

BMC ProactiveNet
Performance Management –
Application Diagnostics

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INTRODUCTION

Business applications are the lifeblood of your organization. When they fail, your company stands to lose revenue and reputation. You may often find yourself under immense pressure to instantly fix problems and restore service, all while dealing with demanding management, employees, customers, and partners.

To effectively handle the potential severe impact of application malfunctions, you have to carefully and consistently manage your applications so that, if and when they fail, you have the tools to:

- Detect the problem “before the phone rings”
- Assign the right priority to the problem, based on how it might impact the business
- Isolate the root cause of the problem to determine which team needs to be engaged to diagnose and resolve the problem

In today’s dynamic IT environment, where each application is composed of hundreds of moving parts deployed in virtual and cloud environments, and where dynamic business requirements dictate constant change, root cause isolation is a key challenge. Wrestling with the inherent complexity of today’s distributed Web applications, most organizations find themselves going through “all hands on deck” exercises when problems arise, disrupting process-based operations and wasting the time of expert IT staff.

BMC ProactiveNet Performance Management - Application Diagnostics empowers IT staff to quickly isolate the cause of problems in custom distributed applications, thereby eliminating finger-pointing and slashing problem resolution time.

BMC ProactiveNet Performance Management - Application Diagnostics gathers data from Java EE and .NET application servers to provide you with the visibility you need to determine which component of my application is causing the problem?” Since BMC ProactiveNet Performance Management - Application Diagnostics takes the guesswork out of the equation; you can now escalate incidents to their appropriate owners and eliminate inefficient and frustrating “war room” situations.

BMC ProactiveNet Performance Management - Application Diagnostics extends BMC’s Proactive Application Performance Management capabilities by providing deep dive application problem isolation and diagnosis; complementing both our existing application, database, and middleware performance monitoring (BMC Middleware Management and BMC ProactiveNet Performance Management – Application, Database, and Middleware) and our end user experience monitoring for real user transactions (BMC ProactiveNet Performance Management - Real Transactions) and synthetic user transactions (BMC ProactiveNet Performance Management - Synthetic Transactions). Together, these products deliver the industry’s only proactive application performance management solution -- delivering early problem identification with rapid problem isolation and resolution.

This paper presents the challenges of problem isolation and introduces BMC ProactiveNet Performance Management - Application Diagnostics.

PROBLEM ISOLATION CHALLENGES

With IT as an enabler of your organization’s business processes, you are most likely using Java EE or .NET application servers for backend business logic processing, as well as for integration of your enterprise applications and for Web based applications. These application environments, while providing numerous advantages, also add several levels of complexity that make problem isolation a formidable challenge.

The architecture of Java EE and .NET-based applications is multi-tier, relying on multiple networked components, such as client machines, load balancers, firewalls, Web servers, application servers, security servers, transaction servers, and database servers. The application server, in itself, is a highly componentized entity. Increasingly, applications are being virtualized and deployed in cloud computing environments, adding additional infrastructure components to manage.

Add to the inherent complexity of distributed and virtualized applications the frequent changes these applications go through due to regular maintenance, fixes, and new business requirements and it is easy to see why proper application performance management is vital.

Hopefully, you are already using BMC ProactiveNet Performance Management to proactively manage your end to end application performance and availability. BMC ProactiveNet Performance Management automatically

learns the normal and seasonal patterns of behavior of your applications infrastructure and end-user experience in order to accurately identify performance degradations and predict when potential problems might occur in the future. Figure 1 shows a typical list of performance events, failures, or predictive alerts generated based on the learned behavior of your applications and their supporting infrastructure. In addition, your service desk may already be using BMC IT Service Management (ITSM) as your first line of contact with customers and users. However, when an alert is raised — either through an alert from BMC ProactiveNet Performance Management or a third party monitoring tool, or in the worst case (if you aren't monitoring end user experience), after end users call to complain — it is imperative to first assign the appropriate priority (based on business impact), then isolate the tier or component that is causing the problem, and finally assign the problem to the right person.

