IDERA® | Precise Solution Brief

MANAGING THE PERFORMANCE OF COMPLEX PEOPLESOFT ENVIRONMENTS

INTRODUCTION

Experienced PeopleSoft personnel recognize the need to include application performance best practices throughout the entire application lifecycle, from development to deployment and operation. The most significant challenges facing PeopleSoft administrators today are

1. Defining a systematic process to understand application behavior, usage patterns, and service levels
2. Alerting the right people of problems before they can affect business users
3. Helping those people drill down to the root cause of the problem.

Another challenge is measuring the actual service that PeopleSoft delivers to the end user and then determining the end-to-end service time contributors. These measurements are needed to make the proper tuning, design, or architectural changes and to successfully integrate the PeopleSoft application with other legacy or third party applications.

Addressing these challenges has become even more important with the advent of newer PeopleSoft versions. For example, where PeopleSoft 8 introduced technologies (such as Web servers, Java Enterprise Edition servlets, and Jolt), versions that are more recent continued and introduced newer technologies (such as Asynchronous JavaScript and XML).

Paradoxically, these new technologies demand more responsiveness and round-the-clock high performance than the less-complex client and server applications of PeopleSoft. The process of rolling out an application from development to production is a tedious activity that may result in business dissatisfaction if proper practices for application performance management are not employed.

IDERA developed a solution for application performance management for PeopleSoft that spans the entire PeopleSoft Information Technology infrastructure, including the PeopleSoft Internet Architecture.

The Precise Application Performance Platform provides a solution to define application performance management in a way that quickly and efficiently captures and correlates PeopleSoft application metrics (such as user-activated Uniform Resource Locators, invoked Java Enterprise Edition servlets, Jolt Application Programming Interfaces, Tuxedo services, and database SQL statements) across the entire PeopleSoft infrastructure. Precise presents these important metrics in a manner that promotes crisp communication and rapid problem detection, correction, and verification throughout the application lifecycle.

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PEOPLESOFT APPLICATIONS

By their very nature, PeopleSoft applications are highly complex and mission-critical. They run in a complex, multi-tiered environment where high performance and effective performance management are necessary. After all, the service provided to PeopleSoft business users is only as good as the performance.

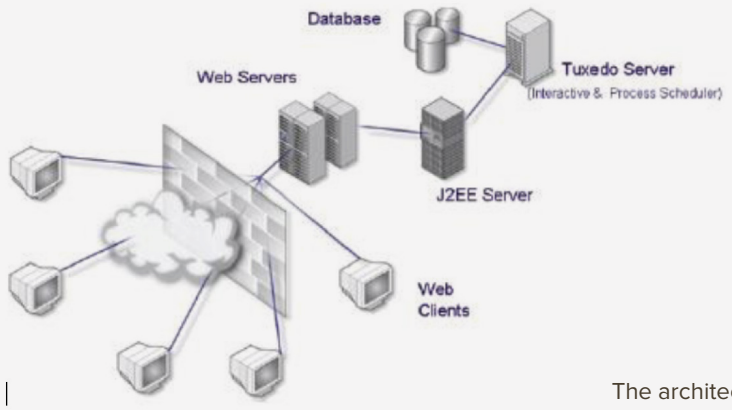
Organizations require continuous access to their PeopleSoft applications from anywhere. PeopleSoft has provided Web access through the introduction of the Pure Internet Architecture. The Pure Internet Architecture enables customers to access their traditional PeopleSoft applications using a Web browser. While this provides for faster deployment time and lower Total Cost of Ownership, Information Technology also introduces an element of unpredictable load on the system: Users can access their information from anywhere at any time.

Web access brings with it Information Technology components (such as Web servers, Java Enterprise Edition servlets, and Jolt). Performance management in these environments is more challenging because there are more devices involved, there are more potential points of failure, and there are more technologies that must interact not only among themselves but with other applications as well. These components mean more functionality and convenience for the end user. However, they mean more responsibility and complexity for PeopleSoft administrators.

