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eBook

Applying a DevOps Mentality to Network Monitoring



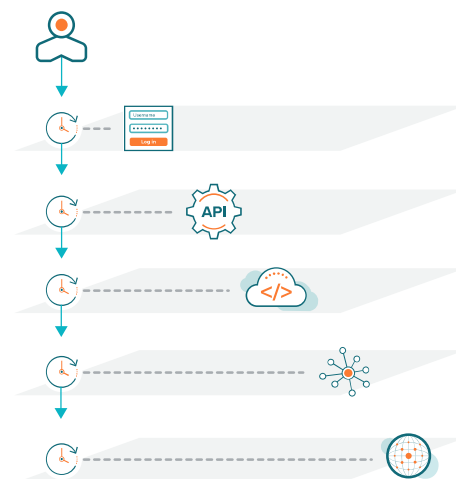
Optimizing Applications Is Critical to Achieving Business Outcomes

Applications are the backbone of any business. They are the vehicles driving revenue, increasing brand loyalty and delivering value to customers, partners and employees. Business success depends on these applications providing optimal digital experiences. This means that the continuous delivery of optimal application performance and reliability is a mandatory requirement and priority for all businesses to achieve their outcome objectives.

While development and DevOps teams build applications and services at a layer of abstraction above the details of the underlying network architecture, they do this with the implicit trust that someone else is ensuring their API calls get to and from the right place within acceptable latency and performance thresholds. Too often, applications are tested within the sandbox of the local environment, without verifying if calls to various APIs will reliably complete with the performance and reliability required to ensure great digital experiences.

This “someone else” includes the networking and NetOps teams that operate at least partially in the physical world, worrying about things such as how well and how fast bits move across the network. Unfortunately, these teams are typically not integrated into the development process, instead often receiving code thrown over the proverbial wall with the responsibility to make sure the underlying network continuously performs optimally. What’s worse is that they are given this responsibility without having the visibility to fix things beyond the limited part of the network where they have some level of control.

It is at this boundary of where the DevOps and NetOps worlds operate—marching to different SLA requirements and workflows—that problems can surface, compromising service delivery and putting digital experiences at risk.



Digital Experience Is Dependent on the New Enterprise Network Backbone

Until fairly recently, the application developers and DevOps teams were the primary owners of the digital experience—monitoring, testing and implementing code changes to optimize performance and the end user experience. However, today's modern applications and services have become increasingly distributed, reliant on APIs and Internet-centric. This adds to the multitude of network paths traversed across the Internet before, for instance, an ecommerce webpage can fully load. In other words, the underlying network is now taking a central role in the delivery of the optimal application performance and reliability.

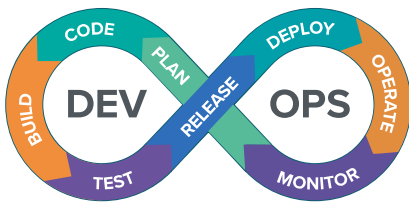
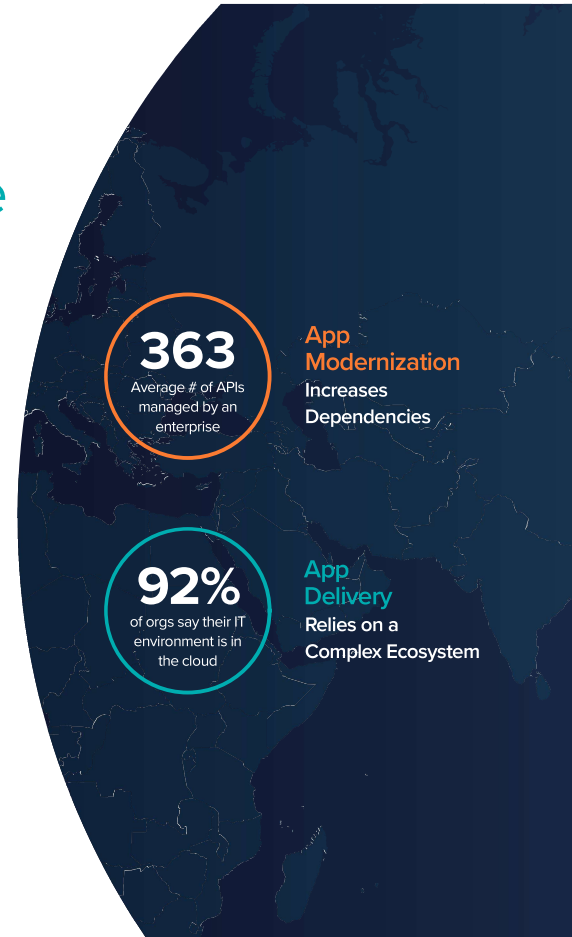


