

Version 2 Release 3

*IBM IMS Performance Solution Pack for
z/OS
Overview and Customization*



Note:

Before using this information and the product it supports, read the "Notices" topic at the end of this information.

First Edition (October 2020)

This edition applies to Version 2 Release 3 of IBM IMS Performance Solution Pack for z/OS (product number 5655-S42) and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces SC27-9519-01.

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About this information

IBM® IMS Performance Solution Pack for z/OS® (also referred to as IMS Performance Solution Pack) is a product that provides a comprehensive portfolio of IBM IMS performance management tools.

IMS Performance Solution Pack combines the following products into a single offering:

- IBM IMS Connect Extensions for z/OS V3.1
- IBM IMS Performance Analyzer for z/OS V4.5
- IBM IMS Problem Investigator for z/OS V2.5

These topics provide an overview of the products and capabilities delivered with IMS Performance Solution Pack as well as a selection of usage scenarios to help you understand the capabilities of the combined product suite. It also includes post-SMP/E installation instructions which must be performed before these products can be used.

These topics are designed to help database administrators, system programmers, application programmers, and system operators perform the following tasks:

- Understand the capabilities of the functions that are associated with IMS Performance Solution Pack
- Plan for the installation of IMS Performance Solution Pack
- Migrate from previous releases of the tools that comprise IMS Performance Solution Pack
- Perform the post-SMP/E installation of IMS Performance Solution Pack

Before using this product, you should have a working knowledge of:

- The z/OS operating system
- ISPF
- IMS Database (IMS DB) and IMS Transaction Manager (IMS TM) systems
- IMS Connect

Always check the IMS Tools Product Documentation page for the most current version of this information:

<http://www.ibm.com/software/data/db2imstools/imstools-library.html>

Chapter 1. IBM IMS Performance Solution Pack for z/OS overview

IBM IMS Performance Solution Pack for z/OS (also referred to as IMS Performance Solution Pack) provides a comprehensive portfolio of IBM IMS performance management tools.

IMS Performance Solution Pack V2.3 combines the following tools into a single offering:

IBM IMS Connect Extensions for z/OS V3.1

Enhances the manageability of TCP/IP access to IMS through IMS Connect, an integrated function of IMS.

IBM IMS Performance Analyzer for z/OS V4.5

Provides comprehensive transaction performance and system resource usage reporting for your Information Management System Database (IMS DB) and Transaction Manager (IMS TM) systems.

IBM IMS Problem Investigator for z/OS V2.5

Enables interactive analysis of log files to gain insight into IMS transaction events within and across systems.

The three products are complementary, making the end-to-end analysis of IMS transactions faster and easier. The IMS Performance Solution Pack can help improve productivity for problem analysts, improve IMS application performance, increase the efficiency of IMS resource utilization, and provide higher system availability.

What does IMS Performance Solution Pack do?

IMS Performance Solution Pack provides a comprehensive solution for reporting on IMS performance and diagnosing performance problems.

IMS Performance Solution Pack provides integration of the following IBM IMS tools:

- [“IMS Connect Extensions V3.1” on page 3](#)
- [“IMS Performance Analyzer V4.5” on page 4](#)
- [“IMS Problem Investigator V2.5” on page 5](#)

The three products are complementary, making the end-to-end analysis of IMS transactions faster and easier, supporting improved productivity for problem analysts, improved IMS application performance, more efficient IMS resource utilization, and higher system availability.

The following diagram illustrates the interaction between IMS Connect Extensions, IMS Performance Analyzer, and IMS Problem Investigator. When IMS Connect event details in IMS Connect Extensions journals are merged with IMS (and related) logs, IMS Performance Analyzer and IMS Problem Investigator can provide a comprehensive insight into the lifecycle of IMS transactions.

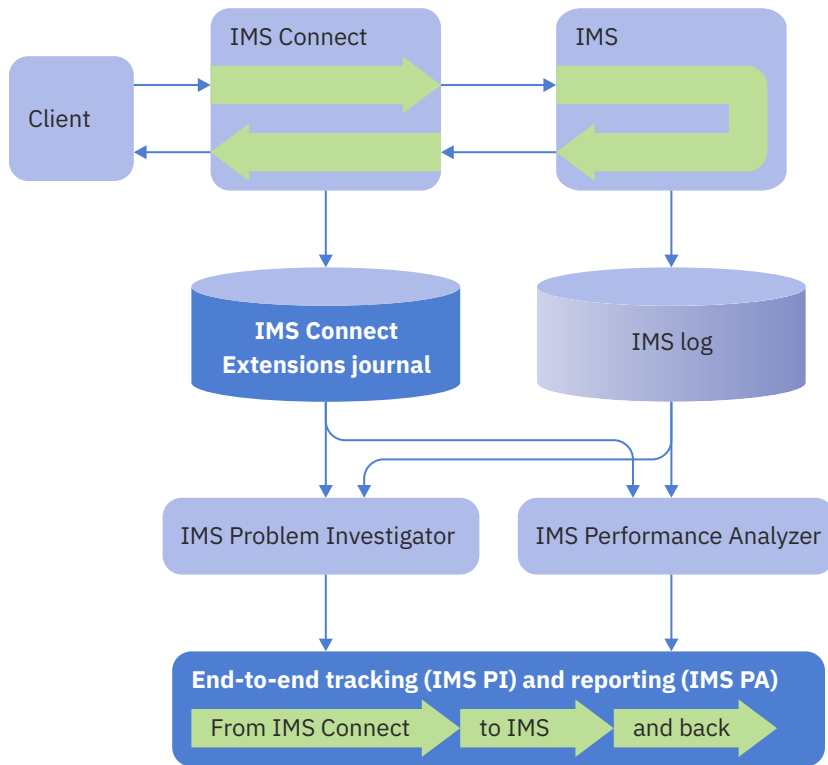


Figure 1. End-to-end tracking and reporting using IMS Performance Solution Pack

IMS Problem Investigator, IMS Performance Analyzer, and IMS Connect Extensions can be used together for end-to-end tracking and reporting of transactions from IMS Connect to IMS, or they can be used separately in a variety of useful ways.

Related concepts

Scenarios

These scenarios demonstrate just some of the ways in which IBM IMS Performance Solution Pack for z/OS can help you improve the performance of your IMS system environment.

IMS Connect Extensions V3.1

IMS Connect Extensions is a tool that enhances the operation of IMS Connect. IMS Connect, a function of IMS, is the premier pathway for accessing IMS applications and databases via TCP/IP.

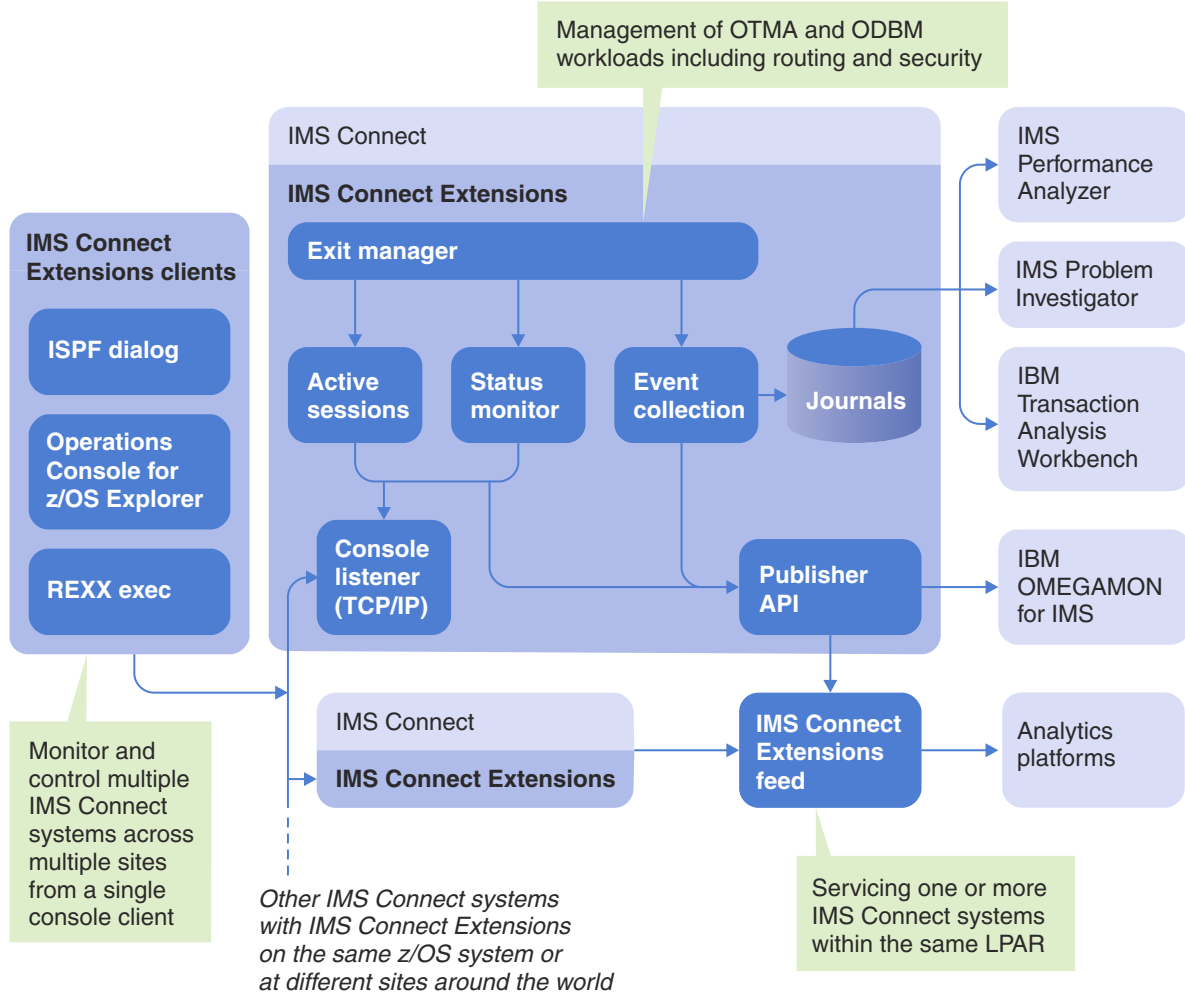


Figure 2. Components of IMS Connect Extensions

IMS Connect Extensions extends IMS Connect by providing the following features:

Monitoring and recording of IMS Connect activity

IMS Performance Solution Pack provides a detailed audit of activity, giving you the information you need to analyze performance, throughput, resource availability, and security. You can use this information to debug clients and new applications. Use the IMS Performance Solution Pack feed to expose near real-time IMS Connect transaction summary data to analytics platforms. This includes information regarding the message's origin, its destination, and the overall response time.

Single point of control for multiple IMS Connect systems

Centralized management of all your IMS Connect systems, including monitoring and control of OTMA and Open Database workloads, MSC physical links, and remote IMS Connect systems, from an ISPF Operations dialog or from the IMS Performance Solution Pack Operations Console for z/OS Explorer. Use the IMS Performance Solution Pack host command environment for REXX to automate operations management tasks as desired.

Enhanced workload management

Dynamic management of TCP/IP transactions, allowing you to define routing rules to automatically balance and distribute workloads and reroute messages when IMS system failures occur. Temporarily

suspend routing of messages to an IMS data store to reduce the likelihood of transactions failing or being rejected when IMS is shut down. Ability to assign selected OTMA routing rules to a routing plan and dynamically switch between routing plans. Automatically response to changes in the IMS environment such as dynamically added IMS data stores and flood conditions. Automatically respond to the failure of an IMS™ Connect system by balancing the number of TCP/IP sessions directed to each remaining live IMS Connect system.

Enhanced Open Database management

Dynamic management of TCP/IP DRDA requests, allowing you to define rules to redistribute workload based on capacity or by relative machine running costs. Ability to assign selected ODBM routing rules to a routing plan and dynamically switch between routing plans.

Socket management

Controls the number of input messages for a persistent session, allowing automatic distribution of persistent session workloads in a sysplex environment.

Enhanced security

Control access to OTMA transactions or DRDA requests based on the client IP address and IMS Connect port number, and to IMS Connect instances, via a system authorization facility (SAF) security class. Use IP address rules to treat messages coming from an IP address as a trusted user or to assign a specific user ID to the request.

Improved client services

Additional features for IMS Connect clients such as enhanced information in error messages, password change facility, and extended message translation.

These features enable you to:

- Improve the availability, reliability, and performance of IMS Connect.
- Speed and simplify problem determination.
- Make your systems more transparent so that they are easier to audit and manage.

IMS Performance Analyzer V4.5

IMS Performance Analyzer (IMS PA) provides comprehensive transaction performance and system resource usage reporting for IMS Database (IMS DB) and Transaction Manager (IMS TM) systems.

IMS Performance Analyzer has become the standard for IMS resource and performance management. It provides a comprehensive set of performance metrics that help you to perform the following tasks:

- Analyze transaction response time.
- Measure usage and availability of important resources, including databases, programs, regions, buffers (including database) and queues (message and other internal queues).
- Plan for IMS operational management, including scheduling database reorganizations, monitoring service level adherence, chargeback accounting, and capacity planning.
- Monitor significant system events that can adversely affect system performance and availability.
- Boost system and application programmer productivity.
- Report critical performance information, from high-level management summaries to detailed traces for in-depth analysis.
- Analyze the impact of IMS Connect on transaction performance using [IMS Connect Extensions](#) journals.

Forms-based reporting

Create tailored reports from IMS Performance Analyzer using Forms-based reporting. Using log data and a personalized Report Form, IMS Performance Analyzer can generate Forms-based reports and CSV extracts. These can be loaded into Db2® tables or imported into third-party analytics platforms where the data can be further analyzed and charted.