Moreover, the current economic climate is leaving many Information Technology departments increasingly overworked and understaffed. As many companies rush to finish their PeopleSoft implementation phase (that includes customization and changes), they are paying less attention to critical issues (such as performance, scalability, and load). When the system goes live, serious performance problems often appear. Unfortunately, by this time those issues have become very expensive to find and fix. If these companies paid more attention to critical performance, scalability, and load issues earlier in the cycle, the performance problems could be detected and corrected before end users were affected, thereby preventing any business losses stemming from the poor performance of PeopleSoft.

THE TYPICAL PEOPLESOFT ENVIRONMENT

PeopleSoft architecture, with PeopleSoft Internet Architecture, includes Web servers, Java™ servlets running in a Java Enterprise Edition servlet engine (such as WebLogic or WebSphere), Jolt, Tuxedo server process, and a database (for example, Oracle®, Microsoft® SQL Server, or IBM® DB2 Universal Database). This architecture supports thousands of Web users who can access the system from any location.



The architecture diagram of PeopleSoft.

The PeopleSoft Internet Architecture is composed of the following components:

- PeopleSoft Web components that include a Web server component, Java servlets, and Jolt running on a Java Enterprise Edition application server
- PeopleSoft application components that implement PeopleSoft applications and services, using Tuxedo as their underlying technology
- Database

Each application component can deploy on a different tier or, alternatively, several components can occupy the same tier. The tiers are the following:

- Web Server
- Java Enterprise Edition Server that includes the servlet engine and servlets (such as PeopleSoft Portal, PeopleSoft Component, and Content Servlet along with the Jolt component)
- Application Server that runs the different Tuxedo services
- Database Server

A typical usage scenario starts with a user connecting to the PeopleSoft Web server to request a page or PeopleSoft panel:

- The Web server receives the request and forwards Information Technology to a Java Enterprise Edition servlet that is responsible for building the response.
- The servlet creates a Jolt message and sends it to Tuxedo.
- When Tuxedo receives the request, it looks at the called service and sends Information Technology to the appropriate Tuxedo server process running that service.
- The activated Tuxedo service fetches the required data from the database using SQL statements.
- Tuxedo returns a response to the activating servlet, again through Jolt, that in turn builds an answer page and sends Information Technology back to the user.

The new generation of PeopleSoft applications adds new functionality as well as new components or tiers to manage. Managing these environments presents many formidable challenges.

PERFORMANCE MANAGEMENT CHALLENGES

Spreading PeopleSoft applications across multiple tiers makes it difficult for Information Technology to pinpoint the source of any performance problem. Among the many challenges are:

- Finding a comprehensive, yet straightforward way to measure the end-user experience by geographic location
- Defining, measuring, and committing to organizational business objectives and Service-level Objectives
- Collecting performance metrics in real time across the PeopleSoft infrastructure, continuous, with very low overhead
- Correlating large amounts of performance metrics to quickly isolate a problematic component (such as a network, Web server, Java Enterprise Edition servlet, Jolt, Tuxedo or the database)
- Analyzing large amounts of data (if available) to pinpoint performance issues and recommend solutions
- Coping with unpredictable load periods and handling massive transaction and data volumes
- Proactively managing the system to be sure Information Technology can maintain satisfactory service levels even when deviations from normal behavior occur
- The ability to find PeopleSoft users and transactions that have a direct impact on performance, and those that are most vulnerable to performance degradation
- Define normal and abnormal application usage behavior through baselines to identify problem patterns before the end user is affected
- Monitoring external Java or Tuxedo interfaces between PeopleSoft and legacy and third-party applications
- Maintaining historical data for trending, exception reporting, and capacity planning

These challenges are not covered by system management frameworks, by synthetic robots testing the system from multiple locations, or by stovepipe snapshots from individual servers along the application path.

System frameworks are extremely well suited for determining system availability. Unfortunately, they do not focus on the end-user experience, activity, and usage. Therefore, if all system parameters look acceptable, how can we tell that particular locations or certain users suffer from poor response time, or why certain Uniform Resource Locators for PeopleSoft are slow? Moreover, if we do not collect and correlate activities across tiers, how can we tell if the problem is due to a poor Tuxedo service or a problematic SQL statement?

