



IBM IMS Tools Performance and Tuning Solution Helping You Achieve and Maintain Superior IMS Performance



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Smart Solutions for Optimal Performance

In today's on-demand world, the ability to adapt and respond quickly to system performance issues is crucial to the continued success of your business. Performance problems are often erratic in nature and generally occur when you least expect them. They can cause poor application response time that could result in low customer satisfaction experiences and missed service level agreements.

In extreme circumstances, IMS™ performance problems can result in downtime for your IMS systems. When your data becomes unavailable, you risk losing valuable business and potential new revenue. An on-demand world operates 24 hours a day, 7 days a week, 365 days a year, and your customers require that same level of availability from your business. The longer it takes your IMS personnel to troubleshoot, diagnose, and take steps to rectify a performance issue, the more likely your reputation and bottom line will be impacted negatively.



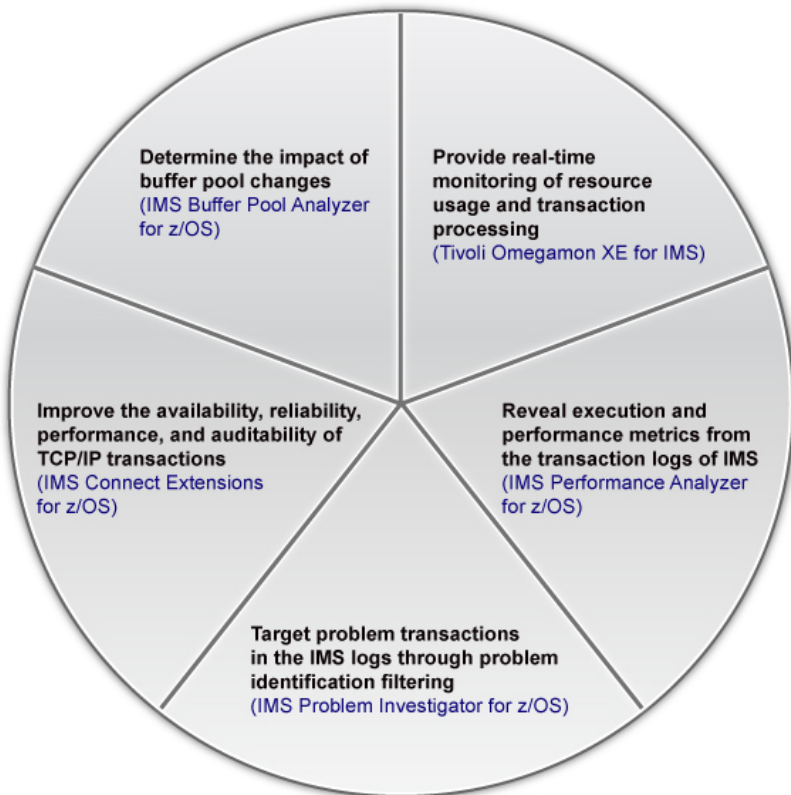
The IMS Tools Performance and Tuning Solution from IBM® provides comprehensive performance analysis and tuning assistance for IMS transactions and databases, and includes functionality that is not currently available in base IMS. By analyzing specific system data, IMS specialists can troubleshoot and address performance issues quickly and accurately when they occur. Additionally, this data allows more optimal tuning of IMS systems to prevent and, in some cases, eliminate performance-related issues altogether. Managers of these IMS systems can use this information to efficiently verify service levels, predict trends, and generate reports for upper management.

The IMS Tools Performance and Tuning Solution includes a set of IMS Tools products that provides the following performance analysis capabilities:

- Real-time monitoring of resource usage and transaction processing (Tivoli® OMEGAMON® XE for IMS)
- Execution and performance metrics from IMS transaction logs (IMS Performance Analyzer for z/OS®)
- The ability to target problem transactions in the IMS logs through problem identification filtering (IMS Problem Investigator for z/OS)
- Improved availability, reliability, performance, and auditability of TCP/IP transactions (IMS Connect Extensions for z/OS)
- The ability to determine the impact of buffer pool changes before they are implemented (IMS Buffer Pool Analyzer for z/OS)

In this white paper, we'll examine the features of these products in more detail, and we'll show you how keeping your IMS systems operating at peak performance can help increase your return on investment in IMS.