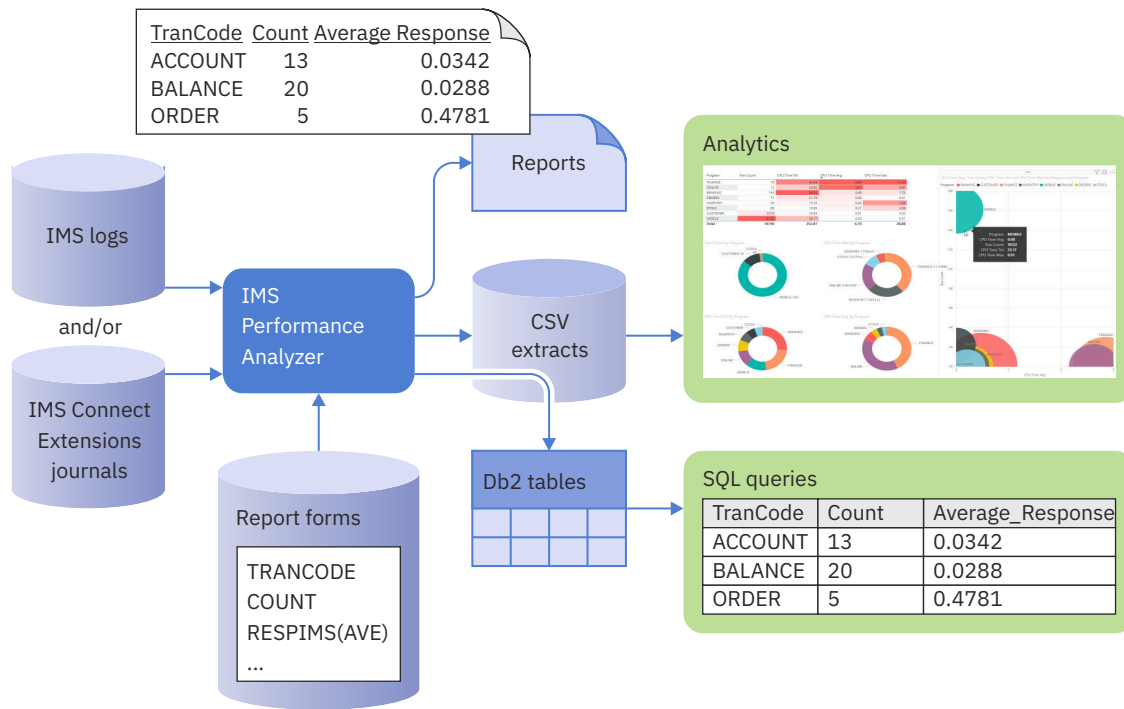


Figure 3. IMS Performance Analyzer Forms-based Log reporting

IMS transaction index

The IMS transaction index is a specialized extract file created using IMS Performance Analyzer.

Each record in an IMS transaction index represents an IMS transaction and contains accumulated information about each transaction from the original IMS log files.

IMS Problem Investigator uses the index with transaction tracking to help make problem determination faster and easier.

As shown in the following diagram, IMS Performance Analyzer uses transaction information in the IMS Log to create the IMS transaction index, which can then be used by both IMS Performance Analyzer and IMS Problem Investigator to help make log reporting and analysis more efficient.

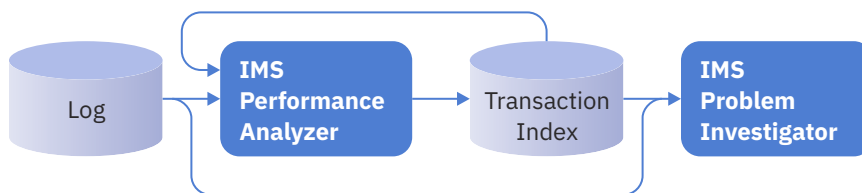


Figure 4. Creating and using the IMS transaction index

IMS Performance Analyzer can also generate an IMS Connect transaction index which accumulates transaction information from IMS Connect Extensions journals.

IMS Problem Investigator V2.5

IMS Problem Investigator (IMS PI) helps determine the cause of problems in an IMS systems environment and helps trace the flow of events end to end.

IMS Problem Investigator is a powerful problem analysis aid for IMS DB and IMS TM systems that helps make identifying and resolving problems faster and easier. It allows you to analyze log files from a variety of sources to gain insight into IMS transaction events within and across systems. You can interactively explore formatted, interpreted, and easily customizable views of log records. Then, you can use the results to help identify and analyze problems quickly, even if you do not have an expert understanding of log data structures and the relationships between log records.

To rapidly diagnose and resolve problems, use IMS Performance Analyzer first to highlight performance problem areas, and then analyze them in more detail with IMS Problem Investigator.

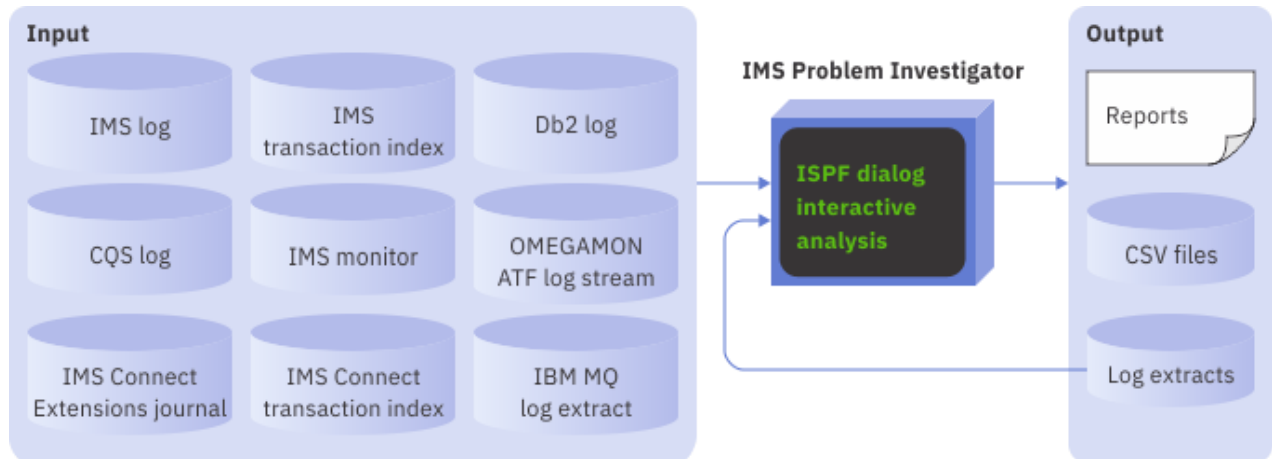


Figure 5. Problem analysis with IMS Problem Investigator

IMS Problem Investigator supports the following types of logs:

- IMS logs
- The IMS transaction index containing transaction summary records. The index is created by [IMS Performance Analyzer](#) using the IMS log
- IMS TM and IMS DB monitor data sets
- Common Queue Server (CQS) log streams and extracts
- IMS Connect event data that is collected by [IMS Connect Extensions](#)
- The IMS Connect transaction index containing IMS Connect transaction summary records. The index is created by [IMS Performance Analyzer](#) from data in the IMS Connect Extensions journal.
- OMEGAMON® for IMS Application Trace Facility (ATF) log streams and extracts
- IBM Db2 logs
- IBM MQ log extracts
- SMF: IRLM Long Lock records
- IMS Trace Table entries (IMS log record codes 67FA and 67FF)
- IMS Repository Audit log streams and extracts

Log file merging

IMS Problem Investigator can merge data from multiple log input files from multiple IMS and IMS Connect systems. The following diagram shows that you can use dialog and batch reporting facilities (CSV files, log extracts, and reports) to analyze the merged log data from a number of systems in a sysplex to pinpoint where and why a performance problem occurred.

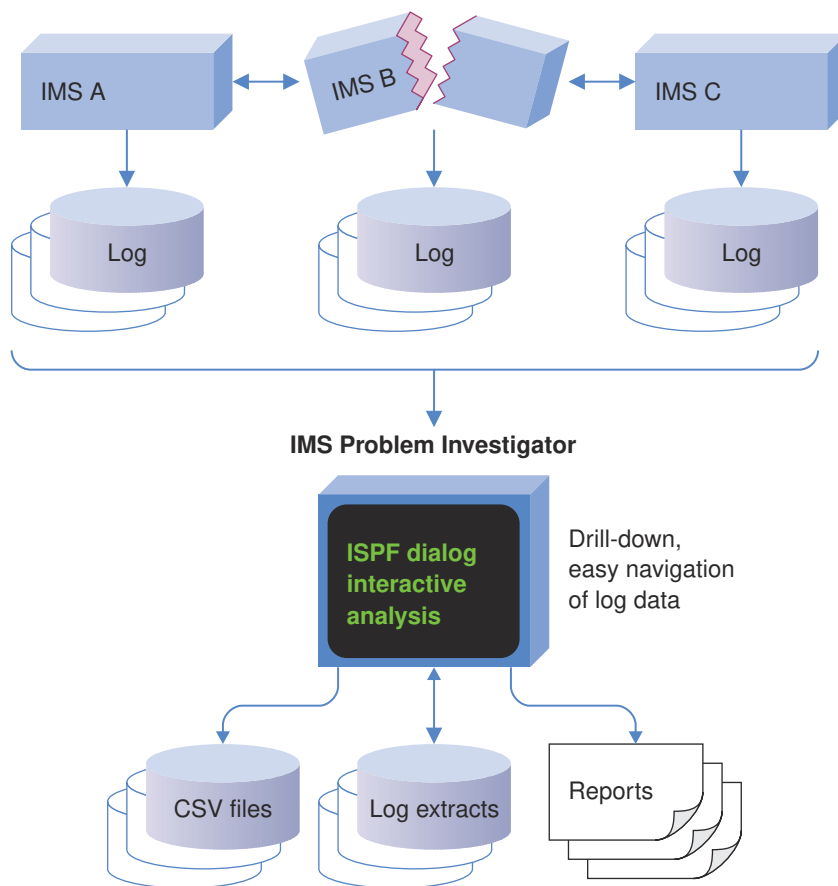


Figure 6. Using IMS Problem Investigator to processing IMS logs from multiple systems in a sysplex to identify the location of a problem

Records are processed (reported or extracted) in time sequence as if they were read from a single log file. The time sequence is determined by the STCK time stamp in the log record suffix.

Typically, the most efficient way to process sysplex log data is to use *automated file selection*. Automated file selection ensures that the correct SLDS (and optionally OLDS) log files for all IMS systems, and the correct IMS Connect Extensions journals for all IMS Connect systems, are selected for your specified reporting interval.

End-to-end transaction analysis

IMS Performance Solution Pack enables cross-system end-to-end transaction analysis. With IMS Problem Investigator, you can use automated file selection to select the relevant data files, merge them, and write filtered records from the merged files to an extract data set. The extract data set can then be merged with other files and analyzed using the IMS Problem Investigator ISPF dialog. Records can also be analyzed using batch utilities, REXX programming services, and you can create filtered extracts and CSV files to aid problem investigation. Smaller extract files are easier to analyze, but similar efficiencies can be obtained with the original large log files by using the *time slicing* feature.

You can perform the following tasks with the IMS Problem Investigator ISPF dialog:

- View formatted logs with detailed field descriptions. Set color and highlighting according to log type.
- Navigate to an exact point in time within a log file.
- Investigate specific problem areas. For example, transaction, database, security, or checkpoint processing.
- Merge log files to combine different aspects of IMS processing into a single view.
- Track the flow of a transaction in a single system or across a sysplex.

- Track entire transactions, including program switches, and drill down to isolate an individual unit of recovery.
- Determine response times and latencies.
- Extract the current result set (of log records from filtering and tracking) into a data set for later analysis.

The IMS logs are a rich source of information about your IMS environment because they provide essential data for many business functions. While the logs supply data for business functions, they were not primarily designed for such purposes. Without IMS Problem Investigator, much of the valuable information in the logs can be hard to understand.

Through its emphasis on interactive analysis and easy customization, IMS Problem Investigator can help speed and simplify log analysis, allowing you to use IMS and related logs for tasks such as debugging, performance tuning, tracing, and creating audit trails.

Benefits

IMS Performance Solution Pack offers a suite of tools which provide a powerful performance analysis capability.

Each of the tools that comprise IMS Performance Solution Pack provide you with a wealth of insight into activity within IMS.

When used together, they help to provide the following analysis potential:

Reduced downtime

Rapidly isolate problems in complex and interrelated enterprise systems.

Improved performance

Pinpoint exactly where and why transactions are delayed. Solve problems with new and existing applications and transactions. Quickly eliminate IMS Connect as the source of performance problems and determine whether the problem is in OTMA, MQ, Db2, shared queues or any of many other subsystems. Helps you meet your service level agreements (SLAs) and conduct capacity planning.

Improved productivity

Automated file selection, merging, and formatting allows staff to focus on solving business problems rather than finding and formatting logs. Automatically select and combine [IMS Connect Extensions](#) journals with IMS logs to view only those records from the time of day that a problem occurred. Interactively browse log records, navigate by the time of day, and select records to drill down right to the values of individual flag bits.

Improved understanding

Expose the inner workings of IMS to your staff. Map the life cycle of individual transactions. View formatted logs with detailed field descriptions. Audit changes, security violations, and transaction pathways. Enable less experienced team members to perform advanced analysis and to improve their IMS knowledge. Generate customized performance reports.

Product dependencies

IMS Performance Solution Pack is installed by using SMP/E and standard RECEIVE, APPLY, and ACCEPT processing.

Complete information about installation requirements, prerequisites, and procedures for IMS Performance Solution Pack V2.3 is located in the *Program Directory for IBM IMS Performance Solution Pack for z/OS*, GI13-4905.

Product publications

For detailed information about the component products in IMS Performance Solution Pack V2.3, refer to the publication libraries of the individual products.

IBM IMS Connect Extensions for z/OS Version 3 Release 1

User's Guide (SC27-9517)

IBM IMS Performance Analyzer for z/OS Version 4 Release 5

User's Guide (SC19-4365)

Report Reference (SC19-4366)

IBM IMS Problem Investigator for z/OS Version 2 Release 5

User's Guide (SC27-9600)

Service updates and support information

Service updates and support information for this product, including software fix packs, PTFs, frequently asked questions (FAQs), technical notes, troubleshooting information, and downloads, are available from the web.

To find service updates and support information, see the following website:

http://www.ibm.com/support/entry/portal/Overview/Software/Information_Management/IMS_Tools

Product documentation and updates

IMS Tools information is available at multiple places on the web. You can receive updates to IMS Tools information automatically by registering with the IBM My Notifications service.

