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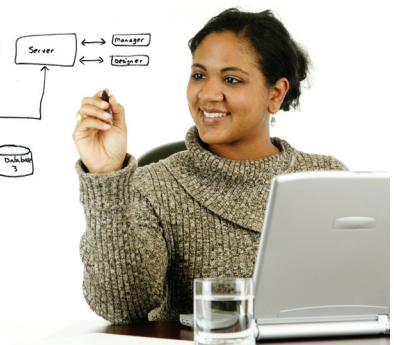
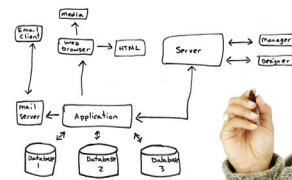
High Definition Application Performance Management

The IT Service Management Challenge

Introduction

Ask a group of IT professionals, “Who is responsible for end-to-end application performance?” and multiple individuals may raise their hands. Or as is often the case, no one might. Most IT organizations struggle to address end-to-end application management. Yet the responsiveness and availability of critical business applications and IT services is of paramount concern to CIOs everywhere.

Why the apparent disconnect? A typical enterprise application relies on dozens or even hundreds of separate hardware and software components to deliver the business service for which it is deployed. These components include web servers, application servers, databases, network devices, WAN and LAN links, WAN accelerators, load balancers, and storage devices. Furthermore, most applications rely on other common services, such as directory services, DNS, or other business applications with which they share information. Managing this interconnected web of hardware and software naturally requires different types of tools for different types of components. For management purposes, we refer to the different types of components as belonging to different “management domains.” While it makes



sense to be able to manage each domain with specialized tools, there is also a need for cohesive management approaches that facilitate addressing the issues of the service in its entirety. To date, management technology as well as business organizations have evolved mostly in a “silobased” approach that has proven insufficient to actually resolve and prevent performance problems. This situation is progressively becoming more acute due to the increasingly distributed and complex nature of the application infrastructure.

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The term “end-to-end APM” refers to the notion of a cohesive approach based on the following capabilities:

- Easily transitioning from one management domain to another, guided by contextual information. This is sometimes commonly referred to as “drilling down” from one domain to another.
- Generating unified views and reports combining information from multiple domains;
- Performing combined analysis across multiple domains to facilitate root-cause isolation of performance issues.

However, is end-to-end APM sufficient to truly empower organizations to reach their goal of rapid resolution and even prevention of performance problems? Unfortunately, in most cases, it is not. While an end-to-end approach provides coverage across the different management domains, it does not speak to the issue of gathering and analyzing data at a sufficiently detailed level to actually penetrate into the root cause of problems. End-to-end is about breadth of information. The necessary complementary quality required to deliver on the promise of APM is, *depth* of information. The following section delves into specific approaches used by OPNET to deliver an APM solution suite with these qualities.

Source: OPNET

The OPNET Approach to APM

High Definition APM – The OPNET Approach

Continuing in its tradition as a leading technology innovator, OPNET is extending the state of the art in APM by delivering solutions that directly tackle these key challenges in IT service management. OPNET's approach is to provide a solution suite that is end-to-end according to the definition provided above, and also capable of extracting and analyzing highly detailed information to support true root cause isolation. OPNET refers to these combined qualities as "high definition APM."

Breadth

OPNET solutions are able to span the traditional infrastructure silos, gathering data across the application footprint, including web and application servers, database servers, client machines, routers, switches, load balancers, firewalls, and WAN accelerators. In many cases, vendor or platform-specific data is gathered to provide the maximum amount of information to the APM process. When devices or components cannot be directly instrumented for technical or policy reasons, remote measurements are obtained via standards-based methods such as SNMP, WMI, or JMX.

Depth

OPNET's solutions excel at obtaining high quality, fine-grained data specifically targeted at troubleshooting the performance of applications. Both active (agent-based) and passive (off-board) instrumentation techniques are used to gather data about the behavior and performance of all elements of the application infrastructure. For example, end-user response time data is gathered on individual transactions, while performing code-level tracing within back-end business logic, and also retaining network traffic, for the same transaction. Database queries and inter-server remote procedure or web-services calls are also visible to OPNET's instrumentation. A detailed understanding of the network infrastructure allows the entire "path" of the application to be discovered, monitored, and analyzed. for changes or abnormalities in performance as well as configuration.

Low Overhead

OPNET has developed patented, industry-leading capabilities for collection, long-term storage, and rapid retrieval of high-volume, fine-grained data. While other solution suites may gather fine-grained data in certain management domains, OPNET solutions stand apart because they are specifically engineered to minimize intrusiveness and performance impact. For example, OPNET agents use a patented approach to instrument Java or .NET code in such a way as to avoid areas of a program that are susceptible to incurring high overhead. Also, thanks to a unique, patented method for analyzing memory consumption in real time, OPNET believes it is the only vendor offering a memory leak detection capability suitable for constant use in a production environment. As a result of such specific attention to achieving low intrusiveness, the OPNET APM solution suite is uniquely well-suited for performance-sensitive production environments, while still extracting the high quality data needed for effective APM.

Integration across Domains

OPNET APM solutions obtain, analyze and report on two primary types of data: *Performance Data* and *Forensic Data*. Both types of data exist in each of the various management domains discussed earlier. Performance data represents measurements that are captured and recorded over time, and is often aggregated over regular intervals, as well as over groups of transactions. It characterizes the historical and present state or "health" of the components of the application. Forensic data goes beyond quantitative metrics, and is obtained from lower-level techniques, such code level tracing, detailed resource tracking (e.g., memory consumption), and deep packet inspection of network traffic. Forensic data is used to "drill-down" deep into the behavior of the application, determine how components are interacting with each other, and break down all activity related to an individual transaction of interest. This rich information is the basis for OPNET's best-in-class root cause isolation capabilities. OPNET solutions integrate performance data with forensic data, and also bridges across management domains, in order

to allow a progressively deeper analysis starting with a symptom, going through triage, and leading to conclusive root cause isolation.

Analytics

OPNET Analytics are industry leading, with differentiators such as true correlation of performance-related metrics and events (i.e., not merely side-by-side presentation), adaptive base-lining of performance metrics, rules-driven analysis, and advanced visualization that synchronizes data across application tiers to present an integrated view.

Rapid ROI and Low TCO

OPNET believes that to be effective, an APM solution suite must have the qualities described above, which collectively provide what we call "high definition". However, from a practical perspective, high definition cannot come at the cost of long implementation times and time-consuming ongoing configuration. OPNET's APM suite specifically addresses this challenge through numerous advanced technology approaches, including automated discovery of infrastructure and applications, self-tuning of instrumentation for overhead minimization, automatic base-lining and alerting, and flexible out-of-the-box reporting and visualization.

Source: OPNET



High Definition APM Solutions

AppInternals Xpert™ delves into the complex software frameworks of modern servers to extract vast amounts of performance and forensic data to support all aspects of APM from the server perspective. AppInternals Xpert can provide valuable analysis for any type of application, but excels in particular in Java and .NET environments. It continuously monitors thousands of system and application metrics within each server, across all application tiers, and automatically spots performance anomalies. AppInternals Xpert uses unique technology to provide deep instrumentation with very low overhead. Its patented correlation technology automatically detects patterns in metrics and events, revealing cause-and-effect relationships and pinpointing issues that might otherwise go undetected. AppInternals Xpert also utilizes advanced, low-overhead continuous tracing techniques to provide deep visibility into application code as it executes.

AppResponse Xpert™ and **NetResponse Xpert™** are appliance-based solutions that monitor and analyze end-user experience, and support in-depth analysis of the behavior and performance of the underlying network infrastructure. Response Xpert leverages the central role of the network in transporting transaction data to gather performance information. It provides complete visibility of transactions and users across the enterprise, with detailed real-time and historical information about end-user response times, utilization, route quality, ISP performance, and traffic patterns. On-board analytics extract user-level transactions from network traffic, and break down application response time, identifying which parts of the infrastructure are contributing most to delays. Data is automatically summarized according to applications and user-defined business entities. Response Xpert is offered in a variety of models, including a range of hardware appliances, software appliances running within VMware® virtualized servers, and an embedded version for Riverbed Steelhead® devices.

App SQL Xpert™ provides deep visibility into database performance through real-time monitoring of a broad range of metrics, with drill-down to fine-grained forensic database transaction data for troubleshooting. It performs detailed

tracking of database usage for trending and performance optimization. It also detects database policy violations, such as unauthorized access and suspicious usage patterns. SQL Xpert provides a high definition understanding of database performance without requiring access to database servers – and consequently it has no performance impact on database operation.

