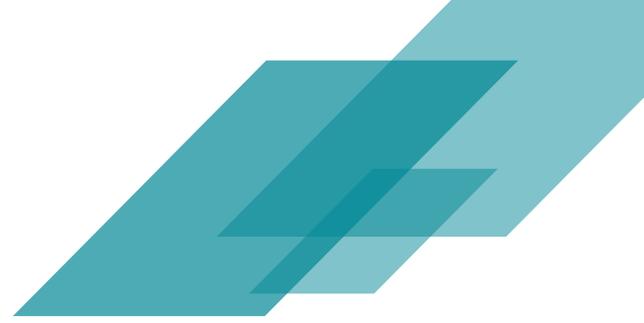


# **Why Network Intelligence Unlocks New Opportunities for Digital Transformation**

**Whitepaper | Digital Transformation**

A decorative graphic element consisting of multiple wavy, horizontal lines that create a sense of motion and depth. The lines are composed of small, light orange dots, giving it a textured, digital appearance. The pattern starts as a solid line at the top and gradually transitions into a dotted pattern as it moves downwards, mirroring the color scheme of the main title.



# Setting the Stage

**This paper aims to help CIOs and VPs of IT who say “We want to go farther with digital transformation, but our network is holding us back.” We hear that again and again, and the problem is often due to, in an application-centric world, being unable to identify, understand, and mitigate network issues that impact application performance, resulting in sub-standard customer experiences alongside unacceptable costs and complexity.**

The problem doesn't stem from a lack of data. Everyone has a massive amount of network data. Over the past fifteen years, organizations have become proficient at collecting data from endpoints, enterprise systems, cloud services, and network devices.

We also know how to analyze a data set. Big data analytics tools are mature and robust, so that all the data we collect from a smart car can be analyzed fifteen different ways to uncover problems and opportunities to improve performance, reliability, and value.

The problem is that we don't know how to gather disparate data sources, examine them contextually, and find the most impactful insights at the right time, in the right way, to take the right actions. And this is especially true at the level of ITOps and network operations, where there's a wealth of information provided by the network, and no good way to make sense of all the data in a proactive, actionable way, particularly as we evolve toward IT 4.0, an emerging approach to IT that's hybrid, multi-cloud, and distributed — encompassing edge, core, and cloud.

In this paper, we're going to explore the trends and challenges behind what businesses need to succeed to pursue digital transformation, including obstacles to network automation, problems accessing optimized value from the edge, and issues with security that result from a lack of network intelligence. We're writing for business leaders who want to understand why network intelligence is a critical element of transforming digital infrastructure, and how, by improving their networks, they can resolve standing limitations with their digital transformation initiatives.



# What's Happening in the World

To put it simply, organizations want to deliver game-changing experiences, and IT has to change to support those experiences.

Imagine, for a moment, that you're a retailer, and you want to build a better understanding of how prospective customers learn about your products, buy them, use them, and then continue to be customers for years to come. You're seeking an omnichannel experience that follows customers from desktop to mobile, from streaming platform to augmented in-store advertising. And you want to deliver this omnichannel retail experience with game-changing performance, the highest levels of resilience, and at a reasonable cost.

In this scenario, you're working to deliver a digitally transformed retail experience, and you're not alone. According to PTC, 70% of organizations have a digital transformation strategy, or are working on one.<sup>1</sup> Digital transformation is becoming the game-changing strategic focus for enterprises seeking to gain share, increase revenue, and boost profitability.

The problem is that, to do digital transformation well, organizations have to change their approach to IT. Traditional data-center centric, monolithic applications simply aren't agile or flexible enough to support digital transformation. So today's leading-edge organizations are adopting event driven architectures, built with microservices, spread across edge infrastructure, core data centers, and multiple clouds. Shifting workloads to the edge is the critical change, providing compute, storage, and analytics capabilities closer to the end users who need it without sacrificing security or performance. This approach offers the power and flexibility to serve today's digital transformation initiatives.

But...at a cost: complexity.

<sup>1</sup> [https://financesonline.com/digital-transformation-statistics/#:~:text=70%25%20of%20organizations%20have%20a,transformations%20\(PTC%2C%202019\).](https://financesonline.com/digital-transformation-statistics/#:~:text=70%25%20of%20organizations%20have%20a,transformations%20(PTC%2C%202019).)



