Critical Capabilities for Application Performance Monitoring

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By Analysts Padraig Byrne, Federico De Silva, Josh Chessman

Initiatives: Infrastructure, Operations and Cloud Management

APM software provides visibility into users’ interactions with their most important applications. With a growing number of organizations moving to digital channels and driving demand for this insight, I&O leaders must select appropriate APM software based on stakeholders’ business needs.

This Critical Capabilities is related to other research:
Magic Quadrant for Application Performance Monitoring
View All Magic Quadrants and Critical Capabilities

Overview

Key Findings

- Businesses adapted to the COVID-19 pandemic by pivoting to online channels to engage with their employees and customers. This has increased interest in application performance monitoring (APM) in departments beyond its traditional domains of IT operations and DevOps teams.

- Artificial intelligence (AI) continues to play an increasing role in APM products by identifying anomalies, reducing noise and improving human operator efficiency.

- In addition to many established vendors, new startups have the potential to disrupt the APM market, creating opportunities for clients to explore new methodologies at a lower cost.

Recommendations

I&O leaders responsible for infrastructure, operations and cloud management should:

- Optimize the ROI of APM by collaborating with departments outside of IT operations to identify use cases around visibility for customer journeys, business metrics and processes — such as trades, orders, compliance or claims — and show how APM can deliver benefits beyond IT operations.

- Optimize user experience by deploying APM software that uses AI/machine learning (ML) to automate issue detection and resolution, and provide predictive analysis across the full stack.
Strategic Planning Assumptions

By 2024, 75% of organizations monitoring infrastructure as a service/platform as a service (IaaS/PaaS) environments will consume metrics via cloud providers’ APIs.

By 2025, 70% of new cloud-native application monitoring will use open-source instrumentation, rather than vendor-specific agents for improved interoperability.

What You Need to Know

APM software supports many roles in IT and the business. It must provide the following key functional requirements:

- Front-end monitoring
- Application discovery, tracing and diagnostics (ADTD)
- Domain-centric AI/ML

Gartner has established four critical capabilities in the context of five use cases that differentiate the most-popular tools in this market:

- Application debugging and distributed profiling
- Business analysis
- IT services monitoring
- Root cause analysis

The five use cases are:

- IT operations
- DevOps/AppDev
- Application owner/line of business
- SRE/CloudOps
- Digital experience monitoring (DEM)
This research focuses on the competitiveness of APM software products with respect to key functional dimensions, rather than the overall strengths and weaknesses of the vendors themselves. This analysis complements the Magic Quadrant for Application Performance Monitoring, which defines the market and highlights a broad set of factors, including corporate viability, vision, marketing and the geographic focus of the vendors that offer these APM software products. We recommend that organizations use this research in conjunction with the Magic Quadrant, inquiries with Gartner analysts and other Gartner research to define their requirements and select the solutions that best match their needs.

**Analysis**

**Critical Capabilities Use-Case Graphics**

![Vendor Score Chart]

Source: Gartner (April 2021)
### Vendors’ Product Scores for DevOps/AppDev Use Case

<table>
<thead>
<tr>
<th>Product or Service</th>
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As of 29 March 2021

Source: Gartner (April 2021)
### Vendors' Product Scores for Application Owner/Line of Business Use Case

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<td>ManageEngine</td>
<td>1.60</td>
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</tbody>
</table>

As of 29 March 2021

Source: Gartner (April 2021)
Vendors’ Product Scores for SRE/CloudOps Use Case

Product or Service Scores for SRE/CloudOps

- Dynatrace: 3.90
- Datadog: 3.54
- Broadcom: 3.33
- Cisco (AppDynamics): 3.25
- Elastic: 3.04
- Atenity: 3.02
- Microsoft: 2.97
- New Relic: 2.91
- IBM (Instana): 2.49
- Splunk: 2.31
- Tingyun: 2.30
- SolarWinds: 2.27
- Alibaba Cloud: 2.24
- Oracle: 2.15
- ManageEngine: 1.64

As of 29 March 2021

Source: Gartner (April 2021)
Vendors

**Alibaba Cloud**

Alibaba's APM offering evaluated in this research consists of three products: Application Real-Time Monitoring Service (ARMS) for application monitoring, Cloud Monitor for resource and infrastructure monitoring, and Log Service for log file aggregation and analysis. The tools are optimized for running inside the Alibaba Cloud ecosystem, with an option for on-premises deployment for large clients. Limited support is available for cloud providers other than Alibaba.

Alibaba's APM offering scored below the mean on all critical capabilities. Alibaba's highest score was in IT service monitoring, where the ARMS product offered integrated topology views, real-user monitoring
and integrated DevOps tooling. The lowest score was on business analysis, with limited tools for non-IT users.