AppTransaction Xpert™ is the most powerful tool available for detailed analysis of individual transactions observed on the network. In today's complex application architectures, a single transaction can involve many processing tiers and require literally millions of data packets to be communicated among those tiers. By processing packet traces recorded in the actual application environment, Transaction Xpert is able to shed light on transaction behavior and performance. The software makes extensive use of patented visualization and analytics to dramatically improve and accelerate pre-deployment testing and prediction, as well as rapid troubleshooting in production. The combination of Response Xpert and Transaction Xpert is unique in the industry, providing a seamless workflow that spans monitoring, alerting, triage, root cause diagnosis, and selected recommendations for remediation.

AppForensics Xpert™ enables enterprise-wide, centralized control of application packet capture agents deployed throughout the infrastructure. In addition to supporting all aspects of packet capture via a web interface, Forensics Xpert provides a portal for end-users to report application problems (e.g., availability, errors, response time, etc.). When end-users report application problems via Forensics Xpert, a “snapshot” of the relevant data is captured so that IT staff can examine the traces within AppTransaction Xpert at a later time. This approach has the dual benefit of accelerating mean-time-to-repair, and dramatically reducing the time spent by help-desk personnel in gathering the information necessary for troubleshooting.

“OPNET provides end-to-end visibility into application performance from both the network and the application perspective. With any task, you need the right tool to get the job done quickly and efficiently and we have found the right tools with [OPNET]. We continue to purchase solutions from OPNET because of their integrated APM approach and their focus on customer feedback.”

I/S Manager
Regional Health Care Network

AppTelemetry Xpert™ uses remote instrumentation techniques to provide visibility into the performance of the underlying application infrastructure, including server and network devices. This solution is particularly useful in cases where direct, on-board instrumentation is not possible or desired, and other external means of gathering data are not available. Using remote, standards-based interfaces for data acquisition (e.g., SNMP, WMI, JMX), historical and real-time data from application infrastructure components is seamlessly incorporated into analyses across OPNET's APM solution suite for a more complete picture of end-to-end application performance.

AppTelemetry Xpert also supports the concept of gathering data from an "Application Path" -- a group of elements traversed by an application transaction. A powerful workflow discovers the elements of interest, retrieves relevant metrics, and presents them in several different formats to automate and substantially improve the accuracy of a very common troubleshooting process.

Source: OPNET

Research from Gartner

Magic Quadrant for Application Performance Monitoring

Business is driving IT operations management to become increasingly application-centric. At the same time, applications are becoming more difficult to manage. How vendors respond to the application performance monitoring challenge will have a profound impact on their overall market positions.

WHAT YOU NEED TO KNOW

This document was revised on 15 March 2010. For more information, see the [Corrections page](#) on gartner.com.

Application performance monitoring (APM) now requires coordinated decisions across five distinct dimensions of functionality: end-user experience monitoring; user-defined transaction profiling; application component discovery and modeling; application component deep-dive monitoring; and application performance management database capabilities. Enterprises should use the results of this Magic Quadrant to help guide vendor selection decisions and evaluate how well the vendors support the various dimensions. Because vendors rarely demonstrate equal competency across all five dimensions, an enterprise will often need to “mix and match” offerings from different product portfolios to achieve a best-of-breed fit for its own requirements.

MAGIC QUADRANT

Market Overview

Market Dynamics

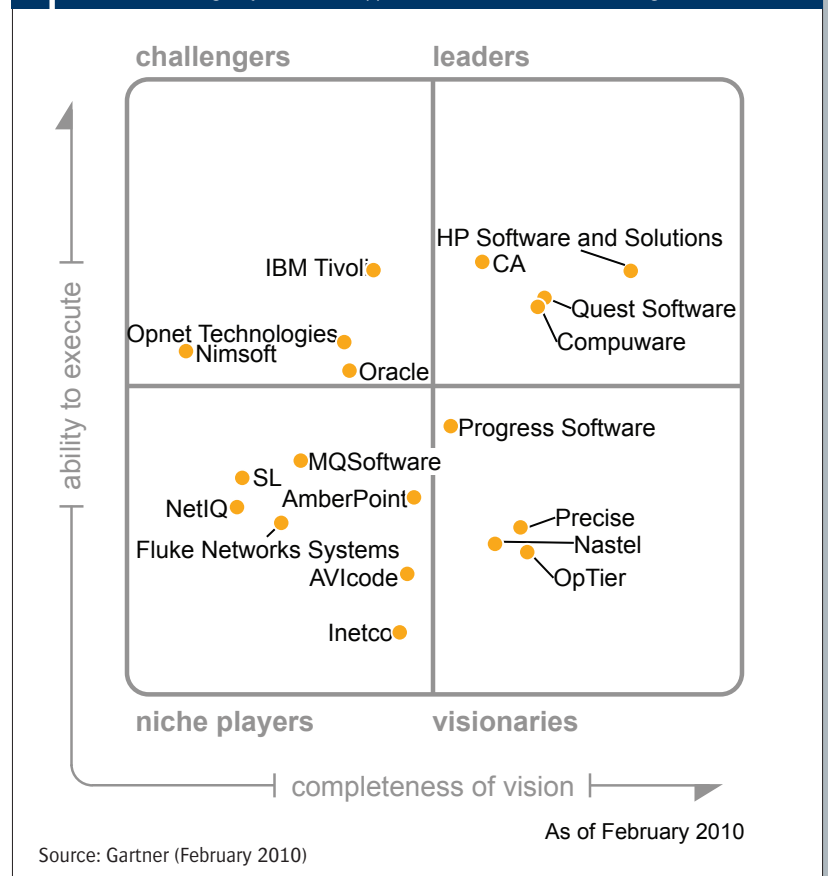
During the past five years, IT operations management has become increasingly application-centric. While most IT operations teams still regard the management of infrastructure components (virtual and real servers, networks, and storage farms) as their core competency, they have increasingly come to understand that these elements deliver value to the business only in the context of the applications they support, and, therefore, unless infrastructure components are managed with an eye to their impact on application performance, it will prove increasingly difficult to justify the investment and labor time associated with traditional IT operations management. Business decision makers have,

in fact, been the most enthusiastic advocates of application-centric IT operations management among large enterprises, precisely because they have grown more appreciative of the role that IT plays in enabling the unfolding and execution of revenue or value-generating business processes, and, to them, the most important and visible element that IT delivers with regard to business process execution is the predictable and effective flow of application-based transactions.

Key Challenges

Unfortunately, during the same time period in which business decision makers and IT operations management teams have discovered the importance of applications as key elements to be

FIGURE 1 Magic Quadrant for Application Performance Monitoring



managed, application architectures have evolved in such a way as to make monitoring application performance a real challenge.

Application architectures have become increasingly modular during the past five years. Whether explicitly following the dictates of service-oriented architecture (SOA) or not, the general trend has been toward breaking down application business logic into more self-contained components, in the hopes of encouraging increased agility with regard to changing business demands and increased ability to exploit the ever more virtualized and, indeed, modularized infrastructure supporting the execution of that business logic.

Applications have become increasingly distributed. Particularly in the wake of the great consolidation waves that have swept the large-enterprise community since the 2001 recession, it is not uncommon to see one data center complex supporting users and customers across a hemisphere (and, in some cases, even across the globe). It is not often appreciated until once the consolidation is well under way that the application, in its service of remote user or customer communities, is the only element that links IT infrastructure resources to the physical locales in which those resources are consumed. In other words, enterprises have (often unintentionally) forced application architectures to become more distributed to compensate for the centralization of the physical infrastructure.

The ability to maintain application identity across time has become increasingly challenging. Popular application development methodologies, such as Agile, demand a vast acceleration in the rate at which changes are injected into application code running in production. Furthermore, up and down the stack, we increasingly prefer (once again, in favor of flexibility) technologies that bind late, often comparatively long after a business transaction is launched. The implications of our late-binding bias are such that what may appear to the user (and to many of our monitoring systems) as repeated executions of the same transaction from one day to the next are, in fact, realized by very different paths across the infrastructure, and may result in very different levels of resource consumption.

Finally, the boundaries between one application and another, and the boundaries between application and infrastructure, have become quite blurred. Given the extent to which shared services are increasingly invoked, it can prove almost impossible to attribute any specific quantity of resource consumption to one set of application users or another. Additionally, it is not just a question of application monitoring tools' inability to look deeply enough into the situation. The physics and the logic of the situation could very well be such that it is literally meaningless to seek to establish such an allocation.

These challenges, taken together, make the task of monitoring applications extremely difficult. Fortunately, the market is beginning to respond to the challenge.

Market Definition/Description

The Five-Dimensional Model

Large enterprises have been trying to monitor and manage applications since the mid-1990s, but the first generation of application performance technology (e.g., BMC's early versions of Patrol and Compuware's EcoTools) treated applications as just another set of components of the IT infrastructure. Thresholds were set in advance by vendor or user, signifying levels of local element resource consumption or latency measures that were considered impermissible to cross, and polling agents were periodically put in place to determine whether those thresholds were close to getting crossed or, worse, had been crossed since the last time the local element was checked. As long as application code was monolithic, centralized and static, and clear boundaries separated one application from the next, such an approach seemed effective. Not too many agents were required and not too many thresholds needed to be examined to infer the end-to-end state of a given application.