# What's Standing in the Way of Success

Today's IT infrastructures have thousands of devices, from IoT sensors to software defined networking stacks at the edge, to middle mile fiber, to servers, storage, firewalls, core switches, serverless infrastructure in the cloud, and dozens of other components and devices with distinct functionality. Each device, whether hardware or software, generates data about its operations, its performance, reliability, and security.

All this data and all the interactions travel over the network, so in the network, there's a goldmine of possibility if an organization can, in real time, explore the depth and breadth of sensor data, the interactions at every level, and then MAKE SENSE (derive meaning) from the data automatically. These interactions are the genesis of digital experience. Deriving value from the interactions is the foundation for digital transformation, whether that's new services to drive down costs in manufacturing, make self-driving cars better, create omnichannel retail experiences, etc.

However, two problems stand in the way.

The first problem is analysis. It's not that we're unable to use the data generated by thousands of IoT sensors — we can, it's a single data set, we can analyze it. The issue is that we're not able to put that data into context that's derived from other data sets — network performance, server responsiveness, fiber throughput. Big data contextualization is the newest tool for deriving new value from data, and every leading-edge organization is asking themselves, "how do we contextualize massive data sets from massive collections of endpoint and edge sensors, probes, etc.?" And since so many performance and reliability problems in IT derive from network issues, organizations are asking "how can we monitor, maintain, and mitigate our entire network stack, from endpoint to cloud, using contextual analysis?"

The other problem is that organizations also tend to get bogged down in the vast volume of data coming from sensors and devices scattered across the network, manually dealing with an endless supply of possible problems that cause so much noise, they end up being unable to notice or rectify network degradation or failure before customers notify them. Contextual analysis helps by determining what matters, providing insight into priorities rather than forcing every problem to be reviewed and evaluated.

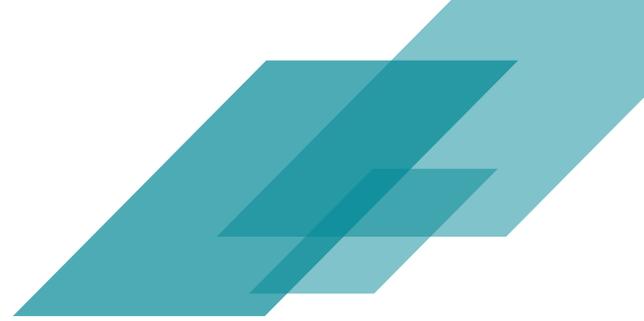


And contextual analysis has to work automatically. The old days of manually defining database joins is insufficiently agile. Today's approach is data correlation, algorithmically run by AI. Machine learning and AIOps are the keys to breathing new life into, and deriving new value from the network. It's becoming increasingly necessary to build, into the network:

1. **Prescriptive advice** — code that suggests solutions to problems. These solutions could be based on a database of historical solutions or based on crowdsourcing.
2. **Automated pattern discovery and prediction** — discovering groups, patterns, or clusters of issues to describe correlations in historical and streamlining data. These patterns provide a source of intelligence for predicting the probability of various incidents occurring.
3. **Anomaly detection** — using patterns to determine normal behavior, and then identify deviations from the norm, both univariate and multivariate. Those outliers have to be correlated with business impact and other processes such as release management to be useful, and not just noise.
4. **Probable cause determination** — pruning down the network of correlations and deviations to define causality chains, linking cause and effect.
5. **Topological analysis** — using application, network, infrastructure, and other topologies to provide added context, establishing relevance and illustrating hidden dependencies.

Telemetrically driven correlative AI not only offers contextual insight, but helps solve the noise problem. It says, "I see data patterns and trends, I can see the trend here, correlated across domain systems. Administrators, I've learned that a fiber cut always results in an app problem, which we need to plan for, but the last two times, the fiber cut was a red herring, the real problem was at the server level."

Of course, correlative data analysis for the network is only as good as the scope of visibility and control, and most tools lack the ability to see and control the entire network because a vendor provides a tool for their platform, not for any possible device on the network. Siloed management is the norm — it's easy enough to have visibility and control over the network in a public cloud, or a data center, but not a single pane of glass for both. Customers struggle to monitor all their cloud and other software-defined infrastructure platforms together with SD-WAN. Managing the network seamlessly, across dozens of edge locations, multiple clouds, several data centers, all connected by multiple wired and wireless carriers, simply isn't easy.