Alibaba's APM product is suited to companies invested in the Alibaba Cloud platform and ecosystem. It has integrated offerings with other parts of the Alibaba suite, such as Enterprise Distributed Application Service (EDAS; Alibaba's PaaS solution) and DingTalk. Alibaba has a strong commitment to open-source integration, with significant investments in Prometheus and OpenTelemetry. The tooling overall has developed rapidly in recent years and continues with a roadmap that includes enhancements to its DEM suite and improvements in its AI capabilities. However, the user interface is not as intuitive as others, and lags behind the leaders in the APM space in many areas.

Alibaba Cloud monitoring is best suited to application owners/line of business and DEM use cases.

**Aternity**

The Aternity APM product evaluated in this research is Aternity 12. Aternity 12 is a combination of products previously known as AppInternals and Aternity. Aternity integrates with products from Riverbed, including NetProfiler for enhanced network visibility.

Aternity scored above the mean on all critical capabilities. It scored highest on the business analysis use case and lowest on the application debugging and distributed profiling use case. Aternity continues to excel at use cases involving DEM, which is one of the vendor's primary focus points. Aternity combines its extensive DEM agent technology with back-end APM functionality to position itself as a vendor able to provide end-to-end visibility.

Aternity differentiates itself from competitors with a strong focus on DEM and transaction-level monitoring for end-to-end visibility for all types of applications, including managed, desktop and SaaS. Aternity is the only vendor evaluated in this research with a dedicated endpoint agent, which provides the aforementioned capabilities. Additionally, Aternity provides the ability to process and capture billions of transactions and user impressions with no loss of fidelity.

Aternity's roadmap for APM is heavily focused on DEM and endpoint visibility, with plans to continue to expand functionality in that area. The company plans to increase focus on instrumentation with work around microinstrumentation and improving support for open telemetry and related technologies. Additional improvements are planned around providing more automated insights and improving self-service and remediation functions.

Aternity's offering is best suited for application owners/line of business and DEM use cases.

**Broadcom**

Broadcom's APM products evaluated in this research are the DX APM 20.2.1 and DX SaaS. Available for either on-premises or as SaaS, both options provide functionality and code parity in the most recent release. The APM offerings form part of Broadcom's suite of monitoring products under the umbrella of
AIOps from Broadcom. The vendor further integrates with a suite of other infrastructure software as part of its BizOps platform, including automation, testing and security, among others.

Broadcom’s APM offering scored above the mean on all critical capabilities. IT service monitoring continues to be a key strength for this provider, achieving Broadcom’s highest score along with application debugging and distributed profiling. Broadcom’s APM product uses assisted triage to facilitate anomaly detection used in service monitoring. Broadcom’s APM product scored its lowest in business analysis, as the product relies on manual and heavy customization of dashboards to do analytics and it is not as automated as competing solutions.

Broadcom’s APM product offering has strong functionality for complete end-user experience monitoring for IT operations use cases. It has strong analysis workflows showing complete user transactions and the ability to record and play back video of user activity within the context of the user journeys being monitored. The APM solution also showed strong functionality in multidomain analysis using AIOps capabilities. Time to value for Broadcom’s APM solutions is extended due to reliance on the customer to configure dashboards for common metrics that other solutions provide by default. Broadcom’s roadmap for APM is focused on expanding support for hybrid cloud environments by adding network layer visibility and improved visualizations, increasing capabilities into root cause analysis for DevOps and SREs with insights into SLOs and SLIs, and facilitating customer onboarding based on persona and enriched insights.

Broadcom’s APM offering is best suited for IT operations and DevOps/AppDev use cases.

**Cisco (AppDynamics)**

Cisco (AppDynamics)’s APM product evaluated in this research is the AppDynamics platform, which provides native DEM capabilities. It also integrates with ThousandEyes (acquired by Cisco in 2020) for internet and SaaS monitoring, and Cisco Intersight Workload Optimizer (IWO), the SaaS version of Cisco Workload Optimization Manager (CWOM), which is offered as an OEM product by Turbonomic for workload analysis and optimization.

Cisco (AppDynamics) scored above the mean on all critical capabilities. The offering continues to excel in business analysis, in particular with its Business iQ product and the recently launched Experience Journey Map user journey map capabilities, which apply ML algorithms to technology and business metrics. Cisco (AppDynamics)’s lowest score is in application debugging and distributed profiling, as the product has historically focused on operations rather than development teams.