Figure 1: DevOps Framework

The Internet has become the new enterprise network backbone. The challenge here is that paths through the routes that make up the Internet typically don't come with performance guarantees, creating potential latency risks. As a consequence, NetOps teams are finding that they now have the responsibility of ensuring optimal application experiences—yet they don't own the apps and they can't control the Internet.

To address this challenge, NetOps must influence the application experience from the network side by adopting a DevOps mentality and framework (Figure 1). NetOps needs to understand—at the test phase of application development—how the network will interact with the application and how the application will behave over the network. In the end, it will be the differing characteristics of every part of the journey running over the network, in conjunction with the architecture of the application, that will ultimately guide performance. Likewise, DevOps needs to be enabled to constantly monitor the underlying network performance as applications are running in production.





Monitoring App Performance Alone Is Not Enough

Managing and optimizing application performance today depends on an increasingly complex underlying network and Internet infrastructure. Application Performance Monitoring (APM) tools provide a great starting point, essentially telling you how an application is performing. However, these tools frequently lack visibility into the underlying network. For instance, a degradation in application performance may be caused by a latent DNS server, or a completely unrelated Internet Service Provider that has made a configuration error leading to network traffic becoming bottlenecked. How can the NetOps team quickly diagnose these types of network issues? This leaves a visibility gap for the DevOps and NetOps teams as they struggle to diagnose problems in the network.

In addition, most of the tools built to monitor the performance of applications exclusively rely on code injection and other instrumentation techniques that are only possible for applications that you own and control. However, this isn't the case for SaaS applications, such as Microsoft 365 or Salesforce, that are business-critical yet rely on infrastructure that is entirely out of your control. The potential consequence is that NetOps may ultimately be unable to see into critical parts of the delivery system architecture—nevertheless, they are responsible for the experience.

Removing the Silos Between NetOps and DevOps

Indeed, modern applications are revealing unintended consequences, such as digital experience blind spots and shifting responsibilities between DevOps and NetOps. What is required is deeper visibility and observability at the network layer, along with a common framework that enables NetOps and DevOps to speak a unifying language to better address their joint objective of delivering exceptional digital experiences as shown in **Figure 2**.

This innovation comes from two sides of the challenge:



Transaction monitoring

This emulates a user workflow through an application and measures the performance from a user perspective. Among other things, this capability can surface potential issues during the Test phase of the DevOps framework.



Internet and WAN visibility

These provide visibility into the performance and availability of the underlying Internet and WAN networks. This enables NetOps to track how the actual networks are doing in real-time.

It's also desirable to have a single solution that brings these two areas together in an easy-to-consume interface.



Figure 2: End-to-End Service Visibility

Removing the Silos Between NetOps and DevOps



Transaction Monitoring

ThousandEyes transaction monitoring emulates the expected path a user would take through an application. It allows the network and application teams to proactively measure and check the availability and performance of applications and related infrastructure—from the end user perspective. And, from an optimization perspective, transaction monitoring correlates visibility across network, application, routing and device layers.

Transaction monitoring also provides a continuous improvement model, which borrows from the DevOps operational framework:

1. The first order of priority is to identify baseline performance and any third-party dependencies that may impact the application.
2. Second, this baseline is used to identify areas of improvement that would optimize application performance.
3. Third, optimization efforts are rolled out in the pre-production environment to test both application performance as well as the impact of backend network infrastructures, such as choice of cloud provider, DNS provider and the impact of geographic location.