Without comprehensive visibility and control, problems emerge at the edge. Edge is where digital transformation rubber meets the road, and so ensuring edge performance and reliability is important. Problem is, the changing patterns of network traffic at the edge, caused by new and evolving edge applications, makes it harder than ever before to ensure that edge infrastructure is performing as well as it can, with the highest degree of reliability, without unnecessary added hard and soft costs.

But the edge isn't the only place problems emerge. The reality of today's multicloud world, which everyone wants to add scale, agility, performance, and other advantages, makes inter-cloud and core connectivity increasingly critical. Integrating the WAN provider, Internet provider, and cloud service providers, monitoring them holistically, and being able to see where bottlenecks emerge, additional bandwidth is needed, when a fiber cut takes an edge node offline, or where a new connection can make a difference remains a key challenge for most businesses.

Finally, end to end, integrated security is a problem that most vendors struggle to solve. Public cloud and data center vendors offer native solutions (firewall, DDoS, ADC, etc.) that serve the basic needs of traditional infrastructure, but as organizations shift toward more distributed infrastructures, stronger, end to end, cloud-based security controls become an essential part of delivering next-generation services. Making sure that users, the edge, the core, and multiple clouds are secure is an ever-evolving problem today's organizations can't resolve without a solution most of them lack.



# The Ideal Path Forward

So what's the way forward? Let's consider an ideal approach.

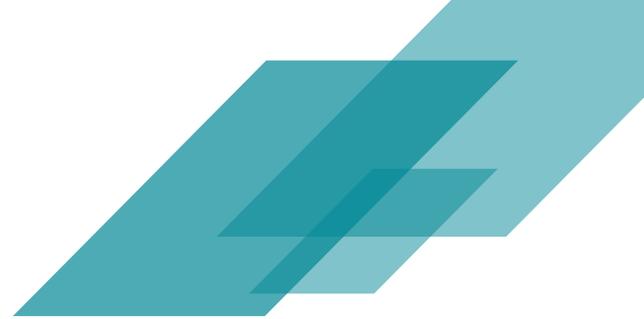
At a high level, organizations need network intelligence, and that intelligence needs to be application-centric. After all, applications are the priority because customer experience is the priority. It does no one any good to identify a network problem that doesn't address the application problem.

## The optimal solution has two elements:

- Network-centric application monitoring: focuses the network operations center on both network and app performance with a front-line, single pane of glass for application monitoring and alerting.
- Proactive application performance optimization: a set of responses that improve application performance.

## The solution should work through a five step process:

1. It would gather telemetry from a range of disparate sources, proactively monitoring APIs, Syslogs, devices, orchestration, and other data sources across carriers, LTE, SD-WAN, and networks.
2. It would tie in security data as well from sources including edge devices, firewalls, web gateways, and the like.
3. Once an event occurs, integration with an ITSM platform like ServiceNow would give administrators visibility to change, problem, and incident data, triggering an alert where necessary, and automating ticketing.
4. Alternatively, it should provide all contextual historical, current, and forecasted data in a management portal, a single pane of glass that lets administrators go beyond simple analysis for network events, bridging domain silos, and making recommendations automatically without manual intervention.
5. Finally, the solution would devise resolution steps as well as root cause correlations to guide necessary changes, including remote reboots, policy adjustments, and circuit reroutes.



**For organizations familiar with AIOps, this five step process should look familiar, and align with the typical AIOps workflow:**

- Aggregate, normalize, enrich disparate data sets
- Detect incidents in real-time
- Automate incident triage
- Surface root cause changes
- Automate ticketing, notifications, and workflows

Any IT leader, manager, and administrator can see the potential value of a solution that provides these capabilities. But does an intelligent network monitoring solution like this exist? Yes, it does — and we call it QOS by Zayo.



# Understanding the Zayo Difference

Our acquisition and integration of QOS Networks to Zayo empowered us to deliver an ideal set of contextual network intelligence capabilities across our leading-edge, global fiber network, providing compelling value for both old and new customers. We deliver a holistic edge to core to cloud network performance and optimization portfolio, offering organizations a distinct set of capabilities that empower them to deliver next-generation services for their customers. Our capabilities include:

- Multi-source, multi-domain data capture across disparate network devices
- Contextualization and correlation across all network events
- Problem discovery, alerting, resolution recommendation
- Root cause analysis for future improvements
- Integration with ServiceNow as well as a front-end management portal