Robots provide external samples of synthetic transactions. They reflect neither the real load on the application nor the actual executing transactions. Real application traffic varies dramatically from simulated traffic. For example, you may have distributed robots at three locations but today, unbeknownst to you, most of the traffic is coming from a fourth location, or users may continue to suffer from bad response times for certain transactions while a robot is simulating other transactions. Moreover, synthetic activity is only activated periodically, that causes a gap in continuous data collection of performance metrics. What happens between one synthetic sample and the next one? Robots can create more unnecessary work on the system and may compete directly with end users for critical resources. Additionally, any simulated transactions that perform a commit to the database need to be backed out somehow from the system.

The stovepipe approach takes snapshots from individual servers (such as Java Enterprise Edition, Tuxedo, and Oracle). It does not provide an answer to the problem either. Snapshots provide very coarse information, general statistics taken separately from each tier, and no correlation across tiers. For example, you can look at Java servlets and Tuxedo or Oracle metrics and still not understand which component of a problematic transaction is causing the bottleneck. By following the real end-user transaction across the PeopleSoft tiers, we discover that a Tuxedo service is running long because of long-running SQL statements in the database. Snapshots can tell that the average response times of Java servlets, Tuxedo, and SQL are acceptable. However, they cannot tell which Tuxedo services or SQL statements belong to which transactions. Therefore, snapshots cannot help much in isolating the problem.

Agents with application knowledge and visibility must capture metrics for end-to-end application analysis. They must also reflect the end user's experience. Real-time performance metrics should be collected continously and correlated across the PeopleSoft application infrastructure path, enabling both problem isolation and root cause identification.

The data gathered from different tiers and application components must be correlated. For example, connect Java servlets with requested Jolt messages and Tuxedo calls, and associate Tuxedo calls with SQL statements sent to the database. Without this correlated data, Information Technology may take an exorbitant amount of time and effort to isolate the problem and find its root cause due to granularity, activity, and parallelism. For example, we have detected that all users that are executing a specific PeopleSoft transaction or a specific URL suffer from long response times. Where is the problem? Is Information Technology the network, the Web server, the Java servlet, Tuxedo, or the database? Without correlating granular metrics across tiers, we cannot isolate and solve the problem. In the example, looking at a correlated view reveals immediately that the problem is Tuxedo. "Drilling down into Tuxedo shows that there is a long queue. The solution is simple: launch an additional Tuxedo server process.

Collecting performance metrics continuously and correlating them is mandatory. However, Information Technology is not enough to provide a useful PeopleSoft performance management solution that directly addresses the challenges mentioned earlier. Collected data is kept for long-term analysis, exceptions, baselines, trending, and capacity planning. Based on this historical data, we can calculate the typical PeopleSoft behavior. For example, there are peaks each Monday morning and at the end of each month. Knowing this behavior, we can generate exceptions for abnormal behavior or set the right Service-level Agreement thresholds. We can also use historical data to calculate database table growth and allocate enough space in advance or to create appropriate indexes to reduce fetch times.

As we have seen, infrastructure frameworks provide critical system and network management bottoms-up detail but do not look at end-user and transaction activity. Robots provide external samples of synthetic transactions, and the stovepipe approach looks at each tier separately and provides general statistics for that tier only. These methods lack the power to find, isolate, and focus on the root causes of performance degradation as well as the real response time experience of end users.

The Precise Application Performance Platform fills this gap by providing the actual end-user experience and detailing the end-to-end response time contributions of the applications. This analysis enables PeopleSoft administrators to see how their applications are performing from the perspective of their end users and to correlate that experience with the underlying application components regarding end-to-end performance contribution. This functionality is a very powerful combination.