IMS Performance and Tuning

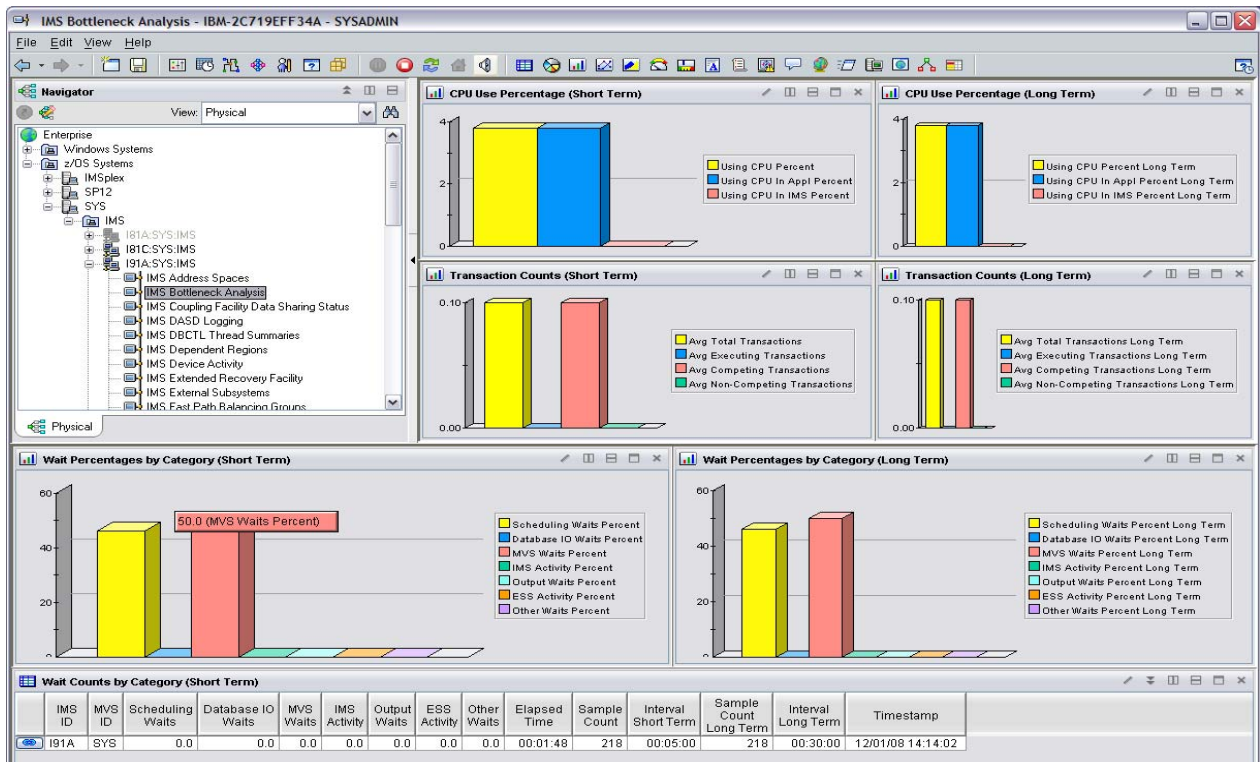


Tivoli OMEGAMON XE for IMS

The most important part of any performance solution is a reliable real-time monitor that allows you to stay on top of your IMS systems by providing you with a bird's-eye view of your entire environment. IBM Tivoli OMEGAMON XE for IMS on z/OS gives you this ability by providing a single point of control over IMS in parallel sysplex environments. It helps you reduce or eliminate potential delays and outages by allowing you to report on the performance of a wide range of critical IMS attributes, such as coupling facility structure statistics, shared queue counts, database lock conflicts, and others. In addition, by using an IMS Connect Extensions API that provides access to event records, Tivoli OMEGAMON XE for IMS can deliver real-time reporting capabilities for IMS Connect.

regions for a given IMS system, including those systems that are running in a parallel sysplex environment, and enables you to drill all the way down to the individual resource or transaction level. Having a comprehensive view of your environment that includes both a high-level summary of the overall health of your systems and detailed information about a particular resource allows you to quickly and easily investigate and resolve problems no matter where they exist.

When it comes to measuring resource usage and optimizing transaction processing, Tivoli OMEGAMON XE for IMS helps you achieve both granular and system-wide views of your IMS operations by collecting and summarizing information about key resources. These resources include enqueue, I/O, CPU, paging rates, pool storage, and buffer pool metrics. Information such as this is useful by itself, but



Using OMEGAMON XE for IMS, you can easily view performance bottlenecks in your IMS systems and take appropriate action.

