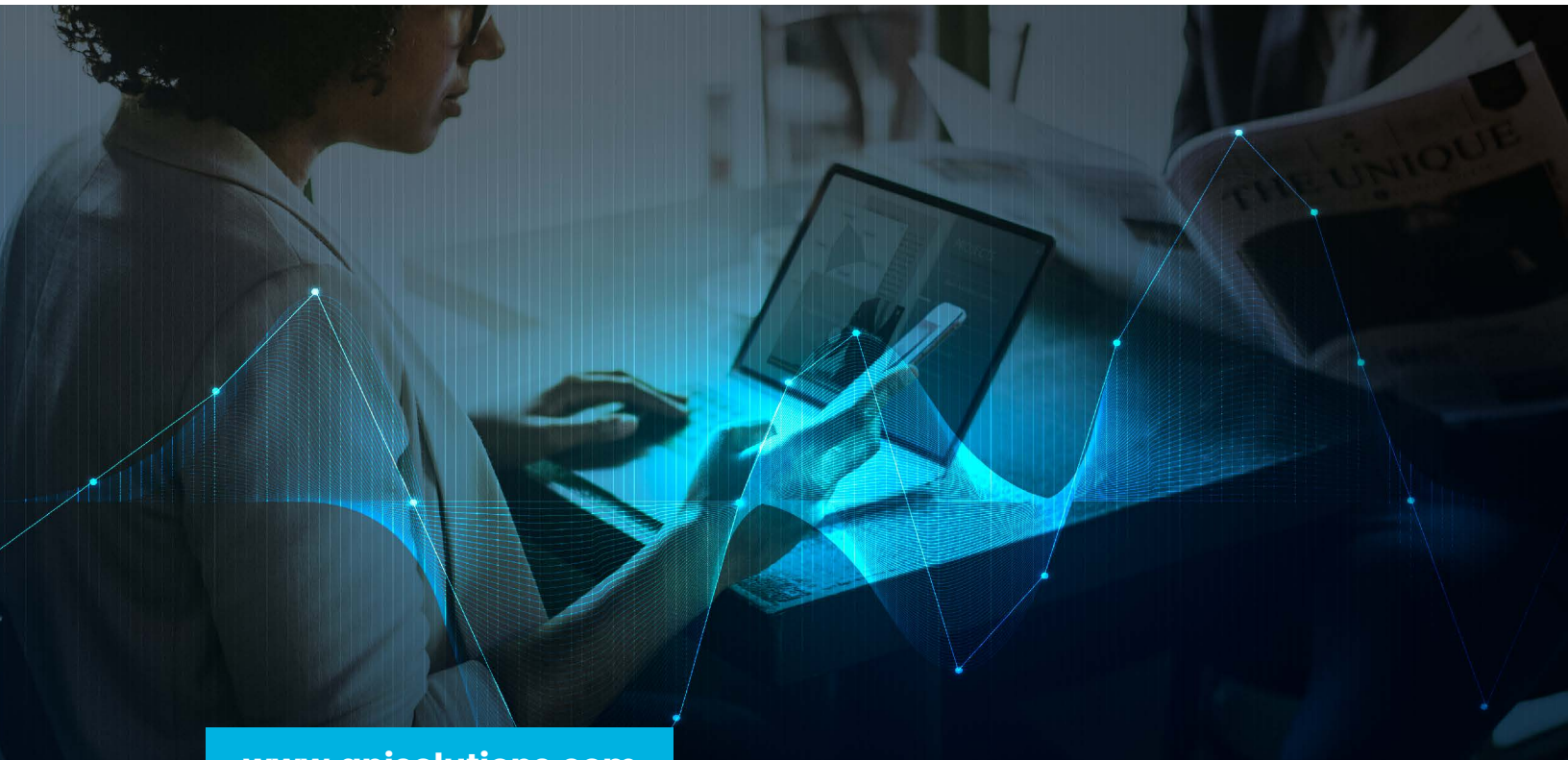




# A NEW ERA OF NETWORK OPERATIONS



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# A New Era of Network Operations

## *Why a Unified, Intelligent Network Monitoring Solution is More Critical Than Ever Before*

The past decade has presented radical changes in the way enterprise environments deliver applications. For instance, mobile devices have replaced traditional workstations, and centralized data centers now act as servers. In the past, various applications would be consolidated in data centers, but now, IT experts can easily access them through ticketing systems, CRMs, and emails.

Currently, the cloud is like a new hub that connects clients to multiple SaaS applications. Most of the network monitoring technologies that were effective in the 2000s have now been deemed obsolete, mainly because modern environments are more distributed, diverse, and complex. This has brought about the need for new network monitoring technologies.

# The Evolution of Network Monitoring

As an IT expert, you're probably processing vast amounts of data from multiple sources and for various purposes. If you're using old-school network monitoring tools for your data processing needs, you've likely noticed that they're insufficient. They don't have the capabilities required to fulfill the data-mining efforts of your enterprise. This is why the need for a high-scale, unified, and intelligent network monitoring solution is greater than it has ever been.

