solution, and offers a host of advantages compared to traditional, on-premises network management systems. Even industries or regions that have traditionally relied on on-premises deployments, due to security and availability concerns, are increasingly moving to cloud-based management solutions. Hopefully, this guide has proven useful in determining whether to SaaSify your network management is the right choice.

Here is a checklist of benefits and capabilities that should be considered in potential solutions:

Flexibility

- Ability to seamlessly grow and upgrade the network
- Transferable licenses
- Choice of locations and cloud IaaS vendors
- A portfolio of APIs and a developer program
- Full support of a range of deployment options
- Upgrade options to add AIOps and business insights capabilities

Simplicity and Efficiency

- Unified management of the network vendor, third-party and IoT devices, plus SD-WAN and fabric
- Easy remote access via a mobile application
- Comparative network performance analytics
- Automatic device firmware updates
- Streamlined device lifecycle management

Cost Effectiveness

- Avoid or reduce upfront hardware and software CapEx
- Reduce OpEx for hosting and maintaining
- Licensing options to transition to SaaS and move to OpEx cost-effectively

Sources

[1] IDC, "Network Observability: Advantages of a Cloud-Based SaaS Delivery Model", Doc# US50981423, July 2023.
[2] Enterprise Strategy Group, "Research Report: End-to-end Networking Visibility and Management", April 2023, page 11.
[3] MarketsAndMarkets, "Cloud System Management Market", https://www.marketsandmarkets.com/Market-Reports/cloud-system-management-software-market-197839352.html.
[4] Enterprise Strategy Group, "Research Report: End-to-end Networking Visibility and Management", April 2023, page 12.
[5] Enterprise Strategy Group, "Research Report: End-to-end Networking Visibility and Management", April 2023, page 14.
[6] IDC, "Network Observability: Advantages of a Cloud-Based SaaS Delivery Model", Doc# US50981423, July 2023
[7] The Forrester Wave™, "Artificial Intelligence For IT Operations, Q4 2022", December 2022.
[8] IDC, "AIOps: Growing Adoption and Best Practices", Doc # US49753122, October 2022.

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