FACE DEVOPS CHALLENGES HEAD-ON WITH A REDEFINED APPROACH TO APPLICATION MONITORING

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In this report, Aberdeen analyzes the challenges modern application developers face, as well as the strategies and capabilities that leading businesses are following, such as AI-driven analysis, to optimize their applications. We'll also delve into the steps that organizations can take to modernize Application Performance Monitoring (APM) and make it ready for the applications of today and the future.

Application developers today face a constant and rapid pace of change.

How today's developers create and deploy applications has transformed dramatically from just a few years ago. Rather than large, monolithic applications, today's developers are building microservices based on containers, Kubernetes, serverless and ephemeral infrastructures, and often deployed on multiple clouds — both public and private.

However, many of the APM solutions that organizations are using to monitor and manage applications were not designed to meet these new development paradigms. For businesses with older solutions, understanding, optimizing, and improving their applications using disconnected and siloed APM tools with slow analytics that alert in minutes instead of seconds, rely heavily on clients, and can't scale to handle thousands of diverse containers, is often a complex and nearly impossible task.

Aberdeen research has found that when leading organizations adopt modern APM tools that have been built from the ground up to support today's applications, IT Ops and DevOps teams have deep and fast insight into their applications so that they can troubleshoot and prevent issues before they impact end users.
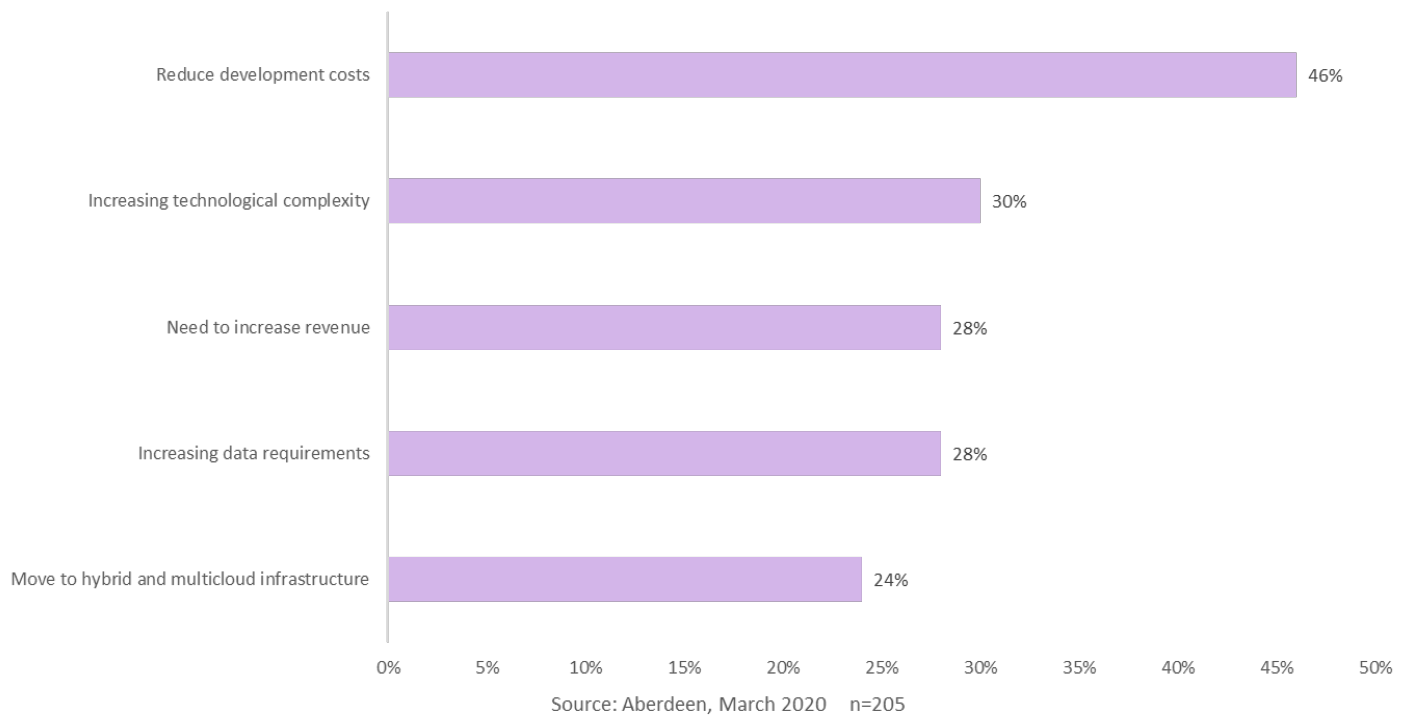
Defining Modern APM:
Designed to meet the needs of today's applications and microservices, a modern APM provides powerful real-time streaming, full-fidelity data ingestion, open source instrumentation, and deep AI-driven data analytics

