

WHITE PAPER

Maximizing the Success of Your Cloud Migrations with AppNeta

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EXECUTIVE SUMMARY

When organizations migrate workloads and services to the cloud, they can gain a number of advantages. However, they can also encounter some challenging obstacles, most notably, significant gaps in visibility when it comes to tracking and managing service levels and user experience. This white paper explores these challenges, and it reveals how AppNeta by Broadcom offers the differentiated capabilities needed to address these visibility gaps.

INTRODUCTION

Today's enterprises are now solidly in a cloud era.

While there are unique requirements and business cases that may lead a business to keep running an application on premises, those cases are becoming increasingly rare. Now, around 94% of enterprises use cloud services. And recent estimates show cloud spending continues to increase around 20% a year and was estimated to approach \$600 billion in 2023. Over 60% of cloud decision-makers reported a cloud-native first approach, adopting Kubernetes, one of the more common open-source container management systems, in public or private clouds.

THE CHALLENGE

While benefits in the cloud are plentiful, so too are the roadblocks and obstacles. The reality is that moving apps or workloads into the cloud is not always simple—especially when it comes to delivering improvements once migration is complete. Ensuring continuously optimized service levels and user experience is particularly challenging. This is due to several reasons.

Limited Visibility

While permutations of cloud services are virtually infinite today, generally, enterprises move to the cloud in two fundamental ways:

- Migrating apps to cloud environments.
- Relying on SaaS applications that run in a vendor's cloud.

Both approaches introduce significant visibility gaps. When teams migrate their applications to cloud platforms, most of the infrastructure that sits between the user and the server running the application moves out of internal IT and network operations teams' purview. When relying on SaaS, the user experience is largely dependent upon infrastructure that's outside of the internal team's control.

Teams can take the applications they have on premises and start running them in cloud environments like AWS, Azure, or Google Cloud Platform. From a network operations standpoint, these apps are effectively running in a black box. Further, the infrastructure the apps are running in is being shared by other users, which can introduce or exacerbate potential variability in service levels.

When relying on a cloud service, in effect your workloads occupy a rack in the cloud providers' data center. These are black boxes for the customers' internal IT teams. When a user's packet leaves your internal network, you can't see what happens from that point on.

How do you determine if an ISP is throttling back connection speeds for your users?

Network operations teams can use a service like Azure ExpressRoute or Google Cloud Interconnect. These services employ a private connection through a third-party service provider to effectively extend the organization's on-premises network into the cloud. However, even after employing this type of service and receiving a 30 ms service level agreement (SLA), how do you know whether the SLA commitment is being met?

Cost and Complexity

After applications are moved to the cloud, teams confront the fact that they're still using networks and architectures that were in use when applications were running on premises. The result is typically a lot of complexity and the continued risk of poor user experiences.

Network operations teams may opt to contend with the high cost and poor user experience associated with backhauling traffic. Organizations may introduce software-defined wide area networks (SD-WAN) into the mix. However, if there are a large number of remote locations, they may have to look at approaches like cost scaling. They'll also likely have to introduce cloud access security brokers (CASB) and zero-trust network access solutions to secure user traffic. While SD-WAN and CASB offer advantages of centralization, which enables faster changes, these services also further limit internal teams' visibility.

Continued Migrations, and Disruptive Change

Cloud migrations are rarely, if ever, a one-and-done proposition. For the most part, teams will be in some various phases of cloud migrations for years, if not decades. Often, migrations will represent multi-year projects, and when one initiative is complete others will start, or already be in process with other groups. Even in companies as successful in the cloud as Amazon, Microsoft, and Netflix, cloud transitions weren't a simple flip of a switch.

Implications of Distance and Latency

Fundamentally, cloud services introduce physical and logical distance between end users and applications. This is true for virtually any external cloud models, whether SaaS, IaaS, or PaaS. This changing nature of proximity has fundamental implications for networks, applications, and the user experience.

Particularly, when teams take a lift-and-shift approach to cloud migration, problems can arise. These legacy internal applications weren't designed for the latency realities of the cloud. For example, a legacy on-premises application may rely upon calls to many other internal apps. If that app is moved as is onto a cloud platform, all those calls will be contending with latency. When hosted internally, that application could easily handle thousands of simultaneous queries, but when running in the cloud it may crash immediately when encountering that type of traffic.

IT AND NETWORK OPERATIONS ACCOUNTABLE

After moving to the cloud, executives and other users will fully expect service levels to be the same or better as when workloads were running on premises. While IT and network operations teams give up much visibility and control when services are moved to the cloud, they're still the ones held accountable for service level issues.

They'll be held accountable for service levels and for measuring performance, even if the cloud services aren't part of their budget or part of their monitoring landscape. To contend with these realities, these teams need to employ a new approach, one that's aligned with the new requirements posed by cloud services.

THE SOLUTION: APPNETA BY BROADCOM

AppNeta by Broadcom helps IT and network operations teams reduce resolution times and better understand the networks that support business-critical applications, no matter where users may be located or which networks they're relying on.

AppNeta provides the tools you need to identify the current state of application and network performance and establish an effective baseline, before any changes are made.

This baseline can be used to objectively measure service levels before, during, and after a cloud migration. In this way, teams can objectively determine whether service levels are worse, the same, or better after the migration is complete.

