BROADCOM

WHITE PAPER

3 Keys to Optimizing Service Levels and Business Performance

A Guide for Communications Service Providers

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EXECUTIVE SUMMARY

Without network connectivity, our digital world grinds to a halt. Without network connectivity, our work doesn't get done, communications don't get through, and transactions fail. For the communications service providers (CSPs) responsible for these networks, the penalties of downtime are severe, leaving their businesses exposed to increased customer churn and eroding revenues. This white paper explores why ensuring optimized user experiences and network performance and availability have become so challenging for CSPs' network operations teams—and it shows how these organizations can overcome these challenges.

THE CSP'S PRESSING BUSINESS IMPERATIVES

CSP's networks represent the core infrastructure of a rapidly digitizing world. These networks are relied upon continuously for our communications, business transactions, entertainment, and much more. For the CSP, ensuring optimized user experiences and network performance and availability only keeps getting more critical.

While these demands remain a constant, CSPs have to contend with several intensifying business imperatives:

- **Grow the business**. To sustain growth, CSPs need to provide more value, both through the delivery of innovative new offerings and enhancements to existing services. It is through these offerings that CSPs will be positioned to expand their reach, boost cross-sell and up-sell opportunities, and reduce churn. Through these enhanced services, CSPs will be better positioned to strengthen existing services and customer relationships, so they can more effectively combat price pressures and competitive threats.
- **Reduce costs**. In their dynamic, ultra-competitive markets, CSPs must be able to strike the balance between attractive pricing and sustainable margins. Ultimately, they can't succeed by making incremental cost improvements. To achieve their objectives, these organizations must chart a transformative path to remove complexity, including from networks, portfolios, and business models. To do so, it is vital to maximize the efficiency of tooling and operational processes.
- **Accelerate digital transformation and cloud adoption**. To meet their imperatives, CSPs will need to be at the forefront of digital transformation. As part of this objective, they must leverage cloud models in innovative ways to transform their own operations and service delivery.

Rapid Technological Innovation

To meet their urgent business imperatives, CSPs must speed the technological innovation of their networks. They'll need to harness new technologies that enable the delivery of new high-value service offerings and that provide support for new business models. This will require the rapid integration and continued optimization of a range of technologies and approaches. Following are just a few of the key areas:

- **Modern network architectures**. Networks increasingly feature technologies like software-defined wide area networks (SD-WAN), software-defined data centers (SDDC), and secure access service edge (SASE) architectures. These technologies are key to establishing networks that deliver the agility, security, and cost-efficiency CSPs and their customers require. In addition, as the 5G network expands, a range of new innovations are being employed, enabling CSPs to monetize new service offerings.
- **Cloud migration**. As outlined above, cloud adoption is and will be a key enabler of the CSP's digital transformation. Cloud services will play an increasingly integral role in the delivery of applications and services that support the CSP's internal operations, and they'll continue to enable the delivery of external, customer-facing service offerings. As the race to monetize 5G services gathers pace, cloud migration will be increasingly vital. These cloud services will be instrumental in enabling CSPs to speed the delivery of innovative 5G and edge computing services to customers and boost competitive differentiation.
- **Automation**. CSPs need to employ automation as a cost-effective way to speed innovation and support growing demand. Increasingly, they are establishing an open architecture to enable streamlined automation and seamless operational support system (OSS) integration.

All these different innovations and technologies have one key thing in common: They'll fuel increasing complexity for IT operations and network delivery teams. Software-defined networks, the spiraling proliferation of networks introduced by network slicing, the increasing inter-reliance upon cloud networks and other external providers, and other innovations are all making networks more dynamic. Networks have more moving parts and more interdependencies, along with more diverse technologies, protocols, and interfaces.

LIMITATIONS OF TRADITIONAL SILOED NETWORK TOOLS AND APPROACHES

All these technology innovations must be rapidly leveraged to optimize existing services and enable the fast, efficient delivery of new and enhanced offerings. However, these innovations can't jeopardize service levels.

