

IBM iDoctor for IBM i PEX Analyzer

IBM iDoctor for IBM i Development Team

7 July 2023

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Abstract

This document covers PEX Analyzer in iDoctor.

Changes

7 July 2023 – Updated for 2023 and builds 1623+.

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1 Introduction

This chapter provides an overview of the interfaces within iDoctor's PEX Analyzer component. PEX refers to and is short for [Performance Explorer](#) which is provided with IBM i at all releases.

The PEX Analyzer component provides many options designed to help the user analyze detailed performance problems on IBM i. PEX offers 3 modes (Trace, Stats and Profile), but primarily only Trace and Stats modes are used by most iDoctor users.

PEX can collect a vast amount of data in a very short period, so use caution when starting to use the tool or system problems may occur. PEX is the most powerful tool within iDoctor in terms of being able to pinpoint problems, but its use comes with some risk and some level of knowledge is required before diving in.

For example: Do not collect every PEX event at once. Typical use is a focused trace on a key set of events required for analyzing something specific in a short (5 minute) duration.

When using PEX, you will create either a *MGTCOL object or PEX database files which are created in QAYPE* files on the system.

PEX Analyzer is available for trial evaluation or purchase via this website and is sold via IBM Technology Services.

A license for PEX Analyzer includes:

- PEX Analyzer software (licensed by system serial number via an access code)
- Electronic defect support for the software for the term of the contract
- No charge updates to the software for the term of the contract

More details about what PEX is follows:

Performance Explorer collects more detailed information about a specific application, program or system resource, and provides detailed insight into a specific performance problem. This includes the capability both to perform several types and levels of traces and to run detailed reports.

Performance Explorer is a data collection tool that helps the user identify the causes of performance problems that cannot be identified by collecting data using Collection Services or by doing general trend analysis. Two reasons to use Performance Explorer include:

- Isolating performance problems to the system resource, application, program, procedure, or method that is causing the problem
- Analyzing the performance of applications

Performance Explorer is a tool that helps find the causes of performance problems that cannot be identified by using tools that do general performance monitoring. As your computer environment grows both in size and in complexity, it is reasonable for your performance analysis to gain in complexity as well. The Performance Explorer addresses this growth in complexity by gathering data on complex performance problems.

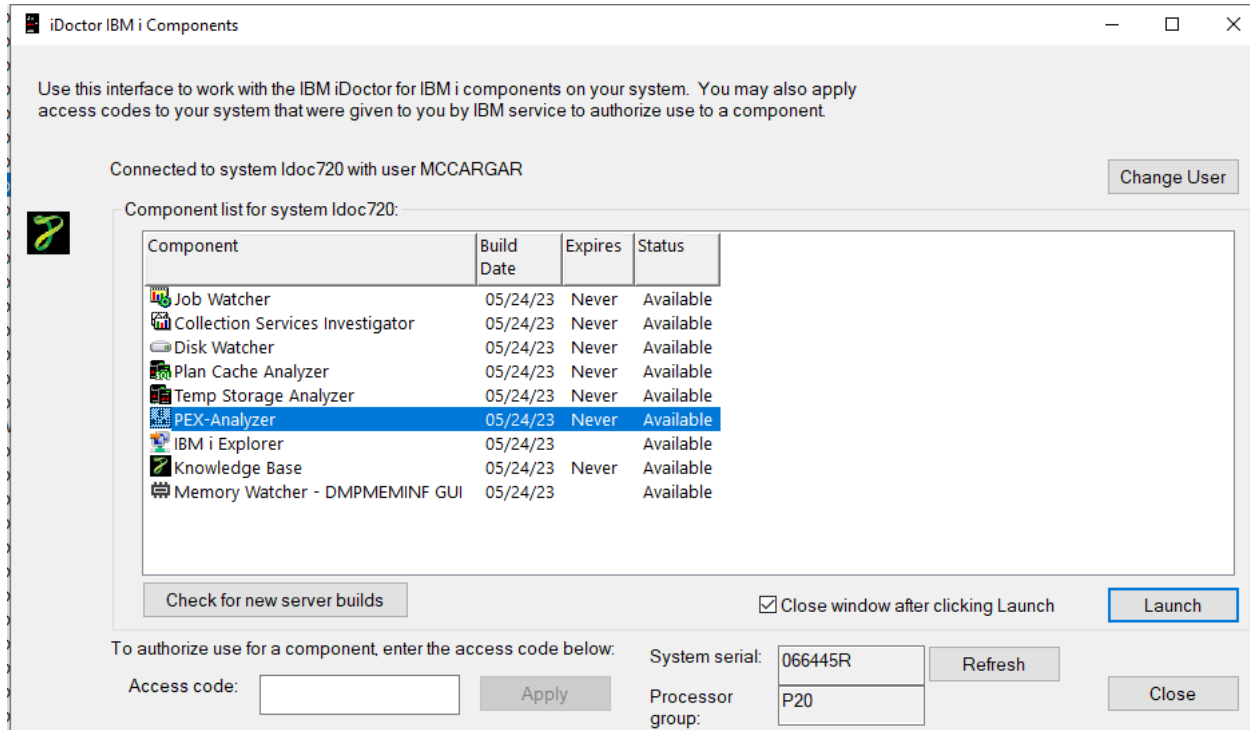
Data is collected in PEX Analyzer using commands that are included with IBM i which are:

- ADDPEXDFN – Adds a PEX definition to the system
- STRPEX – Starts a PEX collection
- ENDPEX – Ends an active PEX collection

2 Starting PEX Analyzer

PEX Analyzer is a component of the iDoctor suite of tools. After launching iDoctor, the PEX Analyzer component is started from the IBM i Connections List View by double-clicking on the desired system.

A list of available components will appear on the next window. Double-click on the PEX Analyzer component or select PEX Analyzer and click the Launch button to continue.

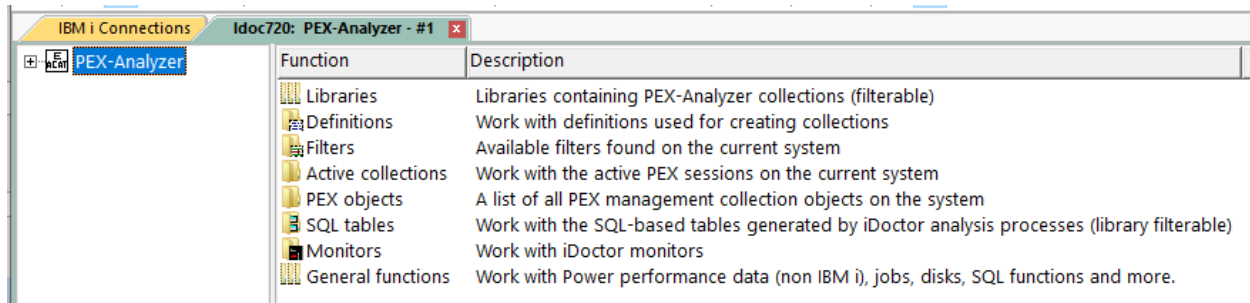


iDoctor IBM i Components Window

3 PEX Analyzer Component View

The PEX Analyzer folder contains a list of folders, each providing different features available. Collections can be displayed in various ways, either under the Libraries folder on a per library basis, or under the Monitors folders to show PEX collections under a monitor.

This also provides options for working with the PEX Definitions that exist on the system. These are used for defining the aspects for the data is collected. Several IBM-supplied definitions exist, or the user can make their own.



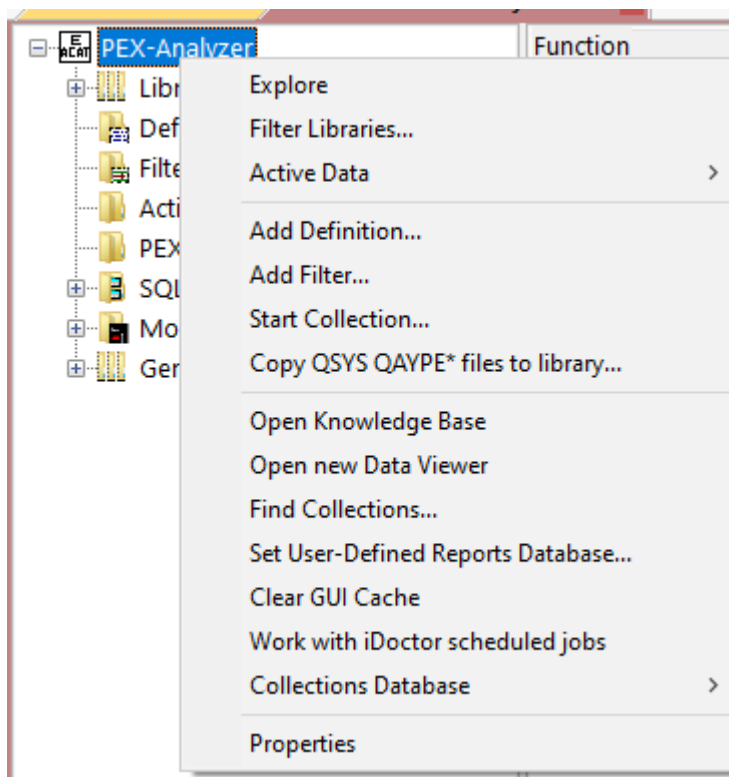
PEX Analyzer Component View

The General functions folder contains several additional options for working with the IFS, browsing objects, working with the disk units and ASPs or working with any non-IBM i data (VIOS/HMC) that has been collected and moved to this system. The options for working with non-IBM i data are stored in the General functions -> Power folder.

These folders are covered in more detail in the next sections.

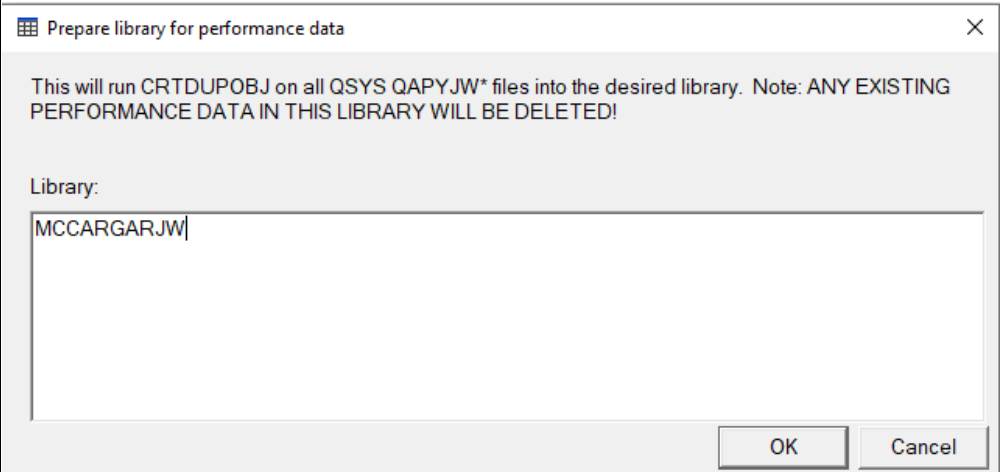
3.1 Root Folder Menu Options

The following menu options are available by right clicking on the 'PEX Analyzer' icon in the component view:



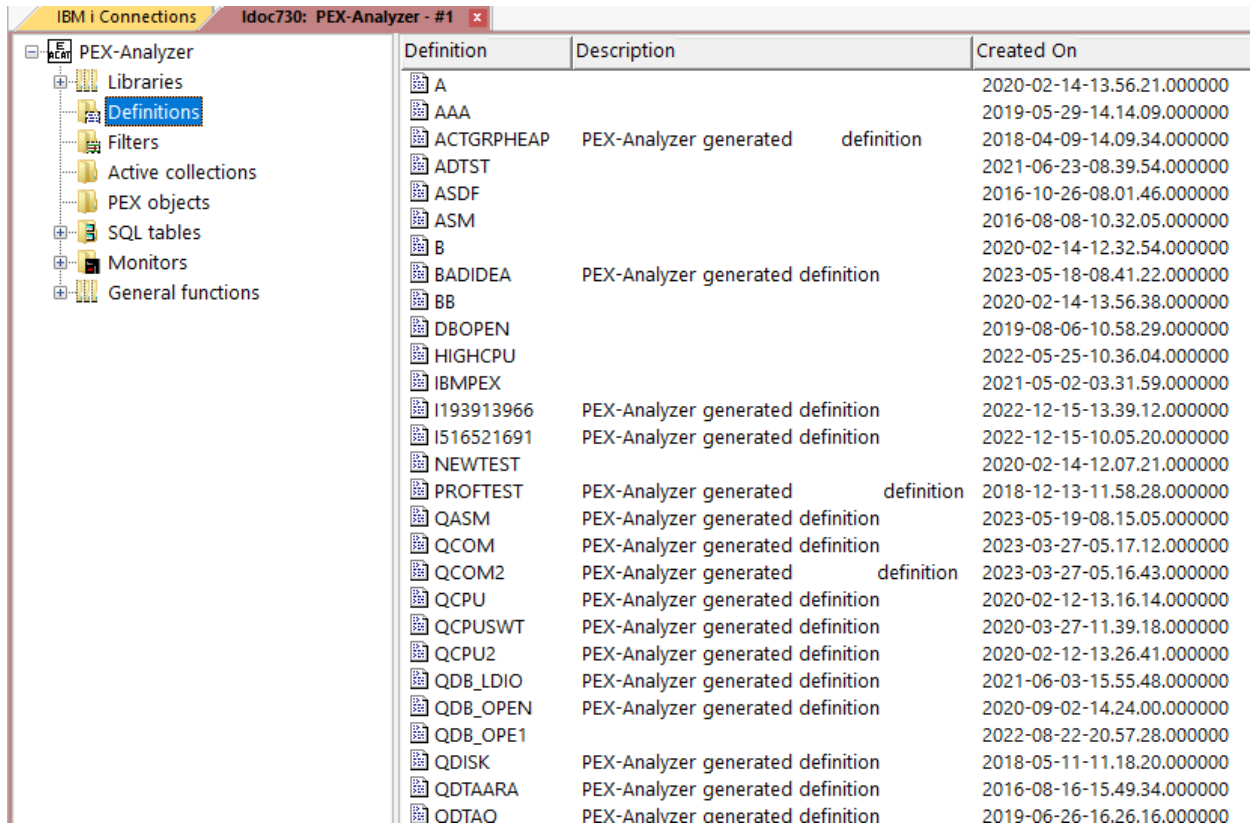
PEX Analyzer Popup-Menu

Menu Item	Description
Filter Libraries...	This option allows you to filter the libraries shown in the Libraries and SQL Tables folders by a generic library name or library owner. This is useful for speeding up the display of the list if the system contains many libraries containing collections (and/or SQL tables).
Active Data	This menu option allows options to view the currently running Job Watcher monitor collection (STRJWMON command) or Collection Services collection. There are no options relating to PEX collections under this menu. Requires 7.3+ and May 2023 or later iDoctor server builds.
Add Definition	This option displays the PEX Definition Wizard . The definition defines characteristics about the collection such as which events to collect and the type of PEX collection to run. This is an interface over the ADDPEXDFN command.
Add Filter...	Displays the PEX Filter Wizard that lets you add a PEX filter on your system in order to limit the amount of data included in the collection. This is an interface over the ADDPEXFTR command.
Start Collection	Displays the PEX Collection Wizard that lets you start a new PEX collection on the system. This is an interface over the PEX Analyzer QIDRPA/STRPACOL command, which is a wrapper for the OS commands ADDPEXDFN, STRPEX and ENDPEX.

Menu Item	Description
Copy QSYS QAYPE* files to library...	This option can be used to copy all QAYPE* files from QSYS to the desired library. This is an optional step that prepares a library for collecting performance data. It also allows the library to appear under the Libraries folder in PEX Analyzer.  <i>Prepare library for performance data window</i> Note: The reason this exists, is in some situations where previous release DB files are used to collect performance data on the current release, then various problems will occur.
Open Knowledge Base	This option will open the Knowledge Base component on the default system (indicated by a checkbox in your list of IBM i Connections.)
Open New Data Viewer	Opens a new Data Viewer window. This window is used to display tables and graphs on the system. You can open iDoctor-defined reports into this window or you can also open any database file or SQL table and display the results in graph or table form.
Find Collections...	This option displays the Find Collections interface which provides the ability to look for collections matching user-defined characteristics. Example SQL statements are provided. The results of these queries are available under the General Functions -> Find collections results folder once the process completes.
Set User-Defined Reports Database	This option allows the user to view/modify the currently used user-defined reports database. The database can either be an MS Access file or a library on an IBM i. The database stores the information needed to build the user-defined tables and graphs shown in iDoctor.
Clear GUI cache	This option clears everything loaded in the GUI's cache (like menus, graph definitions, query definitions, stored procedure versions installed, etc.)
Work with iDoctor scheduled jobs	This option is a shortcut to the General functions -> Work management -> Scheduled jobs folder. It shows all the iDoctor created scheduled jobs that exist on the current IBM i system.
Collections database	The iDoctor collection database identifies all collections on the system and can be used to facilitate the drill down from one component to another in some situations.
Properties	Use this menu to display version information for the current component installed on the current system. The build level of the GUI is also displayed here.

4 Definitions

A Definitions folder is provided in PEX Analyzer to allow the user to work with the PEX Analyzer definitions on the current system. An example of this interface is:



PEX Analyzer Definitions Folder

The following options are available when right clicking on one or more definitions in the list:

Menu	Description
Change Definition...	Displays the PEX Definition Wizard that lets you change the selected PEX definition.
Add Definition...	Displays the PEX Definition Wizard that lets you add a PEX definition to your system.
Start Collection...	Displays the PEX Collection Wizard that lets you create a PEX collection on the system using the selected PEX definition.
Delete	Removes the selected definitions from the system.
Properties	Displays the properties for the selected definition. This option is only enabled if 1 definition is selected.

4.1 PEX Definition Wizard

A **PEX definition** defines most of the aspects of making a PEX collection except the following:

- When to begin making the collection
- When to end the collection
- The library where collection data is stored

PEX definitions are stored in QUSRSYS in table QAPEXDFN. Each member represents a different definition.

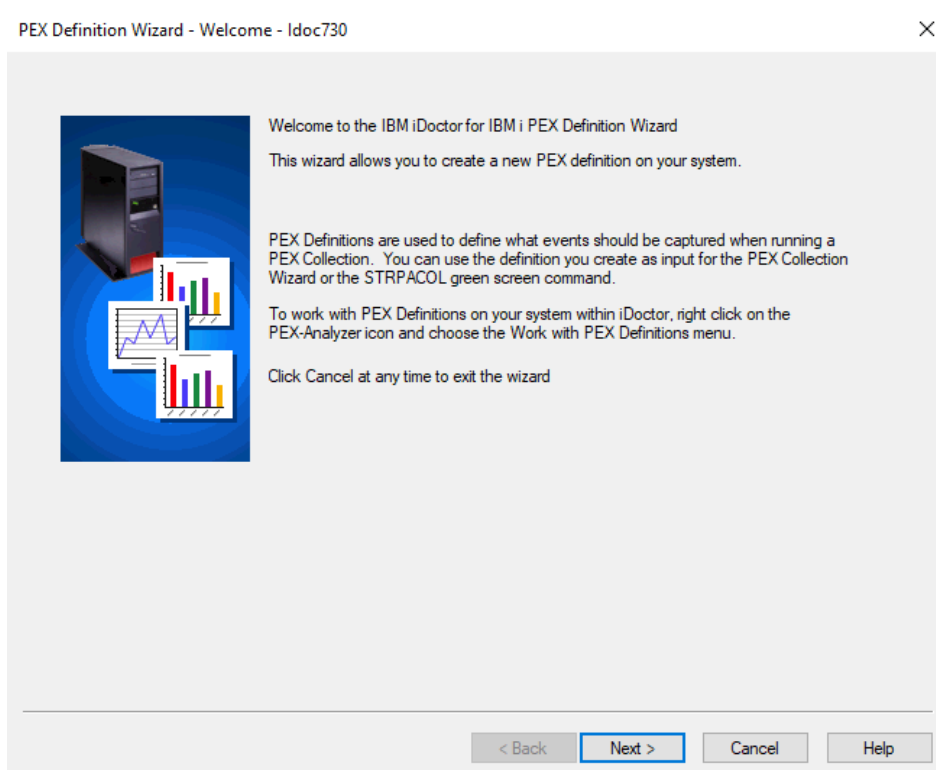
A PEX definition controls:

- Which subset of the hundreds of event types are to be activated
- Granularity of CPU sampling
- Maximum amount of data to be collected
- Subset of jobs or system tasks (or all jobs and all tasks) that are to be traced

The PEX Definition Wizard is a full-featured interface over the ADDPEXDFN IBM i command. Use the PEX Definition Wizard to create or modify a PEX definition.

4.1.1 Welcome

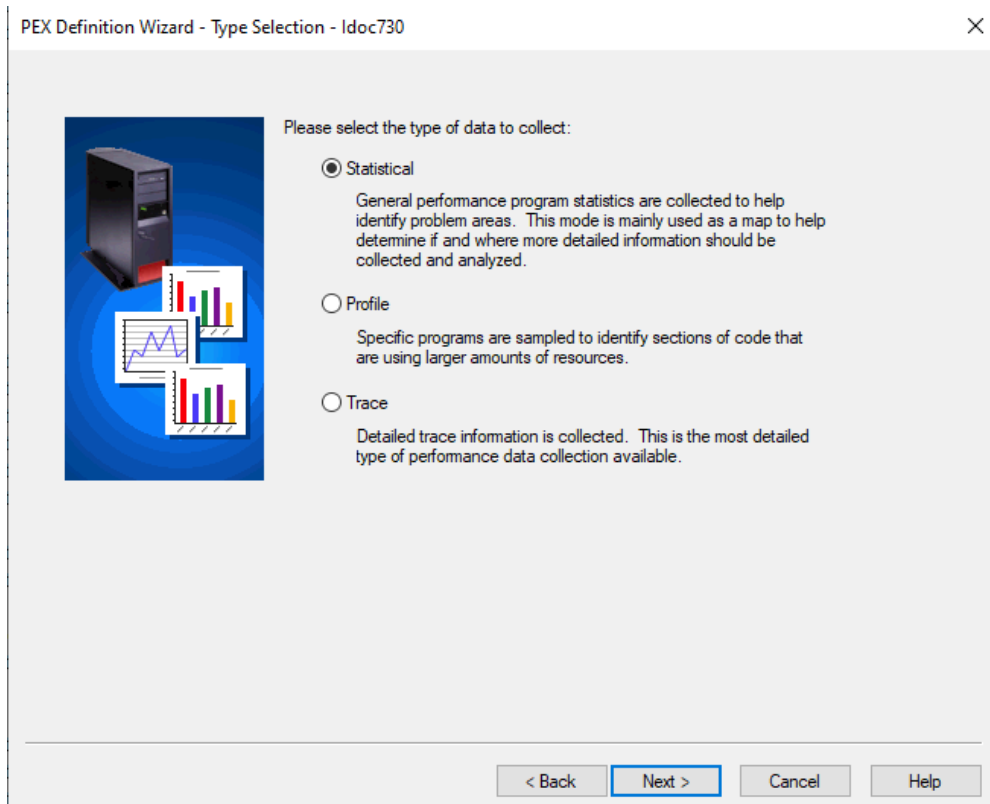
The Welcome page in the PEX Definition Wizard introduces the user to the wizard and offers information about what the wizard will do. When changing an existing PEX definition the current values will be filled into the Wizard.



PEX Definition Wizard – Welcome

4.1.2 Type Selection

The Type Selection page in the PEX Definition Wizard lets a user decide the most important characteristic about the definition; its type. The value picked adjusts the options shown on the following pages. For example, several options that are only available for trace collections will only be shown if Trace is selected.

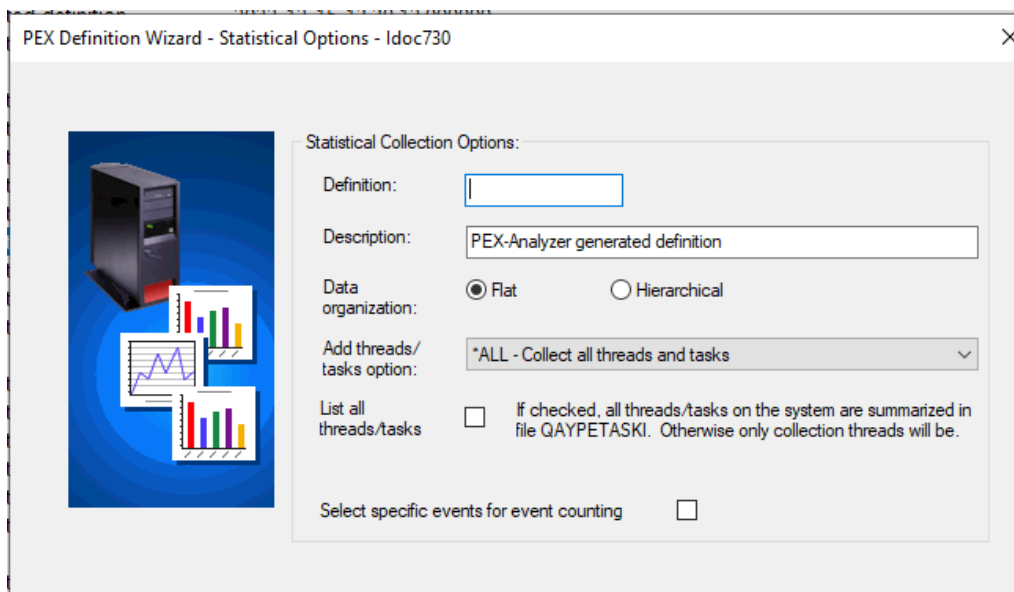


PEX Definition Wizard – Type Selection

4.1.3 Statistical Options

The Statistical Options page in the PEX Definition Wizard lets the user decide the most basic parameters for the Stats definition. This page is only displayed if Statistical was selected as the type of definition to create on the Type Selection page.

An example of the Statistical Options Page is shown below:



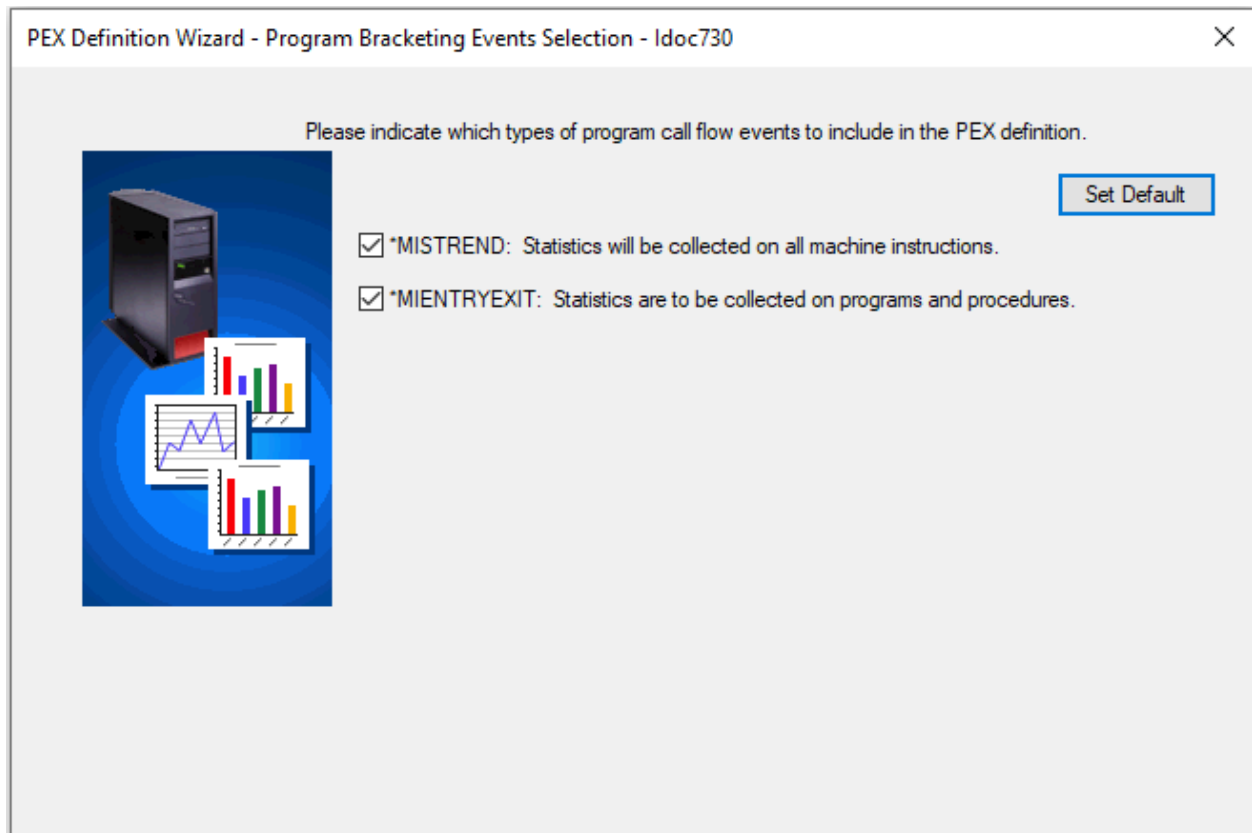
PEX Definition Wizard – Statistical Options

This table defines the parameters available on this page:

GUI Element	Description
Definition	Name of the PEX definition. This value matches the member name of the definition stored in the QUSRSYS/QAPEXDFN file.
Description	Specifies the text description for the definition.
Data Organization	Specifies how the stats data is organized. The possible values are: Flat - The statistics are collected without call levels. Hierarchical - The statistics are collected with call levels. Note: If using the “hierarchical” option be sure to limit the number of jobs specified to a small number < 10 or even just 1 job. This will be very resource intensive and likely impact performance negatively on your IBM i if this is ran against all jobs.
Add threads/tasks option	This value indicates which jobs and tasks should be included in the collection. The jobs and tasks included for all of these will be reduced if the job and task selection screen are also used. The possible values are: *ALL – All jobs and tasks will be included. *NEW – Only collect jobs and tasks created after the collection begins. *CURRENT – Only collect jobs and tasks that existed when the collect starts.
List all threads/tasks	Specifies whether summary data should be listed for all jobs and tasks in the system, or only those jobs and task specified on the job and task selection screens.
Select specific events for counting	Statistical definitions allow you to define event counters that indicate the total number of events that occurred within each counter bucket. If checked a screen to select the events to count will be shown later in the Wizard.

4.1.4 (Statistical Mode) Program Bracketing Events Selection

When creating a PEX Stats definition, this page lets you decide which program call flow events to include. Check the box next to each type of program call flow events to include them in the definition.



PEX Definition Wizard - Program Bracketing Events Selection (Client 1618+)

The following table summarizes the possible program bracketing event groups:

Event Group	Description
*MISTREND	Statistics are to be collected on all machine instructions.
*MIENTRYEXIT	Statistics are to be collected on programs and procedures. This includes any program that has been compiled at optimization level 30 or below. Optimization level 40 programs are also enabled, but only for procedures that stack a frame on the invocation stack when called (non-leaf procedures).

Use the Set Default button to update the selections on this screen to the default values (both checked.)

4.1.5 (Statistical Mode) Event Selection

This page lets you decide which events to include in the stats counters during collection. There are 8 counters when working with a stats definition and multiple events can be assigned to the same counter bucket if desired. The purpose of the counter buckets is to provide the total occurrences of all the events specified in each bucket.

PEX Definition Wizard - Event Selection - Idoc730

Please select the events to include in your PEX definition.

Category: Database events Counter: 8 Add Event(s)

Category events:

Event	Short name
Database Optimizer 2	*OPTIMIZER2
Database DASD Meter	*DASDMETER
Database I/O	*IO
Database Runtime	*RUNTIME
Database Seize/Lock	*SEIZELOCK

Events to collect: Remove All Remove Selected

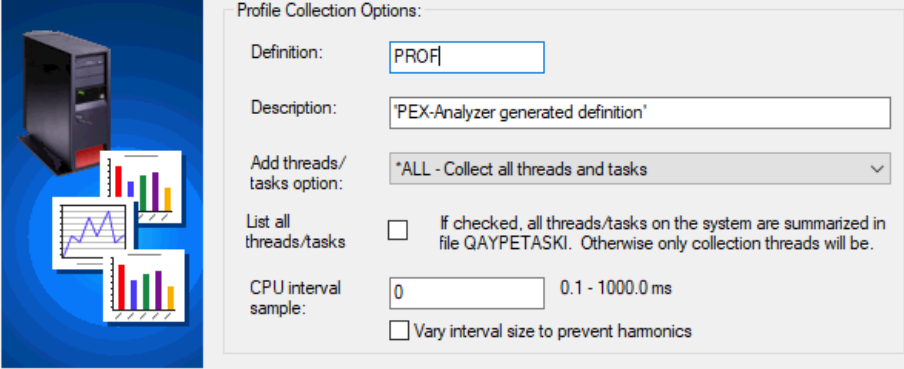
Counter	Category	Event	Short name
8	Database events	Database I/O	*IO
8	Database events	Database Runtime	*RUNTIME
8	Database events	Database Seize/Lock	*SEIZELOCK

PEX Definition Wizard – (Statistical Mode) Event Selection

4.1.6 Profile Options

The Profile Options page in the PEX Definition Wizard lets the user decide the main parameters for the Profile mode definition. This page is only displayed if Profile was selected as the type of definition to create on the Type Selection page.

An example of the Profile Options Page is shown below:



Profile Collection Options:

Definition:

Description:

Add threads/tasks option:

List all threads/tasks ☐ If checked, all threads/tasks on the system are summarized in file QAYPETASKI. Otherwise only collection threads will be.

CPU interval sample: 0.1 - 1000.0 ms

☐ Vary interval size to prevent harmonics

PEX Definition Wizard – Profile Options

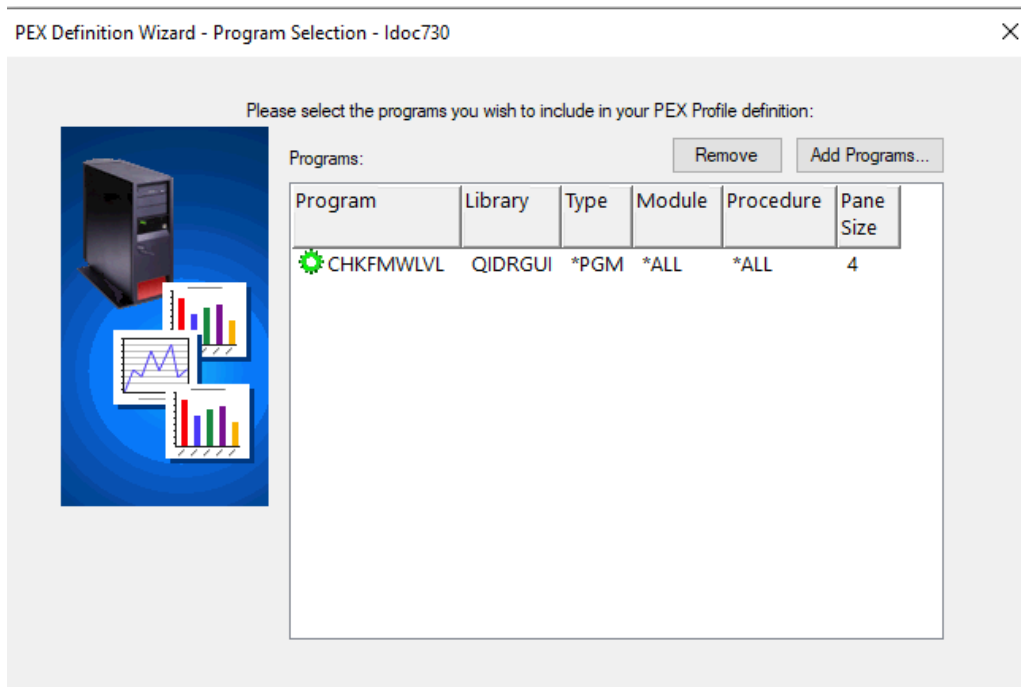
This table defines the parameters available on this page:

GUI Element	Description
Definition	Name of the PEX definition. This value matches the member name of the definition stored in the QUSRSYS/QAPEXDFN file.
Description	Specifies the text description that describes the PEX definition.
Add threads/tasks option	This value indicates which jobs and tasks should be included in the collection. The jobs and tasks included for all of these will be reduced if the job and task selection screen are also used. The possible values are: *ALL – All jobs and tasks will be included. *NEW – Only collect jobs and tasks created after the collection begins. *CURRENT – Only collect jobs and tasks that existed when the collect starts.
List all threads/tasks	Specifies whether summary data should be listed for all jobs and tasks in the system, or only those jobs and task specified on the job and task selection screens.
CPU Interval Sample	Specifies the size of the interval for the CPU samples taken during collection. A low interval will cause a high number of samples to be taken, and will also cause higher overhead. A low interval will also provide relatively more data.

4.1.7 (Profile Mode) Program Selection

The program selection page allows the user to select up to 16 program/module/procedure entries when creating a PEX Profile definition.

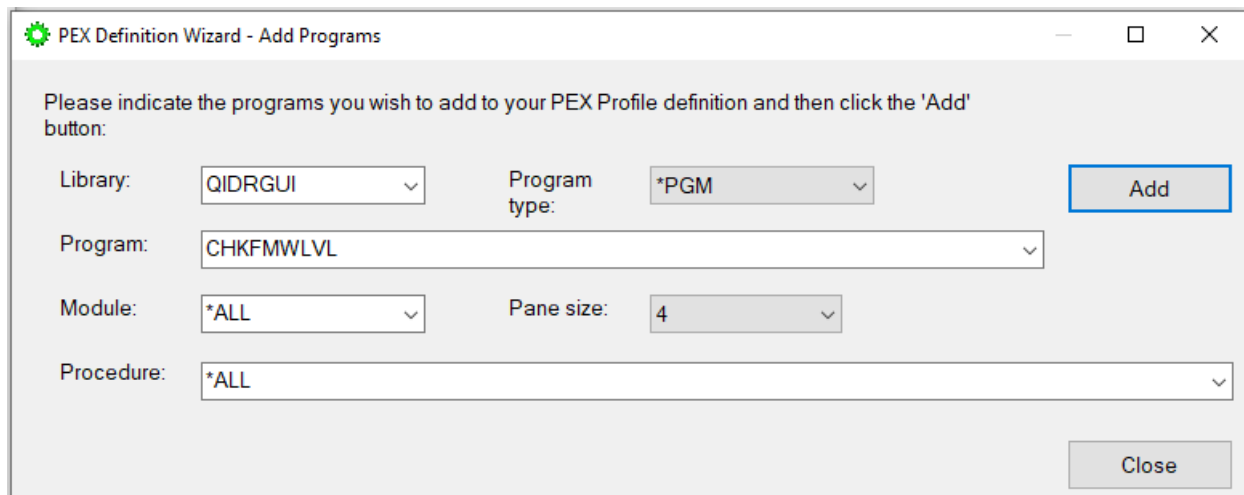
This page displays a list of selected program information to be captured in the PEX definition. There are also two buttons on this page used to add or remove programs from the list.



PEX Definition Wizard - Program Selection

4.1.8 (Profile Mode) Add Programs Window

The add programs window allows a user to browse any programs/service programs on the system for the purpose of adding them to a PEX Profile definition. After finding the programs you want to add to the collection click the Add Selected button to add the selected program/module/procedure to the list. If a program is an ILE program you will see the modules contained within the program in the modules list. If desired select on these modules to see procedure entries found in the module. By selecting a specific program/module/procedure combination you can collect information only about the procedure(s) you are interested in.



PEX Definition Wizard - Add Programs Window

Note: The pane size is the number of consecutive program instruction addresses assigned to each counter. The smaller the pane size, the more fine-grained the program profile information will be.

4.1.9 Trace Options

The Trace Options page in the PEX Definition Wizard lets the user decide the main parameters for the Trace mode definition. This page is only displayed if Trace was selected as the type of definition to create on the Type Selection page.

An example of the Trace Options Page is shown below:

PEX Definition Wizard - Trace Options - Idoc730

Definition:

Description:

Trace type: ☐ Select specific events/MI instructions

Event groups:

☒ *CALLRTN	☐ *BASIC	☐ *DSKIO1	☐ *DSKIO2
☐ *DSKSVR	☐ *DSKSTG	☐ *VRTADR	☐ *PGMACT
☐ *FILEOPEN	☐ *PRFDTA	☐ *TASKSWT	☐ *HEAP

Maximum data to collect: 1024 - 250000000 KB

Trace full action: ☒ Stop trace ☐ Wrap data

Add threads/tasks option:

List all threads/tasks ☐ If checked, all threads/tasks on the system are summarized in file QAYPETASKI. Otherwise only collection threads will be.

CPU interval sample: 0.1 - 200.0 ms -or- blank for none

☐ Vary interval size to prevent hamonics

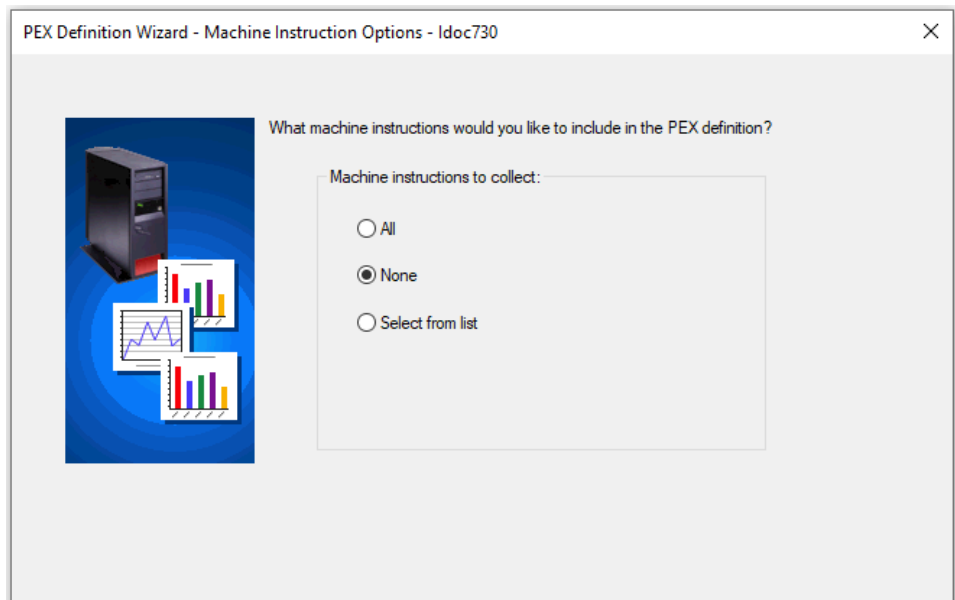
PEX Definition Wizard – Trace Options

This table defines the parameters available on this page:

GUI Element	Description
Definition	Name of the PEX definition. This value matches the member name of the definition stored in the QUSRSYS/QAPEXDFN file.
Description	Specifies the text description that describes the PEX definition.
Select specific events	This checkbox toggles the interface between selecting individual PEX events or PEX event groups. If individual PEX events are to be selected, this is done later in the Wizard.
Maximum data to collect	The maximum amount of disk space the collection should consume in kilobytes. The default value is 500,000.
Trace full action	The action to take if the maximum data to collect value is reached. The choices are to either suspend/stop the collection or wrap the data. If the data is wrapped the oldest trace records will be overwritten with the newest ones.
Add threads/tasks option	This value indicates which jobs and tasks should be included in the collection. The jobs and tasks included for all of these will be reduced if the job and task selection screen are also used. The possible values are: * ALL – All jobs and tasks will be included. * NEW – Only collect jobs and tasks created after the collection begins. * CURRENT – Only collect jobs and tasks that existed when the collect starts.
List all threads/tasks	Specifies whether summary data should be listed for all jobs and tasks in the system, or only those jobs and task specified on the job and task selection screens.
CPU Interval Sample	Specifies the size of the interval for the CPU samples taken during collection. A low interval will cause a high number of samples to be taken, and will also cause higher overhead. A low interval will also provide relatively more data.

4.1.10 (Trace Mode) Machine Instruction Options

This screen is shown when creating a PEX trace definition in order to decide if MI instructions should be included in the collection.



PEX Definition Wizard – Machine Instruction Options

Note: If the “Select from list” option is used, another screen is shown next to allow you to pick individual MI instructions.

4.1.11 (Trace Mode) Event Selection

This page lets you decide which events to include in the trace collection. Some trace events have different formats that can be collected. This is specified using the Format drop down list in the interface.

For example, the PMCO event format 2 would include a 16-level deep call stack. Format 4 PMCO is used for cacheline information reports. PMCO format 1 should generally NOT be collected as it contains no call stack.

Many additional PEX format 2 events will capture call stacks. Some examples are: *TASKSWTOUTQ, *CRTSEG, *DLTSEG, *EXDSEG, *TRUNCSEG, *ACTGRPCRT, *DBIO and *DBOPEN.

PEX Definition Wizard - Event Selection - Idoc730 ✕

Please select the events to include in your PEX definition.

Category: Disk events Format: 1 Add Event(s)

Category events:

Event	Short name
All Disk Events	*ALL
All Disk Start Events	*ALLSTR
Service	*SERVICE
Read Start	*READSTR
Read End	*READEND

Events to collect: Remove All Remove Selected

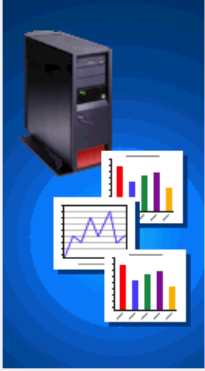
Format	Category	Event	Short name
1	Disk events	All Disk Events	*ALL

PEX Definition Wizard – (Trace Mode) Event Selection

4.1.12 Job/Task Options

On this page you may decide which jobs and tasks should be included in the PEX collection. Selecting specific jobs and tasks is optional, but is often recommended depending on the events selected to reduce the overall size of the collection.

PEX Definition Wizard - Job Task Options - Idoc730



You have the option to collect over all active jobs and/or tasks on the system at the time of collection or to only collect data for specific jobs/tasks.

Job selection:

☒ All jobs
 ☐ Selected jobs
 ☐ Current job

Task selection:

☐ All tasks
 ☐ Selected tasks
 ☒ None

PEX Definition Wizard - Job/Task Options

If Selected Jobs or Selected Tasks are picked on this window, then the Job Selection and/or Task Selection pages will be shown next.

4.1.13 Job Selection

The job selection page displays a list of selected job information to use in the PEX definition. There are also two buttons on this page used to add or remove jobs from the list.

PEX Definition Wizard - Job Selection - Idoc730

Indicate the job selection criteria to include in your collection below:



Job selection criteria:

Job Name	User	Number	Thread IDs	Subsystem
 QIDRJWSUM	*ALL	*ALL		

PEX Definition Wizard - Job Selection

4.1.13.1 Add Jobs Window

The add jobs window allows a user to add jobs to the Job Selection page in the wizard. Job information can be of two types: generic job name/generic job user/generic job number -or- job name/job user/job number.

The "Job Information" portion of the window includes text fields used to define a generic job to add to the Job Selection Page or to use as a filter when refreshing the list of jobs shown in the window. The Add button will add the current generic job to the Job Selection page and the Add Selected button will add the selected jobs from the active jobs list to the Job Selection page.

Indicate the jobs to include in your collection below:

Job Information:

Name: User: Number:

Current user: Subsystem filter: Status:

Jobs matching the job filter information:

Job name (JBNAME)	Job user profile (JBUSER)	Job number (JBNBR)	Job type (JOB_TYPE)	Active job status (ACTIVE_JOB_STATUS)	Threads (THREAD_COUNT)	Priority (RUN_PRIORITY)	Current user (CURUSER)	Elaps CPU time (ELAP)
QZBSEVTM	QUSER	320915	autostart	EVTW	1	50	QUSER	
QZDAINIT	QUSER	320942	prestart	PSRW	1	20	QUSER	
QZRCRSVS	QUSER	320951	prestart	TIMW	1	20	QSECOFR	
QZDASOINIT	QUSER	320959	prestart	TIMW	1	20	QSECOFR	
QZLSFILE	QUSER	320967	prestart	PSRW	1	20	QUSER	
QZRCRSVR	QUSER	320974	prestart	PSRW	1	20	QUSER	
QZSCSRVR	QUSER	320980	prestart	PSRW	1	20	QUSER	
QZRCRSVS	QUSER	321107	prestart	TIMW	1	20	QSECOFR	
QZLSSERVER	QPGMR	321118	batch	EVTW	3	20	QPGMR	
QZSCSRVSD	QUSER	321125	batch	SELW	1	20	QUSER	

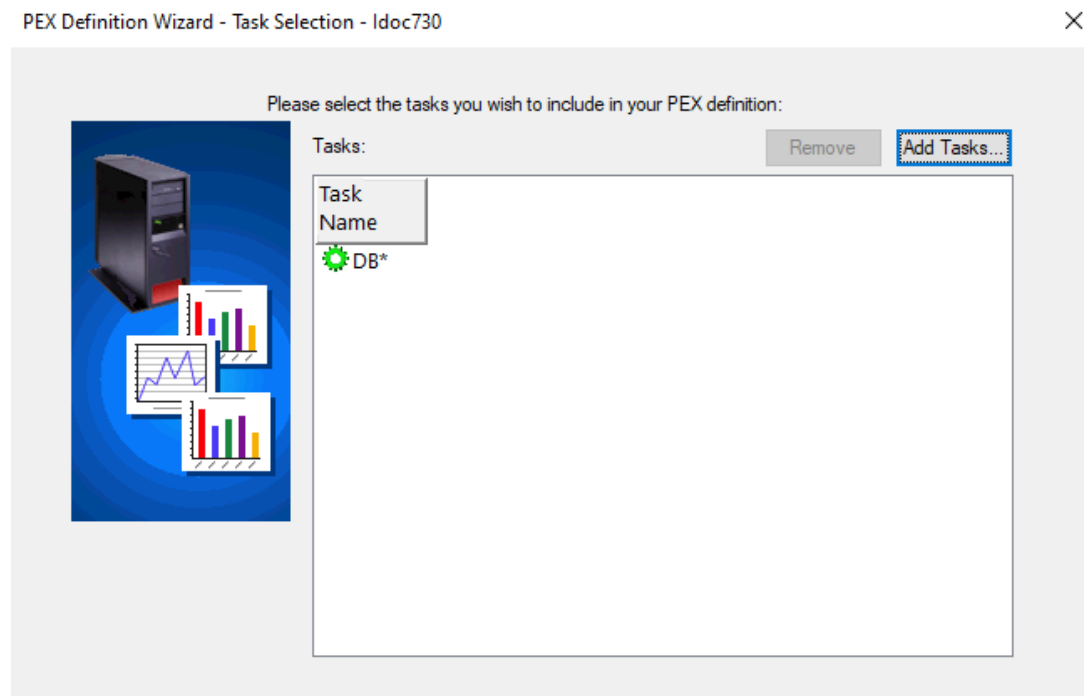
PEX Definition Wizard - Add Jobs Window

The table below summarizes the different elements on this page:

Field	Description
Name	A text field for entering a generic or specific job name. When specifying a generic name use a * at the end of the job name.
User	A text field for entering a generic or specific job user. When specifying a generic name use a * at the end of the job user name.
Number	A text field for entering a specific job number or *ALL.
Current user	A text field that allows you to filter the list of jobs shown (on this screen, not in the definition) based on the current user profile of the jobs.
Add button	This button will add the current job name/user/number values in the text fields to the Job Selection page. This can be used to add a generic job name/user/number value such as QZ*/MCCARGAR/*ALL. This value indicates all job names starting with QZ, for job user MCCARGAR.
Refresh button	This button is used to refresh the active jobs list based on the current values specified in the name, user and number text fields.
Add Selected button	Use this button to add the selected active jobs to the Job Selection Page.
Active jobs matching job information list	This list shows all active jobs on the system matching the current Job information specified.

4.1.14 Task Selection

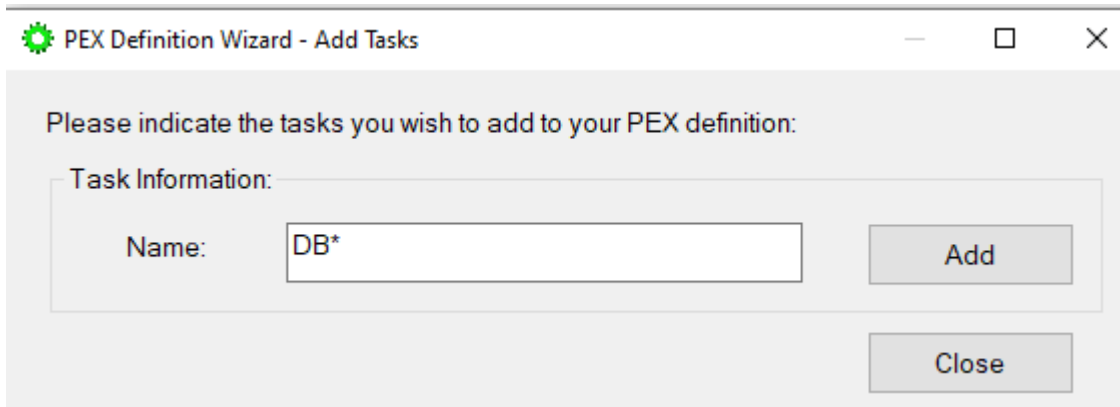
The task selection page displays a list of selected tasks to include in the PEX definition. There are also two buttons on this page used to add or remove tasks from the list.



PEX Definition Wizard - Task Selection

4.1.14.1 Add Tasks Window

The add tasks window allows a user to add tasks to the Task Selection page in the wizard. The task name can either be *ALL, *NONE, a generic task name like Q*, or a specific task name. Change the task name field and click the add button for each task that you would like to include in your PEX definition.



PEX Definition Wizard - Add Tasks

Please indicate the tasks you wish to add to your PEX definition:

Task Information:

Name:

Add

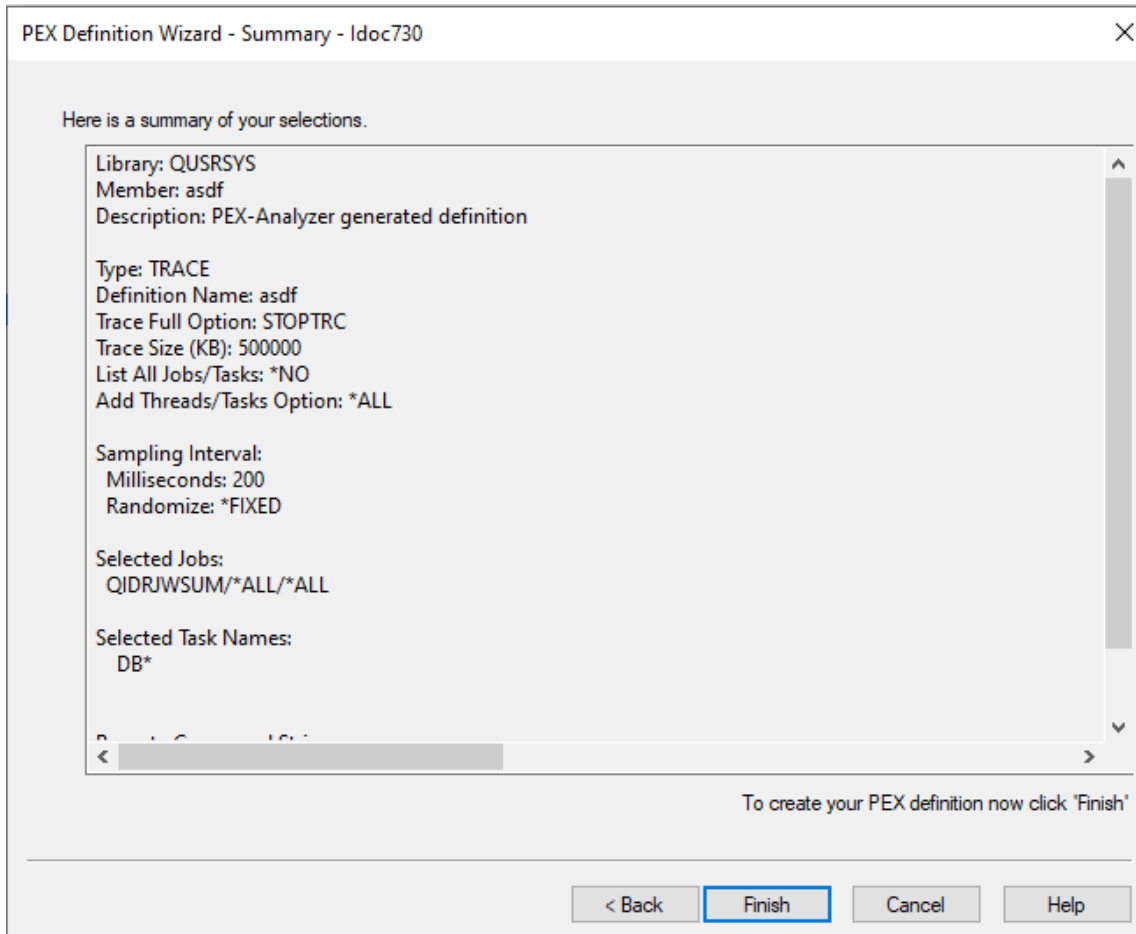
Close

PEX Definition Wizard - Add Tasks Window

4.1.15 Summary

The summary page of the PEX Definition Wizard presents a summarization of all of the input provided in the wizard. It lists all of the details about the type of PEX definition to create or change, as well as the selected jobs or tasks, and the events to include

To create the PEX definition as defined click on the Finish button. After creating your definition you can use the PEX Collection Wizard to create a PEX collection using the new PEX definition.