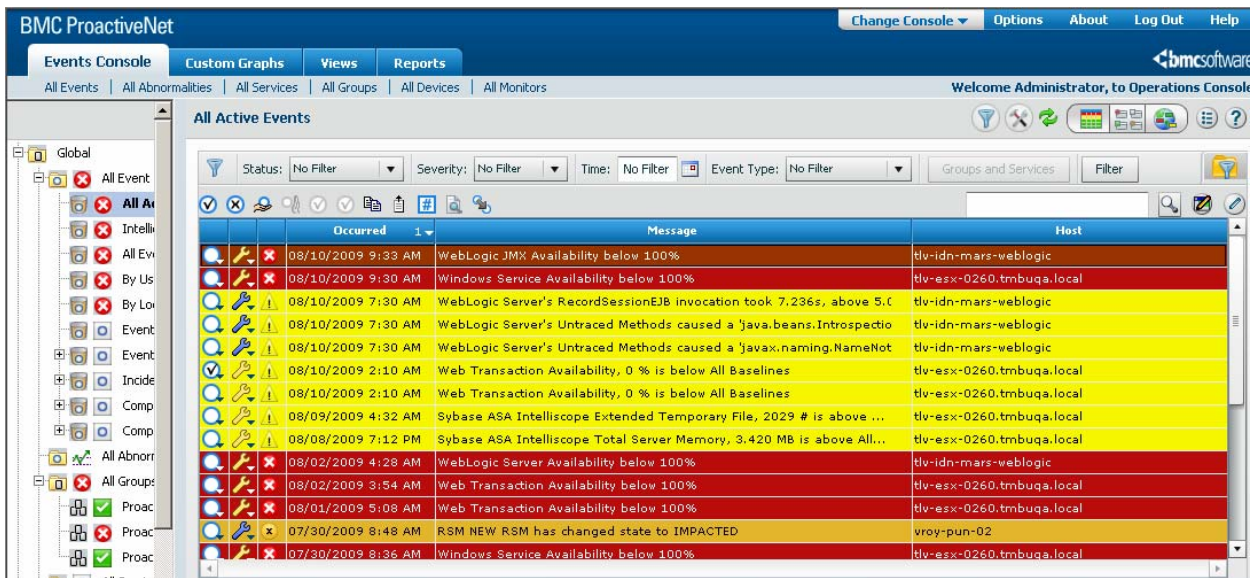


Figure 1. BMC ProactiveNet Performance Management generates intelligent performance and predictive events when it detects 'abnormal' application behavior indicating current or potential degraded performance or failures.

Nevertheless, running distributed applications composed of so many different moving parts means that multiple teams touch the application, including the IT operations staff who manage the servers, the DBAs who set up the database, the security engineers who own firewalls and authentication servers, the mainframe system administrators, the network administrators, and others.

For example, when a bank employee attempts to execute a transaction and receives poor performance, who do you blame? Was this a network hiccup? Insufficient application server connection pools? An overloaded backend server? A bug in a Java EE component? Etc.

The traditional method for addressing critical problems is to summon representatives from all functional teams (both within and outside the organization), shut them in a big meeting room, and let them “figure it out.” Per industry analysts, on average, 10-14 people are involved when a single service outage occurs.

Traditional problem analysis is based on vast amounts of log files, memory dumps, end-user reports, performance monitoring statistics, and guesswork.

Needless to say, traditional problem isolation methods are extremely inefficient. With little data (or too much irrelevant data) to go on, finger-pointing is common, and IT staff often spend more time proving their innocence on problems that have nothing to do with their domain. For example, some database transactions may not be processed due to incorrect configuration of the application server or a bug in a Java EE component; hence DBAs would waste their time sitting in the “war room.” Even worse, the lack of clear visibility into application transaction execution means longer mean-time-to-repair (MTTR), thereby increasing the costs of application problems.