One of the most important features of Tivoli OMEGAMON XE for IMS is a modern, user-friendly, Web browser interface. From here, you can monitor the health of your IMS systems, as well as your CICS®, DB2®, and other systems, from any location and within one integrated display. This single interface displays all IMS

the real value comes when you can effectively leverage it to make better business decisions. Tivoli OMEGAMON XE for IMS provides the ability to set user-defined exception conditions and then evaluate these conditions against the status of your IMS systems in real time. This



data can be included in workspaces or reports, and in both charts and table views, effectively providing all of the information that you need to evaluate system exceptions and build automatic responses.

When exceptions do occur, the built-in automation in Tivoli OMEGAMON XE for IMS is designed to take action quickly to avoid any further interruptions to your IMS operations. A robust Situation Editor lets you define complex threshold and alert combinations that Tivoli OMEGAMON XE for IMS can use to respond promptly to problems. Through the Situation Editor you can see detailed information about what triggered the alerts, and view expert advice that suggests possible solutions based on industry best practices. These complex situation-based scenarios can be created by novices and experts alike, freeing up your most experienced IMS specialists to work on more business-critical tasks.

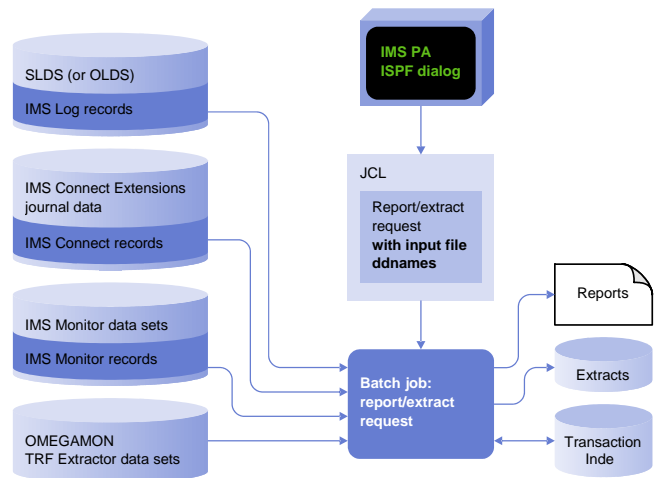
Lastly, one of the newest features in Tivoli OMEGAMON XE for IMS is Dynamic Workspace Linking (DWL), which allows you to easily navigate between Tivoli Enterprise Portal workspaces. The advanced linking of DWL aids problem determination, improves integration across your monitoring solutions, and allows you to quickly determine the root cause of a problem.

Predefined cross-product links provided by the Tivoli OMEGAMON XE products allow you to obtain additional information about systems, subsystems, resources, or network components that are being monitored and managed throughout your company.

IMS Performance Analyzer for z/OS

IMS Performance Analyzer for z/OS is another tool in the Performance and Tuning suite of products from IBM. It provides a wide variety of performance, usage, and availability reports to assist you in IMS resource and performance management. This critical performance information is reported at the required level of detail, from high-level management summaries and graphical reports to detailed traces for in-depth analysis. Prior to IMS Performance Analyzer, this information was scattered, and had to be collected and collated manually before it could be of any use. IMS specialists spent valuable time gathering all of this data and

analyzing it before they could even begin using it to resolve a performance issue. IMS Performance Analyzer vastly simplified this process by providing a robust reporting engine that is accompanied by a multitude of easy-to-read, consolidated reports. The information in IMS Performance Analyzer is presented to you in a flexible reporting format, so your staff can start using it immediately.



Information from various separate sources is now collected and presented in one location with IMS Performance Analyzer.

These report collections cover the entire spectrum of IMS performance and tuning. They can help you analyze transaction response time, measure the usage and availability of important resources (including databases, programs, regions, buffers, and queues), and plan for the operational management of IMS. Armed with this information, you can optimally schedule your database reorganizations, monitor adherence to service levels and capacity planning, and monitor significant system events such as System and Batch Messaging Program (BMP) checkpoints and deadlocks that can adversely affect system performance and availability.