Cisco (AppDynamics) has strong functionality for monitoring and analyzing complete user journeys and translating application performance into business metrics such as funnel analysis and abandonment rates. Root cause analysis for critical enterprise applications like SAP, for which Cisco (AppDynamics) has a specific product called SAP Peak, is also strong, which differentiates it in a market where only a handful of vendors can offer such a capability. The ability to do analytics was embedded in the product this year (it was previously in separate dashboards); however, correlating traces with logs is not as intuitive as other solutions. Cisco (AppDynamics) lags behind leading vendors in its monitoring support
for public cloud and Kubernetes environments. Its roadmap for APM is focused on expanded support for Kubernetes, OpenTelemetry, cloud providers beyond Amazon Web Services (AWS), and support for monitoring platform as a service (PaaS) and database as a service (DBaaS). Cisco (AppDynamics) continues to modernize its agent and agentless telemetry ingestion technologies, as well as to further integrate the AppDynamics and ThousandEyes platforms.

Cisco (AppDynamics) offering is best suited for application owners/line of business and DEM use cases.

**Datadog**

Datadog’s platform is based on a unified interface with separate components for each core functional area. For APM, the core modules include APM, profiling and log management, and real-user and synthetic monitoring. Other recent additions include security and network monitoring.

Despite being a relatively new entry to the field, Datadog’s APM offering scored above average on all critical capabilities. Application debugging and distributed profiling and continuous profiling are key strengths for this provider, achieving Datadog’s highest score. Datadog offers distributed tracing with no sampling, but with a 15-minute limit for searching (users can then pay for longer-term storage). Datadog’s lowest score was in the category of business analytics, with limited offerings for the non-IT/DevOps user.

Datadog has successfully broadened its portfolio in recent years beyond core infrastructure monitoring, and this has been reflected in its growing customer base. Most of its clients that Gartner has seen use more than one Datadog module, with a large number using three or more — usually APM, log management and infrastructure monitoring. Future areas include enhancements to its AI/ops tooling (currently called Watchdog), business analytics, and further integrations of its server and application monitoring tools.

This product is well-suited for midsize to large enterprises, particularly those with applications deployed in the cloud or hybrid environments. Based on Gartner’s analysis, the product is well-aligned with the ARE/CloudOps user role.

**Dynatrace**

Dynatrace’s APM product evaluated in this research is the Dynatrace platform. The product is offered as a SaaS or managed service, both based on the same code. The Dynatrace platform, in addition to its core APM functionality, offers modularized capabilities via products such as ITIM, DEM business analytics, AI/ops, cloud automation and application security.

Dynatrace scored above the mean on all critical capabilities, achieving the highest overall ratings across the four capabilities evaluated. Dynatrace demonstrated strong capabilities for root cause analysis in particular because its AI/ops engine, Davis, is embedded across the platform and examines data across modules and data types. Dynatrace’s workflows and use of PurePath to analyze complex distributed
traces with code-level detail allow users to detect application performance problems and probable root cause with relative ease, compared with other offerings. Dynatrace's lowest score is in business analysis, as this newer module continues to evolve and mature relative to some of the leading market offerings in this particular category.

Dynatrace's offering has strong functionality for monitoring SLOs and error budgets. This can be achieved with the assistance of wizards, although Dynatrace's Davis AI engine is also conducting analysis of SLOs and error budgets, which gives teams flexibility in how they want to monitor them. Dynatrace provides out-of-the-box integration with DevOps tools and automates detections of errors and performance problems due to application changes. Dynatrace can also receive flag changes and display data in the graphs to correlate the impact of the feature rollouts to performance. Its capabilities in detecting network or ISP issues is more basic compared with other solutions.

Dynatrace's roadmap for APM is focused on extending the analytics capabilities of its Davis AI engine to new data sources, such as OpenTelemetry and expanding its presence in cloud provider marketplaces like AWS, Microsoft Azure and Google Cloud Platform. Dynatrace is commercializing Keptn, its automation platform, to allow customers to integrate the Dynatrace platform with automation platforms as well as drive its own automation capabilities.

Dynatrace's APM offering is best suited for IT operations and SRE/CloudOps use cases.

**Elastic**

Elastic's APM product evaluated in this research is Elastic Observability. This product is the most recent version of Elastic's APM offering, previously named Elastic APM. Elastic provides a range of functionality beyond just APM, including the ability to process and analyze a wide range of time-series-based data.

Elastic scored above the mean on the root cause analysis, IT services monitoring and application debugging and distributed profiling critical capabilities. Elastic scored below the mean on the business analysis use case. It scored highest on the application debugging and distributed profiling use case and lowest on the business analysis use case.

Elastic differentiates itself from its competitors with a simplified pricing model and the fact that the underlying Elasticsearch architecture is highly flexible, allowing for the ingestion of a wide variety of data types that can all be used as part of different analyses. Elastic's product roadmap includes improved support for OpenTelemetry, synthetic and user experience analytics, and introducing support for native mobile applications. Elastic also is planning to improve usability in areas such as root cause analysis and dynamic instrumentation.

Elastic's APM offering is best suited for the SRE/CloudOps use case.