With this level of network visibility, teams can deploy end-to-end performance thresholds to create a continuous testing and improvement process.

Transaction monitoring enables network operations teams to determine if an application is slow or experiencing intermittent service issues that are impacting actual end users. Since transaction monitoring does not require actual web traffic to generate application performance metrics, it enables 24/7 visibility. This way, applications can be pre-tested prior to a live customer-facing launch, ensuring that network or software updates do not impact application performance.

Removing the Silos Between NetOps and DevOps



Internet and WAN Visibility

It's also important to have visibility into the underlying networks that the application relies on to deliver value to the customer. As mentioned earlier, these networks are increasingly out of the business' control. Therefore, providing NetOps with real-time network visibility using issue notifications is critical to the continuous delivery of optimally performing applications.

ThousandEyes Internet and WAN visibility provides this required insight, enabling NetOps to see the Internet and WAN as if it's their own. It provides correlated visibility across the network, application, routing and device layers, giving NetOps teams insights into how the performance of Internet and WAN connectivity impacts user experiences.

These capabilities include:

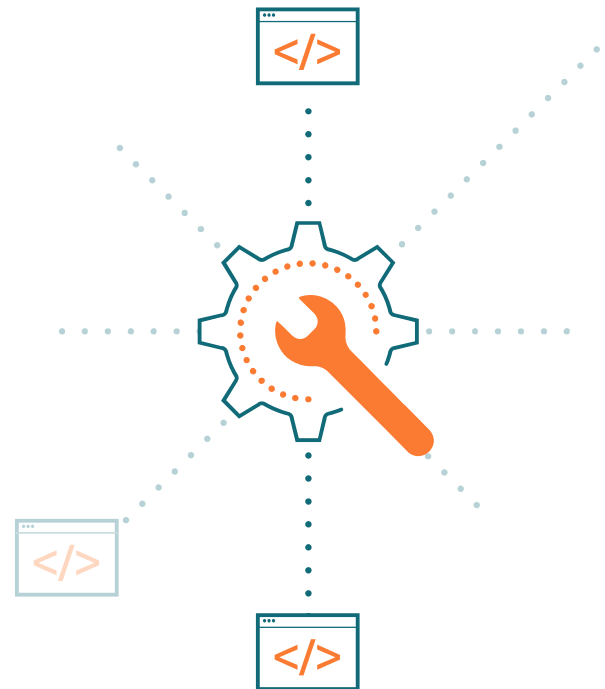
- **Network Path Visualization:** Providing automatically generated, unified, interactive, multipoint and topologically correlated views of all network paths between selected agents and the target URL or IP address.
- **End-to-End Network Performance:** Providing page-load times and service availability and performance.
- **BGP Visualization:** Ingesting BGP routing data from dozens of global BGP collectors and automatically providing visibility as a configurable layer under service, network and path visualization layers.
- **Web Server Availability and Response Time:** Providing a variety of protocol-specific tests (HTTP, SIP, RTP) that can be run in parallel with web transactions or they can stand alone alongside network layer visibility.
- **DNS Performance and Integrity:** Providing DNS tests that monitor the availability and response time of DNS servers, as well as the integrity of DNS responses.

Network and Application Experience Through a Single Lens

Simply having these capabilities is still not enough if they are provided through a myriad of disparate solutions. Rather, the people responsible for the application and network need to be able to gain this visibility through an interface that provides contextual insights that align with a single workflow. After all, if the raw data can't easily be converted into actionable insights, then we're back to where we started without truly understanding how the network is impacting application performance and reliability.

Additionally, this visibility needs to be actionable for the users who own the application and underlying network. For instance, those responsible for the application need to pay more attention to how the Internet is impacting the performance and availability of their applications and incorporate that into their workflow. Likewise, those responsible for the network need to enhance their workflow by including a more detailed understanding of the role the network is playing in the health of the business.

By making it easy for these insights to be accessed and utilized by both NetOps and DevOps, ThousandEyes makes it easier for these teams to incorporate network and Internet intelligence into their day-to-day processes.



