TECHNOLOGY AUDIT

dynaTrace Continuous APM
dynaTrace software Inc.

BUTLER GROUP VIEW

ABSTRACT

dynaTrace Continuous APM is an Application Performance Management solution that enables organisations to isolate and fix application performance and scalability issues before they affect production environments. Also, a highly significant differentiator is its ability to operate in the live environment without significant overhead, aiding developers in tracing the causes of problems without having to recreate a case. The costs and delays brought about by software performance difficulties can be a significant competitive disadvantage, particularly as applications are closer than ever to business processes. The dynaTrace solution is capable of serving SOA-based and virtualised IT environments in addition to client-server applications, and it integrates with many ALM and IT management tools to provide holistic visibility into application performance. Organisations can use this product to address performance issues during code development, and performance and load testing, as well as in production. The solution focuses on tracing individual transactions and collects highly granular data from a wide variety of sources to facilitate speedy resolution of issues, unlike many competing solutions which focus on aggregated metrics reporting. The vendor plans to release a toolkit to facilitate integration with broader IT environments, which in Butler Group’s view would address the limitation that currently this solution can only work for applications operating in Java or .NET environments.

KEY FINDINGS

- Provides 24x7 end-to-end transaction-tracing capabilities in live environments with minimal overheads.
- Supports SOA-based and virtualised environments.
- Integrates with a wide variety of ALM and IT Management tools.
- Does not currently cover applications that operate on platforms other than Java and .NET.
- Provides role-based dashboards for different stakeholders across the application lifecycle.
- Provides detailed drill-downs for root cause analysis and problem resolution.
- Offers comprehensive application discovery and dependency mapping functionality.
- dynaTrace plans to support other application types via a SDK late in 2009.

Key: ✅ Product Strength  ❌ Product Weakness  ❁ Point of Information
LOOK AHEAD

dynaTrace plans to add further application architecture validation functionality to the solution, and late in 2009 plans to release a SDK that will extend the product capabilities to platform environments beyond those of Java and .NET.

FUNCTIONALITY

Application Performance Management (APM) is increasingly being seen as part of the larger IT Service Management (ITSM) discipline. With the release of ITIL v3 in 2007, the governing body set forth guiding principles and policies to govern IT infrastructure, services, and operations. ITIL v3 takes a holistic, service-oriented view of IT operations, classifying APM within the end-to-end management of IT services. With more and more organisations moving towards Service Oriented Architectures (SOA), performance monitoring and management of complex Web services has become a pressing need. Butler Group is of the view that APM software solutions should extend beyond traditional application performance monitoring and reporting to include a wider variety of data sources, provide greater application dependency mapping capabilities, and offer bidirectional integration capabilities with SOA software components as well as software development lifecycle tools. This would enable better coverage of service-oriented IT environments. Furthermore, there should be a balance between agentless and agent-based data collection techniques such that the APM tools provide maximum visibility into operations while minimising the overheads.

Product Analysis

APM is at the core of managing business service levels and end-user experience for software applications. Whether the application is part of revenue-generating business process, or deployed for driving internal efficiencies, performance management and continuous improvement through enhanced visibility into runtime as well historic operational data is necessary to maintain business agility. In Butler Group’s opinion, APM can usefully encompass application performance monitoring and optimisation, fault management, deployment testing, and scenario modelling. dynaTrace Continuous APM covers all of these areas of requirements, and lays special emphasis on the most critical: end-to-end transaction tracing. It covers applications platformed on Java or .NET, and has been deployed to manage various complex and business-critical applications in a wide variety of organisations.

dynaTrace Continuous APM is available in three editions:

- dynaTrace Development Edition enables development teams to isolate and address performance issues during the development phase itself, in integration with commonly used Integrated Development Environments (IDEs) such as Microsoft Visual Studio, and Eclipse. The solution facilitates root cause analysis of performance and scalability issues for Java and .NET platform applications by introducing problem documentation capabilities at code level, supplemented by comprehensive drill-down ability. dynaTrace Development Edition also integrates with build automation tools such as Apache’s Ant and Nant, and Microsoft’s MSBuild (used for builds within Microsoft Visual Studio Team System) as well as continuous integration systems such as CruiseControl, QuickBuild, Visual Studio Team System, Anthill, Bamboo, and more.
dynaTrace Test Center Edition is aimed at load and performance testing teams, and integrates with test automation tools including LoadRunner, SilkPerformer, ITKO LISA SOA Test, Neotys, JMeter, and WebLoad. The solution enables testers to automate documentation and diagnosis of performance-related defects at code level, which can then be forwarded to the relevant development teams for further analysis.