PEX Definition Wizard - Summary - Idoc730

Here is a summary of your selections.

Library: QUSRSYS
Member: asdf
Description: PEX-Analyzer generated definition

Type: TRACE
Definition Name: asdf
Trace Full Option: STOPTRC
Trace Size (KB): 500000
List All Jobs/Tasks: *NO
Add Threads/Tasks Option: *ALL

Sampling Interval:
Milliseconds: 200
Randomize: *FIXED

Selected Jobs:
QIDRJWSUM/*ALL/*ALL

Selected Task Names:
DB*

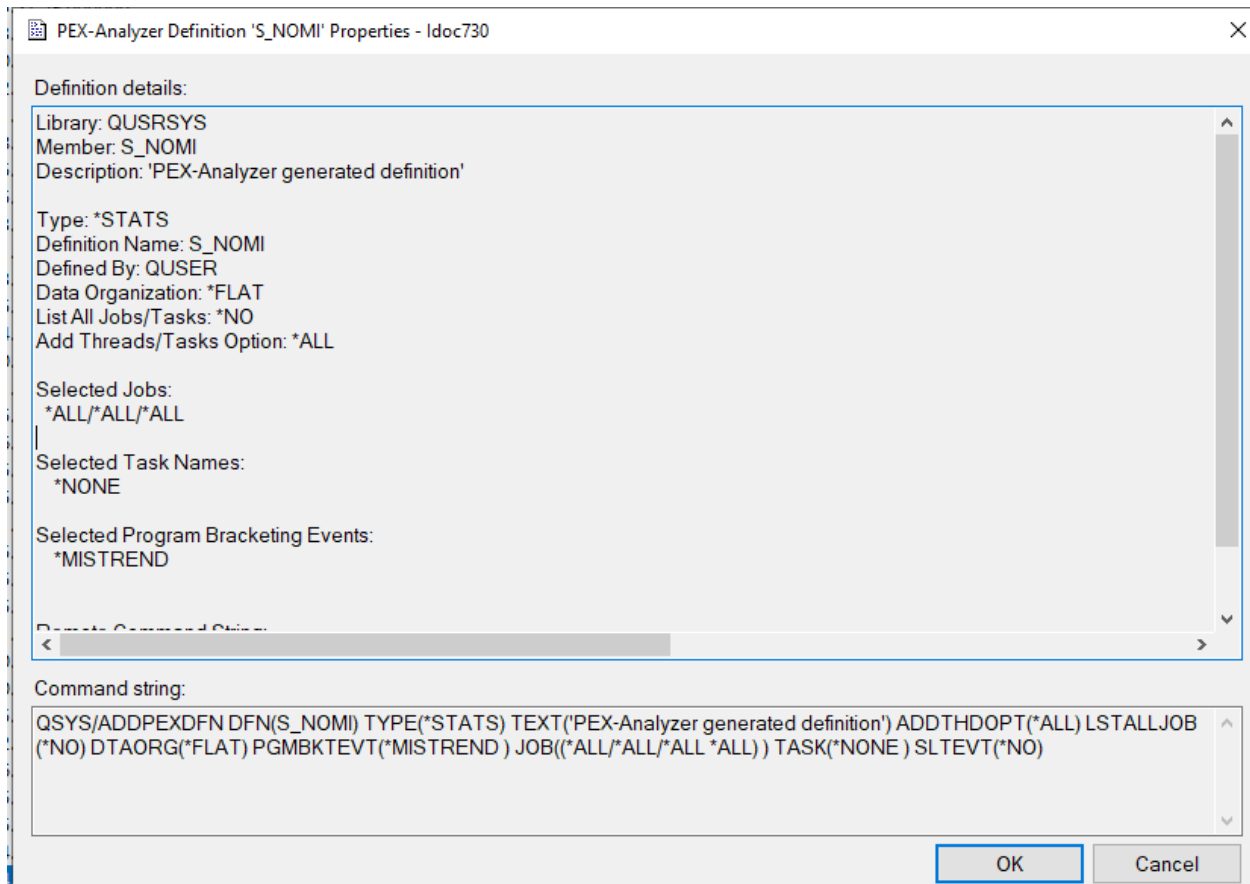
To create your PEX definition now click 'Finish'

< Back Finish Cancel Help

PEX Definition Wizard - Summary

4.2 Properties

Double-clicking on a definition or using the Properties menu from the PEX Analyzer Definitions View displays all of the parameters that were used when creating the definition. An example of this interface is:



PEX Analyzer Definition Properties

Tip: At the bottom of this view, is the command string that was used to create the definition. This allows you to copy and paste to the green screen on another system to create the same definition there.

5 PEX Collection Wizard

Using PEX Analyzer there are two ways to create a new PEX collection. You can either use the PEX Collection Wizard in the GUI or you can use the QIDRPA/STRPACOL green screen command. This section covers the PEX Collection Wizard in the GUI.

Note: A 3rd way to create a PEX collection without using iDoctor is via the ADDPEXDFN, STRPEX and ENDPEX commands.

PEX Collections are created using a PEX definition. [Definitions](#) can be created using the green screen ADDPEXDFN command or via the PEX Definition Wizard, also available in the GUI. PEX Analyzer ships several commonly used PEX definitions called 'PEX Analyzer-supplied' PEX definitions. There are several different PEX Analyzer-supplied definitions that cover the most basic problem types.

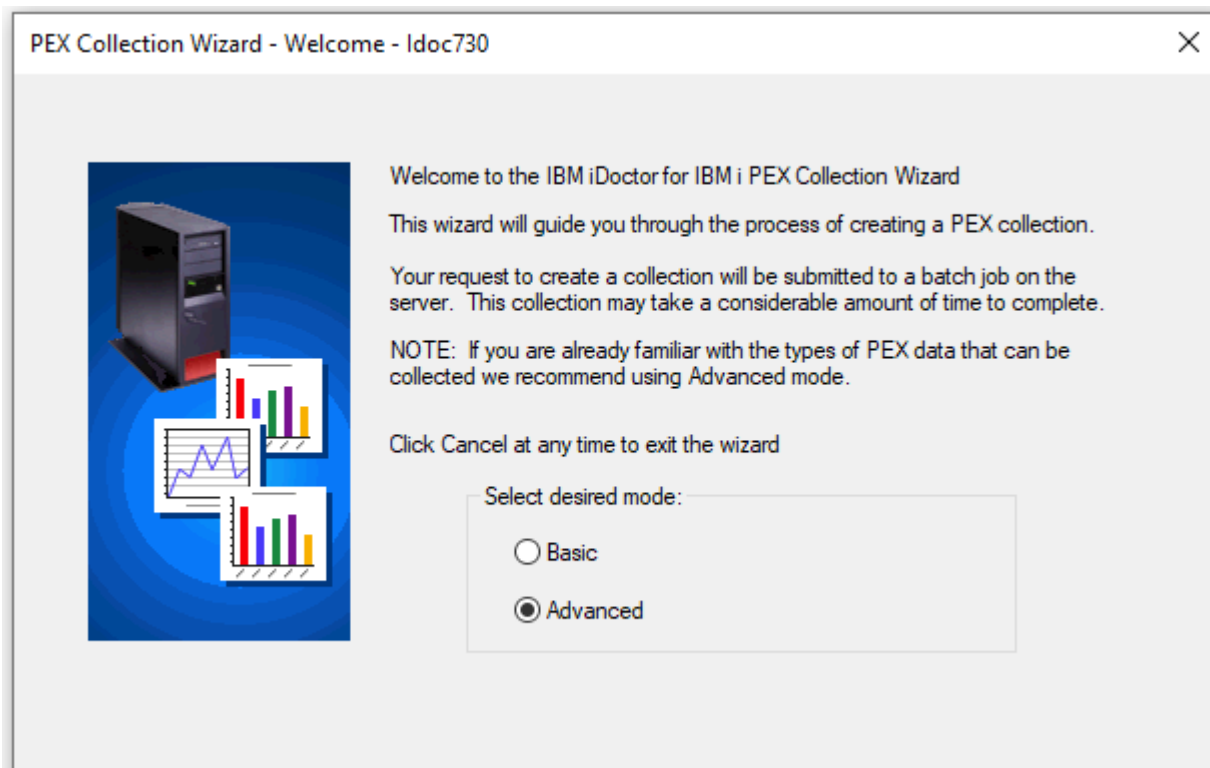
PEX definitions are used to define the specific types of events to capture on the system.

You can access the PEX Collection Wizard using the Create PEX Collection popup menu when right-clicking on either the PEX Analyzer icon or a library icon.

PEX Collections are created from a batch job on the server (job name QIDRPACOL). Depending on the type of data collected, the number of events collected, and the size of the system, the collection could take anywhere from 30 seconds to many hours to collect and dump the data into the collection's database files. For this reason, it is important to keep the total time of collection (the Duration parameter) as small as possible and to only collect events that you intend to analyze.

5.1 Welcome

The Welcome page in the PEX Collection Wizard introduces the user to the wizard and offers information about what the wizard will do. From here a user can decide which mode to run the wizard in: basic or advanced. Basic mode will follow with a series of questions designed to help a user determine what type of PEX Analyzer-supplied definition best fits the type of performance problem they are having. Advanced mode skips the questions and goes right into the Collection Options page.

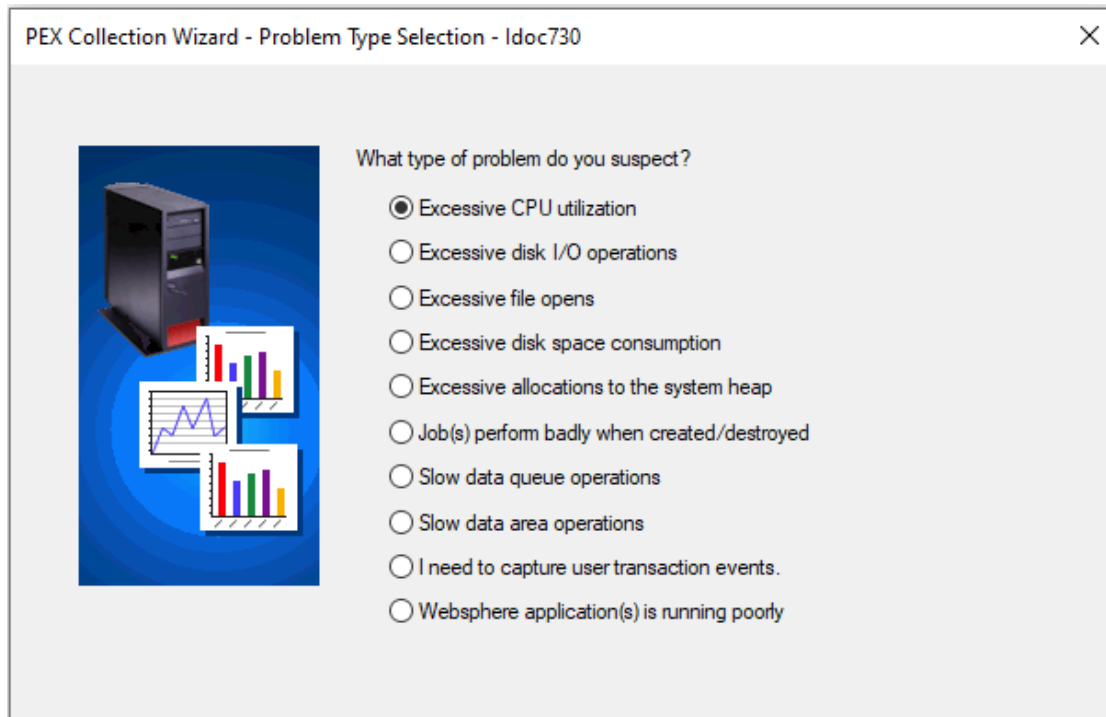


PEX Collection Wizard - Welcome

5.2 (Basic Mode) Problem Type Selection

The Problem Type Question Pages present a series of questions designed to help a user more easily determine the type of PEX Analyzer-supplied definition to use. These question pages are only shown when running the Wizard in Basic mode. An expert would typically use Advanced mode and skip these questions. Each set of responses on these pages leads to a single PEX Analyzer-supplied definition. This definition will be automatically selected on the Collection Options Page once definition is determined.

The questions will follow a flow from general categories of problems like the page shown below down to very specific questions that when answered will determine exactly which PEX Analyzer-supplied definition best fits the situation.



PEX Collection Wizard - Problem Type Selection

5.3 Options

The Options Page allows the user to specify the most basic pieces of information about a collection like the PEX definition to use when creating the collection, the name of the collection, library to store the collection in, and more.

PEX Collection Wizard - Options - Idoc730



Collection Options:

Definition type: ☒ PEX-Analyzer-supplied ☐ User-defined

Definition: *STATSFAT Details...

☐ Start in standby (suspended) mode

Collection name:

Library: QPADATA

Description:

Duration: 10 1 - 1440 minutes

Maximum events to collect: Leave blank for no max

Advanced options: Configure...

Scheduled start time: Configure... Immediate

< Back Next > Cancel Help

PEX Collection Wizard - Options

The following table provides more information about each of the criteria available on this page:

Field	Description
Definition Type	This indicates if the PEX definition will be PEX Analyzer-supplied or user-defined. You can define your own PEX definition using the PEX Definition Wizard or via the ADDPEXDFN command. If you select the user-defined option you can click the Details.. button to quickly see all the details for the PEX definition. When using a user-defined PEX definition the rest of the selection pages in the Wizard like Job selection and Task selection are skipped. This is because any Job or Task criteria will come from the PEX definition.
Definition	The name of the PEX Analyzer-supplied or user-defined PEX definition. You must select a value from the list. In Basic mode this field will be selected based on the answers to the problem type questions. Note: When using a PEX Analyzer-supplied definition named something like *CPU the * is replaced with Q (i.e. *CPU -> QCPU.) Any existing definition on the system is replaced before running the STRPACOL command.
Details button	Displays the properties for the selected user-defined definition.
Start in standby mode option	Check this box to create the collection but to have it be initially in suspended mode. This option is useful if you need to start the collection at a more exact time (right after a test program is called perhaps) because resuming a suspended collection is much faster than starting a new one
Collection name	The name of the PEX collection. The collection name matches the member name created in each of the PEX files stored in the library.
Library name	The name of the library to create the PEX collection in.
Description	A description to give the PEX collection.

Duration (minutes)	The total amount of time to spend collecting data. This value is listed in minutes and must have a value from 1 to 1440. Certain definition types like task switch can generate many million events in a relatively short amount of time. Make sure this value is not too large to avoid ending up with much more data than desired.
Maximum data to collect	The maximum amount of disk space this collection should use in kilobytes. The default value is 500,000. This parameter only applies to PEX Analyzer-supplied Trace mode definitions. When using a user-defined PEX trace definitions this parameter is ignored because it is provided within the PEX trace definition.
Maximum events to collect	If this option is used, then periodically an API call is done to check if the number of events collected thus far has exceeded the desired maximum. Once the maximum has been reached the collection will end.
CPU interval sample	Specifies the size of the interval which CPU samples are taken of the program. A low interval will cause a high number of samples to be taken, and will also cause higher overhead. A low interval will also provide relatively more data. This parameter will be grayed out if it does not apply to the selected PEX Analyzer-supplied definition.
Advanced options	This option allows you to configure advanced options that are typically only used by IBM support personnel.
Scheduled start time	This option allows you to schedule when the collection should start.

5.3.1 Advanced Options

This page allows you to configure advanced options when creating the PEX collection. An example of this interface is shown below:

Advanced Options

Advanced Options:

Job queue name:	QIDRJW
Job queue library:	QGPL
Output format:	PEX DB files (QAYPE*)
ENDPEX job priority:	51 10 - 99
Number of threads for ENDPEX:	*CALC 1 - 256 or *CALC
PEX filter:	*NONE Details...
Collect system information:	Yes
Wrap trace: (if max size reached)	No
PMCO format:	2

OK Cancel

PEX Collection Wizard – Advanced Options

Field	Description
Job queue name	The job queue that the collection job will be submitted to.
Job queue library	The library of the job queue that the collection job will be submitted to.
Output format	Indicates if the collection should be created into the typical PEX database files or into a management collection object. Tip: Create the collection as a management collection object if you wish to send the collection to another system. Use the convert option to generate the database files for a PEX management collection object (*MGTCOL).
ENDPEX job priority	This value controls the run priority of the job/threads created for use by the ENDPEX processing of the collected data. The default value is 51, change as you feel is appropriate.
Number of threads for ENDPEX	With the default value of '*CALC', ENDPEX will determine an appropriate number of threads to use when the data is being dumped into the collection files. You can supply a value of between 1 and 256 depending on the impact that you wish on the system when the data is being dumped.
PEX filter	The filter (if desired) to use with the PEX collection in order to limit the number of events collected. The drop down list contains all the filters that currently exist on the system. Press the Details button to see the Properties for the selected PEX Filter.
Collect system information	With the default value of 'Yes', WRKSYSSTS and WRKDSKSTS information is collected and saved into two files, SMTRSTS and SMTRDTS in the collection library. The member names in each file will be the same as the collection name. This information can give you insight into what the system was doing during the collection of the PEX data.
Wrap trace	By default, the collection will end if the maximum size to collect is reached. Selecting 'Yes' will cause the collection to wrap should this occur such that the oldest events are discarded for the newest ones. Note: Collections that wrap can cause difficulty in performing analysis with PEX Analyzer.
PMCO format	This allows you to specify here the desired PMCO event format (2-4 only). Note: This only applies when using a PEX Analyzer supplied definition. When using a user-defined definition, this must be set in the definition before using this interface.

5.3.2 Scheduling Options

This page allows the user to determine a specific date and time for the collection to begin. By clicking the checkbox the user can optionally include a date/time to schedule the collection. This option will create a scheduled job on the system.

Use the iDoctor Scheduled Jobs window to check the status of scheduled iDoctor jobs on the system. Access that window by right clicking the PEX Analyzer icon in the PEX Analyzer component view.

An example of this page of the Wizard is:

 Schedule collection start time
 ✕

Use this interface to schedule an action for a later time.

☒ Schedule the collection start time

Note: Date and time values are based on the server's clock, not your PC's clock.

Frequency: Once

Scheduled date:

June 2023

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	1
2	3	4	5	6	7	8

Today: 6/6/2023

Current (system) time: 8:33:39 AM Idoc730

Scheduled collection start time: 9:29:08 AM

OK Cancel

PEX Collection Wizard – Schedule Collection Start Time

5.4 (Trace Mode) Trace Additional Events

This page is only shown when the PEX Analyzer-supplied definition is one that generates a PEX Trace collection. You will not see this page when creating a collection using a user-defined PEX definition.

The list contains additional event groups that can be added to the collection. The more event types you select the more data that will get generated and the longer it will take for your collection to finish processing the data into output files.

PEX Collection Wizard - Trace Additional Events - Idoc730

Please check the additional PEX Trace event groups that you wish to collect.

NOTE: The more event types you select the more data that will get generated and the longer it will take for your collection to finish processing the data into output files.

Description	Event Group
☐ Activation group he...	*ACTGRPHP
☐ All heap storage	*HEAPALL
☐ Communications	*COM
☐ CPU switch	*CPUSWT
☐ Data areas	*DTAARA
☐ Data queues	*DTAQ
☐ Database logical I/O	*DB_LDIO
☐ DB file opens	*DB_OPEN
☐ Domino trace	*DOMINOTRC
☐ Handle-based heap	*HDLHEAP
☐ ILE activation group	*ILEACTGRP
☐ Integrated file system	*IFSEVTS
☐ Java program entry...	*JVAENTRYEXIT
☐ Local heap	*LCLHEAP

< Back **Next >** Cancel Help

PEX Collection Wizard - Trace Additional Events

5.5 Job/Task Options

On this page you may decide if you would like to select specific jobs or tasks to include in the PEX collection. Selecting specific jobs and tasks is optional, but is necessary when you only want to collect data for the job(s) or task(s) you are interested in.

PEX Collection Wizard - Job/Task Options - Idoc730

You have the option to collect over all active jobs and/or tasks on the system at the time of collection or to only collect data for specific jobs/tasks.

Job selection:

☒ All jobs ☐ Selected jobs ☐ None

Task selection:

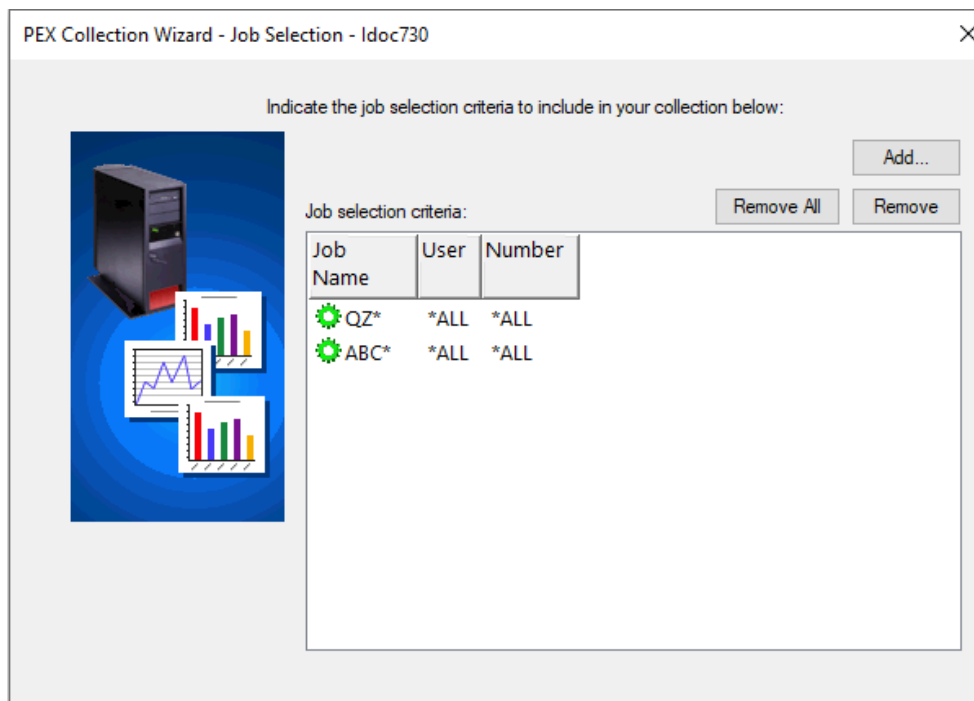
☐ All tasks ☐ Selected tasks ☒ None

PEX Collection Wizard - Job/Task Options

If Selected Jobs or Selected Tasks are picked on this window, then the Job Selection and/or Task Selection pages will be shown next.

5.6 Job Selection

The job selection page displays a list of selected job information to use in the PEX collection. There are also two buttons on this page used to add or remove jobs from the list.



PEX Collection Wizard - Job Selection

5.6.1 Add Jobs Window

The add jobs window allows a user to add jobs to the Job Selection page in the wizard. Job information can be of two types: generic job name/generic job user/generic job number -or- job name/job user/job number.

The "Job Information" portion of the window includes text fields used to define a generic job to add to the Job Selection Page or to use as a filter when refreshing the list of jobs shown in the window. The Add button will add the current generic job to the Job Selection page and the Add Selected button will add the selected jobs from the active jobs list to the Job Selection page.

IBM iDoctor for IBM i

Add Jobs - Idoc730

Indicate the jobs to include in your collection below:

Job Information:

Name: User: Number:

Current user: Subsystem filter: Status:

Jobs matching the job filter information:

Job name (JBNAME)	Job user profile (JBUSER)	Job number (JBNBR)	Job type (JOB_TYPE)	Active job status (ACTIVE_JOB_STATUS)	Threads (THREAD_COUNT)	Priority (RUN_PRIORITY)	Current user (CURUSER)	Elapsed CPU time (m) (ELAPSE)
QZDASOINIT	QUSER	328025	prestart	RUN	1	20	MCCARGAR	
QZDAINIT	QUSER	320942	prestart	PSRW	1	20	QUSER	
QZDASOINIT	QUSER	320959	prestart	TIMW	1	20	QSECOFR	
QZDASRVSD	QUSER	321131	batch	SELW	1	20	QUSER	
QZDASOINIT	QUSER	328026	prestart	TIMW	1	20	MCCARGAR	
QZDASOINIT	QUSER	328112	prestart	PSRW	1	20	QUSER	
QZDASOINIT	QUSER	328113	prestart	PSRW	1	20	QUSER	
QZDASSINIT	QUSER	328137	prestart	PSRW	1	20	QUSER	
QZDASSINIT	QUSER	328138	prestart	PSRW	1	20	QUSER	

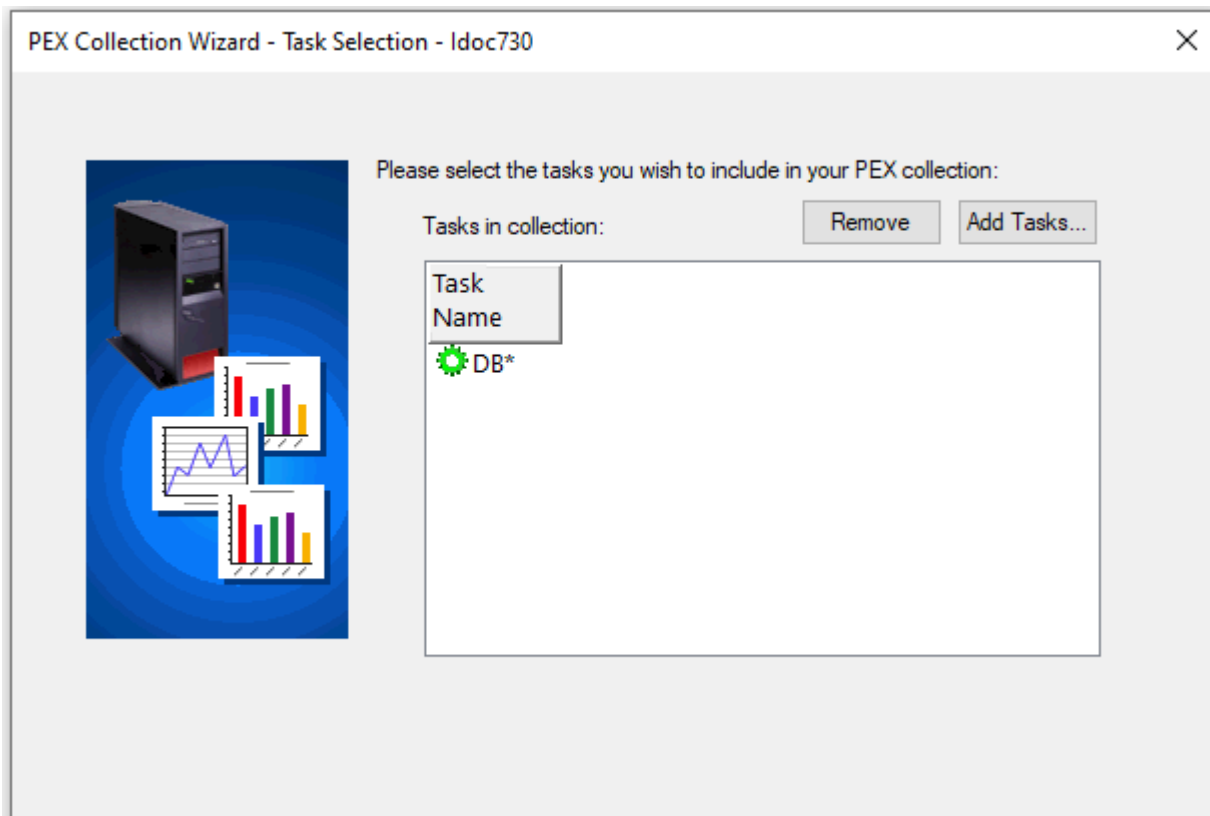
PEX Collection Wizard - Add Jobs Window

The table below summarizes the different elements on this page:

Field	Description
Name	A text field for entering a generic or specific job name. When specifying a generic name use a * at the end of the job name.
User	A text field for entering a generic or specific job user. When specifying a generic name use a * at the end of the job user name.
Number	A text field for entering a specific job number or *ALL.
Current user	A text field that allows you to filter the list of jobs shown (on this screen, not in the collection) based on the current user profile of the jobs.
Add button	This button will add the current job name/user/number values in the text fields to the Job Selection page. This can be used to add a generic job name/user/number value such as QZ*/MCCARGAR/*ALL. This value indicates all job names starting with QZ, for job user MCCARGAR.
Refresh button	This button is used to refresh the active jobs list based on the current values specified in the name, user and number text fields.
Add Selected button	Use this button to add the selected active jobs to the Job Selection Page.
Active jobs matching job information list	This list shows all active jobs on the system matching the current Job information specified.

5.7 Task Selection

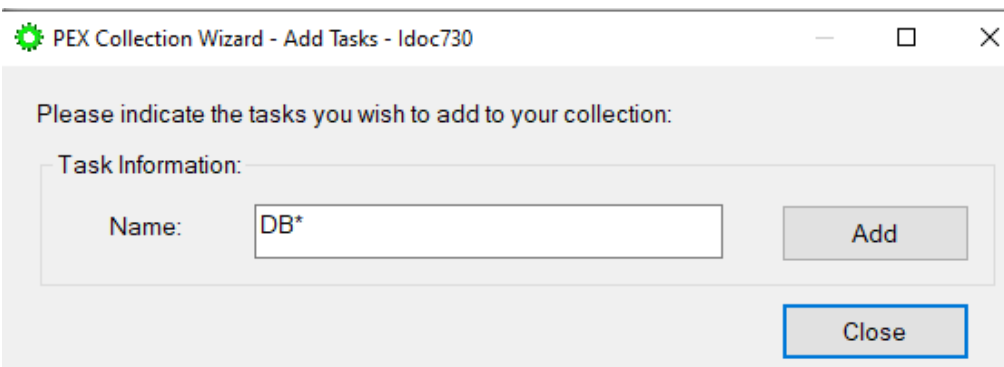
The task selection page displays a list of selected tasks to include in the PEX collection. There are also two buttons on this page used to add or remove tasks from the list.



PEX Collection Wizard - Task Selection

5.7.1 Add Tasks Window

The add tasks window allows a user to add tasks to the Task Selection page in the wizard. The task name can either be *ALL, *NONE, a generic task name like Q*, or a specific task name. Change the task name field and click the add button for each task that you would like to include in your PEX collection

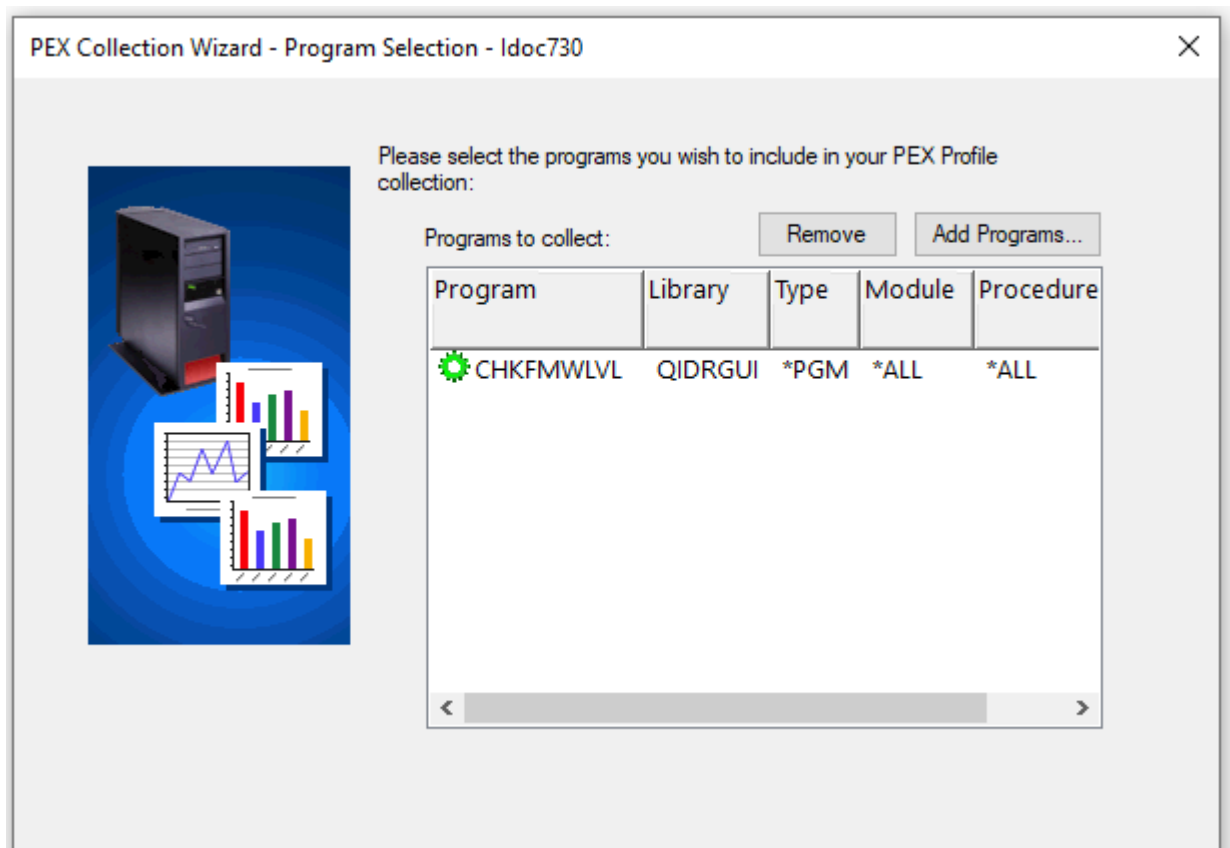


PEX Collection Wizard - Add Tasks Window

5.8 (Profile Mode) Program Selection

The program selection page allows the user to select up to 16 program/module/procedure entries when creating a PEX Profile collection.

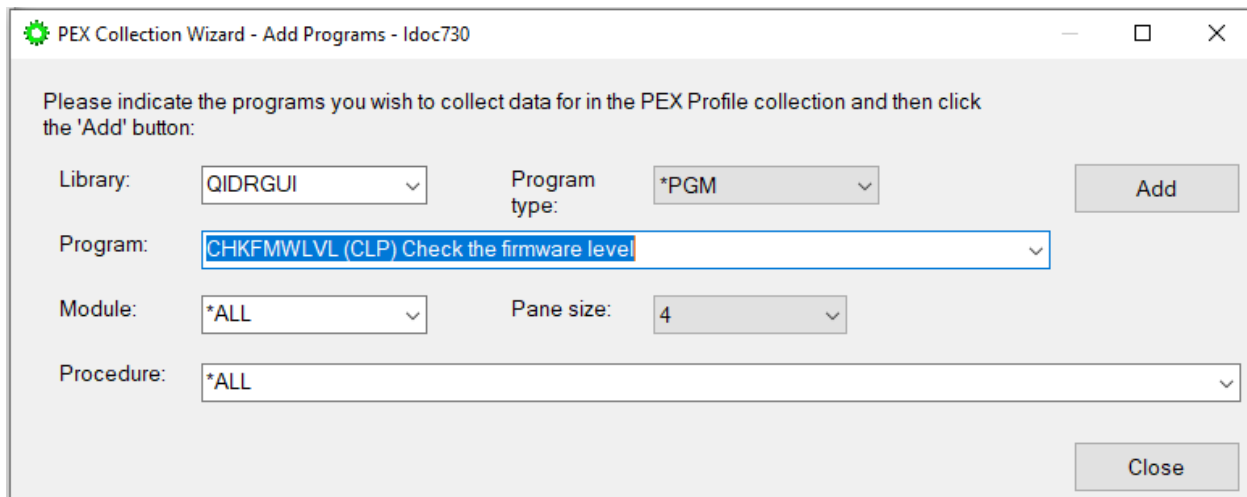
This page displays a list of selected program information to be captured in the PEX collection. There are also two buttons on this page used to add or remove programs from the list.



PEX Collection Wizard - Program Selection

5.8.1 (Profile Mode) Add Programs Window

The add programs window allows a user to browse any programs/service programs on the system using generic program and library names for the purpose of adding them to a PEX Profile collection. After finding the programs you want to add to the collection click the Add Selected button to add the selected program/module/procedure to the list. If a program is an ILE program you will see the modules contained within the program in the modules list. If desired select on these modules to see procedure entries found in the module. By selecting a specific program/module/procedure combination you can collect information only about the procedure(s) you are interested in.



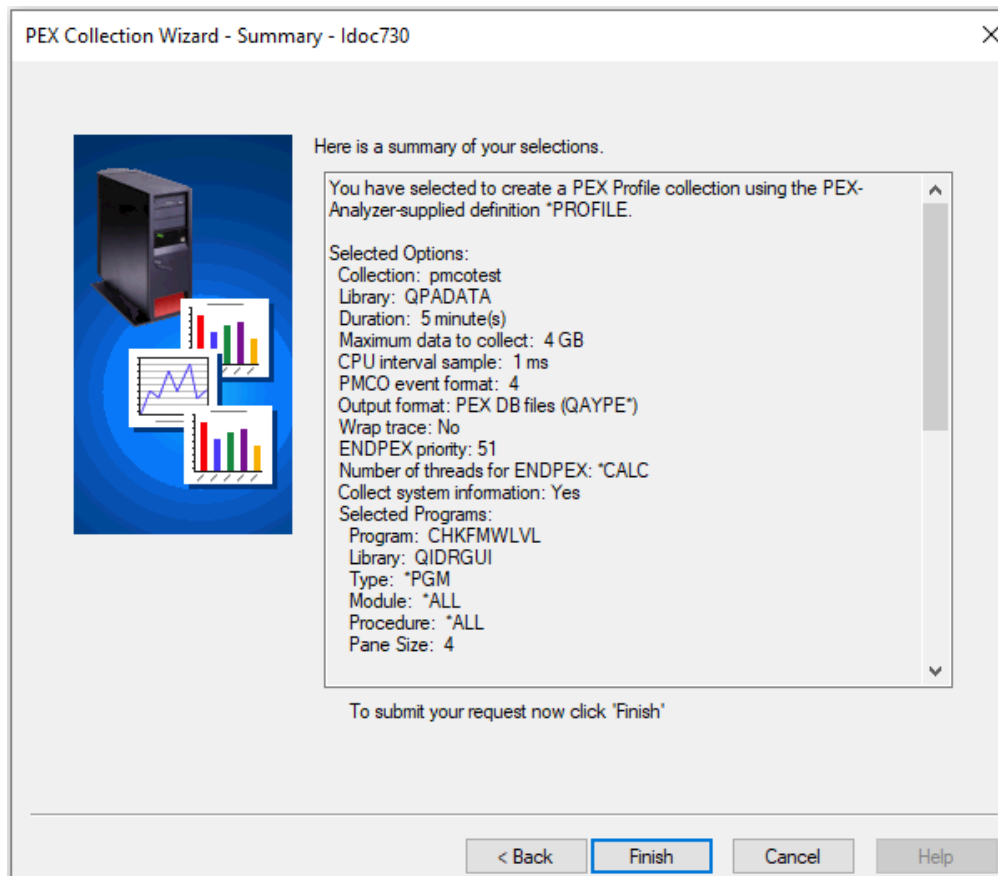
PEX Collection Wizard - Add Programs Window

Note: The pane size is the number of consecutive program instruction addresses assigned to each counter. The smaller the pane size, the more fine-grained the program profile information will be.

5.9 Summary

The summary page of the PEX Collection Wizard presents a summarization of the selections made in the wizard. It lists details about the selected jobs/tasks/programs as well as information from the Options page like collection name and duration.

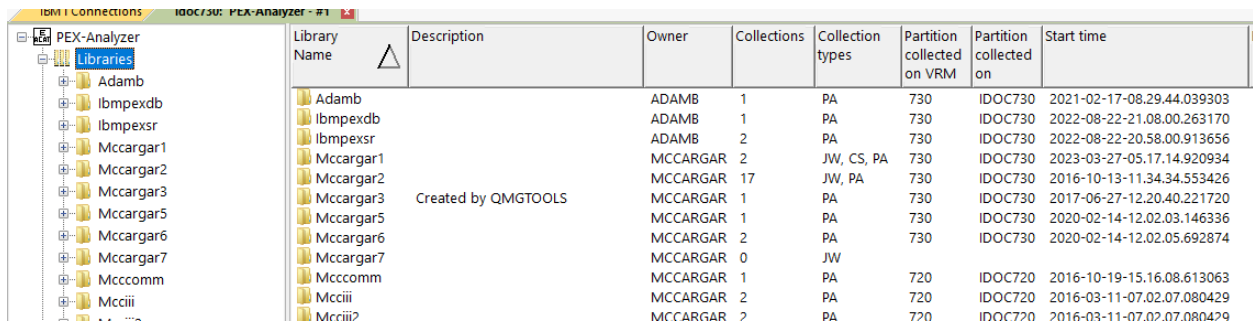
To submit the job and create the PEX Collection click on the Finish button. After submitting your collection go to the library that the collection is to be created in to see the status of the PEX collection in progress.



PEX Collection Wizard - Summary

6 Libraries

This folder contains the libraries on the system that contain PEX data or are actively creating collections destined for a library using the STRPACOL command. For existing PEX data, these are the libraries on the system containing file QAYPERUNI. The list displays each library's name and description. By expanding a library in the tree, you will see the collections that exist within it.



Library Name	Description	Owner	Collections	Collection types	Partition collected on VRM	Partition collected on	Start time
Adamb		ADAMB	1	PA	730	IDOC730	2021-02-17-08:29:44.039303
Ibmpebdb		ADAMB	1	PA	730	IDOC730	2022-08-22-21:08:00.263170
Ibmpebsr		ADAMB	2	PA	730	IDOC730	2022-08-22-20:58:00.913656
Mccargar1		MCCARGAR	2	JW, CS, PA	730	IDOC730	2023-03-27-05:17:14.920934
Mccargar2		MCCARGAR	17	JW, PA	730	IDOC730	2016-10-13-11:34:34.553426
Mccargar3	Created by QMGTOOLS	MCCARGAR	1	PA	730	IDOC730	2017-06-27-12:20:40.221720
Mccargar5		MCCARGAR	1	PA	730	IDOC730	2020-02-14-12:02:03.146336
Mccargar6		MCCARGAR	2	PA	730	IDOC730	2020-02-14-12:02:05.692874
Mccargar7		MCCARGAR	0	JW			
Mcccomm		MCCARGAR	1	PA	720	IDOC720	2016-10-19-15:16:08.613063
Mcciii		MCCARGAR	2	PA	720	IDOC720	2016-03-11-07:02:07.080429
Mcciii2		MCCARGAR	2	PA	720	IDOC720	2016-03-11-07:02:07.080429

Libraries in PEX Analyzer

For more information on this, visit the [Main Window PDF](#) documentation on the Libraries Folder and Library Folders.

6.1 Menu Options

The following menu options are available by right clicking on a library in the component view.

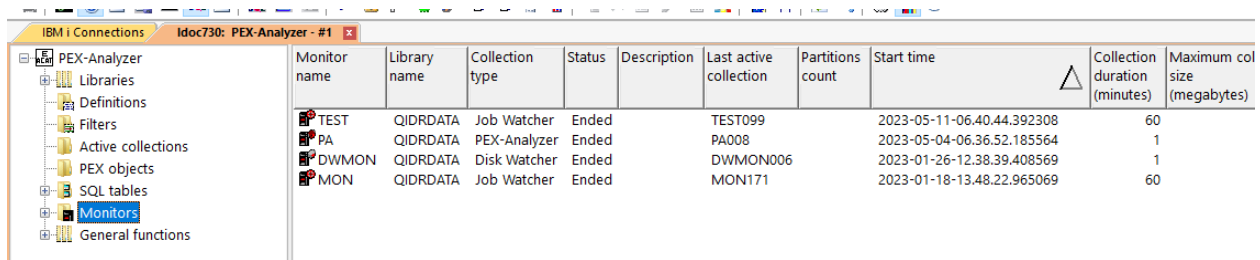
Menu Item	Description
Start Collection...	This menu will open the PEX Collection Wizard where the user can define and run a collection.
Delete all PEX Analyses	This will remove all iDoctor created SQL tables relating to PEX Analyzer in the selected library.
Delete all PEX collections and analyses	This will delete all PEX data and iDoctor created SQL tables relating to PEX Analyzer in the selected library.

Additional menu options that are common to all library folders in iDoctor are discussed [Main Window PDF](#) documentation.

7 Monitors

PEX Analyzer monitors allow for 24x7 collection of PEX data on a system. They run continuously storing only the most recent collections desired. PEX monitors will run until ended manually by the user. Monitors can be held and released if the user wishes to stop collecting data for now and then continue collection again later. Monitors can also be scheduled to start and end at the desired times.

Note: This function requires a valid access code to both Job Watcher and PEX Analyzer.



Monitor name	Library name	Collection type	Status	Description	Last active collection	Partitions count	Start time	Collection duration (minutes)	Maximum col size (megabytes)
TEST	QIDRDATA	Job Watcher	Ended		TEST099		2023-05-11-06.40.44.392308	60	
PA	QIDRDATA	PEX-Analyzer	Ended		PA008		2023-05-04-06.36.52.185564	1	
DWMON	QIDRDATA	Disk Watcher	Ended		DWMON006		2023-01-26-12.38.39.408569	1	
MON	QIDRDATA	Job Watcher	Ended		MON171		2023-01-18-13.48.22.965069	60	

Monitors Folder

Once a monitor has been started and ended, it must be restarted using the Restart Monitor option. You cannot use the Start New Monitor option to restart an existing monitor.

The following green screen commands are used in library QIDRWCH to work with PEX Analyzer monitors:

Command	Description
STRPAMON	This will start or restart a PEX Analyzer monitor.
HLDPAMON	This will hold the PEX Analyzer monitor. The monitor job remains active, but no new data will be captured until the RLSPAMON command is used to release it.
RLSPAMON	This command is used to release a PEX Analyzer monitor that has been previously held.
DLTPAMON	This command is used to remove a PEX Analyzer monitor and all the collections within it from the system.

A Monitors folder is provided in PEX Analyzer to allow the user to work with the monitors that exist on the current system. For more information about monitors, see the section on Monitors in the [Main Window PDF](#) documentation.

8 SQL Tables

This folder contains all the SQL tables that exist on the system generated by PEX Analyzer analyses.

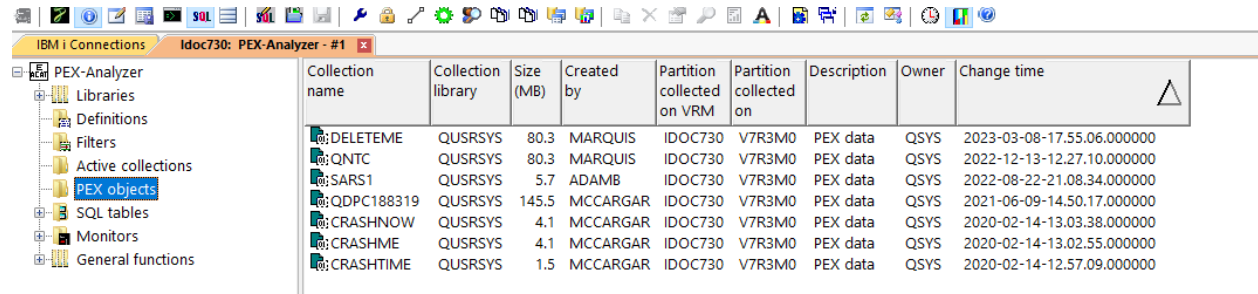
The folder exists in 3 places, and each will filter the contents appropriately based on where it is located:

Location	Description
Under PEX Analyzer	Entire system
Under a library	All collections in the library
Under a collection	Only this collection

For more information see the SQL Tables section in the [Main Window PDF](#) documentation.

9 PEX objects

The PEX objects folder provides the user with a list of all PEX management collection objects (*MGTCOL) on the system. From this view the user can view the size and location of each object, and use an option to build the database files from any of them.



Collection name	Collection library	Size (MB)	Created by	Partition collected on VRM	Partition collected on	Description	Owner	Change time
DELETEME	QUSRSYS	80.3	MARQUIS	IDOC730	V7R3M0	PEX data	QSYS	2023-03-08-17:55:06.000000
QNTC	QUSRSYS	80.3	MARQUIS	IDOC730	V7R3M0	PEX data	QSYS	2022-12-13-12:27:10.000000
SARS1	QUSRSYS	5.7	ADAMB	IDOC730	V7R3M0	PEX data	QSYS	2022-08-22-21:08:34.000000
QDPC188319	QUSRSYS	145.5	MCCARGAR	IDOC730	V7R3M0	PEX data	QSYS	2021-06-09-14:50:17.000000
CRASHNOW	QUSRSYS	4.1	MCCARGAR	IDOC730	V7R3M0	PEX data	QSYS	2020-02-14-13:03:38.000000
CRASHME	QUSRSYS	4.1	MCCARGAR	IDOC730	V7R3M0	PEX data	QSYS	2020-02-14-13:02:55.000000
CRASHTIME	QUSRSYS	1.5	MCCARGAR	IDOC730	V7R3M0	PEX data	QSYS	2020-02-14-12:57:09.000000

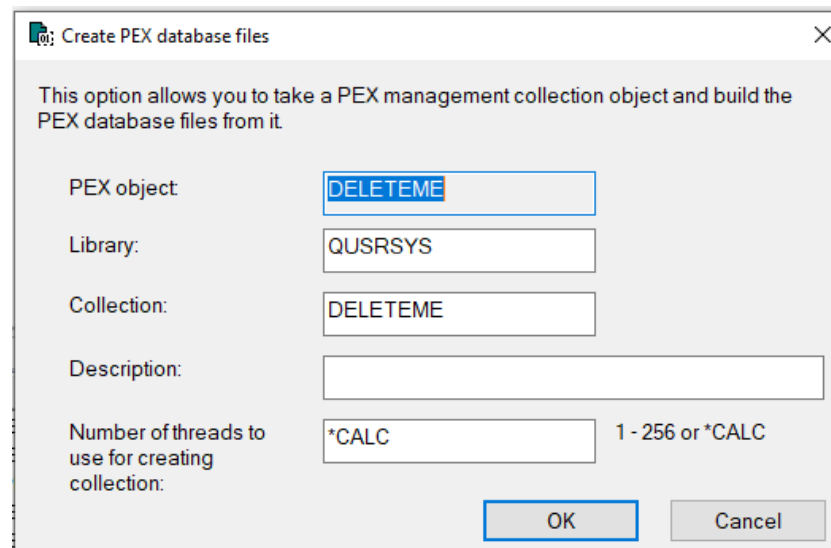
PEX Objects Folder

The following options are available when right clicking on one or more objects in the list:

Menu	Description
Create Collection	Displays the Create PEX database files window that allows you to build the PEX database files from the selected management collection object.
Copy	This will create a duplicate object of the selected *MGTCOL to a new name and/or library.
Delete	Removes the selected objects from the system.
Save...	Saves the selected management collections object(s) to the desired save file. Collections saved using this option will appear in the Saved Collections folder.
Transfer to...	Displays the Transfer Collection(s) window which allows you to save and then transfer the desired collections to another system.
Properties	Displays information about the selected PEX object in a window.

9.1 Create PEX database files

This window is used to build the PEX database files from a PEX management collection object.



This option allows you to take a PEX management collection object and build the PEX database files from it.

PEX object:

Library:

Collection:

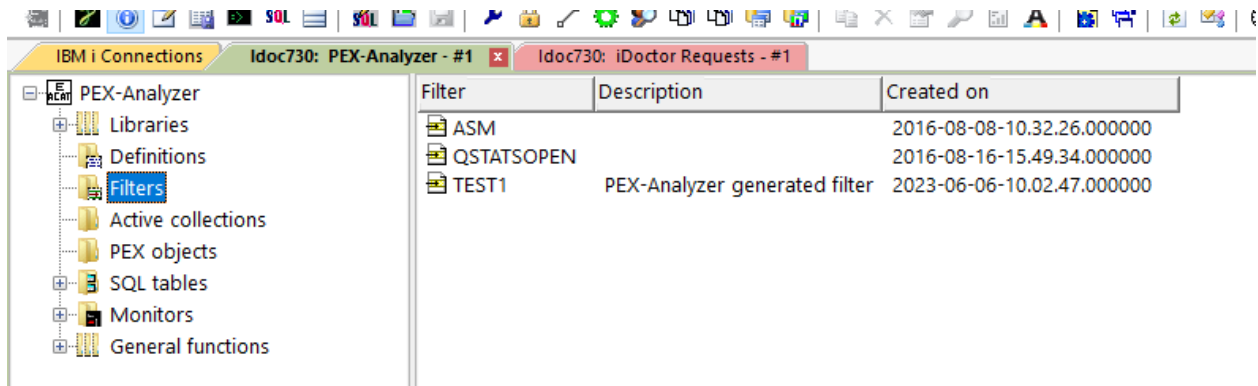
Description:

Number of threads to use for creating collection: 1 - 256 or *CALC

Create PEX database files window

10 Filters

The Filters folder allows a user to work with the PEX filters defined on the system. An example of this interface is:



PEX Filters Folder

The following options are available when right clicking on one or more filters in the list:

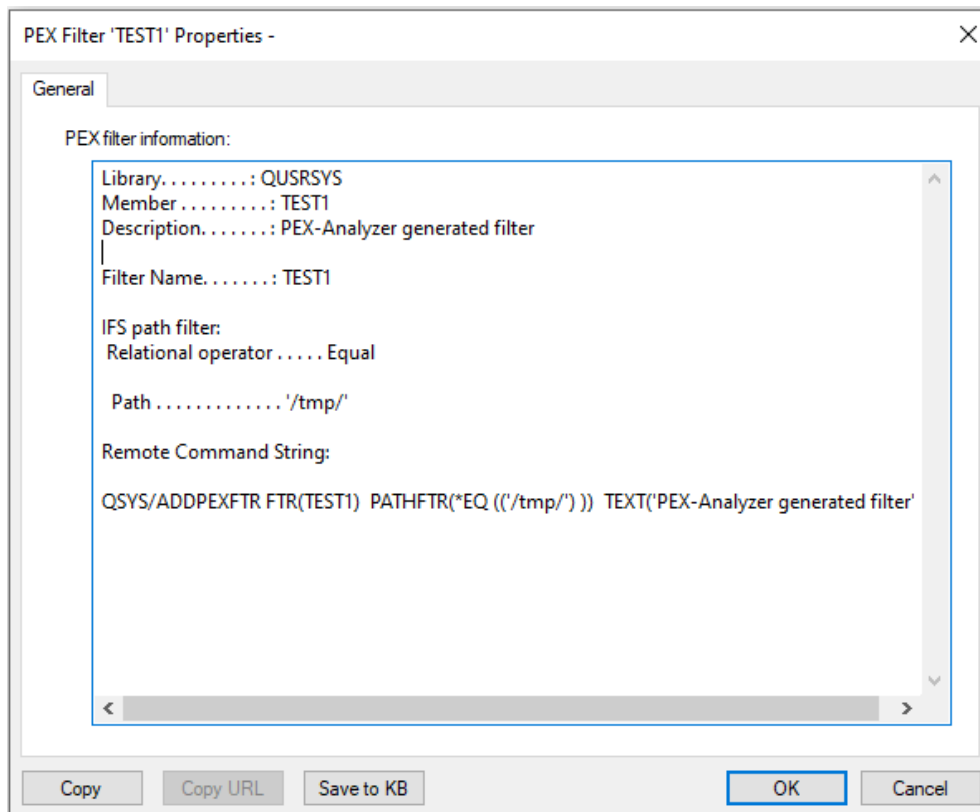
Field	Description
Create PEX Filter...	Displays the PEX Filter Wizard that lets you add a new PEX filter to your system.
Change PEX Filter...	Displays the PEX Filter Wizard that lets you <u>change</u> the selected PEX filter. This option is only enabled if 1 filter is selected.
Delete	Removes the selected filters from the system.
Properties	Displays the properties for the selected filter. This option is only enabled if 1 filter is selected. Tip: Double-click on a Filter to do this option.

10.1 PEX Filter Wizard

This is an interface over the ADDPEXFTR IBM i command. See the help text for this command for more information.

10.2 Properties

Double-clicking on a definition or using the Properties menu from the PEX Filters View displays the parameters used when creating the filter. An example of this interface is:



PEX Filter Properties

Tip: At the bottom of this view, is the command string that was used to create the PEX filter. This allows you to copy and paste to the green screen on another system to create the same filter there.

11 Collections

Moving down the tree within each Library folder are one or more collections that have been created (or are currently being created) within the current library. The status field is used to indicate if any errors occurred during collection or the status of an active collection.