For the teams responsible for ensuring optimized service levels, legacy network operations and monitoring tools are presenting an increasing set of challenges and obstacles. Many of these teams are relying on a significant number of siloed tools to monitor different network technology domains. Further, as more technologies and services are introduced, the number of tools continues to climb. For example, in the wake of implementing SD-WAN, a team may deploy a tool for their specific vendor's SD-WAN technology. Now, they may be running SD-WAN solutions from multiple vendors, meaning multiple tools are employed just for SD-WAN.

All these tools make it difficult to aggregate and normalize data and to gain real intelligence. Fundamentally, teams lack end-to-end network visibility, exposing CSPs to potentially damaging monitoring blind spots that can lead to costly outages. When issues arise, disparate teams are left having to sift through data from multiple tools to try and locate the problem.

Even with all these tools, teams still have visibility gaps. For example, they lack coverage of the networks managed by third parties, such as cloud providers, other CSPs, and so on.

COSTLY IMPLICATIONS

These limitations and blind spots leave CSPs exposed to a range of obstacles:

- **Latency and performance issues**. Teams lack the unified, aggregated intelligence needed to spot potential problems. These groups only find out about issues after subscriber or user services have been affected.
- **Increasing mean time to resolution** (MTTR). Costly, time-consuming troubleshooting and remediation efforts result in lengthy MTTR. When issues arise, many teams need to get engaged in troubleshooting, with each group looking in multiple disparate tools. As networks grow more complex and interdependent, these resolution metrics continue to expand. Finding and fixing network issues gets more complicated, which means it takes longer to resolve issues. This increases the CSP's risk of encountering damaging outages and SLA compliance violations as well as associated penalties, including eroding customer loyalty, customer churn, and financial losses.
- **Lengthy mean time to innocence** (MTTI). Because teams lack intelligence into all the networks that user services are reliant upon, they spend significant amounts of time diagnosing internal systems when issues arise. This time continues to be expended, even when issues arise in externally managed environments.

REQUIREMENTS

To contend with the proliferation of technologies and increasing complexity, while ensuring optimized service levels, your teams must take a more unified approach, one that encompasses cloud networks and SaaS applications. Here are a few key requirements:

- **End-to-end visibility**. Teams must gain visibility into the entire network delivery path between users, managed infrastructure, cloud environments, and business-critical applications.
- **User experience**. You need visibility into the user's experience, regardless of where users may be located or which applications they're accessing.

- **Unified, scalable platform**. It is vital for your teams to reduce their reliance on disparate tools and establish a single console that can provide a unified view of multi-vendor, multi-technology environments. This is key to not only accessing actionable, correlated intelligence but making significant gains in operational efficiency. This unified platform needs to be open, capable of supporting multi-vendor technologies. It must scale effectively to handle business growth and be resilient in the face of disruptions. Security is crucial, so the platform must be hardened. Additionally, it should be flexible enough to keep up with the accelerating pace of cloud and AI adoption.
- **Ease of operations**. Operating a multi-vendor network can be quite challenging for your network operations teams. However, having a dashboard that provides a single-pane-of-glass view that spans across CSP and customer networks can alleviate these obstacles. To capitalize on this potential, teams need network tools that are extensible enough to accommodate emerging technologies and services, including new cloud offerings. Specifically, your teams need capabilities for quickly identifying and isolating root causes of network issues, proactively detecting issues before they affect customers, and effectively utilizing automation to streamline network operations.

With these capabilities, your organization will be better positioned to boost MTTR, MTTI, and all the other network performance and network experience metrics that matter to the business. Further, you'll be able to accelerate network transformations and enhance connected experiences.

HOW BROADCOM CAN HELP

Broadcom offers a leading network observability solution that features these products:

- **AppNeta by Broadcom**. With AppNeta, you can monitor network performance from users' perspectives, no matter where they are, which network they are using, or which cloud-based apps they access.
- **DX NetOps by Broadcom**. With this solution, you can gain unified, scalable network monitoring for traditional and modern, software-defined infrastructures.