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Modern Applications Need Modern Approaches to Monitoring

New technologies and trends are bringing significant changes to all application developers, and just as many organizations have finally started to adapt to the changes brought by DevOps, agile, and CI/CD — they now also face microservices, serverless applications, and Kubernetes that disrupt the way that applications are built and deployed.

While modern application architectures and frequent code pushes help accelerate organizational responsiveness and innovation, they are adding new complexities and challenges to monitoring. IT Ops and DevOps teams are limited by traditional APM tools, which have only become more difficult to use given the many new changes to application environments. In our research into application development, Aberdeen asked organizations to list the top drivers pushing them to upgrade and improve their application monitoring as a result of more modern infrastructure and application environments.

Figure 1: Top Pressures to Improve Application Performance Monitoring

Pressure	Percentage
Reduce development costs	46%
Increasing technological complexity	30%
Need to increase revenue	28%
Increasing data requirements	28%
Move to hybrid and multicloud infrastructure	24%

Source: Aberdeen, March 2020   n=205

Analyzing the data from Figure 1, we find that while many businesses are still driven by the need to reduce the costs associated with application development, another major pressure to improve how they monitor and

optimize applications is the rapid pace of technological innovation, and the additional complexity that accompanies it.

Businesses understand the need to be aggressive in adopting technologies that are cloud-native, flexible, and that bring a competitive advantage. However, these businesses and DevOps teams realize that managing and successfully adopting emerging technologies with legacy monitoring tools is a recipe for failure.

The data from Figure 1 also highlights the challenge businesses face with their ability to harness the massive amounts of new data that are generated every day by users, systems, and devices. As always, executives need to ensure that they are getting the most out of their technology investments.

How Leading Organizations Are Transforming Their APM Capabilities

While many organizations are striving to upgrade and improve their APM capabilities, we've found that those who are leaders are going beyond simply getting the latest version of what they already have. Businesses that Aberdeen has identified as leaders in application development — meaning they score in the top 30% in uptime, performance, cost savings, and customer satisfaction — are choosing new modern APM solutions that are designed for today's microservices and cloud-native applications.

What kind of APM solution are leaders identifying and deploying? We've found that they are looking for APM with deep analytical capabilities that can handle the massive amount of data from applications, including all metrics, traces, logs, and every other valuable piece of information.

They are identifying APM that can give them analytics in seconds, as they understand keeping customers and end-users happy relies on troubleshooting issues before they become a real problem. And we've seen that organizations that are leaders in application development are deploying APM that takes advantage of artificial intelligence to more effectively analyze and optimize their applications, as seen in Figure 2 below.

Leaders also want APM solutions that are as based on open standards as the tools and systems that they are using to build and deploy microservices and modern cloud-native applications. By embracing open tools, leading businesses can avoid vendor lock-in and take advantage of high levels of integration and flexibility.