To fully address problem isolation and minimize business disruptions, you need reliable probable root cause information with detailed diagnostic data. And you need it fast, every single time a problem occurs. BMC ProactiveNet Performance Management provides on-demand probable cause analysis to quickly isolate the

most likely cause of performance issues or failures. When the likely cause exists in the application layer, further diagnosis is required.

ENTER BMC PROACTIVENET PERFORMANCE MANAGEMENT - APPLICATION DIAGNOSTICS

BMC ProactiveNet Performance Management - Application Diagnostics helps IT operations and application support staff to isolate problems in distributed applications running in Java EE, Microsoft .NET, or COM/COM+ application environments.

By quickly determining where the root cause of the problem lies, the product enables IT staff to route the problem to the appropriate domain expert for rapid resolution. As the need to involve multiple IT groups to diagnose the problem is eliminated, the entire problem resolution process is expedited, service is restored promptly, and end users are either unaware that a problem was averted or simply satisfied that they are productive again.

MAIN COMPONENTS

BMC ProactiveNet Performance Management - Application Diagnostics consists of the following main components:

AGENTS

BMC ProactiveNet Performance Management - Application Diagnostics agents are lightweight software agents deployed on Java EE or .NET application servers. Their primary role is gathering diagnostic data on application transaction performance, execution, and errors. These agents are based on the BMC AppSight Black Box patented technology and provide deep application diagnostics for inclusion in application root cause analysis.

SERVER

The BMC ProactiveNet Performance Management - Application Diagnostics Server is a middle-tier component that connects the agents and the BMC ProactiveNet Performance Management server, and provides access to captured data.

CONSOLE

The BMC ProactiveNet Performance Management - Application Diagnostics analysis data is available in the BMC ProactiveNet Performance Management web console.

PAINLESS DEPLOYMENT

When business applications fail to perform, IT needs to act quickly to restore service. It is essential that any tool used in the course of the problem isolation and resolution process is easy to deploy and use. After all, IT staff needs to spend its time finding the root cause and fixing the problem rather than setting up supporting tools.

BMC ProactiveNet Performance Management -Application Diagnostics requires no change to monitored application environments. You do not need to modify Java EE application server startup scripts, run a special version of the Java Virtual Machine (JVM) or Common Language Runtime (CLR), or change application code.

You can install BMC ProactiveNet Performance Management - Application Diagnostics agents through the command line or by using any existing deployment tools. The Java EE version of the agent is packaged as an EAR file and can be deployed using the Java EE application server Administrator console. The Windows/.NET version is packaged a Windows service that can be easily deployed directly or through your standard software distribution processes and tools.

After installing the agents, you can get started with gathering transaction execution data from your application. BMC ProactiveNet Performance Management - Application Diagnostics, designed with special focus on simplicity, comes with predefined configurations for monitoring all common distributed application environments; hence no scripting or special customization is involved. The tool's ease-of-use enables a high level of flexibility, allowing users to choose between running agents continuously or deploying and running them only when problems occur.

ANALYSIS: STARTING WITH A BIRD'S EYE VIEW

The location of a problem's root cause is rarely known when analysis begins. Therefore, you have to start by looking at the big picture and finding "suspect" tiers or components before drilling down. The Technology Breakdown view shown in Figure 2 provides you with exactly that. It displays duration data on transaction performance as recorded from within the application server. Using this view, you can easily spot slow-performing transaction categories and determine which tier may have caused the issue.

For example, an application support engineer charged with isolating root cause of a problem in an online Java EE based trading application may find that a certain type of account verification transaction performs poorly when compared to other transactions or to historical performance data. Application transaction performance breakdown shows that the majority of time was spent on the database side.