Broadcom enables your teams to gain complete visibility, from customer site to the cloud. AppNeta can feed cloud monitoring and user experience data into DX NetOps, enabling unified visibility, reporting, and administration.

With the network observability solution, teams can use a single, unified portal that offers visibility of inventory, topology, device metrics, logs, configurations, faults, flows, and user experience metrics. The solution converts all this intelligence into actionable insights—enabling your team to track issues, analyze trends, and efficiently isolate and resolve the network delivery issues that degrade user experiences.

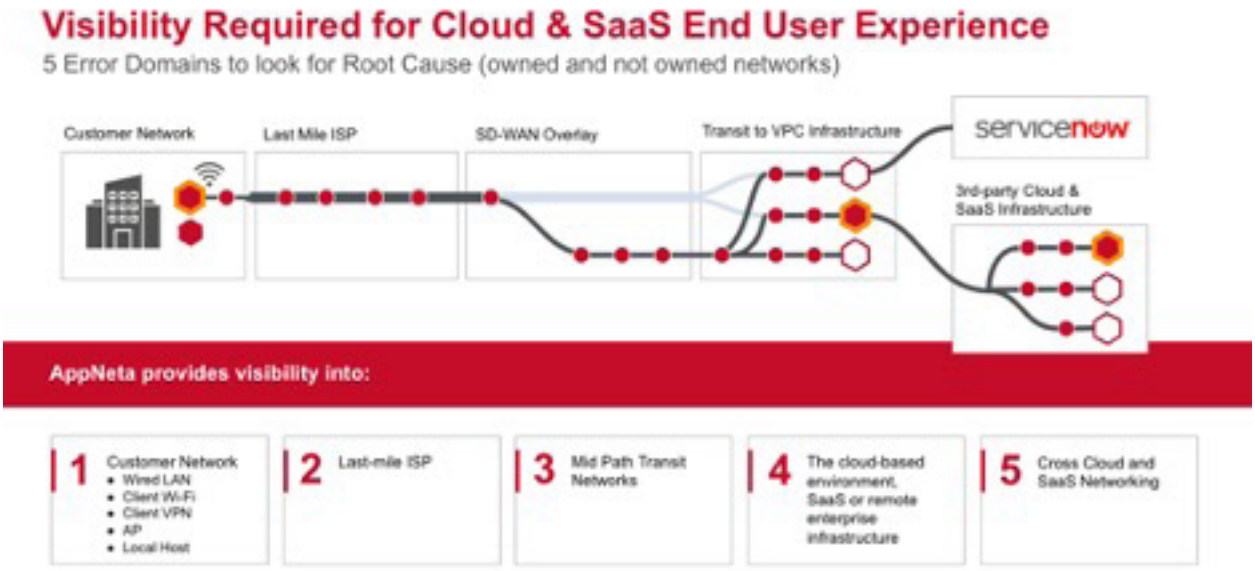
APPNETA: KEY CAPABILITIES

AppNeta provides the active monitoring capabilities that IT and network teams in CSPs need today. By employing AppNeta, your teams can gain the timely intelligence they need to streamline troubleshooting, speed remediation, and boost service levels—no matter where users are based or which networks they are relying upon.

The product works with any device, deployment, and network, employing active and passive monitoring. Teams can place monitoring points anywhere: on premises, in virtual hosts, on workstations, or near application code. AppNeta monitors any connection between users, data, and locations, and spots congestion.

Following are some of the solution's key capabilities for CSPs:

- **Complete visibility for any network**. Broadcom can help CSPs and their customers move to the cloud, without losing visibility into their applications, users, and networks. The solution provides performance monitoring for any cloud architecture and network, including public and private clouds and hybrid cloud environments. AppNeta can show you the path of your data inside any cloud network.