THE PRECISE SOLUTION METHODOLOGY

It is vital for all organizations to understand the importance of a systematic approach to managing performance issues and to realize the inherent ineffectiveness of ad-hoc problem solving. The foundation of the Precise Application Performance Platform solution is a methodology designed to facilitate the rapid detection, isolation, analysis, correction, and verification of application performance problems. All organizations can benefit from the discipline that the Precise Application Performance Platform solution brings to the performance management process. The methodology of the Precise Application Performance Platform enables using a proven process, as well as proven supporting solutions, to implement effective performance management within organizations. The solution of the Precise Application Performance Platform helps:

1. Identify the symptoms that can indicate a performance problem
2. Determine the problematic tier and application component
3. Drill down into the root cause of the problem
4. Determine the steps required to improve performance
5. To make sure that the implemented measures achieved the desired goal

These combine to form a process that provides a systematic approach to finding and resolving all kinds of performance issues, both predictable and unforeseen.

For example, the methodology begins with an automated proactive detection through baselines and Service-level Agreements, using built-in alert capabilities. Direct alerts to the appropriate infrastructure framework, organization, or administrator based on what was detected. Alternatively, the right person in the organization can periodically detect some long service times while reviewing the performance trends of elements (such as Java Enterprise Edition servlets, Tuxedo services, database calls).

Depending on the issue detected, the PeopleSoft application manager can view the application, end to end, and isolate the problematic tier and the application component that is the source of the degradation. Network delays, long-running servlets, Jolt, long-running Tuxedo services, or extended database access times may cause problems. The process of finding the problematic component is end-user focused so that we follow the end-user transaction or the interfaced application all the way from the time the user activates the transaction.

After finding the problematic component, an in-depth analysis of that component must be done to focus on the root cause of the problem. For example, if we conclude that Tuxedo is the problematic component, then we want to understand which Tuxedo service is causing the problem. We also want to understand whether of the cause is long queue wait time or processing time. Conversely, if the issue concerns the Java servlets, we want to look at the different methods called, including Jolt and Tuxedo calls through Jolt, to understand whether of the problem is due to a particular method or long-running Tuxedo calls. After focusing on the root cause of the problem, the next step is the actual fixing of the problem. If we continue with our earlier Tuxedo example, launching additional Tuxedo server processes fixes a long queue time waiting for a Tuxedo service.

After applying the fix, we should verify that the problem has indeed been fixed and that Information Technology will not reappear. Examine the service time before and after the fix was applied with the long-term information kept in the Warehouse of the Precise Application Performance Platform. This examination shows whether or not we fixed the problem and if service times are as expected.

THE PRECISE SOLUTION

The Precise Application Performance Platform solution focuses on providing organizations with the ability to measure and monitor application performance end to end (that is, from the browser and Web server to the Java servlets, Jolt, the Tuxedo server processes, the database, and even the physical storage).

At the highest level, The Precise Application Performance Platform provides:

- Agents and logic required to enable the Information Technology organization to see the end-to-end response time contributions across the client, the network, the Web, Java Enterprise Edition, Tuxedo, and the database servers and to isolate the components that are responsible for slowdowns and performance bottlenecks. The whole process starts by examining the end-user experience, measuring the actual Web-user response time at the application, transaction, or page level. Then, upon detection of a Response-time Objective or baseline breach, the problematic tier and component are found, as described earlier in the methodology section.

- In-depth silo-oriented drill-down capability to identify the root causes of performance problems by collecting and correlating detailed component information, including Java Enterprise Edition servlet-specific information and methods, database resource consumption breakdowns, and the slowest SQL statements.

- Real- time and near-time alerts that are driven by exceptions to the baseline and by defined thresholds. Information Technology also includes the reporting components of the overall solution. This comprehensive set of reporting capabilities enables the presentation of ad-hoc reports as well as scheduled reports. These reports are particularly useful for tracking service levels, trending, and conducting management by exception.

The Precise Application Performance Platform solution also includes the Warehouse of the Precise Application Performance Platform, that provides a common repository for long-term historical data collected by the different ??? The Precise Application Performance Platform solution agents along the PeopleSoft application path (such as Web servers, servlets, Tuxedo services, databases, and storage devices). This warehouse facilitates trend analysis, long-term capacity planning, and baseline calculations.