IMS Performance Analyzer presents reports from a variety of sources, including SLDS (or OLDS), IMS log records, and IMS Monitor records, as well as from other IBM tools such as Tivoli OMEGAMON XE for IMS and IMS Connect Extensions. The new Connect Transit reports provide a complete picture of the lifecycle of transactions as they pass through IMS Connect and IMS. This synergy is a perfect example of IMS Performance Analyzer



combining what used to be separate islands of information into one consolidated resource. The Report Forms feature allows you to tailor the contents of IMS Connect transit reports to provide you with only as much information as you need. For example, you can tailor an IMS Connect transit report to include only required metrics or to summarize information according to your requirements. Forms-based reporting can be especially helpful early in the problem analysis process because you can produce smaller, more focused reports that exclude data that is not relevant to your analysis.

To help you locate your problem transactions quickly, IMS Performance Analyzer has added the ability to create a transaction index from the IMS logs. This transaction index contains the execution and performance metrics for all of your transactions. And you can use this index as the source input for subsequent IMS Performance Analyzer forms-based reporting, or you can use it as input to IMS Problem Investigator to locate a problem transaction in the IMS log. Finally, the Connect Event Trace can include IMS Connect and IMS Log records in a single report that provides a complete end-to-end transaction lifecycle picture.

With its easy-to-use ISPF dialog, IMS Performance Analyzer allows you the unique ability to tailor the format of all of its reports to suit your personal requirements. Of course, you can always choose from the many pre-built reports that IMS Performance Analyzer provides right out of the box. These include reports on Transaction Resource Usage, Database Update Activity, Message Queue Utilization, Fast Path Buffer Usage, Deadlock Summary, System Checkpoint, Internal Resource Usage, and many more. By having these reports available to you from day one, your expert personnel do not have to waste valuable time collecting the information. Instead, they can spend their time addressing, and ultimately preventing, performance-related issues.

IMS Problem Investigator for z/OS

Commitment to quality and reliability is a cornerstone of most IT organizations. This commitment is reflected in the mission statement of many companies. Furthermore, many IT organizations use service level agreements as their established charter.

Information Technology's ability to adhere to these agreements defines the quality of service that is provided. Being unable to respond to IMS problems can lead to near-term performance issues and, at a minimum, customer satisfaction issues. IMS Problem Investigator is an investigative tool for IMS systems and application programmers that can determine the cause of problems and trace the flow of events end to end. With IMS Problem Investigator, your IT organization can meet its service level agreements, and your business can maintain a high degree of reliability and customer satisfaction. IMS Problem Investigator can tell you why you have a problem on the database side of IMS by providing crucial information such as who or what incorrectly updated a database, when the database was updated, and how to reverse the changes. It can also help diagnose performance issues on the transaction management side of IMS by tracking IMS transactions end-to-end through IMS and outside to related systems and by determining transaction times and event latencies to help identify bottlenecks.

As part of the IMS Tools Performance and Tuning solution, IMS Problem Investigator complements other IBM tools, including Tivoli OMEGAMON XE for IMS, IMS Performance Analyzer, and IMS Connect Extensions, by providing enhanced log analysis and reporting. For example, IMS Problem Investigator offers drill-down capabilities to the field level to help pinpoint the exact cause of problems that were highlighted in the high-level transaction response time and resource utilization reports of IMS Performance Analyzer. You can also use IMS Problem Investigator to analyze the transaction index that is created by IMS Performance Analyzer. You can use IMS Problem Investigator to create filters on the transaction index, which, in turn, can enable you to immediately identify problem transactions that you need to analyze and to easily locate those problem transactions in the IMS log.

Also available for analysis through IMS Problem Investigator are IMS log and monitor records, Common Queue Server (CQS) records, OMEGAMON TRF records, DB2 log records, WebSphere® MQ log records, and IMS Connect event data that is collected by IMS Connect Extensions. By using IMS Problem Investigator's ISPF dialog, you can merge these multiple log files into a single logical view to gain an end-to-



end picture of transactions in the IMS plex and to follow a transaction's life cycle across IMS Connect, IMS, and CQS. The result is improved productivity for problem analysts, more efficient IMS application performance, and higher system availability.

IMS Connect Extensions for z/OS

IMS Connect is an integrated function of IMS Version 9 and later, and is the premiere pathway through which TCP/IP transactions enter IMS. IMS Connect Extensions enhances the manageability of TCP/IP access to IMS through IMS Connect. It consists of components that run with IMS Connect, journal data sets that record IMS Connect activity, and an ISPF client interface to manage IMS Connect systems and their IMS Connect Extensions features.