- **Validation of SD-WAN overlay and underlay**. In SD-WAN environments, the solution can track the performance of both overlay and underlay networks, across remote sites. This is critical as CSPs grow increasingly reliant upon cost-effective SD-WAN technology to enable user connections to cloud and SaaS apps. The solution features an SD-WAN dashboard that enables NOC operators to quickly validate that the SD-WAN is healthy, both from an underlay and overlay point of view. In a single portal, the solution provides intelligent views and unified support across multi-vendor software-defined networks, reducing tool sprawl and streamlining operations.
- **Optimized insights into VMware VeloCloud SD-WAN deployments**. AppNeta extends the native management capabilities of VeloCloud SD-WAN, providing end-to-end visibility into the network overlay, underlay, and cloud-based applications. The solution provides actionable intelligence to automatically pinpoint problems. This reduces internal resource costs and speeds issue resolution, so teams can more quickly return to revenue-producing activities. With its active monitoring capabilities, AppNeta enables network operations teams to fully understand how performance is affected by common events like application outages, route changes, connectivity drops, and ISP peering changes. Armed with proactive insights, teams can boost SD-WAN performance and resilience.
- **Flexible deployment**. Broadcom offers an array of options, so that you can tailor your monitoring deployment in the way that makes most sense for your environment and objectives. AppNeta can be delivered as a service that is accessed from our public cloud. Alternatively, customers can deploy the solution in their own environment.

NETWORK OBSERVABILITY BY BROADCOM: MAKING EVERY NETWORK WORK FOR YOU

AppNeta and DX NetOps are part of the Network Observability by Broadcom solution set. Network Observability by Broadcom delivers complete visibility across internal networks and networks that are managed by external parties. This unified solution integrates user experience metrics with standardized operational workflows. With the solution, your network operations teams can quickly isolate any network performance issues that affect the connected experience.

The solution offers an extensive range of advanced capabilities, such as patented alarm noise reduction, sophisticated traffic analysis, unified network topology, capacity planning, volatility analytics, multi-vendor technology support, and more. With these capabilities, you can realize a range of benefits:

- **Optimize network operations**. Network Observability by Broadcom enables teams to establish optimized network operations that fuel intelligent and fast triage. The solution offers proven, scalable, multi-vendor data collection and correlation. It also delivers advanced alarm noise reduction and analytics.
- **Accelerate network transformations**. With the solution's comprehensive coverage and unified operations, your teams can accelerate network transformation and new service delivery. The solution provides unified, end-to-end visibility into LAN, WAN, Wi-Fi, ISP, and cloud networks. Plus, it enables seamless performance management across traditional and software-defined architectures.
- **Enhance connected experiences**. By delivering active monitoring that spans from client to cloud, Network Observability by Broadcom helps you ensure users have optimized experiences. With the solution, your teams can speed root cause isolation across external, third-party managed networks, and minimize MTTI.
- **Leverage a hardened CSP platform**. The solution ensures network scalability, availability, and performance, supporting business growth. By establishing an open architecture, the solution enables seamless OSS integration and automation. This multi-tenant solution enables efficient, secure, and scalable support of your entire customer base.

CUSTOMER CASE STUDY: ALTICE

Challenges

Altice is highly reliant upon IT infrastructure to deliver high-value services to its consumers and business clients. As a large telco that has been serving customers for years, the organization had accrued a large, complex IT environment with multiple generations of infrastructure.

Like other CSPs, Altice is operating in a new age of networking. Altice continues to expand its remote data center and cloud offerings. Further, they continue to bring new technologies into their environment. For example, they're implementing software-defined architectures, including SD-WAN, and they're supporting clients' SD-WAN deployments. In addition, Altice customers are now highly reliant upon cloud services and SaaS offerings as well. Further, both for Altice employees and customers, work-from-anywhere approaches are now a given.

For the IT operations group, it is vital to ensure the optimized performance and availability of the IT services that support critical employee functions. In addition, they must ensure continuously optimized service levels for their subscribers and business customers. In recent years, the team has continued to contend with increasing complexity, more systems, and more dynamic environments.