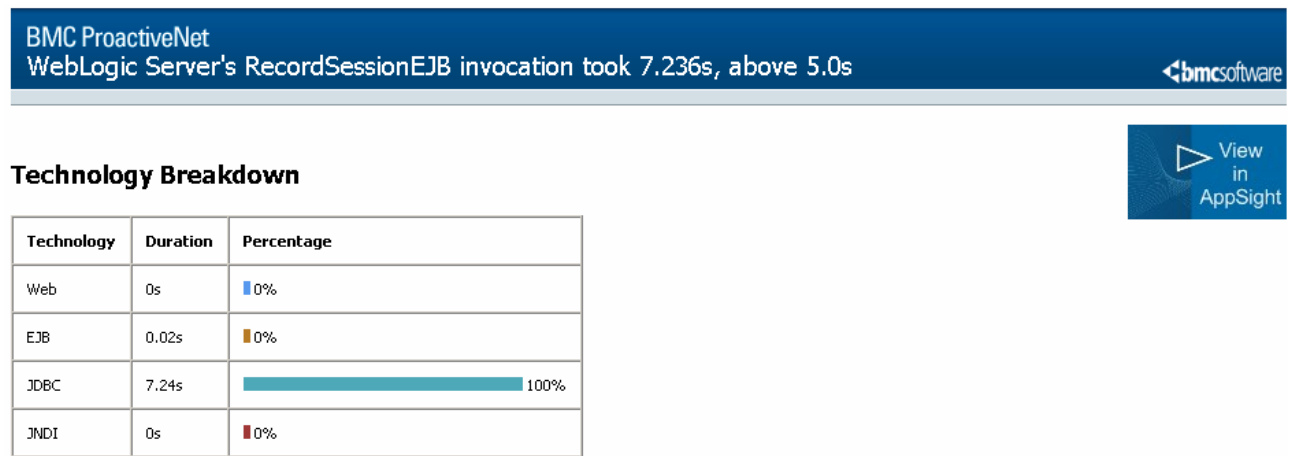


Figure 2. Probable Cause Detailed Diagnostics include application technology breakdown to quickly isolate where the transaction is spending the most time.

TAKING THE QUICK DIVE

While a high-level view is a good starting point for analysis, it hardly ever suffices for root cause isolation, as it only tells part of the story. Before making the final determination as to where the root cause lies, you need to investigate problematic transactions and understand their actual execution performance at a more granular level.

Rather than executing a different tool to gather more detailed information or sift through long server logs, BMC ProactiveNet Performance Management - Application Diagnostics lets you drill-down into the problematic transaction invocations at a click of a button.

The tool's Application Transaction Breakdown view presents actual transaction execution, including full transaction execution path — SQL queries, EJB calls, Servlets, JSPs, JMS, JCA, JTA, JNDI, ASP/Xs, COM/COM+, and more — made in the context of the transaction. Performance data is displayed for each of the transaction steps. Figure 3 illustrates some of the application components that might be displayed when application performance degradation occurs.