In a world of highly modular, highly distributed, volatile and fuzzy-edged applications, the number of agents that would be required to deliver a holistic view of application performance would likely cripple the performance of the applications being monitored. Furthermore, the interactions among the various modules of modern applications have become so complex and multidimensional

that it is likely that valid inferences from local to global application states would be almost impossible to carry out with any regularity.

The vendor community has slowly assembled a five-dimensional response to the increasingly recognized importance of APM that takes into account the management problems entailed by modern application architectures. The first four dimensions capture specific, yet global, views of end-to-end application behavior, while the last dimension is concerned with both the real-time and historic correlation and analysis of the extremely large data sets associated with each of the first four dimensions. The five dimensions are:

- **End-user experience monitoring:** Technologies in this dimension are concerned with how the enterprise user or business customer is experiencing the quality with which an application is executing user-defined transactions (i.e., sequences of user activities and system responses that are perceived by the user to be a single, logical unit of work; this only rarely corresponds to a transaction or logical unit of work in the traditional sense of a consistent change of database state). Four technology types are currently targeted at end-user experience monitoring: (a) synthetic transaction-based software robots, (b) network-attached appliance-based packet capture and analysis systems, (c) endpoint instrumentation systems based on classical manager agent software architectural schemes, and (d) special-purpose systems targeted at voice over Internet Protocol (VoIP) and other complex IP-based services.
- **User-defined transaction profiling:** These are technologies that follow a user-defined transaction as it traverses the application stack and infrastructure elements that support the application; two technology types are currently focused on user-defined transaction profiling: automated transaction-centric event correlation and analysis, and transaction tagging.
- **Application component discovery and modeling:** These technologies discover what software and hardware components are exercised as user-defined transactions are executed, and how those components are related to one another, in so far as they support user-defined transaction execution paths. Of all five dimensions, this one is the least mature. Current solutions are typically an amalgam of three distinct technologies: IT service dependency mapping tools that are, in fact, technologies for discovering how different types of traffic flow among different types of physical and virtual infrastructure elements; transaction profile snapshots (models built from reports generated in the second dimension of APM); and SOA topology maps, where meaningful and available.
- **Application component deep-dive monitoring:** This dimension is composed of a diverse set of technologies. In addition to the higher-level application health portraits obtained by the first three dimensions, effective diagnosis of performance problems frequently involves “looking under the covers” of the critical elements that hold a modern, highly modular application stack together; such elements include database management systems, application server middleware, message-oriented middleware, off-the-shelf application stack frameworks and even some aspects of the network infrastructure. (Byte code instrumentation is a frequently favored way, for example, of deep-dive monitoring for application servers.)
- **Application performance management database:** Each of the previous four dimensions generates very large data sets; not only does each of these data sets need to be filtered, but also they often need to be correlated to yield value. For example, a typical workflow might traverse the first four dimensions as follows: An examination of accumulating end-user experience monitoring data determines that a response time slowdown is accelerating, and will soon hit a key customer’s threshold of consciousness as he or she continues in the execution of a series of user-defined transactions. Attention shifts to the user-defined transaction-profiling dimension, and examining the data therein locates the source of rapid latency expansion to an application server running JBoss (by Red Hat) sitting in the Malaysia data center complex, while a study of the application model helps further specify the location of the server in the data center and its key configuration characteristics. An application component deep-dive monitoring tool is then brought to bear to determine which Java Virtual Machines and methods in the application server are

doing the damage, while a second perusal of the application model helps the IT operations management and application support teams, working together, to determine what other elements of the infrastructure and application stack might be impacted. Each workflow step within and across dimensions requires the ability to rapidly filter, correlate and analyze a significant quantity of data, and such filtering, correlation and analysis (ideally in real-time, but more typically, for the moment, offline) is the role of application performance management database functionality.

Although, at first, different vendors tended to focus only on some subset of the five dimensions, during the past year, they have come to recognize that all five dimensions are equally critical, and the vendors are, through either acquisition or internal development, adjusting their product portfolios accordingly. More importantly than vendor conclusions about market requirements, large-enterprise users among IT operations teams, application support teams and even network administration teams have also (independently of vendor influence) come to the conclusion that these five dimensions of functionality are equally important. In fact, it has been technology buyer insistence, rather than the forward-looking vision of the vendors, that has led to the almost-universal adoption of the five-dimensional model for APM.

Adjacent Markets, Overlapping Definitions

APM, as a technology category, is closely related to, and frequently confused with, five other technology categories, and, unfortunately, vendors have often exploited and compounded this market confusion. The five related categories are:

- **Application management (AM):** APM technologies are a proper subset of application management technologies, which include application development, testing, quality and release management technologies, as well as application project and portfolio management technologies.
- **Business service management (BSM):** Business services are collections of IT functionality defined and presented in terms intelligible to business users or customers, and governed by service-level agreements stated and measured in terms that are relevant to business or customer concerns; most BSM offerings have focused on mapping infrastructure events (i.e., warnings or instances of resource consumption or average latency threshold transgression) to business-meaningful events, defined in terms of business service functionality and the resultant parallel monitoring of business service and infrastructure events. As such, BSM is compatible with APM, although, given that for many large enterprises, the business services of interest to users and customers are applications, we do find an increasing number of BSM efforts being delayed in favor of the more-immediate results from APM projects. In such cases, a better way of relating BSM to APM would be to say that business services decompose into user-defined transaction types, the execution of instances of which are monitored by APM technologies.
- **Business process monitoring (BPM):** BPM technologies enable the monitoring of the execution of a modeled business process flow. Currently, most business processes in large enterprises contain some paths that are, in fact, executed by means of applications, and it would be conceivable for a BPM platform to hand off the monitoring of those application-enabled paths to an APM system, particularly those dimensions associated with end-user experience monitoring and user-defined transaction profiling. In practice, few BPM platform implementations capitalize on that possibility, although a number of APM vendors (e.g., HP and Oracle) have added some BPM functionality to their APM portfolios.
- **Business transaction management (BTM):** Thanks to some effective marketing on the part of one APM vendor (OpTier), BTM has recently become a popular term to describe APM offerings that are restricted to user-defined transaction profiling and packet-based real-user experience monitoring. Many users, particularly those that are in IT operations management, as opposed to being application-support-focused, find that conjunction of dimensions to be an attractive starting point for APM; hence, we believe that BTM denotes a useful concept. The qualifier “business” is misleading, however, because it assumes that such technologies are, “out of the box,” concerned with business-meaningful transactions like bank account updating or ticket buying, when, in fact, they are simply concerned with any named set of

user activities at an application interface. The qualifier “management” is also misleading, because it presupposes that the technologies concerned do something more than simply exhibit how a series of events kicked off by some user activity at an application interface makes its way across an application stack and supporting infrastructure.

- **Application-aware network performance monitoring (AANPM):** In parallel with the IT operations management and application support team interest in application performance, large-enterprise network administrators have become increasingly interested in understanding the end-to-end performance of networks as a complement to their traditional interest in event and fault management. To some degree, this is because networks, like applications, are becoming more modular, distributed and volatile; however, it is also because, as applications become more distributed, networks are making an ever-greater contribution to application latency. If only to deflect unwarranted blame, then, network administrators have become increasingly concerned about the application context of network performance, and this often means a concern with end-to-end performance monitoring. As a result, the market has seen the emergence of technologies that resemble APM technologies quite closely, particularly the packet-capture-based end-user experience monitoring solutions, which differ in that the network performance tools tend to focus on packet flow aggregation based on TCP, UDP, and NetFlow, while the APM tools concern themselves with user transactions that are defined, ultimately, in terms of HTTP and HTTPS. Furthermore, the application-aware network performance monitoring technologies tend to define applications in terms of ports, while APM technologies make some kind of further effort to understand how a user might conceptualize that application end to end. Visualization and reporting can also be quite differentiated; nonetheless, despite the very real differences, these two areas are converging, and we do expect that they will be fully converged within the next five years.

Inclusion and Exclusion Criteria

Vendors that were eligible for inclusion in this Magic Quadrant met the following criteria:

- Gartner client inquiry data confirms that the product is of interest to Gartner clients in enterprise environments by making their product selection shortlists.
- The vendor’s APM product portfolio should be capable of at least two of the following dimensions of functionality:
 - End-user experience monitoring
 - User-defined transaction profiling
 - Application component discovery and modeling
 - Deep-dive monitoring of key application components (e.g., Java Platform, Enterprise Edition [Java EE] and Oracle database management system [DBMS])
- The vendor must have at least 50 customers that use its APM products actively in the production environment for at least two out of the four previously mentioned dimensions of functionality.
- The vendor must be able to obtain and support customers, whether directly or through channel partners, on two continents.