**IBM (Instana)**
Instana was acquired by IBM in December 2020. IBM's previous offerings in the APM space will be retired, with pathways available to be replaced by Instana. Instana is offered as a single product, Instana APM, delivered as a SaaS or as an on-premises deployment. Instana offers limited native log file analysis while partnering with third parties such as Humio and Coralogix, and currently does not offer synthetic monitoring, for which it partners with Apica.

Instana scored below the mean for all the critical capabilities. Its best showing was in the area of IT service monitoring. Instana is strong in monitoring for serverless and Kubernetes environments, although it lacks some capabilities such as the ability to view cold start times for containers. The lack of an integrated synthetic monitoring solution, in particular, limited its abilities for some use cases. Instana APM has limited support for legacy environments and business analysis capabilities because it is missing some key functionality. It currently does not have native log management capabilities.

In the near term, IBM plans to integrate Instana more closely with the IBM portfolio, including IBM Cloud Pak for Watson AIOps. IBM plans to enhance its native log analytics beyond the current application warning and error message capabilities. Additionally, IBM will introduce native synthetic monitoring to complement its offerings. Instana APM is best suited to midsize and large organizations seeking to deploy APM for modern environments. Based on Gartner's analysis, the product is best aligned with the DevOps/AppDev and SRE/CloudOps use cases.

**ManageEngine**

ManageEngine's APM offering consists of two separate tools: ManageEngine Applications Manager, an on-premises offering, and Site24x7 for SaaS deployments. While the two share common code, they do not have feature parity.

ManageEngine scored below the mean for all critical capabilities. It scored highest for IT service monitoring. It was notable that ManageEngine's offerings were much less integrated than others evaluated, often lacking the ability to switch in context from one part of the application to another. Workflows were inefficient, requiring more effort to navigate the platform than other tools.

ManageEngine's roadmap includes a focus on increasing its capabilities in serverless monitoring, adding support for Alibaba Cloud and Oracle, expanding DEM capabilities, and integration of AIOps for analysis and noise reduction.

Both products are best suited to small to midsize enterprises. Based on Gartner's analysis, the product is best aligned with the IT operations use case.

**Microsoft**

Microsoft's APM product evaluated in this research is Microsoft Azure Monitor. It is part of the larger set of cloud-based products under Microsoft Azure and is only offered as SaaS. The APM functionality within Azure Monitor is Application Insights, and there are practical limitations for customers that wish to use Application Insights to monitor workloads outside of Azure and in hybrid environments.
Microsoft scored above the mean on all critical capabilities. Its strongest demonstrated capabilities were for business analysis, with straightforward funnel analysis of user flows or journeys, although this capability is basic relative to leading vendors. Microsoft Azure Monitor is tightly integrated into the provider’s development and operations tools, and demonstrated good capabilities for application debugging and distributed profiling. The strong set of functionality and application maps is somewhat offset by the manual workflows that require high knowledge of the product and environment being analyzed for root cause analysis, which was the vendor’s lowest-rated capability.

Microsoft’s APM product provides tight integration with the vendor’s ecosystem, such as Azure DevOps and GitHub, but also extends bidirectional integration with many other popular DevOps tools. Microsoft Azure Monitor uses query-driven charts built on log analytics to monitor SLOs and error budgets, but building them is manual in nature and they are more basic compared to leading solutions. Microsoft Azure Monitor lags behind in monitoring performance at endpoints and isolation of performance problems caused by network traffic, which required a separate product. Microsoft’s roadmap for APM is focused on extending support for distributed tracing for cloud-native applications. This includes support for OpenTelemetry for a wider set of Azure services. Microsoft’s roadmap also includes continued expansion of multicloud support to provide customers with monitoring of workloads running on-premises and on competitor’s clouds. As more customers adopt COTS and SaaS applications, Microsoft Azure Monitor plans to continue adding support for these application environments.

Microsoft’s APM offering is best suited for application owner/line of business and DEM use cases.

**New Relic**

New Relic’s APM product evaluated in this research is part of the New Relic One platform. This offering is intended to go beyond APM to provide a single data store for a wide variety of data types.

New Relic scored above the mean for all critical capabilities. Its highest score was in the IT services monitoring use case. Its lowest score was in business analysis, partially due to its product lacking the maturity of some of the other leading vendors.

New Relic’s approach of ingesting multiple telemetry data types and making them available for analysis both via their telemetry data platform (TDP) and as part of their APM differentiates the vendor from most others. New Relic’s roadmap focuses on numerous product areas. Some of its focus areas include improving data exploration and correlation, simplifying the instrumentation process with a common user experience and interface, and improving developer collaboration tools. It is also looking at continuing to enhance its AIOps offerings, including with deeper ITSM integrations, and continuing to focus on its partnership with AWS.

New Relic One is best suited for IT operations, application owner/line of business and DEM use cases.