FEATURES OF THE PRECISE SOLUTION

The Precise Application Performance Platform provides the Information Technology or application support staff with a full end-to-end view of the PeopleSoft environment components, from the Web client to the Web server, Java Enterprise Edition server, Tuxedo server, and Oracle database. Information Technology provides an alert overview of the various components by category (for example, performance or load alerts at the Oracle database). From here, Information Technology is easy to find additional information when problems occur.

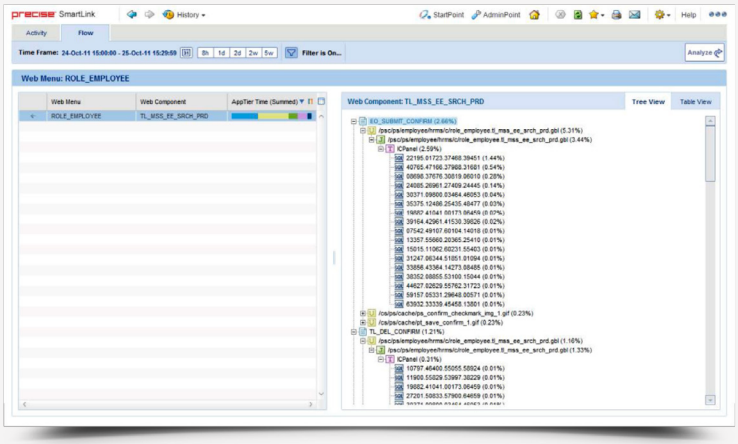
The user interface of the Precise Application Performance Platform shows a PeopleSoft environment.

PROACTIVE MANAGEMENT BY EXCEPTION

Managing a large PeopleSoft application infrastructure with hundreds or thousands of users is difficult at best. The only way to do so effectively is by working proactively rather than reactively. The Precise Application Performance Platform solution provides the way to do so by exceptions, based on Service-level Objectives and baselines. End users are of the utmost importance. If they are satisfied, then application managers are satisfied. The Precise Application Performance Platform provides a way to measure exact response times as seen by end users and to define Service-level Agreement thresholds based on those metrics.

CORRELATED END-TO-END VIEW

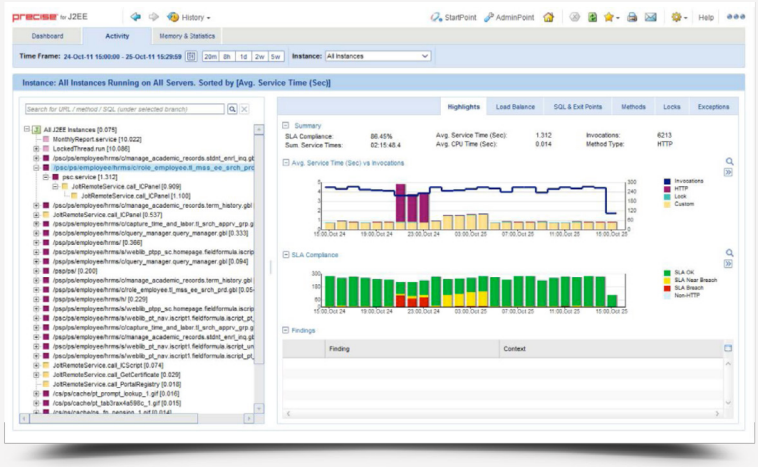
We now take a brief digression into the world of SQL Server licensing. While BI systems aretypically I/O bound, CPU can play a large factor in system performance including the number of concurrent queries and the amount of I/O a system can consume.



The Precise Application Performance Platform allows for end-to-end tracking of PeopleSoft activity.