As mentioned previously, applications that were previously in data centers are now served from the cloud. According to the [Gartner Market Report for AIOps Platform, 2019](#), around 180% of digital enterprises are connected to multiple IoT devices and use multiple clouds. The end result is that modern businesses are now mainly reliant on multi-cloud environments & complex infrastructures, and billions of devices are connected to various networks. This has also resulted in modern businesses being hyperconnected.

Unfortunately, due to the pressure subjected to these networks, they're more prone to outages and failure now more than ever before, increasing the need for new and more advanced ways of conducting network monitoring. According to the [2020 Gartner Market Guide for Network Performance Monitoring and Diagnostics](#), by the end of 2021, it's predicted that half of all network operations teams will have to readjust their network monitoring stack to keep up with hybrid networking.





# Problems to Address Before Launching a New Network Monitoring Solution

Before you adopt a systems-oriented approach to network operations, you must address 5 core problems.

- **The adaptive problem:**

The software and hardware landscape is highly dynamic and is constantly changing. The network monitoring models being implemented need to be flexible enough to keep up with the changing enterprise needs.

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- **The unification problem:**

There are multiple elements involved in the management of network operations. The systems have to leverage various types of information that are generated and stored by the networks, including storage & application data, traffic sampling, configuration, policies, etc. This will allow you to get a holistic view of the networks and understand how to operate them effectively.

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- **The scale problem:**

One of the main shortcomings of traditional network operations is that they cannot efficiently collect and process information to keep up with the scaling needs of enterprises. New network systems must be able to gather and process network data.

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- **The heterogeneity problem:**

Most modern networks aren't homogenized and can't be operated based on singular data collection procedures. Advanced network monitoring systems must adopt a system-oriented approach when collecting data from multiple touchpoints.

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- **The continuous-state model problem:**

Traditional network monitoring systems focus on the individual elements instead of looking at them holistically. When it comes to advanced network systems, they must take a network-oriented approach that's more pre-emptive than reactive and provides full visibility across diverse, hybrid-cloud architectures.

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All advanced analytic approaches, including visualization & machine learning, and network feedback abstractions (such as traffic distribution & network health) are dependent on solving the above core problems. Modern networks are distributed systems and must be treated as such. By taking a system-oriented approach to their operations, you'll be able to solve long-standing network operation challenges and address issues such as the complexity, speed, and scale of modern environments.

# Past Meets the Present: How Network Monitoring Is Changing the Rules of the Game

More enterprises are scrambling to build new network monitoring systems that can meet their data mining needs. This, however, comes with three key consequences:

01

Applications are distributed across various networks, and, due to this, it's no longer enough that your servers have the highest RPM disk drives or your applications are running on the fastest algorithm. This kind of network latency tends to have a significant impact on how distributed applications perform.

02

There's a significant change in network applications caused by operating distributed applications. Previously networks were divided into areas, zones & layers, and applications could only exist within either of the segments. However, since modern applications are highly distributed, they operate across several boundaries. This causes an increase in performance requirements and on-demand capacity, which then needs automation and real-time feedback.

03

Traditional network operating systems are now inadequate for modern enterprise requirements. This is mainly because they work on a model that's dependent on managing and using networks instead of operating application environments.

The bottom line is network operations and monitoring have become more complex, especially now that enterprises deploy multiple applications and devices to meet the increasing customer volume and demands. This ultimately makes it more challenging to identify experience touchpoints as even simple transactions undergo numerous stages.

For you to effectively monitor service transactions, they have to be modeled into the OSS (operating support system) at the correct time. Network operators previously used more resources to boost the capacity of the circuit before large-scale integrated circuits were introduced. Currently, IT experts only add more physical resources proactively based on the prediction and monitoring of the key performance indicators.



## Network Monitoring Today

Application flows and networks were undoubtedly simpler in the past. However, it was difficult to install and use the solutions, and most of the time, multiple hardware boxes were needed for every data center. Provisioning and configuring the monitoring process was also more challenging since there was no centralized management systems. Deployment required multiple experts and was capital intensive, while users had to deploy bug fixes and upgrades manually.

Fast forward to today, enterprise networks are significantly different, and applications are now hosted in consolidated data centers. Users are also heavily reliant on mobile devices, and the capabilities of the network systems are expected to handle the increased bandwidth requirements.

There are various types of network monitoring solutions that exist today, and they vary based on their data collection techniques and what they measure. They include:

- **Device Polling:** They take a device-centric approach that uses simple network management protocol to query devices and collect device load, interface status information, cpu, traffic volumes, etc.
- **Active Probing:** They adopt a service-centric approach that uses synthetic measurements such as http get requests and icmp echo requests to collect data. Most of the time, the measurements are used to capture service availability by analyzing network properties that are difficult to capture using passive measures.
- **Packet Analysis:** They derive information from singular packets using a network tap or switch span port.
- **Flow Collection:** These solutions use network devices, including switches and routers, to collect traffic information. This info is aggregated and stored for post-analysis, making it easy to process compared to packet data. It, however, gives less granular information.
- **Log Analysis:** They collect data that's been generated by machines in the form of log files. They then correlate with various events across several systems, such as web servers and routers, by presenting queries.