Invocation Tree

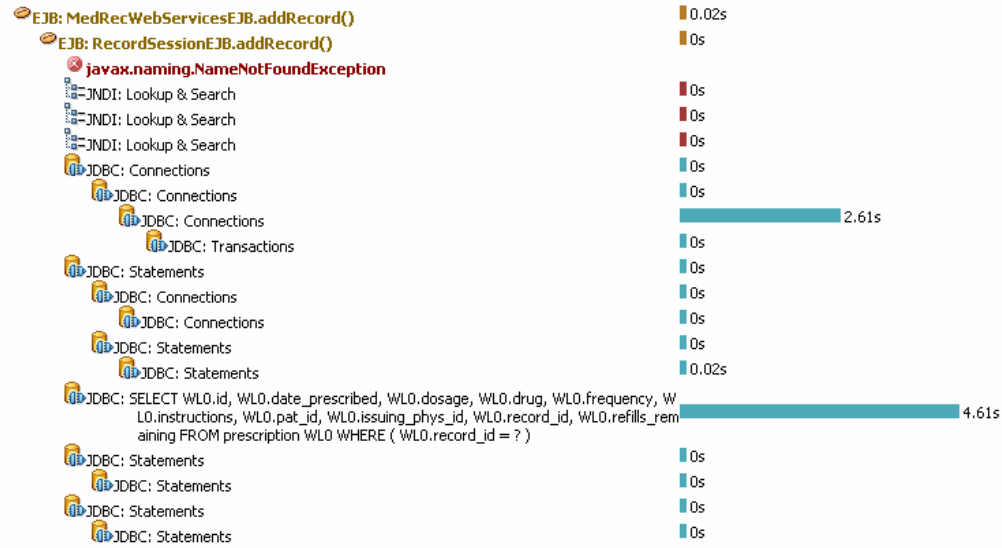


Figure 3. The Transaction Breakdown listed in the Invocation Tree pinpoints the components within the transaction causing the performance degradation.

To continue our example, the support engineer selected to zoom in on the account verification transaction. The support engineer now focuses on the Transaction Breakdown and notices that a certain type of JDBC call takes an exceptionally long time to complete, and throws an exception. BMC ProactiveNet Performance Management -Application Diagnostics displays the full SQL query as sent to the database, helping the support engineer realize that it goes out to an external database on a company's partner extranet. When an incident is escalated, a simple mouse click allows the developer to drill down further to the actual line of code details and parameter values that existed at the time the degradation occurred; as depicted in Figure 4,

Instead of spending countless hours (and many people's time), the problem is now accurately isolated and escalated to the partner's help desk team for resolution.