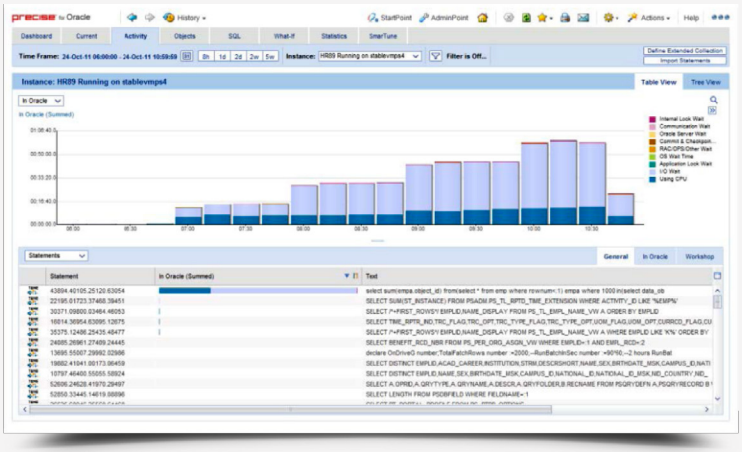
EXPERT ANALYSIS

Experts can obtain even more details. For example, we can look in more detail at each one of the Java servlets, including the Jolt methods Information Technology invokes. Precise allows Java method response-time analysis.



The Precise Application Performance Platform allows response-time analysis of Java methods.

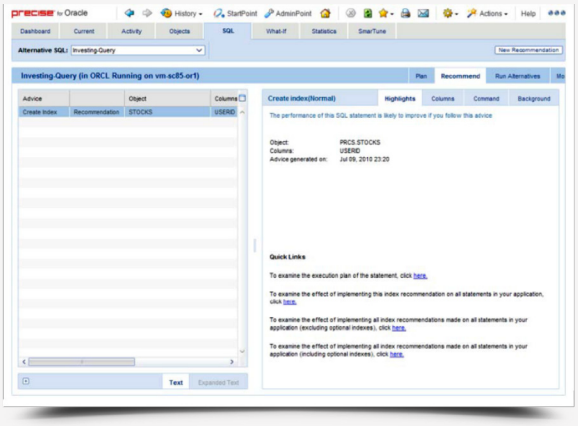
Similarly, at the Oracle level, detailed resource consumption breakdown, SQL statements, execution plan, users, and programs are provided. Moreover, a unique feature correlates an SQL statement with the appropriate PeopleSoft user name, easily identifying which user is responsible for generating problematic statements.



Analyzing PeopleSoft SQL statements in Oracle.

AUTOMATIC ANALYSIS & RECOMMENDATIONS

The Precise Application Performance Platform also provides powerful automated analysis for PeopleSoft servlets, Jolt, and Tuxedo. This analysis ranks the possible reasons for the bottlenecks and provides explanations. This capability turns inexperienced personnel into experts and helps even experienced ones who want to save time and get right to the source of the problem. Precise presents this information as recommendations that can be automatically implemented by The Precise Application Performance Platform. Before implementing, however, The Precise Application Performance Platform provides a what-if capability to simulate the impact of the changes before making these changes.



Precise provides recommendations and what-if analysis to accelerate problem resolution.

LONG-TERM ANALYSIS

The Precise Application Performance Platform keeps the performance metrics collected from the client tier, Web server, Java Enterprise Edition servlets, Tuxedo, and the database in a long-term repository called the Performance Warehouse. The Precise Application Performance Platform uses these metrics for trending and capacity planning. The Precise Application Performance Platform uses the Performance Warehouse to generate hundreds of out-of-the-box smart reports.

DASHBOARD FOR PEOPLESOFT OPERATIONS

The Precise Application Performance Platform comes with the Service Dashboard of the Precise Application Performance Platform, a portal-based infrastructure for the graphical user interface. Information Technology provides a highly customizable dashboard that can aggregate data from multiple sources (such as databases, storage, Java Enterprise Edition, and Web products) to deliver next-generation performance management capabilities on a single console. The Application Service Dashboard comes with a set of predefined PeopleSoft portlets that can be configured to provide customized and personalized PeopleSoft application views, meeting the requirements of the different roles involved in PeopleSoft management and operations (such as monitoring and PeopleTools and database administration). With Application Service Dashboard, critical application stakeholders can see what they need to see in the way that they want to see it.

The Application Service Dashboard shows relevant metrics to Information Technology or business in a single pane of glass.

