Capture and Replay Database Workloads to Optimize Application Performance
Objectives

Achieve top performance for transactional applications

Tuning high-performance applications, evaluating software or configuration changes, knowing the impact system changes will have, and being able to reproduce and troubleshoot performance problems in a test environment—all are essential to optimizing your production system. The workload analyzer option for SAP® Adaptive Server® Enterprise (SAP ASE) makes all this possible.

Application performance can vary based on many factors—server configuration, frequently executed queries, and concurrent users, to name a few. The challenge is removing the guesswork from database tuning. IT departments can spend enormous amounts of time and resources testing changes to databases before certifying those changes for use on production systems. What’s needed is a way to recreate actual production workloads on test or development systems to test the effect changes will have on performance.

SAP has extended the capabilities of SAP ASE with the workload analyzer option, enabling you to analyze the impact of changes to the database configuration and environment on your application performance. You can capture a database workload on a production system, replay it on a test or development system, and analyze how configuration changes may affect your applications. The workload analyzer helps assess the risks of database or infrastructure changes quickly, easily, and with great accuracy.
Capture your production workloads for later analysis

The workload analyzer lets you capture production workloads directly from the database server, thus accurately reflecting the requests received by the server and avoiding the need to utilize a network sniffer or decrypt secure network traffic. Client traffic including query time stamps, source addresses, port numbers, and even the tabular data stream data itself is captured and used for detailed analysis and replay.

Using the SAP ASE cockpit, a user-friendly graphical interface included with the server, you can easily specify filters to adjust various factors – such as application and login names – so that you can capture particular workloads that interest you most. The cockpit also includes a wizard to help you initiate the capture quickly and easily.

The capture process can be monitored in real time using the monitor window in the cockpit dashboard, and the process can also be stopped, if needed, to modify particular conditions. The captured workload data is saved to disk in standard packet capture (PCAP) files for future analysis and evaluation.

Capture, analyze, and replay workloads with the workload analyzer in SAP ASE.
Analyze workloads to determine critical performance elements

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<td>Capture your production workloads for later analysis</td>
<td>Once they’re captured, your workloads can be analyzed using the dashboard function in the SAP ASE cockpit. Basic information such as client connections and queries is resident in the workload data files, but the powerful analytical engine also calculates valuable statistical information, such as frequently executed queries, the longest-running queries, error frequency, and application, login, and client network address activity. The workload analyzer reports metrics from the overall workload level, the individual client connections, and the performance of individual queries. All of the measurement data, including the statistics, is archived in the repository database for future use (see the figure on the following page). Nothing is lost, so you can recreate and replay any workload in the future and compare historical results with new workload configurations on your test system. And once you’ve completed your analyses, you can replay the captured workload any number of times to perform what-if analyses in a test environment.</td>
<td>Pinpoint application performance issues with more accuracy and confidence.</td>
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Capture your production workloads for later analysis

**Analyze workloads to determine critical performance elements**

Replay workloads to assess performance as you modify key metrics

**SAP ASE = SAP Adaptive Server® Enterprise**

Figure: Storing analyzed production workloads in the repository for analysis and replay
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<td>Capture your production workloads for later analysis</td>
<td>The workload analyzer is easy to tailor to a variety of test objectives, including functional testing, capacity planning, performance testing, and more. The cockpit allows you to replay any workload once you’ve configured the test environment to your specifications. A wizard incorporated in the cockpit offers step-by-step instructions along with options to change the time delay between replay requests in order to increase or decrease the workload sent per unit of time and to capture the replayed workload so that the performance characteristics of each query can be analyzed in detail. The wizard also provides filters so that you can include or exclude specific applications or clients during the replay.</td>
<td>During the replay, a window is displayed on the cockpit dashboard to monitor its progress. Once complete, a detailed report is available so that the replayed workload can be compared to the original production workload to identify any changes in performance.</td>
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Optimize application performance with the workload analyzer

Application performance in SAP ASE depends on configuration, network conditions, client users, schema structures, and other critical factors. The workload analyzer option lets you assess, measure, and modify your applications natively without impacting production operation.

Combined with the SAP ASE cockpit dashboard, the workload analyzer allows you to analyze performance differences or changes in behavior due to configuration, software version, or changes to the application database design. It establishes a powerful iterative tool to help you find the optimum configuration for every application you use with SAP ASE. Ultimately, this can help you save time and resources while tuning your applications for maximum performance and user satisfaction.

Quickly assess the impact of server configuration changes on application performance – without disrupting production systems.
Use in a variety of scenarios

The workload analyzer option for SAP ASE provides a comprehensive solution for capturing and replaying application workloads executed on an SAP ASE server. It can be used in a variety of scenarios to:

- Identify problematic queries with a long response time due to missing indexes
- Discern client activity patterns, such as the number of requests per IP address
- Measure the performance of captured workloads in different server configurations
- Compare query and overall workload performance between different server configurations

Benefits

- Evaluate database upgrades and understand the benefits from new options
- Diagnose problems by replaying functionality in a controlled environment
- Determine the longest-running or most frequently executed queries
- Stress test the server to increase the rate of transactions
- Replay workloads and compare the results to the original captured workload
Summary
The workload analyzer option for SAP® Adaptive Server® Enterprise (SAP ASE) offers a next-generation solution for tuning applications, evaluating the effect of changes, and troubleshooting performance issues to optimize your production system.

Objectives
• Achieve maximum performance for transaction-intensive applications
• Diagnose issues without disrupting production systems
• Test the impact of a variety of system changes without exposing your business to unnecessary risk

Solution
• Capture and recreation of production SAP ASE workloads for testing and analysis
• Comparison of new configurations with previous production results to optimize each application
• Ability to adjust critical metrics and success factors as you evaluate configurations
• Direct integration with the SAP ASE cockpit – a user-friendly Web-enabled interface

Benefits
• Ability to assess database or infrastructure changes quickly and with unprecedented accuracy
• Minimal impact on real-time production activity
• Simple configuration setup, replay conditions, and assessment analysis

Learn more
To find out more, call your SAP representative today or visit us online at www.sap.com/ase.