Information on the web

The IMS Tools Product Documentation web page provides current product documentation that you can view, print, and download. To locate publications with the most up-to-date information, refer to the following web page:

<http://www.ibm.com/software/data/db2imstools/imstools-library.html>

You can also access documentation for many IMS Tools from IBM Knowledge Center:

<http://www.ibm.com/support/knowledgecenter>

IBM Redbooks® publications that cover IMS Tools are available from the following web page:

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1. Go to <http://www.ibm.com/support/mysupport>
2. Enter your IBM ID and password, or create one by clicking **register now**.
3. When the My Notifications page is displayed, click **Subscribe** to select those products that you want to receive information updates about. The IMS Tools option is located under **Software > Information Management**.
4. Click **Continue** to specify the types of updates that you want to receive.
5. Click **Submit** to save your profile.

How to send your comments

Your feedback is important in helping to provide the most accurate and high-quality information. If you have any comments about this book or any other IBM product documentation, use one of the following options:

- Use the online reader comment form, which is located at <http://www.ibm.com/software/data/rcf/>.
- Send your comments by email to comments@us.ibm.com. Include the name of the book, the part number of the book, the version of the product that you are using, and, if applicable, the specific location of the text you are commenting on, for example, a page number or table number.

Accessibility features

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use a software product successfully.

The major accessibility features in this product enable users to perform the following activities:

- Use assistive technologies such as screen readers and screen magnifier software. Consult the assistive technology documentation for specific information when using it to access z/OS interfaces.
- Customize display attributes such as color, contrast, and font size.
- Operate specific or equivalent features by using only the keyboard. See the following publications for information about accessing ISPF interfaces:
 - *z/OS ISPF User's Guide, Volume 1*
 - *z/OS TSO/E Primer*
 - *z/OS TSO/E User's Guide*

These guides describe how to use the ISPF interface, including the use of keyboard shortcuts or function keys (PF keys), include the default settings for the PF keys, and explain how to modify their functions.

Chapter 2. Scenarios

These scenarios demonstrate just some of the ways in which IBM IMS Performance Solution Pack for z/OS can help you improve the performance of your IMS system environment.

Table 1. IMS Performance Solution Pack products used in each scenario			
Scenario	IMS Connect Extensions	IMS Performance Analyzer	IMS Problem Investigator
“Determining the cause of TCP/IP client delays” on page 11	✓	✓	✓
“From real-time problem mitigation to problem determination” on page 13	✓		✓
“Determining why transactions are falling below SLA” on page 15		✓	✓
“End-to-end analysis of an IMS transaction with Db2 and IMS Connect activity” on page 18	✓		✓
“Tracking an IMS transaction across related systems” on page 20			✓
“Identifying IMS problems using the TCP/IP characteristics of a transaction” on page 22	✓	✓	✓
“Analyzing IMS Connect transaction timeouts” on page 25	✓	✓	✓
“Analyzing IMS-to-IMS TCP/IP connections” on page 31	✓		✓
“Analyzing Open Database transactions” on page 31	✓	✓	✓
“Customized reports using Report Forms” on page 32		✓	

Related concepts

What does IMS Performance Solution Pack do?

IMS Performance Solution Pack provides a comprehensive solution for reporting on IMS performance and diagnosing performance problems.

Determining the cause of TCP/IP client delays

In a TCP/IP-enabled environment, **IMS Connect Extensions** and **IMS Performance Analyzer** can, together, help you identify performance problems in IMS Connect or OTMA, and to eliminate these components as potential causes of problems. Once you have isolated the problem, **IMS Problem Investigator** can help you understand why the problem occurs and resolve it.

This scenario demonstrates that a web services client may experience poor transaction performance even if traditional tools show that the transaction is performing well. The scenario identifies the causes of such a disparity, and then shows how to extend reporting to gain a more complete picture of transaction performance. The IMS Performance Solution Pack can bridge the gap between the web client's perspective of transactional performance and the IMS perspective of transactional performance.

Features used in this scenario

IMS Connect Extensions

- Event collection via IMS Connect Extensions journal

IMS Performance Analyzer

- Combined reporting with IMS and IMS Connect
- Create CSV extract

IMS Problem Investigator

- Log file merging
- Transaction tracking

- Elapsed time view

Scenario description

Suppose your organization provides web access to your IMS applications and your web users are reporting long delays from IMS. When web clients connect to IMS, there are at least three more components that contribute to transaction performance before the input message is even queued. Those same three components also contribute to transaction performance after a response to the client is placed on the output queue.

The following figure shows message transit from WebSphere Application Server through IMS Connect, OTMA, and IMS. The client registers unacceptable responses of more than two seconds, but the IMS performance tools shows sub-second responses from the message placed on the input queue to the message placed on the output queue.

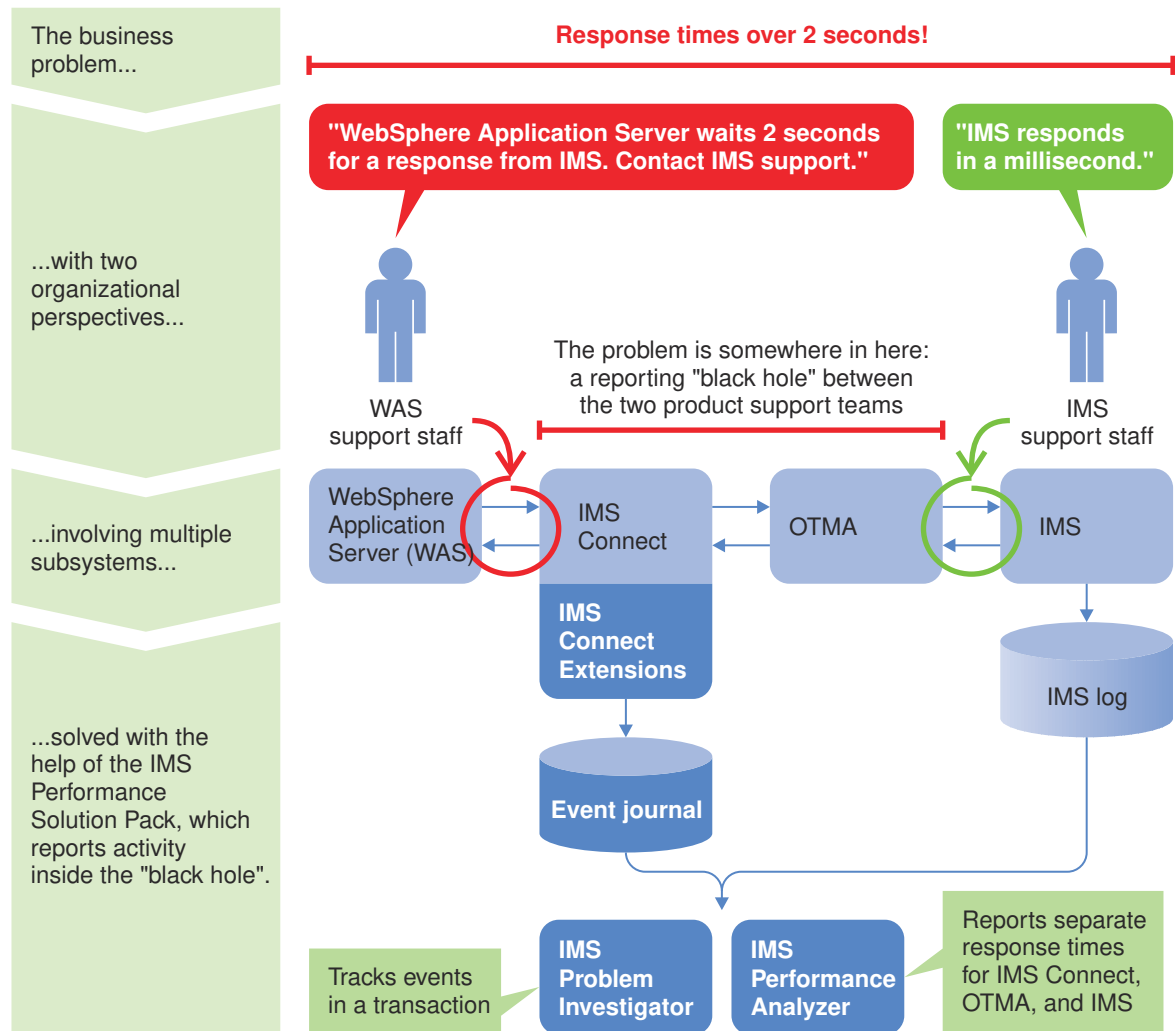


Figure 7. Resolving cross-system performance problems

The clients reports unacceptable delays; IMS processing (from input message being queued to response being placed on the output queue) itself registers sub-second responses. *What do you do in this situation to identify the source of the problem and to eliminate those components that are performing well?*

The data that **IMS Connect Extensions** collects and the reports that **IMS Performance Analyzer** can produce from that data are vital for problem determination. IMS Performance Analyzer reports can combine the IMS Connect Extensions journal records with the IMS log to provide an end-to-end overview of the transaction.

The following figure shows a graph produced by a common PC spreadsheet application (not supplied) from an IMS Performance Analyzer CSV extract. It shows IMS performance to be steady and below 100th of a second throughout the day.

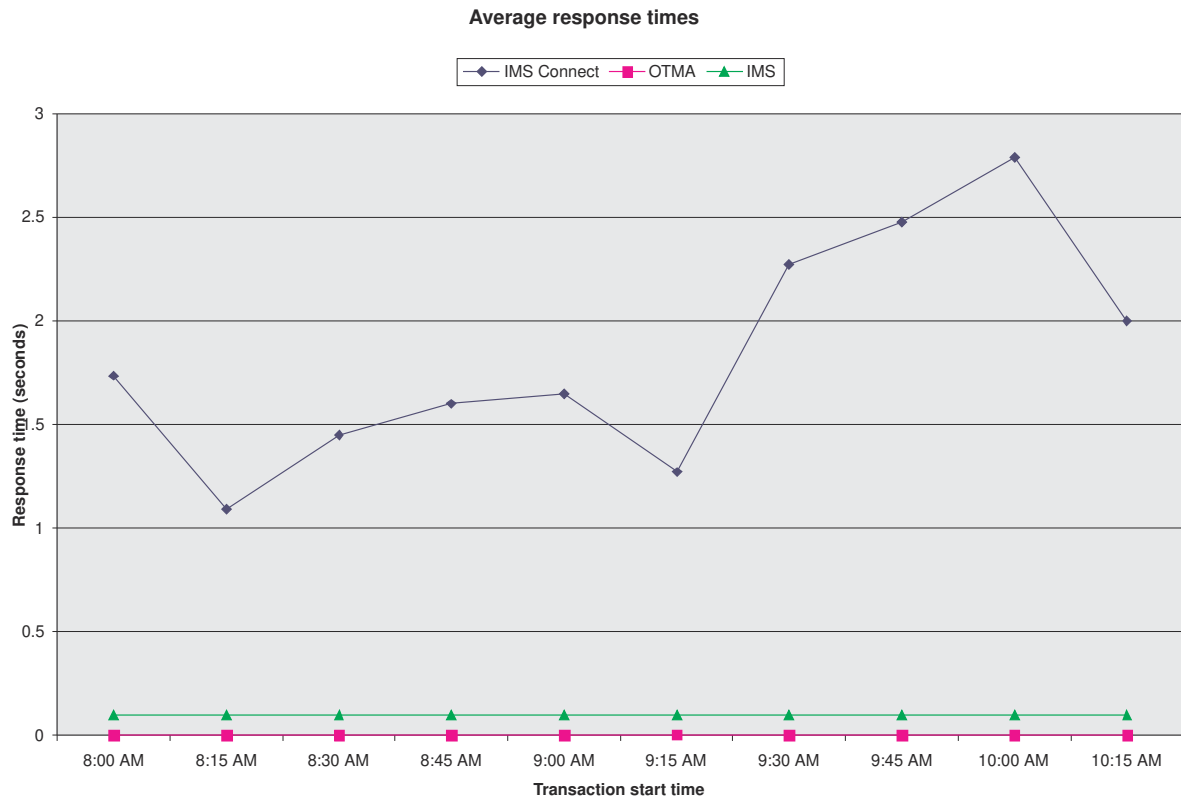


Figure 8. Comparing cross-system performance to identify where the problem occurs

The addition of journals from IMS Connect Extensions allows us to see IMS Connect and OTMA performance throughout the day. The source of the problem is clear: it is in IMS Connect. Now that we know *where* the problem is, we can use **IMS Problem Investigator** to identify *why* the problem occurs.

The IMS Problem Investigator dialog provides a variety of facilities for exploring log data interactively and helps you to determine the history of events and the cause of problems; facilities such as tracking transactions and units of work, applying filters and forms, calculating relative times, accommodating different time zones, navigating to a particular time of day or record number, and skipping forwards or backwards through the file by specified time intervals.

Summary

With the combination of IMS Performance Analyzer, IMS Problem Investigator, and IMS Connect Extensions, you can quickly eliminate or verify IMS Connect and OTMA as the source of a problem. In the absence of these tools, you cannot get a single unified view of problem transactions, and resolving and identifying problems requires more time and more skill in the various IMS components.

From real-time problem mitigation to problem determination

IMS Connect Extensions Operations Console is an Eclipse-based graphical user interface (GUI) client that allows you to view activity on IMS Connect systems and control the state of these systems. It provides you with enough information about active sessions so that you can track those sessions in **IMS Problem Investigator** for later advanced analysis. The IMS Connect Extensions Operations Console plug-in can be installed into IBM Explorer for z/OS (also referred to as z/OS Explorer).

Features used in this scenario

IMS Connect Extensions Operations Console

- Status monitor, providing basic real-time statistics on activity in IMS Connect.
- Active sessions, containing details of all sessions currently running in IMS Connect.

IMS Problem Investigator

- Transaction tracking, allowing more detailed analysis of events when the problem occurred.

Scenario description

A customer reports a problem connecting to IMS Connect. IMS Connect Extensions identifies that a previous connection attempt has hung, preventing new connection attempts. Using the Operations Console, you can then cancel the session to allow new connections, but not before details of that session are recorded. Using the information from IMS Connect Extensions, you can then perform an analysis of the root cause of the problem and perform the required corrective measures.