Collection	Status	Description	Data ready	DB files VRM	Partition collected on VRM	Partition collected on	Type	Po typ
SQL tables								
Shier	Ready			7.3	7.3	Idoc730	Stats - Hier	P7
Tskswt13	Ready - Contains: PMCO2, TSKSWT			7.3	7.3	Idoc730	Trace	P7
Tsk	Ready - Missing: BASE - Contains: TSKSWT			7.3	7.3	Idoc730	Trace	P7
Ldio113	Ready - Missing: BASE - Contains: LDIO	CPU, LDIO		7.3	7.3	Idoc730	Trace	P7
Ldio112	Ready - Missing: BASE - Contains: LDIO	CPU, LDIO		7.3	7.3	Idoc730	Trace	P7
Ldio111	Ready - Missing: BASE - Contains: LDIO	CPU, LDIO		7.3	7.3	Idoc730	Trace	P7
Ldio110	Ready - Contains: PMCO2, LDIO	CPU, LDIO, BURN		7.3	7.3	Idoc730	Trace	P7
Ldio1	Ready - Contains: PMCO2, LDIO	STK, CPU, LDIO, BURN, TRC, TPROF		7.3	7.3	Idoc730	Trace	P7
Dtaq	Ready - Contains: PMCO2, DTAA, DTAQ			7.3	7.3	Idoc730	Trace	P7
Cpu604	Ready - Contains: PMCO2			7.3	7.3	Idoc730	Trace	P7
Prof2	Ready			7.3	7.3	Idoc730	Profile	P7
Prof1	Ready			7.3	7.3	Idoc730	Profile	P7
Disk1	Ready - Contains: PMCO2, PDIO	HOT, PDIO		7.3	7.3	Idoc730	Trace	P7
Asm	Ready - Contains: PMCO2, ASM	NET		7.3	7.3	Idoc730	Trace	P7
Actgr	Ready - Contains: PMCO2, ACTGRP	ACTGRP		7.3	7.3	Idoc730	Trace	P7
Cpu1	Ready - Contains: PMCO2			7.3	7.3	Idoc730	Trace	P7
Tprof1	Ready - Contains: PMCO2	STK, TPROF		7.3	7.3	Idoc730	Trace	P7

PEX Analyzer Collections in a Library

The list of collections displays the collection name, description, status as well as several additional fields.

Each collection in the list has a set of fields available which can be optionally reordered and displayed. To change the current field selections for the collection list, use the [Select fields...](#) menu from the library folder. Some of the less obvious columns shown in a list of collections are described below:

Field	Description
Collection	Name of the collection. This name matches the member name used in the database files named QAYPE* that exist in the current library.
Status	With May 2023 builds or later, the Status column provides information about which commonly needed files are missing from the collection as well as the types of events captured in the collection. Place your mouse pointer over this column to get more information about the missing files and which reports they apply to.
Data ready	This identifies which PEX Analyzer analyses have been ran and are ready for use.
Type	The type field lists either the PEX collection type (Trace, Statistical or Profile) if PEX Analyzer was not used to create the collection, or the PEX Analyzer-supplied definition type if PEX Analyzer was used to create the collection.

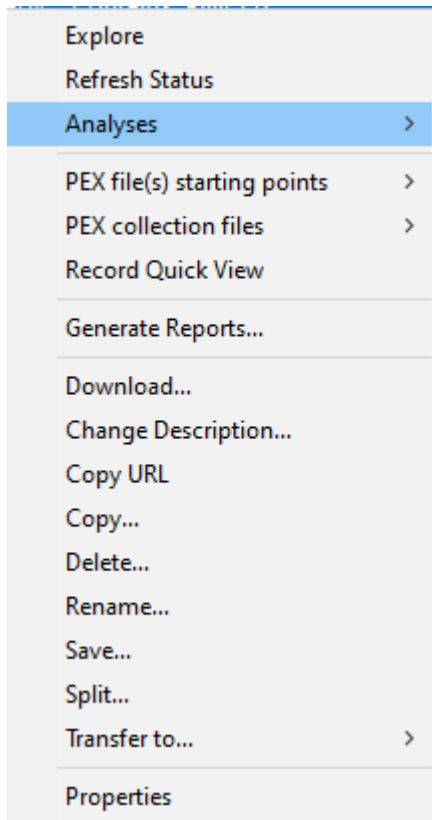
The Data ready column indicates which PEX Analyzer analyses have been ran and are ready to be used. Each analysis identifier maps to an additional set of menu options will appear with graphs and reports when right clicking a collection.

The mapping of data ready identifiers, to the analysis that created it and folder name that will appear is:

ID	Analysis / Folder	Description
ASM	ASM	Analyzes auxillary storage management events looking for growth or fragments. This also runs the Trace details analysis.
STK	Call stacks	This summarizes the 16-level call stacks found in the collection, grouping them by instruction (more detailed) and/or by procedure.
CPU	CPU Profile	This provides an estimated CPU consumption profile over time with drill downs available by various job groupings.
DTAA	Data areas	Analyzes the data area events captured in the collection.
DTAQ	Data queue	Analyzes the data queue events captured in the collection.
HOT	Hot sectors	Reports displaying I/O "hotness" based on MB chunk with most activity. You must run Physical Disk I/Os first before this one.
LDIO	Logical database I/O	Graphs and reports over logical database I/O operations.
NET	Net size changes	Graphs and reports showing ASM event size changes.
PDIO	Physical disk I/Os	Detailed analysis of disk events somewhat like that provided in CSI – Disk graphs.
BURN	Top CPU burners	Indicates the MI programs and modules using the most CPU (non-Q named if available),
TPROF	TPROF (CPU profile summary)	Ranks programs/procedures by CPU usage.
TRC	Trace details	Consolidates data from many of the PEX files. Intended for advanced users.

11.1 Menu Options

The table below outlines the different types of operations that may be performed by right clicking on a collection that has finished collecting data within PEX Analyzer.



Collection popup-menu

Menu Item	Description
Explore	Show the contents of the collection.
Refresh Status	In some situations, the Status column may indicate files are missing incorrectly. This option is used to refresh the collections cache for the selected collection(s) to be sure that the files are truly missing. This also can be used in cases where report folders are missing.
Analyses -> Analyze Collection	Displays the Analyze Collection window showing the available analyses that can be ran against the desired collection(s). Data generated by these analyses are stored in SQL tables which are accessible under the SQL Tables folder.
Analyses -> Run ALL default analyses	If checked, the Run ALL default analyses option will be used. All default analyses will be executed for each collection.
Analyses -> Run XYZ	This lists you run a specific analysis which varies by component and VRM of the collection. See the Analyses section for a list of those available.

PEX files starting points	These are a set of reports available that will vary based on the events collected.
ASM	Analyzes auxiliary storage management events looking for growth or fragments. This also runs the Trace details analysis.
Call stacks	This summarizes the 16-level call stacks found in the collection, grouping them by instruction (more detailed) and/or by procedure.
CPU Profile	This provides an estimated CPU consumption profile over time with drill downs available by various job groupings.
Data areas	Analyzes the data area events captured in the collection.
Data queue	Analyzes the data queue events captured in the collection.
Hot sectors	Reports displaying I/O "hotness" based on MB chunk with most activity. You must run Physical Disk I/Os first before this one.
Logical database I/O	Graphs and reports over logical database I/O operations.
Net size changes	Graphs and reports showing ASM event size changes.
Physical disk I/Os	Detailed analysis of disk events somewhat like that provided in CSI – Disk graphs.
Top CPU burners	Indicates the MI programs and modules using the most CPU (non-Q named if available),
TPROF (CPU profile summary)	Ranks programs/procedures by CPU usage.
Trace details	Consolidates data from many of the PEX files. Intended for advanced users.
PEX collection files	These reports just show the QAYPE* files as is.

Record Quick View	Displays the fields for a collection in the list view vertically for easier viewing. Not available from the tree side, only the list side.
Generate Reports...	This option can be used to build a report of the desired set of Job Watcher tables and graphs. The report consists of a screenshot of each graph along with its title and collection information. The reports are built into a HTML page and displayed in the web browser when completed.
Download...	This option will create a save file containing the selected collection(s), then download this to the PC using the File transfer setting defined in applicable to your system in your list of IBM i connections.
Change Description...	This option is used to modify the description shown in the list for a single collection.
Copy URL	Creates a link to the component, library and collection that can be accessed later, or sent to another user.
Copy...	Allows you to copy the collection(s) to another location.
Delete...	Deletes the selected collection(s).
Rename	Rename the selected collection.
Save	This option lets you save the collection(s) into a save file on the server.
Split	Divides a collection into multiple pieces based on an interval range or a time range. Tip: This can be used to improve performance of graphs if the collection is very large.
Transfer to...	Allows a user to create a save file of the selected collection(s) and transfer it to another system, the PC or to IBM.
Properties	Displays the property pages for the collection.

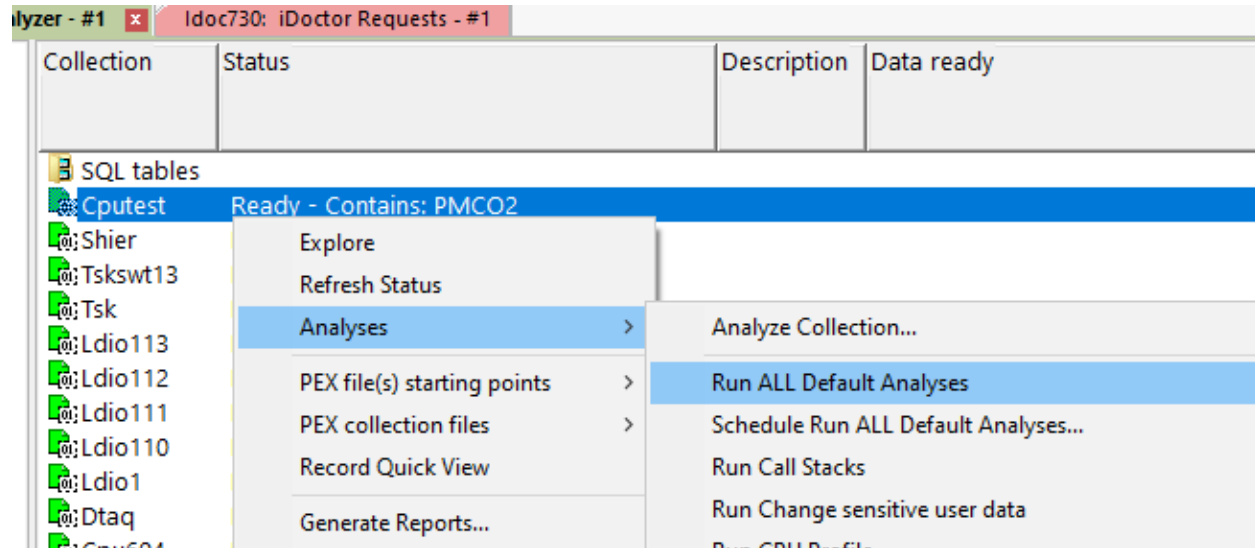
11.2 Active Collection Menu Options

Collections that are in progress have the following set of menu options:

Menu	Description
End Collection -> Create DB Files	Stop the collection prematurely and immediately begins dumping the collected data into the PEX collection's database files.
End Collection -> Create single object	Stop the collection prematurely and immediately begins dumping the collected data into a PEX management collection object.
End Collection -> Delete	Stops collecting immediately and destroys the data that has been collected so far.
End Collection -> Stop	Stops collecting data immediately. The collection files will not be created until initiated by the user using the Create DB Files option.
Restart	Destroys the data that has been collected so far and then restarts the collection using the same settings.
Properties	Displays the basic collection properties like the name and type. From collection properties you can view the job log of the job running the PEX collection.

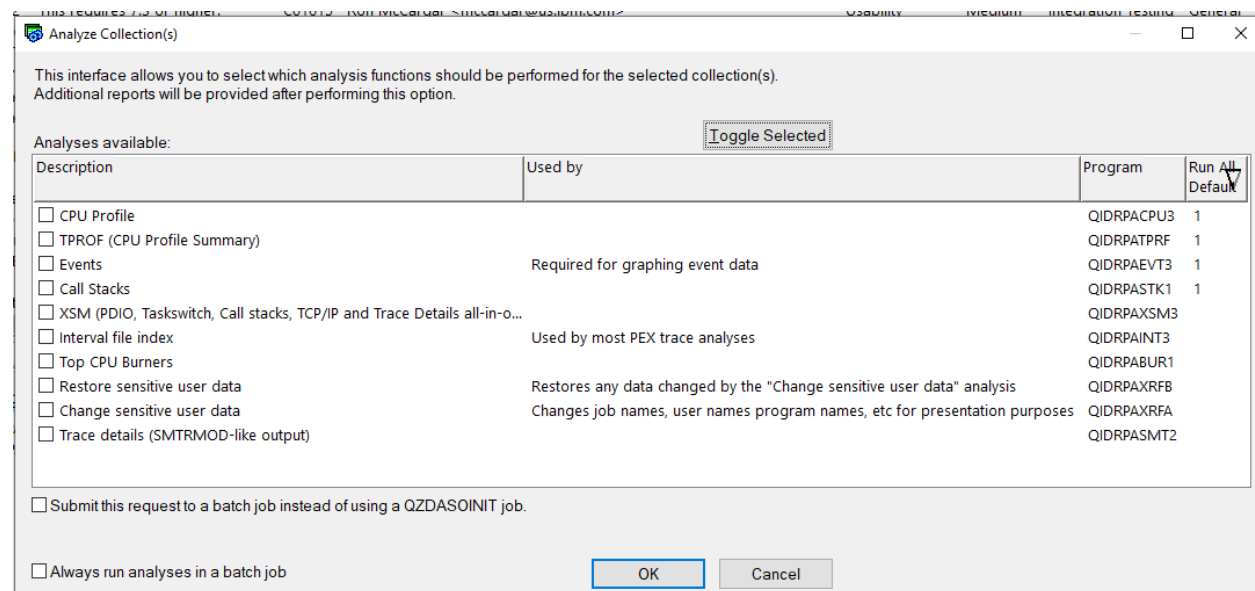
11.3 Run ALL Default Analyses

This will run the “default” set of analyses on the selected collections.



Collection menu -> Analyses -> Run ALL Default Analyses

This list of “default” analyses varies based on the types of events captured in the current collection and can be viewed by using the menu option “Analyses -> Analyze Collection” and looking for the **Run All Default** column in the list of analyses.



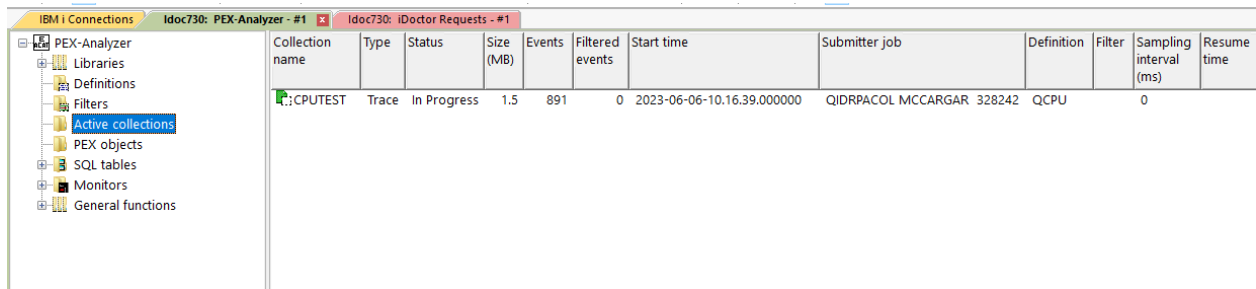
Analyze Collection(s) Window -> Run All Default column example

Tip: On the green screen these default analyses are ran when using the QIDRGUI/STRIDRSUM and QIDRGUI/RSTIDRDTA SUM(*YES) commands.

11.4 Active Collections

A folder is provided in PEX Analyzer that allows a user to view the active PEX collections on the system.

This view is like what you see on the green screen by running the ENDPEX command on the system with no parameters.



Collection name	Type	Status	Size (MB)	Events	Filtered events	Start time	Submitter job	Definition	Filter	Sampling interval (ms)	Resume time
CPUTEST	Trace	In Progress	1.5	891	0	2023-06-06-10.16.39.000000	QIDRPACOL MCCARGAR 328242	QCPU		0	

Active Collections Folder

The list of collections displays information such as the total size of the data collected so far and the number of events collected.

From this view a user can right-click the desired collection and end the collection, delete it, or view the job log for the job that is creating the collection.

The menu options available are described in the [Active Collection Menu Options](#) section.

11.5 Properties

This section covers the property pages for a collection. Access the property pages by right clicking on a collection and choosing the Properties menu. There are three primary types of collections: Trace, Profile and Statistical. The property pages available to the user vary slightly based on the type of collection used and the status of the collection. If the collection is still running, then only the General and Creation Settings pages are shown with reduced information available.

11.5.1 General

The General property page provides basic information about the collection such as when it was created.

IBM i Connections | Idoc730: PEX-Analyzer - #1 | Collection 'Aaaaa' Properties - Idoc730 - #1

General | Creation Settings | Definition | Events | Collection Jobs | Collection Tasks | System | CPU Totals | Wait Buckets

Collection: Aaaaa DB VRM: 7.3

Description:

Library: Qpdata System: Idoc730

Definition: Badidea

Type: Trace

Status: Ready - Contains: TSKSWT, HEAP, ASM, PDIO, FLT, SAR, ACTGRP

Summary:

Total time:	00-00.05.00.245604	Events:	120,683
Duration of trace (us):	300,245,604	filtered:	3
Start time:	2023-05-18-08.43.23.758502	missed:	0
End time:	2023-05-18-08.48.24.004106		
Wrap count:	0		
Jobs:	0		
Threads:	9		
Tasks:	0		
PMCO interval size (ms):	200		

First event start time: 2023-05-18-08.43.51.773200

Last event start time: 2023-05-18-08.48.23.919216

[Fetch Event Times](#)

Collection Properties – General

The following information is displayed on the General property page:

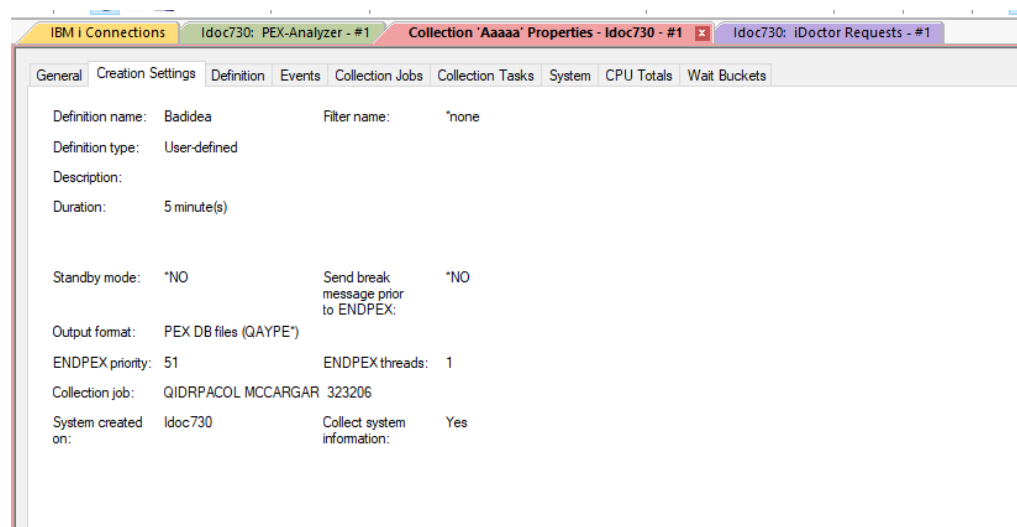
Field Name	Field Description
Collection name	PEX collection name. The collection name is the member name in the QAYPE* files in the current library.
Description	Collection description.
Library	Library containing the collection.
System	The current system the collection resides on.
Definition	The PEX definition used when creating the collection.
Type	Trace, statistical, and profile are the three types of PEX data. Note: There are two subtypes of statistical - hierarchical and flat.
Status	Indicates whether the collection is useable or indicates the status of the job creating the collection if the collection is currently in the process of being created. May also indicate the types of events found in the collection.
Show Job Log button	This button is used to display the job log of the job used for creating the PEX collection. If the job log is not found on the system the button will not be visible.

Total time	The difference between the start and end times for the collection listed in timestamp format.
Duration of trace (us)	Same as previous but in microseconds.
Start time	Date and time the collection started.
End time	Date and time the collection ended.
Suspended time (us)	Total number of microseconds the collection was suspended during data gathering. If this is not visible, then collection was not suspended.
Suspend start time	Date and time the collection was suspended (if applicable.)
Suspend end time	Date and time the collection was resumed (if applicable.)

Wrap count	Indicates if the collection data was wrapped.
Jobs	These fields indicate the total number of jobs included in the collection and the number of jobs detected on the system but not included.
Threads	These fields indicate the total number of threads included in the collection and the number of threads detected on the system but not included.
Tasks	These fields indicate the total number of tasks included in the collection and the number of tasks detected on the system but not included.
PMCO interval size	The sample size when collecting PMCO events (in milliseconds). The smaller the value the more PMCO events that will be captured.
Events	Total number of events included in the collection, and the number of events filtered or missed.
First event start time	Press the Fetch Event Times button to run a query to determine the timestamps of the 1 st and last event captured in the collection.
Last event start time	Press the Fetch Event Times button to run a query to determine the timestamps of the 1 st and last event captured in the collection.

11.5.2 Creation Settings

The Creation settings property page provides details about the parameters that were used on the STRPACOL command when creating the collection. This panel is only shown for collections created by PEX Analyzer and is not shown for collections created using STRPEX/ENDPEX.



Collection Properties – Creation Settings

11.5.3 Definition

The definition page displays the parameters that were included in the definition used to create the collection at the time the collection was created.

The screenshot shows the 'Definition' tab of the 'Collection 'AAAAA' Properties' window. The window title bar includes 'IBM i Connections', 'Idoc730: PEX-Analyzer - #1', and 'Collection 'AAAAA' Properties - Idoc730 - #1'. The 'Definition' tab is selected, showing the 'PEX definition for collection AAAAA'. The definition parameters are as follows:

- Type: Trace
- Definition Name: BADIDEA
- Defined By: QUSER
- Trace Full Option: STOPTRC
- Trace Size (KB): 500000
- List All Jobs/Tasks: *NO
- Add Threads/Tasks Option: *NEW
- Sampling Interval:
 - Milliseconds: 200
 - Randomize: *FIXED
- Selected Jobs:
 - *ALL/*ALL/*ALL
- Selected Task Names:
 - *NONE
- Selected Events:
 - MI Complex Instructions:
 - *REQIO
 - *SIGEVT
 - *WAITEVT
 - *ENQ
 - *DEQWAIT
 - *INITPR
 - *RESPR
 - *SUSPR
 - Category: PGMEVT - Program Events
 - *JVAENTRY Java Entry
 - *JVAEXIT Java Exit
 - *PASEPRCENTRY PASE Procedure Entry
 - *PASEPRCEXIT PASE Procedure Exit
 - *MISTR Machine Interface Instruction Start
 - *MIEND Machine Interface Instruction End
 - *MIEXIT Exit
 - *MIENTRY Entry
 - Category: BASEVT - Base Events
 - *TASKSWTOUT Task Switch Out
 - *PMCO Performance Measurement Counter Overflow
 - *PGMDBG Flasher BreakPoint
 - *TASKSWTOUTINT Task Switch Out Interrupt
 - *ACTGRPDLT Activation Group Delete
 - *ACTGRPCRT Activation Group Create
 - *ACTGRPACTPGM Activation Group Activate Program
 - *TASKSWTOUTQ Task Switch Out Queueing
 - *TASKSWTIN Task Switch In
 - *TASKAVAIL Task Available For Dispatch
 - Category: STGEVT - Auxiliary Storage Management Events

Collection Properties – Definition

11.5.4 Events

The Events property page provides information about the events that were captured within the collection.

IBM i Connections

Idoc730: PEX-Analyzer - #1

Collection 'Aaaa' Properties - Idoc730 - #1

Idoc730: iDoctor Requests - #1

General

Creation Settings

Definition

Events

Collection Jobs

Collection Tasks

System

CPU Totals

Wait Buckets

Total events: 120,683

Events missed: 0

Sampling interval (ms): 200

Events specified in the PEX definition:

Total events (EVT CNT)	Event type (CATEGORY)	Subtype (TYPE)	Event type description (CATDESC)	Subtype description (TYPEDESC)	Format (FORMAT)
58179	PGMEVT	*MIENTRY	Machine Interface Program Bracketing Events	Entry	1
58163	PGMEVT	*MIEXIT	Machine Interface Program Bracketing Events	Exit	1
688	STGEVT	*USRHEAP	Auxiliary Storage Management Events	User Created Heap	1
455	BASEVT	*TASKSWTIN	Base Events	Task Switch In	1
455	BASEVT	*TASKAVAIL	Base Events	Task Available For Dispatch	1
450	BASEVT	*TASKSWTOUTQ	Base Events	Task Switch Out Queueing	1
293	STGEVT	*LCLHEAP	Auxiliary Storage Management Events	Local Heap	1
208	STGEVT	*RESHEAP	Auxiliary Storage Management Events	Resident Heap	1
199	SAREVT	*CLR	Segment Address Register Events	Clear	1
148	STGEVT	*SYSHEAP	Auxiliary Storage Management Events	System Heap	1
136	PGMEVT	*MISTR	Machine Interface Program Bracketing Events	Machine Interface Instruction Start	1
136	PGMEVT	*MIEND	Machine Interface Program Bracketing Events	Machine Interface Instruction End	1
130	DSKEVT	*WRTSTR	Direct Access Storage Device Events	Write Start	1
130	DSKEVT	*WRTEND	Direct Access Storage Device Events	Write End	1
127	STGEVT	*ACTGRPHEAP	Auxiliary Storage Management Events	Activation Group Heap	1
100	FAULT EVT	*STR	Page Fault Events	Page Fault Start	1
83	SAREVT	*RMV	Segment Address Register Events	Remove	1
75	STGEVT	*EXDSEG	Auxiliary Storage Management Events	Extend Segment	1
70	STGEVT	*CRTSEG	Auxiliary Storage Management Events	Create Segment	1
68	SAREVT	*WRT	Segment Address Register Events	Write	1
60	STGEVT	*FNDSEGSIZ	Auxiliary Storage Management Events	Find Segment Size	1
56	STGEVT	*HDLHEAP	Auxiliary Storage Management Events	Handle Based Heap	1
48	STGEVT	*DLTSEG	Auxiliary Storage Management Events	Delete Segment	1
44	SAREVT	*WRTASYN	Segment Address Register Events	Write Asynchronous	1
25	STGEVT	*TRUNCSEG	Auxiliary Storage Management Events	Truncate Segment	1
14	BASEVT	*ACTGRPACTPGM	Base Events	Activation Group Activate Program	1
7	DSKEVT	*READSTR	Direct Access Storage Device Events	Read Start	1
7	DSKEVT	*READEND	Direct Access Storage Device Events	Read End	1
1	BASEVT	*ACTGRPCRT	Base Events	Activation Group Create	1
0	PGMEVT	*JVAENTRY	Machine Interface Program Bracketing Events	Java Entry	1
0	PGMEVT	*JVAEXIT	Machine Interface Program Bracketing Events	Java Exit	1

Collection Properties – Events

The following information is displayed on the Events property page:

Field Name	Field Description
Total events	The total number of events collected.
Events missed	The total number of events not captured within the collection.
Sampling interval (ms)	A value used to determine the frequency of Performance Measurement Counter Overflow (PMCO) events in milliseconds. A low value generates more PMCO events than a high value.
Events specified in the PEX definition list	A list of events included in the collection. An event is an event type/subtype combination found in the PEX definition. The possible event types are listed within the ADDPEXDFN command or see file QAYPEEVENT for more information.

11.5.5 Collection Jobs

The Collection Jobs property page lists every job (primary thread) and secondary threads captured in the PEX collection.

IBM I Connections

Idoc730: PEX-Analyzer - #1

Idoc730: IDocor Requests - #1

Collection 'Aaaaa' Properties - Idoc730 - #1

General

Creation Settings

Definition

Events

Collection Jobs

Collection Tasks

System

CPU Totals

Wait Buckets

Total jobs: 0

Total threads: 9

Threads in collection:

Process job name (QTSJNM)	Job user (QTSJUS)	Job number (QTSJNB)	Thread ID (THRID)	CPU time (us) (QTSRUN)	Pool ID (QTSPL)	Initial task priority (QTSPRI)	Primary thread (THRDTYPE)	Elapsed (us) (ELAPSED)	Collection overhead (us) (QTSOHD)	Synchronous DB reads (QTSSDR)	Synchronous non-DB reads (QTSSNR)	Synchronous DB writes (QTSSDW)	Synchronous non-DB writes (QTSSNW)
QZDASOINIT	QUSER	323197	0000000000000042	30366	2	160		68783700	13053	0	7	0	0
ADMIN5	QLWISVR	321099	000000000000009C	18473	2	165		196382654	9882	0	0	0	0
ADMIN5	QLWISVR	321099	000000000000009F	4286	2	165		36951153	2272	0	0	0	0
ADMIN5	QLWISVR	321099	000000000000009E	2124	2	165		37190875	932	0	0	0	0
ADMIN1	QWEBADMIN	321098	0000000000000084B	1315	2	165		261064408	21	0	0	0	0
ADMIN1	QWEBADMIN	321098	0000000000000084A	1234	2	165		261723370	30	0	0	0	0
QYUSCMCRMD	QSYS	321037	000000000000008F1	506	2	190		325378	280	0	0	0	0
QYUSCMCRMD	QSYS	321037	000000000000008F0	335	2	190		5137	160	0	0	0	0
ADMIN5	QLWISVR	321099	000000000000009D	194	2	165		3060627	61	0	0	0	0

Collection Properties – Collection Jobs

Tip: You can right-click a column heading in the list for sort/filter options.

The following information is displayed on the Collection Jobs property page:

Field Name	Field Description
Total jobs	The total number of primary threads captured in the collection.
Total threads	The total number of secondary threads in the collection.
Threads in collection list	A list of all threads included in the collection. Due to the potential for huge amounts of data, a menu is available by right clicking on the list providing additional features. The popup menu offers copy and paste to the clipboard, customizable font, and search capabilities.

11.5.6 Collection Tasks

The Collection Tasks property page lists every task that was captured in the PEX collection. This page also lists the total number of system tasks captured (excluding the CFINT tasks).

IBM i Connections

Idoc730: PEX-Analyzer - #1

Idoc730: iDoctor Requests - #1

Collection 'Aaaaa' Properties - Idoc730 - #1

General

Creation Settings

Definition

Events

Collection Jobs

Collection Tasks

System

CPU Totals

Wait Buckets

Total system tasks: 0

Tasks in collection:

Task name (QTSNM)	CPU time (us) (QTSRUN)	Pool ID (QTSPL)	Initial task priority (QTSPRI)	Elapsed (us) (ELAPSED)	Collection overhead (us) (QTSOHD)	Synchronous DB reads (QTSSDR)	Synchronous non-DB reads (QTSSNR)	Synchronous DB writes (QTSSDW)	Synchronous non-DB writes (QTSSNW)	Asynchronous DB reads (QTSAR)
CFINT001	76483	0	0	300243632	0	0	0	0	0	0
CFINT004	19912	0	0	300243632	0	0	0	0	0	0
CFINT002	19285	0	0	300243633	0	0	0	0	0	0
CFINT003	17889	0	0	300243632	0	0	0	0	0	0
CFINT005	158	0	0	300243631	0	0	0	0	0	0
CFINT006	0	0	0	300243632	0	0	0	0	0	0
CFINT007	0	0	0	300243631	0	0	0	0	0	0
CFINT008	0	0	0	300243632	0	0	0	0	0	0

Collection Properties – Collection Tasks

Tip: You can right-click a column heading in the list for sort/filter options.

The following information is displayed on the Collection Tasks property page:

Field Name	Field Description
Total system tasks	The total number of system tasks included in the collection. Tasks named CFINT01...CFINTnn where nn equals the number of processors on the system are not included in this total.
Tasks in collection list	A list of all tasks included in the collection. Due to the potential for huge amounts of data, a menu is available by right clicking on the list providing additional features. The popup menu offers copy and paste to the clipboard, customizable font, and search capabilities.

11.5.7 System

The System property page provides basic information about the system the collection was created on.

IBM i Connections

Idoc730: PEX-Analyzer - #1

Idoc730: iDoctor Requests - #1

Collection 'Aaaaa' Properties - Idoc730 - #1

General

Creation Settings

Definition

Events

Collection Jobs

Collection Tasks

System

CPU Totals

Wait Buckets

Description	Value
System information:	
Partition collected on	Idoc730
IBM i version	V7R3M0
Power type	P7
Type-Model	8231-E2B
Serial number	066437R
Memory	54.932 GB (58,982,400,000 bytes)
Partition ID	01
User who started collection	MCCARGAR
Maximum processors during collection	16
Active processors at collection start	8
Active processors at collection end	8
Configured ASPs	1
Configured logical DASD	6
Processor mode	Shared
Processor multithreading	On
PowerPC MMCR0 register	2214641666
PowerPC MMCR1 register	519369218
PowerPC MMCR2 register	1610612736
PowerPC IMR or IMC register	0
Calibration state	Complete
Affinity balancer state	0
Effective processor version	4129281
Effective processor compatibility	3
Current partition index	1
Partitions active	1

Collection Properties – System

11.5.8 (Trace) CPU Totals

The CPU Totals property page for Trace collections provides information about CPU usage within the collection.

Trace - CPU Collectionwide Totals	CPU Microseconds (us)	Percent of Total
Jobs Including Collection Overhead:	58,833	30.553
Jobs Collection Overhead:	26,691	13.861
Tasks Including Collection Overhead:	133,727	69.447
Tasks Collection Overhead:	0	0
Total Including Collection Overhead:	192,560	

Collection Properties – (Trace) CPU Totals

The following information is displayed on the Trace CPU Totals property page:

Field Name	Field Description
Jobs including collection overhead	Total number of CPU microseconds and percent of total CPU including PEX collection overhead for all jobs in the collection.
Jobs collection overhead	Total number of CPU microseconds and percent of total CPU for just the collection overhead of jobs captured.
Tasks including collection overhead	Total number of CPU microseconds and percent of total CPU including PEX collection overhead for all tasks in the collection.
Tasks collection overhead	Total number of CPU microseconds and percent of total CPU for just the collection overhead of system tasks captured.
Total including collection overhead	The total CPU microseconds for the collection including collection overhead.

11.5.9 (Profile) CPU Totals

The CPU Totals property page for Profile type collections provides information about CPU usage within the collection.

Profile - CPU Collectionwide Totals	CPU Microseconds (us)	Percent of Total
Jobs Including Collection Overhead:	5,529,371	98.934
Jobs Collection Overhead:	115	.002
Tasks Including Collection Overhead:	59,555	1.066
Tasks Collection Overhead:	0	0
Total Including Collection Overhead:	5,588,926	
Percent of Total Samples		
Total Samples:	96,475	
Hits:	39,125	40.555

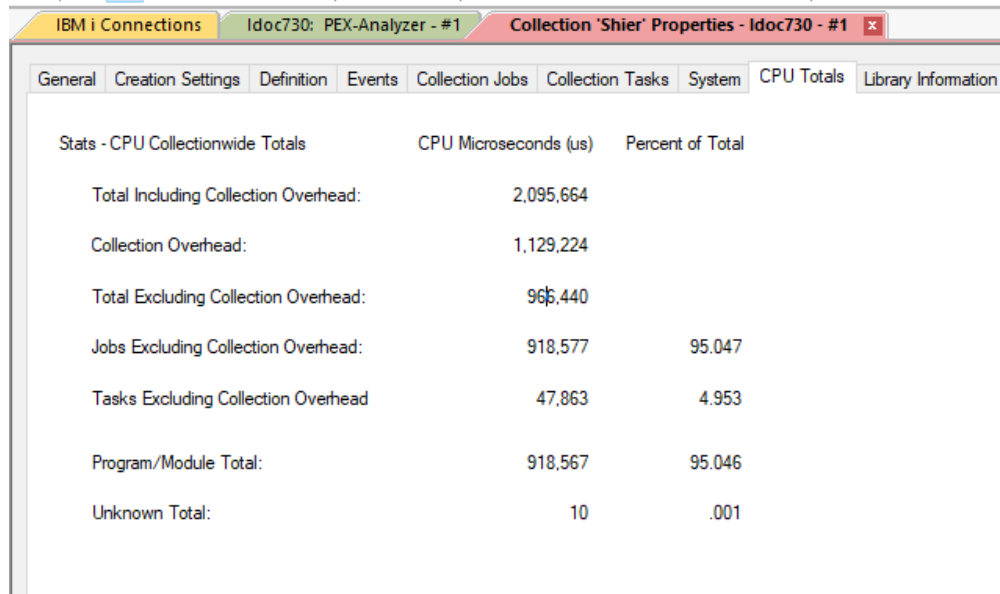
Collection Properties – (Profile) CPU Totals

The information shown on this screen is identical to that shown for Trace except includes additional fields for total samples and hits.

Field Name	Field Description
Total samples	Total sample count.
Hits	Hit count from the total samples.
Percent of total samples	Percentage of hit CPU microseconds used over the total samples in the collection.

11.5.10 (Statistical) CPU Totals

The CPU Totals property page for Statistical collections provides information about CPU usage within the collection.



Stats - CPU Collectionwide Totals	CPU Microseconds (us)	Percent of Total
Total Including Collection Overhead:	2,095,664	
Collection Overhead:	1,129,224	
Total Excluding Collection Overhead:	965,440	
Jobs Excluding Collection Overhead:	918,577	95.047
Tasks Excluding Collection Overhead	47,863	4.953
Program/Module Total:	918,567	95.046
Unknown Total:	10	.001

Collection Properties – (Statistical) CPU Totals

The following information is displayed on the Stats CPU Totals property page:

Field Name	Field Description
Total including collection overhead	CPU microseconds for the collection including collection overhead.
Collection overhead	CPU microseconds collection overhead (relating to PEX capturing the data.)
Total excluding collection overhead	The total CPU microseconds for the collection excluding collection overhead.
Jobs excluding collection overhead	Total number of CPU microseconds excluding PEX collection overhead for all jobs in the collection.
Jobs excluding collection overhead (Percent of total)	Percentage of Total CPU excluding collection overhead used by jobs in the collection.
Tasks excluding collection overhead	Total number of CPU microseconds excluding PEX collection overhead for all tasks in the collection.
Tasks excluding collection overhead (Percent of total)	Percentage of Total CPU excluding collection overhead used by tasks in the collection.
Program/Module Total	Total number of CPU microseconds and (% of total) used by programs and modules.
Unknown Total	Total number of CPU microseconds and (% of total) which cannot be attributed to specific programs or modules.

11.5.11 (Statistical) Library Information

The Library Information property page provides information about the libraries in the PEX collection. This page is only shown for Statistical collections.

IBM i Connections Idoc730: PEX-Analyzer - #1 Collection 'Shier' Properties - Idoc730 - #1										
General Creation Settings Definition Events Collection Jobs Collection Tasks System CPU Totals Library Information Wait Buckets										
Library information:										
Library name (LIBNAM)	Times called (CALLCOUNT)	Calls made (CALLMADE)	Calls to MI complex instructions (CALLMICPX)	Inline CPU us (INCPUUS)	Inline percent CPU (INPCPUUS)	Inline sync DB IOs (INSD)	Inline async DB IOs (INAD)	Inline sync non-DB IOs (INSN)	Inline async non-DB IOs (INAN)	
QSYS	1822788	1822188	84805	598789	28.572	0	0	0	14	
QIDRGUI	318	927	0	1793	.085	0	0	0	0	
MI COMPLEX	84805	0	0	317984	15.173	0	0	6788	2724	
**LIC	0	0	0	47863	2.283	0	0	0	0	

Collection Properties – (Statistical) Library Information

Tip: You can right-click a column heading in the list for sort/filter options.

11.5.12 Wait Buckets

This screen shows the 32 wait buckets or 300+ wait bucket mapping including individual wait points for the OS release the data was captured.

Tip: Uncheck the box to see the wait bucket mapping.

IBM iConnections | Idoc730: PEX-Analyzer - #1 | Collection 'Tskswt13' Properties - Idoc730 - #1

General | Creation Settings | Definition | Events | Collection Jobs | Collection Tasks | System | CPU Totals | Wait Buckets

This table shows the wait buckets, their descriptions and the specific wait types (enums) contained within each bucket.

☒ Display wait buckets only

Wait bucket number (BUCKETNUM)	Wait bucket description (BUCKETDESC)
1	Dispatched CPU
2	CPU queueing
3	Reserved
4	Other waits
5	Disk page faults
6	Disk non fault reads
7	Disk space usage contention
8	Disk op-start contention
9	Disk writes
10	Disk other
11	Journaling
12	Semaphore contention
13	Mutex contention
14	Machine level gate serialization
15	Seize contention
16	Database record lock contention
17	Object lock contention
18	Ineligible waits
19	Main storage pool overcommitment
20	Journal save while active
21	Reserved
22	Reserved
23	Reserved
24	Socket transmits
25	Socket receives
26	Socket other
27	IFS
28	PASE
29	Data queue receives
30	Idle/waiting for work
31	Synchronization token contention
32	Abnormal contention

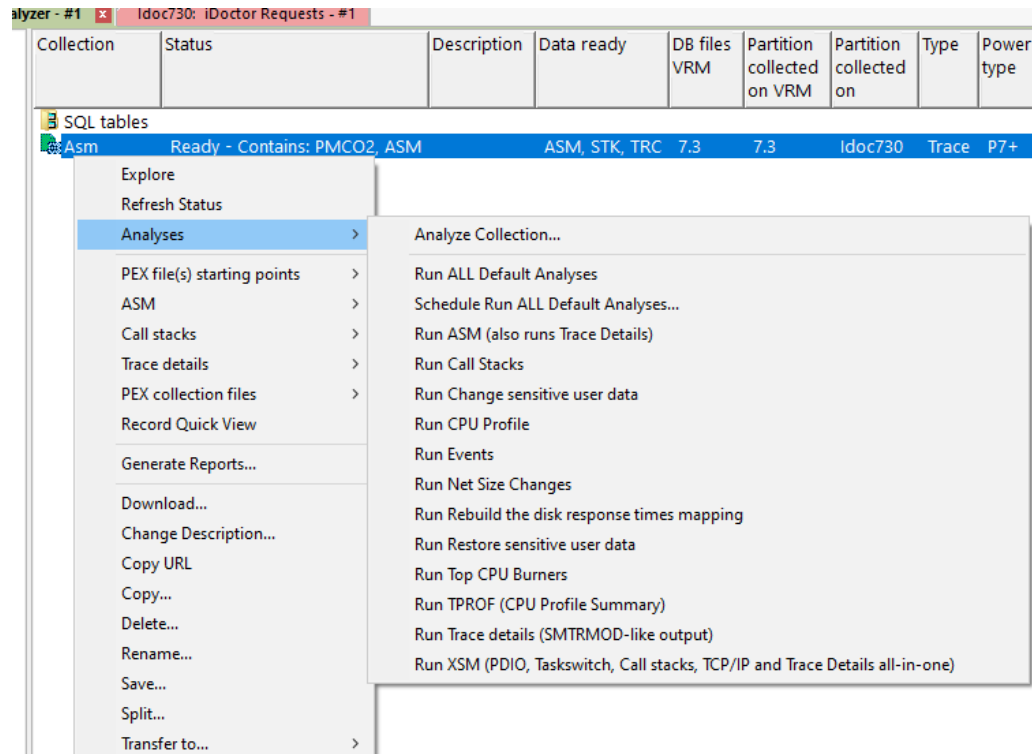
PEX Analyzer – Wait Buckets

12 Analyses

The available analyses in PEX Analyzer and what they provide is described in this section.

All analyses listed below are assumed to be for Trace-type collections unless otherwise noted.

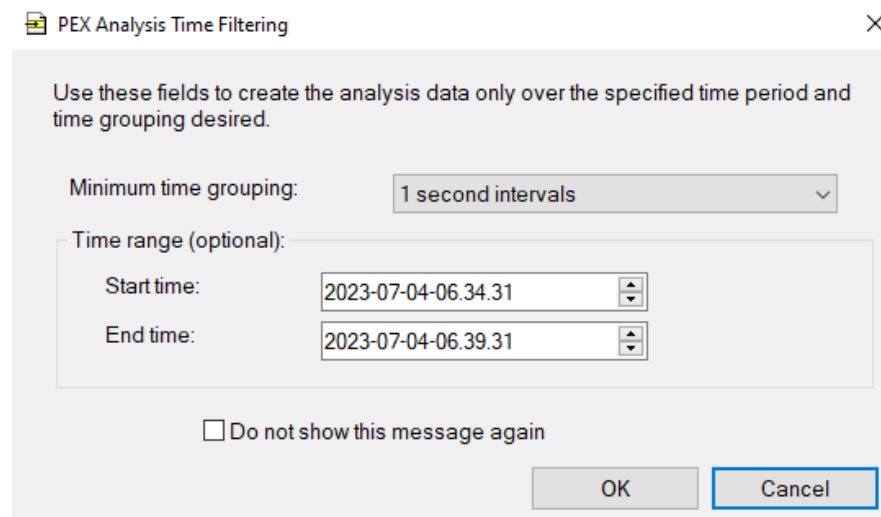
All analyses are written as SQL stored procedures and are initiated from the Analyses menu after selecting one or more collections and right-clicking. Each analysis has a 'fast path' option that allows it to be ran without visiting the Analyze Collection window.



Analyses popup-menu for a collection

12.1 PEX Analysis Time Filtering

Most trace-based analyses will show an optional prompt like the following to allow for time filtering of the PEX collection as well as grouping of time intervals.



PEX Analysis Time Filtering

Tip: If “Do not show this message again” checkbox is used then it can be reenabled later using Preferences -> Confirm -> Prompt for filtering options when running most PEX and some JW analyses.

The minimum time range size defaults to 1 second intervals, but can be set to 1/10th of a second or 1/100th of a second if more granularity is required. This will result in longer run times to complete the analysis and disk space used. However, not all of the trace-based analyses support this feature so in some cases it will have no effect.

12.2 Analyze Collection Window

The Analyze Collection window presents the user with a list of available analyses that can be ran over the currently selected collection(s). It is opened using the **Analyses -> Analyze Collection...** menu.

Analyze Collection(s)

This interface allows you to select which analysis functions should be performed for the selected collection(s). Additional reports will be provided after performing this option.

Toggle Selected

Description	Used by	Program	Run All Default
☐ ASM (also runs Trace Details)		QIDRPASM	1
☐ Call Stacks		QIDRPASTK1	1
☐ Change sensitive user data	Changes job names, user names program names, etc for presentation purposes	QIDRPAXRFA	
☐ CPU Profile		QIDRPACPU3	1
☐ Events	Required for graphing event data	QIDRPAEVT3	1
☐ Interval file index	Used by most PEX trace analyses	QIDRPAINT3	
☐ Net Size Changes		QIDRPAASM3	1
☐ Restore sensitive user data	Restores any data changed by the "Change sensitive user data" analysis	QIDRPAXRFB	
☐ Top CPU Burners		QIDRPABUR1	
☐ TPROF (CPU Profile Summary)		QIDRPATPRF	1
☐ Trace details (SMTRMOD-like output)		QIDRPASMT2	
☐ VSM (BDN, Taskswitch, Call stacks, TCD/ID and Trace Details all-in-one)		QIDRPAVSM3	

☐ Submit this request to a batch job instead of using a QZDASOINIT job.

☐ Always run analyses in a batch job

OK Cancel

Analyze Collection(s) Window

Each available analysis is presented to the user on this screen. **Only the checked analyses will be executed.**

The controls on this interface and what they do is described in more detail in the following table:

Option	Description
Toggle selected button	This button changes the checked state of all analyses in the list.
Analyses available list	This is the list of the analyses available. Checking an analysis name indicates that it will be ran when the OK button is pressed.
Submit this request to a batch job	If this option is used an SQL script will be created on the server and ran in a new submitted job. NOTE: This requires FTP access to the IBM i or this option will fail.
Always run analyses in a batch job	This option is a preference linked with Preferences -> Miscellaneous tab -> "Always run analyses in a batch job". If checked the analysis will run in a batch job instead of a Remote SQL Statement Status View.

12.3 Change sensitive user data

These options are used to hide/replace potentially sensitive data in PEX Analyzer.

It will update the following things in the PEX files:

- 1) User names and job names that do not start with 'Q' in QAYPETASKI.

- 2) Serial number and system name in file QAYPERUNI.
- 3) Program name, program library, module name and procedure name in file QAYPEPROCI

Other things that could contain sensitive data that are NOT updated include:

- a) Activation group names and program activation program names
- b) Socket data (IP address, user profiles, job information)

12.3.1 SQL Tables

The list of SQL tables generated by the analysis is shown below and is accessible under the **SQL tables** -> **Change sensitive user data** folder. These files are mappings of the original values to the new or "sanitized" values.

Note: These tables are used by the Restore sensitive user data analysis to restore the data to the original contents.

SQL table	Description
PEXPROCIXRF_<MBR>	Mapping of original to "sanitized" to QAYPEPROCI data or system serial # or system name..
PEXTASKIXRF_<MBR>	Mapping of original to "sanitized" to user names and job names.

12.4 Rebuild the disk response times mapping

This option is not really an analysis but is used to recreate the disk response time mapping data in QUSRSYS/QAIDRDBKT if it does not already exist.

Note: This table is created during the installation, and this should not need to be ran unless this file is removed in which case the [Physical Disk I/Os analysis](#) will fail to execute. Run this analysis once on any PEX collection that contains PDIO events to recreate this table.

12.5 Restore sensitive user data

This option can be used to restore data changed by the [Change sensitive user data](#) analysis back to its original state.

Note: This is only applicable if 2 things are true:

- 1) The status column shows SANITIZED (meaning the change sensitive user data analysis has been ran.)
- 2) The original SQL tables created by the Change sensitive user data analysis still exist.

12.6 XSM (PDIO, Taskswitch, Call stacks, TCP/IP and Trace Details all-in-one)

This option can be used to run the following analyses in one step:

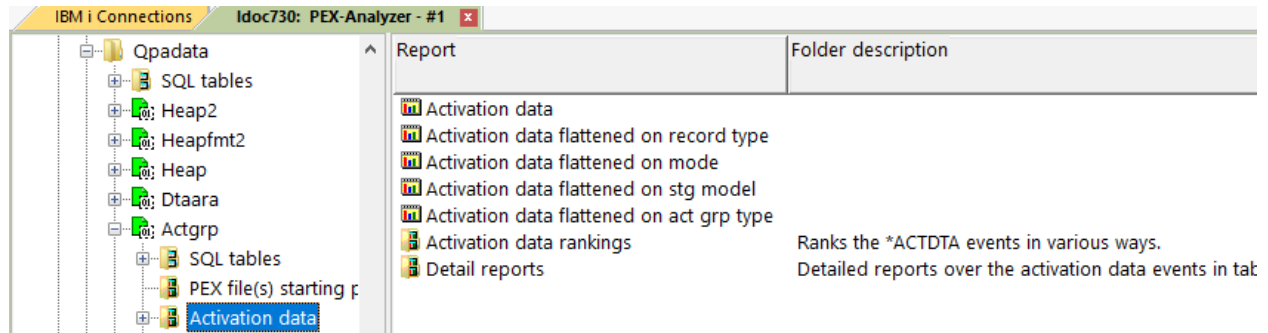
1. Physical Disk I/Os
2. Taskswitch
3. Call stacks
4. TCP/IP Communications
5. TCP/IP Communications format 2
6. Trace Details

Note: With build 1623 or higher, option 5 was added above. Older builds will not include that.

Also, the analysis will fail with older builds if any of the required events were not captured. With 1623 or higher it will run and produce data for the events captured even if some types were not collected.

13 Activation data

This analysis examines the *ACTDTA events (type 24, 8) only. **This analysis only appears with latest builds (June 2023+ or later)** and previously the reports it contains existed within the Activation groups analysis.



Activation data folder

13.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

13.2 SQL Tables

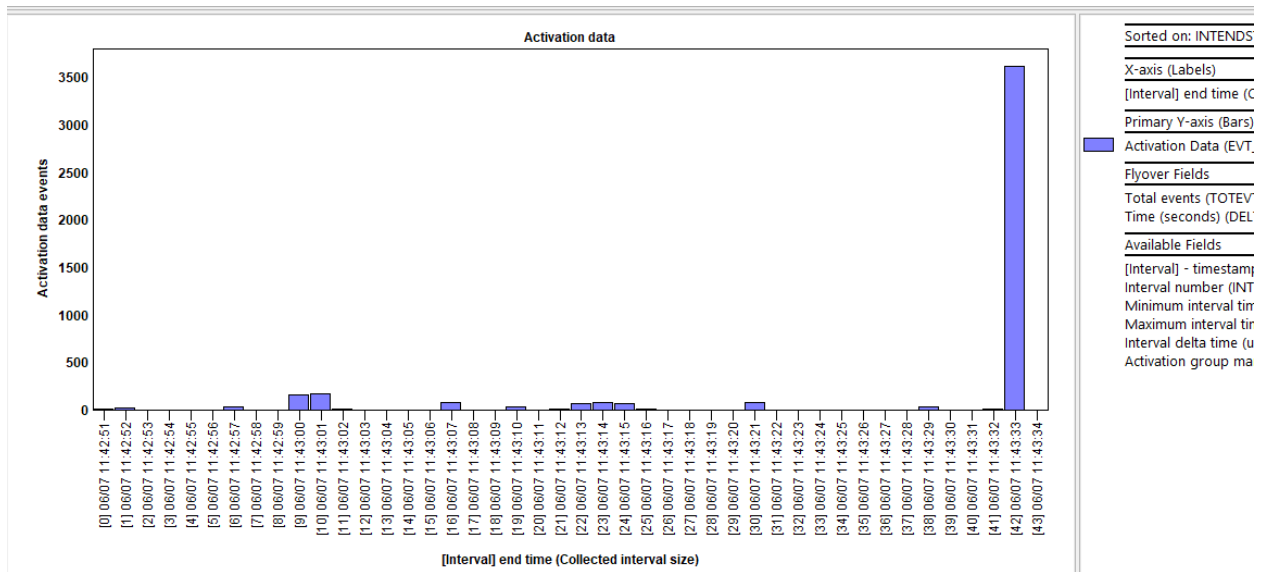
The list of SQL tables generated by the analysis are shown below:

SQL table	Description
PEXACTDTA_<MBR>	Activation data event details

13.3 Activation data

The activation data graph indicates when the activation data events occurred over time.

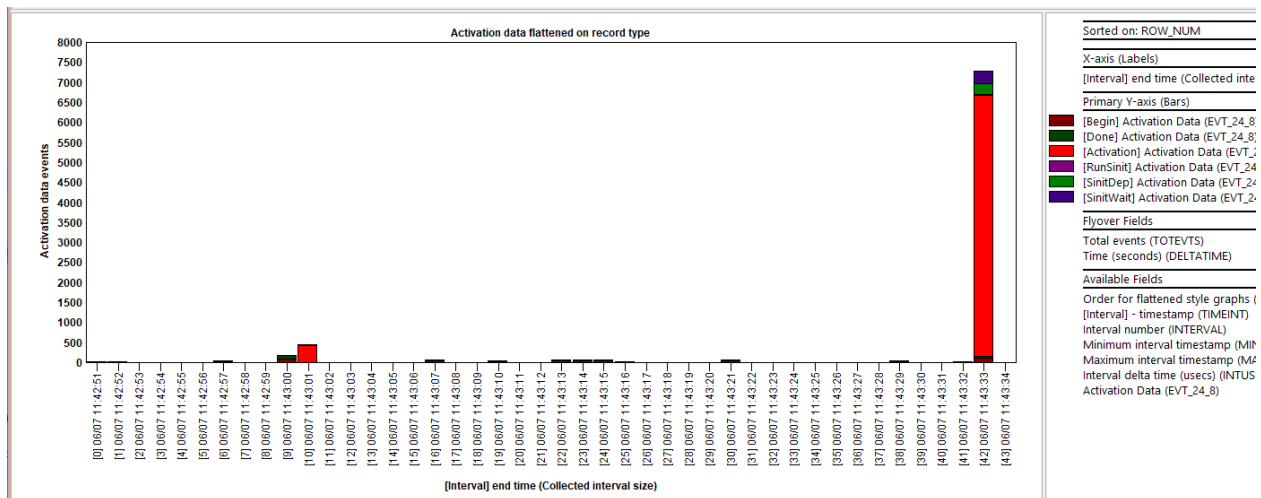
Right-click on a selected bar for more options.