**Oracle**
Oracle's APM product evaluated in this research is the Oracle Management Cloud (OMC) platform for SaaS and Oracle Enterprise Manager (OEM) for on-premises. The two product offerings vary significantly in terms of capabilities and do not share the same codebase, as they are intended for different use cases and customer requirements. OMC is part of Oracle Cloud Infrastructure (OCI), similar to other cloud providers that offer a management platform. APM capabilities support multicloud environments, but are optimized for the Oracle stack.

Oracle's APM offering scored below the mean on all critical capabilities. Oracle's highest score was in root cause analysis and IT service monitoring. Oracle's APM product's lowest score was in business analysis, as the workflows are not as automated or intuitive relative to competitive offerings.

Oracle's APM product offers added screenshot capture capability to monitor end-to-end user journeys, which brings this product somewhat closer to competitive products but still behind leading offerings. OCM offers good root cause analysis capabilities, but the workflows are manual relative to the more automated ones found in competing solutions, and capabilities for investigating multiple data sources for observability remain behind those of competitors. Oracle's roadmap for APM is based on a new generation of monitoring. The OCI Observability and Management Platform, over time, will unify many of the OMC capabilities into a single platform, such as log analytics and application and infrastructure monitoring, with native support for open standards. As of this writing, a limited subset of APM capabilities within the new platform remain in limited availability. Application transaction analysis is based on OpenTracing and includes support for legacy technologies as well. Oracle's APM solution adds support for OpenMetrics and OpenTelemetry through proprietary collectors that allow the platform to collect data from Prometheus.

Oracle is best suited for IT operations and DevOps/AppDev use cases.

**SolarWinds**

SolarWinds offers a SaaS-based suite that is an integration of its APM tools, AppOptics, Loggly and Pingdom. The SaaS suite is optimized for cloud-native environments and supports code-level instrumentation and infrastructure monitoring. The product also supports on-premises and traditional environments. SolarWinds’ Server & Application Monitor (SAM) product has a reduced APM feature set for on-premises monitoring.

SolarWinds scored below the mean for all of the critical capabilities, with its strongest performance in the IT service monitoring space. In particular, SolarWinds’ recent addition of using AI tooling to suggest root cause analysis will be useful for IT operators as it surfaces likely issues quickly. SolarWinds can instrument at the method level, like other competitors. However, many of the analytics capabilities require manual effort by users, with relatively little in the way of automated workflows.

SolarWinds scored least well in business analysis due to the limited tools and displays available for non-IT users. This is in keeping with the vendor's primary customer being the IT professional within the organization.
SolarWinds is best suited for IT operations use cases.

**Splunk**

Splunk’s APM product evaluated in this research is the Splunk Observability Suite. Splunk provides a range of functionality beyond just that available from the Splunk Observability Suite, including the ability to perform advanced analysis of time-series-based data.

Splunk scored below the mean on all critical capabilities. Splunk continues to improve its offering through internal development of existing products and through the acquisition of outside companies. Over the past several years, Splunk has acquired several companies in this space, including Rigor, Plumbr and Flowmill in the last 12 months, and is continuing work to integrate them fully with its existing technology.

Splunk's ability to leverage complete end-user journeys and compare them against both Google standards and benchmark against organizationally relevant competitors helps Splunk stand out from other APM vendors. The vendor continues to invest in its APM functionality through several recent acquisitions focusing on enhancing its offerings in areas such as real user monitoring, synthetic transaction monitoring, bytecode instrumentation and network monitoring. Splunk is also working to provide faster problem detection, investigation and resolution through increased investments in AI and ML functionality. Additionally, it continues to focus on providing support for end-to-end visibility.

Splunk is best suited for application owner/line of business and SRE/CloudOps use cases.

**Tingyun**

Tingyun’s APM products evaluated in this research are Tingyun APM, Tingyun BPI (for business analysis) and Tingyun NeurAlert (for event management and analytics). The Tingyun APM platform can be deployed in Docker environments for SaaS and on-premises versions. Tingyun offers other monitoring products, such as network monitoring, which can be combined with APM. Tingyun's APM capabilities primarily support AWS and Alibaba clouds, although the vendor is most focused on the latter given the shared market interest, even though they are also direct competitors.

Tingyun's APM offering scored below the mean on all critical capabilities. Tingyun's highest score was in IT service monitoring, followed by root cause analysis. Its analytics capabilities for surfacing problem root causes have evolved over the years, although it remains behind leading vendors. Tingyun's APM product's lowest score was in application debugging and distributed profiling, as this vendor is primarily focused on traditional IT operations monitoring organizations.