The following figure shows the **IMS Connect Extensions Operations Console**. You can see which systems are active, and then browse activity for each system, or multiple systems at the same time. In this case, we can see only a low volume of activity entering IMS Connect, with no messages returning errors.

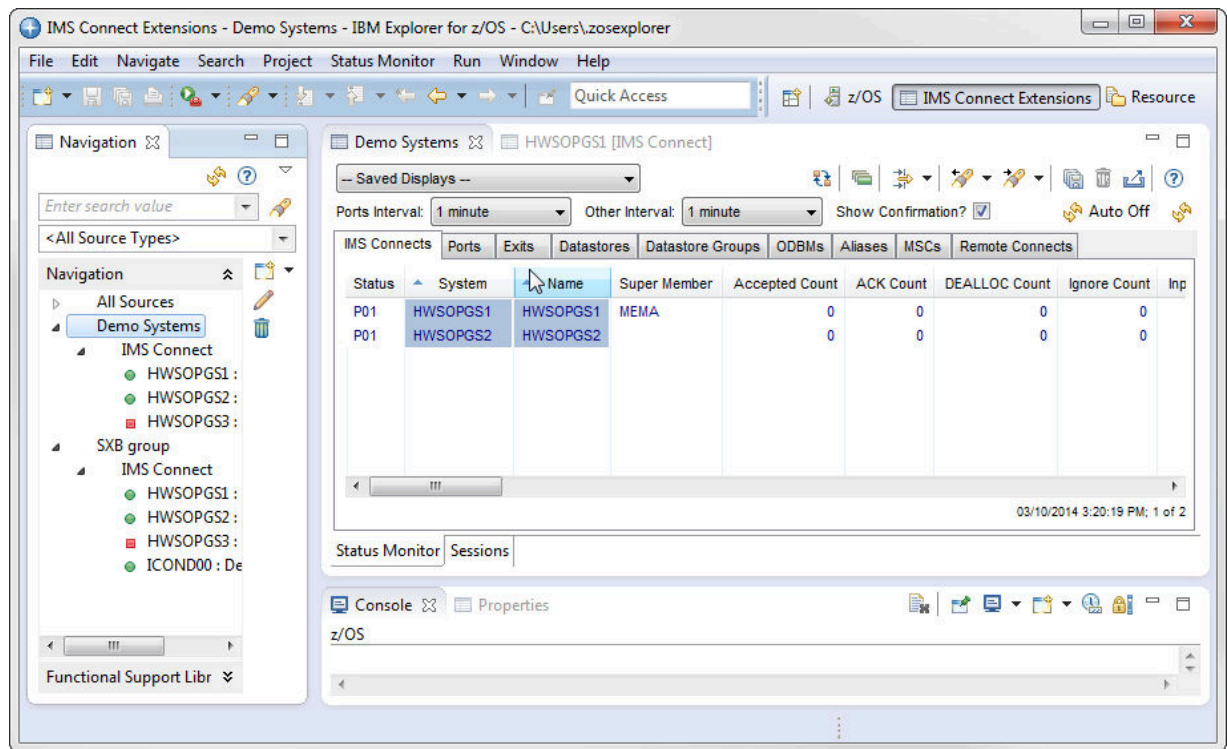


Figure 9. IMS Connect Extensions Operations Console: Monitoring system status

As shown in the following figure, you can then examine all sessions currently running on the system. If there is a large number of sessions, you can use filters to identify just the sessions that interest you.

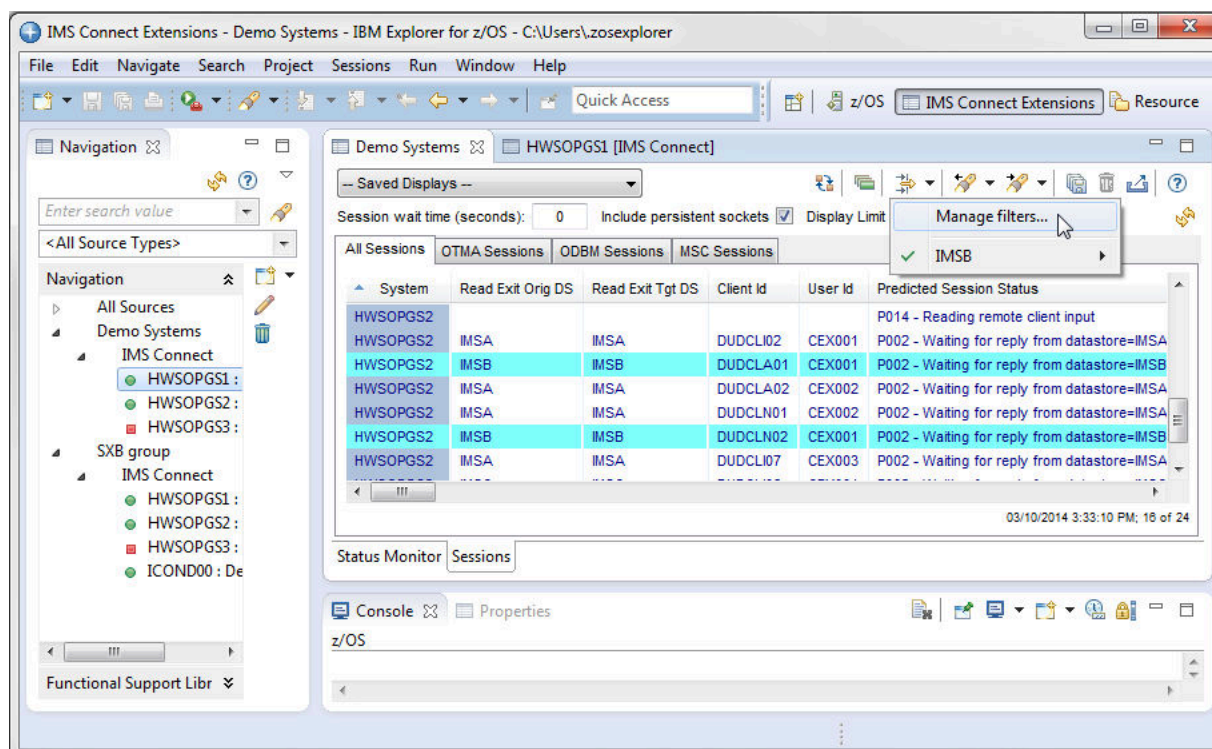


Figure 10. IMS Connect Extensions Operations Console: Filtering active sessions

The problem session might now be obvious. You can prepare to cancel the session from the console to allow new connections with the same client ID.

Before cancelling the session, you can export the details of the session (or multiple sessions) to an extract file for more advanced analysis in **IMS Problem Investigator**. The extract file will include information such as the Event Key, the time of day the problem occurred, client ID, LTERM name, and more.

Summary

With the IMS Connect Extensions Operations Console, your frontline support staff can be more directly involved in problem mitigation. The ability to correlate information in the Operations Console with the data that IMS Problem Investigator can browse ensures that your IMS programmers can perform advanced analysis if required.

Determining why transactions are falling below SLA

More than a quarter of transactions are falling below your service level agreement (SLA). This scenario demonstrates how you can use **IMS Performance Analyzer** to monitor your SLAs and when agreements are not met, introduce **IMS Problem Investigator** to discover exactly where the problem occurs.

Features used in this scenario

IMS Performance Analyzer

- Distribution reporting
- IMS transaction index

IMS Problem Investigator

- Log file merging; specifically Db2 and SMF log file support
- Transaction tracking
- Elapsed time view

Scenario description

An IMS Performance Analyzer Forms-based Summary Log report has been set up in your environment to observe transaction resource usage with a customized Report Form. The report reveals that 28% of **DSN8CS** transactions take more than two seconds to complete:

IMS Performance Analyzer Summary Log Report - Resource Usage											
Data from 05.30.49 08Nov2019 to 05.45.18 08Nov2019										Page	1
Trancode	Tran Count	Avg InputQ Time	Avg Process Time	Avg OutputQ Time	Avg Total IMS Time	<=1.0 IMS Time	1.0-2.0 Total IMS Time	>2.0 Total IMS Time	Avg CPU Time	Avg DB Call Count	
DSN8CS	7	0.011024	0.930524	0.000000	0.941549	71.43%	0.00%	28.57%	0.024617	0	
DSN8PP	7	0.009017	0.627191	0.000000	0.636208	85.71%	14.29%	0.00%	0.018776	0	
DSN8PS	21	0.011219	0.427845	0.007012	0.446075	100.00%	0.00%	0.00%	0.017876	0	
DSN8PT	6	0.010506	0.373590	0.035327	0.419423	100.00%	0.00%	0.00%	0.018377	0	
Total	41	0.010705	0.539763	0.008761	0.559229	92.68%	2.44%	4.88%	0.019254	0	

Figure 11. IMS Performance Analyzer: Forms-based Summary Log report showing transaction resource usage

From this information, you decide to run a IMS Performance Analyzer Forms-based List report. Using another customized Report Form, the report shows individual **DSN8CS** transactions, and allows you to focus specifically on transactions that took longer than two seconds to complete:

List Log Report - Transaction Transit										Page	1
Data from 05.30.49 08Nov2019											
Org	Trancode	DB Call	IMS Tran	CPU	InputQ	Process	OutputQ	Total			
LTERM		Count	Start	Time	Time	Time	Time	IMS Time			
FUNTRM69	DSN8PT	0	05.39.50.738060	0.023359	0.007564	0.199647	0.121131	0.328342			
FUNTRM69	DSN8PS	0	05.43.38.400003	0.014557	0.020709	0.287724	0.000000	0.308433			
FUNTRM69	DSN8CS	0	05.44.52.678102	0.046589	0.013049	2.037216	0.000000	2.050265			

Figure 12. IMS Performance Analyzer: Forms-based List report

You can pinpoint the exact time of day that a problem transaction occurred, but this gives no indication of the cause. As DSN8CS is a transaction that involves Db2, the cause of the delay may be outside of IMS.

Determine the exact cause of the problem using the following procedure:

1. Use **IMS Performance Analyzer** to generate an IMS transaction index from the IMS log. The IMS transaction index includes all the data you can generate in a list report (and more) in a format that IMS Problem Investigator can read.
2. Use **IMS Problem Investigator** to perform the following tasks:
 - a. Merge the IMS transaction index, IMS log, SMF logs, and Db2 logs.
 - b. Use the IMS transaction index to show transactions that took longer than two seconds to complete by entering a filter condition:

```

Conditions
Command ==> _____ Row 1 to 1 of 1
Scroll ==> CSR

Code: CA01 Transaction

/ Field Name +      Oper Value +
_ PROCESS          GT 2.0
***** Bottom of data *****

```

Figure 13. IMS Problem Investigator: Specify filter conditions for the IMS transaction index

- c. Use tracking to reveal all the log records from IMS, Db2, and SMF for the problem transaction.

d. Step through the transaction and see exactly where the problem occurred.

Forwards / Backwards . . 00.00.00.000100		Time of Day . . 05.44.52.678102
Code	Description	Date 2019-11-08 Tuesday Time (Elapsed)

E 01	Input Message TranCode=DSN8CS	05.44.52.678102
— 35	Input Message Enqueue TranCode=DSN8CS	0.007919
— 08	Application Start TranCode=DSN8CS Region=0001	0.000807
— 5607	Start of UOR Program=DSN8IC0 Region=0001	0.000000
— 31	DLI GU TranCode=DSN8CS Region=0001	0.004315
— 5616	Start of protected UOW Region=0001	0.000262
— 5600	Sign-on to ESAF Region=0001 SSID=DB2P	0.165798
— 5600	Thread created for ESAF SSID=DB2P	0.000041

— 0020	DB2 Unit of Recovery Control - Begin UR Userid=MKR IMSID=I9DE LUW=FTS1 /DB2PLU /BFAAB47AF91B/0001 URID=0003EC74CC34	1.651871

— 0020	DB2 Exclusive Lock on Pageset Partition or DBD	0.000016
— 0020	DB2 Insert into a Data Page	0.000000
— 0020	DB2 Update Area Map/Spacemap Bit Changes or Whole Byte	0.000032
— 0020	DB2 Type 2 Index Update	0.001952
— 5600	Commit Prepare starting Region=0001 SSID=DB2P	0.009863
— 0020	DB2 Unit of Recovery Control - End Commit Phase 1	0.014200
— 03	Output Message Response LTerm=FUNTRM69	0.004067

— 36	Output Message Dequeue LTerm=FUNTRM69	0.034227
— 33	Free Message	0.001001

— 101	DB2 Accounting RecToken=I9DE/0000001900000000 CPU1=00.030586 CPU2=00.000000 I/O3=00.000000 SSID=DB2P SYSID=FTS1 GtPgRq=152 SyPgUp=11 Suspnd=0 DeadLk=0 TimOut=0 MxPgLk=6 Des=0 Pre=0 Ope=1 Fet=12 Clo=1	0.132925

— 33	Free Message	0.002256
— 0020	DB2 Unit of Recovery Control - Begin Commit Phase 2	0.000127
— 0020	DB2 Unit of Recovery Control - End Commit Phase 2	0.002016
— 5600	Commit Continue completed Region=0001 SSID=DB2P	0.003950
— 5612	End of Phase 2 Syncpoint Program=DSN8IC0	0.000008

— 07	Application Terminate UTC=05.44.54.728881 TranCode=DSN8CS Program=DSN8IC0 Region=0001 RecToken=I9DE/0000001900000000 RegTyp=MPP MCNT=1 DBDLI=0 DCDLI=2 CPU=00.046589	0.000529

Figure 14. IMS Problem Investigator: Tracking the transaction end-to-end

When you activate tracking in IMS Problem Investigator, the following information is displayed:

0020 DB2 Unit of Recovery Control - Begin UR

Db2 start of UOR. This uniquely identifies the transaction so that you can use Db2 analytical tools to further analyze the Db2 side of the problem.

101 DB2 Accounting

SMF accounting record. It shows high page fetch and update activity, as well as high CPU usage.

07 Application Terminate

The IMS termination record. It reveals the source of the problem: it shows that most of the CPU time was spent in Db2.