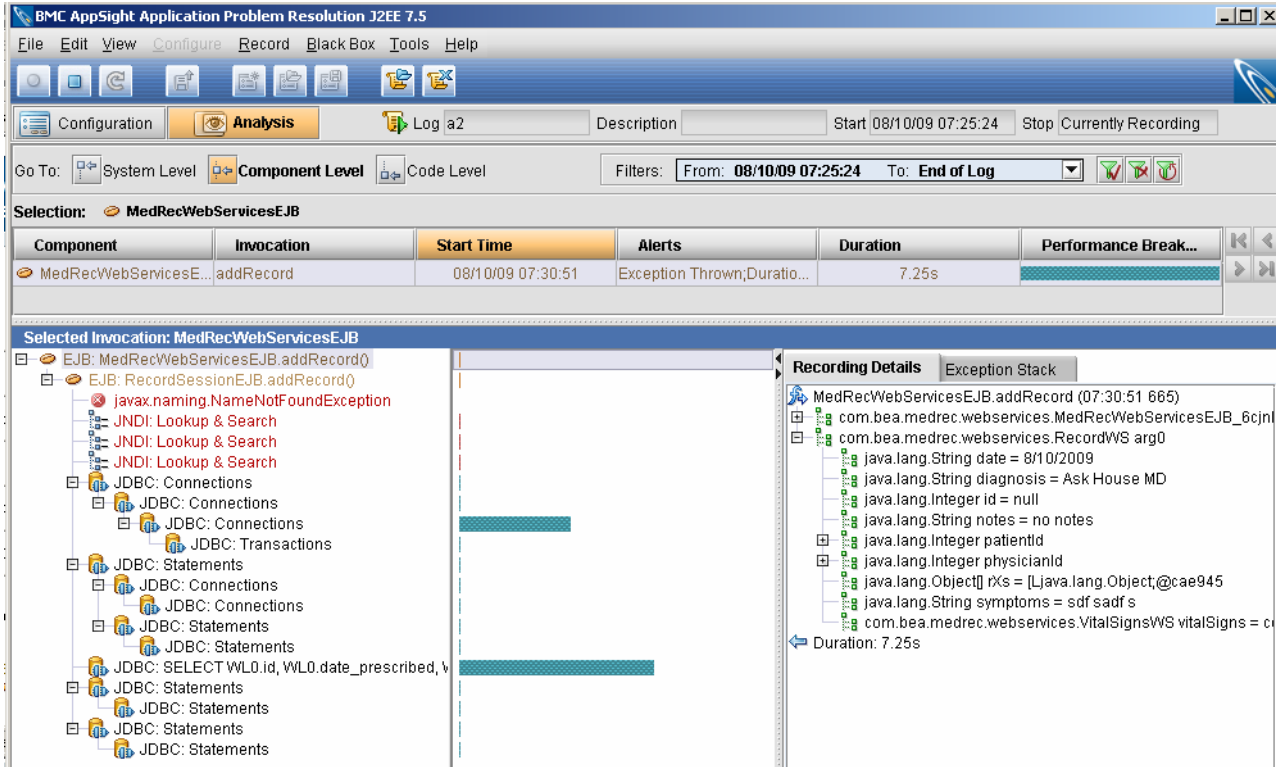


Figure 4. Deep dive diagnostic drilldown into BMC AppSight shows the parameter values, object state and lines of code for better root cause analysis by application developers.

END-TO-END PROACTIVE APPLICATION PROBLEM MANAGEMENT

BMC ProactiveNet Performance Management - Application Diagnostics addresses one of the fundamental challenges in management of distributed applications. However, an end-to-end solution also has to address problem detection and problem management.

Application problems are automatically detected through a powerful combination of component monitors coupled with real and simulated end-user monitoring, and analyzed with predictive analytics. BMC ProactiveNet Performance Management analyzes the performance and availability of all infrastructure components as well as real and synthetic end user experiences, and alerts IT staff when degraded performance occurs. It can also warn IT staff about a potential problem in the next few hours, based on recent and current trends in system and application behavior. BMC ProactiveNet Performance Management provides on-demand probable cause analysis for every event, ensuring IT staff have enough information available to quickly isolate the root cause of performance issues so they can be assigned to the right person to resolve the issue as quickly and efficiently as possible.

Once a problem is detected, an alert is routed through BMC ProactiveNet Performance Management to BMC Event and Impact Manager, where the IT Operations staff performs an initial analysis of the incident and its business impact. The high-level snapshot provided by these products enables the IT staff to determine the severity of the problem, as well as the location and application in which it occurred. Finally, BMC ProactiveNet Performance Management - Application Diagnostics is used for quickly isolating problems and routing them to the appropriate person or team.

PART OF A COMPREHENSIVE BUSINESS SERVICE MANAGEMENT APPROACH

Business Service Management (BSM) is the most effective approach for managing IT from the perspective of the business. BSM helps your IT organization do more of what supports the business and less of what doesn't.

With BSM, you will reduce cost, lower risk of business disruption, and benefit from an IT infrastructure built to support business growth and flexibility.

BMC ProactiveNet Performance Management - Application Diagnostics follows IT Infrastructure Library (ITIL) guidelines on problem investigation and diagnosis, and helps you achieve BSM by:

- Optimizing problem isolation and diagnosis processes across the organization
- Minimizing the impact of application problems on business processes by quickly restoring service levels upon failure

SUMMARY

BMC ProactiveNet Performance Management - Application Diagnostics isolates problems in distributed Java EE and .NET applications, helping you to:

- Reduce escalations to Level 3 support
- Diagnose and fix problems faster
- Improve process efficiencies
- Increase availability and performance of critical business applications

To learn more about BMC ProactiveNet Performance Management - Application Diagnostics, please visit www.bmc.com/products/offering/BMC-ProactiveNet-Performance-Management.html

Business runs on IT. IT runs on BMC Software.

Business thrives when IT runs smarter, faster, and stronger. That's why the most demanding IT organizations in the world rely on BMC Software across both distributed and mainframe environments. Recognized as the leader in Business Service Management, BMC provides a comprehensive and unified platform that helps IT organizations cut cost, reduce risk, and drive business profit. For the four fiscal quarters ended September 30, 2009, BMC revenue was approximately \$1.88 billion.