## The Need for Intelligent Network Monitoring Solutions Is on the Rise

[Studies reveal](#) that enterprises will spend around \$3.5M on cloud apps, the majority of which (48%) will invest in SaaS. This can be largely attributed to businesses wanting to keep up with the increasing complexities of networks and evolving consumer demands. There are several factors that are shaping consumer expectations, including merging technologies, innovative customer offerings, and increasing competition. Consumers are also currently digital-savvy, which is why organizations are putting them at the heart of their network systems so as to create a satisfactory user experience.



# Top Ways DX Netops Is Delivering Authentic Customer Experiences

Outdated solutions to network monitoring are no longer equipped to deal with most companies' current hybrid, multi-cloud environment these days, and a more advanced, comprehensive solution is needed. This is where [DX NetOps](#) comes into play. It is one of the most popular and mission-critical solutions that enables modern enterprises to proactively manage their networks and provides them with complete visibility into the performance of large, diverse, multi-technology architectures, ensuring flawless user experience.

## Why DX NetOps?

Currently, most companies are using way too many tools to manage their network operations, resulting in too much manual effort and too much noise. For instance, enterprises are deploying multiple assurance tools across networks intending to enhance customer experience. However, network operators need to focus on their services to bridge the gap between actual and perceived customer experience. They also need to identify the key issues that affect user experience and combine this knowledge with service and network KPIs. This will enable them to assess user experiences and service performances in real-time. DX NetOps helps solve all these issues.





# DX NetOps Overview

DX NetOps provides unified network visibility and advanced AI capabilities of hybrid-cloud environments, resulting in sophisticated, efficient network management. It integrates user experience with simplified NetOps intelligence to transverse modern architectures, enabling full-stack analytics of both modern and traditional architectures. DX NetOps also converts device metrics, flow, faults, topology, inventory, and package analysis into actionable insight that network operations teams can utilize to optimize network performance. This ultimately allows IT experts to fuel superior user experiences by establishing remediation and autonomous capabilities across various networks, applications, and infrastructure, which translates to faster remediation time and less performance issues. Some of the reasons why enterprises are adopting this solution include:



It helps improve your network awareness while reducing the number of point tools you need to do your job by combining real-time performance monitoring and machine learning into one centralized, intelligent solution.



It unifies all your monitoring metrics into one portal that scales to meet demand and delivers end-to-end coverage across any network.



It helps IT teams move from reactive to preemptive network management, so less time is spent chasing down alarms or trying to make sense of multiple data streams.



When complemented by Broadcom's AIOps solution that combines full-stack observability and advanced analytics with automation across applications, infrastructure, and networks, it helps solve complex IT problems before they impact customer experience.

# Key Benefits of DX NetOps

There are several key benefits of this network solution. For starters, it reduces operational fatigue by allowing you to eliminate manual efforts, minimize noise, streamline workflows and obtain visibility. You can also use it to boost your service levels by harnessing the automation features and predictive insights to automatically identify and correct any network issues before they impact user experience.

DX NetOps is a great way to protect your investment by supporting modern architectures while still gaining AI & ML capabilities and advanced network visibility.

The main features of this solution include:



Operational workflows that make large and complex software-defined networking technologies easy to work with.



It provides cross-domain AIOps insights that allow you to detect root cause topologies that are application-centric and also helps you identify system anomalies.



It gives you access to reliable, normalized, and correlated data, providing you with alarm, topology, and capacity analytics.



It enables granular visibility by unifying packet analysis, flow faults, and unified device availability.



It has a proactive congestion triage functionality that provides real-time insights into network latency.



It balances your overall costs and end-user experience through optimized application policies.



It allows you to monitor your project from the pilot stage to deployment by offering modern architecture support.



# The Future of Network Operations

Ultimately, network teams are facing a technological revolution, and new solutions must be implemented to support the dynamic needs of consumers and manage diverse, distributed network environments. Current network teams are also struggling to keep up with and make sense of the extensive metrics and data that are being generated by modern & complex architectures. To stay competitive, enterprises must invest in more advanced network management solutions such as DX NetOps. A unified, intelligent network monitoring solution is the only way enterprises can overcome these new technical network challenges and ensure long-term business success.

[Contact us for more information.](#)





## About A&I Solutions

A&I Solutions is a leading software and services provider, with more than 20 years of experience focused on the Broadcom portfolio of products. A Broadcom Tier 1 partner, A&I offers advanced and integrated solutions that help modern companies overcome technical challenges and maximize business growth. By delivering intelligently designed software, expert IT services, and comprehensive tools and resources, A&I helps customers master all aspects of the digital lifecycle. The team's services span mainframe, distributed, virtual, and cloud platforms. They have extensive expertise in the entire application lifecycle—including planning, building, testing, deploying, operating, and securing.

With this expertise, A&I enables customers to transform their business by boosting consistency and efficiency. Today, A&I supports more than 500 customers nationwide. The company serves customers across a variety of industries and sectors. A&I remains focused on helping customers seamlessly meet their evolving technology needs and accelerate future growth.