Summary

With the combination of IMS Performance Analyzer you can monitor your service level agreements. When IMS Performance Analyzer reporting identifies that you are not meeting your SLAs, you can feed the transaction information it stores into IMS Problem Investigator and track down the source of the problem, even if it is outside IMS.

Tip: If your transactions use the MQ bridge or adapter, you can use the same methodology described here to identify or eliminate MQ as the source of the problem. Simply input MQ logs into IMS Problem Investigator instead of (or as well as) your Db2 logs.

End-to-end analysis of an IMS transaction with Db2 and IMS Connect activity

IMS Problem Investigator transaction tracking allows you to focus on activity related to a particular transaction. Tracking helps performance analysts isolate where problems occur and track them back to their source.

Features used in this scenario

IMS Connect Extensions

- Event collection via IMS Connect Extensions journal

IMS Problem Investigator

- Log file merging
- Transaction tracking
- Relative time view

Scenario description

Perform end-to-end analysis of IMS transactions by merging the **IMS Connect Extensions** journal, IMS logs, and Db2 logs with **IMS Problem Investigator**. Use IMS Problem Investigator to track important transactions, and use the relative time view to observe sudden jump in elapsed time.

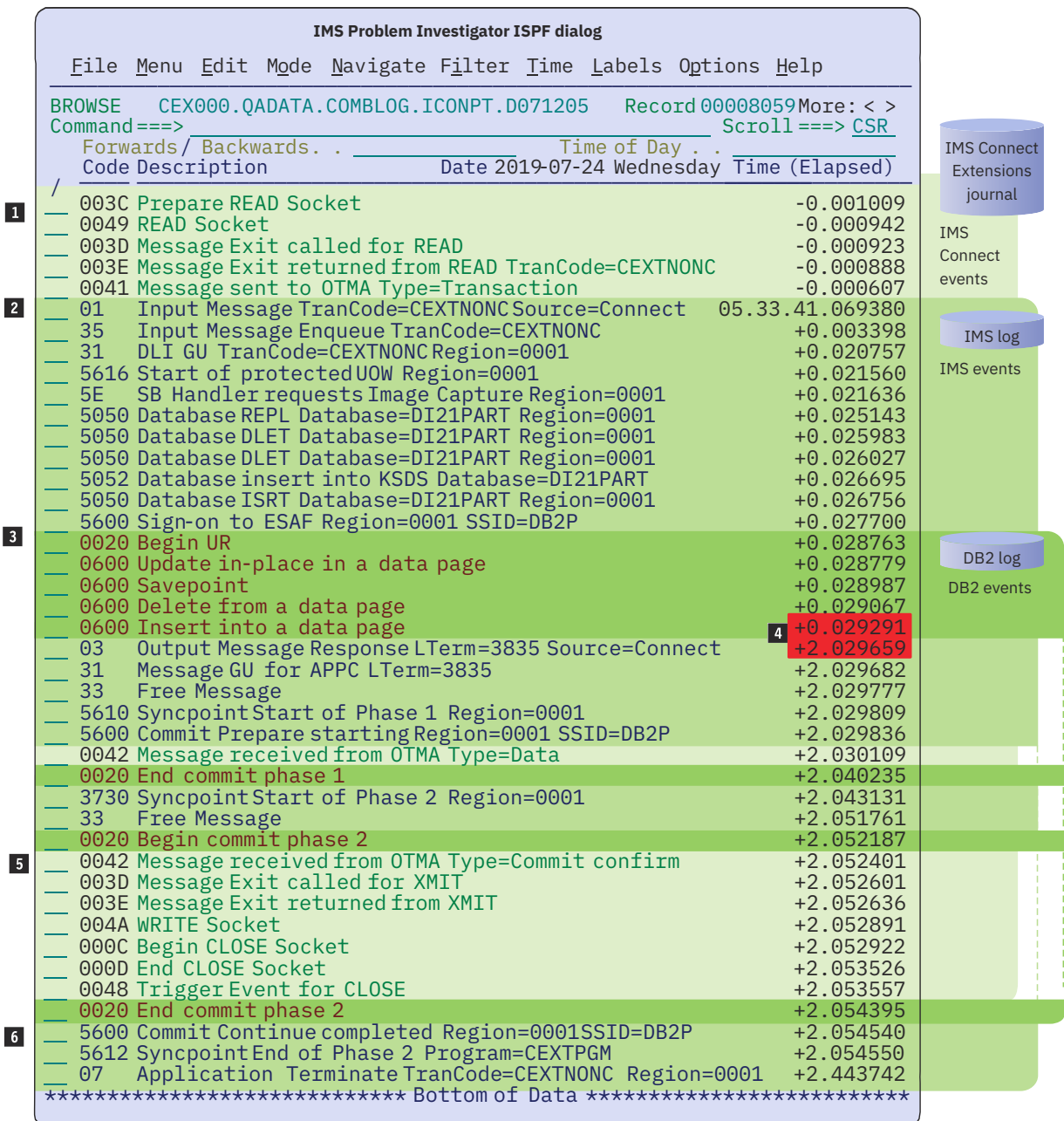


Figure 15. IMS PI: End-to-end analysis of an IMS transaction with Db2 and IMS Connect activity

In the previous figure, we can see the following sequence of events:

- 1 IMS Connect receives transaction request via TCP/IP.
- 2 IMS Transaction Manager (TM) receives request from IMS Connect, and starts processing the transaction.
- 3 Transaction starts Db2 activity.
- 4 Sudden jump in elapsed time indicates the Db2 Insert took over 2 seconds! Why? Select this event to view the details and begin analysis.
- 5 IMS Connect receives transaction response from IMS TM, and sends it to the client via TCP/IP.

IMS TM ends transaction.

Summary

IMS Problem Investigator, together with the information provide by the IMS Connect Extensions journal, can help you improve your understanding of your IMS environment. It allows less experienced team members to perform advanced analysis and to learn about the life cycle of individual transactions.

Tracking an IMS transaction across related systems

You can use **IMS Problem Investigator** to analyze log data from a variety of sources, including OMEGAMON for IMS Application Trace Facility (ATF), Db2, IBM MQ, and SMF.

Features used in this scenario

IMS Problem Investigator

- Log file merging
- Transaction tracking
- Elapsed time view
- OMEGAMON for IMS Application Trace Facility (ATF) support
- Db2 support
- IBM MQ support
- SMF: IRLM Long Lock support

Scenario description

Using the dialog or batch reporting, you can use **IMS Problem Investigator** to merge IMS log data with the logs from related systems, apply forms and filters, and track the activity of a single transaction as it progressed through IMS with calls to the related systems. If the transaction included program switches, you can track an individual unit of recovery within the transaction. IMS Problem Investigator provides additional support for tracking transactions across systems in the following ways:

OMEGAMON for IMS Application Trace Facility (ATF) support

The Application Trace Facility (ATF) for IBM OMEGAMON for IMS on z/OS provides detailed application-level monitoring of database calls and CPU utilization.

The ATF component collects detailed data about IMS Monitor events that occur within one or more transactions. The ATF supports the MPP, JMP, IFP, BMP, JBP, CICS®/DBCTL, and ODBA IMS application and region types, and collects the following types of data:

- Application abends
- Application API call details for each occurrence of a DL/I, Db2 SQL, and IBM MQ call
- Application elapsed times and processor times for each event and associated region
- External subsystems events that are related to the processing of Db2 and IBM MQ threads
- Other IMS Monitor events that are associated with API calls
- Properties of a transaction and its environment, such as the region where the transaction runs
- Transaction scheduling and termination

The analysis of the data collected by the ATF can be used in IMS Problem Investigator to:

- Identify transaction response-time components
- Fine-tune applications
- Understand how application programs operate

In addition, the ATF component can write to the IMS logging environment one record per transaction or program execution instance. The record contains summarized information of DL/I,

DB2®, and MQ calls with counts, elapsed and CPU times. The records can be used for application performance reporting.

Db2 support

IMS Problem Investigator can be used to report records in Db2 log files. IMS and Db2 events within a single IMS transaction can be reported when merging IMS and Db2 log files. This allows you to measure transaction event latencies and to investigate performance problems when IMS transactions use Db2 databases.

IMS Problem Investigator supports both Db2 archive and active log files.

When merged with the IMS log file, Db2 and IMS events associated with IMS transactions can be viewed together in a single diagnostic session. Merging Db2 with IMS log data allows you to:

- Track both IMS and Db2 events associated with an IMS transaction, to help determine whether Db2 is the cause of a problem in IMS.
- Measure Db2 and IMS event latencies that can be the cause of poor performance.
- Investigate the type of Db2 activity undertaken by IMS transactions.
- Review update activity against Db2 databases.
- Identify the Db2 URID and LUWID tokens associated with an IMS transaction, then use this information to investigate the problem further with tools like IBM Db2 Log Analysis Tool for z/OS.

IBM MQ support

IMS Problem Investigator can be used to process the IBM MQ log. Use IMS Problem Investigator to analyze and track IMS and MQ events for individual IMS transactions by merging their respective logs. This allows you to measure transaction event latencies and to investigate performance or application problems when IMS transactions use MQ. IMS Problem Investigator uses an *extract* of the native MQ log using the MQ log print utility **CSQ1LOGP**.

When merged with the IMS log file, MQ and IMS events associated with an IMS transaction can be viewed together in a single diagnostic session. Merging MQ with IMS log data will allow you to perform the following functions:

- Track both IMS and MQ events that are associated with an IMS transaction, to help determine whether MQ is the cause of a problem in IMS.
- Measure MQ and IMS event latencies that can be the cause of poor performance.
- Investigate the type of MQ activity that was undertaken by IMS transactions.
- Review messages put onto a queue, including their message descriptors and text.
- For transactions that use both Db2 and MQ, the three IMS, Db2, and MQ logs can be merged to provide a complete picture of transaction activity.

SMF: IRLM Long Lock support

IMS Problem Investigator can be used to report the SMF 79.15 (X'4F0F') record for IRLM Long Locks. Typically two records are created for each Long Lock – a Waiter and a Blocker, although there can be more than one of each. Long Lock events in a single IMS transaction can be reported when merging IMS and SMF log files. This allows you to measure transaction event latencies and to investigate performance problems when IMS transactions experience IRLM Long Locks.

Summary

Using the dialog or batch reporting, you can use IMS Problem Investigator to merge IMS log data with the logs from related systems. Once merged, track the activity of a single transaction as it progresses through IMS into related systems.

Identifying IMS problems using the TCP/IP characteristics of a transaction

IMS Performance Analyzer can generate an IMS Connect transaction index from **IMS Connect Extensions** journals. Use the IMS Connect transaction index with **IMS Problem Investigator** to identify IMS problems when all you know about the problem is its TCP/IP characteristics.

Features used in this scenario

IMS Connect Extensions

- Event collection via IMS Connect Extensions journal

IMS Performance Analyzer

- Creating an IMS Connect transaction index using the IMS Connect Extensions journal

IMS Problem Investigator

- Merging the IMS Connect transaction index with the IMS log
- Finding the problem transaction and then tracking all other IMS records associated with the transaction
- Isolating the problem within IMS

Scenario description

Suppose a TCP/IP client reports a problem. Sometimes, you may not know enough about the downstream transaction to help you locate the problem using traditional tools. For example, what if all you know is the IP address, the approximate time of the problem, and the nature of the problem (say, "long delay")? Using only the IMS log, and with only limited details of the problem transaction, pinpointing the transaction can be difficult, let alone an examination of the underlying cause. To help address this challenge, IMS Performance Solution Pack allows you to generate an IMS Connect transaction index that you can use to identify transactions in IMS.

1. Use **IMS Performance Analyzer** to generate the IMS Connect transaction index.

The IMS Connect transaction index is generated by IMS Performance Analyzer from **IMS Connect Extensions** journals. It collates all the information that can be known about the transaction from the available IMS Connect Extensions journal records. This information may include the client ID, IP address, overall performance, timings of significant events, IMS Connect exit specific performance, and dozens of additional pieces of information. You can use the IMS Connect transaction index as both a reduced form of the IMS Connect Extensions journal and as an input to IMS Problem Investigator and IMS Performance Analyzer.

2. Use **IMS Problem Investigator** to perform the following tasks:

- a. Merge the IMS Connect transaction index with the IMS log.

The following figure shows an IMS Connect transaction index merged with an IMS log in IMS Problem Investigator.

```

BROWSE      CEX000.QADATA.SLOWPRT3.ICON.D111028.IPIID  Record 00007982 More: < >
Command ==> _____ Scroll ==> CSR
Forwards / Backwards . . 00.00.00.000100    Time of Day . . 08.28.20.388036
Code Description                      Date 2020-02-16 Sunday    Time (LOCAL)
/ -----
___ CA20 Connect Transaction TranCode=PRT3                      10.26.45.252647
___ 01 Input Message TranCode=PART Source=Connect              10.26.46.820236
___ 35 Input Message Enqueue TranCode=PART                      10.26.46.820264
___ 08 Application Start TranCode=PART Region=0001              10.26.46.820754
___ 5607 Start of UOR Program=DFSSAM02 Region=0001              10.26.46.820755
___ 31 DLI GU TranCode=PART Region=0001                        10.26.46.820791
___ 5616 Start of protected UOW Region=0001                     10.26.46.821478
___ 5E SB Handler requests Image Capture Region=0001           10.26.46.841470
___ 5E SB Handler requests Image Capture Region=0001           10.26.46.841475
___ 03 Output Message Response LTerm=3801 Source=Connect        10.26.46.845009
___ 31 Message GU for APPC LTerm=3801                           10.26.46.845032
___ 33 Free Message                                             10.26.46.846983
___ 5610 Syncpoint Start of Phase 1 Region=0001                 10.26.46.847018
___ 3730 Syncpoint End of Phase 1 Region=0001                   10.26.46.847074
___ 33 Free Message                                             10.26.46.847145
___ 5612 Syncpoint End of Phase 2 Program=DFSSAM02 Region=0001 10.26.46.847197
___ 07 Application Terminate TranCode=PART Region=0001          10.26.46.847830
___ 5E SB Handler requests Image Capture Region=0001           10.26.46.847935
___ 0901 SB Summary Statistics for PST                           10.26.46.847940
___ 03 Output Message Response LTerm=3801 Source=Connect        10.26.47.458046
___ 31 Message GU for APPC LTerm=3801                           10.26.47.458072
___ 33 Free Message                                             10.26.47.460059
___ 5610 Syncpoint Start of Phase 1 Region=0002                 10.26.47.460094
___ 3730 Syncpoint End of Phase 1 Region=0002                   10.26.47.460146
___ 33 Free Message                                             10.26.47.460218
___ 5612 Syncpoint End of Phase 2 Program=DFSSAM33 Region=0002 10.26.47.460283
___ 07 Application Terminate TranCode=PRT3 Region=0002          10.26.47.461009
___ 5E SB Handler requests Image Capture Region=0002           10.26.47.461127
___ 0901 SB Summary Statistics for PST                           10.26.47.461132
___ CA20 Connect Transaction TranCode=PART                      10.26.47.856639
___ 01 Input Message TranCode=PART Source=Connect              10.26.47.857495
___ 35 Input Message Enqueue TranCode=PART                      10.26.47.857522
___ 08 Application Start TranCode=PART Region=0003              10.26.47.857982
___ 5607 Start of UOR Program=DFSSAM02 Region=0003              10.26.47.857982
___ 31 DLI GU TranCode=PART Region=0003                        10.26.47.858017
___ 5616 Start of protected UOW Region=0003                     10.26.47.858634

```

Figure 16. IMS Problem Investigator: Merged view of an IMS log with an IMS Connect transaction index

It is difficult to know exactly where the problem transaction has occurred by simply looking at the merged log. However, we can *filter* the IMS Connect transaction index records to identify only those transactions matching the client's characteristics and then use *tracking* to pickup information from IMS about that specific transaction.