Activation data

13.4 Activation data flattened on record type

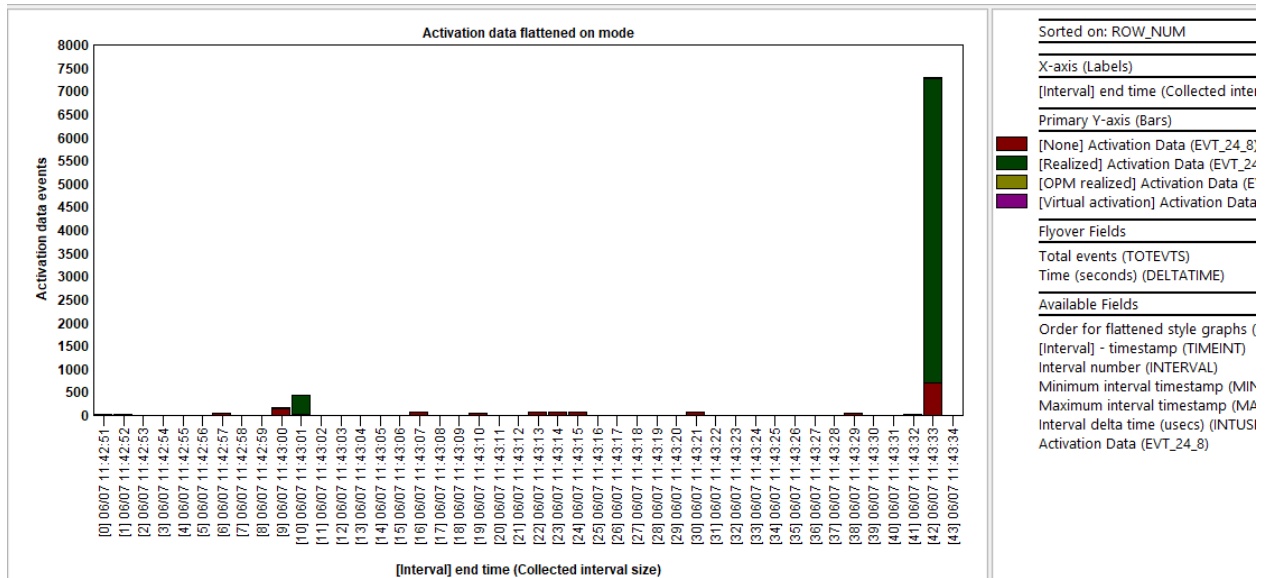
This graph is the same as the Activation data graph but uses a different color per record type (indicated in the graph legend.)



Activation data flattened on record type

13.5 Activation data flattened on mode

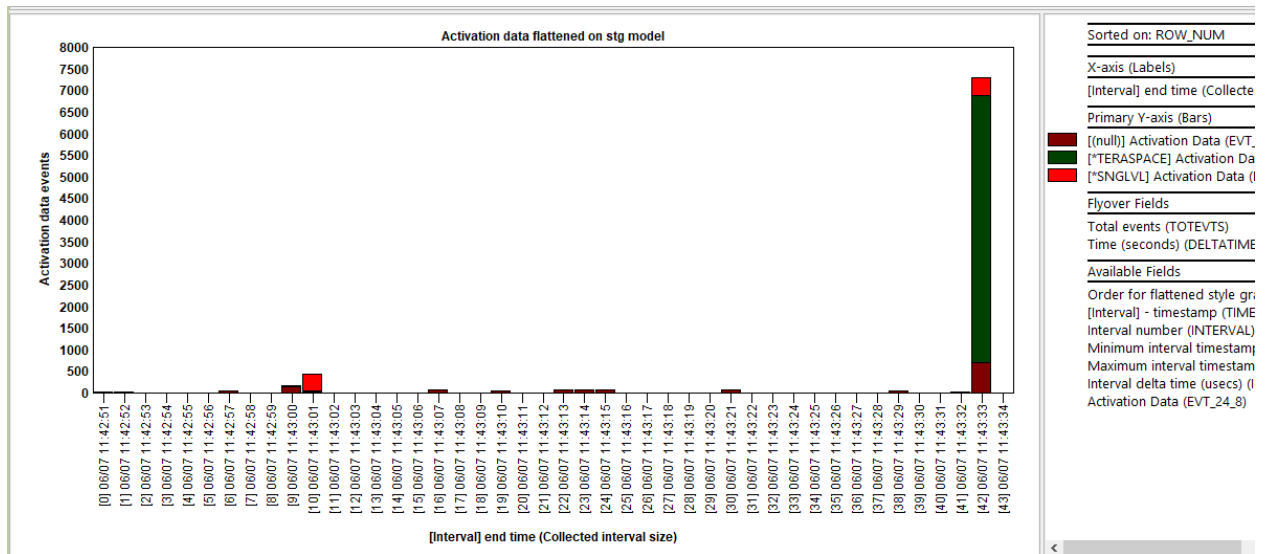
This graph is the same as the Activation data graph but uses a different color per mode (indicated in the graph legend.)



Activation data flattened on mode

13.6 Activation data flattened on stg model

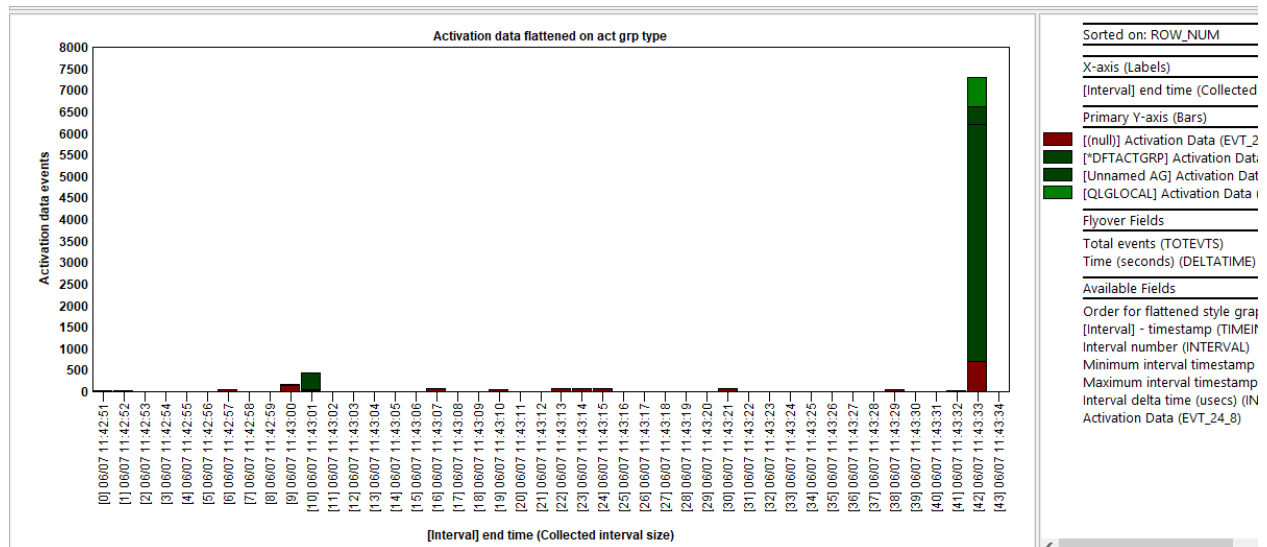
This graph is the same as the Activation data graph but uses a different color per storage model (indicated in the graph legend.)



Activation data flattened on stg model

13.7 Activation data flattened on act grp type

This graph is the same as the Activation data graph but uses a different color per activation group type (indicated in the graph legend.)

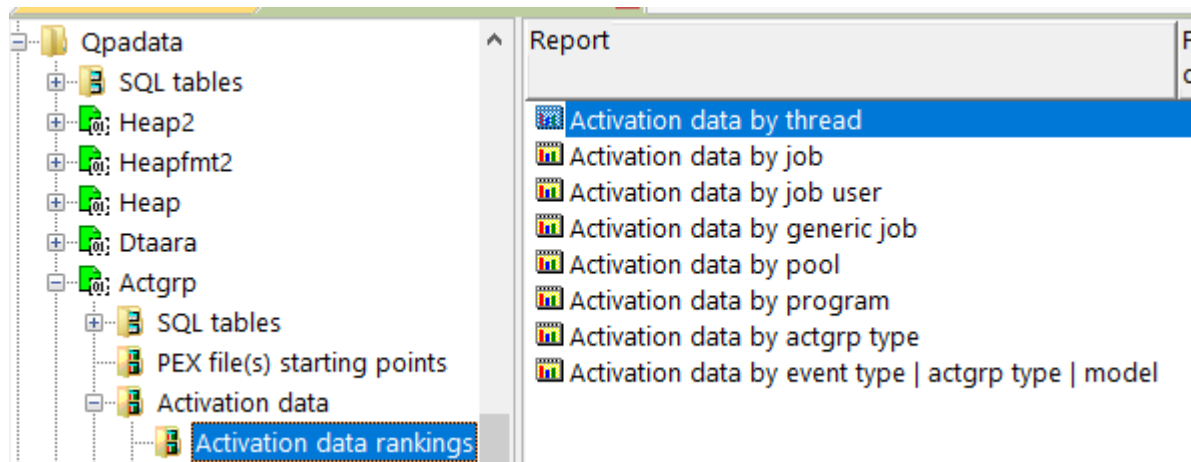


Activation data flattened on act grp type

13.8 Activation data rankings

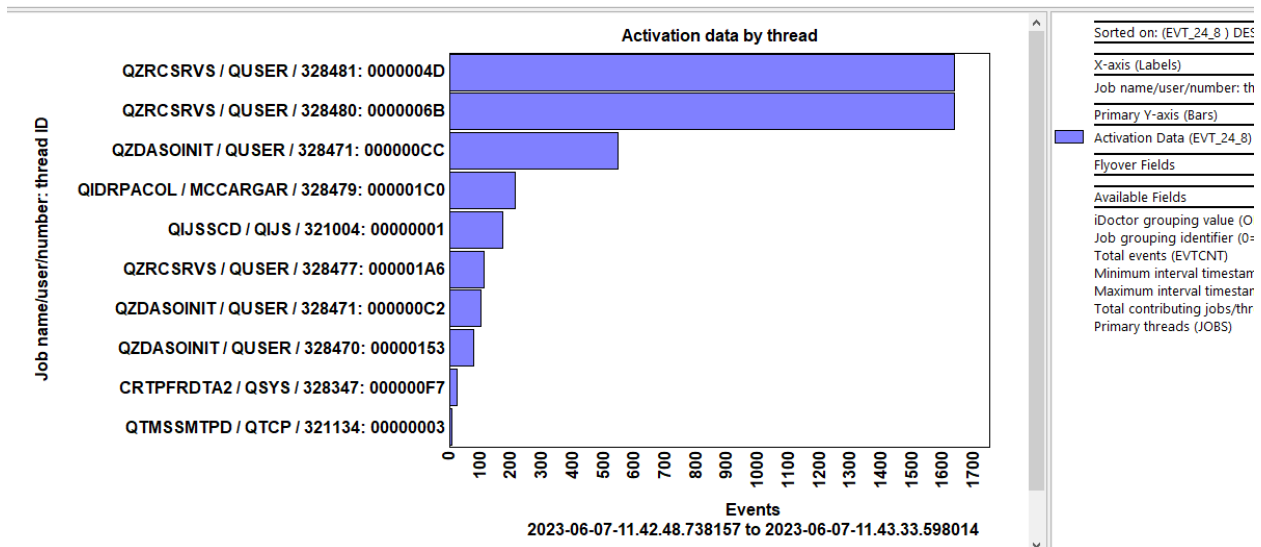
These graphs can be accessed and ran against the entire collection or as a drill down from one of the overview charts. They add up the number of events that occurred for various job groupings for the desired time.

Tip: You can right-click on a bar and use the Detail reports -> Activation data reports see the data behind the selected job grouping.



Activation data -> Activation data rankings

An example is shown below:

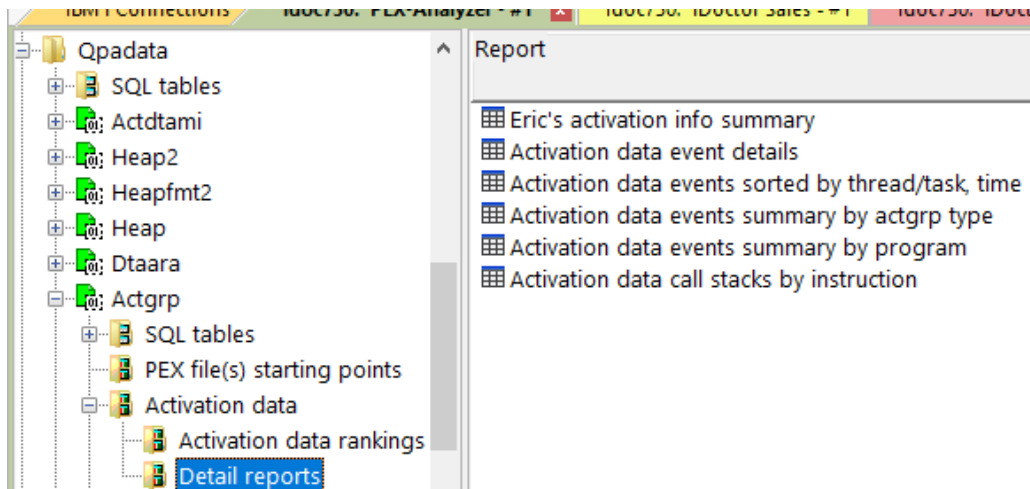


Activation data by thread

13.9 Detail reports

These reports provide more information about the *ACTDTA events. They can be accessed from this folder and will run against the entire collection, or you can also access these as a drill down from one of the graphs previously discussed.

Note: Client 1619+ is required to have the latest changes shown in this section.



Activation data -> Detail reports

13.9.1 Eric's activation info summary

This report groups the activation data by most fields including program, record type, invoker, program type and more.

Total events (TOTEVTS)	Percentage of total events (%) (EVTPTCT)	Collection library (LIBNAME)	Program being activated (PGMACTNAME)	Record type (RECTYPE)	Activation invoker (ACTINVOKER)	Invocation type (INVOKETYPE)	Activation mode (ACTMODE)	Program type (PGMTYPE)	Group storage model (GRPMODEL)	Group type (GRPTYPE)
863	7.30	QSYS	QLEAWI	Activation			Realized	SrvPgm	Terraspace	Default
702	6.00			SinitDep			None			
631	5.40	QSYS	QC2UTIL1	Activation			Realized	SrvPgm	Terraspace	Default
612	5.20			SinitWait			None			
365	3.10			Done			None			
351	3.00	QSYS	QYPPRT370	Activation			Realized	SrvPgm	Terraspace	Default
189	1.60	QSYS	QTRCRCD	Activation			Realized	SrvPgm	Terraspace	Default
155	1.30	QSYS	QPOZCPA	Activation			Realized	SrvPgm	Terraspace	Default
143	1.20	QSYS	QUSHDLR	Activation			Realized	SrvPgm	Terraspace	Default
142	1.20	QSYS	QLEAWI	Activation			Realized	SrvPgm	SLS	Default
138	1.20			RunSinit			None			
133	1.10	QSYS	QLEAWI	Activation			Realized	SrvPgm	SLS	Unnamed
133	1.10	QSYS	QTRCMGR	Activation			Realized	SrvPgm	Terraspace	Default
125	1.10	QSYS	QC2UTIL1	Activation			Realized	SrvPgm	SLS	Default
121	1.00	QSYS	QC2UTIL1	Activation			Realized	SrvPgm	SLS	Unnamed
119	1.00	QSYS	QPOLLIB1	Activation			Realized	SrvPgm	Terraspace	Default
109	.90	QSYS	QSQSBS	Activation			Realized	SrvPgm	Terraspace	Default
87	.80	QSYS	QTRCMGR	Activation			Realized	SrvPgm	Terraspace	Default

Eric's activation info summary

13.9.2 Activation data event details

This shows all activation data events sorted by time.

Resource event type (QTITY)	Resource event subtype (QTISTY)	Timestamp (QTITSP)	Taskcount (HEX) (QTIFTC)	QGPADDR (QGPADDR)	QRECTYPE (QRECTYPE)	QINVOKER (QINVOKER)	QACTMODE (QACTMODE)	QACTMARK (QACTMARK)	QGENCODE (QGENCODE)	Activation group name (QNAME)
24	8	2023-06-12-09.37.21.040233	0000000000012CFD	2669882316000000	000A	0001	0064	0000000000000000	00000000	
24	8	2023-06-12-09.37.21.040243	0000000000012CFD	3AB92229C9000000	0014	0000	0000	0000000000329331	0000D060	
24	8	2023-06-12-09.37.21.040260	0000000000012CFD	1706A189BE000000	0014	0000	0000	000000000000002BD	00000008	
24	8	2023-06-12-09.37.21.040269	0000000000012CFD	1CCC19A535000000	0014	0000	0000	000000000000002BE	00000008	
24	8	2023-06-12-09.37.21.040277	0000000000012CFD	0A1F7692F7000000	0014	0000	0000	000000000000002BF	00000008	
24	8	2023-06-12-09.37.21.040286	0000000000012CFD	2CF857773F000000	0014	0000	0000	000000000000002C0	00000008	
24	8	2023-06-12-09.37.21.040297	0000000000012CFD	0000000000000000	005A	0000	0064	0000000000329331	0000D060	
24	8	2023-06-12-09.37.21.040730	0000000000012CFD	2669882316000000	000A	0001	0064	0000000000000000	00000000	
24	8	2023-06-12-09.37.21.040733	0000000000012CFD	3AB92229C9000000	0014	0000	0000	0000000000329341	0000D061	
24	8	2023-06-12-09.37.21.040741	0000000000012CFD	1706A189BE000000	0014	0000	0000	000000000000002BD	00000008	
24	8	2023-06-12-09.37.21.040748	0000000000012CFD	1CCC19A535000000	0014	0000	0000	000000000000002BE	00000008	
24	8	2023-06-12-09.37.21.040755	0000000000012CFD	0A1F7692F7000000	0014	0000	0000	000000000000002BF	00000008	
24	8	2023-06-12-09.37.21.040762	0000000000012CFD	2CF857773F000000	0014	0000	0000	000000000000002C0	00000008	
24	8	2023-06-12-09.37.21.040766	0000000000012CFD	0000000000000000	005A	0000	0064	0000000000329341	0000D061	
24	8	2023-06-12-09.37.21.057620	0000000000012CFD	12957F4119000000	000A	0001	0001	000000000000015E	00000000	

Activation data event details

13.9.3 Program activation trace

Note: This report will only appear if *MIENTRY, *MIEXIT events were collected along with the *ACTDTA event.

It has the same content as the previous report but includes every call level performed and sorts this by time, so you can determine which program calls triggered activation data events.

13.9.4 Activation data events sorted by thread/task, time

Shows the event data from the SQL table created by the analysis but sorted by thread or task and time. It has a different format in terms of the fields shown.

Idoc730/QPADATA/ACTGRP/Activation data events sorted by thread/task, time - #1																	
Call stack QRECN (JOB_QRECN)	(Minimum) QRECN (QRECN)	Taskcount (QTFIC)	Timestamp (QTTIME)	Nanoseconds since collection started (QTTIME)	Program library (QPRQL)	Program name (QPRPGN)	Record type (ACTGRP_RECTYPE)	Invoker (ACTGRP_INVOKER)	Invocation type (ACTGRP_INVTYPE)	Activation data flags (bmap) (ACTGRP_FLAGSBITMAP)	Reserved (FLAG_RESERVED)	DepIFR (FLAG_DEPFR)	DepData (FLAG_DEPDATA)	Wait (FLAG_WAIT)	Has SS (FLAG_HAS_SS)	Mimic OPM (FLAG_OPM_MIMIC)	Is valid (FLAG)
4701	4701	00000000000000780	2023-06-07-11:43:01.435566	12697409876	QJ5	QJ5SCMON	Begin	Eager (implicit)	Call program (ILE)	3	0	0	0	0	0	0	1
4702	4702	00000000000000780	2023-06-07-11:43:01.435569	12697412490	QJ5	QJ5SCMON	Done	0	0	0	0	0	0	0	0	0	1
4703	4703	00000000000000780	2023-06-07-11:43:01.436108	12697951392	QJ5	QJ5SCMON	Begin	Eager (implicit)	Call program (ILE)	3	0	0	0	0	0	0	1
4706	4706	00000000000000780	2023-06-07-11:43:01.436165	12698008896	QJ5	QJ5ALMON	Activation	0	0	1	0	0	0	0	0	0	0
4708	4708	00000000000000780	2023-06-07-11:43:01.436182	12698023958	QJ5	QJ5ARFCR	Activation	0	0	1	0	0	0	0	0	0	0
4710	4710	00000000000000780	2023-06-07-11:43:01.436182	12698033177	QJ5	QJ5ARFCR	Activation	0	0	1	0	0	0	0	0	0	0
4712	4712	00000000000000780	2023-06-07-11:43:01.436201	12698044521	QJ5	QJ5ARSEQ	Activation	0	0	1	0	0	0	0	0	0	0
4714	4714	00000000000000780	2023-06-07-11:43:01.436211	12698054222	QJ5	QJ5ARFQX	Activation	0	0	1	0	0	0	0	0	0	0
4716	4716	00000000000000780	2023-06-07-11:43:01.436220	12698063302	QJ5	QJ5ARNAIM	Activation	0	0	17	0	0	0	1	0	0	0
4718	4718	00000000000000780	2023-06-07-11:43:01.436229	12698072521	QJ5	QJ5LEAW	Activation	0	0	1	0	0	0	0	0	0	0
4719	4719	00000000000000780	2023-06-07-11:43:01.436231	12698074177	QJ5	QJ5ARNAIM	Activation	0	0	49	0	1	1	0	0	0	0
4720	4720	00000000000000780	2023-06-07-11:43:01.436239	12698082396	QJ5	QJ5ARMTX	Activation	0	0	1	0	0	0	0	0	0	0
4722	4722	00000000000000780	2023-06-07-11:43:01.436248	12698091302	QJ5	QJ5AREXTN	Activation	0	0	1	0	0	0	0	0	0	0
4724	4724	00000000000000780	2023-06-07-11:43:01.436257	12698100302	QJ5	QJ5LECW	Activation	0	0	1	0	0	0	0	0	0	0
4726	4726	00000000000000780	2023-06-07-11:43:01.436267	12698110025	QJ5	QJ5CQ	Activation	0	0	1	0	0	0	0	0	0	0
4728	4728	00000000000000780	2023-06-07-11:43:01.436276	12698119332	QJ5	QJ5CTUL1	Activation	0	0	17	0	0	0	1	0	0	0
4729	4729	00000000000000780	2023-06-07-11:43:01.436277	12698120521	QJ5	QJ5LEAW	Activation	0	0	1	0	0	0	0	0	0	0
4731	4731	00000000000000780	2023-06-07-11:43:01.436288	12698131160	QJ5	QJ5PCZCA	Activation	0	0	1	0	0	0	0	0	0	0
4732	4732	00000000000000780	2023-06-07-11:43:01.436290	12698133335	QJ5	QJ5ARNAIM	Activation	0	0	17	0	0	0	1	0	0	0
4733	4733	00000000000000780	2023-06-07-11:43:01.436291	12698134453	QJ5	QJ5ARMTX	Activation	0	0	1	0	0	0	0	0	0	0
4734	4734	00000000000000780	2023-06-07-11:43:01.436292	12698135546	QJ5	QJ5CTUL1	Activation	0	0	17	0	0	0	1	0	0	0
4736	4736	00000000000000780	2023-06-07-11:43:01.436316	12698159083	QJ5	QJ5CTUL3	Activation	0	0	1	0	0	0	0	0	0	0
4737	4737	00000000000000780	2023-06-07-11:43:01.436317	12698160345	QJ5	QJ5LEAW	Activation	0	0	1	0	0	0	0	0	0	0
4738	4738	00000000000000780	2023-06-07-11:43:01.436318	12698161871	QJ5	QJ5ARNAIM	Activation	0	0	17	0	0	0	1	0	0	0
4739	4739	00000000000000780	2023-06-07-11:43:01.436319	12698162996	QJ5	QJ5ARMTX	Activation	0	0	1	0	0	0	0	0	0	0
4740	4740	00000000000000780	2023-06-07-11:43:01.436321	12698164115	QJ5	QJ5LECW	Activation	0	0	1	0	0	0	0	0	0	0
4741	4741	00000000000000780	2023-06-07-11:43:01.436322	12698165208	QJ5	QJ5CQ	Activation	0	0	1	0	0	0	0	0	0	0
4742	4742	00000000000000780	2023-06-07-11:43:01.436323	12698166562	QJ5	QJ5CTUL1	Activation	0	0	17	0	0	0	1	0	0	0
4743	4743	00000000000000780	2023-06-07-11:43:01.436324	12698167652	QJ5	QJ5LEAW	Activation	0	0	1	0	0	0	0	0	0	0
4744	4744	00000000000000780	2023-06-07-11:43:01.436326	12698169490	QJ5	QJ5ARNAIM	Activation	0	0	17	0	0	0	1	0	0	0
4745	4745	00000000000000780	2023-06-07-11:43:01.436327	12698170615	QJ5	QJ5ARSEQ	Activation	0	0	1	0	0	0	0	0	0	0
4746	4746	00000000000000780	2023-06-07-11:43:01.436328	12698171638	QJ5	QJ5ARMTX	Activation	0	0	1	0	0	0	0	0	0	0
4747	4747	00000000000000780	2023-06-07-11:43:01.436329	12698172693	QJ5	QJ5LECW	Activation	0	0	1	0	0	0	0	0	0	0
4748	4748	00000000000000780	2023-06-07-11:43:01.436330	12698173759	QJ5	QJ5CTUL1	Activation	0	0	1	0	0	0	0	0	0	0
4749	4749	00000000000000780	2023-06-07-11:43:01.436331	12698174804	QJ5	QJ5LEAW	Activation	0	0	1	0	0	0	0	0	0	0
4750	4750	00000000000000780	2023-06-07-11:43:01.436333	12698176326	QJ5	QJ5LECW	Activation	0	0	1	0	0	0	0	0	0	0
4751	4751	00000000000000780	2023-06-07-11:43:01.436334	12698177400	QJ5	QJ5ARMTX	Activation	0	0	1	0	0	0	0	0	0	0
4752	4752	00000000000000780	2023-06-07-11:43:01.436335	12698178521	QJ5	QJ5ARFCR	Activation	0	0	1	0	0	0	0	0	0	0

Activation data events sorted by thread/task, time

13.9.5 Activation data events summary by actgrp type

This report summarizes the data by activation group type.

Idoc730/QPADATA/ACTGRP/Activation data events summary by actgrp type - #1						
Total events (TOTEVTS)	Activation group type (ACTGRP_TYPE)	(Minimum) QRECN (QRECN)	Job grouping identifier (0=thread, 1=job, etc) (JOBGRPTYPE)	Actgrp type (OBJNAME)	iDoctor grouping value (OBJVALUE)	Minimum ir timestamp (MINDTETIM)
2609	*DFTACTGRP	6	74	*DFTACTGRP	*DFTACTGRP	2023-06-07
1418		5	74			2023-06-07
274	Unnamed AG	1847	74	Unnamed AG	Unnamed AG	2023-06-07
219	QLGLOCAL	90	74	QLGLOCAL	QLGLOCAL	2023-06-07

Activation data events summary by actgrp type

13.9.6 Activation data events summary by program

This report summarizes the data by program associated with the *ACTDTA event.

Idoc730/QPADATA/ACTGRP/Activation data events summary by program - #1								
Total events (TOTEVTS)	Activation group type (ACTGRP_TYPE)	Program library (QPRPQL)	Program name (QPRPGN)	(Minimum) QRECN (QRECN)	Job grouping identifier (0=thread, 1=job, etc) (JOBGRPTYPE)	Program (OBJNAME)	iDoctor grouping value (OBJVALUE)	Min time (M)
698		QSYS	QSYGRAUT	1815		QSYGRAUT	QSYGRAUT	20
468	Unnamed AG	QSYS	QLEAWI	27		QLEAWI	QLEAWI	20
376	Unnamed AG	QSYS	QC2UTIL1	21		QC2UTIL1	QC2UTIL1	20
324				1516		AiSinitCondition	AiSinitCondition	20
278				1500		AiActGraph	AiActGraph	20
148	Unnamed AG	QSYS	QYPPRT370	137		QYPPRT370	QYPPRT370	20
80	Unnamed AG	QSYS	QTRCMGR	113		QTRCMGR	QTRCMGR	20
79	*DFTACTGRP	QSYS	QTRCRCD	115		QTRCRCD	QTRCRCD	20
69	Unnamed AG	QSYS	QP0ZCPA	92		QP0ZCPA	QP0ZCPA	20
58	*DFTACTGRP	QSYS	QUSHDLER	56		QUSHDLER	QUSHDLER	20
57	Unnamed AG	QSYS	QC2UTIL3	71		QC2UTIL3	QC2UTIL3	20
49	*DFTACTGRP	QSYS	QTQSRVP2	19		QTQSRVP2	QTQSRVP2	20
49	Unnamed AG	QSYS	QP0LLIB1	44		QP0LLIB1	QP0LLIB1	20
49	Unnamed AG	QSYS	QTQICONV	33		QTQICONV	QTQICONV	20
48	Unnamed AG	QSYS	QLECW	68		QLECW	QLECW	20
46	Unnamed AG	QSYS	QLESPI	74		QLESPI	QLESPI	20
45	Unnamed AG	QSYS	QC2SDATA	78		QC2SDATA	QC2SDATA	20
44	*DFTACTGRP	QSYS	QSQSBAS	874		QSQSBAS	QSQSBAS	20
42	Unnamed AG	QSYS	QC2IO	196		QC2IO	QC2IO	20
40	*DFTACTGRP	QSYS	QSYCLEANUP	129		QSYCLEANUP	QSYCLEANUP	20
40	Unnamed AG	QSYS	QC2UTIL2	39		QC2UTIL2	QC2UTIL2	20
35	*DFTACTGRP	QSYS	QCATRS	1844		QCATRS	QCATRS	20
34	QLGLOCAL	QSYS	QSYVPHDL	111		QSYVPHDL	QSYVPHDL	20
33	*DFTACTGRP	QSYS	QSQRUN4	1006		QSQRUN4	QSQRUN4	20
32	*DFTACTGRP	QSYS	QSQSBAS2	668		QSQSBAS2	QSQSBAS2	20

Activation data events summary by program

13.9.7 Activation data call stacks by instruction

This report summarizes the call stacks found in the PEX collection (for *ACTDTA events) looking for the most common ones.

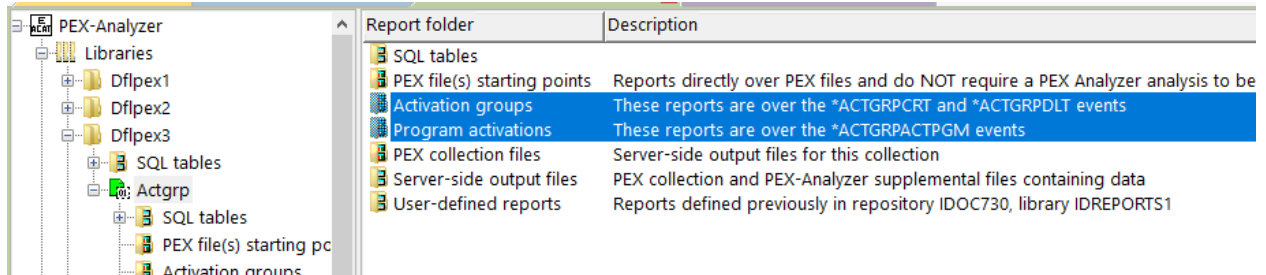
Idoc730/QPADATA/ACTGRP/Activation data call stacks by instruction - #1								
Total events (TOTEVTS)	Call level (LEVEL)	Program model (MODEL)	Program name (PGMNAM)	Module name (MODNAM)	Procedure name (PRCNAM)	Offset (ADDR_OFFSET)	Statement number (STMTNBR)	Min time (M)
2582	1	LIC		AiEagerActivator	pBuildDepGraph_16AiEagerActivatorFR10AiActGraphP11AiPgProgram	0000000000000784	1972	2
2582	2	LIC		AiEagerActivator	pCreateActivation_16AiEagerActivatorFP11AiPgProgram	0000000000000178	376	2
2582	3	LIC		AiEagerActivator	activate_16AiEagerActivatorFv	000000000000007C	124	2
2582	4	LIC		AiUpcallProgram	pActivatePgm_15AiUpcallProgramFP5AiPgmP9AiProcessR14AiCbClearAreaRii	0000000000000320	800	2
2582	5	LIC		AiUpcallProgram	targetProgramActivation_15AiUpcallProgramFR14AiCbClearAreaP16AiMachinePgmCall	00000000000002AC	684	2
2582	6	LIC		AiUpcallProgram	machineProgramCall_15AiUpcallProgramFP16AiMachinePgmCall	00000000000001CC	460	2
2582	7	LIC		AiUpcallPortalMach	aimach_program_call_portal	0000000000000054	84	2
2582	8	LIC		pminitiateprocess	pminitiateProcessUnderTarget_Fv	0000000000000604	1540	2
324	1	LIC		AiSinitCondition	WaitForComplete_16AiSinitConditionFP16AiSinitCondition	0000000000000254	596	2
324	2	LIC		AiActGraph	PreVisit_12SinitVisitorFUIP12SinitVisitorP12AiActivation	0000000000000138	312	2
324	3	LIC		AiActGraph	ProcessSinit_10AiActGraphFP12AiActivation	0000000000000178	376	2
324	4	LIC		AiEagerActivator	pProcessSinit_16AiEagerActivatorFP12AiActivation	0000000000000080	128	2
324	5	LIC		AiEagerActivator	activate_16AiEagerActivatorFv	0000000000000094	148	2
324	6	LIC		AiUpcallProgram	pActivatePgm_15AiUpcallProgramFP5AiPgmP9AiProcessR14AiCbClearAreaRii	0000000000000320	800	2
324	7	LIC		AiUpcallProgram	targetProgramActivation_15AiUpcallProgramFR14AiCbClearAreaP16AiMachinePgmCall	00000000000002AC	684	2
324	8	LIC		AiUpcallProgram	machineProgramCall_15AiUpcallProgramFP16AiMachinePgmCall	00000000000001CC	460	2
324	9	LIC		AiUpcallPortalMach	aimach_program_call_portal	0000000000000054	84	2
324	10	LIC		pminitiateprocess	pminitiateProcessUnderTarget_Fv	0000000000000604	1540	2

Activation data call stacks by instruction

14 Activation groups

This analysis is used to analyze the base event types *ACTGRPACTPGM, *ACTGRPCRT and *ACTGRPDLT relating to activation group activations, creation, and deletion. These events are type 3, sub types 13, 14, 15.

After this analysis completes the PEX collection will contain 2 folders as shown below:



Activation groups and Program activations folders under a collection

14.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

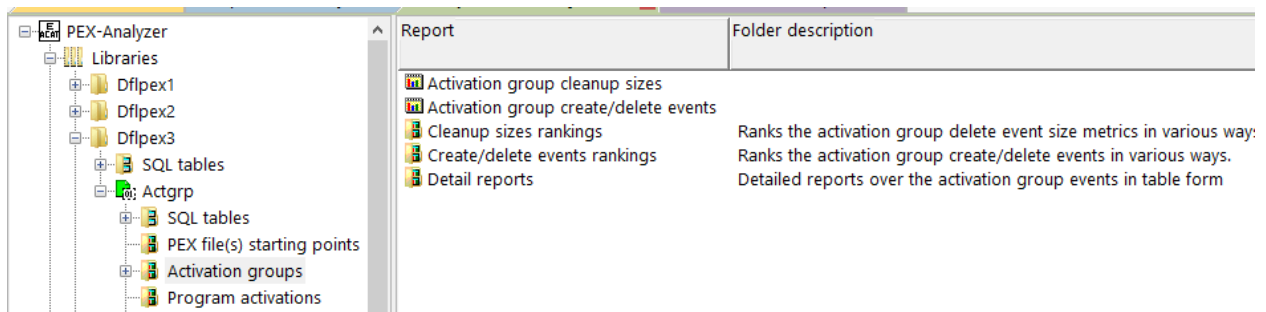
14.2 SQL Tables

The list of SQL tables generated by the analysis are shown below:

SQL table	Description
PEXACTGRP_<MBR>	Activation group summary
PEXACTGRPEVTS_<MBR>	Activation group event details

14.3 Activation groups folder

This folder contains graphs and reports over the *ACTGRPCRT and *ACTGRPDLT events.



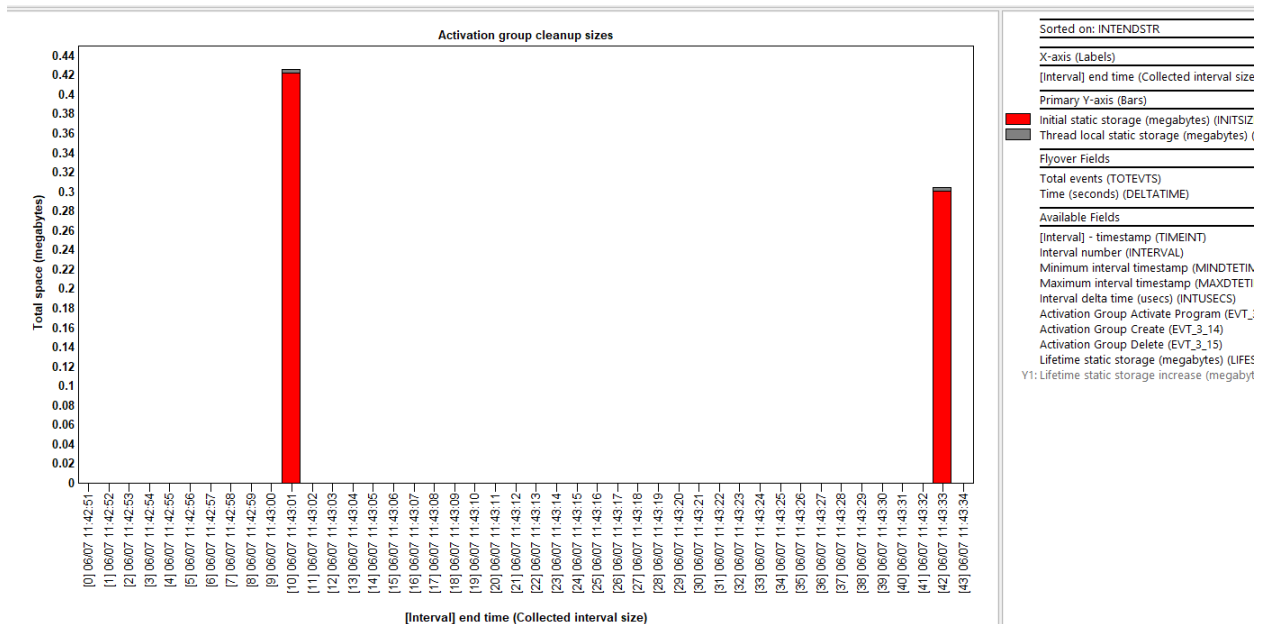
Activation groups

14.3.1 Activation group cleanup sizes

This graph examines the *ACTGRPDLT events to determine 3 values over time.

1. Initial static storage (MBs) which is derived from QBSH05 in QAYPEBASE.
2. Thread local static storage (MBs) which is derived from QBSH07 in QAYPEBASE.

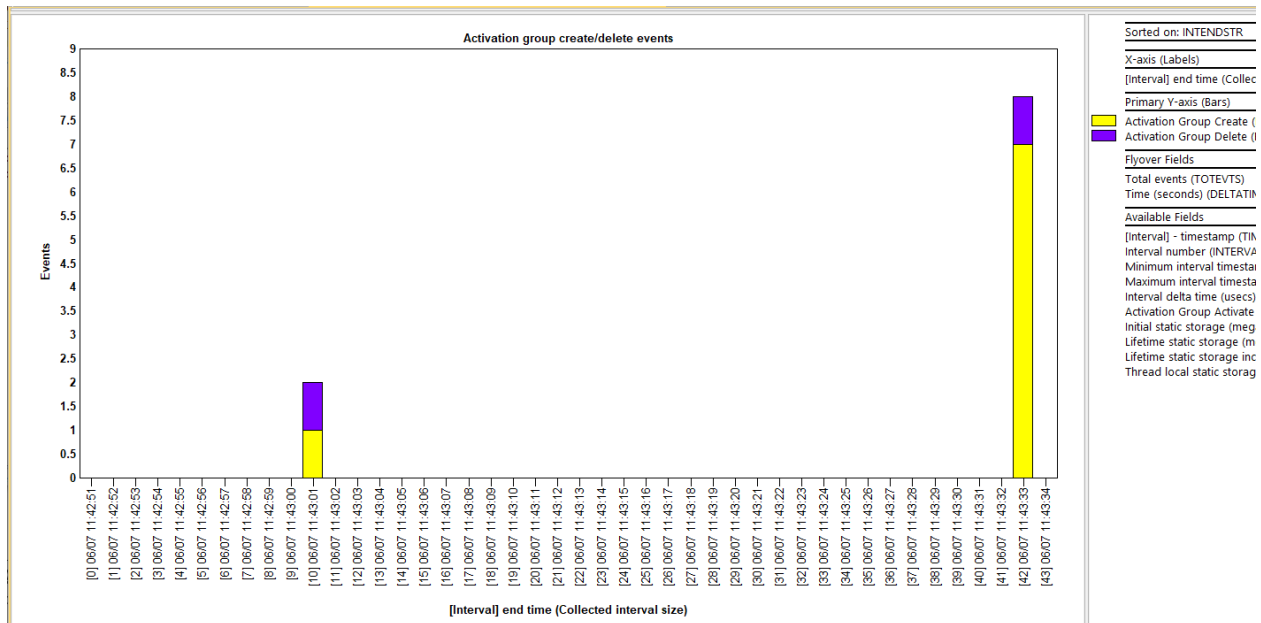
3. Change in static storage (MBs) which is derived from a delta value in QBSH06 between events.



Activation group cleanup sizes

14.3.2 Activation group create/delete events

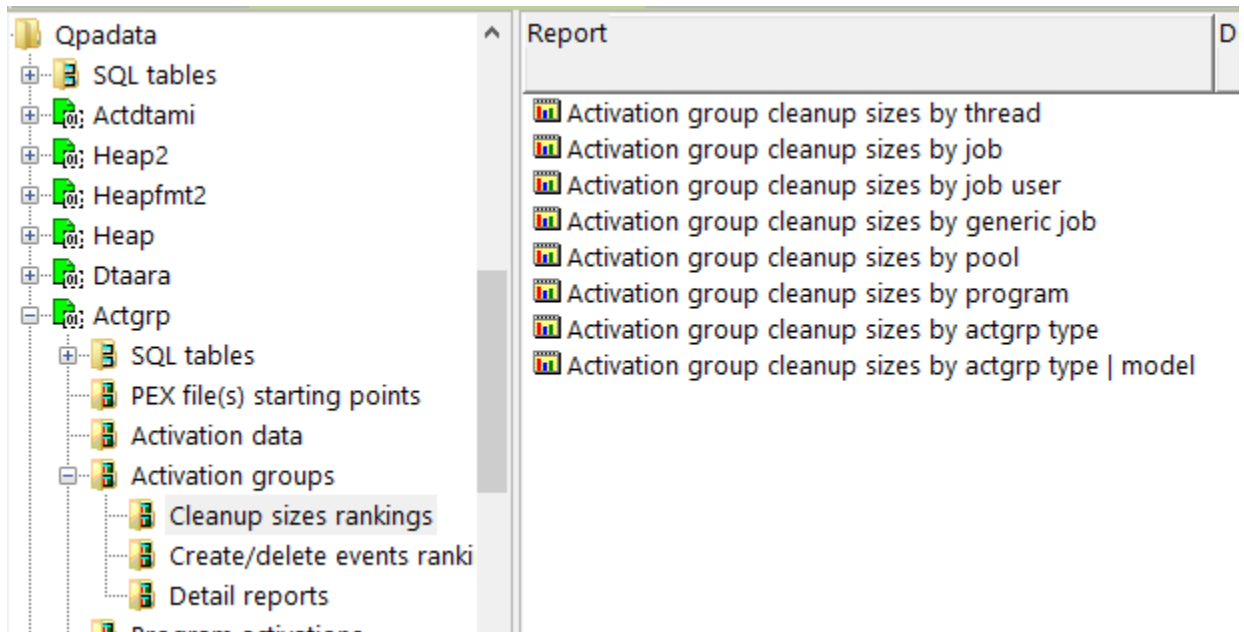
This graph simply counts and displays the *ACTGRPCRT and *ACTGRPDLT events over time.



Activation group create/delete events

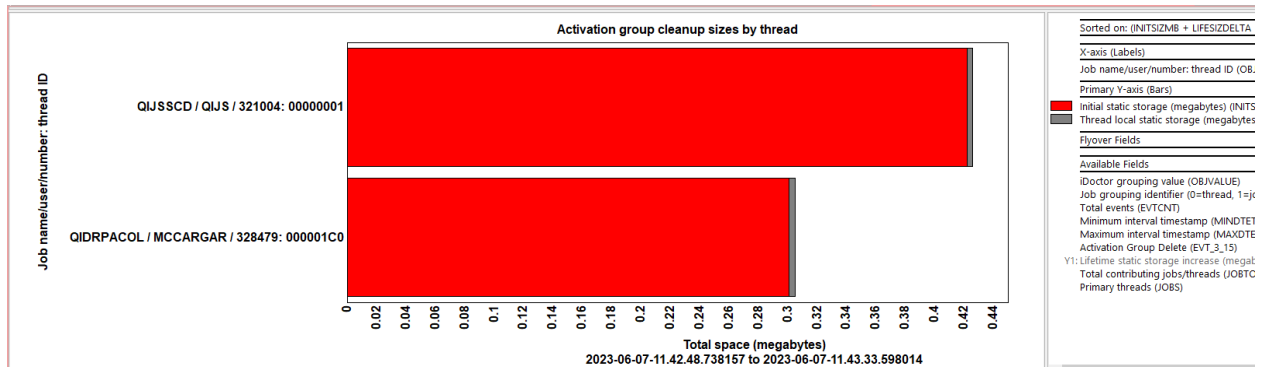
14.3.3 Cleanup sizes rankings

These graphs rank the cleanup sizes data discussed previously by various job groupings or based on activation group type.



Activation groups -> Cleanup sizes rankings

An example graph is shown below:



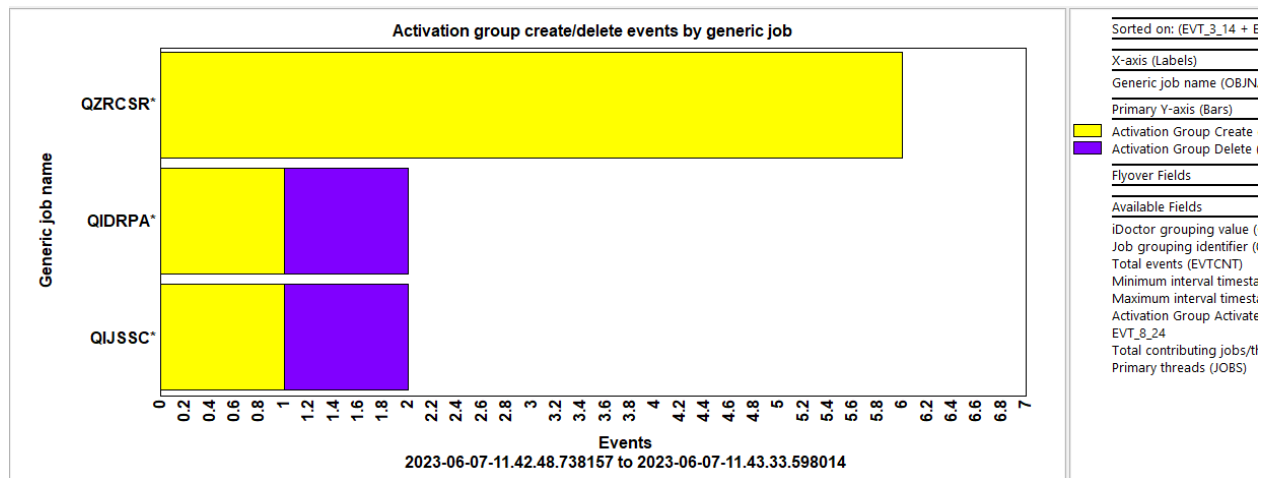
Activation groups cleanup sizes by thread

14.3.4 Create/delete events rankings

These graphs rank the create/delete events by various job groupings or based on activation group type.

It can be accessed from the overview graph by the same name for a selected time period as a drill-down or the folder it exists with to run it against the entire collection.

An example graph is shown below:

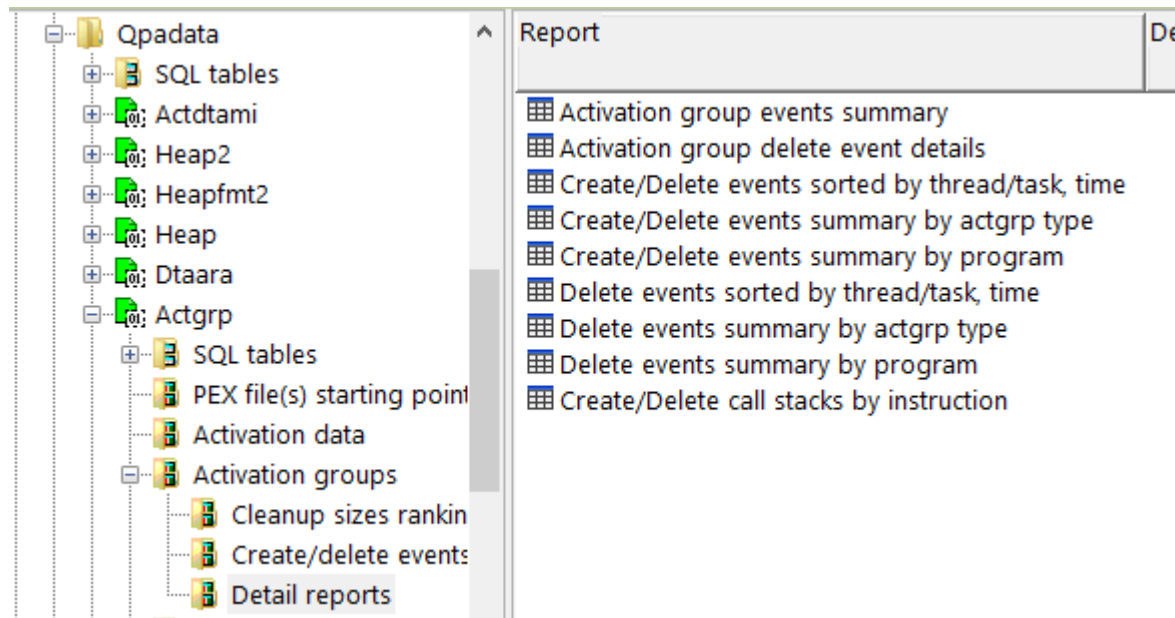


Activation group create/delete events by generic job

14.3.5 Detail reports

These reports show the details behind all the events in the collection or summarized in different ways.

Tip: Except for the Activation group events summary, which is an SQL table generated by the analysis, these reports can also be accessed as a drill-down based on the time range selected or job grouping from one of the previously discussed graphs in most cases.



Activation groups -> Detail reports

An example is shown below:

Idoc730/QPADATA/ACTGRP/Create/Delete call stacks by instruction - #1						
Total events (TOTEVTS)	Event subtype description (short) (QEVSSN)	Call level (LEVEL)	Program model (MODEL)	Program name (PGMNAM)	Module name (MODNAM)	Procedure name (PRCNAM)
2	*ACTGRPCRT	1	LIC		AiProcess	pCrtSysDft_9AiProcessFv
2	*ACTGRPCRT	2	LIC		AiProcess	__ct_9AiProcessFP8HeapBaseP20PmProcessNonResident
2	*ACTGRPCRT	3	LIC		AiProcess	ProcessInit_9AiProcessFP20PmProcessNonResident
2	*ACTGRPCRT	4	LIC		pminitiateprocess	pmlInitiateProcessUnderTarget_Fv
2	*ACTGRPCRT	1	LIC		AiProcess	pCrtUsrDft_9AiProcessFv
2	*ACTGRPCRT	2	LIC		AiProcess	__ct_9AiProcessFP8HeapBaseP20PmProcessNonResident
2	*ACTGRPCRT	3	LIC		AiProcess	ProcessInit_9AiProcessFP20PmProcessNonResident
2	*ACTGRPCRT	4	LIC		pminitiateprocess	pmlInitiateProcessUnderTarget_Fv
2	*ACTGRPCRT	1	LIC		AiProcess	pCreateActGrp_9AiProcessFQ2_2Ai10ActGrpTypeQ2_2Ai9ExecStateQ2_2Ai
2	*ACTGRPCRT	2	LIC		AiEagerActivator	pFindAndUpgradeSrvPgmActivation_16AiEagerActivatorFR10AiActGraphP
2	*ACTGRPCRT	3	LIC		AiEagerActivator	pBuildDepGraph_16AiEagerActivatorFR10AiActGraphP11AiPgProgram
2	*ACTGRPCRT	4	LIC		AiEagerActivator	pCreateActivation_16AiEagerActivatorFP11AiPgProgram
2	*ACTGRPCRT	5	LIC		AiEagerActivator	activate_16AiEagerActivatorFv
2	*ACTGRPCRT	6	LIC		AiUpcallProgram	pActivatePgm_15AiUpcallProgramFP5AiPgmP9AiProcessR14AiCbClearAre
2	*ACTGRPCRT	7	LIC		AiUpcallProgram	targetProgramActivation_15AiUpcallProgramFR14AiCbClearAreaip16AiM:
2	*ACTGRPCRT	8	LIC		AiUpcallProgram	machineProgramCall_15AiUpcallProgramFP16AiMachinePgmCall
2	*ACTGRPCRT	9	LIC		AiUpcallPortalMach	aimach_program_call_portal
2	*ACTGRPCRT	10	LIC		pminitiateprocess	pmlInitiateProcessUnderTarget_Fv

Create/delete call stacks by instruction

15 ASM

The ASM analysis looks for growth or fragments in the Auxillary Storage Management events captured in the collection. **This is only available at 7.3 or higher and requires May 2023 or later server builds.**

Note: The reports created by this analysis are not interval based so the minimum time range size option on the PEX Analysis Time Filtering window will have no effect.

This analysis requires that STGEVT (storage events) have been specified on the PEX definition and captured. An example of the typical events captured to produce this analysis is:

Events specified in the PEX definition:

Total events (EVT CNT)	Event type (CATEGORY)	Subtype (TYPE)	Event type description (CATDESC)	Subtype description (TYPEDESC)	Format (FORMAT)
4196	STGEVT	*FNDSEGSIZ	Auxiliary Storage Management Events	Find Segment Size	1
2612	STGEVT	*EXDSEG	Auxiliary Storage Management Events	Extend Segment	2
2597	STGEVT	*CRTSEG	Auxiliary Storage Management Events	Create Segment	2
2104	STGEVT	*DLTSEG	Auxiliary Storage Management Events	Delete Segment	2
712	STGEVT	*TRUNCSEG	Auxiliary Storage Management Events	Truncate Segment	2
3	BASEVT	*PMCO	Base Events	Performance Measurement Counter Overflow	2

Collection Properties -> Events

After the analysis has finished running and the collection refreshed, an ASM folder will appear under the collection. This folder contains the following reports:

The screenshot shows the IBM iDoctor interface with two tabs: 'Idoc730: PEX-Analyzer - #1' and 'Idoc730: iDoctor Requests - #1'. The left pane displays a tree view of the 'PEX-Analyzer' collection, which includes folders for 'Libraries' (Adamb, lbmpexdb, lbmpexsr, Mccargar1, Mccargar2, Mccargar3), 'SQL tables' (Asm2, Asm), 'PEX file(s) starting points', 'ASM' (highlighted in blue), 'Call stacks', and 'Trace details'. The right pane shows a list of reports under the heading 'Report' and 'Folder description'. The reports listed are: MI Object Fragmentation Details, MI Object Growth Details, MI Fragmentation Summary, MI Object Growth Summary, ASM out, ASM growth, and ASM frag.

ASM folder within collection ASM

Note: The ASM reports are just intermediate tables used to produce the 1st 4 reports and not discussed below.

15.1 Running the analysis

When running the analysis, no prompt appears as neither time filtering nor the minimum time grouping option applies.

15.2 SQL Tables

The list of SQL tables generated by the analysis are shown below:

SQL table	Description
PEXKCASMGROW_ <MBR>	Indicates where the growth (pages in segment) occurred.
PEXSMGROW_ <MBR>	Same as previous
PEXKCASMOUT_ <MBR>	Lists each CRT/DST/EXT (create/destroy/extend) operation.
PEXSMOUT_ <MBR>	Same as previous
PEXSMFRAG_ <MBR>	Indicates where fragmentation occurred.

15.3 MI Object Fragmentation Details

This report shows details about fragmented objects (due to truncates or extends) that occurred during the collection.

