AppNeta
Performance in Production

4 Reasons why you need an APM tool with network visibility

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Developing applications has changed dramatically in the last five years. The need to develop applications that can scale to match any audience size while providing an excellent end-user experience has forced development teams and their supporting DevOps partners to move away from monolithic application architectures. This has lead to the rapid rise and adoption of various host and server virtualization strategies – starting first with virtualization using tools such as VMWare, and now continuing with the use of containerization technologies such as Docker.

Cloud hosting has taken off at the same time as containerization with good reason: cloud hosting makes it easy to deploy these technologies at scale. Platforms such as Amazon Web Services or Microsoft Azure do a wonderful job of providing easily scalable environments – telling developers that they do not need worry about infrastructure. Essentially, companies are trading the ability to scale easily for control and visibility. This means that you'll know exactly how many servers you have and the memory and CPU associated with that server, but you won't have visibility into how different services such as S3, RDS, SQS and others connect together. Companies will also continue to lose visibility as AWS and Azure introduce more services, like AWS' Lambda, that further abstract infrastructure away from the developer.

The complexity of the development environment doesn't end there. More and more applications rely on 3rd party services, from simple services such as Google Maps to more complex services such as payment gateways. The first wave of adoption of these technologies was largely limited to newer companies with little legacy technology or technical debt. Increasingly, organizations are moving applications to the cloud piece-by-piece – often leaving major portions of an application such as the data layer behind in traditional data centers. This added complexity means that applications are now utilizing the WAN more and more. Yet most applications are developed without taking this into account, causing potential headaches down the road as network latency suddenly rears it's ugly head. The assumption that networks essential create zero latency can lead to extremely poor end-user experiences.

The APM market, to date, has largely focused on analyzing performance inside the application, ignore the network infrastructure that provides critical support. The current state provides good functionality, but is ultimately insufficient to provide complete visibility from the end-user, through the WAN to the application and across all the internal application services.

With this as background, here are four reasons why an APM with network visibility is better than an APM solution without it.

1. Developers don't think about network in application implementation

Performance is generally not the first concern of a developer. The reason is simple: performance is not a feature. An application that doesn't do much but does it quickly isn't the chief goal of a development or product group. Instead, developers and product owners concentrate on features and functionality for their target audiences and generally only address performance when it becomes an issue. In a survey by one of our AppNeta customers, the DevOps manager found that only 13% of developers were considering performance as they worked. Developers assume that services will be available and fast. They generally do not take into account WAN time, even if their application requires multiple calls to 3rd party services or to another data center.

Instead, performance often falls on either DevOps or an Application Performance team. The issue is that if the application is not performant due to network issues, traditional APM tools will not allow them to see network latency. Diagnosing applications issues may get done, but it will likely take more time – particularly challenging in a downtime situation.