In years' past, user services relied upon internal data centers and direct office connections. Now, their network paths are fundamentally different. The majority of daily business activities are highly reliant upon the internet, with user traffic routinely traversing local Wi-Fi and third-party ISP networks. Ensuring these users have a consistent, quality connection and experience is a top priority, and it was a big challenge.

Solution

To support and optimize its IT service management, the team at Altice has been relying on Broadcom solutions. They're employing DX NetOps to monitor network performance, fault, and flow, both in their traditional and software-defined architectures.

With DX NetOps, the Altice team has been able to adapt seamlessly to new technologies and the demands of new networks. For business customers, Altice offers various tiers of monitoring services, ranging from first-tier, basic up/down system monitoring, to higher level tiers that provide more advanced performance and service level monitoring. Broadcom solutions are instrumental in delivering these valued services. Broadcom solutions provided these key advantages:

- **User experience monitoring**. Recently, the team started using AppNeta. AppNeta extends Altice's monitoring visibility and control beyond the edge of their networks and into externally managed networks like home Wi-Fi as well as third-party telecommunication, cloud, and SaaS environments that customers constantly rely upon. With AppNeta, teams can quickly isolate the location of performance issues, including those that arise on networks not owned by Altice. Ultimately, by leveraging AppNeta, they're planning to add a new monitoring service tier, which will provide clients with user experience monitoring.
- **Streamlined delivery of new SD-WAN service**. With DX NetOps, they've been able to immediately get SD-WAN monitoring up and running, without having to deploy a different tool, use a new administrative console, or change existing workflows or practices. This support will enable them to pursue plans to add new SD-WAN monitoring services to their portfolio of offerings. The team will be able to deliver differentiated SD-WAN services by monitoring the entire end-to-end SD-WAN path, from client to cloud, rather than just relying on the edge-to-edge network coverage that SD-WAN vendors supply today.
- **Scalability**. With Broadcom solutions, the team has been able to continue to scale to accommodate new technologies and new offerings and support an expanding customer base. In the business services segment, they now have more than 1,000 clients who are relying on services based on Broadcom solutions for network performance, fault, and flow management. The team at Altice is now managing more than 50,000 devices and hundreds of thousands of different interfaces for these clients.

Results

Broadcom solutions have proven indispensable for Altice. These solutions have helped support the organization's digital transformation and the evolution of its customer environments. With these solutions, the team at Altice has realized these gains:

- **Accelerate new technology support and new service delivery**. With Broadcom's people and solutions, Altice has been better positioned to deliver new, high-value services to customers and better ensure they're staying ahead of the competition. The team has been able to adapt their operational environments efficiently and rapidly, so they can most fully take advantage of emerging technological innovations.
- **Optimize service levels of new offerings**. AppNeta's active network testing enables teams to validate every hop in the network path of new service offerings, from client to application. As a result, they can spot and address any issues that would have a negative impact on the user experience, all before rolling new offerings into production.
- **Improve MTTI**. With Broadcom solutions, the team at Altice is able to correlate individual device performance with end-to-end network monitoring, across both internal environments and externally managed networks. As a result, they can quickly pinpoint the location and root cause of issues, speeding MTTI.
- **Enhance brand protection and customer satisfaction**. By ensuring network services are reliable and responsive, the team at Altice is better equipped to optimize user experiences, helping improve customer loyalty and protect the company's brand. AppNeta's active network testing enables the team to validate every hop in the network path of new services, so they can ensure customers have a positive experience from day one.
- **Speed MTTR**. Broadcom solutions deliver improved visibility into managed and unmanaged networks that customers count upon. With this comprehensive visibility into networks and the user experience, the team can identify and resolve network issues in minutes—not hours.

CONCLUSION

For today's CSPs, the opportunities are massive—but so are the challenges. By establishing optimized network operations, CSPs will be well positioned to address the challenges posed by today's dynamic, complex networks—while accelerating not only MTTR, but new service delivery and digital transformation.

Learn more about Network Observability by Broadcom today. Find out how the solution is enabling CSPs to capitalize on their market opportunities.

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For more information, visit our website at: www.broadcom.com