Tingyun's APM product offers new capabilities around event management via the Tingyun NeurAlert, including event parsing, enrichment and routing. It also added support in 2020 for OpenTelemetry to monitor end-to-end user journeys, which brings this product somewhat closer to competitive products but still behind leading offerings. Tingyun has all of the critical capabilities, but lacks many of the automated workflows found in leading offerings. It requires more manual steps to find the root cause.
While demonstrating user journey flows, the tabular nature of the data presentation makes it less intuitive to follow than other product offerings.

Tingyun’s roadmap for APM is focused on integrating log monitoring into the platform as well as ML for fault discovery and diagnostics across the various modules within the platform. Tingyun is also focusing on increasing support for 5G through DEM capabilities for mobile devices, given China’s strong mobile e-commerce market. Finally, the vendor is also investing in linking software testing capabilities into its platform via the APM module.

Tingyun is best suited for IT operations and DEM use cases.

Context

APM software solutions are useful to a growing set of stakeholders in IT, developer communities and the business. Given many organizations’ increased adoption of hybrid and multicloud technologies to support digital transformation initiatives, APM has become increasingly critical to their success. APM helps improve user experience, shortens mean time to repair (MTTR), improves service availability, detects anomalous application behavior and forecasts future problems. It also provides critical data that is useful outside a purely IT operations context, including insight into the impact that full-stack performance has on customer behavior and business processes.

APM software is part of an overall enterprise availability and performance monitoring portfolio, and its adoption becomes more important due to a confluence of factors, including:

- The growing trend and need for digital transformation driving the importance of the health of the application, which directly corresponds to the health of the business
- Increasing application architecture complexity; on-premises, hybrid, cloud-native and multicloud deployments; and an uptake in the adoption of containers, Kubernetes, microservices and serverless computing
- The escalating velocity of application release, configuration change, and integration
- The large and varied number of potential endpoints from which the consumption of enterprise business services occurs

Product/Service Class Definition

APM software solutions provide for the collection, aggregation and analysis of data to assess application performance. These tools increasingly are tasked to solve difficult issues in diverse and complex application architectures — on-premises, in the cloud and hybrid — using the APM critical capabilities identified in the Critical Capabilities Definition section.

Critical Capabilities Definition
Business Analysis

Business analysis identifies the health of the organization with respect to its KPIs, including financial metrics. Business processes describe and, using APM, track its flow and status across the underlying infrastructure.

Business analysis goes beyond performance and availability statistics. It provides insight to lines of business, including digital marketers and application developers, on the efficacy of the services being offered. Shopping cart abandonment rates, shopping cart conversions and even the financial value of a transaction are some of the measures to look for in this area.

Root Cause Analysis

Root cause analysis attempts to determine the probable cause of a problem, then construct a causality chain linking cause and effect. Much of the activity of APM technology focuses on detecting and providing insight into root causes.

The probable cause (for example, a failure or degradation) is linked on a graph to the entities (for example, application, services or infrastructure) that are affected or will be affected. This methodology supports differentiation between cause and effect, and prioritizes repair on the cause rather than attempting to fix transient symptoms.

IT Services Monitoring

IT services monitoring reflects whether agreed-on commitments regarding responsiveness and uptime are being met. This includes identifying adherence to contracted service-level availability and performance thresholds.

Often spelled out in the form of SLAs, OLAs and SLOs, these measures provide visibility to line-of-business and application owners, as well as to IT operations and DevOps teams, on the health of key services. The metrics provide a common view or boundary object that enables communication across these disparate teams.

App Debugging Distributed Profiling

Application Debugging: This is a primary activity of application developers and, sometimes, application support teams, in the process of finding the causes that produce undesirable program effects. This often requires identifying the sources of defects and errors in computer program code. APM tools often enable this by collecting data from public interfaces, such as JMX in Java application servers or the CLR in .NET applications. A method called bytecode instrumentation (BCI) provides visibility into running software through the dynamic instrumentation of the code, typically at load time.

Distributed Profiling: There are many potential sources of application performance degradation, and distributed profiling focuses on mitigating this anomalous condition. It involves identifying and localizing the sources of performance degradation across an infrastructure made up of applications, services and machines. Numerous IT shareholders have an interest in this capability, which typically is
implemented by tagging or tracing (and sometimes by time-based or statistical analysis). These users can then track transactions across a mesh of interconnected nodes, followed by detection of where along the path the degradation appears to be happening.

Use Cases

**IT Operations**

IT operations teams are usually tasked with keeping the infrastructure operating efficiently. However, its areas of responsibility can vary widely.

IT operations practitioners may be in specific silos, such as the network team, server team, virtualization team, mainframe team or other cross-functional teams (such as a generalized monitoring team). Most APM use in traditional IT operations teams involves generalists tasked with identifying problems quickly. This is accomplished by using service monitoring and anomaly detection for early warning notifications of performance issues.

**DevOps/AppDev**

DevOps release teams must rapidly assess the quality (and effectiveness) of recent releases to detect and diagnose issues quickly.