- b. Filter transactions using an IMS Connect transaction index.

The following figure shows a filter for the IMS Connect transaction index.

```

Command ==> _____ Conditions _____ Row 1 to 2 of 2
Scroll ==> CSR

Code: CA20 Connect Transaction

/ Field Name + Oper Value +
- RESPTIME GT 2.0
- IPADDRESS EQ '172.17.69.25'
***** Bottom of data *****

```

Figure 17. IMS Problem Investigator: A filter that displays slow transactions from a specific IP address

The following figure shows a possible result of this filtering. In this case, we can see a record of the problem transaction, its overall performance and other key indicators.

```

BROWSE CEX000.QADATA.SLOWPRT3.ICON.D111028.IPIID Record 00008119 More: < >
Command ==> _____ Scroll ==> CSR
Forwards / Backwards . . 00.00.00.000100 Time of Day . . 08.28.20.388036
Code Description Date 2020-02-16 Sunday Time (LOCAL)
/ -----
- CA20 Connect Transaction 10.27.17.944277
TranCode=PRT3 Userid=CEX1 IMSID=ICDH ClientID=CLNAC13 Port=3801
LogToken=C8962E98210EAA00 SSN=0905 Response=2.163217 CM=1 SYNCLEVEL=1
TOV=38_MIN Socket=Pers
-----
***** Bottom of Data *****

```

Figure 18. IMS Problem Investigator: Tracking a slow IMS Connect transaction

- c. Track the problem transaction. As shown in the following figure, tracking (line action TX) reveals all records associated with the TCP/IP transaction. We can use the elapsed time view (on the right-hand side) to identify significant timing delays and then drill down to the individual records for further investigation.

```

BROWSE      CEX000.QADATA.SLOWPRT3.ICON.D111028.IPIID      Tracking active
Command ==> _____ Scroll ==> CSR
Forwards / Backwards . . 00.00.00.000100      Time of Day . . 08.28.20.388036
Code Description      Date 2020-02-16 Sunday      Time (Elapsed)
/ -----
CA20 Connect Transaction TranCode=PRT3      10.27.17.944277
01 Input Message TranCode=PRT3 Source=Connect      0.000713
35 Input Message Enqueue TranCode=PRT3      0.000032
08 Application Start TranCode=PRT3 Region=0001      0.000451
5607 Start of UOR Program=DFSSAM33 Region=0001      0.000000
31 DLI GU TranCode=PRT3 Region=0001      0.000036
5616 Start of protected UOW Region=0001      0.000650
5E SB Handler requests Image Capture Region=0001      0.013011
5E SB Handler requests Image Capture Region=0001      0.000005
03 Output Message Response LTerm=3801 Source=Connect      2.143720
31 Message GU for APPC LTerm=3801      0.000026
33 Free Message      0.002149
5610 Syncpoint Start of Phase 1 Region=0001      0.000068
3730 Syncpoint End of Phase 1 Region=0001      0.000053
33 Free Message      0.000071
5612 Syncpoint End of Phase 2 Program=DFSSAM33 Region=0001      0.000065
07 Application Terminate TranCode=PRT3 Region=0001      0.000787
***** Bottom of Data *****

```

Figure 19. IMS Problem Investigator: Identifying the cause of a slow IMS Connect transaction

In this example, IMS Problem Investigator has revealed a large elapsed time for the 03 record.

Summary

The result of using a combination of tools provided in the IMS Performance Solution Pack is that we have a much clearer picture of exactly when the problem occurred, how it progressed, and where it was delayed in IMS.

Analyzing IMS Connect transaction timeouts

This scenario explains how to diagnose timeouts in IMS Connect using **IMS Connect Extensions**, **IMS Problem Investigator**, and **IMS Performance Analyzer**.

Features used in this scenario

IMS Connect Extensions

- Event collection via IMS Connect Extensions journal

IMS Performance Analyzer

- Forms-based reporting

IMS Problem Investigator

- Transaction tracking
- Elapsed time view

Scenario description

You are interested in analyzing IMS Connect transactions that have timed out.

1. Use **IMS Performance Analyzer** to create a Forms-based report that lists all the IMS Connect transaction timeouts:
 - a. Create a List Report Form that includes IMS and IMS Connect fields.

```

EDIT                                     List Report Form - TIMEOUT                                     Row 1 to 8 of 8
Command ===>                             Scroll ==> PAGE

Description . . . Transaction Timeout Report          Category . . IMS  +

Tranmix . . . 1                Page Width . . . 137      Precision: Time . . 6
Report Filter          + Digit Grouping . SEC

Field
/ Name + Func Len Description
--- STARTCON TIME 15 Connect transaction start time
--- TIMEOUT 4 Transaction timeout indicator
--- TIMERV 8 Transaction timer value
--- ORIGDS 8 Original datastore
--- TARGDS 8 Target datastore
--- TRANCODE 8 Transaction Code
--- RESPCON 8 Connect response time
--- EOR ----- End of Report -----
***** Bottom of data *****

```

Figure 20. IMS Performance Analyzer: Summary Report Form for IMS Connect transaction timeouts

- b. Run the list report. A transaction that has timed out is displayed with a T in the Time Out column.

Tip: To generate a report that shows only these transactions, add a report filter to your report form. For more information, see *Report Filters* in the IMS Performance Analyzer User's Guide.

LIST0001 Printed at 23:53:46 10Feb2014				Data from 09.20.15 18Jun2013			
CON Tran	Time	Transact	Original	Target	CON Resp		
Start	Out	Timer	Datastor	Datastor	Trancode	Time	
09.22.05.775464		0.250000	ICDE	ICDE	CEXTNONC	0.014497	
09.22.05.829208	T	0.250000	ICDE	ICDE	CEXSNONC	88.88059	
09.23.34.730098	T	0.250000	ICDE	ICDE	CEXTNONC	88.88073	
09.25.03.632108		0.250000	ICDE	ICDE	CEXSNONC	0.018865	
09.25.03.670884		0.250000	ICDE	ICDE	CEXSNONC	0.009048	
09.25.08.627165		0.250000	ICDE	ICDE	IVTCV	0.020032	
09.25.08.647469		0.250000	ICDE	ICDE	IVTCV	0.019326	
09.25.08.667062		0.250000	ICDE	ICDE	IVTCV	0.007806	
09.25.08.675089		0.250000	ICDE	ICDE	IVTCV	0.010479	
09.25.08.685884		0.250000	ICDE	ICDE	IVTCV	0.009311	
09.25.08.695578		0.250000	ICDE	ICDE	IVTCV	0.007857	
09.25.08.703730		0.250000	ICDE	ICDE	IVTCV	0.272139	
09.28.12.910925		0.250000	ICDE	ICDE	IVTFM	0.000967	
09.28.12.934746		0.250000	ICDE	ICDE	IVTFM	0.001005	
09.30.39.537522	T	0.250000	ICDE	ICDE	IVTNO	23.37174	
09.31.02.695754	T	0.250000	ICDE	ICDE	IVTNO	0.285721	
09.31.02.758075	T	0.250000	ICDE	ICDE	IVTNO	0.269912	
09.31.02.810101	T	0.250000	ICDE	ICDE	IVTNO	0.508239	
09.31.03.085980	T	0.250000	ICDE	ICDE	IVTNO	0.258614	
09.31.03.112666	T	0.250000	ICDE	ICDE	IVTNO	0.258371	
09.31.03.144002	T	0.250000	ICDE	ICDE	IVTNO	0.257708	
09.31.03.171137	T	0.250000	ICDE	ICDE	IVTNO	0.260016	

Figure 21. IMS Performance Analyzer: List of all transaction showing ones that timed out with a T

- c. In a similar fashion, create a summary Report Form, and generate a Forms-based Transaction Transit Summary report based on that Report Form.

SUMM0001 Printed at 23:53:46 10Feb2014 Data from 09.20.15 18Jun2013

CON	Tran	Time	Original	Target	Tran	Avg
Start	Out	Datastor	Datastor	Trancode	Count	Resp
						Time
09.22.00		ICDE	ICDE	CEXTNONC	1	0.014497
09.22.00	T	ICDE	ICDE	CEXSNONC	1	88.88059
09.23.00	T	ICDE	ICDE	CEXTNONC	1	88.88073
09.25.00		ICDE	ICDE	CEXSNONC	2	0.013957
09.25.00		ICDE	ICDE	IVTCV	11	0.034753
09.25.00		ICDE	ICDE	IVTCX	12	0.051326
09.25.00		ICDE	ICDE	IVTFD	11	0.020407
09.25.00		ICDE	ICDE	IVTFM	8	0.022166
09.28.00		ICDE	ICDE	IVTFM	8	0.001251
09.30.00	T	ICDE	ICDE	IVTNO	1	23.37174
09.31.00		ICDE	ICDE	ADDINV	5	0.012178
09.31.00		ICDE	ICDE	ADDPART	4	0.043296
09.31.00		ICDE	ICDE	IVTNO	11	0.033834
09.31.00		ICDE	ICDE	IVTNV	11	0.023821
09.31.00		ICDE	ICDE	MQATREQ1	4	0.193392
09.31.00		ICDE	ICDE	PART	9	0.082517
09.31.00	T	ICDE	ICDE	ADDINV	5	0.270086
09.31.00	T	ICDE	ICDE	ADDPART	4	0.299088
09.31.00	T	ICDE	ICDE	DLETINV	4	0.318987
09.31.00	T	ICDE	ICDE	DLETPART	3	0.276276
09.31.00	T	ICDE	ICDE	DSPALLI	4	0.338915
09.31.00	T	ICDE	ICDE	DSPINV	8	0.292064
09.31.00	T	ICDE	ICDE	IVTNO	10	0.320253
09.31.00	T	ICDE	ICDE	IVTNV	11	0.288142
09.31.00	T	ICDE	ICDE	PART	9	0.272352

Figure 22. IMS Performance Analyzer: Summary of all transactions showing ones that timed out with a T

d. Create an IMS transaction index and an IMS Connect transaction index.

These will be used in the following steps.

2. Use **IMS Problem Investigator** to perform the following tasks:

a. Create a filter with conditions to select all CEXSNONC, CEXTNONC, and IVTNO transactions that ran over 250 milliseconds.

```

EDIT                                     Filter - TIMEOUT                      Row 1 of 2 More: < >
Command ==> _____ Scroll ==> CSR

Description . . . TIMEOUT _____ _ Activate Tracking

/ Log Code + Exc Description
_ IMS CA20 Connect Transaction
  Level 1 Conditions Yes Form _____ + REXX _____
-----
_ IMS CA01 Transaction
  Level 1 Conditions Yes Form _____ + REXX _____
-----
***** Bottom of data *****

```

Figure 23. IMS Problem Investigator: Creating a filter

```

Conditions
Command ==> _____ Row 1 to 3 of 3
Scroll ==> CSR

Code: CA20 Connect Transaction

/ Field Name +      Oper Value +
- TRANCODE          EQ  IVTNO
- TRANCODE          EQ  CEXSNONC
- TRANCODE          EQ  CEXTNONC
***** Bottom of data *****

```

Figure 24. IMS Problem Investigator: Conditions for CA20

```

Conditions
Command ==> _____ Row 1 to 1 of 1
Scroll ==> CSR

Code: CA01 Transaction

/ Field Name +      Oper Value +
- TOTALTM          GE  0.250
***** Bottom of data *****

```

Figure 25. IMS Problem Investigator: Conditions for CA01

- b. Merge the IMS logs, IMS transaction index, IMS Connect transaction index, and **IMS Connect Extensions** journal, and then apply the new TIMEOUT filter.

```

BROWSE      IPI000.QADATA.IMSA.INDEX.SORTED      Filter in use
Command ==> Scroll ==>CSR
Forwards / Backwards . . HH.MM.SS.THMIJU      Time of Day . . 09.20.40.395000
Code Description      Date 2013-06-18 Tuesday      Time (Local)
/
___ CA20 Connect Transaction TranCode=CEXTNONC      09.21.15.831670
___ CA20 Connect Transaction TranCode=CEXTNONC      09.21.15.880424
___ CA20 Connect Transaction TranCode=CEXTNONC      09.21.15.918427
___ CA20 Connect Transaction TranCode=CEXTNONC      09.21.20.951140
___ CA20 Connect Transaction TranCode=CEXTNONC      09.21.40.991695
___ CA20 Connect Transaction TranCode=CEXSNONC      09.21.41.050779
___ CA20 Connect Transaction TranCode=CEXTNONC      09.21.41.099479
___ CA20 Connect Transaction TranCode=CEXSNONC      09.21.41.142324
___ CA20 Connect Transaction TranCode=CEXSNONC      09.21.41.184497
___ CA20 Connect Transaction TranCode=CEXTNONC      09.21.41.219676
___ CA20 Connect Transaction TranCode=CEXTNONC      09.21.50.602981
___ CA20 Connect Transaction TranCode=CEXTNONC      09.21.50.676421
___ CA20 Connect Transaction TranCode=CEXTNONC      09.21.50.723138
___ CA20 Connect Transaction TranCode=CEXTNONC      09.22.05.775464
___ CA20 Connect Transaction TranCode=CEXSNONC      09.22.05.829208
___ CA20 Connect Transaction TranCode=CEXTNONC      09.23.34.730098
___ CA20 Connect Transaction TranCode=CEXSNONC      09.25.03.632108
___ CA20 Connect Transaction TranCode=CEXSNONC      09.25.03.670884
___ CA20 Connect Transaction TranCode=IVTNO      09.30.39.537522
___ CA20 Connect Transaction TranCode=IVTNO      09.31.02.695754
___ CA20 Connect Transaction TranCode=IVTNO      09.31.02.758075
___ CA20 Connect Transaction TranCode=IVTNO      09.31.02.810101
___ CA20 Connect Transaction TranCode=IVTNO      09.31.03.085980
___ CA20 Connect Transaction TranCode=IVTNO      09.31.03.112666
___ CA20 Connect Transaction TranCode=IVTNO      09.31.03.144002
___ CA20 Connect Transaction TranCode=IVTNO      09.31.03.171137
___ CA20 Connect Transaction TranCode=IVTNO      09.31.03.201454
___ CA20 Connect Transaction TranCode=IVTNO      09.31.03.230730
___ CA20 Connect Transaction TranCode=IVTNO      09.31.03.585568
:

```

Figure 26. IMS Problem Investigator: Displaying all IVTNO transactions that had an elapsed time of greater than 250 milliseconds

- c. Use line action TX to perform *transaction tracking* on one of the IVTNO events (for example, the event at 09.31.02.695754), and then switch to *relative time* with line action R.