Evaluation Criteria Ability to Execute

We evaluated technology providers on the quality and efficacy of the processes, systems, methods or procedures that enable IT provider performance to be competitive, efficient and effective, and to positively impact revenue, retention and reputation. Ultimately, technology providers are judged on their ability and success in capitalizing on their vision.

- **Product/Service:** Core goods and services offered by the technology provider that compete in/serve the defined market. This includes current product/service capabilities, quality, feature sets, skills, etc., whether offered natively or through OEM agreements/partnerships.
- **Overall Viability (Business Unit, Financial, Strategy, Organization):** An assessment of the overall organization’s financial health, the financial and practical success of the business unit, and the likelihood of the

individual business unit to continue to invest in the product, continue offering the product, and advance the state of the art within the organization's portfolio of products.

- **Sales Execution/Pricing:** The technology provider's capabilities in all presales activities, and the structure that supports them. This includes deal management, pricing and negotiation, presales support, and the overall effectiveness of the sales channel.
- **Market Responsiveness and Track Record:** The ability to respond, change direction, be flexible and achieve competitive success as opportunities develop, competitors act, customer needs evolve and market dynamics change. This criterion also considers the provider's history of responsiveness.
- **Marketing Execution:** The clarity, quality, creativity and efficacy of programs designed to deliver the organization's message in order to influence the market, promote the brand and business, increase awareness of the products, and establish a positive identification with the product/brand and organization in the minds of buyers. This mind share can be driven by a combination of publicity, promotional, thought leadership, word-of-mouth and sales activities.
- **Customer Experience:** Relationships, products and services/programs that enable clients to be successful with the products evaluated. Specifically, this includes the ways customers receive technical support or account support. This can also include ancillary tools, customer support programs (and the quality thereof), availability of user groups, service-level agreements, etc.
- **Operations:** The ability of the organization to meet its goals and commitments. Factors include the quality of the organizational structure, such as skills, experiences, programs, systems and other vehicles that enable the organization to operate effectively and efficiently on an ongoing basis (see Table 1).

Table 1. Ability to Execute Evaluation Criteria

Evaluation Criteria	Weighting
Product/Service	high
Overall Viability (Business Unit, Financial, Strategy, Organization)	high
Sales Execution/Pricing	standard
Market Responsiveness and Track Record	low
Marketing Execution	standard
Customer Experience	standard
Operations	low

Source: Gartner (February 2010)

Completeness of Vision

We evaluated technology providers on their ability to convincingly articulate logical statements about current and future market direction, innovation, customer needs, and competitive forces, and how well they map to the Gartner position. Ultimately, technology providers are rated on their understanding of how market forces can be exploited to create opportunity for the provider.

- **Market Understanding:** The ability of the technology provider to understand buyers' needs, and to translate those needs into products and services. Vendors that show the highest degree of vision listen to and understand buyers' wants and needs, and can shape or enhance those wants with their added vision.
- **Marketing Strategy:** A clear, differentiated set of messages consistently communicated throughout the organization and externalized through the website, advertising, customer programs and positioning statements.
- **Sales Strategy:** The strategy for selling products that uses the appropriate network of direct and indirect sales, marketing, service, and communication affiliates that extend the scope and depth of market reach, skills, expertise, technologies, services and the customer base.

- **Offering (Product) Strategy:** A technology provider's approach to product development and delivery that emphasizes differentiation, functionality, methodology and feature set, as they map to current and future requirements.
- **Business Model:** The soundness and logic of a technology provider's underlying business proposition.
- **Vertical/Industry Strategy:** The technology provider's strategy to direct resources, skills and offerings to meet the specific needs of individual market segments, including verticals.
- **Innovation:** Direct, related, complementary and synergistic layouts of resources, expertise or capital for investment, consolidation, defensive or pre-emptive purposes.
- **Geographic Strategy:** The technology provider's strategy to direct resources, skills and offerings to meet the specific needs of geographies outside the "home" or native geography, either directly or through partners, channels and subsidiaries, as appropriate for the geography and market (see Table 2).

Leaders

Five aspects characterize vendors that appear in the Leaders quadrant: (1) they have competitive offerings related to all five dimensions of APM, and best-of-breed functionality in two or more of the dimensions; (2) they have credibility in the monitoring of a heterogeneous, multivendor

application domain; (3) they have the ability to deliver and support APM across five continents; (4) they have a consistent track record of innovation; and (5) they have a vision that places APM at the heart of IT operations and application management.

Challengers

Five aspects characterize vendors appearing in the Challengers quadrant: (1) they have competitive offerings in at least three of the five dimensions of APM, but some of the offerings are restricted (either in terms of functional depth in one or more of the dimensions, or with regard to the environments to which their technologies are applied), which keeps them from being considered by some large-enterprise accounts; (2) while staying abreast of market trends, challengers rarely get out in front of them; (3) they typically have a strong and globally consistent support and services infrastructure; (4) they have a well-regarded brand, although that regard is not generated by APM; and (5) they recognize the importance of APM, even if they do not place APM at the strategic center of their overall software portfolios.

Visionaries

Three aspects characterize vendors appearing in the Visionaries quadrant: (1) while not credibly demonstrating capability across all five dimensions of APM, they have been consistently ahead of the market in one or more APM dimensions; (2) they have demonstrated the ability to grow rapidly and maintain the position of their brand among demanding submarkets, such as investment banking and telecommunications; and (3) despite the importance of venture capital to many of the visionaries, a short-term exit through acquisitions is not a central element of their respective business strategies.

Niche Players

One of three aspects characterize vendors appearing in the Niche Players quadrant: (1) they are explicitly focused on a limited number of application types, whether those types are defined in terms of vendor specificity or domain (e.g., Java EE and Oracle DBMS); (2) they credibly support only two of the five dimensions of APM functionality; or (3) they support more than two dimensions of APM functionality and, while, for the most part, keeping abreast of market trends, have not demonstrated innovation with regard to the functionalities they do support.

Table 2. Completeness of Vision Evaluation Criteria

Evaluation Criteria	Weighting
Market Understanding	high
Marketing Strategy	standard
Sales Strategy	standard
Offering (Product) Strategy	high
Business Model	standard
Vertical/Industry Strategy	low
Innovation	standard
Geographic Strategy	low

Source: Gartner (February 2010)

Vendor Strengths and Cautions

AmberPoint

AmberPoint supports three of the five dimensions of APM. For the purposes of this Magic Quadrant, we examined AmberPoint Management System r.6.5 for integrated support of end-user experience monitoring, user-defined transaction profiling and application performance management database functionality.

Strengths

- By extending the tag-based approach to user-defined transaction profiling out to the Web page and the client, the AmberPoint Management System is able to encompass end-user activity and transaction flow in a single integrated view (at the cost of some detail in the former).
- AmberPoint has exploited its foundations in the SOA management space to deliver out-of-the-box APM functionality for important off-the-shelf application stacks not targeted by any other vendors in this Magic Quadrant (e.g., Amdocs' billing applications).

Cautions

- AmberPoint tends to position its platform as a comprehensive APM solution, which undermines the technology's credibility for enterprises looking to embed user-defined transaction profiling capabilities within a framework that also includes more-robust deep-dive monitoring into, for example, application servers and database management systems.
- While AmberPoint has been able to reposition itself in the line-of-business application support market, data center buyers still overwhelmingly perceive AmberPoint as an SOA-centric technology.

AVIcode

AVIcode supports all five dimensions of APM functionality although almost exclusively for .NET based applications. For the purposes of this study, we examined AVIcode Intercept Studio v.5.5, AVIcode uX v.5.5 and AVIcode Advisor v.5.5 for end user experience monitoring; AVIcode Intercept Studio v.5.5, AVIcode Intercept uX v.5.5, AVIcode .NET Management pack v.5.5, AVIcode BizTalk 2006 Application Management Pack/Cartridge v.5.5, AVIcode SharePoint 2007

Application Management Pack/Cartridge v.5.5 and AVIcode SQL Reporting Services Management Pack/Cartridge v.5.5 for user defined transaction profiling; AVIcode Intercept Studio v.5.5, AVIcode .NET Management Pack v.5.5, AVIcode SharePoint 2007 Application Management Pack v.5.5, AVIcode BizTalk 2006 Application Management Pack v.5.5 and AVIcode SQL Reporting Services Management Pack v.5.5 for application component discovery and modeling; AVIcode Intercept Studio v.5.5, AVIcode uX v.5.5 for application component deep-dive monitoring; and the SE Viewer component of AVIcode's management server for application performance management database functionality.