Again, after the cloud migration, much of the network infrastructure is out of the internal team's control. With AppNeta, teams can establish continuous monitoring practices, so they can proactively track service levels and identify issues before users are even affected.

AppNeta delivers invaluable visibility throughout the cloud migration journey:

- **Before.** Establish a baseline of performance on existing infrastructure.
- **During.** Do troubleshooting and quality control throughout the migration process.
- **After.** Establish ongoing monitoring, enabling continued maintenance and optimization.

Four Dimensions of Monitoring

AppNeta combines active and passive monitoring methodologies. The solution offers four dimensions of application and network monitoring:

- **Network paths.** AppNeta takes an active approach to measuring the health and availability of the network.
- **Flows.** With AppNeta, teams can identify which users and apps are active on the network and when.
- **Packets.** The solution can capture 100% of actual data from the packets on the network.
- **Web/URL.** AppNeta features web synthetics that establish a baseline of performance and reveal how it changes over time.

KEY CAPABILITIES

Discovery and Mapping of Traffic Flows and Dependencies

AppNeta offers critical capabilities for establishing baselines before a migration, and for measuring performance after the migration to enable effective comparisons.

This starts with focusing on gaining a complete, accurate picture of the current state of network and application performance. Through a combination of the solution's active testing and synthetic transaction monitoring, a team can gain an accurate view of the user experience and network path.

AppNeta can discover applications running on internal networks and it can identify the third-party services that a given application relies upon. Through a hybrid deployment that includes hardware-based AppNeta Monitoring Points, the solution can also provide passive data insights by layering DPI intelligence on top of flow data. In this way, the solution can identify applications on internal networks. This enables operations teams to determine if specific applications, locations, and even users are experiencing issues.

AppNeta can also identify all the communications between an app and other apps and endpoints. This enables operations to identify dependencies between applications. With this visibility, teams can more knowledgeably determine what the impact of moving a specific application to the cloud will be. For example, as outlined earlier, if an application running internally relies on calls to many other internal apps, teams will encounter issues with latency when migrating that app to the cloud. With AppNeta, teams can identify those issues in advance and take steps to address them, before migration.

Customer Example: Kyndryl Establishes End-to-End Visibility

Challenge

Kyndryl is the world's largest provider of IT infrastructure services, serving thousands of enterprise customers in more than 60 countries. The company has 4,400 customers, including 75 of the Fortune 100.

In recent years, clients and teams across Kyndryl have continued to adopt cloud services for a range of workloads. As a result of this move, users have increasingly become reliant on many networks that the IT operations team doesn't own or manage. This introduced an entirely new level of complexity to troubleshooting.

Solution

With AppNeta, the team could gain a clear picture of end-to-end network performance, expanding coverage beyond the network edge and into ISP and cloud environments. With the solution, the team can monitor connections between data centers and cloud services and between hybrid workers and cloud environments. AppNeta provides hop-by-hop visibility across cloud environments, enabling the team to get essential visibility into application response, network response, and retransmission time.

User Experience and Functionality Testing

AppNeta can use Selenium-based scripts to periodically check the availability of business-critical apps, and also provide deeper interaction metrics. These scripts can be used to mimic how a real user works with an application. For example, a script can login and then begin interacting with the application as an end user would.

The solution can then provide a detailed breakdown of performance, including details on networks, servers, and browser performance. The solution can aggregate metrics into Apdex scores. It can pull in data from domain name servers (DNS) to see which server responded the fastest and look at external calls to third-party APIs or servers.

Continuous Post-Migration Monitoring

As outlined above, once you've moved an app to the cloud, you're relying on your ISP or MPLS vendor, the cloud infrastructure, and, in general, connections that you can't monitor with traditional tooling.

AppNeta provides visibility into the networks that you depend on post-migration. The solution can actively monitor connections, whether traffic goes through SD-WAN, CASB services, MPLS, VPN links, or ISP networks.

Customer Example: CyrusOne Gains Application-Level Visibility of Cloud-Based Services

Challenge

CyrusOne is a leading data center provider, serving almost 1,000 customers globally—including 175 of the Fortune 1000. In recent years, the company's portfolio of cloud-based applications continued to grow, with users heavily reliant upon Office 365, Salesforce.com, and others.

While the IT operations team could track performance of internal networks and those of carriers, they couldn't efficiently pinpoint problems at the application level. Consequently, when a user reported an issue, it was difficult to identify the root cause.

Solution

With AppNeta, the team has a real-time view of cloud-based application performance. They can readily identify exactly where each user is located, taking into account variables like wide-area network (WAN) links, content delivery networks, and load balancers.

AppNeta provides a snapshot of user satisfaction, enabling administrators to drill into application-specific data to remedy issues. For example, at one point, some Office 365 users were experiencing performance problems while others were not. Administrators used AppNeta to research SaaS provider connections and determine which endpoints were sending data. They found that different servers hosted the applications, and that users were only experiencing issues with one of those servers. They could use this intelligence to notify the provider and get them to ensure user requests were moved to other servers.

CONCLUSION

For IT and network operations teams, cloud migrations present a fundamental obstacle. Critical user services rely on networks that these teams have little or no visibility into. The reality is that legacy network performance monitoring tools are ill-equipped to deliver insights into cloud and other third-party network environments. AppNeta delivers the critical visibility your teams need. With the solution, you can measure and manage performance—before, during, and after any cloud migration.

To learn more, visit the AppNeta solution page or request a demo.