Figure 2: How AI-driven Intelligent Monitoring is Adopted
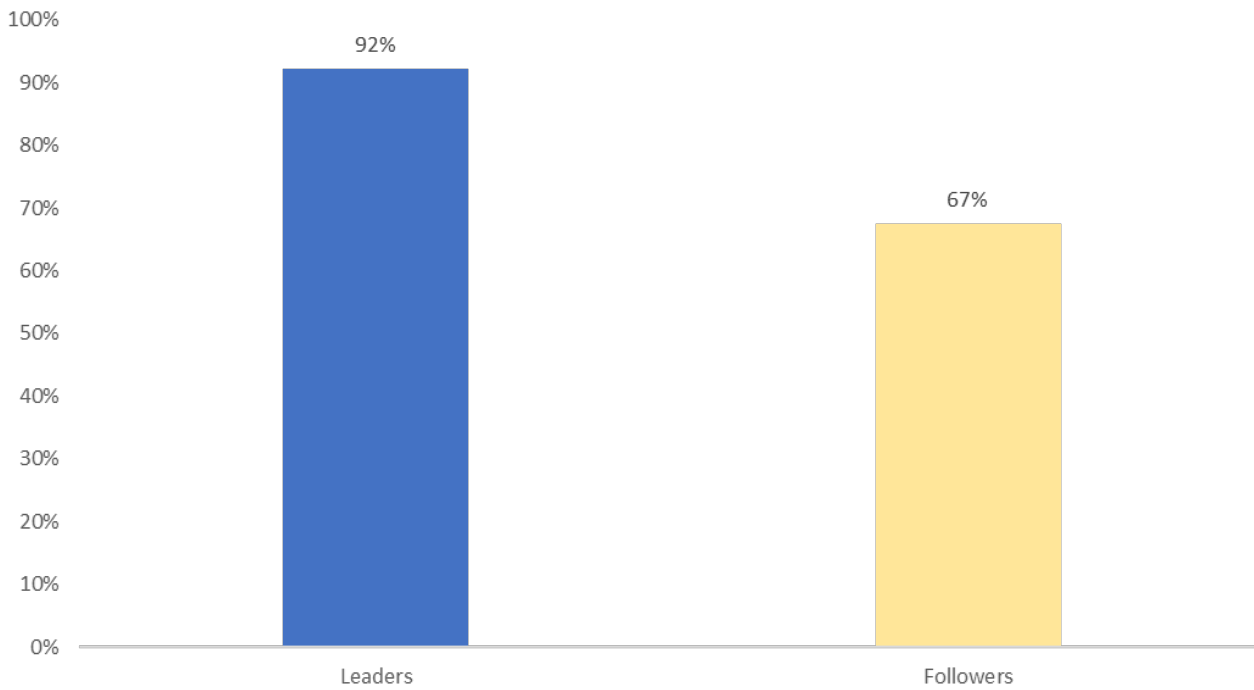
Source: Aberdeen, March 2020   n=205

Looking at this data, we see that adoption of monitoring that utilizes AI to provide faster and better analysis and outcomes is nearly universal among leaders. By implementing AI as part of an overall upgrade to modern, cloud-native APM, leaders are achieving the highest levels of application performance and reliability, and keeping users and customers free from the frustrations of slow and unavailable applications.

Modern, AI-enabled APM Boosts All Application Management

Leaders in application development are taking advantage of APM with powerful real-time streaming, full-fidelity data ingestion, open source instrumentation, and deep AI-driven data analytics. But what are the capabilities and advantages that even organizations that aren't leaders are gaining when they adopt these solutions? To understand, Aberdeen analyzed our research data to identify businesses that had adopted cutting-edge, modern APM. We then compared these organizations to competitors who aren't leveraging APM with streaming analytics and AI capabilities.

We discovered that application development organizations that adopt modern APM (as defined on page 2), outpace their peers in a number of

key capabilities for understanding and managing today's complex cloud-native applications and microservices.