dynaTrace Production Edition is aimed at application support and maintenance teams, and automates 24x7 transaction tracing, application monitoring, and diagnostic data collection for production applications. The solution integrates with various service and systems management tools such as Windows Perfmon, JMX, HP OpenView, and other tools by IBM, CA, Microsoft, VMware, and BMC. Furthermore, the solution includes role-based dashboards that provide relevant diagnostic information with deep drill-down ability for system architects, application architects, and developers to promote speedy resolution of performance issues.

Increasingly APM is required within SOA and virtualised environments, and Butler Group expects that customers will expect APM tools to cover cloud-hosted applications in the near future. SOA environments are inherently more complex than traditional client-server applications, because business services are typically strung together at runtime from hundreds, or possibly thousands, of Web service components each of which has multiple dependencies. Hence, comprehensive application dependency mapping capabilities are a prerequisite for performance management in SOA environments. The dynaTrace solution takes a lifecycle approach to APM, tying performance issues in production to their source within application architectures.

The solution supports various types of operating system platforms, application and portal servers, databases, remote invocation technologies, system and application server monitoring frameworks, Web servers, middleware technologies, and IT management suites out-of-the-box to enable detailed data collection and application-dependency mapping at various layers of the technology stack. However, it does not work with application components that run outside Java and .NET platforms. Additionally, users can download open source plug-ins for systems and application monitoring from the dynaTrace community Web site, and custom end-user monitoring scripts are also supported. The solution integrates with Coradiant’s end-user experience monitoring tool for collecting data on application performance on the user’s machine, which helps provide further deep visibility into end-to-end application performance in production environments.

Two key aspects of the dynaTrace approach to APM are its patent-pending PurePath technology, and gaining value from other application lifecycle tools to address performance issues before they affect production environments. dynaTrace PurePath technology employs different servers for transaction data collection and analysis, and is thus able to monitor individual transactions round the clock with minimal production overheads. This approach is distinct from aggregated application-level metrics tracking, which is more commonly used by competitors, and delivers a highly significant and valuable benefit in that developers do not have to recreate a runtime problem in their own test environments before undertaking diagnosis and root case identification – all relevant metrics from the actual runtime incident are stored with the PurePath (i.e., the trace instance from each transaction processed). The solution is proven to scale to manage thousands of application servers, although there is a limit of 100 servers per solution instance to avoid performance degradation. The solution can be deployed in a federated or clustered configuration, and scales out to cover globally distributed IT environments including virtualised and SOA environments.
The dynaTrace solution uses an agent-based data collection approach (see Figure 1), in which the agents are responsible for sending data to the server in real time. The server then formats the information into PurePath instances for individual transactions. An optional module, dynaTrace Collector, can also be deployed for load sharing with the server, ideally suiting large-scale global deployments. As shown in Figure 1, the dynaTrace technology stack includes Knowledge Sensors, dynaTrace Agents, dynaTrace Collector, dynaTrace Server, and the dynaTrace Repository. The repository is responsible for storing historic performance data for trend analysis, and it can be implemented in a number of database products including IBM DB2, Oracle, Microsoft SQL Server, and the open source PostgreSQL. Additional components include a client module and an open API for integration and extension support. There follows a brief outline of the other technology components:

**dynaTrace Server**

The server module is responsible for collecting and analysing incoming diagnostic data from various agents. All transactions are traced centrally by the server which is responsible for creating PurePaths for individual transactions based on collected trace data. Other information available to the server includes memory allocations, messaging, method invocation, context information such as method arguments and return values, remote invocation, execution sequences, exceptions, and logs. This information is presented to end users through role-based dashboards, with relevant drill-down functionality.
**dynaTrace Agent**

Agents are lightweight code components responsible for diagnostic data collection from the application component or device on which they are deployed. The agent reads and modifies the host component’s operational byte code by injecting a sensor into it. This automated process enables the Agent to collect data and provide visibility into the behaviour of many proprietary applications. It also allows users to dynamically adjust the level of detail for trace data for running application instances. There is some overhead involved with agent-based approaches, such as in deploying the agent to each device or application component, and some performance overhead as well due to instrumented byte code. However, the dynaTrace agents can be deployed and administered centrally, and operate with minimal performance overheads. The agents also collect memory and thread dumps, as well as system monitoring data from runtime environments such as Java Virtual Machines (JVMs), Common Language Runtime (CLR), and application servers.