The primary role of IMS Connect Extensions is to monitor and record IMS Connect activity. IMS Connect Extensions provides a detailed audit of activity, which gives you the information you need to analyze performance, throughput, resource availability, and security. You can also use this information to debug WebSphere, Simple Object Access Protocol (SOAP), and Roll Your Own (RYO) clients. Additionally, the event records that are produced by IMS Connect Extensions are the only way that you can detect transaction delays that occur between IMS Connect sending and IMS accepting the input message. IMS Connect Extensions allows you to measure and report on the time it takes for a message to be delivered to IMS and the time it takes for the response to be delivered to IMS Connect. This transparency into IMS Connect is not available anywhere else and is vital for providing increased availability, reliability, and performance for IMS Connect.

IMS Connect Extensions also provides a single point of control for multiple IMS Connect systems. Its streamlined and straightforward ISPF client interface offers centralized management and control of all your IMS Connect systems by allowing you to issue IMS Connect commands directly from a single location. This interface also affords enhanced transaction management. By using it, you can dynamically manage TCP/IP transactions, allowing you to define rules to automatically distribute workloads and reroute messages. This faster, simplified approach to IMS Connect

problem determination can save you valuable time when network failures occur.

Another major benefit of IMS Connect Extensions is its ability to enable new IMS Connect and IMS features, including Flood monitoring and Transaction Expiration. Some of these features normally require changes to your remote applications. IMS Connect Extensions can request these features automatically on behalf of transactions so that you don't need to manually change your applications.



Additional features for IMS Connect clients, such as enhanced information in error messages, password change facility, and extended message translation, provide you more transparent systems that are easier to audit and manage. IMS Connect Extensions is a high-performance tool that has been designed to scale to even the largest transactional processing environments.

IMS Buffer Pool Analyzer for z/OS

Every database buffer pool has different characteristics, which makes it difficult to know how changes might affect each one. When considering buffer pool changes, you often must resort to guesswork, hoping that your tuning activities will not impede I/O rates. IMS Buffer Pool Analyzer provides statistical analysis reporting that helps evaluate current IMS online and batch job database buffer pools. It provides the information that is required to determine whether changes to the buffer pool configuration would benefit IMS performance.

IMS Buffer Pool Analyzer can review your buffer pool environment and recommend the optimum number of buffers for each subpool. The resulting change in storage usage and reduction



in number of database reads results in better performance for your IMS systems. It can also review the databases that are allocated to each subpool and report on subpools that include databases with inconsistent hit ratios. You can use this information to optimize your subpool configuration even further.

Furthermore, IMS Buffer Pool Analyzer allows you to perform "what if" scenario analysis, including the impact of creating new buffer pools or changing the block size of a database. By using this feature, you can visualize the impact of a change on your buffer pools before you actually implement it. For both an actual buffer pool configuration and for a model configuration (with different buffer pool or database data set assignments), IMS Buffer Pool Analyzer provides a report for each subpool that shows:

- Subpool information, including the pool configuration, buffer request rate, and actual performance information
- Database information, including a list of all database data sets with activity in that subpool, along with the hit ratio, buffer request rate, and I/O rate for each data set
- Projections for various buffer pool sizes that show subpool hit ratio, I/O rate, and buffer life
- A comparative number calculated to help evaluate subpool performance for each buffer pool size projection

All of this information allows you to optimize I/O rates, make more efficient use of storage, and tune your buffer pools to achieve the best IMS performance possible.

Conclusion

The efficient performance of your IMS database operation is critical to your business productivity and profitability. Database administrators continually strive to maximize database performance to support service level agreements, drive higher transaction rates, and ultimately increase customer satisfaction. This white paper has identified some of the important components and capabilities of database performance analysis.

The IMS Tools Performance and Tuning Solution products from IBM comprise an out-of-the-box solution that has been designed to provide you with the information and automation you need to quickly diagnose and resolve performance-related issues when they occur. These IMS Tools products can also place you in the proactive role of identifying potential performance problems before they impact IMS systems, and to ultimately tune your IMS systems for optimum performance and avoid performance-related crises altogether.

Resources

Visit the IMS Tools Performance and Tuning Solution on the Web:

[IBM IMS Tools Web site](#)

[Tivoli OMEGAMON XE for IMS](#)

[IMS Performance Analyzer for z/OS](#)
Program number: 5655-R03

[IMS Problem Investigator for z/OS](#)
Program number: 5655-R02

[IMS Connect Extensions for z/OS](#)
Program number: 5655-S56

[IMS Buffer Pool Analyzer for z/OS](#)
Program number: 5697-H77

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