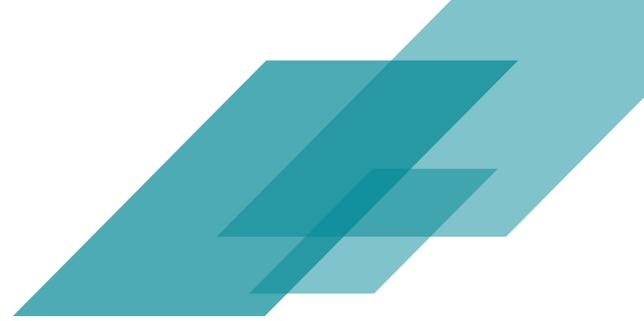
These capabilities, combined with the compelling advantages of Zayo's global fiber network, give enterprises a true end-to-end network solution that offers the performance, resilience, and value that's the right fit for a digital transformation initiative.

At the edge, customers have unprecedented connectivity throughput and resilience, built on our RNS, private wireless, and broadband aggregation capabilities, coupled with the QOS Network SD-WAN and SASE innovations to ensure performance, security, and control. With our edge portfolio, Zayo gives organizations a way to accelerate their shift toward the edge.

As data leaves the edge, providing faster connectivity at the right locations matters. Zayo's extensive, global fiber network, distinctive transport and IP services means that organizations can trust that their edge traffic will move at the right speed, to the right place, at the right cost.

Our cloud links and hyperscaler integrations give organizations the most powerful connectivity to their cloud providers, no matter the provider or location. Any cloud, any zone, for any requirement — Zayo can meet the need.

Wrap all of those services with our security capabilities (encryption, private networks) and software stack that visualizes the network every step of the way, our customers can do more than ever before.



# Transformative Benefits

## But what are the benefits?

### Benefits for Users

- Endpoint customer experiences are better than ever before — performance management of client devices is streamlined and sped up

### Benefits for IT Staff

- Associates no longer have to sift through endless alerts while conducting manual analysis — improving productivity
- Seamless integration into ticketing systems reduces the need for change management
- Daily ops activities are streamlined and simplified with automated trackable, sharable tickets that include extensive, real-time status updates

### Benefits for Business Operations

- New insights made available for long-term network capacity planning
- Remediation of incidents is faster and more efficient than ever before
- Application and network service quality assurance is enhanced, boosting uptime

### Benefits for Business Strategy

- Problems are resolved faster than before, improving customer satisfaction
- Analysis finally spans siloed IT groups, giving organizations valuable insight into controlling costs and optimizing infrastructure
- Business leaders have confidence in network visibility and control capabilities for edge, core, and cloud, freeing them to pursue game-changing digital transformation initiatives



# In Conclusion

To wrap up, our customers know that we deliver superior network performance through powerful analytics tools. We help enterprises identify network issues, solve immediate problems, and resolve root causes. Our **Enhanced SD-WAN solution** gives enterprises a powerful new approach to optimizing IT transformation in support of leading-edge digital transformation initiatives.

**But don't take our word for it. One of our customers said:**

*"When they first implemented the SD-WAN, [Zayo - QOS Networks prior to acquisition] discovered that more than 300 of the existing circuits were throwing lots of errors and were not delivering the bandwidth that KinderCare had contracted for. [Zayo] went to the circuit providers with data from the VeloCloud devices to demonstrate the errors they were seeing on the circuits. KinderCare had been blind to that information until the SD-WAN provided that level of visibility. Getting the circuits in better shape is critical for the company's VoIP strategy.*

*Implementation of the SD-WAN started in mid-2019 and now all but about 20 centers are fully deployed.*

*In addition to saving significant dollars on the internet access, KinderCare has seen other significant benefits as well. "Our mean time to resolution on internet outages has gone down by 70%," says Baker. "Also, [Zayo] has set up integrations for us that make it easier to work with other suppliers. For example, there's an integration with ServiceNow that allows tickets to flow between KinderCare and [Zayo], and soon to other third parties like a partner that provides some hands-on support for us. That provides us with great visibility into where we are with our IT processes".<sup>2</sup>"*

**This is the kind of success Zayo delivers: with advanced monitoring, intelligent insights, and edge management, we provide enterprises with high quality network services, global reach, real-time control and visibility, and consistent security at every network endpoint.**

<sup>2</sup> <https://www.networkworld.com/article/3533309/sd-wan-at-kindercare-supports-company-growth-cost-savings.html>

**Connect what's next for your business.**



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