Figure 3: Modern APM Leads to Better End-to-End Application Management

Source: Aberdeen, March 2020   n=205
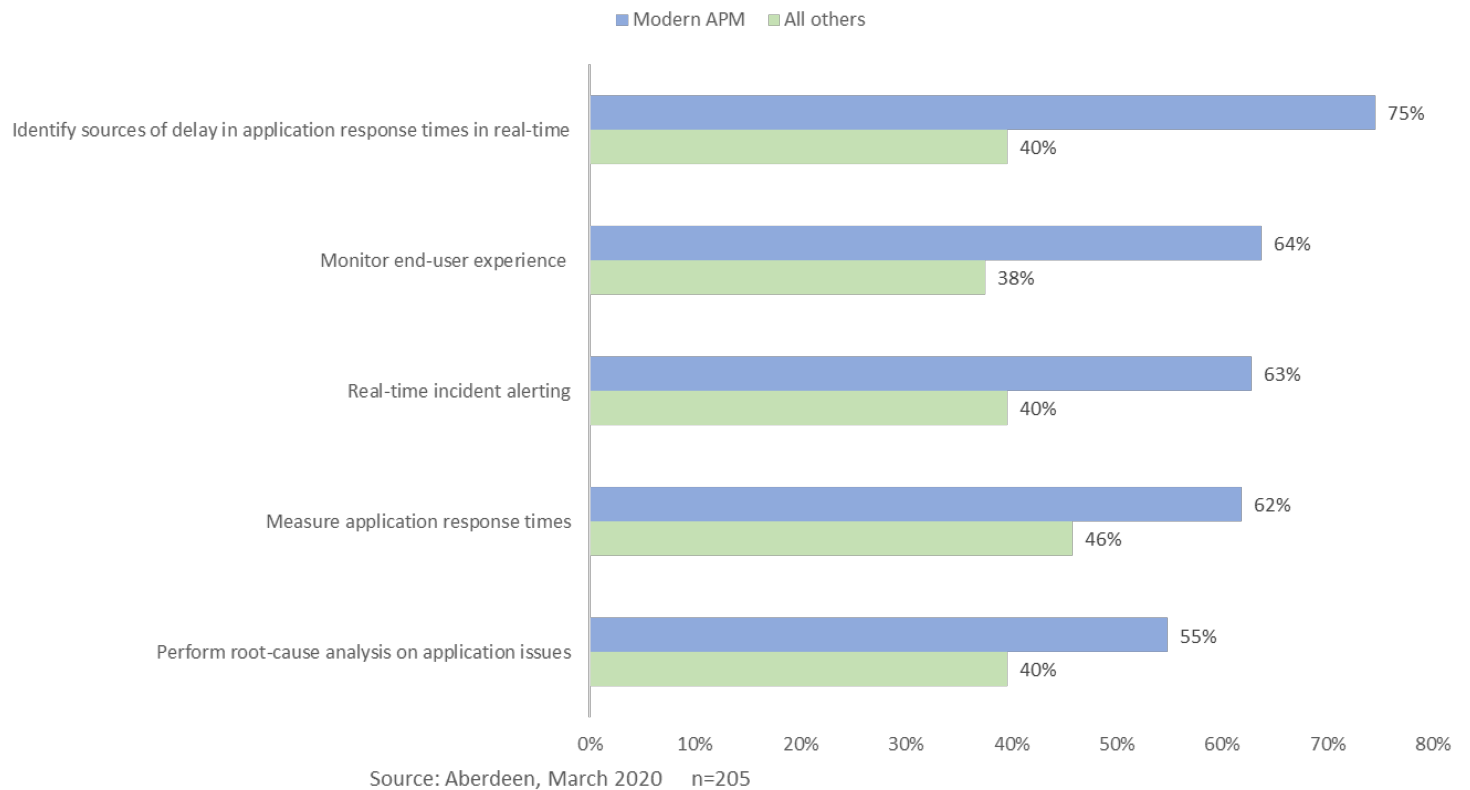
With a modern APM powering their monitoring and troubleshooting capabilities, development organizations are reaping the benefits of real-time alerting, meaning that they are likely to have the capability to identify issues in seconds rather than the minutes or hours businesses with legacy APM experience. A modern APM also leads to better adoption of strong application performance monitoring across the board, and AI enables the ability to perform deep and accurate root-cause analysis for application issues.

It's clear that adoption of a modern APM leads to better end-to-end capabilities for managing today's complex application environments. But Aberdeen research shows that the benefits extend beyond capabilities and is helping organizations improve ROI, reliability, and customer experience.

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We've found that among the top pressures pushing development organizations to improve their application infrastructure is the increasing complexity that new technologies such as Kubernetes, containers, and hybrid cloud are bringing. But IT Ops and DevOps teams are still driven by traditional demands of performance, data demand, and the bottom line. Application developers who are leaders in performance, data management, and ROI are adopting modern APM that provides streaming analytics and artificial intelligence enabled monitoring. But given the near universal adoption of modern APM among the leaders (as shown in Figure 2), it's valid to ask if modern APM is a big part of what makes these businesses Best-in-Class.

When Aberdeen looked at the benefits that application development organizations gained by adopting modern APM, the answer to this question is yes. Across the board, businesses with modern APM are seeing significant gains over their competitors, as shown in Table 1.

Table 1: Meeting Complex Application Demands with a Modern APM

Organizations with a modern APM are:

95%	more likely to speed the resolution of application issues
45%	more likely to see high levels of application availability
80%	more likely to have lowered the costs for application development
2x	more likely to see lower defect rates
3.7x	more likely to report higher levels of customer and end-user satisfaction with applications

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Compared to their peers that are still making use of traditional APM, organizations with modern APM that gives them vital insight and proactive analytics are more likely to have high application reliability, less application downtime, and fewer application defects. With AI tied to real-time analytics, modern APM users are also addressing issues much faster than their competitors, speeding resolution of application problems before they become an issue for end-users and customers.