Strengths

- Early to recognize the importance of .NET as a competitor to Java EE, AVIcode, directly or indirectly through its relationship with Quest Software, is regarded as the market leader in the management of .NET-based applications, most notably SharePoint. A good relationship with Microsoft further legitimizes AVIcode's position.

Cautions

- The market for .NET-based application management is crowding rapidly as .NET itself becomes a more important platform. Furthermore, large enterprises will, most often, opt for a single vendor to provide APM functionality for both .NET and Java EE.
- Despite AVIcode's reputation, its position could still be undermined if Quest Software were to change the sourcing of its .NET functionality.

CA

CA supports all five dimensions of APM functionality. For the purposes of this Magic Quadrant, we examined CA Wily Customer Experience Manager (CEM) r.4.2 and the CA eHealth Application Response (AR) module of the CA eHealth Performance Manager r.6.1 for end-user experience monitoring; CEM r.4.2 and Introscope r.8.1 for user-defined transaction profiling; CEM r.4.2, CA Wily Introscope (Introscope) r.8.1 and CA CMDB r.12.1, with a particular focus on the CA Cohesion Application Manager (CAM) r.5.0 module for application component and discovery modeling; CEM r.4.2 and Introscope r.8.1 for application component deep-dive monitoring; and the SmartStor component of the Introscope platform for application performance management database functionality.

Strengths

- CA's byte code instrumentation-based Introscope technology remains the most effective technology available for deep-dive monitoring application server software and other middleware, despite being 11 years old. This has resulted in CA's domination of a number of key market niches in the use of application component deep-dive monitoring (most notably, SAP NetWeaver monitoring and the monitoring of Java-based Next Generation Operations Support System [NGOSS] applications for IP telecommunications services).
- CA Wily, on the strength of both its Introscope technology and its tight integration between Introscope and CEM (the packet-capture-based end-user experience monitoring system), is recognized as a market leader and, therefore, appears on most large-enterprise shortlists for general APM solutions. Market leadership is attributed specifically to the Wily business unit within CA.
- CA has articulated a clear business transaction conceptual model that has enabled the company to relate the transaction construct to the service construct in a precise manner.
- CA has a broad portfolio of monitoring capabilities, most of which have been, or are in the process of being integrated with Introscope. Particularly deep integration has been achieved between Introscope and CA's network event and correlation analysis platform, called CA Spectrum Infrastructure Manager. The interplay between network management and application management will almost certainly be enhanced in 2010, as a consequence of CA's recent acquisition of NetQoS.
- The global CA direct sales force generally exhibits a deep understanding of the capabilities of Introscope and CEM, and it knows how to position APM functionality to a prospect account that may not have initially perceived an explicit need for such functionality. Furthermore, after-sale customer support experience has, on the whole, been highly positive. This is particularly critical because there had been widespread concern about a degradation in customer support following CA's acquisition of Wily in 2006.

Cautions

- CA's currently favored approach to integrating its application and IT operations management portfolio, which involves the creation of a service-model-centered software overlay into which its individual offerings are plugged, will undermine the central role that APM plays in supporting CA's overall market position. It also undermines the message that APM is not just one management functionality among others, but also is a key organizing principle for management functionalities in general.
- CA has implemented user-defined transaction profiling by extending the scope of Introscope's application component's deep-dive monitoring capabilities to other key environments, and by using the business transaction model to group and structure the data derived from the deep-dive monitoring, and to link it across nodes. This bottom-up approach is problematic, because it restricts the transaction flow monitoring only to environments that have instrumented for deep-dive monitoring.
- While Introscope's ability to monitor middleware is highly regarded, the reputation of many of CA's other monitoring products (e.g., Insight for databases and NSM for server infrastructures) is, justly or unjustly, less highly regarded. As Introscope's embedding within the overall CA portfolio deepens, its brand will likely suffer some weakening by its association with a number of the technologies to which it will become linked.
- Despite recognition of Introscope's functional depth, application instrumentation is seen by most implementers to be a complex, arduous task. Furthermore, Introscope, alongside solutions from IBM and HP, falls into the high-price category.

Compuware

Compuware supports all five dimensions of APM functionality. For the purposes of this Magic Quadrant, we examined Vantage 11 with a particular focus on its Real User Monitoring, Synthetic Monitoring and Network Performance Monitoring modules for end-user experience monitoring; Vantage 11 with a particular focus on its Real User Monitoring, Network Performance Monitoring, Java/.NET Monitoring, Java Monitoring for Z/Series and Server Monitoring modules and

Strobe v.3.4 for user-defined transaction profiling; the Service Model functionality of Vantage 11 and the Tideway-based Vantage Application Dependency Mapping for application component discovery and modeling; Vantage 11 with a particular focus on its Real User Monitoring, Network Performance Monitoring, Java/.Net Monitoring, Java Monitoring for Z/Series and Server Monitoring modules and Strobe v.3.4 for application component deep-dive monitoring; and the Vantage Service Model capability, combined with the Vantage Service Analyzer, for application performance management database functionality.

Strengths

- Vantage 11's packet-capture-based Real User Monitoring module is generally regarded as the most-effective real-user experience monitoring capability available on the market. Compuware shows particular strength in its technology's ability to convert data obtained from a broad range of protocols into intuitive and business-meaningful visualizations of end-user experiences.
- While most approaches to user-defined transaction profiling require node instrumentation and application code decoration, Compuware's approach allows the user to obtain an end-to-end view of transaction flows by adding one or two extra monitoring appliances (beyond those used for end-user experience monitoring) at strategic locations in an enterprise's infrastructure. While increased accuracy and greater detail is dependent on deep instrumentation of application components, the transaction profile picture obtained through the relatively noninvasive deployment of appliances is sufficient for the vast majority of use cases.
- Alongside Opnet Technologies and Fluke Networks Systems, Compuware is one of the few vendors considered in this Magic Quadrant to have successfully integrated network-performance-oriented packet capture and analysis with business-application-performance-oriented packet capture and analysis.
- A year ago, Compuware focused its commercial efforts on APM technology, divesting itself of most products that could not be directly linked to APM. This corporate focus has resulted in a well-informed and aggressive sales force and a highly committed professional services capability.
- Compuware's recent acquisition of Gomez extends both the scope of its monitoring capabilities to applications accessed via the public Internet, as well as providing the company with an infrastructure for delivering APM via a software-as-a-service channel.

Cautions

- Compuware's application component deep-dive monitoring capabilities are weak or nonexistent in a number of key areas (e.g., database management systems).
- BMC's recent acquisition of Tideway threatens the long-term viability of the OEM arrangement that undergirds Compuware's application component discovery and modeling capability.
- Particularly among large enterprises, APM is increasingly seen as part of a larger management problem space that includes infrastructure monitoring and operational process automation. As the APM capabilities of the broad management portfolio vendors improve, Compuware could find itself pigeon-holed as a best-of-breed point solution provider.
- Compuware has, in fact, experienced declining revenue, and, although this was expected due to the divestiture of some application development products, it causes concern among prospects and customers.
- Although focused on APM, the majority of Compuware's product revenue still comes from its legacy mainframe business, causing prospects and customers to question the vendor's priorities.

Fluke Networks Systems

Fluke Networks Systems, a division within Fluke Networks, fully supports three dimensions of APM. For the purposes of this Magic Quadrant, we examined Visual Performance Manager with the Application Performance Appliance (VPM/ APA) v.5.0 for end-user experience monitoring, user-defined transaction profiling and application performance management database functionality. Simple data models are constructed to support visualizing business transaction flow, giving the technology some basic application component discovery and modeling capabilities, while the data sets gathered for database management systems in the course of tracing business transactions are richer than those gathered in most user-defined

transaction flow monitoring functionalities, allowing Fluke Networks Systems to claim rudimentary application component deep-dive monitoring for databases.

Strengths

- The system is easy to implement and maintain, and, being fundamentally based on the capture and analysis of TCP and UDP packet traffic, configurations are robust in the face of changes to application architecture.
- Through its focus on business-user-oriented visualization on the one hand, and database-related metrics on the other, Fluke Networks Systems has taken key steps toward the integration of the application support and network administration perspectives. This has proved to be of particular importance to those customers who need to understand the impact of WAN acceleration functionality on business application performance.

Cautions

- While possessing a number of features that make it attractive to application support or IT operations management, VPM/APA's functionality retains a strong bias toward the needs of the network administrator (e.g., its superficial treatment of application servers).
- Fluke Networks Systems sells VPM/APA primarily through the channel, but its value-added resellers' system integrators, in general, pitch the product as a technology solution for technical problems, failing to exploit the business significance of APM.