**dynaTrace Collector**

The Collector is an optional module that can take over byte code instrumentation responsibility from the dynaTrace Server. If deployed, the Collector manages the agents, and is the destination for collection of their diagnostic data. Additionally, Collector provides enhanced security and data compression between the dynaTrace Server module and the target application component, which eases the memory and CPU usage on the dynaTrace Server instance. The Collector also executes plug-ins based on the Open Software Gateway initiative (OSGi) framework for remote monitoring, if they are installed. If Collectors are used, the data is still forwarded to the dynaTrace Server for analysis.

**dynaTrace Knowledge Sensors**

These sensors monitor extremely lightweight markers (a few bytes in size) for tracing a transaction’s progress through the application infrastructure. Since they operate at byte-code level, they can provide visibility into instructions executed by every application component for which they are deployed. They identify transaction entry points and method calls, and also record contextual information such as method arguments, return values, exceptions, events, I/O usage, network traffic, objects created, SQL calls, remote calls, and synchronisation delays amongst other data. The collected diagnostic data is relayed to the agents, and then to the server for further analysis.

**Product Emphasis**

A key characteristic of the solution is its focus on individual transactions rather than aggregated metrics. dynaTrace PurePath technology traces each transaction from end-to-end with minimal overheads, and collects highly granular data which is then available for analysis by the appropriate IT experts. Additionally, the solution supports various application and portal servers, middleware technologies, operating systems, and other infrastructure components out-of-the-box, thereby facilitating diagnostic data collection from a wide variety of sources, and enabling its translation into holistic visualisation of application performance. Furthermore, the solution supports traditional, virtualised, and SOA environments, and is suitable for all organisations that need to manage performance and scalability issues for business-critical applications running on Java or .NET platforms.
DEPLOYMENT

Solution deployment typically consists of three phases: product installation, configuration, and roll-out. Installation typically takes a few hours depending on the scope of deployment. Configuration follows, taking an average of a few days to complete. Before the solution can be rolled out for general use, it must be integrated with the existing IT environment and business processes, which takes an average of a few weeks to complete. dynaTrace provides professional services for deployment projects and also to help clients re-engineer their processes to take a more holistic approach towards APM practices.

dynaTrace Collector is the only optional component. In order to phase deployment it may be undertaken for a few applications initially, and then the scope expanded for greater coverage, or the solution can be deployed for a particular user category and later expanded to include other teams as well (e.g., organisations can deploy dynaTrace Continuous APM for development, test, and production environments separately). dynaTrace states that management of the solution does not require any dedicated resources subsequent to deployment, as management tasks can be undertaken as part of those relating to other software and infrastructure.

dynaTrace offers both training and certification programmes: training is classified into product and advanced training, and certification courses also follow the same classification. Product training is aimed at end users as well as resellers and consultants, starting with a three-day course that provides an overview of the feature set, and various use cases. The company’s advanced training course covers best practices for product configuration, analysis, diagnosis, troubleshooting, and monitoring – this option is offered only at dynaTrace training centres. The company also offers a quick-start package which includes a three-day, on-site, product-training course, and two days for basic system configuration. Additional resources include online video tutorials available via the dynaTrace community portal. Certification courses are aimed at business partners, and consultants; however, customers may enrol their staff for such courses if required. dynaTrace plans shortly to upgrade its training programmes to enable customers to shift more knowledge transfer to where courses are needed, via use of online delivery.

Technical support is provided via dynaTrace’s customer service portal online, and via e-mail or telephone. The solution can be deployed on various operating system platforms such as Windows, SUSE and RedHat Linux, Solaris, AIX, HP-UX, and IBM z/OS and zLinux. dynaTrace APM does not depend on any particular third-party products such as databases or application servers. The solution supports a wide variety of platforms, and technologies, a full list of which can be found on the vendor’s Web site. The solution ships with an embedded database, but also supports other commonly-used databases. Legacy support is currently not available out of the box, but dynaTrace states that the solution can be tweaked by its own professional services arm to extend the coverage to particular applications that are not sited on Java or .NET platforms. dynaTrace plans to make available a Software Development Kit (SDK) for such legacy applications in late 2009.
PRODUCT STRATEGY

dynaTrace’s target market is horizontal (across business sectors); the company targets organisations that have business-critical applications running on Java and/or .NET platforms. With respect to the kind of IT environments covered, dynaTrace is suitable for traditional, virtualised, and SOA-based environments, giving the company a broad addressable market. The company has won customers from vertical markets such as Banking, Insurance, Application Service Providers (ASPs), Independent Software Vendors (ISVs), Online Retail, Telecommunications, and Government, and thus has developed expertise in serving these markets. The vendor typically targets large enterprises for this solution, and mid- to large-sized enterprises in the software sector (ASPs and ISVs).