The following example reveals a jump in relative time at log code **0045 OTMA Time-out**.

```

BROWSE      IPI000.QADATA.IMSA.INDEX.SORTED      Record 00020731 More: < >
Command ==>                                     Scroll ==>CSR
Forwards / Backwards . . HH.MM.SS.THMIJU      Time of Day . . 09.31.02.695754
Code Description                               Date 2013-06-18 Tuesday      Time (Relative)
/
R 08 Application Start TranCode=IVTNO Region=0003      09.31.02.597281
— 5607 Start of UOR Program=DFSIVP1 Region=0003      +0.059814.347
— CA20 Connect Transaction TranCode=IVTNO      +0.098472.085
— 003C Prepare READ Socket      +0.098472.085
— 0049 READ Socket      +0.098482.460
— 003D Message Exit called for READ      +0.098489.523
— 003E Message Exit returned from READ TranCode=IVTNO      +0.098505.898
— 0041 Message sent to OTMA Type=Transaction      +0.098534.210
— 01 Input Message TranCode=IVTNO Source=Connect      +0.098825.730
— 35 Input Message Enqueue TranCode=IVTNO      +0.098833.016
— 33 Free Message      +0.102785.888
— 01 Input Message TranCode=IVTNO Source=Connect      +0.104784.178
— 31 DLI GU TranCode=IVTNO Region=0003      +0.104789.904
— 5E SB Handler requests Image Capture Region=0003      +0.104941.959
— 5E SB Handler requests Image Capture Region=0003      +0.105050.992
— 5050 Database ISRT Database=IVPDB1 Region=0003      +0.115744.851
— 5050 Database ISRT Database=IVPDB1 Region=0003      +0.115762.888
— 5050 Database ISRT Database=IVPDB1 Region=0003      +0.115766.796
— 5050 Database ISRT Database=IVPDB1 Region=0003      +0.115769.722
— 5052 Database insert into KSDS Database=IVPDB1I Region=0003      +0.127176.891
— 5050 Database ISRT Database=IVPDB1I Region=0003      +0.127201.339
— 5610 Syncpoint Start of Phase 1 Region=0003      +0.127272.062
— 03 Output Message Response LTerm=IPIIN012 Source=Connect      +0.128116.146
— 35 Output Message Enqueue LTerm=IPIIN012 Region=0003      +0.128124.228
— 3730 Syncpoint End of Phase 1 Region=0003      +0.128134.173
— 37 Syncpoint Message Transfer Region=0003      +0.128453.383
— 33 Free Message      +0.131361.425
— 33 Free Message      +0.131870.316
— 5612 Syncpoint End of Phase 2 Program=DFSIVP1 Region=0003      +0.131894.847
— 56FA Transaction Statistics TranCode=IVTNO Region=0003      +0.131895.215
— 03 Output Message Response LTerm=IPIIN012 Source=Connect      +0.133046.858
— 35 Output Message Enqueue LTerm=IPIIN012      +0.133062.526
— 31 Communications GU LTerm=IPIIN012      +0.133074.492
— 0042 Message received from OTMA Type=Data      +0.133162.679
— 003D Message Exit called for XMIT      +0.133205.366
— 003E Message Exit returned from XMIT      +0.133217.929
— 004A WRITE Socket      +0.133258.147
— 0049 READ Socket      +0.133867.772
— 0049 READ Socket      +0.133881.991
— 003D Message Exit called for READ      +0.133887.866
— 003E Message Exit returned from READ TranCode=IVTNO      +0.133901.804
— 0041 Message sent to OTMA Type=Response, Resp=ACK      +0.133923.273
— 36 Output Message Dequeue LTerm=IPIIN012      +0.133991.236
— 33 Free Message      +0.167916.114
— 0045 OTMA Time-out      +0.384012.647
— 003D Message Exit called for XMIT      +0.384025.429
— 003E Message Exit returned from XMIT      +0.384036.022
— 004A WRITE Socket      +0.384090.429
— 000C Begin CLOSE Socket      +0.384098.210
— 000D End CLOSE Socket      +0.384185.460
— 0048 Trigger Event for CLOSE      +0.384193.710
— 07 Application Terminate TranCode=IVTNO Region=0003      +8.035715.551
***** Bottom of Data *****

```

Figure 27. IMS Problem Investigator: Tracking an IVTNO transaction

Analyzing IMS-to-IMS TCP/IP connections

IMS-to-IMS TCP/IP connectivity improves the ability of enterprises to deliver integrated solutions with reduced network complexity. These connection models offer new challenges for performance management and tuning. The IMS Performance Solution Pack helps address these challenges.

IMS Performance Solution Pack supports IMS-to-IMS TCP/IP connections in the following ways:

IMS Connect Extensions

Records IMS-to-IMS requests as they pass through IMS Connect. Requests are recorded in the IMS Connect Extensions journal.

IMS Problem Investigator

Presents, formats, and collates these requests, both from across IMS Connect and IMS, and from across IMS systems.

Analyzing Open Database transactions

IMS Performance Solution Pack helps provide detailed analytics of Open Database transactions. It simplifies the management of connections through the Open Database Access (ODBA) interface, and uses IMS Connect for network connectivity and security authentication. Applications can access IMS databases across LPAR boundaries, extending the reach and impact of your IMS assets.

The Open Database solution requires a Common Service Layer (CSL) component called Open Database Manager (ODBM). ODBM provides an interface for programs that access IMS databases from many different distributed and local environments (ODBA). It also provides routing of incoming requests and can act as a resource manager (if required).

IMS Connect provides the TCP/IP access layer to ODBM. Incoming Open Database requests are identified and an appropriate target ODBM is selected. The role of IMS Connect is to provide the TCP/IP layer, routing to ODBM, and security authentication. From the perspective of distributed client applications, IMS Connect is the primary gateway for Open Database.

Open Database uses the Distributed Relational Database Architecture™ (DRDA) protocol, an open standards based protocol for distributed database access used by Db2 and other enterprise databases. DRDA defines request and reply sequences and the distributed data management (DDM) object data structure. The DRDA protocol itself is managed by The Open Group. The major differentiator for DRDA is that it is standards-based, well established in application environments, and is extensible. IMS uses standard DRDA code points as well as custom DDM objects. The IMS Performance Solution Pack records the DRDA requests, and can format and interpret both standard DRDA and the IMS extensions.

IMS Performance Solution Pack provides extensive support for Open Database development and maintenance.

IMS Connect Extensions

- Records Open Database requests as they pass through IMS Connect.
- Provides enhanced routing and load balancing for Open Database.
- Allows you to secure Open Database access to specific IMS Connect systems, client IP addresses, and ports.

IMS Connect Extensions events provide detailed information about the content of Open Database requests and replies and their sequence of execution. This information can be used to record the sequences and log errors. The information also provides important framing information that help identify request times and bottlenecks.

IMS Performance Analyzer

- Provides form fields for reporting on Open Database activity using forms-based reporting. Reports can be combined with IMS log data for full end-to-end performance reporting.
- Generate event trace reports for Open Database activity.

IMS Problem Investigator

- Provides an easy-to-read, interactive view of requests and reply sequences.
- Interprets DRDA sequences.
- Formats DLI calls that are generated from Open Database SQL queries.
- Shows DLI call results, including I/O and feedback areas.
- Highlights patterns that may signify problems such as non-allocation of PSBs.
- Provides an end-to-end picture by combining the information logged in IMS Connect with the information logged in IMS.

Customized reports using Report Forms

Use **IMS Performance Analyzer** report forms to create a range of customized reports to suit your performance reporting requirements.

Features used in this scenario

IMS Performance Analyzer

- Form-based reporting with customized report forms

Scenario description

You are interested in creating a customized performance report. To do this, use **IMS Performance Analyzer** form-based reporting and a *report form*:

1. Create a report form that includes the report fields you are interested in. Fields appear as column headings in your report output. If you like, you can also add the report form to a report set.
2. Run the report.

IMS Performance Analyzer contains several report form samples. You can use these samples directly in a form-based Transaction Transit list or summary report, or you can use them to create your own.

Example forms

CPU heavy hitters

The following example demonstrates a form that summarizes CPU-intensive transactions by program name:

```
Field      Sort
/ Name +   K 0 Func Len Description
--- PROGRAM K A      8 Program or PSB name
--- TRANCNT      10 Transaction count
--- CPUTIME      D TOTAL 8 CPU time
--- CPUTIME      AVE     8 CPU time
--- CPUTIME      RANGE  8 CPU time
--- CPUTIME      RANGE  8 CPU time
--- CPUTIME      RANGE  8 CPU time
--- CPUTIME      RANGE  8 CPU time
--- CPUTIME      MAX     8 CPU time
--- PROCESS      AVE     8 Processing time
--- PROCESS      RANGE  8 Processing time
--- PROCESS      RANGE  8 Processing time
--- PROCESS      MAX     8 Processing time
--- EOX          ----- End of Extract -----
--- EOR          ----- End of Report -----
***** Bottom of data *****
```

Figure 28. IMS Performance Analyzer: A Summary Report Form showing CPU-intensive transactions by program name

BMP reporting

The following examples demonstrate customized BMP reporting using report forms:

```
Field
/ Name + Func Len Description
__ STARTCON TIME 15 Connect transaction start time
__ PROGRAM      8 Program or PSB name
__ BMPCHKID     8 BMP user checkpoint id
__ STARTIMS TIME 15 IMS transaction arrival time
__ CPUTIME      8 CPU time
__ PROCESS      8 Processing time
__ DBGETS       10 DB get call count
__ DBUPDATS     10 DB update call count
__ FPGETS       10 Fast Path DB get call count
__ EOR          ----- End of Report -----
__ EOX          ----- End of Extract -----
***** Bottom of data *****
```

Figure 29. IMS Performance Analyzer: A List Report Form showing BMP processing between checkpoint intervals

```
Field
/ Name + Func Len Description
__ JOBNAME      8 Region Jobname
__ PROGRAM      8 Program or PSB name
__ BMPCHKID     8 BMP user checkpoint id
__ STARTIMS TIME 15 IMS transaction arrival time
__ DATABASE     8 Database DBD name
__ DBACMETH     4 Database Access Method
__ EOR          ----- End of Report -----
__ EOX          ----- End of Extract -----
***** Bottom of data *****
```

Figure 30. IMS Performance Analyzer: A List Report Form showing BMP checkpoint by DBD

```
Field Sort
/ Name + K 0 Func Len Description
__ STARTIMS K A TIME 8 IMS transaction arrival time
__ TRANCODE K A      8 Transaction Code
__ PROGRAM K A      8 Program or PSB name
__ BMPCHKID K A      8 BMP user checkpoint id
__ BMPCHKPT A COUNT 10 BMP Checkpoint count
__ CPUTIME  AVE 8 CPU time
__ DBCALLS  AVE 10 DB call count
__ DBWAITS  AVE 10 DB wait count
__ EOR      ----- End of Report -----
__ EOX      ----- End of Extract -----
***** Bottom of data *****
```

Figure 31. IMS Performance Analyzer: A Summary Report Form showing BMP detail

Field	Sort					
/ Name +	K	0	Func	Len	Description	
TRANCODE	K	A		8	Transaction Code	
PROGRAM	K	A		8	Program or PSB name	
REGTYPE	K	A		3	Region type	
DBCALLS			TOTAL	10	DB call count	
CPUTIME			TOTAL	8	CPU time	
DBWAITS			TOTAL	10	DB wait count	
DBIOTIME			TOTAL	8	Database IO elapsed time	
LOCKTIME			TOTAL	8	Database Locking elapsed time	
EOR					----- End of Report -----	
EOX					----- End of Extract -----	
***** Bottom of data *****						

Figure 32. IMS Performance Analyzer: A Summary Report Form showing BMP execution and locking statistics

Chapter 3. Migrating from previous releases

If you already have one or more of the products that are included in IMS Performance Solution Pack installed on your system, you might need to migrate those products to the new environment.

About this task

IBM IMS Performance Solution Pack for z/OS, V2.3 is supplied with the following products:

- IBM IMS Connect Extensions for z/OS, V3.1
- IBM IMS Performance Analyzer for z/OS, V4.5
- IBM IMS Problem Investigator for z/OS, V2.5

The individual products delivered with IMS Performance Solution Pack are compatible with previous releases supported by IBM Support. However, only if you upgrade all three to the current level will you obtain full benefit of the cross-product features of the pack.