HP Software and Solutions

HP Software and Solutions (HP SS) supports all five dimensions of APM functionality. For the purposes of this Magic Quadrant, we examined Business Availability Center End User Management Business Process Monitor (BAC EUM BPM) v.8.0 and Business Availability Center End User Management Real User Monitor (BAC EUM RUM) v.8.0 for end-user experience monitoring; Business Process Insight (BPI) v.8.0 and Transaction Vision (TV) v.8.0 for user-defined transaction profiling; Discovery and Dependency Mapping (Advanced Edition) (DDM) v.8.0 and Universal CMDB (uCMDB) v.8.0 for application component discovery and modeling; HP Software Diagnostics v.8.0, Business Availability Center Problem Isolation (BACPI)

v.8.0 and Business Availability Center SiteScope (SiteScope) v.8.0 for application component deep-dive monitoring; and the capabilities of the profile database element of the underlying Business Availability Center (BAC) platform, combined with aspects of the uCMDB for application performance management database functionality.

Strengths

- HP SS has maintained APM market thought leadership since HP's acquisition of Mercury Interactive in November 2006, first by structuring its entire IT operations management software portfolio around a vision that places APM at the center of operational tasks, second by embedding APM within a broader application management life cycle and third by positioning APM as a topic of CIO/executive-level concerns. As a consequence, HP SS technologies will almost always appear on large-enterprise shortlists for strategic APM decisions.
- The portfolio of APM products covers the entire range of APM functionality, and that functionality can act on many of the Web-based and distributed application domains critical to large enterprises. While mainframe-based applications can only be monitored via user-defined transaction-profiling functionality, HP SS has been able to compensate for its mainframe coverage shortfalls through technology partnerships.
- HP SS continues to maintain qualitative leadership in the synthetic transaction approach to end-user experience monitoring, and has been particularly successful at positioning this functionality as an effective on-ramp to APM for line-of-business-based buyers of the technology.
- HP SS can substantively relate the unfolding of a business process and the execution of associated transactions across infrastructure and application stacks, by means of tight coupling between TV and BPI.
- A long-established software-as-a-service delivery mode for synthetic transaction-based EUM BPM provides a low-risk, operating-expenditure-oriented on-ramp to HP SS's broader APM product portfolio.

Cautions

- The HP SS APM product portfolio has many components, and ease of integration remains a work in progress; hence, it is difficult to implement, configure and maintain. A recent focus on solutions, as opposed to products and technologies, has exacerbated the impression that HP looks at APM as a system integration opportunity, which further fuels perceptions that the APM portfolio is complex.
- Implementing the APM portfolio falls into the high-priced category of solutions (alongside IBM and CA), and will, in most cases, require extensive configuration that needs to be revisited as the applications being monitored evolve. Hence, BAC has acquired a reputation for cost, complexity and burdensome maintenance requirements.
- Sales execution is very uneven. The teams involved can appear unresponsive to customer requirements, either with regard to RFP responses or proofs of concept.
- Although HP demonstrates strong vision vis-a-vis its competitors, we are concerned that thought leadership is showing signs of erosion. During the past year, the APM portfolio has seen little, if any, innovation, either at the level of individual functionality or with regard to how the functionalities fit together in a larger architecture; therefore, HP SS's thought leadership, while still considerable, appears to be starting to erode.
- While elements of the APM product portfolio integrate well with products supporting other aspects of the application management life cycle, linkages between the technologies supporting APM and those supporting more-traditional IT operations management disciplines (e.g., infrastructure-oriented event correlation and analysis) are difficult to establish and maintain.

IBM Tivoli

IBM supports all five dimensions of APM functionality. For the purposes of this Magic Quadrant, we examined IBM Tivoli Composite Application Manager (ITCAM) for Transactions v.7.1 for end-user experience monitoring and user-defined transaction profiling; Tivoli Application

Discovery and Dependency Manager (TADDM) v.7.1.2 for application component discovery and modeling; ITCAM for SOA Platform v.6.2.2, ITCAM for WebSphere/Java EE v.6.1, ITCAM for Microsoft Applications v.6.2, ITCAM for Applications v.6.2.2, and IBM Service Management Center for Systems Monitoring, Extended Edition v.4.2 for application component deep-dive monitoring; and the Tivoli Data Warehouse for application performance management database functionality.

Strengths

- The portfolio of APM products covers the entire range of APM functionalities, and those functionalities can act on most of the application domains critical to large enterprises (Web-based, distributed and mainframe). Furthermore, they are, in most cases, well-integrated with one another, both within and across product boundaries. At the same time, the clear separation between application component discovery and modeling and IBM's configuration management database (CMDB) technology allows organizations to fully deploy APM, independently of whatever decisions they may make regarding CMDBs.
- The APM product portfolio is firmly linked to other elements of the Tivoli product set and to core components of IBM's non-management-related software (most notably, WebSphere and the Rational suite). This linkage is not only manifested technologically, but also in market positioning, individual sales motions and responses to RFPs for service engagements.
- IBM's sales force and service capability are well-informed regarding the potential value that IBM's APM products can add to individual transactions or engagements, while significant market share and IBM's installed base ensures business stability in this area.
- IBM Tivoli has a long-standing reputation for supporting customers and continuing to maintain current products, even after changing its overall strategy due to market influences or acquisitions.

Cautions

- Although well-integrated, the APM portfolio falls into the high-priced category (along with HP and CA), and the initial implementation often proves to be a lengthy process.
- While IBM delivers end-user experience monitoring via the synthetic transaction approach, the packet capture approach and the client instrumentation approach, only the synthetic transaction-based technology is widely deployed.
- Although IBM has exhibited leadership on packaging and pricing, it has often lagged behind on the introduction of new features and functions in the market.
- We find IBM's messaging regarding the relationship between APM and BSM to be overly complex, and we believe that many buyers find it confusing.
- Because investment in non-APM IBM software is an important factor in many buyers' decisions to opt for ITCAM over its rivals, we believe many organizations mistakenly do not consider IBM's APM product to be a free-standing solution.

Inetco

Inetco supports three of the five dimensions of APM with a single integrated code base. For the purposes of this Magic Quadrant, we examined Insight 4.5 for end-user experience monitoring, user-defined transaction profiling and application performance management database functionality.

Strengths

- Insight constructs a seamless picture of end-user experience and transaction flows by capturing, analyzing and correlating packets from strategically located span ports across the infrastructure. This approach, while easy to deploy and maintain, can also handle extremely high transaction volumes.
- Inetco has particular expertise in high-volume financial application transactions, while the technology has affinities for the still superficially monitored realm of e-commerce.

Cautions

- Inetco continues to be perceived as a niche financial application vendor. It will have to accumulate more cases of deployment in other industries to establish itself as a general-purpose APM player.

MQSoftware

MQSoftware was acquired by BMC in August 2009, and now operates as part of BMC's Mainframe Service Management business unit. Because the acquisition was not complete at the time we performed the product evaluation for this Magic Quadrant, we evaluated MQSoftware separately. Alongside the recently acquired Tideway and Phurnace Software technologies, Gartner anticipates that MQSoftware's QNami! will play a vital role in the unfolding of BMC's APM strategy in 2010. MQSoftware supports three dimensions of APM. For the purposes of this Magic Quadrant, we examined QNami! v.4.0 for packet-capture-based end-user experience monitoring, user-defined transaction profiling and application performance management database functionality.

Strengths

- QNami! is simple to deploy and maintain. The interface and visualization capabilities are well-suited to the needs of an IT operations management team trying to get an overview of where and when a user-defined transaction might be running into problems.
- QNami!'s ability to handle transaction flow cross-overs between distributed and mainframe environments is particularly strong, given how simple the technology is to implement.

Cautions

- While QNami! provides excellent business-oriented views of user-defined transaction flows, the level of technical detail provided is often seen as insufficient, even for the initial high-level problem diagnostics that are typically supported by transaction-profiling functionality.
- Although half of its deployments encompass distributed environments, QNami! is still broadly perceived by buyers as an effective option only when mainframe environments are

involved. This impression was only deepened when, at the time of acquisition, BMC placed the technology under its Mainframe Service Management business unit. The unit is arguably misleadingly named because, although mainframe-based revenue accounts for the lion's share of its intake, it also has responsibility for a number of cross-platform technologies, including capacity planning, workload scheduling and middleware management.

Nastel

Nastel supports all five dimensions of APM. For the purposes of this Magic Quadrant, we considered AutoPilot M6 v.6.1, AutoPilot TransactionWorks v.6.0 and JKool v.2.1 for end-user experience monitoring; AutoPilot TransactionWorks v.6.0 and JKool v.2.1 for user-defined transaction profiling; AutoPilot M6 v.6.1, AutoPilot, TransactionWorks v.6.0 and JKool v.2.1 for application component deep-dive monitoring; AutoPilot M6 v.6.1, AutoPilot TransactionWorks v.6.0 and JKool v.2.1 for application component discovery and modeling; and aspects of Autopilot M6 v.6.1 for application performance management database functionality.