According to dynaTrace, Return on Investment (ROI) is based upon average salaries of testing and development resources, as the solution helps to reduce the mean time to repair for incidents, which dynaTrace claims can be reduced by around 90% in certain cases. Other benefits include reduced application maintenance expenditure, and a reduced time to market for projects under development. The solution is sold directly by dynaTrace as well as through the channel in certain geographies such as Benelux, Scandinavia, Spain, and Italy. dynaTrace has also entered into OEM agreements with Borland and Coradiant, these vendors being the primary business partners for dynaTrace Continuous APM. dynaTrace has formed technology partnerships with IT vendors such as IBM, Oracle (BEA and Sun), and Microsoft, and is also working closely with Microsoft’s Azure platform team to extend dynaTrace Continuous APM coverage to cloud-hosted applications developed on Azure. dynaTrace also works with VMware for special diagnosis of whether a transaction is slow due to competing resources or due to application issues, which is a key problem for companies deploying data centre consolidation using virtualisation.

dynaTrace offers perpetual licences, with the cost of annual maintenance and support being 20% of the net licence costs. Training courses start at €590 per trainee, and total training costs typically account for 10% of the deal size. The vendor’s roadmap for the APM product focuses on further automation of root cause analysis. dynaTrace also plans to add more application architecture validation features, and extend the solution’s capabilities to cover cloud-hosted applications. The solution has already been deployed to manage globally distributed applications for clients from the Financial Services sector, as well as for managing business-critical applications such as those in ASP organisations. Butler Group is of the opinion that although the solution is relatively new to the market, dynaTrace has created space for itself by delivering holistic performance-management capabilities to organisations and environments whose entire business depends on 24x7 application availability and optimal performance (e.g., organisations that generate revenue by providing applications as a service). Perhaps most notable among this category of clients is Salesforce.com.

COMPANY PROFILE

dynaTrace offers performance diagnostics solutions for applications within Java, .NET, or SOA environments. The company is headquartered in Boston, US, and has a Research and Development (R&D) centre in Linz, Austria, as well as offices in the UK, Germany, Switzerland, and France. dynaTrace is privately held (and does not disclose details of its financial results) and has over 80 employees. The company was founded in 2005 by Bernd Greifeneder, who has considerable experience in developing production monitoring and load testing tools. dynaTrace derives 60% of its revenue from the EMEA region, with business in the US accounting for the rest. The company has 150 customers, and has established presence in the industry sectors of Banking, Insurance, Application Service Providers, Independent Software Vendors (ISVs), Online Retail, Telecommunications, and Government. Well-known names among the company’s customers include Novell, Enernoc, Provinzial, Autotrader, Siemens, T-Systems, Salesforce.com, and UBS.
SUMMARY

dynaTrace's approach to APM is holistic and of great breadth and depth; the solution takes performance management deeper into the application lifecycle and tries to isolate issues within the development and testing phases themselves, before these surface as bottlenecks in production environments. dynaTrace can be looked upon as a newcomer in the APM space, which as a market segment has considerable overlaps with both Application Lifecycle Management (ALM) and IT Service Management, but increasingly is being seen as a subset of the latter, broader market area. This space is dominated by the larger IT management vendors; however, Butler Group is impressed with the relative ease with which dynaTrace has created a significant space for itself in this market. This is also reflected in the consistent three-digit percentage growth in revenues and numbers of customers achieved by dynaTrace.

While the company is young, its growth is not baseless and is founded on a very competent, advanced, and enterprise-strength offering. dynaTrace's solution has been tested in real-world scenarios, having been deployed by many organisations whose business depends on 24x7 application availability and optimal performance, as well as by globally distributed organisations. Butler Group is of the view that dynaTrace's solution should be strongly considered by all organisations with such needs, the numbers of which will increase as the performance of externally facing applications, and also those used internally, becomes a greater factor in assuring business success.

Table 1: Contact Details

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Source: dynaTrace software

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