It's NetOps' Time To Shine

While delivering optimal application experiences was previously a task completely owned by DevOps, the increasingly Internet-centric and distributed nature of modern apps means that NetOps needs to prominently step into the digital experience workflow. After all, while the NetOps team doesn't control the app itself, they are ultimately responsible for the end user experience. In other words, NetOps needs to adopt the same kind of operational approach utilized by their DevOps counterparts: Test in Dev what is monitored in Ops, and Monitor in Ops what is tested in Dev (**Figure 3**).

This type of approach can enable the business to build applications faster and with fewer errors. By proactively catching issues and addressing them earlier in the application development process, teams can optimize the code itself and avoid making time-consuming fixes later on. With ThousandEyes transaction monitoring, both NetOps and DevOps can monitor the same metrics before and after they go into production to catch errors and fix them long before a customer is negatively impacted. By utilizing ThousandEyes Internet and WAN visibility, NetOps can proactively monitor the health of the underlying network and utilize near real-time generated insights to minimize the risk that issues in the network will deteriorate digital experiences.

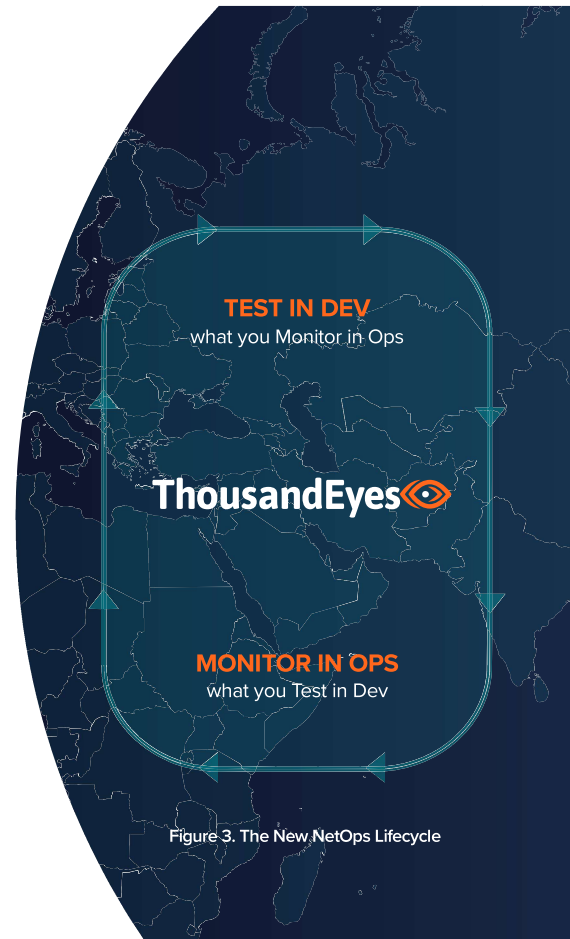


Figure 3. The New NetOps Lifecycle

Ensure Optimal Application Health and User Experiences

Outstanding digital experiences for our customers, partners and employees is the IT outcome that matters most to business success. To say that business hinges on digital experience is no understatement in this modern era of digital transformation. As a result, organizations are turning to digital experience monitoring to understand and make today's complex environment more manageable. ThousandEyes provides proactive visibility into the delivery of any web application across any network to detect issues proactively, troubleshoot quickly, reduce churn and deliver the flawless experiences users expect

ThousandEyes makes the Internet, cloud provider networks, the extended ecosystem and user-level performance (regardless of location) visible, enabling NetOps to manage every network as if it were their own. Whether or not their organization leverages solutions for internally owned applications, ThousandEyes provides the deep insights IT teams need to understand how external factors impact application health and user experience.

Shift the status quo through increased collaboration across NetOps and DevOps by [booking a demo](#) of ThousandEyes, or [request a free](#) trial today.



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About ThousandEyes

ThousandEyes delivers visibility into digital experiences delivered over the Internet. The world's largest companies rely on our platform, collective intelligence and smart monitoring agents to get a real-time map of how their customers and employees reach and experience critical apps and services across traditional, SD-WAN, Internet and cloud provider networks.

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