Strengths

- Nastel has been historically recognized for deep expertise in WebSphere MQ, and, although the company has not been able to transpose its early commercial success in WebSphere MQ management to equivalent levels of success in Java-based application server-centric architectures, it has, even in the Java EE space, acquired a reputation for technical sophistication and code excellence.
- The vendor's "smart correlation" approach to user-defined transaction profiling allows for the application of its technology to a broad number of use cases.
- Efforts begun in early 2009 to transform Nastel's position from that of a message-queuing middleware management specialist to that of a general player in the APM space have been largely successful, particularly for large enterprises that see themselves as requiring an integrated mix of WebSphere Java and WebSphere MQ management functionality.

Cautions

- While Nastel retains its reputation of deep technical competence, its market positioning has yet to resonate with more-business-oriented decision makers. This situation is reinforced by a sales force that continues to call at relatively low technical levels of central IT or line-of-business application support teams.
- With regard to end-user experience monitoring and user-defined transaction profiling, Nastel's technology has purchased depth of information at the price of comparative complexity of implementation and maintenance. Unfortunately, the market, in general, currently values the former more than the latter.

NetIQ

NetIQ supports three dimensions of APM. For the purposes of this Magic Quadrant, we examined the NetIQ AppManager Suite for end-user experience monitoring (this includes NetIQ AppManager v.7.0.4, NetIQ AppManager Control Center; the NetIQ AppManager ResponseTime modules for Microsoft Windows, Microsoft Active Directory and DNS, Exchange; Microsoft SQL Server, Oracle Database, Web and Networks; NetIQ AppManager Performance Profiler v.4.1.2; NetIQ VoIP Management modules for Cisco, Avaya and Microsoft; NetIQ Analysis Center v.2.7; and NetIQ Aegis v.2.1); the NetIQ AppManager Suite for application component deep-dive monitoring; and aspects of the NetIQ Analysis Center v.2.7 for application performance management database functionality.

Strengths

- NetIQ has long recognized that APM architectures need to integrate the management of VoIP and unified communication services, in general, with the management of traditional business applications. Its early leadership in VoIP management ensures that its technology will be considered by organizations of sufficient maturity to appreciate that requirement.
- The vendor's historical and widely recognized association with Microsoft application performance management makes it the major alternative to Quest Software and Microsoft solutions in that space.

Cautions

- The vendor's continued reliance on synthetic transaction-based technology for end-user experience monitoring limits NetIQ's appeal in a market that, in general, favors appliance-based packet capture approaches.
- Microsoft-centric environments constitute a core market for NetIQ's APM solutions, leaving the company vulnerable to Quest Software and, eventually, to Microsoft when it decides to enter this market more aggressively.

Nimsoft

Nimsoft supports all five dimensions of APM with a single integrated code base. For the purposes of this Magic Quadrant, we examined NMS v.4.0 for end-user experience monitoring, user-defined transaction profiling, application component discovery and modeling, application component deep-dive monitoring, and application performance management database functionality.

Strengths

- NMS is simple to deploy and maintain, and, although there are instances where it has been deployed to meet the requirements of large enterprises, it is overwhelmingly used by the high end of the small to midsize business market as a general management platform of which APM is only one aspect.

Cautions

- Despite having the capability to support all five dimensions of APM, most organizations deploying NMS tend to use only its synthetic transaction-based end-user experience monitoring functionality when engaged in APM.
- NMS offers very limited monitoring of application server environments, which are regarded by most organizations as critical nodes in modern application architectures.

Opnet Technologies

Opnet Technologies supports four of the five dimensions of APM functionality. Its support of these dimensions is distributed over a number of technologies. For the purposes of this Magic

Quadrant, we examined ACE Live r.7.2, ACE Analyst r.7.0, ACE Enterprise Management Server r.2.0 and Opnet Panorama r.6.1 for end-user experience monitoring, user-defined transaction profiling, application component deep-dive monitoring and application performance management database functionality.

Strengths

- Opnet is one of the few vendors considered in this Magic Quadrant to have successfully integrated network-performance-oriented packet capture and analysis with business-application-performance-oriented packet capture and analysis.
- The ACE Live and Panorama technologies, working together, integrate deep-dive monitoring of Java and .NET components with a transaction flow view, enabling the user to drill down easily and accurately as needed.
- Opnet's positive reputation across many dimensions of the network administration market puts it in a position to bring network management and application management community buying decisions together within a large enterprise.

Cautions

- Opnet still markets and sells with too much of a technical focus; hence, it loses out in competitive situations in which the sale or relationship being built is more business-driven.
- The vendor is, to some degree, a prisoner of its past successes. It is still primarily seen as a network management concern.

OpTier

OpTier supports four of the five dimensions of APM functionality. For the purposes of this Magic Quadrant, we considered the End-User Experience Monitor module of CoreFirst v.3.2.0 for end-user experience monitoring; CoreFirst v.3.2.0 for user-defined transaction profiling; CoreFirst v.3.2.0 for application component discovery and modeling; and the CoreFirst Repository for performance management database functionality.

Strengths

- OpTier's tag-based approach to user-defined transaction profiling yields very rich sets of data, when compared with products that deploy a similar style of technology. In fact, in a number of cases, CoreFirst has actually replaced Java environment deep-dive monitoring software.
- The vendor was first to market with tag-based user-defined transaction profiling, with an early version of CoreFirst appearing in 2004, and OpTier has maintained a reputation for consistent innovation and code quality excellence, particularly in the investment banking sector.

Cautions

- The application code decoration and instrumentation required to implement CoreFirst is considered burdensome by many organizations and market trends, in general, indicating a willingness in many industry sectors to tolerate some loss of detail and accuracy to gain lightness of technology touch and ease of implementation.
- CoreFirst has, to date, dealt superficially with mainframe environments, although we find that, for many large enterprises, understanding the fate of transactions once they cross from the distributed world into the mainframe world is one of the primary motivators for investing in user-defined transaction profiling functionality.

Oracle

Oracle supports all five dimensions of APM functionality. For the purposes of this Magic Quadrant, we examined Oracle Real User Experience Insight r.5.0 and Oracle Enterprise Manager Grid Control r.10.2.0.5 for end-user experience monitoring; Oracle Composite Application Monitor and Modeller (CAMM) r.10.2.0.5 and Oracle Application Diagnostics for Java (AD4J) r.10.2.05 for user-defined transaction profiling; Oracle Composite Application Monitor and Modeller (CAMM) r.10.2.0.5, Oracle Application Diagnostics for Java (AD4J) r.10.2.05 and Oracle Enterprise Manager Grid Control (EMGC) r.10.2.0.5 for application component discovery and

modeling; Oracle Composite Application Monitor and Modeller (CAMM) r.10.2.0.5, Oracle Application Diagnostics for Java (AD4J) r.10.2.05, Oracle Enterprise Manager Grid Control (EMGC) r.10.2.0.5 for application component deep-dive monitoring; and the Repository component of the Enterprise Manager Grid Control platform for application performance management database functionality.

Strengths

- For enterprises whose core ERP and database requirements are met by Oracle software, Oracle's APM portfolio has, during the past 18 months, emerged as the default solution. Not only has the portfolio's functionality come to be seen as "good enough" to see off many competitors, but there is also a widespread belief that, during the next five years, the Oracle business software stack will, for all intents and purposes, require the APM portfolio to run properly.
- Oracle is the only vendor considered in this Magic Quadrant besides HP SS that has directly grafted BPM functionality to APM functionality. Not only is this a valuable step in and of itself, but it also helps reinforce the positioning of an integrated software stack that combines the delivery of basic functionality with monitoring and management.

Cautions

- While the linkage between Oracle's APM portfolio and its basic software stack has been an effective strategy, it now risks a backlash, thus restricting the appeal of that portfolio even in shops that are otherwise committed to Oracle.
- Oracle's user-defined transaction profiling solution is overly complex to deploy and maintain, and fails to provide information at a suitably high level. The weakness undermines some of the advantages accruing to Oracle, thanks to the BPM/APM integration, given the close relationship between BPM and user-defined transaction profiling.

Precise

Precise supports all five dimensions of APM with a single integrated code base. For the purposes of this Magic Quadrant, we examined Precise 8.5 for end-user experience monitoring, user-defined transaction profiling, application component discovery and modeling, application component deep-dive monitoring, and application performance management database functionality.

Strengths

- The vendor's technology platform is based on the application of sophisticated event correlation algorithms to large data sets that are structured by very rich out-of-the-box models of the environments being monitored (e.g., SAP, Oracle Database, Java and .NET). The resulting single integrated code base greatly eases implementation and maintenance.
- For deep-dive monitoring of off-the-shelf application stacks, such as SAP and PeopleSoft, the Precise approach is optimal.