Upgrading each component product is designed to be seamless. It involves a few simple customization steps to use the new product libraries and existing system definitions and control data sets which are automatically upgraded if required.

Procedure

1. For detailed information and considerations when upgrading each product, refer to the "Upgrading" topics in the individual product user's guides.
See ["Product publications" on page 8](#) for further details.
2. Follow the installation and customization steps in ["Installing IMS Performance Solution Pack" on page 37](#), applying all current maintenance.
3. For each component product, the primary migration considerations are:
 - a) Customize the ISPF product dialog startup procedures to use the new product libraries.
 - b) Ensure the dialog profile settings (primary menu option 0.1) are updated to use the new product libraries, especially the new load library.
 - c) Ensure the dialog profile settings are setup to either share system definitions between the products, or run independently according to your particular operational requirements.
 - d) All objects, such as Filters and Report Forms, created in previous releases of the component products are automatically converted, where required, when new or changed function is first accessed by the ISPF dialog.
 - e) Compare the new JCL samples and procedures with those already in use, so you can modify as required to reflect any changes or enhancements.

Chapter 4. Customizing IMS Performance Solution Pack

The following topics describe how to install and customize IMS Performance Solution Pack.

Installing IMS Performance Solution Pack

Before the complete functionality of IMS Performance Solution Pack is available, all three performance tools must be installed and customized.

About this task

Although supplied as one complete pack, each component product is installed independently. You can choose to operate them independently, but to achieve the full functional benefit, you need to establish the interrelationships by following the few simple steps outlined here.

The following checklist is intended to assist you in the installation, but is not intended to be a comprehensive set of instructions. The user's guides for each product provide detailed installation and customization instructions, plus explanations of messages and codes that you might encounter during the process. See [“Product publications” on page 8](#) for further details.

Complete information about installation requirements, prerequisites, and procedures for IMS Performance Solution Pack is located in the *Program Directory for IBM IMS Performance Solution Pack for z/OS*, GI13-4905.

Procedure

1. Install IBM Common Services Library for z/OS (5655-CSL).
2. Install the component products of IMS Performance Solution Pack using the information supplied in the program directory.
See [“Data sets for IMS Performance Solution Pack” on page 38](#) for further details.
3. Install all current maintenance for the component products.
This ensures that all new functions are available.
4. APF-authorize the IMS Connect Extensions and functional support LINK libraries.
Only IMS Connect Extensions has online, real-time operation. It runs in the IMS Connect address space.
5. Optional: Install the IMS Connect Extensions Operations Console.
The Operations Console is an Eclipse-based PC application that provides a graphical interface to perform IMS Connect Extensions operations. It allows you to monitor and control IMS Connect systems and their components and active sessions from a distributed workstation. See [“Product publications” on page 8](#) and refer to the *IMS Connect Extensions User's Guide* for further details.
6. Install the ISPF-based dialog of each component product by following the procedure described in each user's guide.
7. Verify that the correct Load Library is specified in the dialog profile settings (primary menu option 0.1) for each IMS Performance Solution Pack component product.
8. Compare all new JCL and procedures with those currently in use.
This ensures that all changes or enhancements might have been made to the JCL samples that are included.
9. Optional: Set up shared System Definitions between IMS Performance Analyzer and IMS Problem Investigator.
This allows you to maintain your systems, groups (sysplexes), and file definitions from either product, and changes in one will be reflected in the other.

To achieve this, specify the same data set name for both of the following libraries in the dialog profile settings primary menu option 0.1 **IMS PA Profile Library** in IMS Problem Investigator and the **Permanent ISPF Table Library** in IMS Performance Analyzer.

Note: If IMS Problem Investigator detects that you have IMS Performance Analyzer installed, your IMS PA Profile Library is automatically set. If you do not specify an IMS PA Profile Library, your IMS Problem Investigator System Definitions will be saved in your **IMS PI Personal Profile Library**.

10. Optional: Set up IMS Performance Analyzer and IMS Problem Investigator to use IMS Connect system and journal file definitions in IMS Connect Extensions.

To achieve this, specify the data set name of the default IMS Connect Extensions repository in the dialog profile settings of both the other products.

11. Optional: If you want to offload IMS Performance Analyzer reports, install the IMS Tools Knowledge Base from the IBM Tools Base for z/OS.

To perform the SMP/E installation, see the *Program Directory for IBM Tools Base for z/OS*, GI10-8819. This process allocates and downloads the target and distribution libraries and performs the SMP/E installation. See the *IBM Tools Base IMS Tools Knowledge Base for z/OS User's Guide* for further details.

12. Optional: Set up IMS Tools Knowledge Base as a repository for selected IMS Performance Analyzer log reports:

- a) Specify the data set name of the IMS Tools Knowledge Base (ITKB) load library in the IMS Performance Analyzer profile settings.
- b) Edit and run the IMS Performance Analyzer sample job **IPIDITKB**.

13. Verify the installation.

See [“Verifying your installation” on page 39](#) for further details.

Data sets for IMS Performance Solution Pack

Install IMS Performance Solution Pack by installing each of the component products.

Complete information about installation requirements, prerequisites, and procedures for IMS Performance Solution Pack is located in the *Program Directory for IBM IMS Performance Solution Pack for z/OS*, GI13-4905.

The component products are shipped in separate libraries. The following table lists the data sets distributed in IMS Performance Solution Pack.

Note: Load module library SFUNLINK is supplied with IBM Common Services Library for z/OS (5655-CSL).

Table 2. Data sets for IMS Performance Solution Pack V2.3

Type	Name	Description
DATA	SCXGENU	IMS Connect Extensions Operations Console
EXEC	SCEXEXEC	REXX execs for IMS Connect Extensions
	SIPIEXEC	REXX execs for IMS Performance Analyzer
	SALZEXEC	REXX execs for IMS Problem Investigator
LMOD	SCEXLINK	Executable Load Library for IMS Connect Extensions
	SFUNLINK	IBM Common Services Library for z/OS (5655-CSL) load module library for IMS Performance Solution Pack.
	SIPILINK	Executable Load Library for IMS Performance Analyzer
	SALZLINK	Executable Load Library for IMS Problem Investigator
MACRO	SCEXMACS	Distributed product macros for IMS Connect Extensions
	SIPIMAC	Distributed product macros for IMS Performance Analyzer

Table 2. Data sets for IMS Performance Solution Pack V2.3 (continued)

Type	Name	Description
MESSAGE	SCEXMENU	ISPF messages for IMS Connect Extensions
	SIPIMENU	ISPF messages for IMS Performance Analyzer
	SALZMENU	ISPF messages for IMS Problem Investigator
PANEL	SCEXPENU	ISPF panels for IMS Connect Extensions
	SIPIPENU	ISPF panels for IMS Performance Analyzer
	SALZPENU	ISPF panels for IMS Problem Investigator
SAMPLE	SCEXBASE	SMP/E JCL members for installing IMS Connect Extensions
	SIPIBASE	SMP/E JCL members for installing IMS Performance Analyzer
	SALZBASE	SMP/E JCL members for installing IMS Problem Investigator
	SFUNBASE	SMP/E JCL members for installing Common Services Library server
	SCEXSAMP	Sample JCL members, IVP utilities and automated configuration scripts for IMS Connect Extensions
	SIPISAMP	Sample JCL members for IMS Performance Analyzer
	SALZSAMP	Sample JCL members and REXX execs for IMS Problem Investigator
	SFUNSAMP	Sample JCL members for Common Services Library server
SKEL	SCEXSENU	ISPF skeleton JCL members for IMS Connect Extensions
	SIPISENU	ISPF skeleton JCL members for IMS Performance Analyzer
	SALZSENU	ISPF skeleton JCL members for IMS Problem Investigator
TABLE	SCEXTENU	ISPF tables for IMS Connect Extensions
	SIPITENU	ISPF tables for IMS Performance Analyzer
	SALZTENU	ISPF tables for IMS Problem Investigator

Verifying your installation

After installing IMS Performance Solution Pack, verify that you have installed it correctly by running the installation verification procedure (IVP) for each component product.

Procedure

1. Run the [“IMS Connect Extensions IVP”](#) on page 40.
2. Run the [“IMS Performance Analyzer IVP”](#) on page 40.
3. Run the [“IMS Problem Investigator IVP”](#) on page 41.

What to do next

After you verify that all components of IMS Performance Solution Pack have been installed and configured correctly, you can begin to use it to help you analyze and resolve performance problems with your IMS applications, and monitor and tune your IMS system operations.

IMS Connect Extensions IVP

The installation verification procedures (IVP) generate test sessions to verify the installation of IMS Connect and IMS Connect Extensions.

Procedure

Follow the instructions in the *IMS Connect Extensions User's Guide* to:

1. Modify the IMS Connect startup job to start IMS Connect with IMS Connect Extensions.
2. View the system and its activity through the IMS Connect Extensions ISPF dialog.
3. Customize and run the sample IVP jobs.

IMS Performance Analyzer IVP

The installation verification procedure (IVP) for IMS Performance Analyzer exercises the batch and dialog installations.

IMS PA: Verifying batch installation

Use this method to verify the installation of the batch components of IMS Performance Analyzer.

About this task

The IMS Performance Analyzer batch utility can generate reports, extracts or CSV files. The following steps will verify IMS log reporting.

Procedure

1. Edit the sample JCL member **IP1IVP** supplied in the SIPISAMP library. Insert the placeholders for `<vrsm>`, `<IPI.V4R5M0.SIPILINK>`, and `<input.log>` (an input log file), then submit the job.
2. Review the messages in SYSPRINT.
3. Review the log record output.

IMS PA: Verifying dialog installation

Use this method to verify the installation of the dialog components of IMS Performance Analyzer.

About this task

The guided tour in the *IMS Performance Analyzer User's Guide* provides additional detail on the following steps.

Procedure

1. Set up your IMS PA environment:
 - a) Specify your IMS PA profile settings.
 - b) Define an IMS subsystem to report on.
2. Request a Log report.
3. Create a Report Form.
4. Request a Forms-based Log report.

IMS Problem Investigator IVP

The installation verification procedure (IVP) for IMS Problem Investigator exercises the batch and dialog installations.

IMS PI: Verifying batch installation

Use this method to verify the installation of the batch components of IMS Problem Investigator.

About this task

The IMS PI batch utility can generate reports, produce an extract of selected records from the log, or create a CSV file of selected log record fields. The following steps will verify IMS log reporting.

Procedure

1. Edit the sample JCL member **ALZIVP** supplied in the SALZSAMP library. Insert the placeholders for <vrm>, <ALZ.V2R5M0.SALZLINK>, and <input.log> (an input log file), then submit the job.
2. Review the messages in SYSPRINT. Expect return code 4 if message ALZ0010W is issued (because LOGRPT page limit reached for a large log file).
3. Review the log record output in ddname LOGRPT. Log records are formatted in the same way as the dialog.
4. If IMS log records are processed, a Log Information report will also be output with ddname LOGINFO.

IMS PI: Verifying dialog installation

Use this method to verify the installation of the dialog components of IMS Problem Investigator.

About this task

The ISPF dialog is used to investigate log files. The following steps verify basic log file processing.

Procedure

1. From the **ISPF Primary Option Menu**, select option **6 Command**, and run the following command:

```
EXEC 'ALZ.V2R5M0.SALZEXEC(ALZOREXX)' 'ALZ.V2R5M0'
```

2. From the IMS Problem Investigator **Primary Option Menu**, select option **1 Process**.
3. Specify the **IMS Release** and add a **Log File** data set name in the process list, then select it.

```

                                     Process Log Files          Row 1 of 1 More: < >
Command ==> _____ Scroll ==> PAGE
Select a Log File to browse.          IMS Release 152 +      Zone _____
/      Log File                      Rel + Filter + Zone
S      'IMSP.SLDS.T01'
***** Bottom of data *****
```

Figure 33. IMS Problem Investigator installation verification: Dialog

4. Review the log file contents. Scroll up and down, left and right, then select a record to view its contents.

Chapter 5. Troubleshooting

Use these topics to diagnose and correct problems that you experience with IMS Performance Solution Pack.

The batch processor issues messages with a unique message identifier followed by the message text. The message identifier has one of the following formats where *nnnn* is a four-digit message identification number and *x* is a letter that indicates the severity:

ALZnnnnx

IMS Problem Investigator product message

CEXnnnnx

IMS Connect Extensions product message

FUNnnnnx

IBM Common Services Library support message

IPInnnnx

IMS Performance Analyzer product message

For an explanation of the messages, refer to the corresponding product's user guide. See [“Product publications”](#) on page 8.

How to look up message explanations

You can use several methods to search for messages and codes.

Searching Knowledge Center

In the search box that is located in the top, enter the number of the message that you want to locate. For example, you can enter DFS1065A in the search field.

Use the following tips to help you improve your message searches:

- You can search for information on codes by entering the code; for example, enter -327.
- Enter the complete or partial message number. You can use the asterisk wildcard character (*) to represent multiple characters, and you can use the question mark wildcard character (?) to represent a single character.

The Knowledge Center contains the latest message information for all of the information management products that are included in the Knowledge Center.

Searching for messages on the Web

You can use any of the popular search engines that are available on the Web to search for message explanations. When you type the specific message number or code into the search engine, you will be presented with links to the message information in IBM Knowledge Center.

Gathering diagnostic information

Before you report a problem with IMS Performance Solution Pack to IBM Software Support, you need to gather the appropriate diagnostic information.

Procedure

Provide the following information for all IMS Performance Solution Pack problems:

- A clear description of the problem and the steps that are required to re-create the problem
- All messages that were issued as a result of the problem
- Product release number and the number of the last program temporary fix (PTF) that was installed

- The version of Db2/IMS that you are using and the type and version of the operating system that you are using

Provide additional information based on the type of problem that you experienced:

For online abends, provide the following information

- A screen shot of the panel that you were using when the abend occurred
- The job log from the TSO session that encountered the abend
- The job log from the server
- A description of the task that you were doing before the abend occurred

For errors in batch processing, provide the following information

- The complete job log
- Print output
- Contents of the any data sets that were used during the processing

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