Idoc730/MCCARGAR3/ASM/MI Object Fragmentation Details - #1									
(Minimum) QRECN (QRECN)	Taskcount / TDE (TDE)	SID address (SIDADDR)	Segment type (SEGTYPE)	Object name [objtype/segtype] (NAMETYPE)	SID type (SIDTYPE)	Operation (OPR)	IO length (bytes) (BYTELEN)	LIC module and offset (LICMODOFF)	MI module and offset (MIMODOFF)
8602	00017F21	CACCF7FDD300	0001	QQSPC0000132	19EF T	EXT S	32768	EXDFTHND 000E6C	QQQVALID 0053D0
8612	00017F21	CACCF7FDD300	0001	QQSPC0000132	19EF T	TRN S	20480	SOMOD 002418	QQQSRV11 0091EC
9906	00017F72	CAE835148900	0001	QQSPC0000028	19EF T	EXT S	32768	EXDFTHND 000E6C	QQQVAP 04007C
9921	00017F72	CAE835148900	0001	QQSPC0000028	19EF T	TRN S	20480	SOMOD 002418	QQQSRV11 0091EC
6000	00017F72	CCC846A64500	0001	QQSPC0000018	19EF T	EXT S	32768	EXDFTHND 000E6C	QQQO00DBOP 177A64
9801	00017F72	CCC846A64500	0001	QQSPC0000018	19EF T	TRN S	20480	SOMOD 002418	QQQSRV11 0091EC
2304	00017F21	CC587C737C00	0001	QQSPC00000100	19EF T	EXT S	32768	EXDFTHND 000E6C	QQQVFMF 0049EC
2311	00017F21	CC587C737C00	0001	QQSPC00000100	19EF T	TRN S	20480	SOMOD 002418	QQQSRV11 0091EC
1916	00017F21	CE388E053800	0001	QQSPC0000088	19EF T	EXT S	32768	EXDFTHND 000E6C	QQQSRVE1 06CC2C
1921	00017F21	CE388E053800	0001	QQSPC0000088	19EF T	TRN S	20480	SOMOD 002418	QQQSRV11 0091EC
8581	00017F21	CE5DD1687B00	0001	QQSPC00000124	19EF T	EXT S	53248	EXDFTHND 000E6C	QQQQUERY 005A8C
8629	00017F21	CE5DD1687B00	0001	QQSPC00000124	19EF T	TRN S	40960	SOMOD 002418	QQQSRV11 0091EC
2319	00017F21	CE8D18214B00	0001	QQSPC00000110	19EF T	EXT S	32768	EXDFTHND 000E6C	QQQVFMF 2A83E4
2320	00017F21	CE8D18214B00	0001	QQSPC00000110	19EF T	TRN S	20480	SOMOD 002418	QQQSRV11 0091EC
8292	00017F21	CFE955E12400	0001	QQSPC0000093	19EF T	EXT S	45056	EXDFTHND 000E6C	QQQVWCMP 016BC0

MI Object Fragmentation Details

15.4 MI Object Growth Details

This report shows details about object growth that occurred during the collection.

ADVANCED - iDoctor Data Viewer [Idoc730/Idoc730] - #1 - [Idoc730/MCCARGAR3/ASM/MI Object Growth Details - #1]										
File Edit View Window Help										
Idoc730/MCCARGAR3/ASM/MI Object Growth Details - #1										
Storage growth (bytes) (GROWTH_BYTES)	QRYTNAM2 (QRYTNAM2)		Operation (OPR)	Full address (FULLADDR)	Object name [objtype/segtype] (NAMETYPE)	Segment type (SEGTYPE)	SID type (SIDTYPE)	LIC module and offset (LICMODOFF)	MI module and offset (MIMODOFF)	
12009472	QZDASOINIT QUSER	001107 Y 0000000000000005	EXT S	D419433765000000	LCKLIST	19EF	0001	T	EXDFTHND 000E6C	QSQBQDFT 03C308
8527872	QZDASOINIT QUSER	001107 Y 0000000000000005	EXT S	F8EE73F32000000	QZDASOINITQUSER	001107 1AEF	0081	T	HMALCHS 0013A8	QQQSRV11 0098B0
1712128	QZDASOINIT QUSER	001107 Y 0000000000000005	EXT S	C99600A43D000000	QZDASOINITQUSER	001107 1AEF	007D	T	AIBASEPS 000168	QSQRCHK 0EB084
1449984	QZDASOINIT QUSER	001108 Y 0000000000000002	EXT S	D5A4C7AD0E000000	QZDASOINITQUSER	001108 1AEF	007D	T	AIBASEPS 000168	QSQRPARS 02EFA8
1449984	QZDASOINIT QUSER	001109 Y 0000000000000003	EXT S	DC42A3B678000000	QZDASOINITQUSER	001109 1AEF	007D	T	AIBASEPS 000168	QSQRPARS 02EFA8
1449984	QZDASOINIT QUSER	001106 Y 000000000000000F	EXT S	E3E82D63AE000000	QZDASOINITQUSER	001106 1AEF	007D	T	AIBASEPS 000168	QSQRPARS 02EFA8
1052672	QZDASOINIT QUSER	001108 Y 0000000000000002	CRT S	C16CA02527000000	QZDAROI_work_space	roi_wk19EF	0001	T	SOCRT 000834	QZDASRV 06ACC4
1052672	QZDASOINIT QUSER	001107 Y 0000000000000005	CRT S	D46DD05378000000	QZDAROI_work_space	roi_wk19EF	0001	T	SOCRT 000834	QZDASRV 06ACC4
1052672	QZDASOINIT QUSER	001106 Y 000000000000000F	CRT S	DECBCF805D000000	QZDAROI_work_space	roi_wk19EF	0001	T	SOCRT 000834	QZDASRV 06ACC4
1052672	QZDASOINIT QUSER	001109 Y 0000000000000003	CRT S	F8235137CD000000	QZDAROI_work_space	roi_wk19EF	0001	T	SOCRT 000834	QZDASRV 06ACC4
1048576	QZDASOINIT QUSER	001108 Y 0000000000000002	CRT S	809002CBFF000000	HYPERSPACE DIRECTORY	0000	001C	T	IXMACHEX 000A8	
1048576	QZDASOINIT QUSER	001109 Y 0000000000000003	CRT S	8090667656000000	HYPERSPACE DIRECTORY	0000	001C	T	IXMACHEX 000A8	
1048576	QZDASOINIT QUSER	001106 Y 000000000000000F	CRT S	809536ED72000000	HYPERSPACE DIRECTORY	0000	001C	T	IXMACHEX 000A8	
1048576	QZDASOINIT QUSER	001107 Y 0000000000000005	CRT S	80959A88E9000000	HYPERSPACE DIRECTORY	0000	001C	T	IXMACHEX 000A8	
1048576	QZDASOINIT QUSER	001104 Y 0000000000000009	CRT S	CF36355971000000	MWS CREATED BLOCK	0000	20AA	T	SMHMDERI 003AE0	QQQO00DBOP 177A

MI Object Growth Details

15.5 MI Fragmentation Summary

This shows the LIC and MI modules with the most fragmentation.

ADVANCED - iDoctor Data Viewer [Idoc730/Idoc730] - #1 - [Idoc730/MCCARGAR3/ASM/MI Fragmentation Summary - #1 x]

Total events (EVT CNT)	Total jobs / tasks / threads (TOT TDES)	LIC module and offset (LICMOD OFF)	MI module and offset (MIMOD OFF)
84	2	SOMOD 002418	QQQSRV11 0091EC
19	2	DBSEGMNT 0048C4	QQQOOODBOP 177A64
2	1	SOMOD 002418	QDBEXDFI 005AF8

MI Fragmentation Summary

15.6 MI Object Growth Summary

This ranks the segment type and object types with the most growth (in bytes).

ADVANCED - iDoctor Data Viewer [Idoc730/Idoc730] - #1 - [Idoc730/MCCARGAR3/ASM/MI Object Growth Summary - #1 x]

Total events (EVT CNT)	Total jobs / tasks / threads (TOT TDES)	SID type (SIDTYPE)	Segment type (SEGTYPE)	Object type (OBJTYPE)	Storage growth (bytes) (GROWTH_BYTES)
208	10	T	0001	19EF	24117248
94	14	T	007D	1AEF	16683008
18	7	T	0081	1AEF	9932800
24	9	T	20D7	0000	4956160
8	7	T	20AC	0000	4653056
5	5	T	001C	0000	4341760
7	7	T	2110	0000	3670016
9	1	T	20AA	0000	2818048
70	8	T	007B	1AEF	2293760
23	13	T	007C	1AEF	925696
4	4	P	0001	18A0	671744
18	7	T	0080	1AEF	589824
21	4	DT	2138	0000	557056
47	4	DT	2135	0000	397312
6	2	T	0001	0DED	348160
18	4	P	0001	1934	327680
9	1	P	0001	1901	294912
32	5	DT	2136	0000	253952
17	2	T	0001	0DEF	245760
6	6	T	0087	0000	233472
8	3	DT	20B3	0000	208896
2	2	T	0001	0000	176128

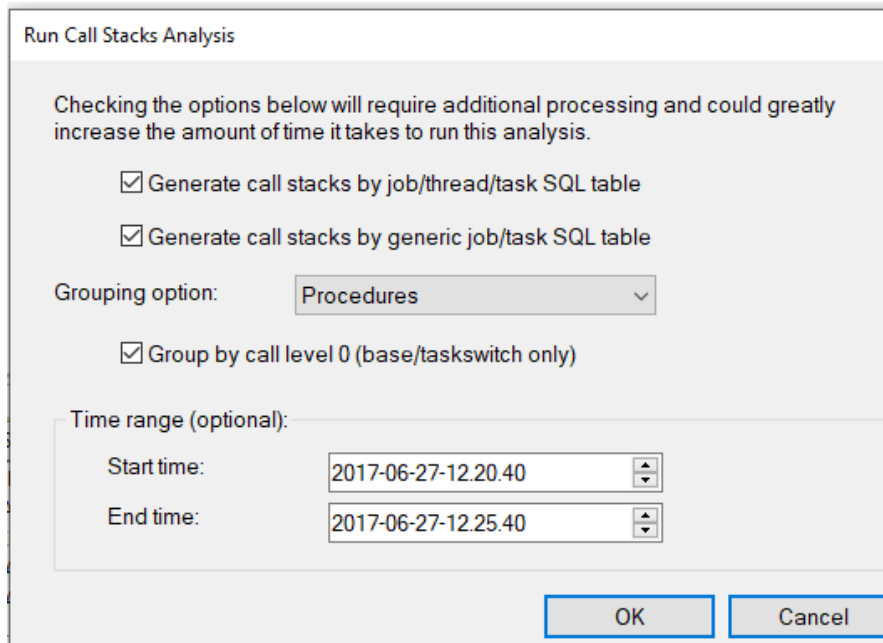
MI Object Growth Summary

16 Call stacks

This summarizes the 16-level call stacks found in the collection, grouping them by instruction (more detailed) or by procedure or produces reports for both.

16.1 Running the analysis

When running the analysis, the following prompt is shown to indicate the options desired:



The image shows a dialog box titled "Run Call Stacks Analysis". Inside the dialog, there is a warning message: "Checking the options below will require additional processing and could greatly increase the amount of time it takes to run this analysis." Below this, there are three checked checkboxes: "Generate call stacks by job/thread/task SQL table", "Generate call stacks by generic job/task SQL table", and "Group by call level 0 (base/taskswitch only)". There is also a "Grouping option:" label followed by a dropdown menu currently set to "Procedures". At the bottom, there is a "Time range (optional):" section with "Start time:" and "End time:" labels, each followed by a date and time picker showing "2017-06-27-12.20.40" and "2017-06-27-12.25.40" respectively. At the very bottom of the dialog are "OK" and "Cancel" buttons.

Run Call Stacks Analysis

Checking the options below will require additional processing and could greatly increase the amount of time it takes to run this analysis.

☒ Generate call stacks by job/thread/task SQL table

☒ Generate call stacks by generic job/task SQL table

Grouping option: Procedures

☒ Group by call level 0 (base/taskswitch only)

Time range (optional):

Start time: 2017-06-27-12.20.40

End time: 2017-06-27-12.25.40

OK Cancel

Option	Description
Generate call stacks by job/thread task SQL table	This indicates that an additional SQL table should be created to group the call stacks by taskcount/TDE.
Generate call stacks generic by job/task SQL table	This indicates that an additional SQL table should be created to group the call stacks by generic job/task. Note: The generic job name length is hard coded at 6 characters.
Grouping option	This indicates how the call stacks are grouped and the options are Procedures, Instructions or Generate both options. The Procedures option means the data will be grouped by fields QIAKEY1-16 if QAYPEIAD. Note: The SQL tables generated will contain a 0 before the collection name such as PEXSTACKS0_<MBR> where <MBR> is the collection name. The Instructions option means the data will be grouped by fields QIAIAD1-16 in QAYPEIAD and is more detailed than the procedures option. The SQL tables generated will contain a 1 before the collection name. The “Generate both options” setting means that SQL tables will be generated for both procedures and instructions separately.
Group by call level 0	This option only applies to base events. If checked, then an additional call level 0 will be added to the call stacks generated resulting in a 17-level call stack instead of 16. This call level is taken from data available in QAYPEBASE and may be in a state of flux and inaccurate in some situations during periods of high CPU usage.
Time range (optional)	Use this to filter the data by start/end time.

16.2 SQL Tables

The list of SQL tables generated by the analysis are shown below:

SQL table	Description
PEXSTACKS0 <MBR>	Groups the call stacks by procedure and event.
PEXSTACKSALL0 <MBR>	Same as previous except contains RANKID column for sorting.
PEXSTACKS1 <MBR>	Groups the call stacks by instruction and event.
PEXSTACKSALL1 <MBR>	Same as previous except contains RANKID column for sorting.
PEXSTACKSALLJOB0 <MBR>	Groups the call stacks by procedure and job
PEXSTACKSALLJOB1 <MBR>	Groups the call stacks by instruction and job
PEXSTACKSGENJOB0 <MBR>	Groups the call stacks by procedure and generic job
PEXSTACKSGENJOB1 <MBR>	Groups the call stacks by procedure and generic job
PEXSTACKSBYJOB0 <MBR>	Groups the call stacks by event, procedure and job
PEXSTACKSBYJOB1 <MBR>	Groups the call stacks by event, instruction and job
PEXSTACKSBYGENJOB0 <MBR>	Groups the call stacks by event, procedure, and generic job
PEXSTACKSBYGENJOB1 <MBR>	Groups the call stacks by event, instruction, and generic job
PEXSTACKSQREC*	The number of these tables created will vary based on the format 2 events found in the collection that produced call stacks. An example if PEXSTACKSQRECNO_38_ASM which are the unique records found for PMCO events in the collection "ASM".
PEXSTACKSTBT*	These are intermediary tables generated to build the call stack reports and contains grouping of the call stack addresses.

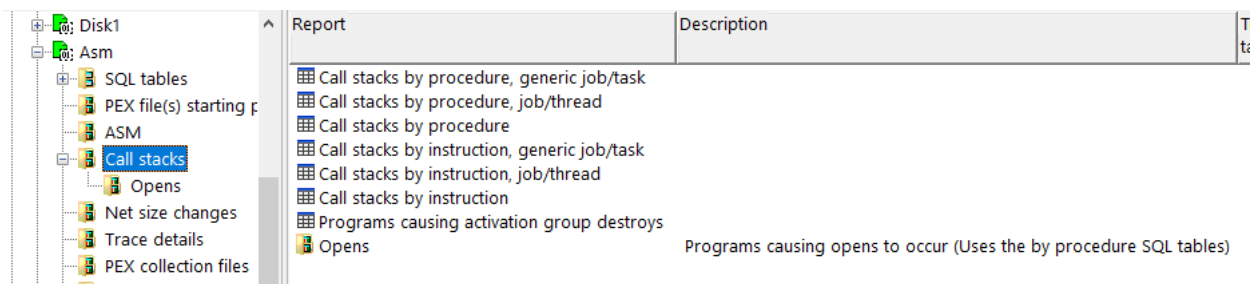
16.3 Call stacks

This folder displays the call stack reports available based on the options picked when running the analysis.

Call stacks are generated in PEX based on the data found in QAYPEIAD which are 16 call levels associated with the PEX event that captured it. Several format 2 PEX events capture a call stack into this file. Format 1 Heap events will also capture a call stack into this file.

Program/procedure name resolution for the addresses found in QAYPIEAD can be found in table QAYPEPROCI.

Note: Some reports will not appear depending on the settings used when running the analysis.



Call stacks folder

Tip: By procedure call stacks means the fields QIAKEY1-16 in QAYPEIAD are used to produce the call stack. This results in fewer variations and less data returned than the by instruction options.

16.3.1 Call stacks by procedure, generic job/task

This report groups the data by generic job or task name and shows the most commonly occurring call stacks found in the PEX collection grouped by procedure. The event type that triggered the call stack is shown in the 3rd column.

Idoc730/MCCARGAR2/ASM/Call stacks by procedure, generic job/task - #2							
Generic job (or task) name (GENJOB)	Total events (TOTEVTS)	Event subtype description (short) (QEVSSN)	Call level (LEVEL)	Program model (MODEL)	Program name (PGMNAM)	Module name (MODNAME)	Procedure (PROCEDURE)
QZDASO*	288	*EXDSEG	1	LIC		SmAsmStacksHighUse	smasmswitchstackandcall
QZDASO*	288	*EXDSEG	2	LIC		AiRawSeg	pCommit_8AiRawSegFl
QZDASO*	288	*EXDSEG	3	LIC		AiRawSeg	Allocate_8AiRawSegFUL
QZDASO*	288	*EXDSEG	4	LIC		AiArenaStg	Allocate_10AiArenaStgFUL
QZDASO*	288	*EXDSEG	5	LIC		AiEagerActivator	pConstructActivation_16AiEagerActivatorFP11AiPgProgramP8AiActGrpIP18AiPgActive
QZDASO*	288	*EXDSEG	6	LIC		AiEagerActivator	pAllocateActivation_16AiEagerActivatorFP11AiPgProgramP8AiActGrpUIUt
QZDASO*	288	*EXDSEG	7	LIC		AiEagerActivator	pFindAndUpgradeSrvPgmActivation_16AiEagerActivatorFR10AiActGraphP11AiPgPro
QZDASO*	288	*EXDSEG	8	LIC		AiEagerActivator	pBuildDepGraph_16AiEagerActivatorFR10AiActGraphP11AiPgProgram
QZDASO*	288	*EXDSEG	9	LIC		AiEagerActivator	pCreateActivation_16AiEagerActivatorFP11AiPgProgram
QZDASO*	288	*EXDSEG	10	LIC		AiEagerActivator	activate_16AiEagerActivatorFv
QZDASO*	288	*EXDSEG	11	LIC		AiUpcallProgram	pActivatePgm_15AiUpcallProgramFP5AiPgmP9AiProcessR14AilcbClearAreaRii
QZDASO*	288	*EXDSEG	12	LIC		AiUpcallProgram	targetProgramActivation_15AiUpcallProgramFR14AilcbClearAreaIP16AiMachinePgm
QZDASO*	288	*EXDSEG	13	LIC		AiUpcallProgram	machineProgramCall_15AiUpcallProgramFP16AiMachinePgmCall
QZDASO*	288	*EXDSEG	14	LIC		AiUpcallPortalMach	aimach_program_call_portal
QZDASO*	288	*EXDSEG	15	LIC		pminitiateprocess	pminitiateProcessUnderTarget_Fv
DbSegm*	258	*DLTSEG	1	LIC		SmAsmStacksHighUse	smasmswitchstackandcall
DbSegm*	258	*DLTSEG	2	LIC		DbSegment	sDestroySegment_9DbSegmentFPvUl
DbSegm*	258	*DLTSEG	3	LIC		DbSegment	sMonitor_Q2_9DbSegment5CacheFRPQ2_9DbSegment5Cache
DbSegm*	258	*DLTSEG	4	LIC		rmInitialRoutine	rmInitialRoutine

Call stacks by procedure, generic job/task

16.3.2 Call stacks by procedure, job/thread

This report is the same as the previous one except groups by job/thread instead.

16.3.3 Call stacks by procedure

This report is the same as the previous except does not segregate the data by job.

16.3.4 Call stacks by instruction, generic job/task

This report groups the data by generic job or task name and shows the most commonly occurring call stacks found in the PEX collection grouped by instruction. The event type that triggered the call stack is shown in the 3rd column.

Idoc730/MCCARGAR2/ASM/Call stacks by instruction, generic job/task - #1							
Generic job (or task) name (GENJOB)	Total events (TOTEVTS)	Event subtype description (short) (QEVSSN)	Call level (LEVEL)	Program model (MODEL)	Program name (PGMNAM)	Module name (MODNAME)	Procedure (PROCEDURE)
QZDASO*	284	*EXDSEG	1	LIC		SmAsmStacksHighUse	smasmswitchstackandcall
QZDASO*	284	*EXDSEG	2	LIC		AiRawSeg	pCommit_8AiRawSegFl
QZDASO*	284	*EXDSEG	3	LIC		AiRawSeg	Allocate_8AiRawSegFUL
QZDASO*	284	*EXDSEG	4	LIC		AiArenaStg	Allocate_10AiArenaStgFUL
QZDASO*	284	*EXDSEG	5	LIC		AiEagerActivator	pConstructActivation_16AiEagerActivatorFP11AiPgProgramP8AiActGrpIP18AiPgActive
QZDASO*	284	*EXDSEG	6	LIC		AiEagerActivator	pAllocateActivation_16AiEagerActivatorFP11AiPgProgramP8AiActGrpUIUt
QZDASO*	284	*EXDSEG	7	LIC		AiEagerActivator	pFindAndUpgradeSrvPgmActivation_16AiEagerActivatorFR10AiActGraphP11AiPgPro
QZDASO*	284	*EXDSEG	8	LIC		AiEagerActivator	pBuildDepGraph_16AiEagerActivatorFR10AiActGraphP11AiPgProgram
QZDASO*	284	*EXDSEG	9	LIC		AiEagerActivator	pCreateActivation_16AiEagerActivatorFP11AiPgProgram
QZDASO*	284	*EXDSEG	10	LIC		AiEagerActivator	activate_16AiEagerActivatorFv
QZDASO*	284	*EXDSEG	11	LIC		AiUpcallProgram	pActivatePgm_15AiUpcallProgramFP5AiPgmP9AiProcessR14AilcbClearAreaRii
QZDASO*	284	*EXDSEG	12	LIC		AiUpcallProgram	targetProgramActivation_15AiUpcallProgramFR14AilcbClearAreaIP16AiMachinePgm
QZDASO*	284	*EXDSEG	13	LIC		AiUpcallProgram	machineProgramCall_15AiUpcallProgramFP16AiMachinePgmCall
QZDASO*	284	*EXDSEG	14	LIC		AiUpcallPortalMach	aimach_program_call_portal
QZDASO*	284	*EXDSEG	15	LIC		pminitiateprocess	pminitiateProcessUnderTarget_Fv
DbSegm*	258	*DLTSEG	1	LIC		SmAsmStacksHighUse	smasmswitchstackandcall
DbSegm*	258	*DLTSEG	2	LIC		DbSegment	sDestroySegment_9DbSegmentFPvUl
DbSegm*	258	*DLTSEG	3	LIC		DbSegment	sMonitor_Q2_9DbSegment5CacheFRPQ2_9DbSegment5Cache
DbSegm*	258	*DLTSEG	4	LIC		rmInitialRoutine	rmInitialRoutine
QZRCR*	222	*EXDSEG	1	LIC		SmAsmStacksHighUse	smasmswitchstackandcall
QZRCR*	222	*EXDSEG	2	LIC		AiRawSeg	pCommit_8AiRawSegFl
QZRCR*	222	*EXDSEG	3	LIC		AiRawSeg	Allocate_8AiRawSegFUL

Call stacks by instruction, generic job/task

16.3.5 Call stacks by instruction, job/thread

This report is the same as the previous one except groups by job/thread instead.

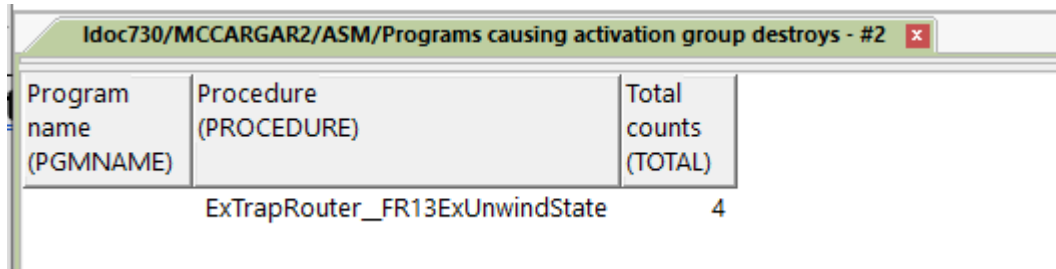
16.3.6 Call stacks by instruction

This report is the same as the previous except does not segregate the data by job.

16.3.7 Programs causing activation group destroys

This report examines all the call stacks looking specifically for procedure DestroyActGrp__9AiProcessFP10StackFrame then reports back the program and procedure on the level above this on the call stack and summarizes the total occurrences for each.

Tip: This SQL statement could be used / changed to do a similar type of analysis against your own programs or procedures.

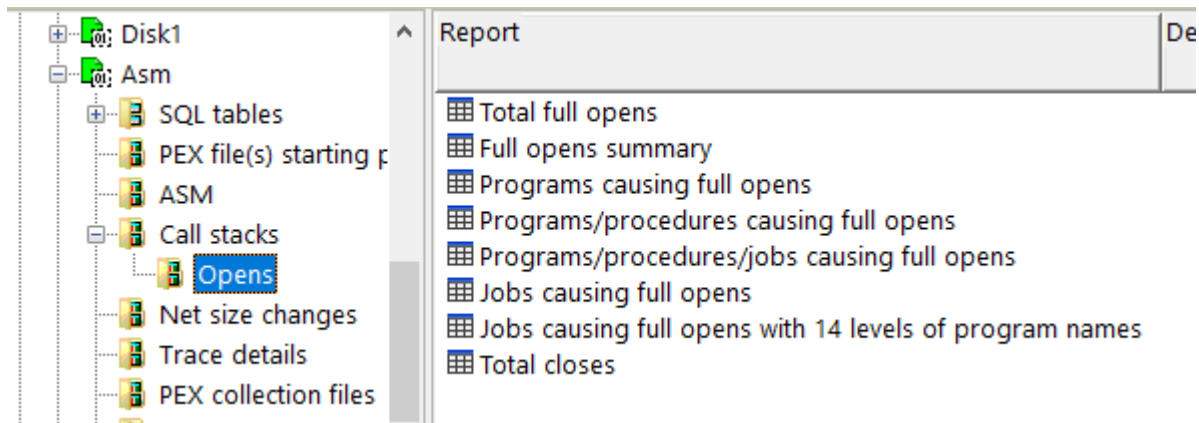


Program name (PGMNAME)	Procedure (PROCEDURE)	Total counts (TOTAL)
ExTrapRouter_FR13ExUnwindState		4

Programs causing activation group destroys

16.3.8 Opens

The Opens folder contains additional reports that examine call stacks looking for full opens or closes.



Call stacks -> Opens

An example report is shown below:

IBM iDoctor for IBM i

Idoc730/MCCARGAR2/ASM/Programs/procedures causing full opens - #1					
Idoc730/MCCARGAR2/ASM/Programs/procedures/jobs causing full opens - #1					
Hit count (TOTALHIT)	Job name/user/number: thread ID (JTTHREAD)	Program open type (OPENTYPE)	Program library (PGMLIB)	Program name (PGMNAME)	PROCEDURE (PROCEDURE)
15	QJSSCD / QJJS / 000461: 00000001	ILE COBOL Native	QJJS	QJSLMON	QJSLMON
15	Q1ACPDST / QBRMS / 000493: 00000001	CQE	QSYS	QQQIMPLE	ACTIVATE
10	QZDASOINIT / QUSER / 001108: 00000002	SQL connect processing	QSYS	QRWCKRDB	GETLCLRDBFROMDIR
10	QZDASOINIT / QUSER / 001107: 00000005	SQL connect processing	QSYS	QRWCKRDB	GETLCLRDBFROMDIR
10	QZDASOINIT / QUSER / 001106: 0000000F	SQL connect processing	QSYS	QRWCKRDB	GETLCLRDBFROMDIR
10	Q1ACPDST / QBRMS / 000493: 00000001	CQE	QSYS	QQQOODBOP	QDBOPOPENUFEB
10	QZDASOINIT / QUSER / 001109: 00000003	SQL connect processing	QSYS	QRWCKRDB	GETLCLRDBFROMDIR
6	QZDASOINIT / QUSER / 001104: 00000009	C Native	QSYS	QQQSVRTN	qqcatlup_FP11schema_nameP9func_namecT3sP11parm_stringPc
5	QZDASOINIT / QUSER / 001107: 00000005	SQE	QSYS	QSQPROC	OPEN_SYROUTINE
3	QIDRPACOL / MCCARGAR / 001105: 00000016	CQE	QSYS	QQQOODBOP	QDBOPOPENUFEB
3	QZDASOINIT / QUSER / 001107: 00000005	C Native	QSYS	QQQSVRTN	qqcatlup_FP11schema_nameP9func_namecT3sP11parm_stringPc
2	QZDASOINIT / QUSER / 001106: 0000000F	SQL connect processing	QSYS	QSQXCUTE	QSQXCUTE
2	QZDASOINIT / QUSER / 001107: 00000005	SQL connect processing	QSYS	QSQXCUTE	QSQXCUTE
2	QZDASOINIT / QUSER / 001108: 00000002	SQL connect processing	QSYS	QSQXCUTE	QSQXCUTE
2	SCPF / QSYS / 000000: 00000001	Log QHST entries to DB file	QSYS	QWCISCFR	QWCISCFR
2	QZDASOINIT / QUSER / 001109: 00000003	SQL connect processing	QSYS	QSQXCUTE	QSQXCUTE
2	QIDRPACOL / MCCARGAR / 001105: 00000016	Copy spool file	QIDRPA	QIDRPASTRN	QIDRPASTRN

Programs/procedures/jobs causing full opens

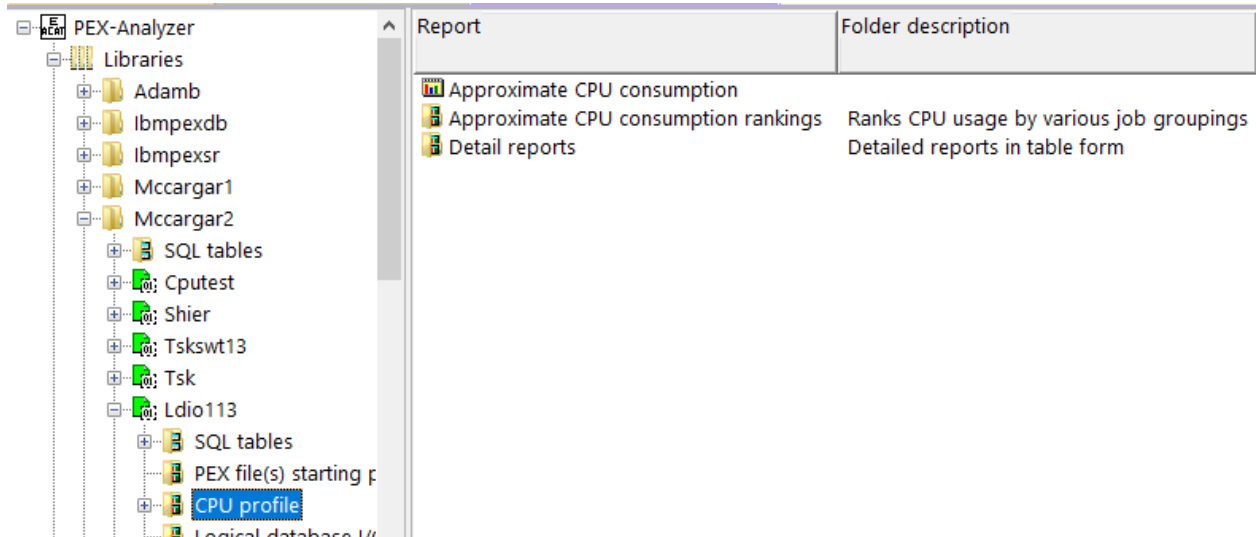
17 CPU Profile

This analysis shows (estimated) CPU consumption over the entire collection and by job/thread.

This analysis examines the task execution cycles field (QTIECY) in QAYPETIDX to estimate over time the amount of CPU used per job/task collected. By adding these totals up, CPU consumption graphs over time, as well as drill downs by job are provided.

Any trace event collected will contribute to the data shown on the graphs and reports generated.

Note: This is dependent upon events being collected somewhat consistently to be an accurate representation. If > 1 second elapses between events per job/task, then the time where CPU was used could be wrong.



CPU profile folder

17.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

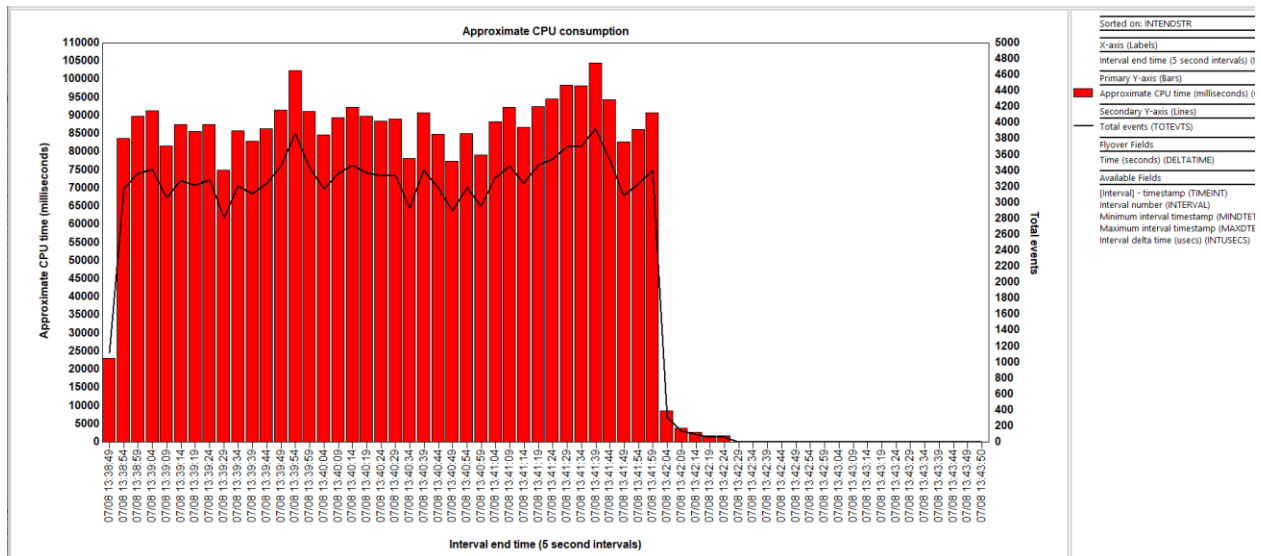
17.2 SQL Tables

The list of SQL tables generated by the analysis are shown below:

SQL table	Description
PEXCPU_<MBR>	Indicates CPU time consumed as a delta between current event and the previous one. The QREC� is also provided which provides a way to link that event back to the job.

17.3 Approximate CPU consumption

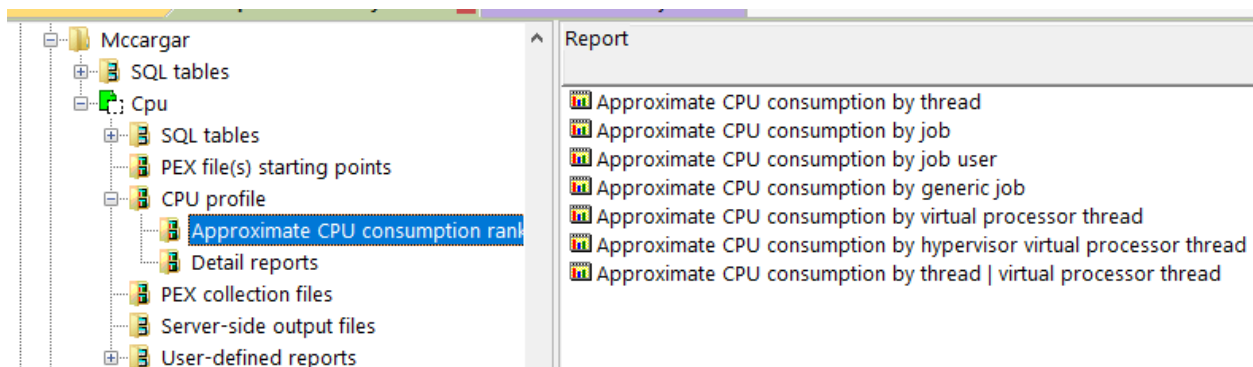
This graph shows the estimated CPU consumption over time (in milliseconds). The Y2 axis shows the total events.



Approximate CPU consumption

17.4 Approximate CPU consumption rankings

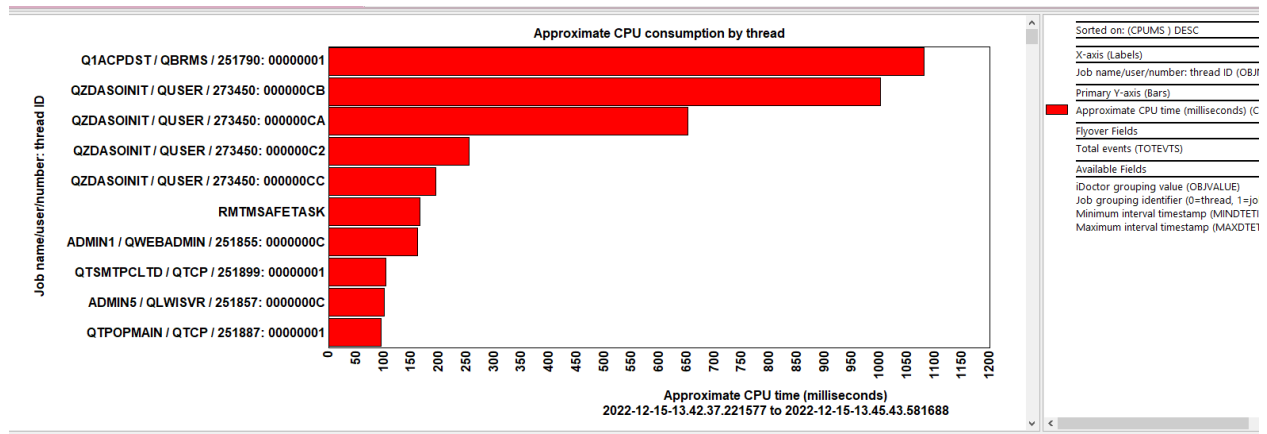
This folder contains the set of ranking graphs that rank job data by approximate CPU time. The jobs with the most CPU time are listed first.



CPU profile -> Approximate CPU consumption rankings

17.4.1 Approximate CPU consumption by thread

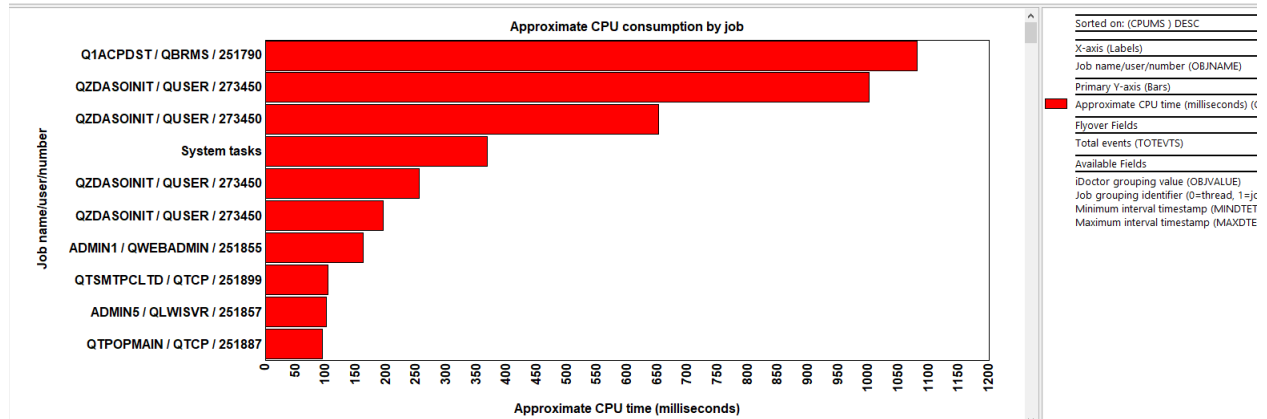
This graph ranks the approximate CPU time by thread or task for the entire collection or selected time-period if accessed as a drill-down.



Approximate CPU consumption by thread

17.4.2 Approximate CPU consumption by job

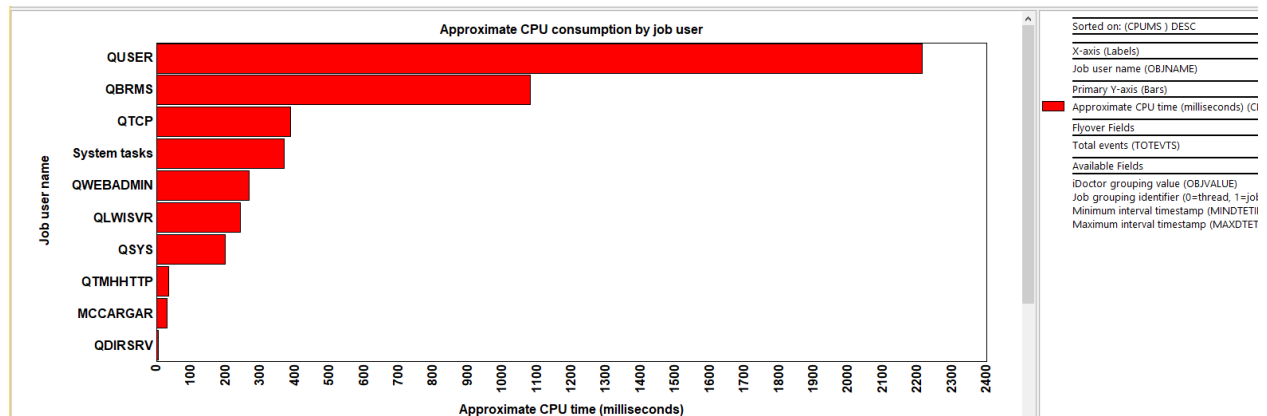
This graph ranks the approximate CPU time by primary thread for the entire collection or selected time-period if accessed as a drill-down.



Approximate CPU consumption by job

17.4.3 Approximate CPU consumption by job user

This graph ranks the approximate CPU time by job user profile for the entire collection or selected time-period if accessed as a drill-down.



Approximate CPU consumption by job user

17.4.4 Approximate CPU consumption by generic job

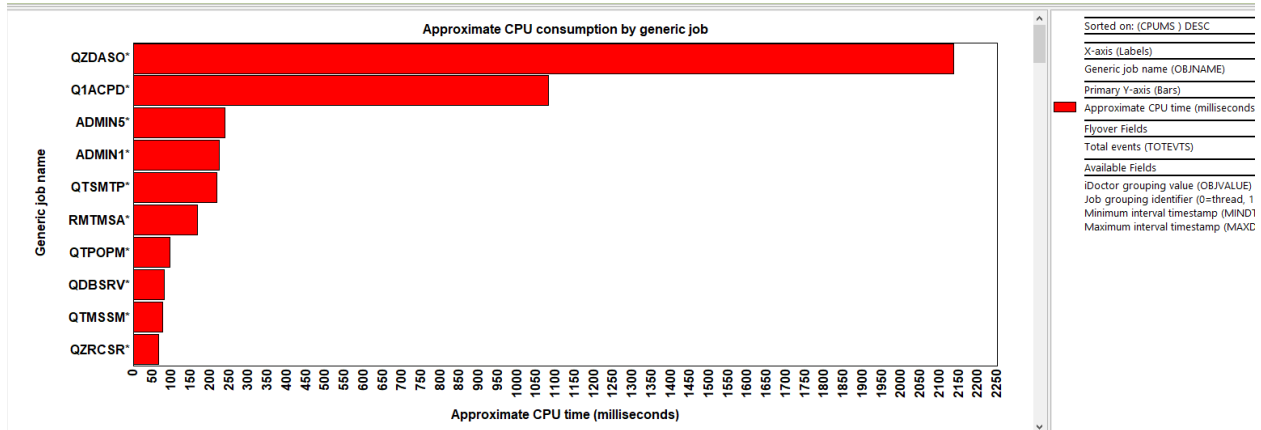
This graph ranks the approximate CPU time by generic job or system task name for the entire collection or selected time-period if accessed as a drill-down. The length (and start position) of the generic name is controlled via the **Preferences -> Data Viewer** options shown below:

Name length for generic name grouping graphs:

6

Start position:

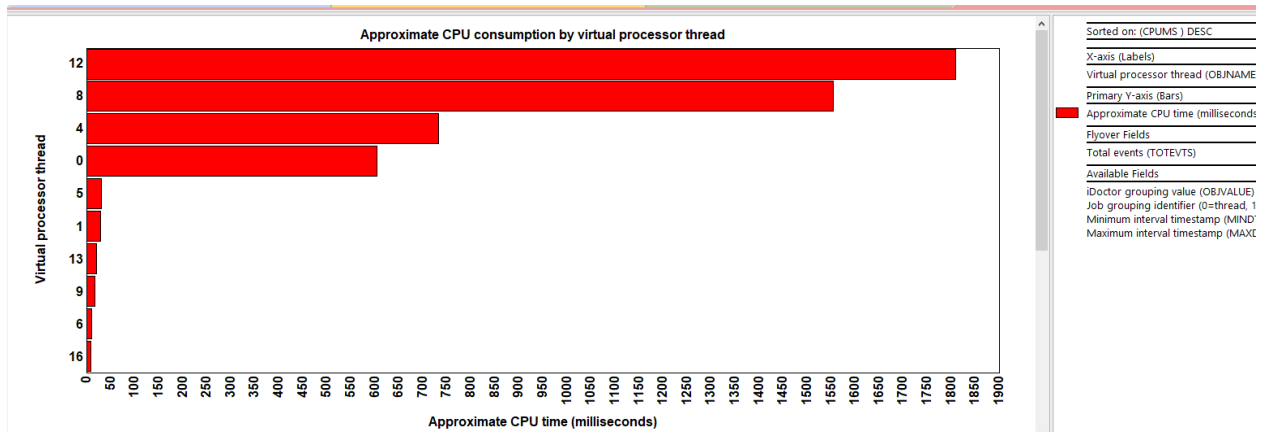
1



Approximate CPU consumption by generic job

17.4.5 Approximate CPU consumption by virtual processor thread

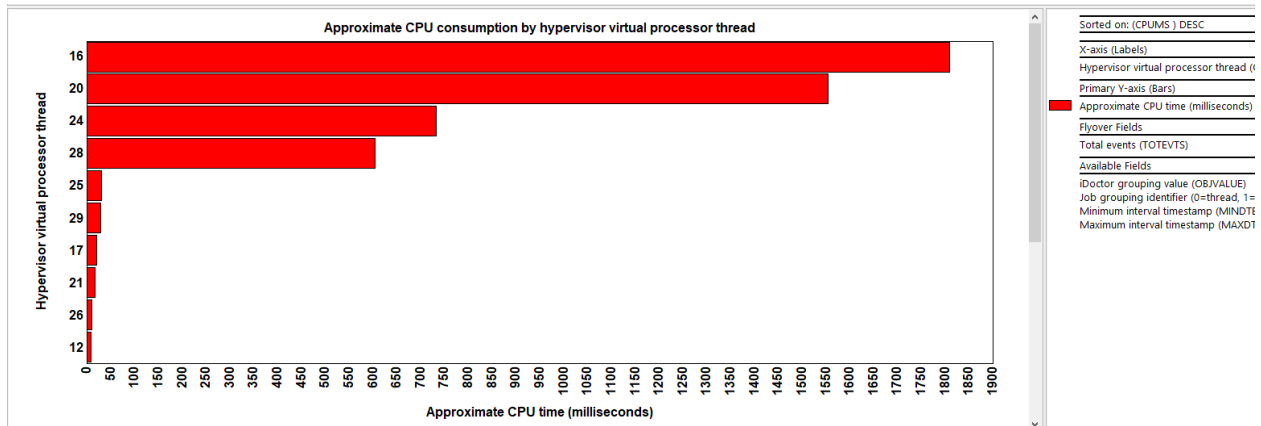
This graph ranks the approximate CPU time by the virtual processor thread (QTIPRN from QAYPETIDX) for the entire collection or selected time-period if accessed as a drill-down.



Approximate CPU consumption by virtual processor thread

17.4.6 Approximate CPU consumption by hypervisor virtual processor thread

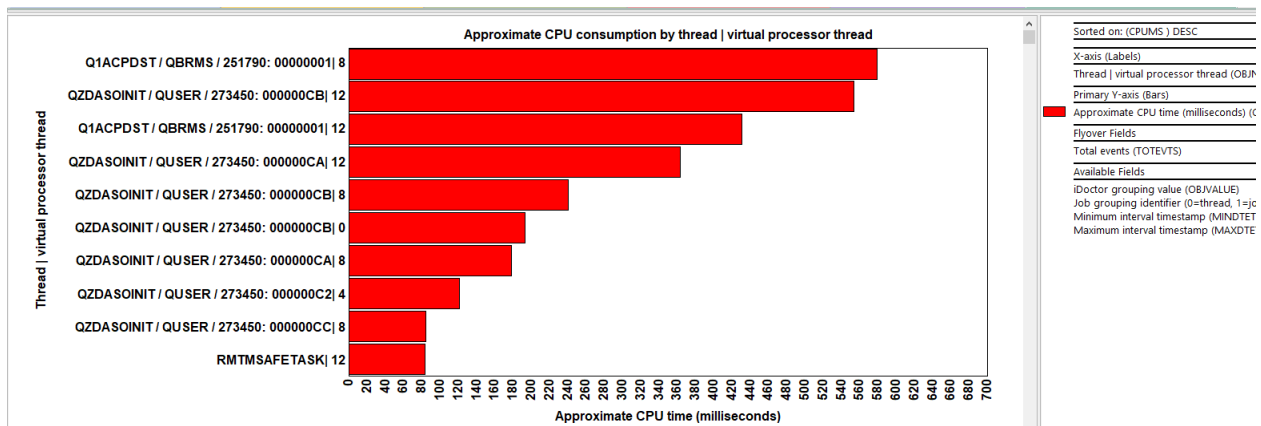
This graph ranks the approximate CPU time by the hypervisor virtual processor thread (QHVLPRCIDX from QAYPETIDX) for the entire collection or selected time-period if accessed as a drill-down.



Approximate CPU consumption by hypervisor virtual processor thread

17.4.7 Approximate CPU consumption by thread | virtual processor thread

This graph ranks the approximate CPU time by thread or task combined with virtual processor thread for the entire collection or selected time-period if accessed as a drill-down.



Approximate CPU consumption by thread | virtual processor thread

17.5 Detail reports

This report calculates the estimated CPU consumed between each event by using the data found in the QAYPETIDX file.

17.5.1 CPU profile event details

CPU time delta from previous event (usecs) (CPUUSECS)	Call stack QRECN (IAD_QRECN)	(Minimum) QRECN (QRECN)	Resource event type (QTITY)	Resource event subtype (QTISTY)	Timestamp (QTITSP)		Nanoseconds since collection started (QTITIMN)	Task execution cycles (QTIECY)	Taskcount (HEX) (QTIFTC)	Virtual processor thread (QTIPRN)	Flags (QTIFLAGS)	Hypervisor timebase (QTITIMB)	Missed event count (QMISSEDEV)
0	63580	63580	3	11	2022-12-15-13.40.02.102750		81646748	40633604	0000000000534693	4	1	20400371078835678	(
0	0	63581	3	22	2022-12-15-13.40.02.102887		81783707	40633604	0000000000534693	12	0	20400371078905801	(
0	0	63582	3	6	2022-12-15-13.40.02.102897		81793541	40633604	0000000000534693	4	0	20400371078910836	(
8.1250	63583	63583	3	11	2022-12-15-13.40.02.102912		81808875	40637764	0000000000534693	4	1	20400371078918687	(
0	0	63584	3	22	2022-12-15-13.40.02.103046		81941998	40637764	0000000000534693	13	0	20400371078986846	(
0	0	63585	3	6	2022-12-15-13.40.02.103054		81950000	40637764	0000000000534693	4	0	20400371078990943	(
0	0	258583	3	22	2022-12-15-13.40.02.103217		82113234	6147544	0000000000534692	4	0	20400371079074519	(
0	0	258584	3	6	2022-12-15-13.40.02.103228		82124703	6147544	0000000000534692	12	0	20400371079080391	(
98.0313	63586	63586	3	11	2022-12-15-13.40.02.103234		82130322	40687956	0000000000534693	4	1	20400371079083268	(
17.0625	258585	258585	3	11	2022-12-15-13.40.02.103261		82157248	6156280	0000000000534692	12	1	20400371079097054	(
0	0	258586	3	22	2022-12-15-13.40.02.103374		82270085	6156280	0000000000534692	0	0	20400371079154827	(
0	0	63587	3	22	2022-12-15-13.40.02.103376		82272031	40687956	0000000000534693	0	0	20400371079155823	(
0	0	258587	3	6	2022-12-15-13.40.02.103382		82278312	6156280	0000000000534692	12	0	20400371079159039	(
0	0	63588	3	6	2022-12-15-13.40.02.103383		82279906	40687956	0000000000534693	4	0	20400371079159855	(
2.4688	258588	258588	3	11	2022-12-15-13.40.02.103387		82283593	6157544	0000000000534692	12	1	20400371079161743	(
31.0234	63589	63589	3	11	2022-12-15-13.40.02.103441		82337513	40703840	0000000000534693	4	1	20400371079189350	(
0	0	258589	3	22	2022-12-15-13.40.02.103511		82407984	6157544	0000000000534692	1	0	20400371079225431	(
0	0	258590	3	6	2022-12-15-13.40.02.103519		82415781	6157544	0000000000534692	12	0	20400371079229423	(
0	0	63590	3	22	2022-12-15-13.40.02.103596		82492531	40703840	0000000000534693	12	0	20400371079268719	(
0	0	63591	3	6	2022-12-15-13.40.02.103604		82500951	40703840	0000000000534693	4	0	20400371079273030	(
48.3906	258591	258591	3	11	2022-12-15-13.40.02.103609		82505283	6182320	0000000000534692	12	1	20400371079275248	(

CPU profile event details

18 Data areas

This analysis examines data area (*DTAARA) events. This is event type 12 subtype 3.

These events examine all data area change or retrieve operations against local or remote data areas.

Tip: Collect format 2 on this event type to include the call stack.

18.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

18.2 SQL Tables

The list of SQL tables generated by the analysis are shown below:

SQL table	Description
PEXDTAARA_<MBR>	Data area event details

18.3 Data areas

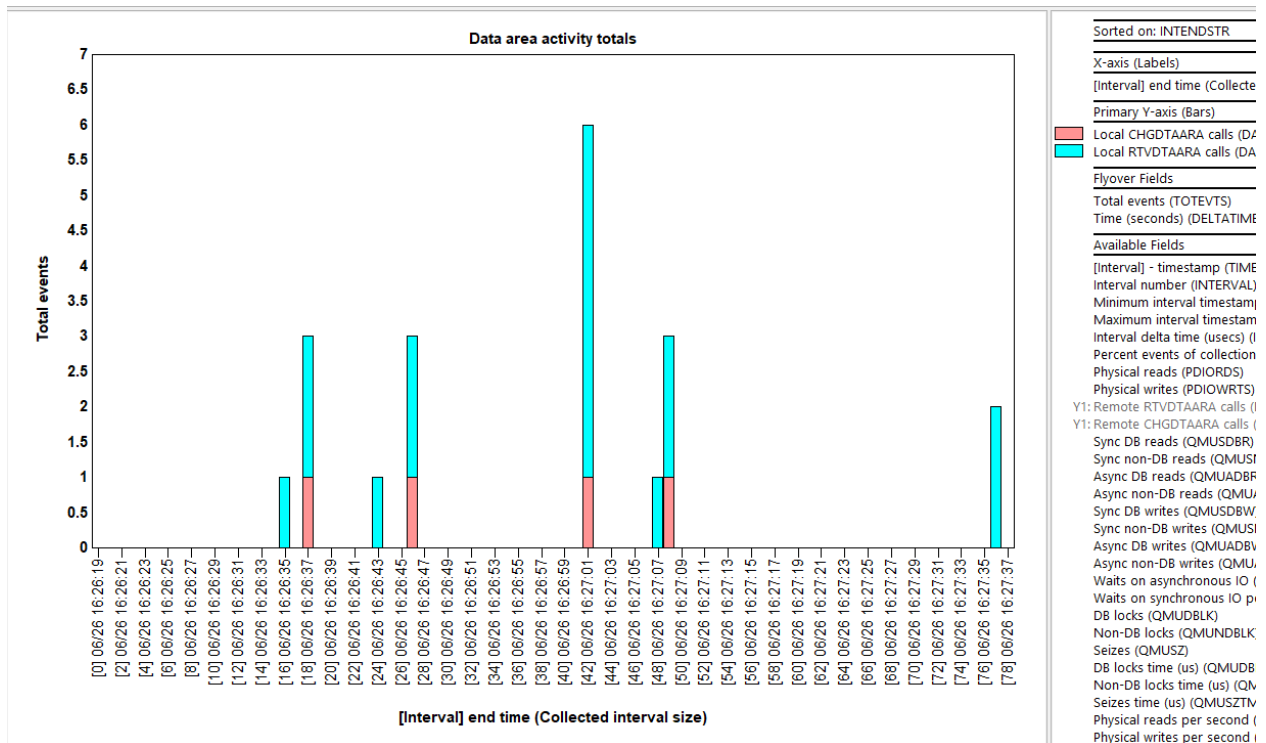
This folder contains the graphs and reports available after the Data areas analysis has completed.