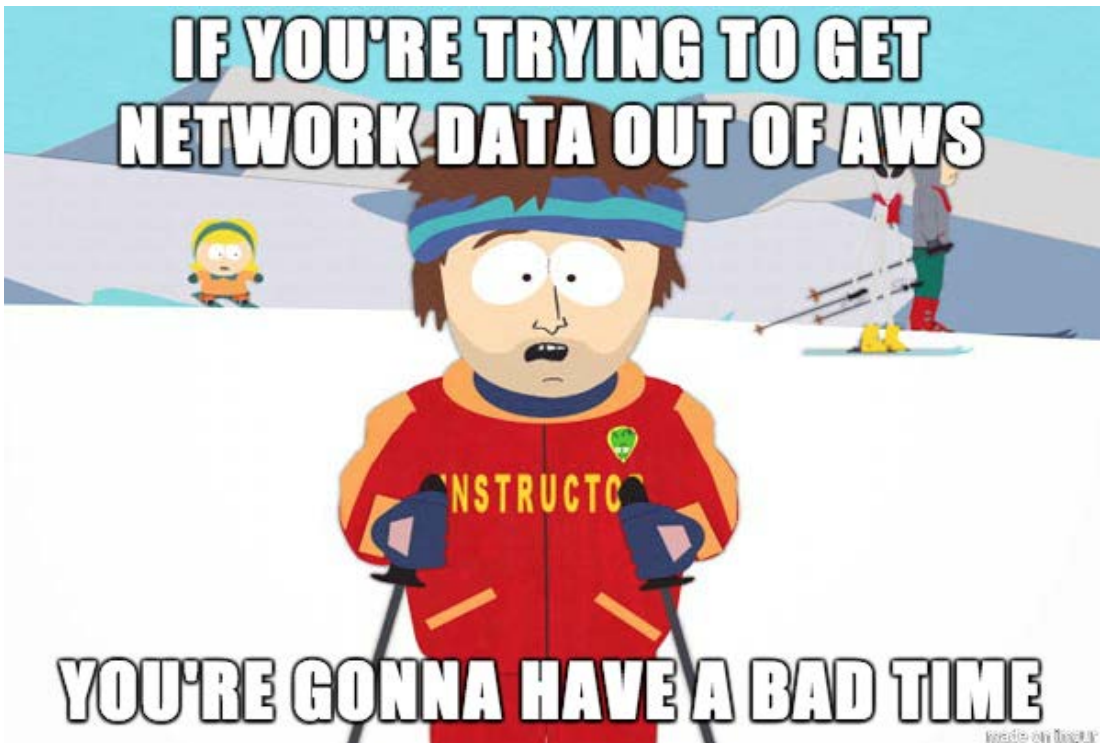
An APM tool that includes network visibility makes it trivial for DevOps and IT teams to troubleshoot an application and get a quick answer to the basic question: Is it the application or the network?

2. When apps go down, everyone is trying to prove it's not their fault

During an application outage, there is always tension between different groups to isolate and identify the problem. Each group involved is trying to rule themselves as "not the problem." At AppNeta, we call this "Mean Time To Innocence" or MTTI - it's the time it takes for a given team to shout "The problem isn't with our stuff."

This is particularly a problem between application and network teams. When an end-user problem or application slowness is reported, each team utilizes their own set of tools to diagnose the issue. Application and DevOps teams traditionally use APM and logging tools, while Network Operations teams utilize a variety of network performance measurement tools. The problem rises in that they are both using different tools, sometimes resulting in both teams declaring MTTI while the CEO or CTO still sees the application as slow.

By combining APM with network visibility, both teams can leverage the same platform, agree on the issue and solve it more quickly, lowering mean time to resolution.



3. Cloud hosting makes the network invisible

Cloud hosting providers like AWS and Azure hide network connectivity between hosts to reduce the complexity. They guarantee CPU and Memory, but the DevOps manager is left in the dark with regard to network. Dan Kuebrich, CTO of AppNeta, studied the issue using our own tools and the AppNeta development platform.

What he found was surprising. “In our own studies, we’ve found that network is highly variable within AWS - with some connectivity between hosts being as many as 30 hops and those routes changing as many as a thousand times per month.” AppNeta also discovered that network packet loss within AWS was much more common than they expected. That visibility changed the approach they took to developing different services.

The network also comes into play when you consider situations where developers connect services together across multiple cloud providers or in hybrid situations combining hosting services such as AWS with a traditional datacenter.

4. You're only as good as your slowest 3rd party service

Apps are increasingly relying on external services such as Google Maps, payment gateways and social media feeds. As these services are generally accessed across the WAN visibility into the performance across the wire is crucial to understanding application performance.

At the end of the day, your end-user experience is only as good as the slowest 3rd party service. The user does not want to or have the ability to determine why an application is slow - they only know that it is slow. While options like circuit-breaker design patterns can provide graceful failure in the case of degradation, the result of slow or missing components is user churn and revenue loss.

Traditional APM cannot give you visibility into the network connectivity between your application and 3rd party services, which is crucial in determining the root cause of a slow app.

Summary

As application continue to get more distributed, visibility across the entire application becomes more and more important. Development and network teams should select tools that provide visibility both in terms of internal application performance as well as both external, end-user performance and the performance of network infrastructure. The result will be a unified view of the overall application from code to infrastructure, and ultimately allow these teams to work together to solve problems more quickly.