BENEFITS OF THE PRECISE SOLUTION

From a business perspective, the Precise Application Performance Platform solution can significantly reduce PeopleSoft slowdowns, achieving a fast Return On Investment while maintaining low Total Cost of Ownership. The Precise Application Performance Platform solution helps organizations to:

- Optimize end-user response time and improve overall quality of service
- Reduce rollout time for their PeopleSoft 9 upgrade projects
- Eliminate blamestorming through the use of SmartLink correlation technology
- Find the definitive root cause of performance degradation in minutes
- Resolve problems faster using expert advice by SmarTune
- Proactively detect potential problems before they can impact end-users
- Improve end-user satisfaction
- Increase the Return On Investment by detecting, finding, and solving problems more quickly
- Effectively manage and tune the application
- Defer equipment and associated software licenses and support costs until they are needed
- Understand capacity requirements, based on current PeopleSoft application usage and growth patterns

In summary, the Precise Application Performance Platform solution is an excellent vehicle for measuring and improving performance objectives, providing all the necessary mechanisms to realize significant savings in cost and effort while effectively managing application performance.

SUMMARY

Managing the performance of PeopleSoft applications is a unique challenge that requires a unique solution. PeopleSoft applications have become an essential part of many organizations. This trend continues to grow with the introduction of PeopleSoft applications, architecture, functionality, and technology. While PeopleSoft provides a great advance for end users by improving business efficiency, productivity, and satisfaction, Information Technology also imposes significant challenges for PeopleSoft administrators.

Experience has shown a direct correlation between the service levels an organization delivers and both its productivity (that is, internal) and its revenue (that is, external). There is also a direct correlation between the targeted service levels and the expenses incurred to achieve those service levels. The penalty for not meeting the performance expectations of the users may be a loss of business, loss of opportunity, or failure to realize a Return On Investment for the effort and operational expenses. Delivering the right level of service is fundamentally more challenging due to the inherent complexity introduced by multiple tiers, a mixture of new and old technologies in the path (such as Java Enterprise Edition servlets and Tuxedo services), database calls, and storage access.

The solution of the Precise Application Performance Platform addresses these challenges and simplifies the deployment and management of PeopleSoft applications. Using the Precise Application Performance Platform solution helps companies manage service levels, contain costs, maximize the efficiency of the operational investment, and improve the service levels experienced by the end users.

FINAL THOUGHTS

The Precise Application Performance Platform is the first solution in the industry to provide a way to quickly and efficiently capture and correlate PeopleSoft application metrics (such as Uniform Resource Locators, Java Enterprise Edition servlets, Jolt, Tuxedo services, and SQL statements) across the PeopleSoft infrastructure. Information Technology presents these important metrics in a manner that enables crisp communication, rapid proactive or reactive detection, correction, and verification throughout the application lifecycle.

The Precise Application Performance Platform solution sets a new milestone in PeopleSoft performance management by delivering a comprehensive, integrated software solution that addresses the significant performance challenges of PeopleSoft multi-tiered application components. This solution:

- Provides proactive management through exceptions, Service-level Agreements, and baselines.
- Provides a way to define and measure organizational business objectives and Service-level Agreements.
- Provides an integrated and correlated view of performance across tiers.
- Continuously monitors real users, real data, and real PeopleSoft transactions, as opposed to simulated or synthetic activity monitoring.
- Isolates the problematic component: network, Web server, Java servlet, Jolt, Tuxedo, database, or inefficient access to storage devices.
- Identifies the root cause right down to the Java Enterprise Edition method, Tuxedo service, and SQL statement.
- Provides best practices corrective actions and recommendations
- Provides a long-term performance repository for analysis, trending, and capacity planning.
- Operates in a production environment with minimal overhead.
- Fits all phases of the application lifecycle.

PRECISE

APPLICATION PERFORMANCE PLATFORM

- End-to-end transaction visibility quickly isolates issues anywhere in the stack
- Recommended corrective actions speed time to resolution
- Historical analysis and trending discovers potential issues before they occur
- Database stores contextual details to correlate transactions with business issues
- Scalable performance for mission-critical business processes
- Multi-platform support spans a diverse range of system clients

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