Report	Description	Tr ta
Data area activity totals		
Data area activity rates		
Data area activity totals rankings	Ranks the data area events in various ways	
Data area activity rates rankings	Ranks the data area events in various ways	
Detail reports	Data area activity in table format	

Data areas

18.3.1 Data area activity totals

This graph shows the data area operations that occurred in the collection over time.



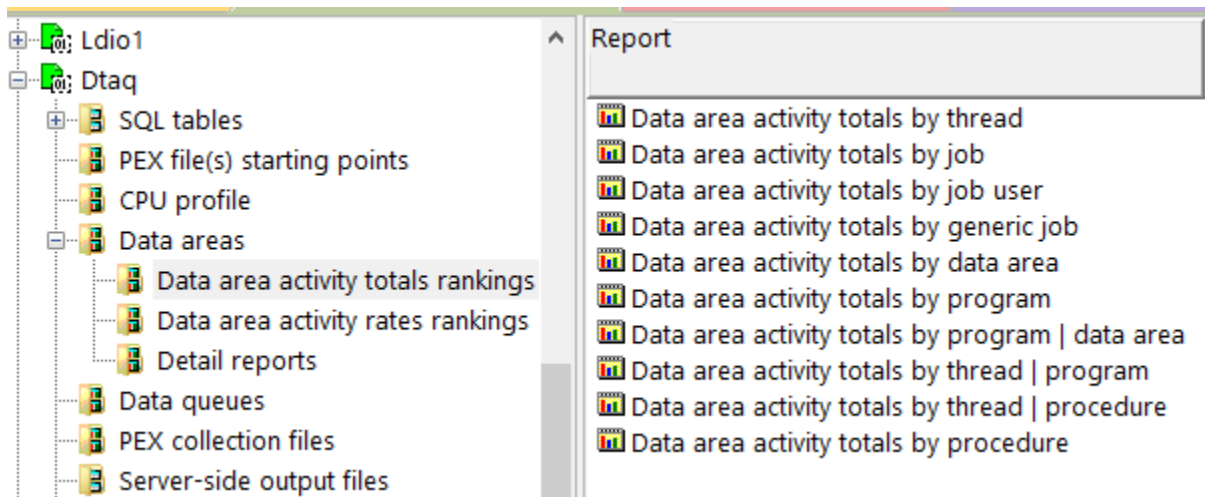
Data area activity totals

18.3.2 Data area activity rates

This graph is the same as the previous but shows the values as a rate per second instead.

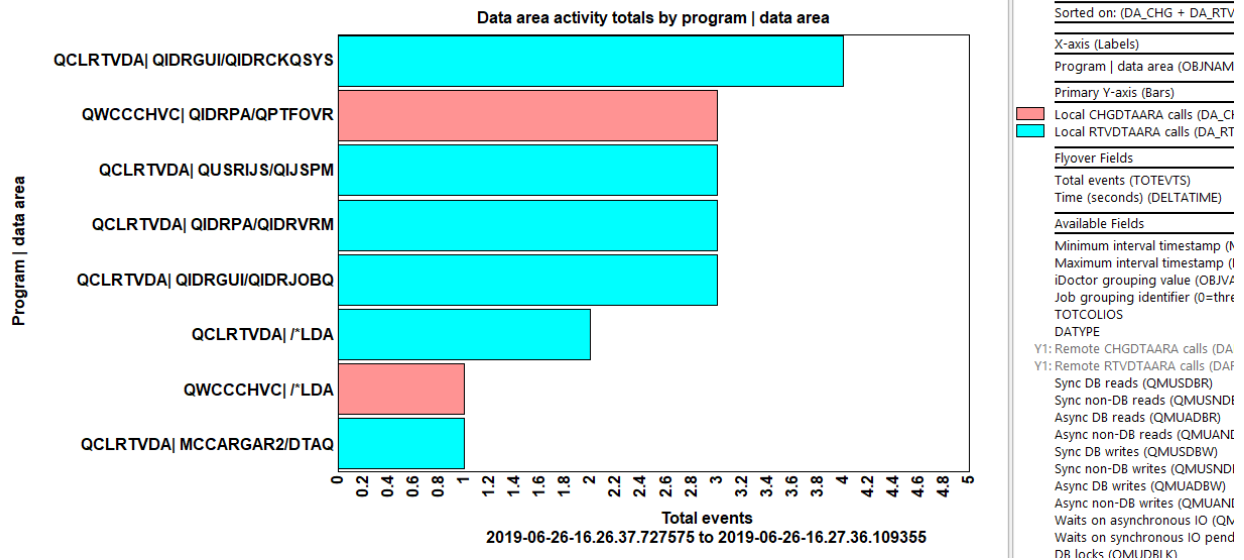
18.3.3 Data area activity totals rankings

These graphs rank the data area activity by various job groupings or by program or procedure information if *FORMAT2 events were captured.



Data areas -> Data area activity totals rankings

An example follows:



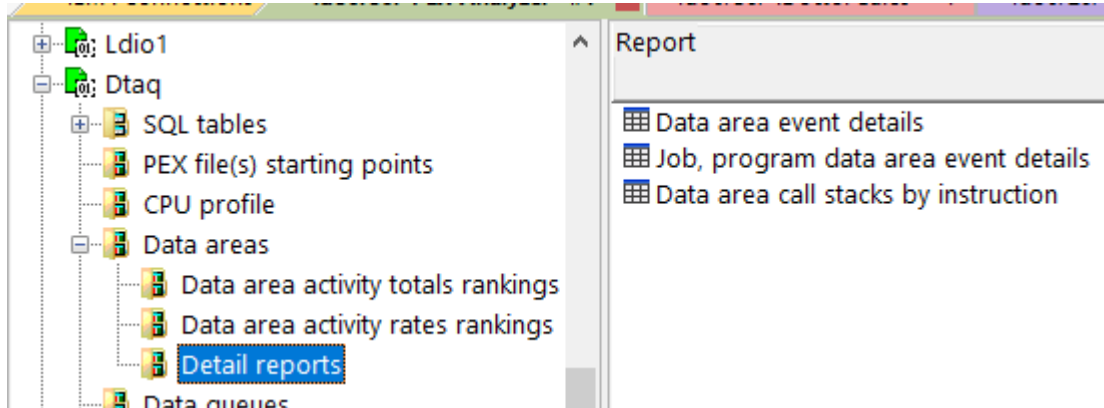
Data area activity totals by program | data area

18.3.4 Data area activity rates rankings

This graph is the same as the previous one except shows a rate per second instead of a count.

18.3.5 Detail reports

These reports show more details behind the data area events captured within the PEX collection.



18.3.5.1 Data area event details

This report shows more details behind each event.

Call stack QRECN (IAD_QRECN)	(Minimum) QRECN (QRECN)	Operation Abbrev. (MODULE)	L = Local, R = Remote (LCLRMT)	Data area library/name (DANAME)	DataArea Lib (DALIB)	C=Char, D=Decimal, L=Logical (DATYPE)	Starting Position (STARTPOS_HEX)	Total Length (TOTLEN_HEX)	Num of Fractional Dec Pos (NUMDECS_HEX)	1st 20 Chars of CHAR Data (CHARDATA)	LGL Data (LGLDATA)	DECIMA Data (DECDA)
1	1	RDA	L	QIDRVRM	QIDRPA	C	1	100	0	V7R3M000 V7R3M0 S001		0
2	2	RDA	L	QIDRCKQSYS	QIDRGUI	C	1	1	0	0		0
3	3	CDA	L	QPTFOVR	QIDRPA	C	1	1	0	0		0
4	4	RDA	L	QIDRJOBQ	QIDRGUI	C	1	128	0	QSYS QIDRJW		0
20	20	RDA	L	QIDRVRM	QIDRPA	C	1	100	0	V7R3M000 V7R3M0 S001		0
21	21	RDA	L	QIDRCKQSYS	QIDRGUI	C	1	1	0	0		0
22	22	CDA	L	QPTFOVR	QIDRPA	C	1	1	0	0		0
23	23	RDA	L	QIDRJOBQ	QIDRGUI	C	1	128	0	QSYS QIDRJW		0
27	27	RDA	L	QIJSMP	QUSRIJS	C	236	1	0			0
28	28	RDA	L	*LDA		C	1	772	0	*USMONITOR		0
29	29	RDA	L	*LDA		C	1	772	0	*USMONITOR		0
30	30	CDA	L	*LDA		C	1	772	0	*USMONITOR		0
31	31	RDA	L	QIJSMP	QUSRIJS	C	229	1000	0	1		0
32	32	RDA	L	QIJSMP	QUSRIJS	C	238	1000	0	1		0
9	9	RDA	L	QIDRVRM	QIDRPA	C	1	100	0	V7R3M000 V7R3M0 S001		0
10	10	RDA	L	QIDRCKQSYS	QIDRGUI	C	1	1	0	0		0
11	11	CDA	L	QPTFOVR	QIDRPA	C	1	1	0	0		0
12	12	RDA	L	QIDRJOBQ	QIDRGUI	C	1	128	0	QSYS QIDRJW		0
5	5	RDA	L	QIDRCKQSYS	QIDRGUI	C	1	1	0	0		0
6	6	RDA	L	DTAQ	MCCARGAR2	C	1	45	0	IDPEXDTAQ ACTIV		0

Data area event details

18.3.5.2 Job, program data area event details

This report is like the previous one except also includes job, and program information associated with each event.

Call stack QRECN (IAD_QRECN)	(Minimum) QRECN (QRECN)	Job name/user/number: thread ID (OBJNAME)	DataArea Lib (DALIB)	Data area library/name (DANAME)	Program name (QPRPGN)	Module name (QPRMNM)	Procedure name (QPRPNM)	C=Char, D=Decimal, L=Logical (DATYPE)	Starting Position (STARTPOS_HEX)	Tot Len (TC)
27	27	QIJS CD / QIJS / 080520: 00000002	QUSRIJS	QIJSMP	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	236	1
28	28	QIJS CD / QIJS / 080520: 00000002		*LDA	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	1	77
29	29	QIJS CD / QIJS / 080520: 00000002		*LDA	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	1	77
30	30	QIJS CD / QIJS / 080520: 00000002		*LDA	QWCCCHVC	QWCCCHVC	QWCCCHVC	C	1	77
31	31	QIJS CD / QIJS / 080520: 00000002	QUSRIJS	QIJSMP	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	229	10
32	32	QIJS CD / QIJS / 080520: 00000002	QUSRIJS	QIJSMP	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	238	10
1	1	ZQRCSRV / QUSER / 080691: 00000002	QIDRPA	QIDRVRM	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	1	10
2	2	ZQRCSRV / QUSER / 080691: 00000002	QIDRGUI	QIDRCKQSYS	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	1	1
3	3	ZQRCSRV / QUSER / 080691: 00000002	QIDRPA	QPTFOVR	QWCCCHVC	QWCCCHVC	QWCCCHVC	C	1	1
4	4	ZQRCSRV / QUSER / 080691: 00000002	QIDRGUI	QIDRJOBQ	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	1	12
20	20	ZQRCSRV / QUSER / 080691: 00000002	QIDRPA	QIDRVRM	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	1	10
21	21	ZQRCSRV / QUSER / 080691: 00000002	QIDRGUI	QIDRCKQSYS	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	1	1
22	22	ZQRCSRV / QUSER / 080691: 00000002	QIDRPA	QPTFOVR	QWCCCHVC	QWCCCHVC	QWCCCHVC	C	1	1
23	23	ZQRCSRV / QUSER / 080691: 00000002	QIDRGUI	QIDRJOBQ	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	1	12
9	9	ZQRCSRV / QUSER / 080691: 00000002	QIDRPA	QIDRVRM	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	1	10
10	10	ZQRCSRV / QUSER / 080691: 00000002	QIDRGUI	QIDRCKQSYS	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	1	1
11	11	ZQRCSRV / QUSER / 080691: 00000002	QIDRPA	QPTFOVR	QWCCCHVC	QWCCCHVC	QWCCCHVC	C	1	1
12	12	ZQRCSRV / QUSER / 080691: 00000002	QIDRGUI	QIDRJOBQ	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	1	12
5	5	ZQRCSRV / QUSER / 080706: 00000001	QIDRGUI	QIDRCKQSYS	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	1	1
6	6	ZQRCSRV / QUSER / 080706: 00000001	MCCARGAR2	DTAQ	QCLRTVDA	QCLRTVDA	QCLRTVDA	C	1	45

Job, program data area event details

18.3.5.3 Data area call stacks by instruction

This report summarizes the call stacks associated with data area events and displays the most common ones first. **Note:** This report was added with client 1619+.

It will only work correctly if *FORMAT2 events were captured.

Tip: You can use this report as a drill down from one of the rankings graphs to focus results on the specific job grouping. Use the Detail reports -> Data areas menu to accomplish this.

IBM iDoctor for IBM i

Idoc730/MCCARGAR2/DTAQ/Data area call stacks by instruction - #1										
Total events (TOTEVTS)	Call level (LEVEL)	Program model (MODEL)	Program name (PGMNAM)	Module name (MODNAM)	Procedure name (PRCNAM)	Offset (ADDR_OFFSET)	Statement number (STMTNBR)	Module timestamp (QPRMTM)	Instruction address (INST_ADDR)	Proc code (QI)
6	1	OPM	QCLRTVDA	QCLRTVDA	QCLRTVDA	0000000000002CE0	502	2017-09-21-16.20.47.000000	2287FAB8E3004420	22
6	2	OPM	QWCRDTAA	QWCRDTAA	QWCRDTAA	0000000000001360	223	2017-09-21-16.21.39.000000	0AD52653B1002A30	0A
6	3	ILE	QZRCRSVS	QZRCRPC	CallProgram	0000000000000830	134	2017-09-21-16.21.42.000000	1187DD79C2008BE0	11
6	4	ILE	QZRCRSVS	QZRCRSVS	main	0000000000000408	58	2017-09-21-16.21.42.000000	1187DD79C2005068	11
6	5	ILE	QZRCRSVS	QZRCRSVS	_C_pep	0000000000000260	0	2017-09-21-16.21.42.000000	1187DD79C2002FE0	11
3	1	OPM	QCLRTVDA	QCLRTVDA	QCLRTVDA	0000000000002CE0	502	2017-09-21-16.20.47.000000	2287FAB8E3004420	22
3	2	OPM	QIDRGUI/QIDRCKQSYS	QIDRCKQSYS	QIDRCKQSYS	0000000000000894	23	2019-06-21-13.34.19.000000	10413AACCF001F74	1C
3	3	OPM	QIDRGUI/QIDRPTFCHK	QIDRPTFCHK	QIDRPTFCHK	000000000000088C	20	2019-06-21-13.34.19.000000	0BA8B39861001F6C	0B
3	4	ILE	QZRCRSVS	QZRCRPC	CallProgram	0000000000000684	110	2017-09-21-16.21.42.000000	1187DD79C2008A34	11
3	5	ILE	QZRCRSVS	QZRCRSVS	main	0000000000000408	58	2017-09-21-16.21.42.000000	1187DD79C2005068	11
3	6	ILE	QZRCRSVS	QZRCRSVS	_C_pep	0000000000000260	0	2017-09-21-16.21.42.000000	1187DD79C2002FE0	11
3	1	OPM	QWCCCHVC	QWCCCHVC	QWCCCHVC	0000000000002854	455	2017-09-21-16.21.37.000000	1A2A3FFDA4003F94	1A
3	2	OPM	QCAPCMD	QCAPCMD	QCAPCMD	00000000000017E8	366	2017-09-21-16.20.46.000000	0980D1F522002EB8	09
3	3	ILE	QZRCRSVS	QZRCRMTC	RunCommand	0000000000000888	109	2017-09-21-16.21.42.000000	1187DD79C2006168	11
3	4	ILE	QZRCRSVS	QZRCRSVS	main	0000000000000448	49	2017-09-21-16.21.42.000000	1187DD79C20050A8	11
3	5	ILE	QZRCRSVS	QZRCRSVS	_C_pep	0000000000000260	0	2017-09-21-16.21.42.000000	1187DD79C2002FE0	11
1	1	OPM	QCLRTVDA	QCLRTVDA	QCLRTVDA	0000000000002CE0	502	2017-09-21-16.20.47.000000	2287FAB8E3004420	22
1	2	OPM	QIDRGUI/QIDRCKQSYS	QIDRCKQSYS	QIDRCKQSYS	0000000000000894	23	2019-06-21-13.34.19.000000	10413AACCF001F74	1C
1	3	OPM	QIDRPA/QIDRPAENST	QIDRPAENST	QIDRPAENST	0000000000000900	21	2019-06-21-13.34.11.000000	30C17942E4001FD0	3C
1	4	OPM	QCAPCMD	QCAPCMD	QCAPCMD	00000000000017E8	366	2017-09-21-16.20.46.000000	0980D1F522002EB8	09
1	5	ILE	QZRCRSVS	QZRCRMTC	RunCommand	0000000000000888	109	2017-09-21-16.21.42.000000	1187DD79C2006168	11
1	6	ILE	QZRCRSVS	QZRCRSVS	main	0000000000000448	49	2017-09-21-16.21.42.000000	1187DD79C20050A8	11
1	7	ILE	QZRCRSVS	QZRCRSVS	_C_pep	0000000000000260	0	2017-09-21-16.21.42.000000	1187DD79C2002FE0	11
1	1	OPM	QCLRTVDA	QCLRTVDA	QCLRTVDA	0000000000002CE0	502	2017-09-21-16.20.47.000000	2287FAB8E3004420	22
1	2	OPM	QIDRPA/QIDRPAENST	QIDRPAENST	QIDRPAENST	00000000000012E8	76	2019-06-21-13.34.11.000000	30C17942E40029B8	3C
1	3	OPM	QCAPCMD	QCAPCMD	QCAPCMD	00000000000017E8	366	2017-09-21-16.20.46.000000	0980D1F522002EB8	09

Data area call stacks by instruction

19 Data queues

This analysis examines data queue (*DTAQ) events. This is event type 12 subtype 4. These events examine all data queue sends or receive operations against local or remote data queues.

Tip: Collect format 2 on this event type to include the call stack.

19.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

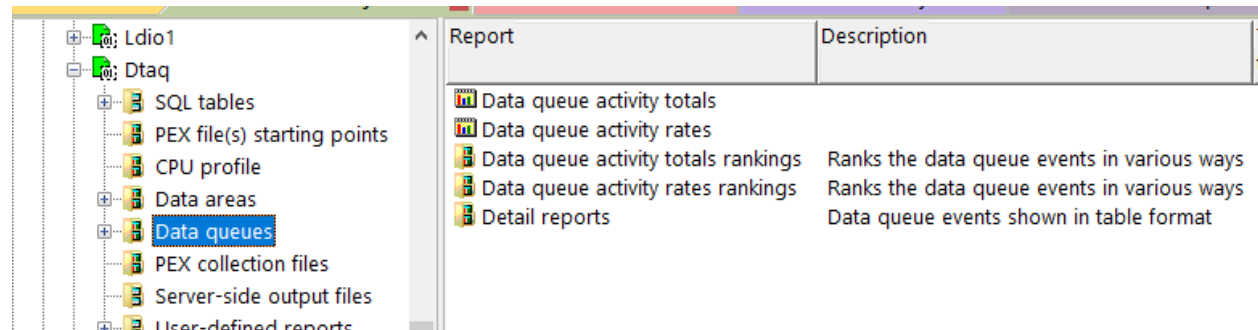
19.2 SQL Tables

The list of SQL tables generated by the analysis are shown below:

SQL table	Description
PEXDTAQ_<MBR>	Data queue event details

19.3 Data queues

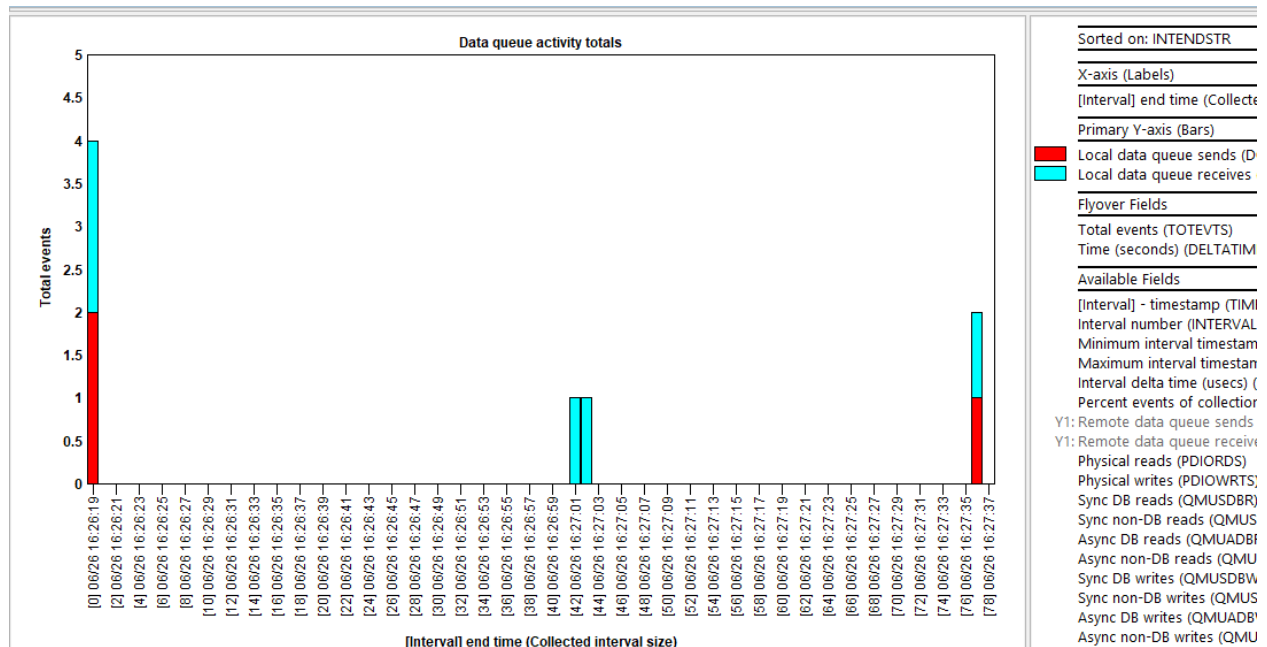
This folder contains the graphs and reports available after the Data queues analysis has completed.



Data queues

19.3.1 Data queue activity totals

This graph shows the data queue operations that occurred in the collection over time.



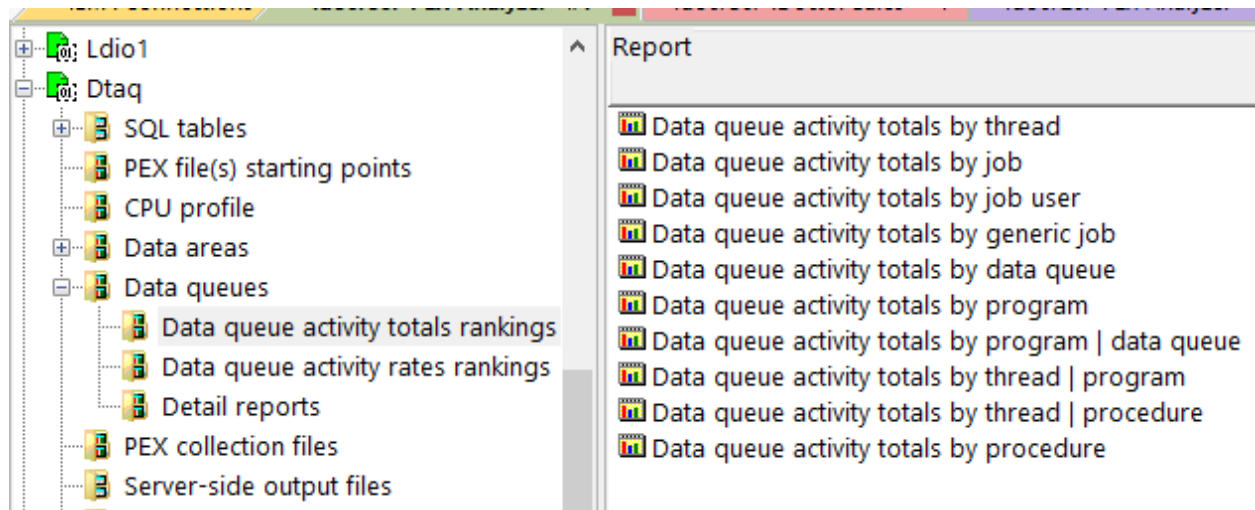
Data queue activity totals

19.3.2 Data queue activity rates

This graph is the same as the previous but shows the values as a rate per second instead.

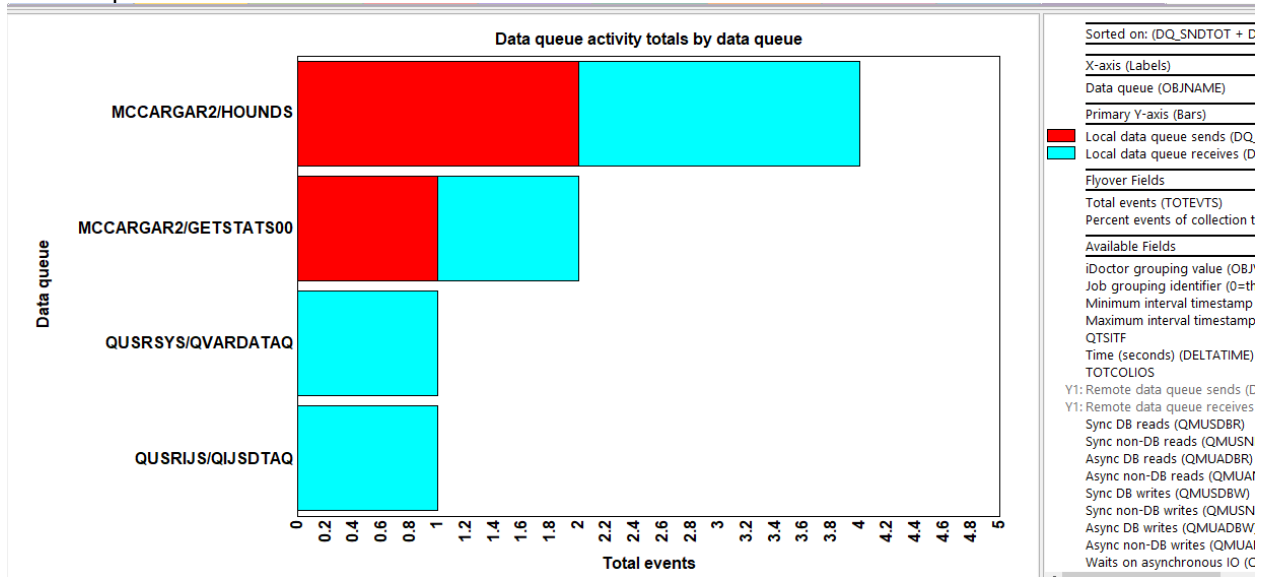
19.3.3 Data queue activity totals rankings

These graphs rank the data queue activity by various job groupings or by program or procedure information if *FORMAT2 events were captured.



Data queues -> Data queue activity totals rankings

An example follows:



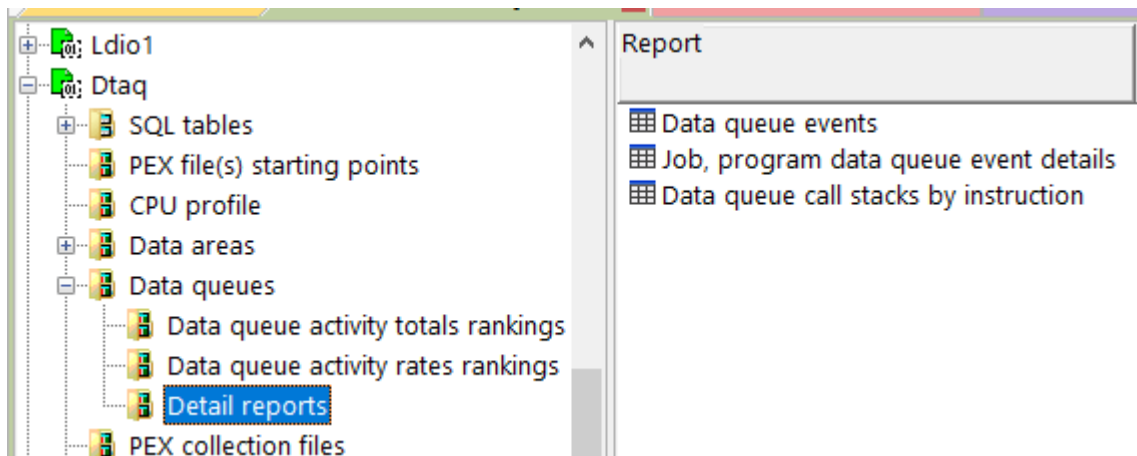
Data queue activity totals by data queue

19.3.4 Data queue activity rates rankings

This graph is the same as the previous one except shows a rate per second instead of a count.

19.3.5 Detail reports

These reports give more details behind the events captured within the PEX collection.



19.3.5.1 Data queue event details

This report shows more details behind each event.

Call stack QRECN (IAD_QRECN)	QDEPTH (QDEPTH)	Timestamp (QTITSP)	(Minimum) QRECN (QRECN)	MODULE (MODULE)	LCLRMT (LCLRMT)	QNAME (QNAME)	QLIB (QLIB)	MSGLEN (MSGLEN)	MSGDATA (MSGDATA)	QDEPTH (QDEPTH)	KEYLEN (KEYLEN)
13	1	2019-06-26-16.26.19.985731	13	DQS	L	HOUNDS	MCCARGAR2	00128	RELEASE THE HOUNDS	1	006
18	0	2019-06-26-16.26.19.985760	18	DQR	L	HOUNDS	MCCARGAR2	00128	RELEASE THE HOUNDS	0	006
19	1	2019-06-26-16.26.19.985953	19	DQS	L	HOUNDS	MCCARGAR2	00128	THE HOUNDS ARE RELEASED	1	006
14	0	2019-06-26-16.26.19.985972	14	DQR	L	HOUNDS	MCCARGAR2	00128	THE HOUNDS ARE RELEASED	0	006
26	0	2019-06-26-16.27.01.532356	26	DQR	L	QJSDTAQ	QUSRIUS	00000		0	000
33	0	2019-06-26-16.27.02.690732	33	DQR	L	QVARDATAQ	QUSRSYS	00000		0	000
7	1	2019-06-26-16.27.36.109744	7	DQS	L	GETSTATS00	MCCARGAR2	00128	*CRTDBF	1	000
17	0	2019-06-26-16.27.36.109761	17	DQR	L	GETSTATS00	MCCARGAR2	00128	*CRTDBF	0	000

Data queue event details

19.3.5.2 Job, program data queue event details

This report is like the previous one except also includes job, and program information associated with each event.

Call stack QRECN (IAD_QRECN)	(Minimum) QRECN (QRECN)	QDEPTH (QDEPTH)	Timestamp (QTITSP)	Job name/user/number: thread ID (OBJNAME)	QLIB (QLIB)	QNAME (QNAME)	Program name (QPRPGN)	Module name (QPRMNM)	Procedure name (QPRPNM)	MODULE (MODULE)	MSGLEN (MSGLEN)
13	13	1	2019-06-26-16.26.19.985731	QIDRPACOL / MCCARGAR / 080700: 00000007	MCCARGAR2	HOUNDS	QSNDDTAQ	QSNDDTAQ	QSNDDTAQ	DQS	00128
14	14	0	2019-06-26-16.26.19.985972	QIDRPACOL / MCCARGAR / 080700: 00000007	MCCARGAR2	HOUNDS	QRCVDTAQ	QRCVDTAQ	QRCVDTAQ	DQR	00128
17	17	0	2019-06-26-16.27.36.109761	QIDRPACOL / MCCARGAR / 080700: 00000007	MCCARGAR2	GETSTATS00	QRCVDTAQ	QRCVDTAQ	QRCVDTAQ	DQR	00128
26	26	0	2019-06-26-16.27.01.532356	QJSSCD / QJUS / 080520: 00000002	QUSRIUS	QJSDTAQ	QRCVDTAQ	QRCVDTAQ	QRCVDTAQ	DQR	00000
33	33	0	2019-06-26-16.27.02.690732	QVARRCV / QSVMS5 / 080512: 00000001	QUSRSYS	QVARDATAQ	QRCVDTAQ	QRCVDTAQ	QRCVDTAQ	DQR	00000
18	18	0	2019-06-26-16.26.19.985760	QZRCRSVS / QUSER / 080691: 00000002	MCCARGAR2	HOUNDS	QRCVDTAQ	QRCVDTAQ	QRCVDTAQ	DQR	00128
19	19	1	2019-06-26-16.26.19.985953	QZRCRSVS / QUSER / 080691: 00000002	MCCARGAR2	HOUNDS	QSNDDTAQ	QSNDDTAQ	QSNDDTAQ	DQS	00128
7	7	1	2019-06-26-16.27.36.109744	QZRCRSVS / QUSER / 080706: 00000001	MCCARGAR2	GETSTATS00	QSNDDTAQ	QSNDDTAQ	QSNDDTAQ	DQS	00128

Job, program data queue event details

19.3.5.3 Data queue call stacks by instruction

This report summarizes the call stacks associated with data queue events and displays the most common ones first. **Note:** This report was added with client 1619+.

It will only work correctly if *FORMAT2 events were captured.

Tip: You can use this report as a drill down from one of the rankings graphs to focus results on a specific job grouping. Use the Detail reports -> Data queues menu to accomplish this.

Idoc730/MCCARGAR2/DTAQ/Data queue call stacks by instruction - #1								
Total events (TOTEVTS)	Call level (LEVEL)	Program model (MODEL)	Program name (PGMNAM)	Module name (MODNAM)	Procedure name (PRCNAM)	Offset (ADDR_OFFSET)	Statement number (STMTNBR)	Module timestamp (QPRMTM)
1	1	OPM	QSNDDTAQ	QSNDDTAQ	QSNDDTAQ	0000000000004CAC	875	2017-09-21-16.2
1	2	OPM	QIDRPA/QIDRPAENST	QIDRPAENST	QIDRPAENST	00000000000022BC	157	2019-06-21-13.3
1	3	OPM	QCAPCMD	QCAPCMD	QCAPCMD	00000000000017E8	366	2017-09-21-16.2
1	4	ILE	QZRCRSVS	QZRCRMTC	RunCommand	0000000000000888	109	2017-09-21-16.2
1	5	ILE	QZRCRSVS	QZRCRSVS	main	0000000000000448	49	2017-09-21-16.2
1	6	ILE	QZRCRSVS	QZRCRSVS	_C_peg	0000000000000260	0	2017-09-21-16.2
1	1	OPM	QSNDDTAQ	QSNDDTAQ	QSNDDTAQ	0000000000004CAC	875	2017-09-21-16.2
1	2	OPM	QIDRPA/QIDRPASTRN	QIDRPASTRN	QIDRPASTRN	000000000000DCE8	983	2019-06-21-13.3
1	3	OPM	QCMD	QCMD	QCMD	0000000000003968	456	2017-09-21-16.2
1	1	OPM	QRCVDTAQ	QRCVDTAQ	QRCVDTAQ	00000000000006E48	1258	2017-09-21-16.2
1	2	OPM	QIDRPA/QIDRPASTRN	QIDRPASTRN	QIDRPASTRN	000000000000E00C	999	2019-06-21-13.3
1	3	OPM	QCMD	QCMD	QCMD	0000000000003968	456	2017-09-21-16.2
1	1	OPM	QRCVDTAQ	QRCVDTAQ	QRCVDTAQ	00000000000006E48	1258	2017-09-21-16.2
1	2	OPM	QIDRPA/QIDRPASTRN	QIDRPASTRN	QIDRPASTRN	000000000000EEB4	1074	2019-06-21-13.3
1	3	OPM	QCMD	QCMD	QCMD	0000000000003968	456	2017-09-21-16.2
1	1	OPM	QRCVDTAQ	QRCVDTAQ	QRCVDTAQ	00000000000006E48	1258	2017-09-21-16.2
1	2	OPM	QIDRPA/QIDRPASTCP	QIDRPASTCP	QIDRPASTCP	000000000000586A4	4574	2019-06-21-13.3
1	3	OPM	QCAPCMD	QCAPCMD	QCAPCMD	00000000000017E8	366	2017-09-21-16.2
1	4	ILE	QZRCRSVS	QZRCRMTC	RunCommand	0000000000000888	109	2017-09-21-16.2
1	5	ILE	QZRCRSVS	QZRCRSVS	main	0000000000000448	49	2017-09-21-16.2
1	6	ILE	QZRCRSVS	QZRCRSVS	C_peg	0000000000000260	0	2017-09-21-16.2

Data queues call stacks by instruction

20 Database File Full Opens/Closes

This analysis looks at the database file full opens event (*DBOPEN). This is event type 12, subtype 2.

Tip: Collect format 2 on this event type to include the call stack.

20.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

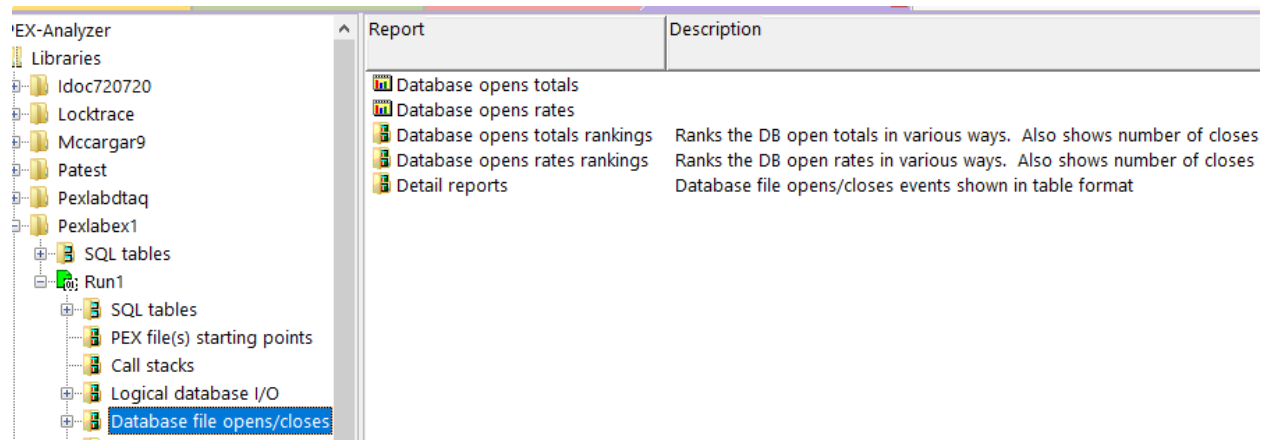
20.2 SQL Tables

The list of SQL tables generated by the analysis are shown below:

SQL table	Description
PEXDBOPN_ <MBR>	Database open event details

20.3 Database file opens/closes

This folder contains the graphs and reports available after the analysis has completed.

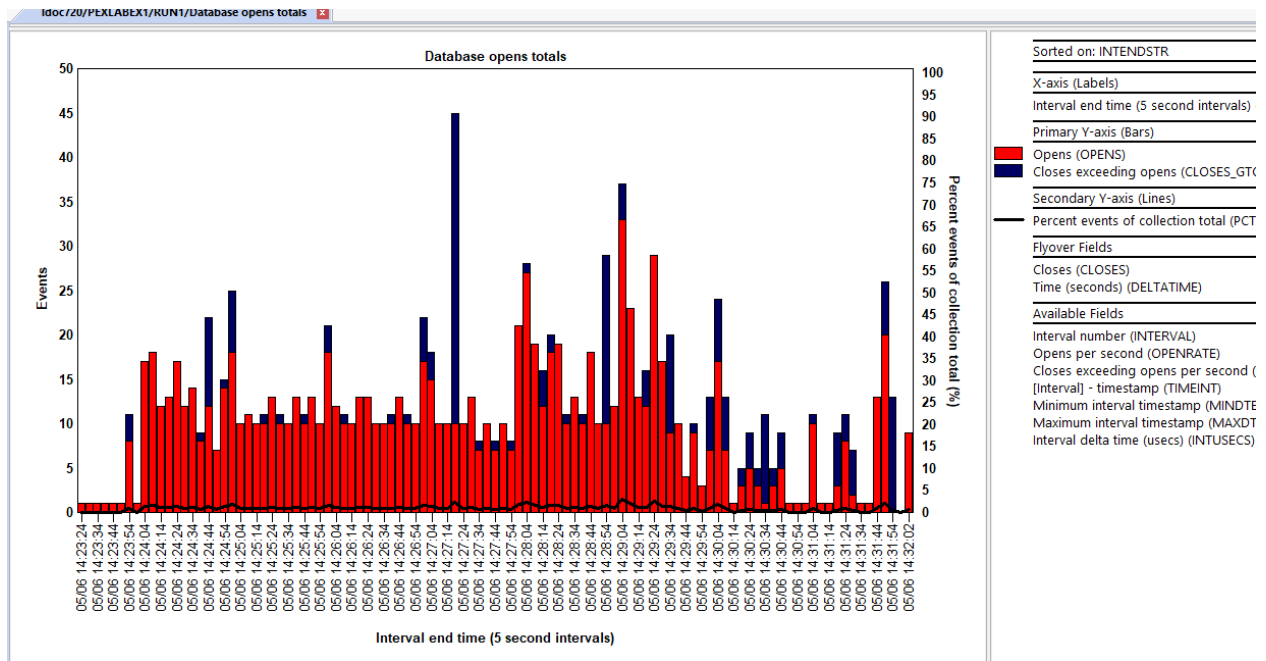


Database file opens/closes

20.3.1 Database opens totals

This graph shows the number of opens and the number of closes that occurred greater than the number of opens over time. The actual number of closes is available in the flyover if needed.

Drill-down into rankings or detail reports for the desired time-period for more options.



Database opens totals

20.3.2 Database opens rates

This graph is the same as the previous one except shows the metrics as a rate per second.

20.3.3 Database opens totals rankings

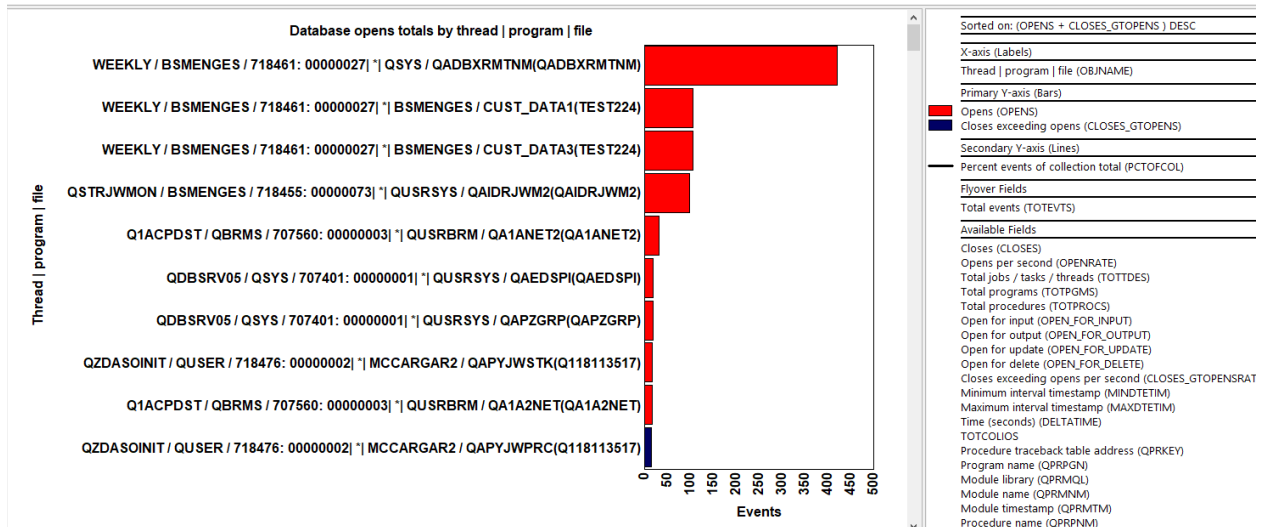
This graph shows the number of opens and the number of closes that occurred greater than the number of opens ranked by 1 of several possible ways. The actual number of closes is available in the flyover if needed.

From these graphs you can right-click and drill-down and see these metrics over time for the selected grouping. Another option is access the detail reports for the selected grouping to get more information about the events behind that data.

The screenshot shows the IBM iDoctor interface with the PEX-Analyzer tool. The left pane displays a tree structure under 'PEX-Analyzer' with folders like Libraries, Idoc720720, Locktrace, Mccargar9, Patest, Pexlabdtaq, Pexlabex1, SQL tables, and Run1. The right pane shows a list of reports under the 'Report' tab, including 'Database opens totals by thread', 'Database opens totals by job', 'Database opens totals by job user', 'Database opens totals by generic job', 'Database opens totals by generic job | file', 'Database opens totals by thread | file', 'Database opens totals by file', 'Database opens totals by pool', 'Database opens totals by subsystem', 'Database opens totals by program', 'Database opens totals by program | file', 'Database opens totals by thread | program', 'Database opens totals by thread | program | file', 'Database opens totals by procedure', 'Database opens totals by procedure | file', and 'Database opens totals by generic job | program'.

Database opens totals rankings

An example follows:



Database opens totals by thread | program | file

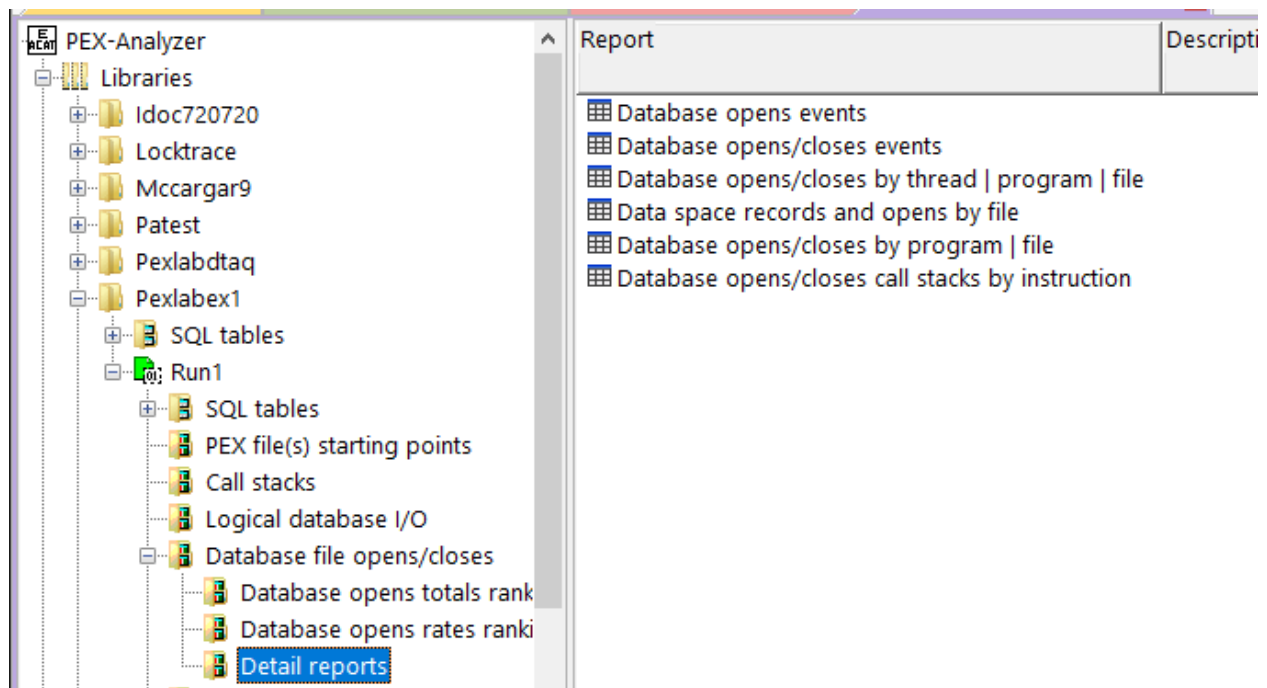
20.3.4 Database opens rates rankings

These graphs are identical to the previous ones except the metrics are shown as a rate per second.

20.3.5 Detail reports

These reports provide more information about the database open events in table form.

Tip: You can access these reports as a drill-down from any of the graphs.



Detail reports

20.3.5.1 Database opens events

This shows all the details available in the database opens events sorted by job/thread and then time. The closes are not shown in this report.

Taskcount (HEX) (QTIFTC)	Event timestamp (QTITSP)	Call stack QRECN (IAD_QRECN)	(Minimum) QRECN (QRECN)	Job name/user/number: thread ID (OBJNAME)	Operation Abbrev. (MODULE)	File Name (FNAME)	Library Name (LNAME)	Member Name (MNAME)	Requested Format Name (FMTNAME)	Option List Contents (OPTLIST)	Open for input (OPEN_FOR_INPUT)	Open for output (OPEN_FOR_OUTPUT)	Open update (OPEN_UPDATE)
00000000000000630	2016-05-06-14:27.19.785811	8045074	8045074	SCPF / QSYS / 000000: 00000001	OPF	QHST16127A	QSYS	QHST16127A		81000000	1	0	
00000000000000630	2016-05-06-14:27.19.886263	12597538	12597538	SCPF / QSYS / 000000: 00000001	OPF	QHST16127A	QSYS	QHST16127A		80800000	0	1	
00000000000000630	2016-05-06-14:27.59.763633	34221792	34221792	SCPF / QSYS / 000000: 00000001	OPF	QHST16127A	QSYS	QHST16127A		81000000	1	0	
00000000000000630	2016-05-06-14:27.59.765454	21711055	21711055	SCPF / QSYS / 000000: 00000001	OPF	QHST16127A	QSYS	QHST16127A		80800000	0	1	
00000000000000630	2016-05-06-14:28.03.101990	34450697	34450697	SCPF / QSYS / 000000: 00000001	OPF	QHST16127A	QSYS	QHST16127A		81000000	1	0	
00000000000000630	2016-05-06-14:28.03.104312	34450766	34450766	SCPF / QSYS / 000000: 00000001	OPF	QHST16127A	QSYS	QHST16127A		80800000	0	1	
00000000000000630	2016-05-06-14:29.22.951946	26639597	26639597	SCPF / QSYS / 000000: 00000001	OPF	QHST16127A	QSYS	QHST16127A		81000000	1	0	
00000000000000630	2016-05-06-14:29.22.963916	19007365	19007365	SCPF / QSYS / 000000: 00000001	OPF	QHST16127A	QSYS	QHST16127A		80800000	0	1	
00000000000000630	2016-05-06-14:29.22.963916	10931655	10931655	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	
00000000000000630	2016-05-06-14:26.57.219350	30537261	30537261	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	
00000000000000630	2016-05-06-14:26.57.225492	30537334	30537334	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	
00000000000000630	2016-05-06-14:26.57.225735	30537351	30537351	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	
00000000000000630	2016-05-06-14:30.09.657592	41140524	41140524	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	
00000000000000630	2016-05-06-14:30.09.657847	41140538	41140538	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	
00000000000000630	2016-05-06-14:30.09.658023	41140551	41140551	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	
00000000000000630	2016-05-06-14:30.09.658199	41140565	41140565	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	
00000000000000630	2016-05-06-14:30.23.186591	41152831	41152831	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	
00000000000000630	2016-05-06-14:30.23.186840	41152845	41152845	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	
00000000000000630	2016-05-06-14:30.23.186992	41152857	41152857	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	
00000000000000630	2016-05-06-14:30.23.187196	41152871	41152871	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	
00000000000000630	2016-05-06-14:30.41.834137	41166486	41166486	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	
00000000000000630	2016-05-06-14:30.41.834385	41166501	41166501	QDBSRV04 / QSYS / 707400: 00000001	OPF	QAPZGRP	QUSRSYS	QAPZGRP		85E08000	1	1	

Database opens events

20.3.5.2 Database opens/closes events

This report is the same as the previous except includes closes as well. This is indicated by the MODULE column containing a value of 'CLF'.

20.3.5.3 Database opens/closes by thread | program | file

This is like the rankings graph of the same name but shown in table form. The total opens and closes are added up and sorted by the thread, program and file having the most first.

Opens (OPENS)	Closes (CLOSES)	Opens per second (OPENRATE)	Job name/user/number: thread ID (OBJNAME)	Job or task name (JOBNAME)	Generic job name (GENJOBNAME)	Library Name (LNAME)	File Name (FNAME)	Member Name (MNAME)	Program library (QPRPQL)	Pr na (Q
420	420	.8103	WEEKLY / BSMENGES / 718461: 00000027	WEEKLY	WEEKLY*	QSYS	QADBXRMTNM	QADBXRMTNM	QSYS	Q
105	105	.2026	WEEKLY / BSMENGES / 718461: 00000027	WEEKLY	WEEKLY*	BSMENGES	CUST_DATA1	TEST224	QSYS	Q
105	105	.2026	WEEKLY / BSMENGES / 718461: 00000027	WEEKLY	WEEKLY*	BSMENGES	CUST_DATA3	TEST224	QSYS	Q
99	99	.1910	QSTRJWMON / BSMENGES / 718455: 00000073	QSTRJWMON	QSTRJW*	QUSRSYS	QAIDRJWM2	QAIDRJWM2	QSYS	Q
32	32	.0617	Q1ACPDST / QBRMS / 707560: 00000003	Q1ACPDST	Q1ACPD*	QUSRBRM	QA1ANET2	QA1ANET2	QSYS	Q
18	18	.0347	QDBSRV05 / QSYS / 707401: 00000001	QDBSRV05	QDBSRV*	QUSRSYS	QAPZGRP	QAPZGRP	QSYS	Q
18	18	.0347	QDBSRV05 / QSYS / 707401: 00000001	QDBSRV05	QDBSRV*	QUSRSYS	QAEDSPI	QAEDSPI	QSYS	Q
16	14	.0309	QZDASOINIT / QUSER / 718476: 00000002	QZDASOINIT	QZDASO*	MCCARGAR2	QAPYJWSTK	Q118113517	QSYS	Q
16	16	.0309	Q1ACPDST / QBRMS / 707560: 00000003	Q1ACPDST	Q1ACPD*	QUSRBRM	QA1A2NET	QA1A2NET	QSYS	Q
12	12	.0232	QIDRPACOL / BSMENGES / 718460: 000000C6	QIDRPACOL	QIDRPA*	QSPL	QASQJBQ	QASQJBQ	QSYS	Q
12	8	.0232	QZDASOINIT / QUSER / 718288: 00000014	QZDASOINIT	QZDASO*	PEXLABEX1	QAPYJWSTS	JWMON002	QSYS	Q
10	10	.0193	QDBSRV04 / QSYS / 707400: 00000001	QDBSRV04	QDBSRV*	QUSRSYS	QAEDSPI	QAEDSPI	QSYS	Q
10	10	.0193	QDBSRV04 / QSYS / 707400: 00000001	QDBSRV04	QDBSRV*	QUSRSYS	QAPZGRP	QAPZGRP	QSYS	Q
8	8	.0154	SCPF / QSYS / 000000: 00000001	SCPF	SCPF*	QSYS	QHST16127A	QHST16127A	QSYS	Q
8	4	.0154	QZDASOINIT / QUSER / 718463: 00000006	QZDASOINIT	QZDASO*	MCCARGAR2	QAPYJWINTI	Q118113517	QSYS	Q
8	8	.0154	Q1ACPDST / QBRMS / 707560: 00000003	Q1ACPDST	Q1ACPD*	QUSRBRM	QA1AZRD	QA1AZRD	QSYS	Q
4	2	.0077	QZDASOINIT / QUSER / 718287: 00000118	QZDASOINIT	QZDASO*	PEXLABEX1	QAPYJWRUNI	JWMON002	QSYS	Q
4	3	.0077	QZDASOINIT / QUSER / 718463: 00000006	QZDASOINIT	QZDASO*	QSYS2	SYSTABLES	SYSTABLES	QSYS	Q
3	3	.0058	QZDASOINIT / QUSER / 718470: 00000003	QZDASOINIT	QZDASO*	QSYS	QADBXRMTNM	QADBXRMTNM	QSYS	Q
3	3	.0058	QZDASOINIT / QUSER / 718462: 00000015	QZDASOINIT	QZDASO*	QSYS	QADBXRMTNM	QADBXRMTNM	QSYS	Q
2	2	.0026	QZDASOINIT / QUSER / 718473: 00000100	QZDASOINIT	QZDASO*	QSYS	QADBXRMTNM	QADBXRMTNM	QSYS	Q

Database opens/closes by thread | program | file

20.3.5.4 Data space records and opens by file

This report groups the data by library, file, member and shows the total opens, closes and maximum data space records (i.e. max number of records processed from all the events) for each grouping.