This often requires in-depth data sourced from multiple, integrated tools. DevOps teams also help plan for future requirements and, therefore, look to assess the impact of recently performed or planned application or infrastructure changes.

Application developers increasingly make APM buying decisions due to changes in how IT teams support the deployment of emerging technologies with cloud-native architectures, as well as increasing separation of responsibilities between core IT functions and developers.

Ultimately, the role responsible for developing and supporting software visibility and instrumentation is a key element. This role also includes some elements of application testing through the application life cycle. A key buying criterion of application developers is method-level code visibility, including the ability to compare and profile code in production environments. Problem isolation is another key capability that is often shared with application support. Infrastructure visibility provides increased understanding of the impact the code has on infrastructure elements.

**Application Owner/Line of Business**

Increasingly, application owners, line-of-business managers and those responsible for service delivery from a nontechnical perspective are becoming interested in APM technologies.

These users formerly had been provided limited infrastructure metrics and health data from IT operations organizations. However, because this information was not enough to make business decisions, line-of-business buyers are driving APM suite tool purchases. The primary focus of these
users is on business metrics and customer journeys, but end-user experience data is also important to
detect trends before they manifest into something that might harm the business.

**SRE/CloudOps**

CloudOps engineers enable continuous operations using cloud-native tools or cloud management
platforms (CMPs) for software deployment and configuration management.

Site reliability engineering (SRE) is a discipline that enables cross-functional teams to design and
operate scalable, resilient systems with complex modern architectures, usually in cloud environments.

As development of cloud-native applications continues to increase, APM vendors have continued to
evolve their support for applications built using microservices, packaged in containers and deployed
across flexible, intelligent infrastructures. Typically, the containers are orchestrated using Kubernetes. As
such, the line between the application and the intelligent infrastructure becomes blurred. This is
especially true as cloud-native applications are isolated or abstracted from server, OS and even
traditional network dependencies. These architectures are of enormous value to the business in terms of
cost and agility, and they present new challenges to monitoring tools.

Most often, CloudOps or SRE engineers are the personas managing cloud-native applications and
responsible for their performance and availability. Their skills are a combination of DevOps and
traditional ITOps skills, and they work with CMP, monitoring and observability tools, such as those from
APM vendors.

**Digital Experience Monitoring**

DEM technologies monitor availability, performance and experience quality as end users interact with
applications and supporting infrastructure.

Users can be external consumers of a service (such as patrons of a retail website), internal employees
accessing corporate tools (such as a benefits management system) or a combination of both. DEM
technologies seek to observe and model the behavior of users as a continuous flow of interactions in the
form of user journeys.

**Vendors Added and Dropped**

**Added**

- Alibaba Cloud
- Elastic

**Dropped**

- Micro Focus did not meet the inclusion criteria.
Inclusion Criteria

For Gartner clients, Critical Capabilities research identifies and then analyzes the most relevant providers and their products in a market. Gartner uses, by default, an upper limit of 20 providers to support the identification of the most relevant providers in a market. On some specific occasions, the upper limit may be extended by Methodologies where the intended research value to our clients might otherwise be diminished.

The inclusion criteria represent the specific attributes that analysts believe are necessary for inclusion in this research.

To qualify for inclusion, providers must demonstrate the capability to observe an application's complete HTTP/S transaction behavior, either through proprietary agent technology and/or distributed tracing. The vendor must demonstrate the capability to automatically collect data from at least three modern application frameworks:

- Java Virtual Machines (JVMs)
- .NET CLRs
- PHP
- Ruby
- Node.js
- AngularJS
- Python
- Go

The vendor must show at least three of the following core capabilities:

- The ability to automatically discover and map an application(s) components (including web servers, application servers and microservices), as well as application frameworks and platforms (such as containers, orchestration mechanisms and service mesh) and their relationships. Additionally, demonstrate the capability to automatically discover infrastructure components (such as physical and virtual servers, storage, databases, IaaS, routers and network devices), as described in Gartner’s Market Guide for IT Infrastructure Monitoring Tools.
- The capability to support applications running in at least two major mobile (native and mobile web) and desktop browsers (including Google Chrome, Firefox, Apple Safari and Microsoft Edge).
The capability to automatically identify the root cause of application performance problems and link problems to business outcomes.

The capability to bidirectionally exchange data with infrastructure automation (see Market Guide for Infrastructure Automation Tools), ITSM (see Magic Quadrant for IT Service Management Tools) and incident response automation (see Automate Incident Response to Enhance Incident Management) tools.

The capability to automatically correlate application performance to business KPIs and user journeys.

The ability to provide domain-agnostic analytics for data from third-party sources (e.g., open-source, cloud provider and/or competitive products). This includes events, traces, metrics, social media and business metrics, in the same manner as data collected from proprietary agent technologies.