Cautions

- Precise has had a complex and troubled history. Acquired by Veritas (which was, in turn, acquired by Symantec), Precise languished out of sight from the market, virtually ignored by its parent companies for three years. Symantec's divestiture of Precise in 2008 has generally had positive results, but the company still needs to prove to the market that it has the wherewithal to compete long term.
- The effectiveness of the vendor's technology depends heavily on its ability to keep up with the evolution of the environments being monitored and, to a certain and increasing extent, on the cooperation of the vendors that provide those environments. As Oracle, in particular, becomes less cooperative with third parties, Precise's ability to maintain a competitive advantage could be eroded.

Progress Software

Progress supports four of the five dimensions of APM. For the purposes of this Magic Quadrant, we examined Progress Actional 8.1 for the integrated support of end-user experience monitoring, user-defined transaction profiling and application, application component discovery and modeling, and application performance management database functionality.

Strengths

- By extending the tag-based approach to user-defined transaction profiling out to the Web page and the client, Actional 8.1 is able to encompass end-user activity and transaction flow in a single integrated view (at the cost of some detail in the former).
- Although initially positioned as technology for SOA governance, the Actional platform was one of the first vendors to seek patent protection for the tag-based approach to user-defined transaction profiling.
- Progress is a well-established vendor, and, although the links between the Actional technology and other elements of its portfolio are not obvious, the vendor's de facto ubiquity across the Global 2000 gives the Actional platform a significant beachhead.

Cautions

- Progress positions Actional as complementary to deep-dive APM solutions, which undermines the vendor's ability to sell to enterprises that are looking to embed user-defined transaction profiling capabilities within a framework that also includes more-robust deep-dive monitoring into, for example, application servers and database management systems.
- While Actional is integrated with other Progress offerings, the synergies between the Actional technology and the rest of the Progress portfolio are not apparent, and the vendor's overall positioning does not sufficiently highlight Actional. This is particularly problematic because much of the market still sees Actional in terms of its preacquisition positioning as an SOA governance platform.

Quest Software

Quest Software supports all five dimensions of APM functionality. For the purposes of this Magic Quadrant, we examined Foglight v.5.5. Foglight's architecture is such that a single, integrated code base supports end-user experience monitoring, user-defined transaction profiling, application component discovery and modeling, application component deep-dive monitoring, and application performance management database functionality. Different functionality packages are available (composed from subsets of data collectors and modeling elements), which roughly

map to APM dimensions (e.g., the end-user management functionality package maps to the end-user experience monitoring dimensions, the application management functionality package maps to a combination of the user-defined transaction profiling dimension with application component deep-dive monitoring into Java and .NET environments, and the database management functionality package maps into the application component deep-dive monitoring dimension, with a focus on database management systems).

Strengths

- Foglight's distinctive, rich, model-centric architecture allows for a genuinely integrated approach to the five dimensions of APM; in fact, it can be extended further to capture various aspects of the physical and virtual infrastructures upon which the applications run. Not only can the collected data be easily normalized and correlated, but the technology is also easy to implement and maintain.
- Quest is the market leader in multivendor database performance monitoring, giving Foglight a credibility unique among the technologies considered in this Magic Quadrant in the area of database deep-dive monitoring.
- Quest's near monopoly in the Microsoft application management market, coupled with the ubiquity of its Toad database utilities package, gives the vendor a beachhead in most large enterprises and in many small to midsize businesses.

Cautions

- The sales and marketing efforts supporting Foglight tend to be technically oriented and feature-/function-driven; thus, precisely because the platform is so flexible, it is frequently acquired to supplement current management solutions, rather than to serve as an enterprise's APM center of gravity. This leaves Quest vulnerable to containment, and even displacement strategies, as competitors improve the functional reach of their own portfolios and become increasingly adept at selling APM solutions high in the IT organization.
- Foglight lacks any deep perspective into the network layer of an enterprise's infrastructure or into mainframe domains; these are increasingly important domains for a technology seeking

to serve as the keystone for a corporate APM architecture, not just as a supplement meant to "fill in the gaps" of another vendor's technology portfolio. Quest's December acquisition of PacketTrap may be seen as a first step toward addressing the network layer issue.

- While Foglight manages critical Microsoft technologies (including .NET, SQL Server and Windows OS), Quest has failed to effectively link these capabilities with its strong position in Active Directory, Exchange and SharePoint management, both technologically and conceptually, in the minds of buyers.

SL

SL supports two of the five dimensions of APM with a single integrated code base. For the purposes of this Magic Quadrant, we examined RTView v.5.3 for application component deep-dive monitoring and application performance management database functionality.

Strengths

- RTView provides effective monitoring of many key middleware environments. The technology is easy to deploy and maintain, which makes it particularly attractive to businesses with few resources to devote to APM.

Cautions

- There is a general drive toward simplification, both from a technology and pricing point of view, across the market. As ease of deployment and use becomes a more prevalent feature, RTView's lack of functionality, particularly regarding end-user experience monitoring, could undermine its position.

Vendors Added or Dropped

We review and adjust our inclusion criteria for Magic Quadrants and MarketScopes as markets change. As a result of these adjustments, the mix of vendors in any Magic Quadrant or MarketScope may change over time. A vendor appearing in a Magic Quadrant or MarketScope one year and not the next does not necessarily indicate that we have changed our opinion of that vendor. This may be a reflection of a change in the market and, therefore, changed evaluation criteria, or a change of focus by a vendor.

Evaluation Criteria Definitions

Ability to Execute

Product/Service: Core goods and services offered by the vendor that compete in/serve the defined market. This includes current product/service capabilities, quality, feature sets and skills, whether offered natively or through OEM agreements/partnerships as defined in the market definition and detailed in the subcriteria.

Overall Viability (Business Unit, Financial, Strategy, Organization): Viability includes an assessment of the overall organization's financial health, the financial and practical success of the business unit, and the likelihood that the individual business unit will continue investing in the product, will continue offering the product and will advance the state of the art within the organization's portfolio of products.

Sales Execution/Pricing: The vendor's capabilities in all pre-sales activities and the structure that supports them. This includes deal management, pricing and negotiation, pre-sales support and the overall effectiveness of the sales channel.

Market Responsiveness and Track Record: Ability to respond, change direction, be flexible and achieve competitive success as opportunities develop, competitors act, customer needs evolve and market dynamics change. This criterion also considers the vendor's history of responsiveness.

Marketing Execution: The clarity, quality, creativity and efficacy of programs designed to deliver the organization's message to influence the market, promote the brand and business, increase awareness of the products, and establish a positive identification with the product/brand and organization in the minds of buyers. This "mind share" can be driven by a combination of publicity, promotional initiatives, thought leadership, word-of-mouth and sales activities.

Customer Experience: Relationships, products and services/programs that enable clients to be successful with the products evaluated. Specifically, this includes the ways customers receive technical support or account support. This can also include ancillary tools, customer support programs (and the quality thereof), availability of user groups, service-level agreements and so on.

Operations: The ability of the organization to meet its goals and commitments. Factors include the quality of the organizational structure, including skills, experiences, programs, systems and other vehicles that enable the organization to operate effectively and efficiently on an ongoing basis.

Completeness of Vision

Market Understanding: Ability of the vendor to understand buyers' wants and needs and to translate those into products and services. Vendors that show the highest degree of vision listen to and understand buyers' wants and needs, and can shape or enhance those with their added vision.

Marketing Strategy: A clear, differentiated set of messages consistently communicated throughout the organization and externalized through the website, advertising, customer programs and positioning statements.

Sales Strategy: The strategy for selling products that uses the appropriate network of direct and indirect sales, marketing, service and communication affiliates that extend the scope and depth of market reach, skills, expertise, technologies, services and the customer base.

Offering (Product) Strategy: The vendor's approach to product development and delivery that emphasizes differentiation, functionality, methodology and feature sets as they map to current and future requirements.

Business Model: The soundness and logic of the vendor's underlying business proposition.

Vertical/Industry Strategy: The vendor's strategy to direct resources, skills and offerings to meet the specific needs of individual market segments, including vertical markets.

Innovation: Direct, related, complementary and synergistic layouts of resources, expertise or capital for investment, consolidation, defensive or pre-emptive purposes.

Geographic Strategy: The vendor's strategy to direct resources, skills and offerings to meet the specific needs of geographies outside the "home" or native geography, either directly or through partners, channels and subsidiaries as appropriate for that geography and market.

Note 1

The Gartner Magic Quadrant evaluation process is time-consuming, and vendors may release updated products after we have performed our analysis. Because of this, we clearly state the product version we analyzed in our commentary on each vendor. We encourage you to engage in discussions with vendors to explore how current shipping versions may or may not address limitations we found in the versions we analyzed.

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About OPNET Technologies, Inc. (NASDAQ: OPNT)

OPNET Technologies, Inc. is a leading provider of solutions for managing applications and networks.

OPNET's best-in-class solutions address: application performance management, network performance management, and network R&D.

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