Max data space records (MAX_NUMRECPRC)	Opens (OPENS)	Closes (CLOSES)	Opens per second (OPENRATE)	Total jobs / tasks / threads (TOTTDDES)	Total programs (TOTPGMS)	Total procedures (TOTPROCS)	Library Name (LNAME)	File Name (FNAME)	Member Name (MNAME)
28261	17	18	.0328	4	3	3	MCCARGAR2	QAPYJWSTK	Q118113517
22262	4	4	.0077	4	2	2	QUSRSYS	QAPZREQ	QAPZREQ
22262	4	4	.0077	4	2	2	QUSRSYS	QAPZREQ2	QAPZREQ2
18655	12	12	.0232	1	2	2	QSPL	QASQJBQ	QASQJBQ
5232	30	30	.0579	3	2	2	QUSRSYS	QAPZGRP	QAPZGRP
5232	4	4	.0077	4	2	2	QUSRSYS	QAPZGRP2	QAPZGRP2
5232	4	4	.0077	4	2	2	QUSRSYS	QAPZGRP4	QAPZGRP4
5232	4	4	.0077	4	2	2	QUSRSYS	QAPZGRP5	QAPZGRP5
4044	4	4	.0077	4	2	2	QUSRSYS	QAPZPTF	QAPZPTF
4044	4	4	.0077	4	2	2	QUSRSYS	QAPZPTF3	QAPZPTF3
745	2	2	.0039	4	2	2	QSYS2	QASQRESL	QASQRESL
745	4	4	.0077	4	2	2	QSYS2	SYSROUTINE	SYSRO00001
677	8	8	.0154	1	2	2	QSYS	QHST16127A	QHST16127A
622	1	15	.0019	2	2	2	MCCARGAR2	QAPYJWPROC	Q118113517
226	1	1	.0019	1	2	2	QUSRSYS	QAPMCCCNDF	QAPMCCCNDF
30	2	2	.0039	1	2	2	PEXLABEX1	SMTRSTS	RUN1
20	2	2	.0026	1	2	2	PEXLABEX1	SMTRSTS	RUN1

Data space records and opens by file

20.3.5.5 Database opens/closes by program | file

This report summarizes the number of opens/closes and groups the data by library, file, member as well as program library, program, module, and procedure.

This type of open (input, output, update, delete) is also provided in this report.

Idoc720/PEXLABEX1/RUN1/Database opens/closes by program file #1																
Opens (OPENS)	Closes (CLOSES)	Opens per second (OPENRATE)	Library Name (LNAME)	File Name (FNAME)	Member Name (MNAME)	Program Name (QPRPQL)	Program Name (QPRPGN)	Module Name (QPRMNM)	Procedure Name (QPRPNM)	Module Library (QPRMQL)	Model: 0=BASE/LIC 1=ILE 2=SRVPGM 3=OPM 4=Java (QPRPMD)	Module timestamp (QPRMTM)	Open for input (OPEN_FOR_INPUT)	Open for output (OPEN_FOR_OUTPUT)	Open for update (OPEN_FOR_UPDATE)	Open for delete (OPEN_FOR_DELETE)
449	449	.8663	QSYS	QADBXMTNM	QADBXMTNM	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	449		0	0
105	105	.2026	BSMENGES	CUST_DATA1	TEST224	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	105		0	0
105	105	.2026	BSMENGES	CUST_DATA3	TEST224	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	105		0	0
103	101	.1987	QUSRSYS	QAIDRWM2	QAIDRWM2	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	103		0	1
32	32	.0617	QUSRBRM	QA1ANET2	QA1ANET2	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	32		0	8
30	30	.0579	QUSRSYS	QAPZGRP	QAPZGRP	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	30	30	30	30
30	30	.0579	QUSRSYS	QAEDSPI	QAEDSPI	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	30		0	0
16	17	.0309	MCCARGAR2	QAPYJWSTK	Q118113517	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	16		0	0
16	16	.0309	QUSRBRM	QA1AZNET	QA1AZNET	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	0	8	0	8
12	9	.0232	PEXLABEX1	QAPYJWST5	JWMQND002	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	12		0	0
12	12	.0232	QSP	QASQJ8Q	QASQJ8Q	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	12		0	0
8	8	.0154	QUSRBRM	QA1AZRD	QA1AZRD	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	8		0	0
8	10	.0154	MCCARGAR2	QAPYJWNT1	Q118113517	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	8		0	0
8	8	.0154	QSYS	QHST16127A	QHST16127A	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	4	4	0	0
5	4	.0096	QSYS2	SYSTABLES	SYSTABLES	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	5		0	0
5	4	.0096	PEXLABEX1	QAPYJWNRN	JWMQND002	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	5		0	0
4	4	.0077	QSYS2	SYSROUTINE	SYSRO00001	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	4		0	0
4	4	.0077	QUSRSYS	QAPZPTF3	QAPZPTF3	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	4		0	0
4	1	.0077	QSYS2	QSQPTABL	QSQPTABL	QSYS	QDBOPEN	QDBOPEN	QDBOPEN			1 2016030919215514	4		0	0

Database opens/closes by program | file

20.3.5.6 Database opens/closes call stacks by instruction

This report summarizes the call stacks associated with database open events and displays the most common ones first. **Note:** This report was added with client 1619+.

It will only work correctly if *FORMAT2 events were captured.

Tip: You can use this report as a drill down from one of the overview or rankings graphs to focus results on a specific time or job grouping. Use the Detail reports -> Database file opens/closes menu to accomplish this.

Idoc720/PEXLABEX1/RUN1/Database opens/closes call stacks by instruction for Thread program file WEEKLY / BS...						
Total events (TOTEVTS)	Call level (LEVEL)	Program model (MODEL)	Program name (PGMNAM)	Module name (MODNAM)	Procedure name (PRCNAM)	Offset (ADDR_OFFSET)
210	1	ILE	QDBOPEN	QDBOPEN	QDBOPEN	0000000000103E4
210	2	OPM	QDMCOPEN	QDMCOPEN	QDMCOPEN	000000000000AFF4
210	3	ILE	QRWCKRDB	QRWCKRDB	CALLGETK	00000000000000C0
210	4	ILE	QRWCKRDB	QRWCKRDB	GETLCLRDBFROMDIR	00000000000000A0
210	5	ILE	QRWCKRDB	QRWCKRDB	GETRMTDRBFROMDIR	00000000000000C0
210	6	ILE	QRWCKRDB	QRWCKRDB	ChkRDB	000000000000056C
210	7	ILE	QSQCONN	QSQCONN	QSQCONN	00000000000008BD0
210	8	ILE	QSQCUTE	QSQCUTE	QSQCUTE	000000000000049A8
210	9	OPM	QXSQL	QXSQL	QXSQL	00000000000011CC0
210	10	ILE	QXSRV01	QXSQLSTAT	QXSQLStatement_Execu	00000000000000B4
210	11	ILE	QXSRV01	QXCONNECT	QXConnection_Reset	00000000000000EC
210	12	ILE	QXSRV01	QXCMDINST	QXCmdInstance_ValidateAndProcessDSQSDBNM	00000000000002F4
210	13	ILE	QXSRV01	QXCMDINST	QXCmdInstance_Start	000000000000043C
210	14	ILE	QXSRV01	QXROUTING	QXRoutingInfo_Route	00000000000002DC
210	15	ILE	QXCPIEX	QXCPIEX	QXCPIEX_ExecuteCommand	0000000000000508
210	16	ILE	QXCPIEX	QXCPIEX	main_module	000000000000042C
210	1	OPM	QDBCLOSE	QDBCLOSE	QDBCLOSE	00000000000005B70
210	2	OPM	QDMCLOSE	QDMCLOSE	QDMCLOSE	000000000000015D0
210	3	ILE	QRWCKRDB	QRWCKRDB	ChkRDB	0000000000000694
210	4	ILE	QSQCONN	QSQCONN	QSQCONN	00000000000008BD0
210	5	ILE	QSQCUTE	QSQCUTE	QSQCUTE	000000000000049A8
210	6	OPM	QXSQL	QXSQL	QXSQL	00000000000011CC0
210	7	ILE	QXSRV01	QXSQLSTAT	QXSQLStatement_Execu	00000000000000B4
210	8	ILE	QXSRV01	QXCONNECT	QXConnection_Reset	00000000000000EC
210	9	ILE	QXSRV01	QXCMDINST	QXCmdInstance_ValidateAndProcessDSQSDBNM	00000000000002F4
210	10	ILE	QXSRV01	QXCMDINST	QXCmdInstance_Start	000000000000043C

Database opens/closes call stacks by instruction

21 Events

This analysis examines the event types and subtypes captured and provides many graphs for investigation. The graphs that appear under the Events folder will vary based on which event categories (or groups) were collected.

From the events overview graphs the user can right-click and see the jobs that caused the events for the selected time periods. These ranking graphs can also be used against the entire collection if accessed from one of the Events -> rankings subfolders.

Note: All job counts graphs show the contributing job counts for each event type, sub type collected and will look identical to the graph before it, just replace event count with contributing job count.

21.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

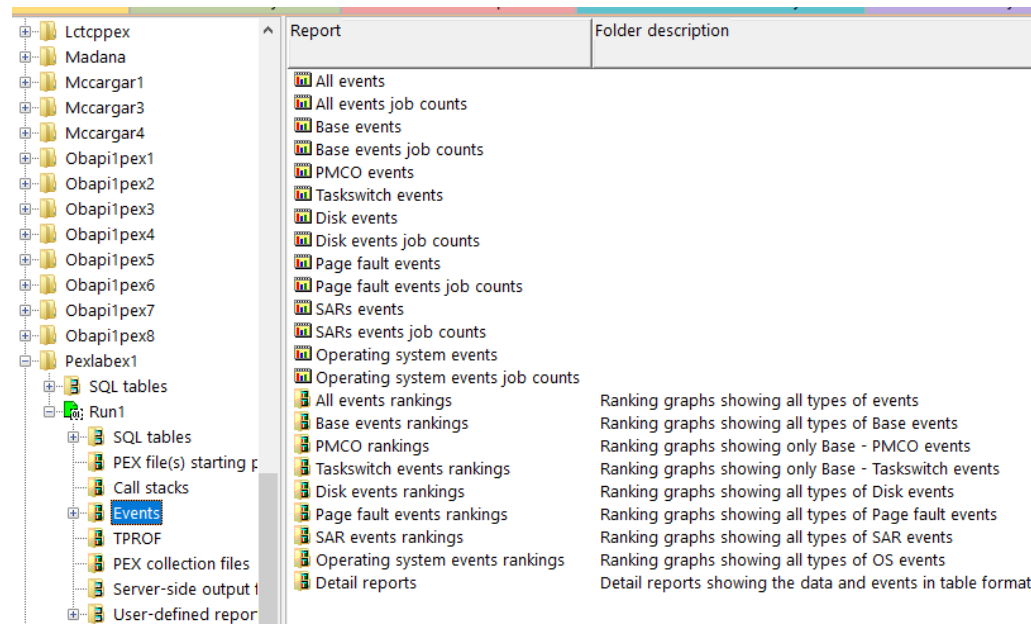
21.2 SQL Tables

The list of SQL tables generated by the analysis are shown below:

SQL table	Description
PEXINTI_<MBR>	Events interval summary

21.3 Events

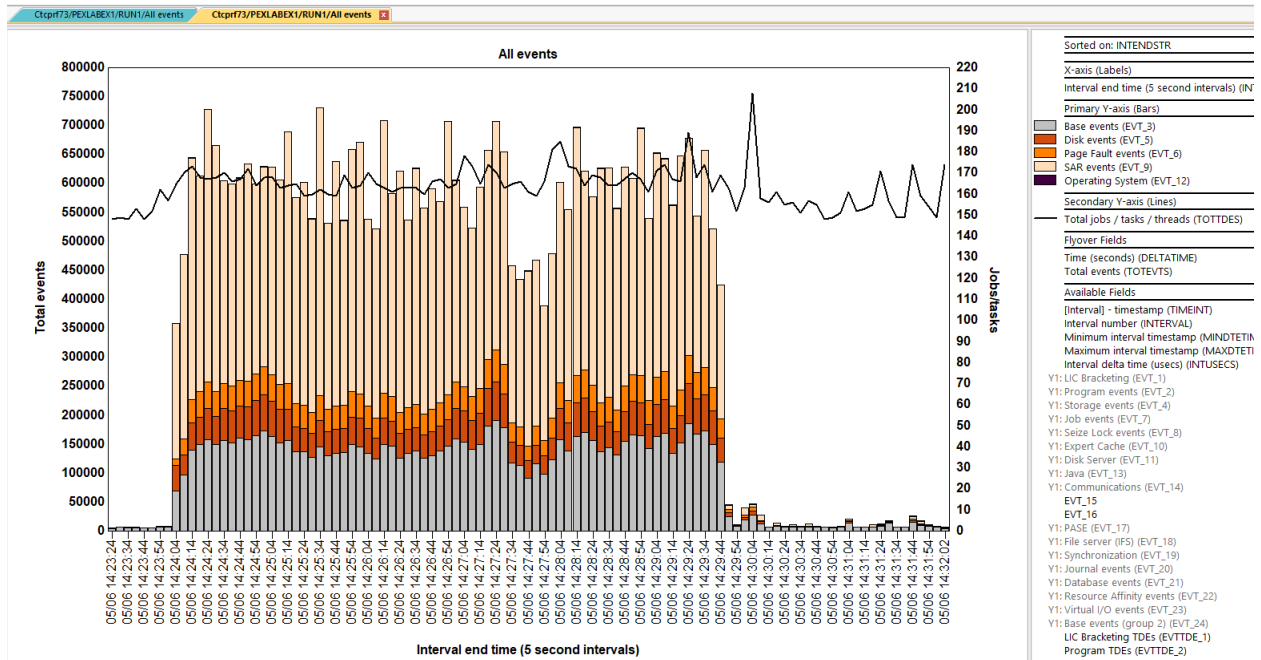
An example of the Events folder is shown below:



Events folder

21.3.1 All events

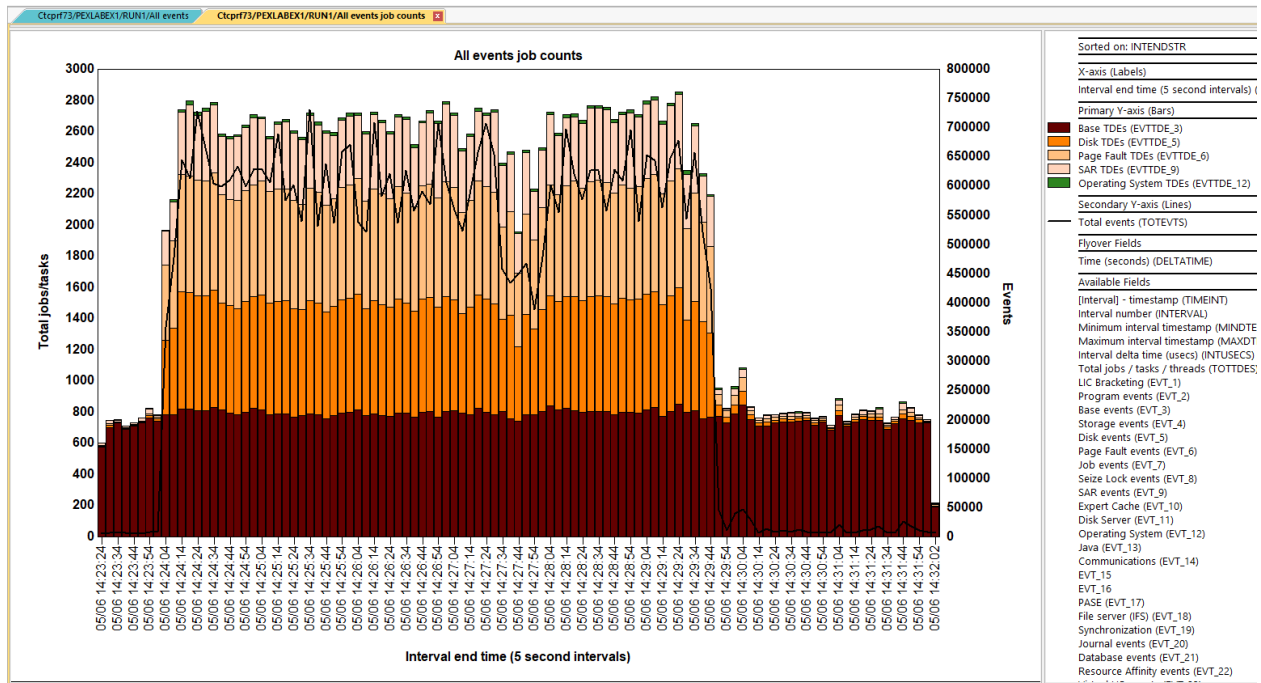
This graph displays the total number of events that occurred over time by event category. Each event category with at least 1 event captured will be included in the graph.



All events

21.3.2 All events job counts

This graph shows the number of contributing jobs/tasks/threads for each event type.



All events job counts

21.3.3 Program events

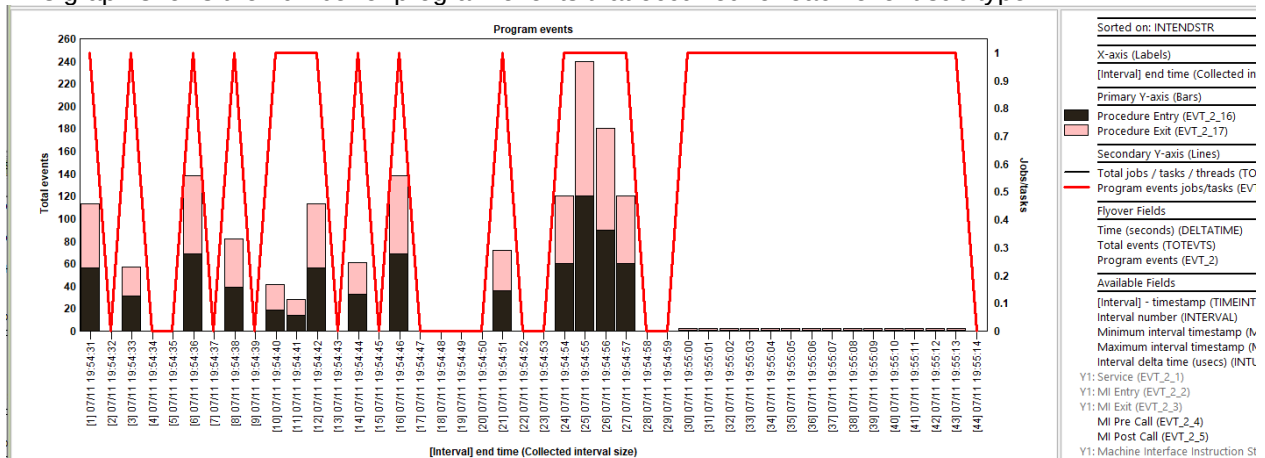
Program events are event type 2 in the PEX files. These are also called Machine Interface program bracketing events.

Tip: *MISTR, *MIEND events can be used to find the program name associated with another event being called. This is not used as much anymore with the addition of call stacks to most of the more commonly used PEX events, but is still available if needed for other event types that do not provide a call stack.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
2	1	PGMEVT	*USER	Service
2	2	PGMEVT	*MIENTRY	Entry
2	3	PGMEVT	*MIEXIT	Exit
2	4	PGMEVT	*MIPRECALL	Pre Call
2	5	PGMEVT	*MIPOSTCALL	Post Call
2	6	PGMEVT	*MISTR	Machine Interface Instruction Start
2	7	PGMEVT	*MIEND	Machine Interface Instruction End
2	8	PGMEVT	*MISUBENT	Machine Interface Subassembly Entry
2	9	PGMEVT	*MISUBEX	Machine Interface Subassembly Exit
2	10	PGMEVT	*JVAENTRY	Java Entry
2	11	PGMEVT	*JVAEXIT	Java Exit
2	12	PGMEVT	*JVAPRECALL	Java Pre Call
2	13	PGMEVT	*JVAPOSTCALL	Java Post Call
2	14	PGMEVT	*JVANTVMTHSTR	Java Native Method Start
2	15	PGMEVT	*JVANTVMTHEND	Java Native Method End
2	16	PGMEVT	*PRCENTRY	Procedure Entry
2	17	PGMEVT	*PRCEXIT	Procedure Exit
2	18	PGMEVT	*PASEPRCENTRY	PASE Procedure Entry
2	19	PGMEVT	*PASEPRCEXIT	PASE Procedure Exit

Program events from QAYPEEVEVENT at 7.4

This graph shows the number of program events that occurred for each event sub type.



Program events

21.3.4 Base events

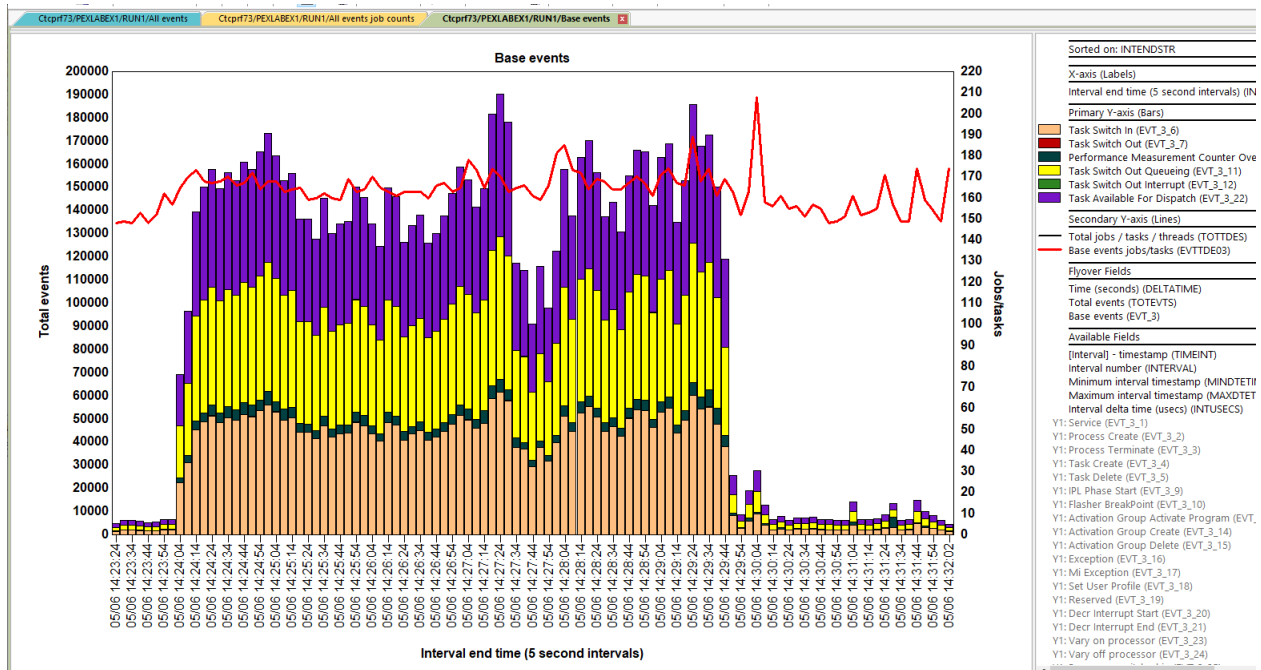
Base events are event type 3 in the PEX files.

Event type (QEVTV)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
3	1	BASEVT	*USER	Service
3	2	BASEVT	*PRCCRT	Process Create
3	3	BASEVT	*PRCDLT	Process Terminate
3	4	BASEVT	*TASKCRT	Task Create
3	5	BASEVT	*TASKDLT	Task Delete
3	6	BASEVT	*TASKSWTIN	Task Switch In
3	7	BASEVT	*TASKSWTOUT	Task Switch Out
3	8	BASEVT	*PMCO	Performance Measurement Counter Overflow
3	9	BASEVT	*IPLSTR	IPL Phase Start
3	10	BASEVT	*PGMDBG	Flasher BreakPoint
3	11	BASEVT	*TASKSWTOUTQ	Task Switch Out Queueing
3	12	BASEVT	*TASKSWTOUTINT	Task Switch Out Interrupt
3	13	BASEVT	*ACTGRPACTPGM	Activation Group Activate Program
3	14	BASEVT	*ACTGRPCRT	Activation Group Create
3	15	BASEVT	*ACTGRPDLT	Activation Group Delete
3	16	BASEVT	*EXCP	Exception
3	17	BASEVT	*MIEXCP	Mi Exception
3	18	BASEVT	*SETPRF	Set User Profile
3	19	BASEVT	*RESERVED	Reserved
3	20	BASEVT	*DCRINTSTR	Decr Interrupt Start
3	21	BASEVT	*DCRINTEND	Decr Interrupt End
3	22	BASEVT	*TASKAVAIL	Task Available For Dispatch
3	23	BASEVT	*CPUVRYON	Vary on processor
3	24	BASEVT	*CPUVRYOFF	Vary off processor
3	25	BASEVT	*CPUSWTIN	Processor switched in
3	26	BASEVT	*CPUSWTOUTP	Processor switched out due to preempt
3	27	BASEVT	*CPUSWTOUTY	Processor switched out due to yield
3	28	BASEVT	*CPUAVAIL	Processor available
3	29	BASEVT	*CPUSWT	LPAR combo event
3	30	BASEVT	*WKLDCAPIING	Workload capping

Base events from QAYPEEVENT at 7.4

This graph shows the number of base events that occurred and breaks down each individual event sub type.

Tip: This does not include the base events group 2 (event type 24). Group 2 events are the ones listed on the ADDPEXDFN command – BASEVT parameter after *WKLDCAPIING.



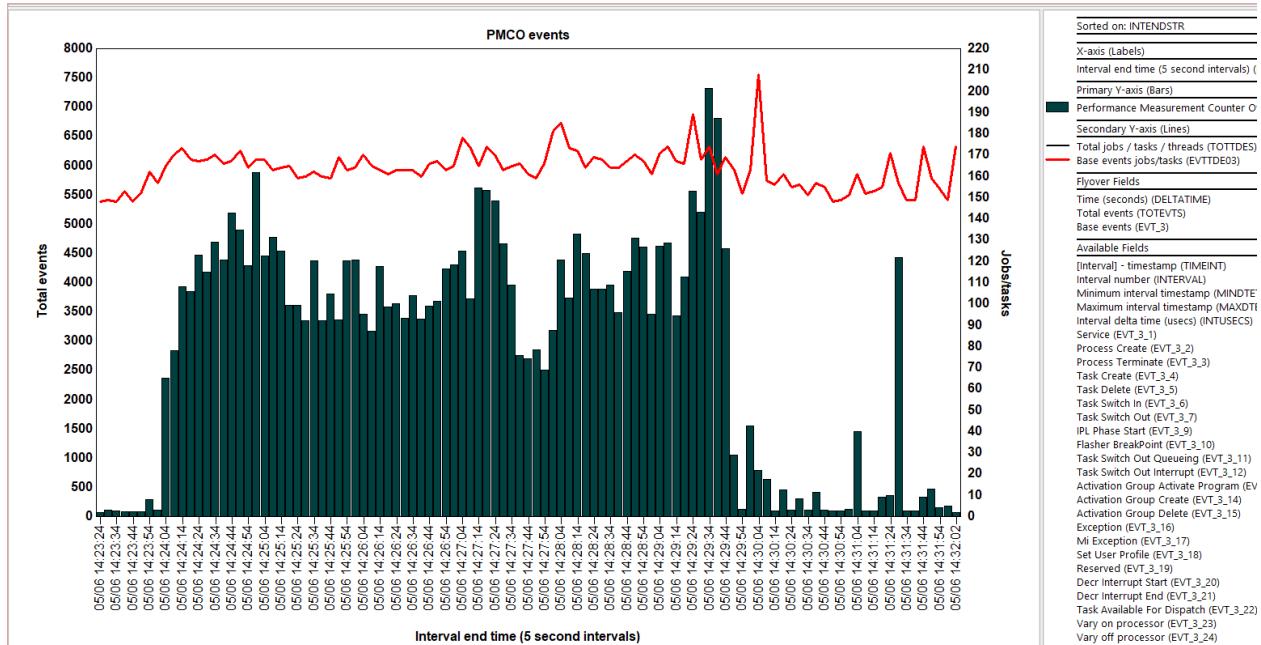
Base events

21.3.5 PMCO events

This graphs only the PMCO event (which is a base type event). PMCO is event type 3 subtype 8 in the PEX data. PMCO stands for Performance Measurement Counter Overflow and is used in TPROF to analyze CPU performance within programs.

Tip: Collect format 2 to include a call stack. Use PMCO format 4 if debugging cacheline data.

Collecting PMCO format 1 is not recommended.



PMCO events

21.3.6 Taskswitch events

Taskswitch events are part of base events and are event type 3, sub types (6, 7, 11, 12, and 22)

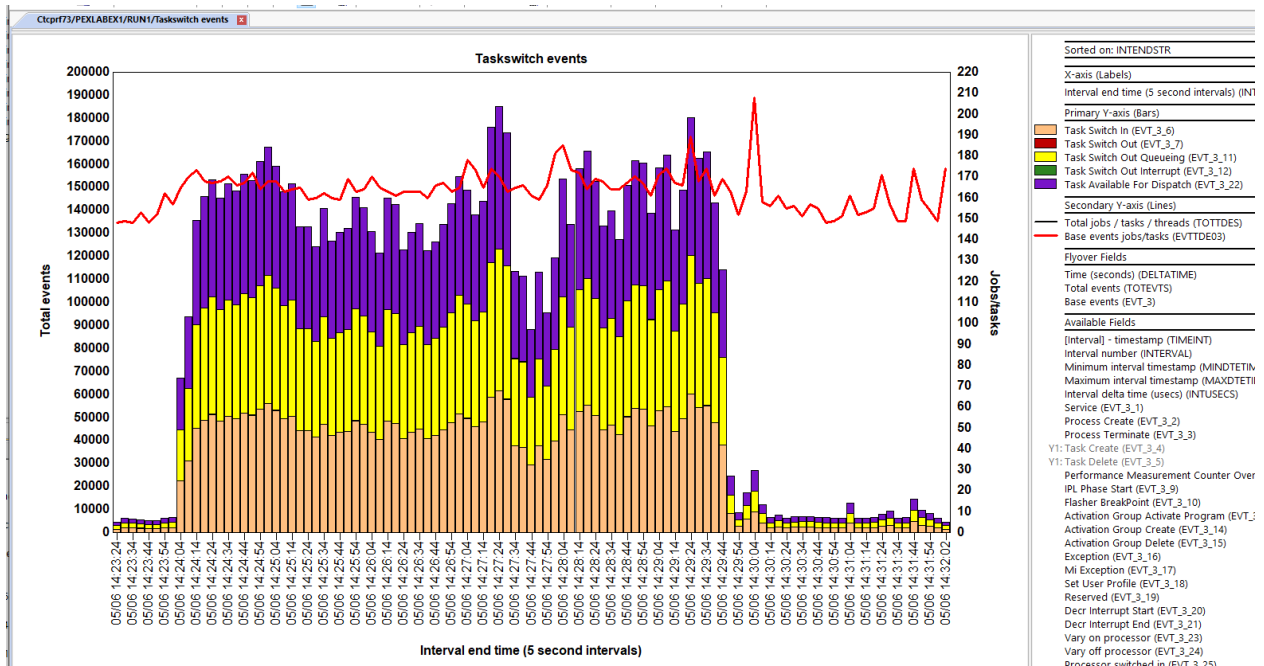
Tip: If *TASKSWTOUQ is collected as format 2 then a call stack is provided (recommended.)

To collect taskswitch, the following events should be included:

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
3	6	BASEVT	*TASKSWTIN	Task Switch In
3	7	BASEVT	*TASKSWTOUT	Task Switch Out
3	8	BASEVT	*PMCO	Performance Measurement Counter Overflow
3	11	BASEVT	*TASKSWTOUTQ	Task Switch Out Queueing
3	12	BASEVT	*TASKSWTOUTINT	Task Switch Out Interrupt
3	22	BASEVT	*TASKAVAIL	Task Available For Dispatch

Taskswitch and PMCO events from QAYPEEVEVENT at 7.4

This graph counts the taskswitch event subtypes over time. Taskswitch is the most detailed/advanced type of analysis found in PEX Analyzer and shows every transition / transaction of work that occurred per job.

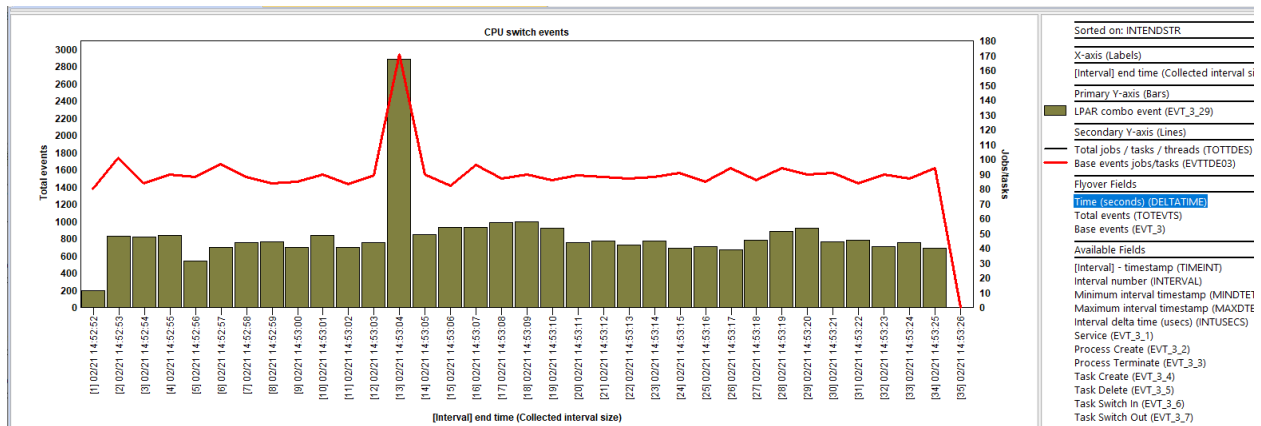


Taskswitch events

21.3.7 CPU switch events

CPU switch events are found within the base events (type 3), sub type 29. These are also called LPAR combo events.

Tip: No PEX Analyzer analysis exists for CPU switch events, but you will find some reports under PEX file(s) starting points -> CPU Switch.



CPU switch events

21.3.8 Storage events

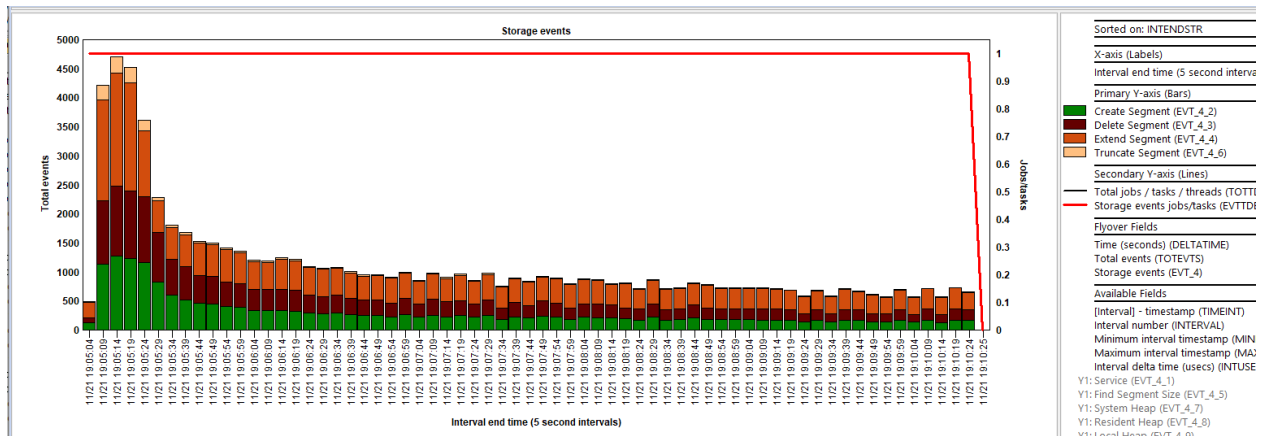
Storage events are used to show changes to disk storage such as creates, extends, truncates and deletes of segments. These are event type 4 in the PEX files.

Tip: These events are used by the Net size changes, Heap storage and ASM analyses.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
4	1	STGEVT	*USER	Service
4	2	STGEVT	*CRTSEG	Create Segment
4	3	STGEVT	*DLTSEG	Delete Segment
4	4	STGEVT	*EXDSEG	Extend Segment
4	5	STGEVT	*FNDSEGSIZ	Find Segment Size
4	6	STGEVT	*TRUNCSEG	Truncate Segment
4	7	STGEVT	*SYSHEAP	System Heap
4	8	STGEVT	*RESHEAP	Resident Heap
4	9	STGEVT	*LCLHEAP	Local Heap
4	10	STGEVT	*USRHEAP	User Created Heap
4	11	STGEVT	*ACTGRPHEAP	Activation Group Heap
4	12	STGEVT	*HDLHEAP	Handle Based Heap
4	13	STGEVT	*TSADRFALSETR...	Teraspace Address False Trap
4	14	STGEVT	*SPCADRFALSETR...	Space Address False Trap
4	15	STGEVT	*STGPTC	Storage Protect
4	16	STGEVT	*CLEHEAP	CLE Heap
4	17	STGEVT	*CHGSEGATR	Change Segment Attributes

Storage events from QAYPEEVEN at 7.4

This graph shows the number of storage events for each sub type collected over time.



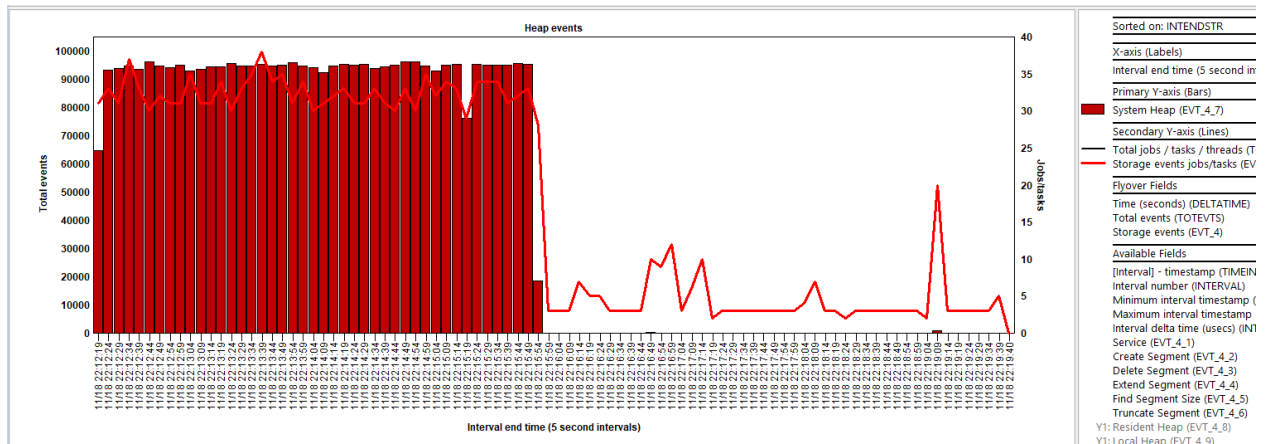
Storage events

21.3.9 Net size events

This graph is like the previous except only shows event sub types (2, 3, 4 and 6) from the storage events.

21.3.10 Heap events

This graph shows the heap events from the storage event type (4) category. Heap events are sub types 7-12.



Heap events

21.3.11 Disk events

Disk events are used to analyze disk performance and are necessary to create the Physical Disk I/Os analysis reports. At a minimum, both *READEND and *WRTEND events should be included.

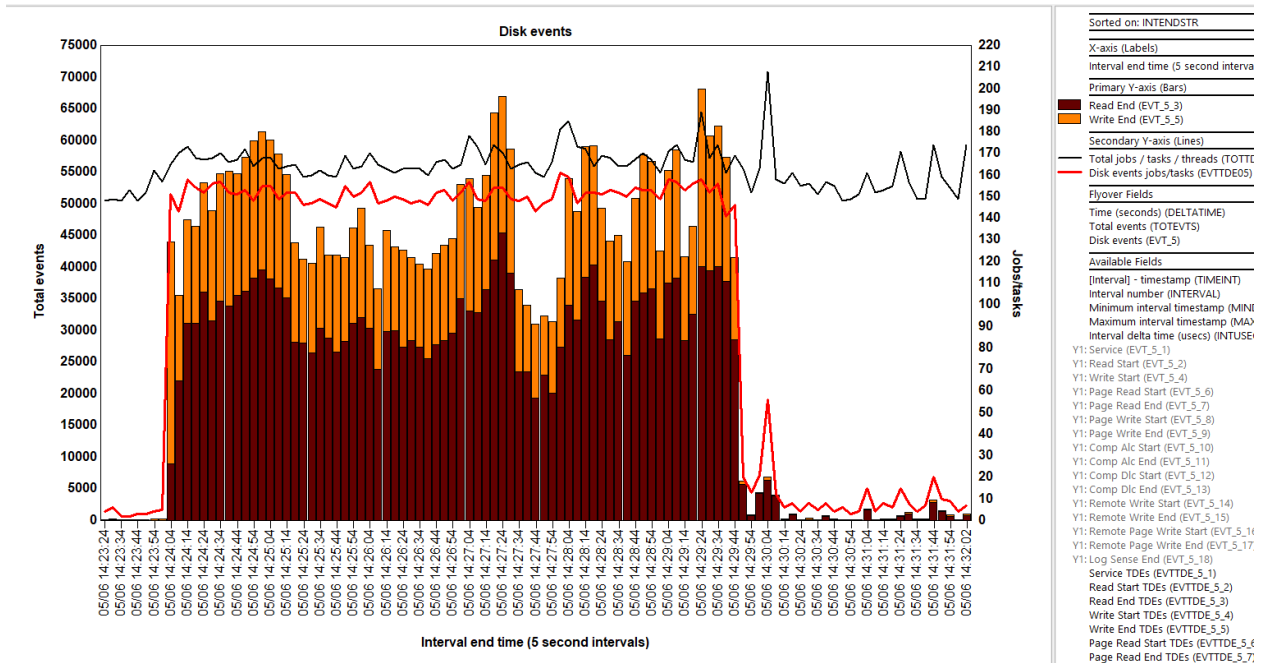
Disk events are event type 5 in the PEX files.

Tip: These events are used by the Physical Disk I/O analysis.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
5	1	DSKEVT	*USER	Service
5	2	DSKEVT	*READSTR	Read Start
5	3	DSKEVT	*READEND	Read End
5	4	DSKEVT	*WRTSTR	Write Start
5	5	DSKEVT	*WRTEND	Write End
5	6	DSKEVT	*PGREADSTR	Page Read Start
5	7	DSKEVT	*PGREADEND	Page Read End
5	8	DSKEVT	*PGWRTSTR	Page Write Start
5	9	DSKEVT	*PGWRTEND	Page Write End
5	10	DSKEVT	*CMPALCSTR	Comp Alc Start
5	11	DSKEVT	*CMPALCEND	Comp Alc End
5	12	DSKEVT	*CMPDLCSTR	Comp Dlc Start
5	13	DSKEVT	*CMPDLCEND	Comp Dlc End
5	14	DSKEVT	*RMTWRTSTR	Remote Write Start
5	15	DSKEVT	*RMTWRTEND	Remote Write End
5	16	DSKEVT	*RMTPGWRTSTR	Remote Page Write Start
5	17	DSKEVT	*RMTPGWRTEND	Remote Page Write End
5	18	DSKEVT	*LOGSENSEND	Log sense end
5	19	DSKEVT	*UNMAPSTR	Unmap start
5	20	DSKEVT	*UNMAPSTR	Unmap end

Disk events from QAYPEEVEVENT at 7.4

This graph shows the number of disk events for each sub type collected over time.



Disk events

21.3.12 Page fault events

Page fault events are event type 6 in the PEX files.

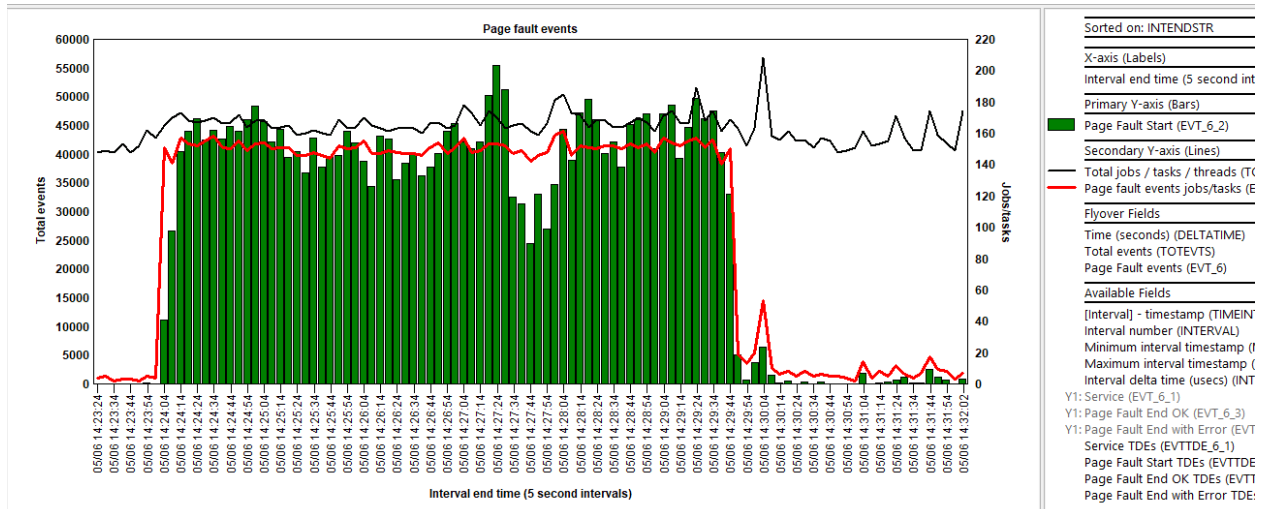
Tip: Collect page fault starts (event type 6, sub type 2) with format 2 to include a call stack.

These events are used by the Page faults analysis.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
6	1	FAULTVT	*USER	Service
6	2	FAULTVT	*STR	Page Fault Start
6	3	FAULTVT	*ENDOK	Page Fault End OK
6	4	FAULTVT	*ENDERR	Page Fault End with Error

Page fault events from QAYPEEVEVENT at 7.4

This graph shows the number of page fault events for each sub type collected over time.



Page fault events

21.3.13 Job events

Job events are event type 7 in the PEX files.

Tip: These events are rarely used, and no analysis or reports exists for job events. You will find the raw data for these events in file Qaypermpm.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
7	1	JOBEVT	*USER	Service
7	2	JOBEVT	*LWSTR	MI Long Wait Start
7	3	JOBEVT	*LWEND	MI Long Wait End
7	4	JOBEVT	*INELIGIBLE	MI Process Ineligible
7	5	JOBEVT	*ACTIVE	MI Process Active
7	6	JOBEVT	*INTERRUPT	MI Process Interrupt
7	7	JOBEVT	*MPLPOOLCHG	MI MPL Pool Change
7	8	JOBEVT	*TOBCHMPLPOOL	MI Process To Batch MPL Pool
7	9	JOBEVT	*TSLEND	Reserved
7	10	JOBEVT	*MPLLEAVE	Leaving Multi Pgm Level

Job events from QAYPEEVEVENT at 7.4

This graph shows the number of job events for each sub type collected over time.

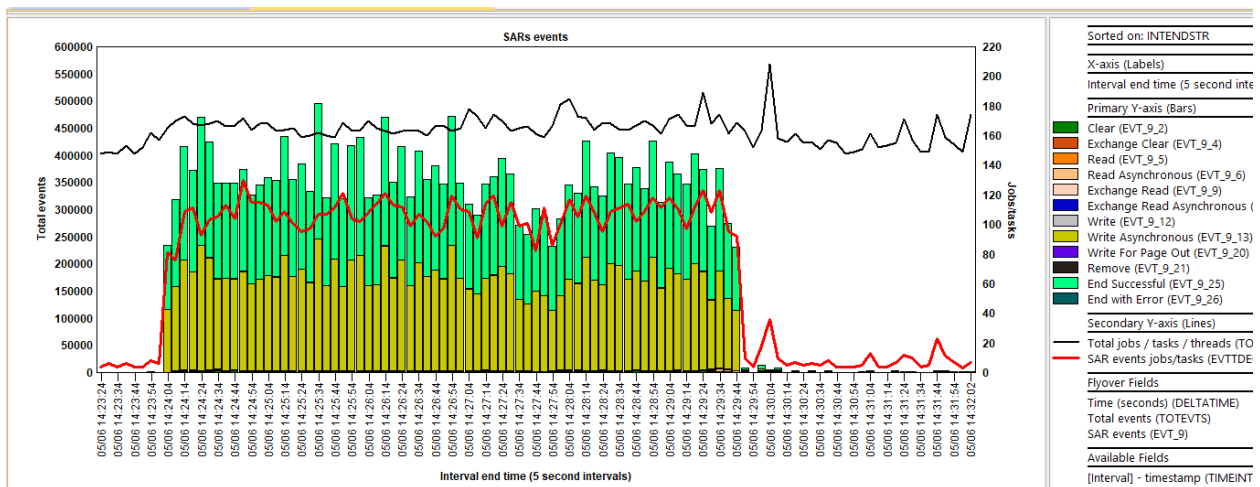
SAR are event type 9 in the PEX files.

Tip: Use the SARs analysis to analyze these events. Additional reports are available under PEX file(s) starting points -> SARs.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
9	1	SAREVT	*USER	Service
9	2	SAREVT	*CLR	Clear
9	3	SAREVT	*CLRPIN	Clear Pin
9	4	SAREVT	*EXCHCLR	Exchange Clear
9	5	SAREVT	*READ	Read
9	6	SAREVT	*READASYNC	Read Asynchronous
9	7	SAREVT	*READASYNC CALL	Read Asynchronous Track Call
9	8	SAREVT	*READPIN	Read Pin
9	9	SAREVT	*EXCHREAD	Exchange Read
9	10	SAREVT	*EXCHREADASY...	Exchange Read Asynchronous
9	11	SAREVT	*EXCHREADASY...	Reserved
9	12	SAREVT	*WRT	Write
9	13	SAREVT	*WRTASYNC	Write Asynchronous
9	14	SAREVT	*WRTASYNC CALL	Reserved
9	15	SAREVT	*WRTASYNCMS...	Reserved
9	16	SAREVT	*WRTASYNCMS...	Reserved
9	17	SAREVT	*WRTASYNCTASK	Reserved
9	18	SAREVT	*WRTASYNCWAIT	Reserved
9	19	SAREVT	*WRTRMV	Write Remove
9	20	SAREVT	*WRTPGOUT	Write For Page Out
9	21	SAREVT	*RMV	Remove
9	22	SAREVT	*UNPIN	Reserved
9	23	SAREVT	*UNPINRMV	Unpin Remove
9	24	SAREVT	*UNPINWRT	Reserved
9	25	SAREVT	*ENDOK	End Successful
9	26	SAREVT	*ENDERR	End with Error

SAR events from QAYPEEVEN at 7.4

This graph shows the number of SAR events for each sub type collected over time.



SARs events

21.3.16 Expert cache events

Expert cache events are event type 10 in the PEX files.

Tip: These events are rarely used, and no analysis or reports exists for expert cache events. You will find the raw data for these events in file Qaypermpm.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
10	1	EXPCCHEVT	*USER	Service
10	2	EXPCCHEVT	*SPVRTUNE	Spvr Tune
10	3	EXPCCHEVT	*SPVRTUNEDB	Spvr Tune DB

Expert cache events from QAYPEEevent at 7.4

This graph shows the number of expert cache events for each sub type collected over time.

21.3.17 Disk server events

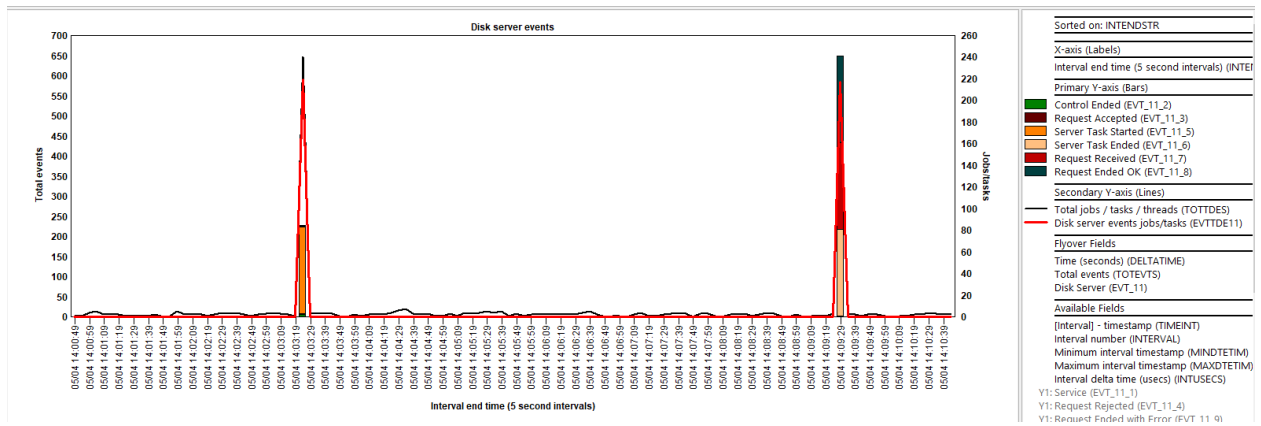
Disk server events are event type 11 in the PEX files. You will need to include system tasks in your collection if you wish to capture these events and they are associated with LDIO* and SMDSTASK* system tasks.

Tip: These events are rarely used, and no analysis exists. You will find a report over these events under PEX file(s) starting points -> Disk server with client 1619+.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
11	1	DSKSVREVT	*USER	Service
11	2	DSKSVREVT	*CTLEND	Control Ended
11	3	DSKSVREVT	*RQSACP	Request Accepted
11	4	DSKSVREVT	*RQSRJT	Request Rejected
11	5	DSKSVREVT	*SVRTASKSTR	Server Task Started
11	6	DSKSVREVT	*SVRTASKEND	Server Task Ended
11	7	DSKSVREVT	*RQSRCV	Request Received
11	8	DSKSVREVT	*RQSENDOK	Request Ended Okay
11	9	DSKSVREVT	*RQSENDERR	Request Ended with Error
11	10	DSKSVREVT	*TAPDONE	Tape Done
11	11	DSKSVREVT	*TAPSND CMD	Tape Send Command

Disk server events from QAYPEEevent at 7.4

This graph shows the number of disk server events for each sub type collected over time.



Disk server events

21.3.18 Operating system events

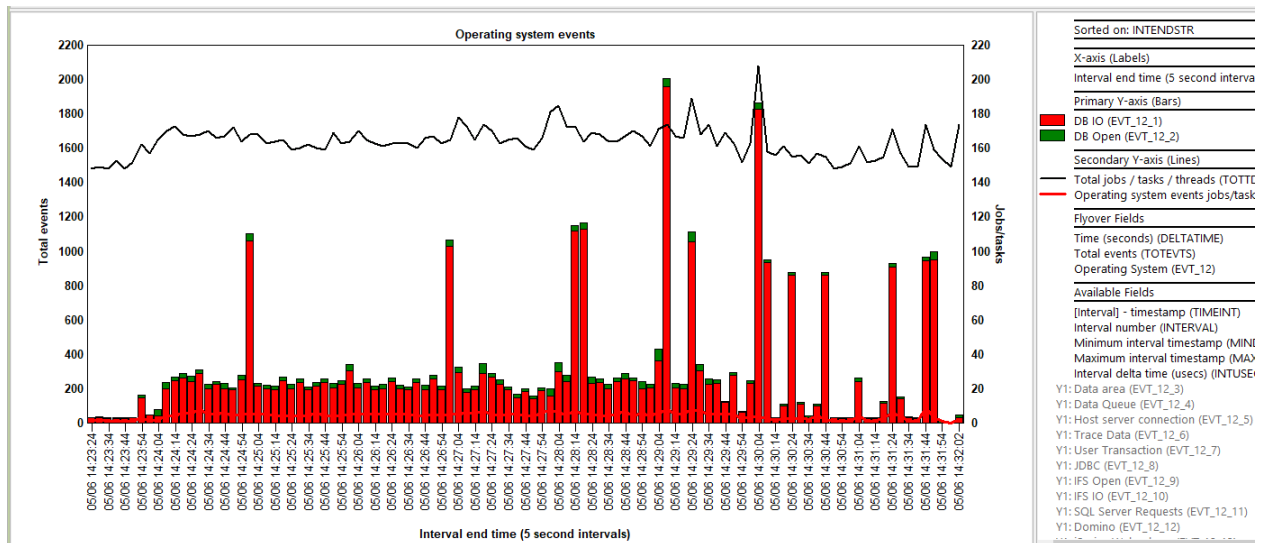
Operating system events are event type 12 subtypes 1-64 in the PEX files. Many of these sub types > 24 are not implemented yet and are reserved for future use.