Most importantly, by upgrading to an APM that is designed from the ground up to handle today's application environments, they are building high-performing and user friendly applications that keep customers and users highly satisfied. And with more reliable applications that work well with modern development environments and solutions, these modern APM organizations are more likely to have lower overall costs for application development.

Key Takeaways

Application developers have been in a constant state of change in recent years. They adopted DevOps and agile, they are shifting left in testing, and they are deploying containerized, Kubernetes-based, cloud-native applications instead of traditional monolithic apps.

This transformative change requires a new approach to APM. As we've seen, organizations that adopt modern, open standards based APM, with full-fidelity tracing and end-to-end, real-time analytics that leverages AI for increased insight into the rising amount of data, gain increased capabilities and see significant benefits.

To join these leaders, and bring their APM capabilities into the modern age, application developers, IT Ops and DevOps teams should:

▶ **Know what is happening right now**. When end-users experience an application problem before operations knows about it, negative results such as poor productivity for employees or dissatisfied customers speaking out on social media will occur. Real-time monitoring in seconds and incident alerting detect application issues as they occur and leads to swift resolution of problems.

▶ **Add deep, continuous and AI-driven monitoring and analytics.** Today's complex applications create a wealth of data that is both valuable and overwhelming. Leading businesses leverage APM that can pull data from all sources, such as traces

and metrics, and can use strong AI to analyze this massive amount of data to gain better understanding and management.

▶ **Take immediate action**. The sooner an application issue is fixed, the less potential it has to affect users (and decrease productivity and revenue). Modern APM systems with streaming analytics and AI capabilities can take quick steps to limit the effect of an application issue and provide the information needed to avoid future problems.

▶ **Be open and break down silos.** Today's applications are built with open standards and frameworks and are designed to easily integrate with any other application or service. The solutions that developers use to manage and monitor applications need the same kind of openness. Leading organizations leverage open standards based APM systems that consolidate monitoring into a single screen and give them the ability to replace their APM at any time, control and own their data, and not be locked in with a single APM vendor that uses a proprietary agent.

Modern applications based on cloud, containers, microservices, and serverless functions need modern application performance monitoring tools. Ephemeral infrastructure, complex service interdependencies, and much more frequent code pushes are quickly becoming the norm and legacy tools are limited in their ability to support these more dynamic and distributed environments.

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These days we hear a lot about how cloud, containers, Kubernetes, and DevOps can help applications scale better, reduce time to market, and give developers the flexibility to choose the right tool for the job. We also hear that the shift from a monolithic to a microservices-based architecture brings new monitoring challenges around the scale of data, the ephemerality of the underlying infrastructure, and the constantly changing interactions between all these components.

Many organizations try to leverage traditional Application Performance Monitoring (APM) tools in order to meet ever-increasing user expectations. However, most traditional APM solutions were designed for a world in which a single monolithic application would run on a static set of on-premises hosts. In such a world, applications were slow to change, written in a single language, and operated by separate teams. That is not the world in which our applications live in today.

Modern applications need an APM tool that is designed for cloud-native, microservices-based architectures from the ground up. Such a solution would have to handle the enormous amount of data associated with a microservices architecture and ephemeral infrastructure. It would need to collect ALL available data and leverage AI-driven analysis to derive insights to enable DevOps and SRE teams to act quickly and efficiently. Finally, as today's developers now have a broad set of tools and languages to choose from, modern APM tools also need support for open and flexible standards that meet the needs of modern DevOps teams.

Splunk designed SignalFx Microservices APM™ with all of this in mind. SignalFx Microservices APM leverages our streaming analytics engine to ingest 100% of trace data, correlate service workloads to underlying cloud infrastructure, and provides AI-Driven Directed Troubleshooting to help DevOps teams detect and resolve issues in their applications before users are negatively impacted. As founding members and active contributors to the CNCF OpenTelemetry project, Splunk is committed to open standards that eliminate vendor lock-in and give developers the most flexibility to ship high quality code quickly and efficiently .

We find that customers who leverage our modern approach to APM are able to achieve things that were impossible with legacy APM tools. Many of them have been able to cut down troubleshooting issues from hours or even days to just a few minutes. By leveraging 100% of trace data they can understand the conditions that cause even the rarest of anomalies, and at a scale unmatched by other solutions. Finally, with our open standards approach to instrumentation they are able to eliminate the overhead of heavy, proprietary agents and maintain full control over their own data.

Today's end users expect instant gratification and superb application experience. Only by taking a modern approach to APM can organizations elevate end user experience, bring applications to market faster, and future-proof their code.