### Table 1: Weighting for Critical Capabilities in Use Cases

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<th>Critical Capabilities</th>
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<th>SRE/CloudOps</th>
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As of 29 March 2021

Source: Gartner (April 2021)
This methodology requires analysts to identify the critical capabilities for a class of products/services. Each capability is then weighted in terms of its relative importance for specific product/service use cases.

Critical Capabilities Rating

Each of the products/services has been evaluated on the critical capabilities on a scale of 1 to 5. A score of 1 equals Poor (most or all defined requirements are not achieved), while 5 equals Outstanding (significantly exceeds requirements). However, readers are cautioned not to compare scores of the 2021 APM critical capabilities ratings with those in the prior version (see Critical Capabilities for Application Performance Monitoring), because the evaluation process has been updated.

In the prior evaluation, Gartner developed persona-based scenario elements against which vendors were asked to demonstrate their product and/or service capabilities. Thus, if the score in the current research is either higher or lower than in the prior version, you should not conclude that the vendor's offering in some way performed better or worse than last year.
Table 2: Product/Service Rating on Critical Capabilities

Enlarged table in Appendix

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Source: Gartner (April 2021)

Table 3 shows the product/service scores for each use case. The scores, which are generated by multiplying the use-case weightings by the product/service ratings, summarize how well the critical capabilities are met for each use case.
To determine an overall score for each product/service in the use cases, multiply the ratings in Table 2 by the weightings shown in Table 1.

Evidence

Gartner conducted APM vendor surveys across 13 main criteria for both Vision and Execution, and reviewed APM vendor recorded product demonstration across five use cases and four critical capabilities, each addressing 25 specific scenarios. This research also is informed by regular vendor briefings focused on areas including business updates, product features, roadmap, etc.

Gartner client inquiries on APM increased 26% in 2020 over 2019.

Critical Capabilities Methodology

This methodology requires analysts to identify the critical capabilities for a class of products or services. Each capability is then weighted in terms of its relative importance for specific product or service use.
cases. Next, products/services are rated in terms of how well they achieve each of the critical capabilities. A score that summarizes how well they meet the critical capabilities for each use case is then calculated for each product/service.

"Critical capabilities" are attributes that differentiate products/services in a class in terms of their quality and performance. Gartner recommends that users consider the set of critical capabilities as some of the most important criteria for acquisition decisions.

In defining the product/service category for evaluation, the analyst first identifies the leading uses for the products/services in this market. What needs are end-users looking to fulfill, when considering products/services in this market? Use cases should match common client deployment scenarios. These distinct client scenarios define the Use Cases.

The analyst then identifies the critical capabilities. These capabilities are generalized groups of features commonly required by this class of products/services. Each capability is assigned a level of importance in fulfilling that particular need; some sets of features are more important than others, depending on the use case being evaluated.

Each vendor's product or service is evaluated in terms of how well it delivers each capability, on a five-point scale. These ratings are displayed side-by-side for all vendors, allowing easy comparisons between the different sets of features.

Ratings and summary scores range from 1.0 to 5.0:

1 = Poor or Absent: most or all defined requirements for a capability are not achieved

2 = Fair: some requirements are not achieved

3 = Good: meets requirements

4 = Excellent: meets or exceeds some requirements

5 = Outstanding: significantly exceeds requirements

To determine an overall score for each product in the use cases, the product ratings are multiplied by the weightings to come up with the product score in use cases.

The critical capabilities Gartner has selected do not represent all capabilities for any product; therefore, may not represent those most important for a specific use situation or business objective. Clients should use a critical capabilities analysis as one of several sources of input about a product before making a product/service decision.

Document Revision History
Critical Capabilities for Application Performance Monitoring - 22 April 2020
Critical Capabilities for Application Performance Monitoring - 14 March 2019
Critical Capabilities for Application Performance Monitoring Suites - 21 December 2016
Critical Capabilities for Application Performance Monitoring - 3 February 2016
Critical Capabilities for Application Performance Monitoring Tools - 10 December 2014

Recommended by the Authors

How Products and Services Are Evaluated in Gartner Critical Capabilities
Solution Comparison for Microsoft Office 365 Monitoring Solutions
Hype Cycle for IT Performance Analysis, 2020
Market Guide for Digital Experience Monitoring
Predicts 2021: Infrastructure Operations and Cloud Management
Observe, Measure and Assist: Three Emerging Ways to Drive Workforce Digital Dexterity
Solution Path for Modern Infrastructure and Application Monitoring
SolarWinds Orion Was Breached — Now What?

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As of 29 March 2021

Source: Gartner (April 2021)
### Table 2: Product/Service Rating on Critical Capabilities

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As of 29 March 2021

Source: Gartner (April 2021)
Table 3: Product Score in Use Cases

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