Tip: Several PEX analyses use these events. Some examples are Logical DB I/O, Database full file opens/closes and Data areas.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
12	1	OSEVT	*DBIO	*DBIO = Mi Event 1
12	2	OSEVT	*DBOPEN	*DBOPEN = Mi Event 2
12	3	OSEVT	*DTAARA	*DTAARA = Mi Event 3
12	4	OSEVT	*DTAQ	*DTAQ = Mi Event 4
12	5	OSEVT	*HOSTSVRCNN	*HOSTSVRCNN = Mi Event 5
12	6	OSEVT	*TRCDTA	*TRCDTA = Mi Event 6
12	7	OSEVT	*USRTNS	*USRTNS = Mi Event 7
12	8	OSEVT	*JDBC	*JDBC = Mi Event 8
12	9	OSEVT	*IFSOPEN	*IFSOPEN = Mi Event 9
12	10	OSEVT	*IFSIO	*IFSIO = Mi Event 10
12	11	OSEVT	*DBSVRREQ	*DBSVRREQ = Mi Event 11
12	12	APPEVT	*DOMTRCDTA	Domino
12	13	APPEVT	*WAS	iSeries Websphere
12	14	OSEVT	*MGTC	*MGTC = Mi Event 14
12	15	OSEVT	*DIRSRV	*DIRSRV = Mi Event 15
12	16	APPEVT	*CONNECT	iSeries Connect
12	17	OSEVT	*TRCCOMP	*TRCCOMP = Mi Event 17
12	18	OSEVT	*MIEV18	Mi Event 18
12	19	OSEVT	*MIEV19	Mi Event 19
12	20	OSEVT	*IFSCOMP	*IFSCOMP = Mi Event 20
12	21	OSEVT	*SAVRST	*SAVRST=Mi Event 21
12	22	OSEVT	*ADDTHD1	*ADDTHD1=Mi Event 22
12	23	OSEVT	*MIEV23	*CLEHEAP=Mi Event 23
12	24	OSEVT	*ARMTRC	*ARMTRC=Mi Event 24
12	25	OSEVT	*MIEV25	Mi Event 25
12	26	OSEVT	*MIEV26	Mi Event 26
12	27	OSEVT	*MIEV27	Mi Event 27
12	28	OSEVT	*MIEV28	Mi Event 28
12	29	OSEVT	*MIEV29	Mi Event 29
12	30	OSEVT	*MIEV30	Mi Event 30
12	31	APPEVT	*APPEVT1	Application event 1
12	32	APPEVT	*APPEVT2	Application event 2
12	33	APPEVT	*APPEVT3	Application event 3
12	34	APPEVT	*APPEVT4	Application event 4
12	35	OSEVT	*MIEV35	Mi Event 35
12	36	OSEVT	*MIEV36	Mi Event 36
12	37	OSEVT	*MIEV37	Mi Event 37
12	38	OSEVT	*MIEV38	Mi Event 38

OS events from QAYPEEVEVENT at 7.4

This graph shows the number of operating system events for each sub type collected over time.



Operating system events

21.3.19 Communications events

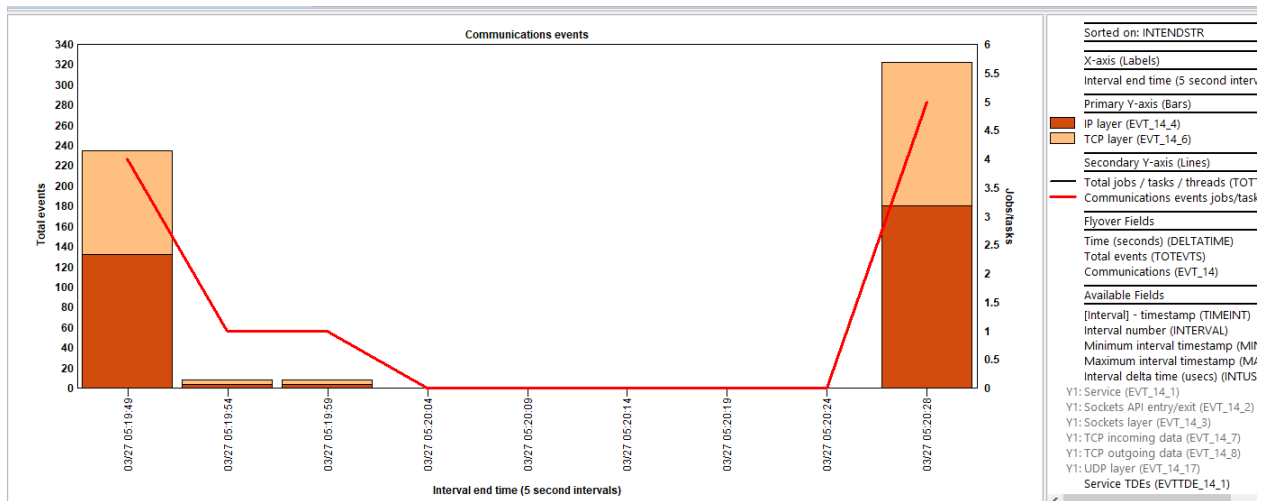
Communications events are event type 14 in the PEX files. Data captured by these events will appear in file QAYPECMN and are used to trace TCP/IP, sockets, RDMA or UDP connections.

Tip: Some of these events can be analyzed using the TCP/IP communications and TCP/IP communication (format 2) analyses.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
14	1	CMNEVT	*USER	Service
14	2	CMNEVT	*SOCKETSAPI	Sockets API entry/exit
14	3	CMNEVT	*SOCKETS	Sockets layer
14	4	CMNEVT	*IP	IP layer
14	6	CMNEVT	*TCP	TCP layer
14	7	CMNEVT	*TCPIN	TCP Incoming data
14	8	CMNEVT	*TCPOUT	TCP Outgoing data
14	9	CMNEVT	*RDMA	RDMA
14	10	CMNEVT	*RDMAQP	RDMAQP
14	17	CMNEVT	*UDP	UDP layer

Communications events from QAYPEEVEVT at 7.4

This graph shows the number of communication events for each sub type collected over time.



Communications events

21.3.20 PASE events

PASE events are event type 17 in the PEX files. Data captured by these events will appear in file QAYPEPASE and are associated with the J9 JVMs.

Tip: These events are rarely used, and no analysis or reports exists.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
17	1	PASEEVT	*USER	Service
17	2	PASEEVT	*FORKPARENTSTR	Fork processing starting in parent process
17	3	PASEEVT	*FORKCHILDSTR	Fork processing starting in child process
17	4	PASEEVT	*FORKEND	Fork processing ended
17	5	PASEEVT	*PRCINITSTR	Process initialization start event
17	6	PASEEVT	*PRCINITEND	Process initialization end event
17	7	PASEEVT	*EXECSTR	Process exec system call started
17	8	PASEEVT	*EXECEND	Process exec system call ended
17	9	PASEEVT	*EXIT	Process exit system call
17	10	PASEEVT	*THDINITSTR	Thread initialization started
17	11	PASEEVT	*THDINITEND	Thread initialization ended
17	12	PASEEVT	*THDEND	Thread ended
17	13	PASEEVT	*LOADSTR	Load system call started
17	14	PASEEVT	*LOADEND	Load system call ended
17	15	PASEEVT	*UNLOADSTR	Unload system call started
17	16	PASEEVT	*UNLOADEND	Unload system call ended
17	17	PASEEVT	*SIGPRCSND	Signal sent to process
17	18	PASEEVT	*SIGTHDSND	Signal sent to thread
17	19	PASEEVT	*SIGRCV	Signal received
17	25	PASEEVT	*SYSCALLSTR	System call start
17	26	PASEEVT	*SYSCALLEND	System call end
17	30	PASEEVT	*TRCHOOK	Trace hook in PASE application

PASE events from QAYPEEVENT at 7.4

This graph shows the number of PASE events for each sub type collected over time.

21.3.21 File server events

File server events are event type 18 in the PEX files. Data captured by these events will appear in file QAYPEFILSV and are associated with the IFS.

Tip: These events are rarely used, and no analysis or reports exists.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
18	1	FILSVREVT	*USER	Service
18	2	FILSVREVT	*IFSBSF	IFSBSf
18	3	FILSVREVT	*IFSDIR	IFSDir
18	4	FILSVREVT	*IFSLFS	IFSLFS
18	5	FILSVREVT	*LIC	IFSLIC
18	6	FILSVREVT	*NETSVR	IFSNetServer
18	7	FILSVREVT	*IFSNFS	IFSNFS
18	8	FILSVREVT	*IFSOS	IFSOS
18	9	FILSVREVT	*VNODMGMT	IFSVNodeManagement

File server events from QAYPEEVENT at 7.4

This graph shows the number of file server events for each sub type collected over time.

21.3.22 Synchronization events

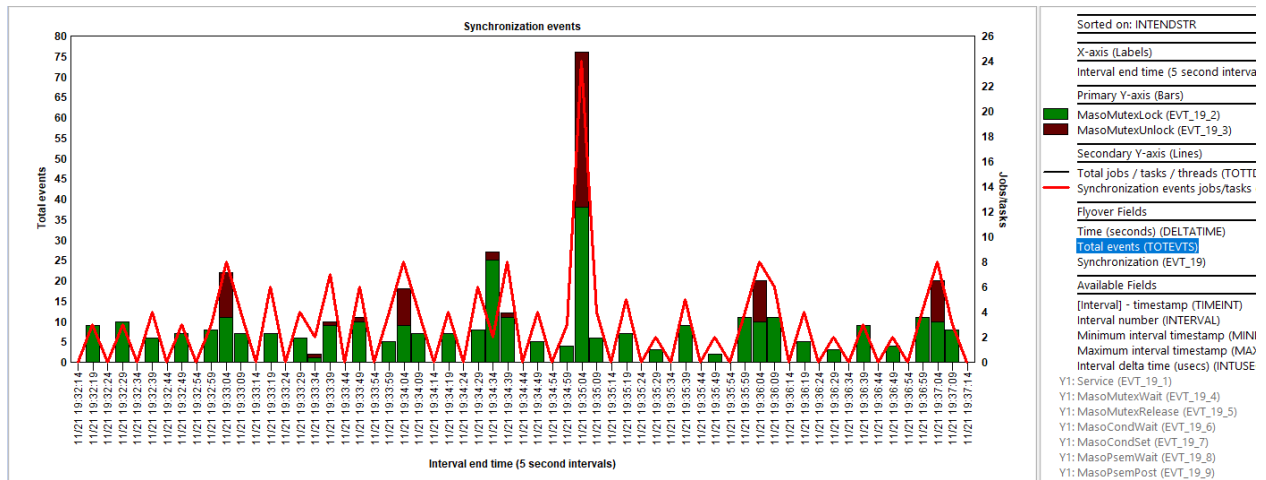
Synchronization events are event type 19 in the PEX files. Data captured by these events will appear in file QAYPESYNC.

Tip: These events are rarely used, and no analysis exists over this data. However, a few reports exist under PEX file(s) starting points -> Mutex cleanup if the mutex related events are captured.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
19	1	SYNCEVT	*USER	Service
19	2	SYNCEVT	*PTRMTXLOCK	MasoMutexLock
19	3	SYNCEVT	*PTRMTXUNLOCK	MasoMutexUnlock
19	4	SYNCEVT	*HDLMTXWAIT	MasoMutexWait
19	5	SYNCEVT	*HDLMTXRLS	MasoMutexRelease
19	6	SYNCEVT	*CONDWAIT	MasoCondWait
19	7	SYNCEVT	*CONDSET	MasoCondSet
19	8	SYNCEVT	*PTRSEMWAIT	MasoPsemWait
19	9	SYNCEVT	*PTRSEMPOST	MasoPsemPost
19	10	SYNCEVT	*NAMSEMWAIT	MasoNsemWait
19	11	SYNCEVT	*NAMSEMPOST	MasoNsemPost
19	12	SYNCEVT	*TKNLOCK	MasoTokenLock
19	13	SYNCEVT	*TKNUNLOCK	MasoTokenUnlock
19	14	SYNCEVT	*MTXCLEANUP	MasoMutexClean...

Synchronization events from QAYPEEVENT at 7.3

This graph shows the number of synchronization events for each sub type collected over time.



Synchronization events

21.3.23 Journal events

Journal events are event type 20 in the PEX files.

Tip: These events are rarely used, and no analysis or reports exists.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVS LN)
20	1	JRNEVT	*USER	Service
20	2	JRNEVT	*STRCOMMIT	Start commit
20	3	JRNEVT	*ENDCOMMIT	End commit
20	4	JRNEVT	*STRROLLBACK	Start rollback
20	5	JRNEVT	*ENDROLLBACK	End rollback
20	6	JRNEVT	*STRCYCLE	Start cycle
20	7	JRNEVT	*STROBJFORCE	Start object force
20	8	JRNEVT	*ENDOBJFORCE	End object force
20	9	JRNEVT	*STREVAL	Start eval
20	10	JRNEVT	*ENDEVAL	End eval

Journal events from QAYPEEVENT at 7.4

This graph shows the number of journal events for each sub type collected over time.

21.3.24 Database events

Database events are event type 21 in the PEX files. Several PEX files will be created based on which events are captured.

SQL table name	Description
QAYPEDBDMT	PEX DATABASE DASD METER DATA
QAYPEDBIO	PEX DATABASE I/O DATA
QAYPEDBOP2	PEX DATABASE OPTIMIZER2 DATA
QAYPEDBOPT	PEX DATABASE OPTIMIZER DATA
QAYPEDBRT	PEX DATABASE RUNTIME DATA
QAYPEDBSGC	PEX DATABASE SEGMENT DATA
QAYPEDBSZL	PEX DATABASE SEIZE AND LOCK DATA

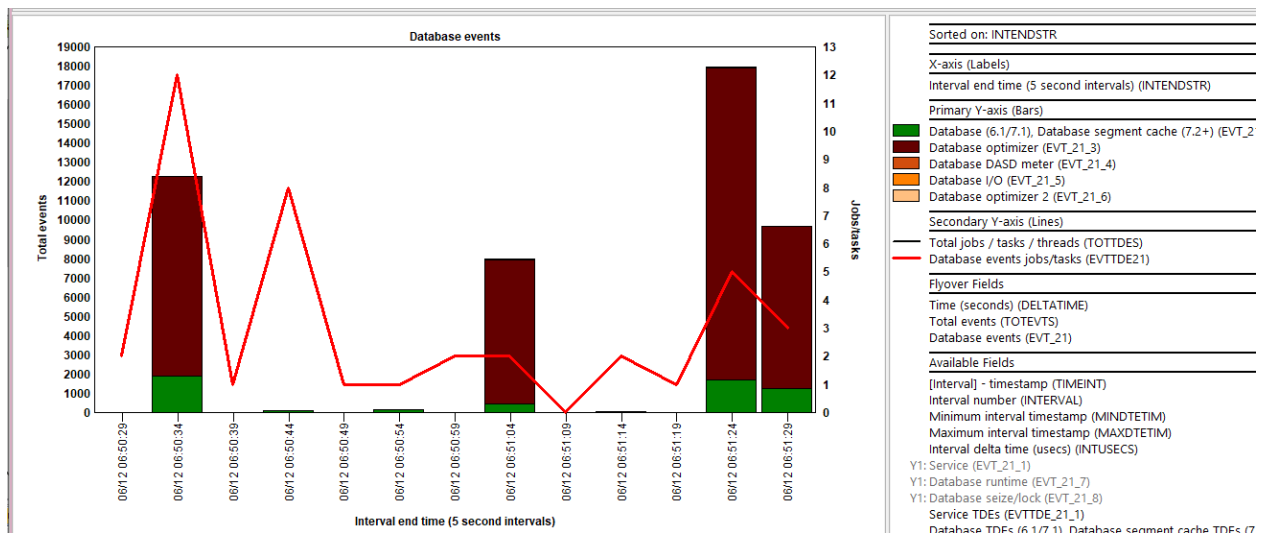
Database event PEX files

Tip: These events are rarely used, and no analysis or reports exists.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
21	1	DBEVT	*USER	Service
21	2	DBEVT	*DBSGC	Database Segment Cache
21	3	DBEVT	*DBOPT	Database Optimizer
21	4	DBEVT	*DBDMT	Database DASD Meter
21	5	DBEVT	*DBIO	Database I/O
21	6	DBEVT	*DBOP2	Database Optimizer2
21	7	DBEVT	*RT	Database Runtime
21	8	DBEVT	*SL	Database Seize/Lock

Database events from QAYPEEVEVENT at 7.4

This graph shows the number of database events for each sub type collected over time.



Database events

21.3.25 Resource affinity events

Resource affinity events are event type 22 in the PEX files. Data captured by these events will appear in file QAYPEAFN.

Tip: These events are rarely used, and no analysis or reports exists.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
22	1	RSCAFNEVT	*USER	Service
22	2	RSCAFNEVT	*CHGTASK	Change task
22	3	RSCAFNEVT	*CHGGRP	Change group
22	4	RSCAFNEVT	*CHGCFG	Change configuration
22	5	RSCAFNEVT	*BALCFG	Balance configuration
22	6	RSCAFNEVT	*CHKBAL	Check balance
22	7	RSCAFNEVT	*VFYBAL	Verify balance
22	8	RSCAFNEVT	*ANZBAL	Analyze balance
22	9	RSCAFNEVT	*CHGBALSTT	Change balancer state

Resource affinity events from QAYPEEVEVENT at 7.3

This graph shows the number of resource affinity events for each sub type collected over time.

21.3.26 Virtual I/O events

Virtual I/O events are event type 23 in the PEX files. Data captured by these events will appear in file QAYPEVIO.

Tip: These events are rarely used, and no analysis or reports exists.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
23	1	VRTIOEVT	*USER	Service
23	2	VRTIOEVT	*SCSISERVER	SCSI server
23	3	VRTIOEVT	*SCSICLIENT	SCSI client
23	4	VRTIOEVT	*SCSICMD	SCSI command
23	5	VRTIOEVT	*SCSITSKMGMT	SCSI task management
23	6	VRTIOEVT	*ISCSI	ISCSI
23	7	VRTIOEVT	*DISKSTR	Disk start
23	8	VRTIOEVT	*DISKEND	Disk end
23	9	VRTIOEVT	*OPTSTR	Optical start
23	10	VRTIOEVT	*OPTEND	Optical end
23	11	VRTIOEVT	*TAPSTR	Tape start
23	12	VRTIOEVT	*TAPEND	Tape end
23	13	VRTIOEVT	*ETHADPT	Ethernet adapter

Virtual I/O events from QAYPEEVEVENT at 7.3

This graph shows the number of virtual I/O events for each sub type collected over time.

21.3.27 Base group 2 events

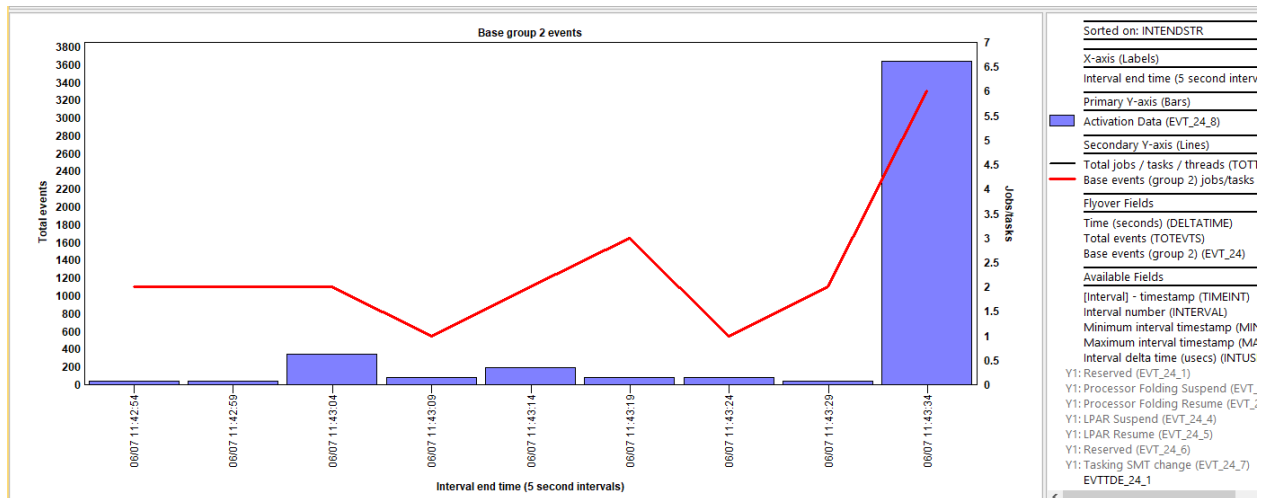
Base group 2 events are event type 24 in the PEX files. These events are specified on the ADDPEXDFN – BASEVT parameter using one of the values after *WKLDCAPIING. *ACTDTA data will appear in file QAYPEACT.

Tip: The *ACTDTA event has an analysis called Activation data. The other events do not have an analysis in iDoctor.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
24	1	BASEVT	*RSV	Reserved
24	2	BASEVT	*PRCFDLSUSPEND	Processor Folding Suspend
24	3	BASEVT	*PRCFLDRESUME	Processor Folding Resume
24	4	BASEVT	*LPARSUSPEND	LPAR Suspend
24	5	BASEVT	*LPARRESUME	LPAR Resume
24	6	BASEVT	*NA	NOT USED YET
24	7	BASEVT	*SMTCHG	Tasking SMT change
24	8	BASEVT	*ACTDTA	Activation info

Base group 2 events from QAYPEEevent at 7.3

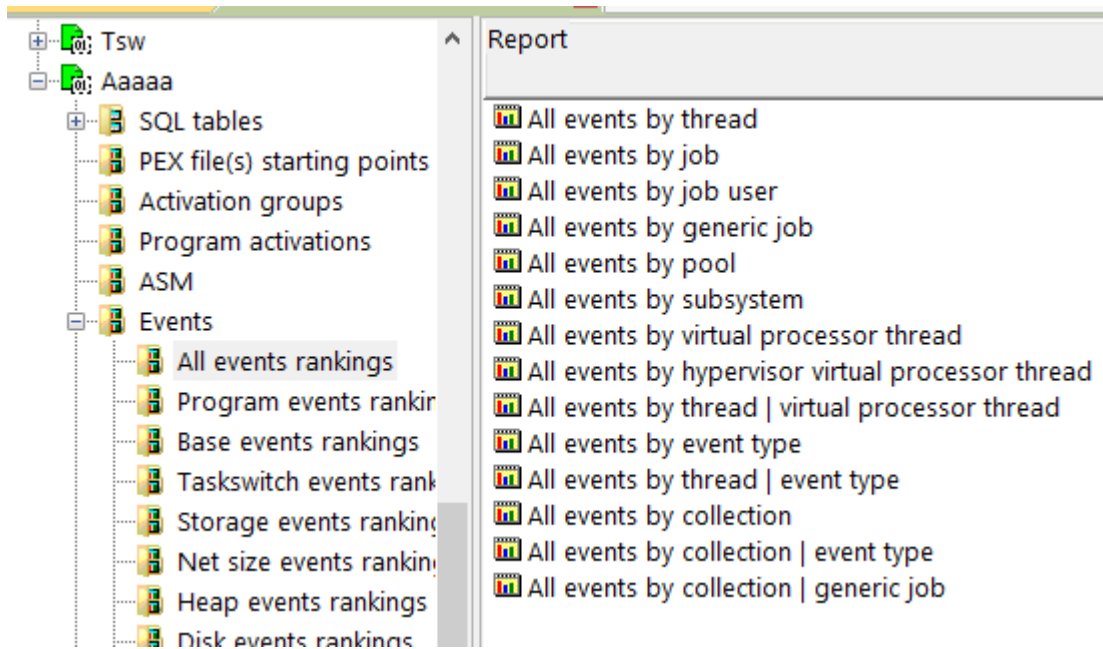
This graph shows the number of base group 2 events for each sub type collected over time.



Base group 2 events

21.3.28 All events rankings

This graph displays the total number of events that occurred by event category ranked by 1 of several possible ways.

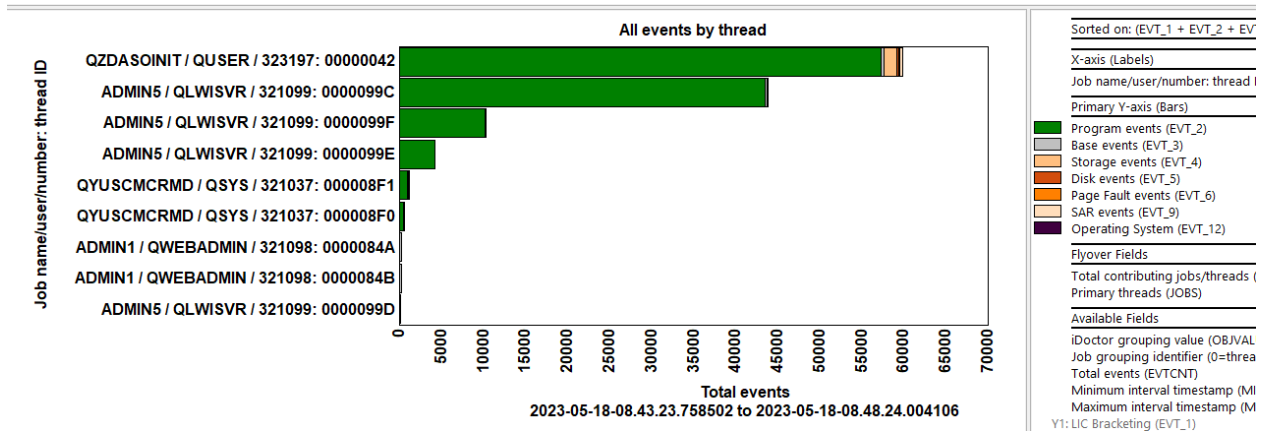


Events -> All events rankings

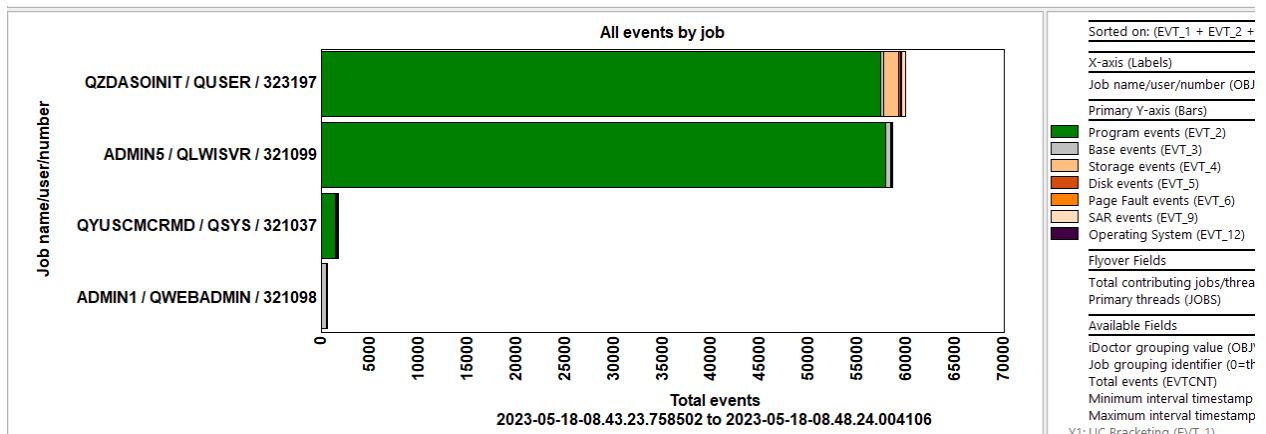
Tip: These graphs can be accessed as a drill-down from the overview graph of the same name.

Examples for each of these graphs follows:

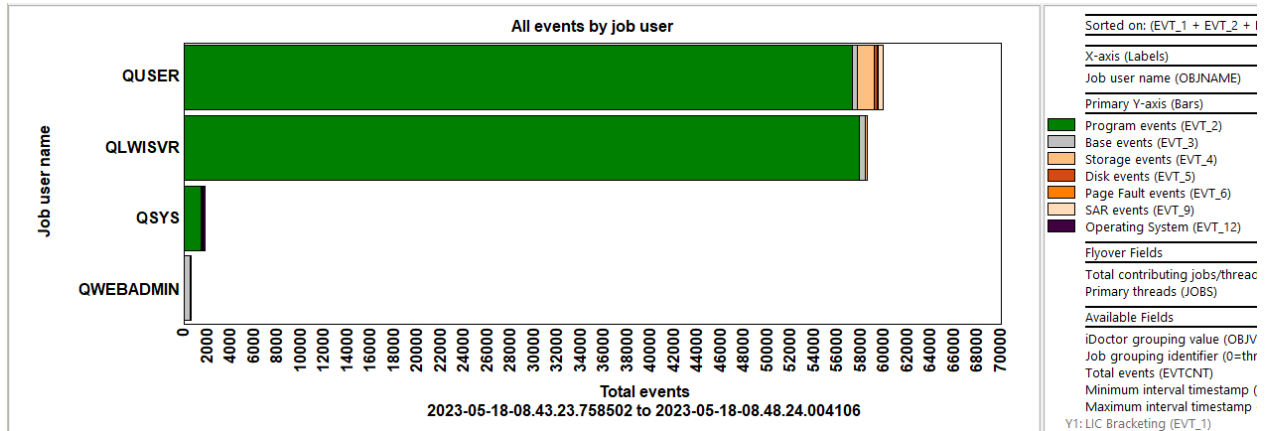
21.3.28.1 All events by thread



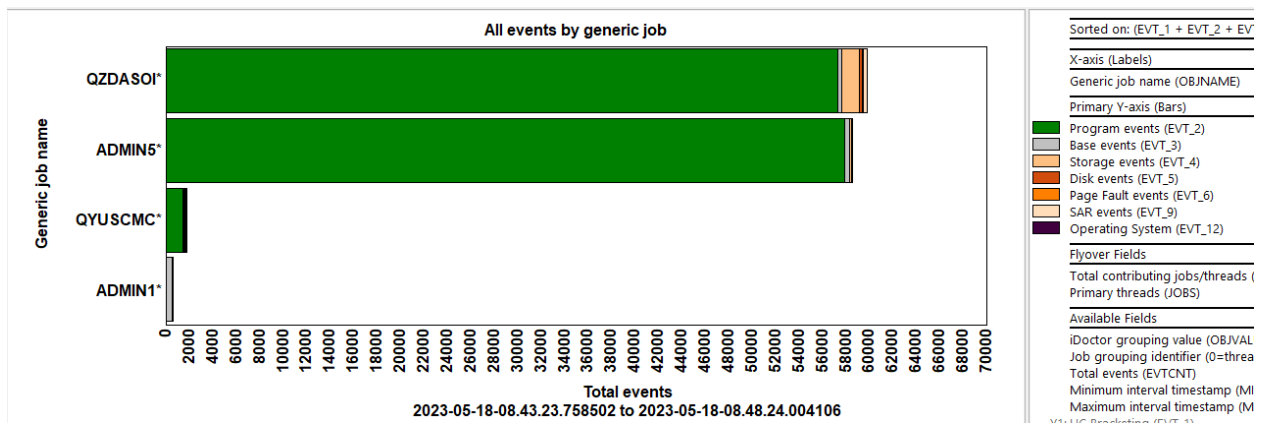
21.3.28.2 All events by job



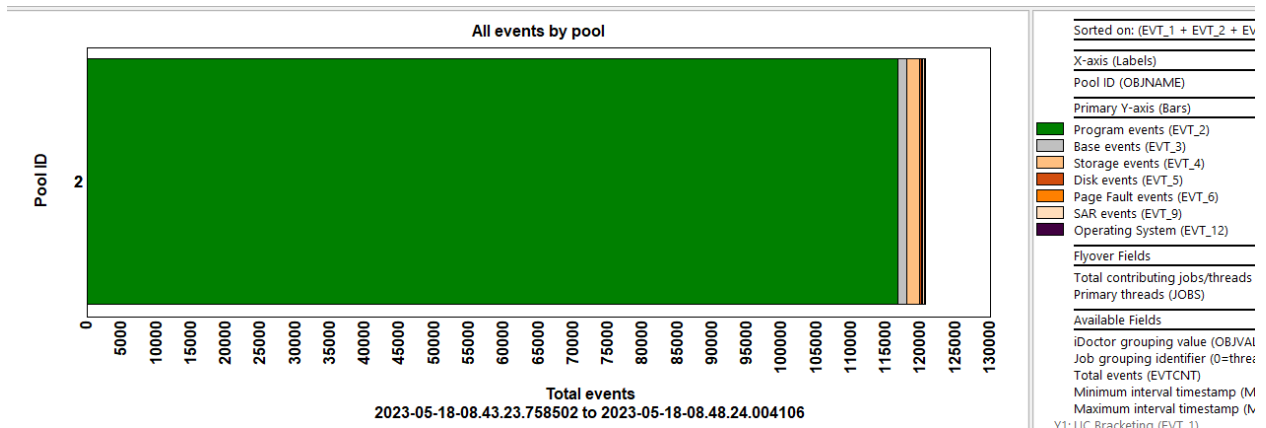
21.3.28.3 All events by job user



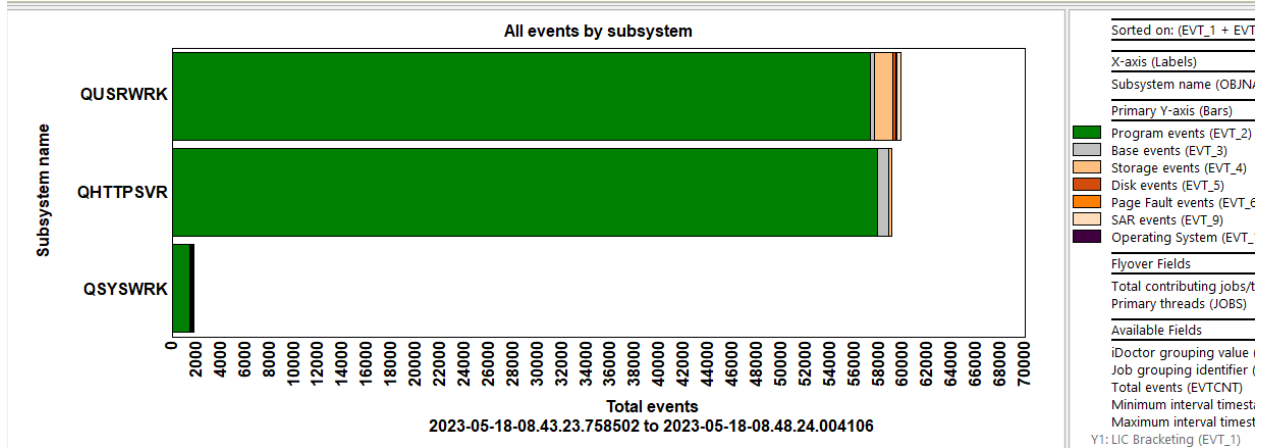
21.3.28.4 All events by generic job



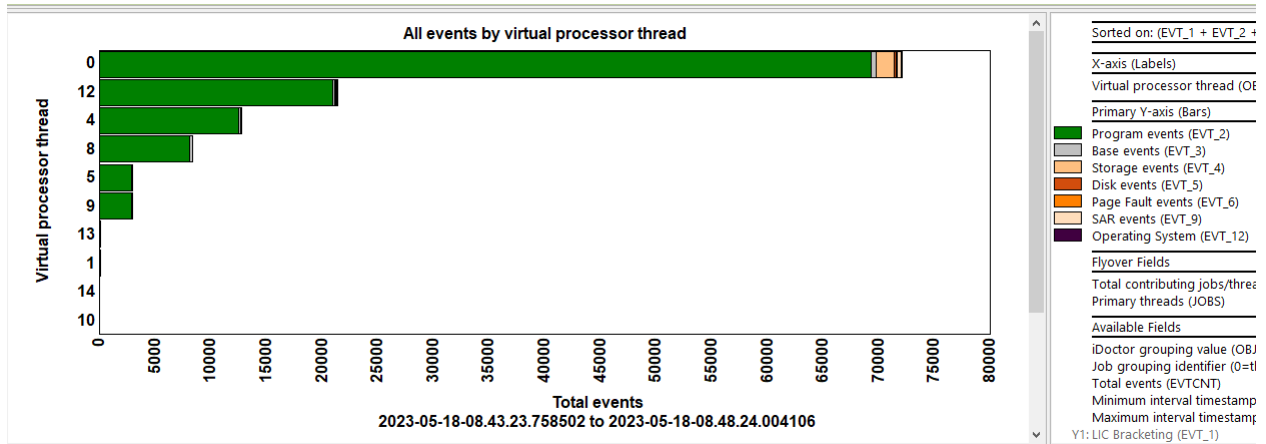
21.3.28.5 All events by pool



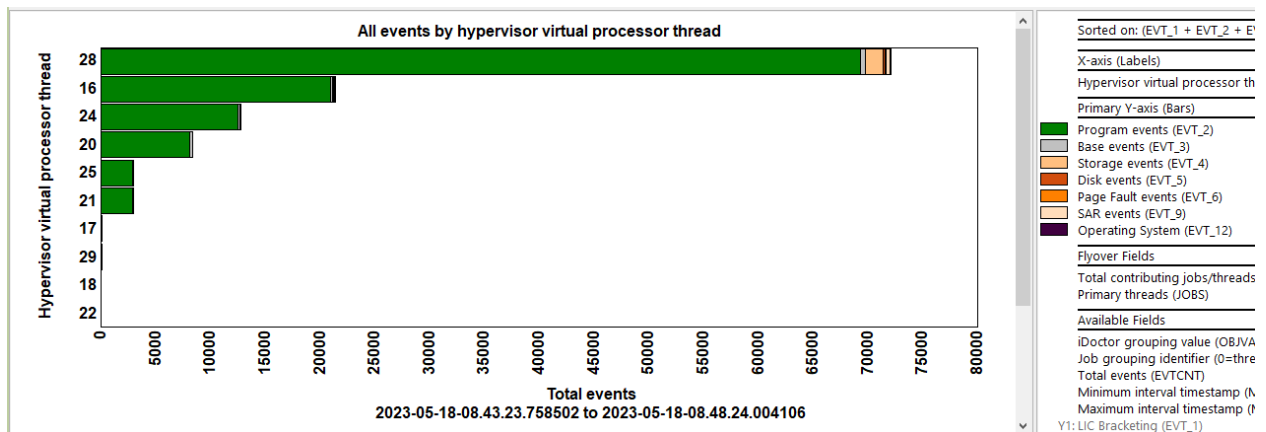
21.3.28.6 All events by subsystem



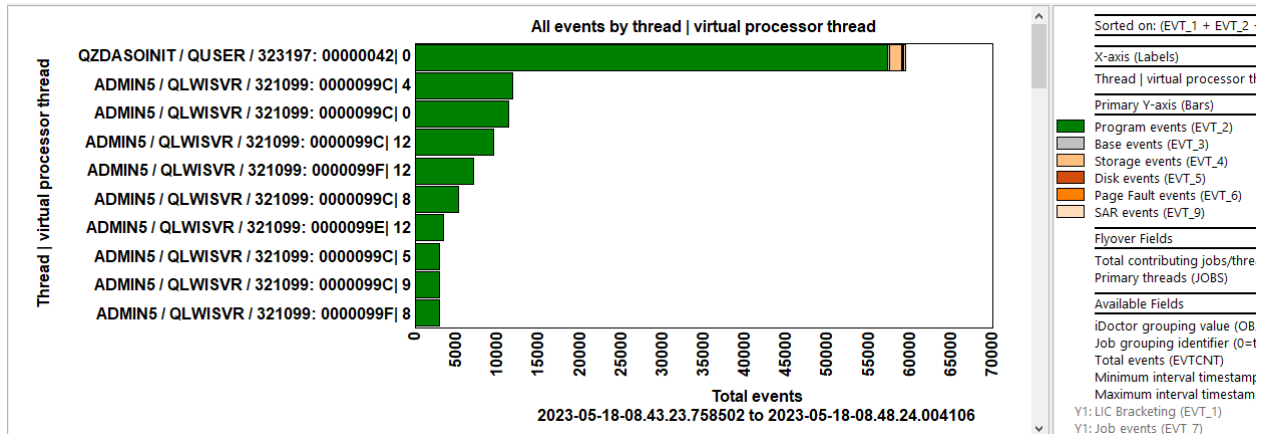
21.3.28.7 All events by virtual processor thread



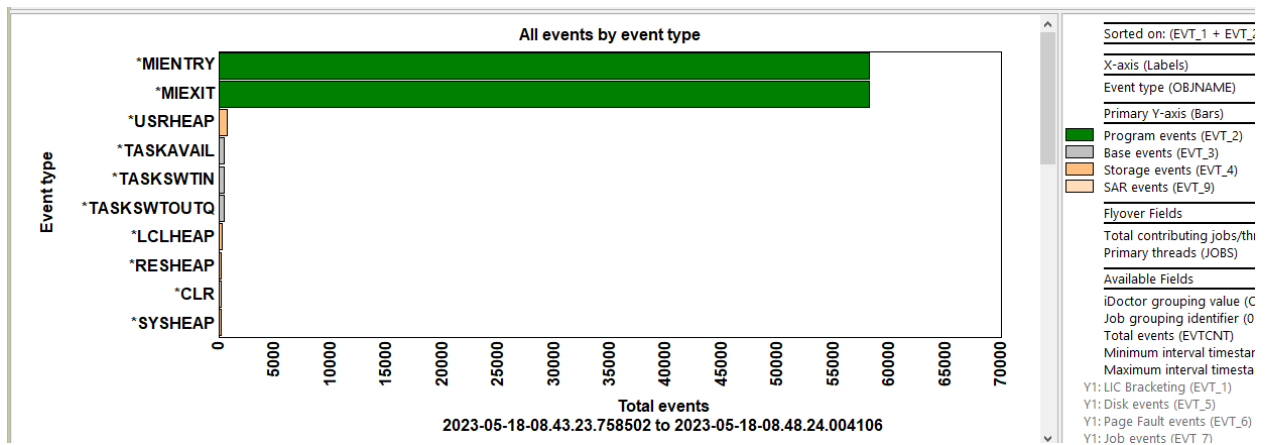
21.3.28.8 All events by hypervisor virtual processor thread



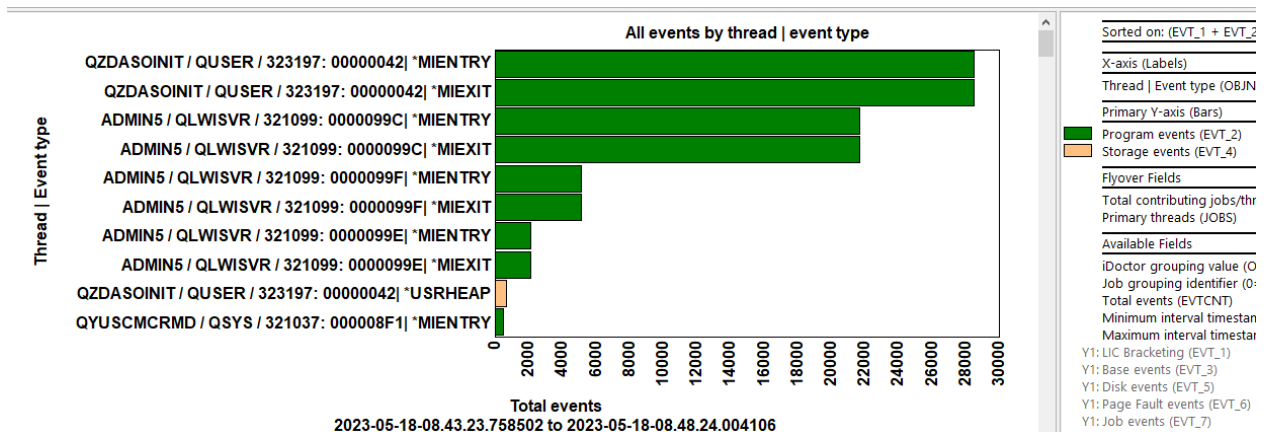
21.3.28.9 All events by thread | virtual processor thread



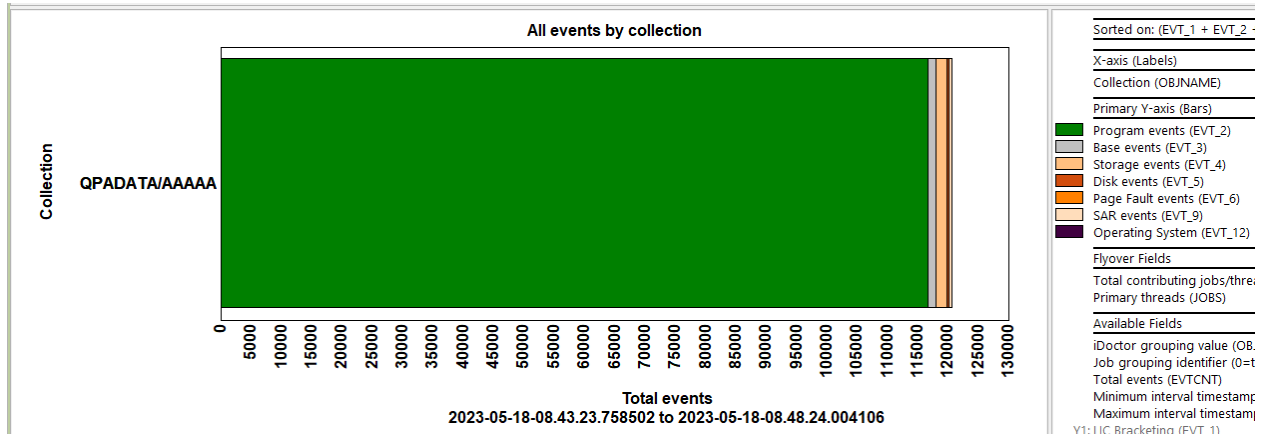
21.3.28.10 All events by event type



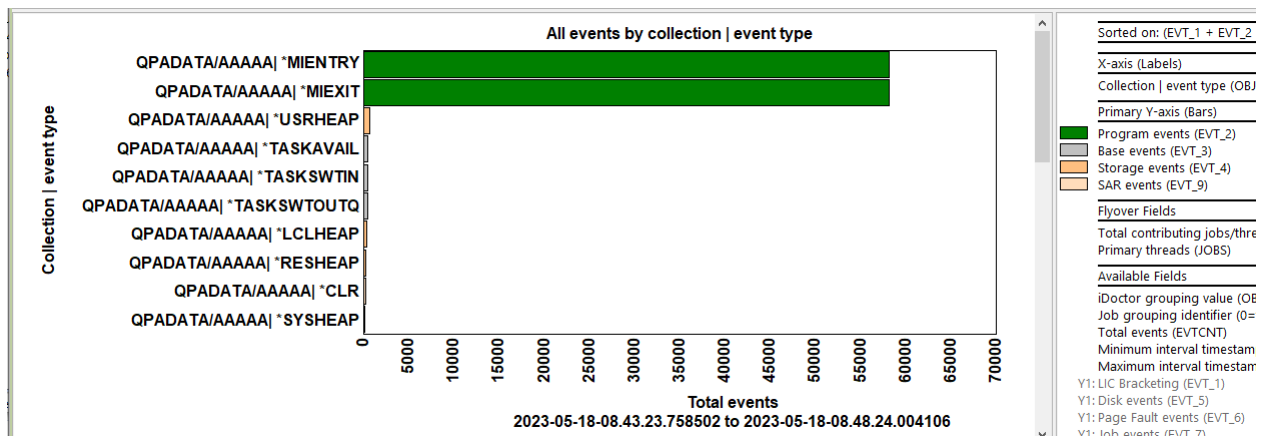
21.3.28.11 All events by thread | event type



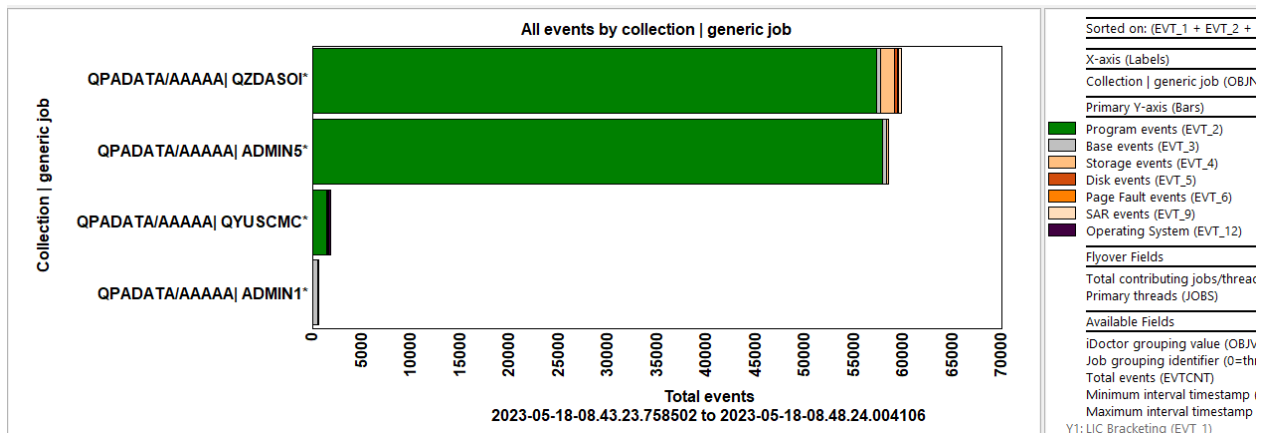
21.3.28.12 All events by collection



21.3.28.13 All events by collection | event type



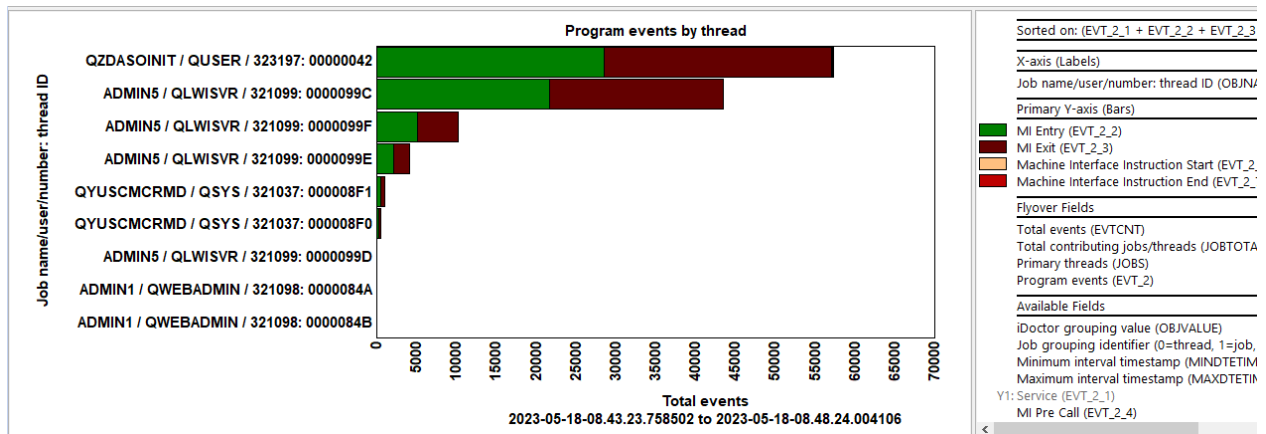
21.3.28.14 All events by collection | generic job



21.3.29 Program events rankings

This graph shows the number of program events that occurred for each event sub type ranked by 1 of several possible ways.

An example follows:

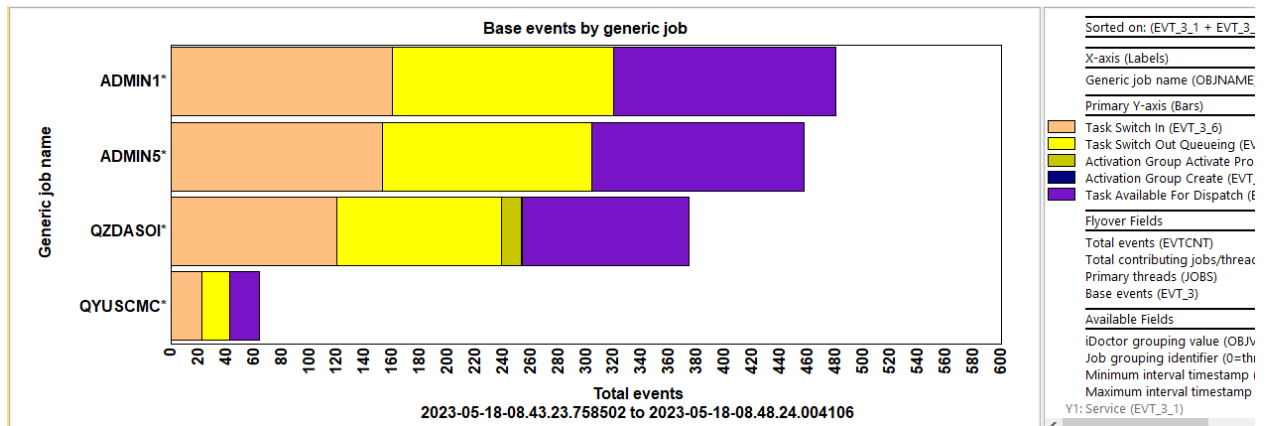


Program events by thread

21.3.30 Base events rankings

This graph shows the number of base events that occurred for each event sub type ranked by 1 of several possible ways.

An example follows:

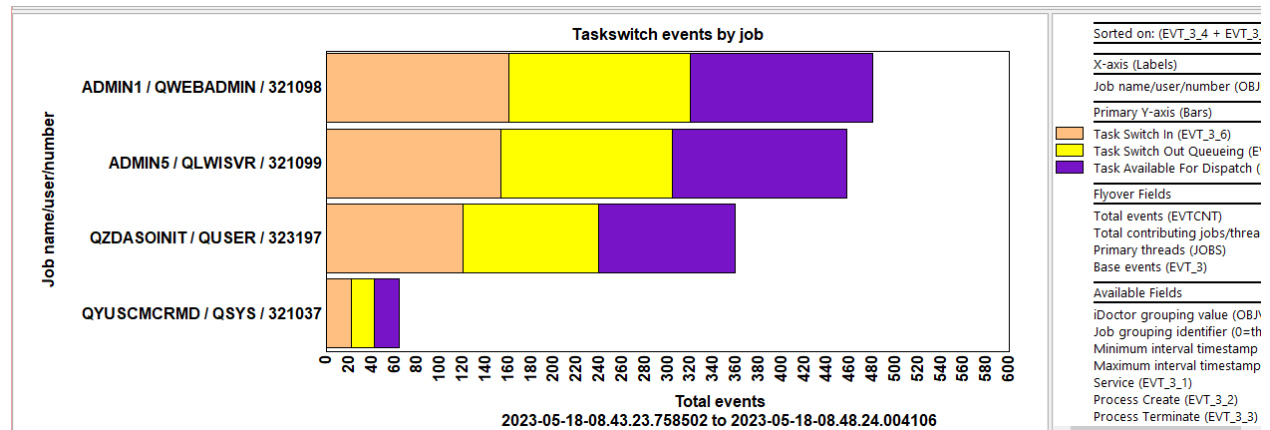


Base events by generic job

21.3.31 Taskswitch events rankings

This graph shows the number of taskswitch events that occurred for each event sub type ranked by 1 of several possible ways.

An example follows:



Taskswitch events by job

22 Heap Storage

This analysis examines the heap storage events. These are event type 4, subtypes 7 – 12 and 16 (*SYSHEAP, *RESHEAP, *LCLHEAP, *USRHEAP, *ACTGRPHEAP, *HDLHEAP and *CLEHEAP.)

Note: Specifying either format 1 or format 2 on these events will include the call stack.

22.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

22.2 SQL Tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
PEXHEAPSTK_<MBR>	Intermediate file.
PEXHEAPISUM_<MBR>	Intermediate file.
PEXHEAPISUM2_<MBR>	This is an interval summary table for the heap events.
PEXHEAPNEW_<MBR>	Intermediate file.
PEXHEAPDST_<MBR>	Intermediate file.
PEXHEAPCRT_<MBR>	Intermediate file.
PEXHEAPSTACKS3_<MBR>	This is a summary of the total suspected leaks and amount of data not deallocated.
PEXHEAPSTACKS_<MBR>	This shows call stacks for the suspected leaks.

22.3 Heap storage

This folder contains the graphs and reports available after the analysis has completed.

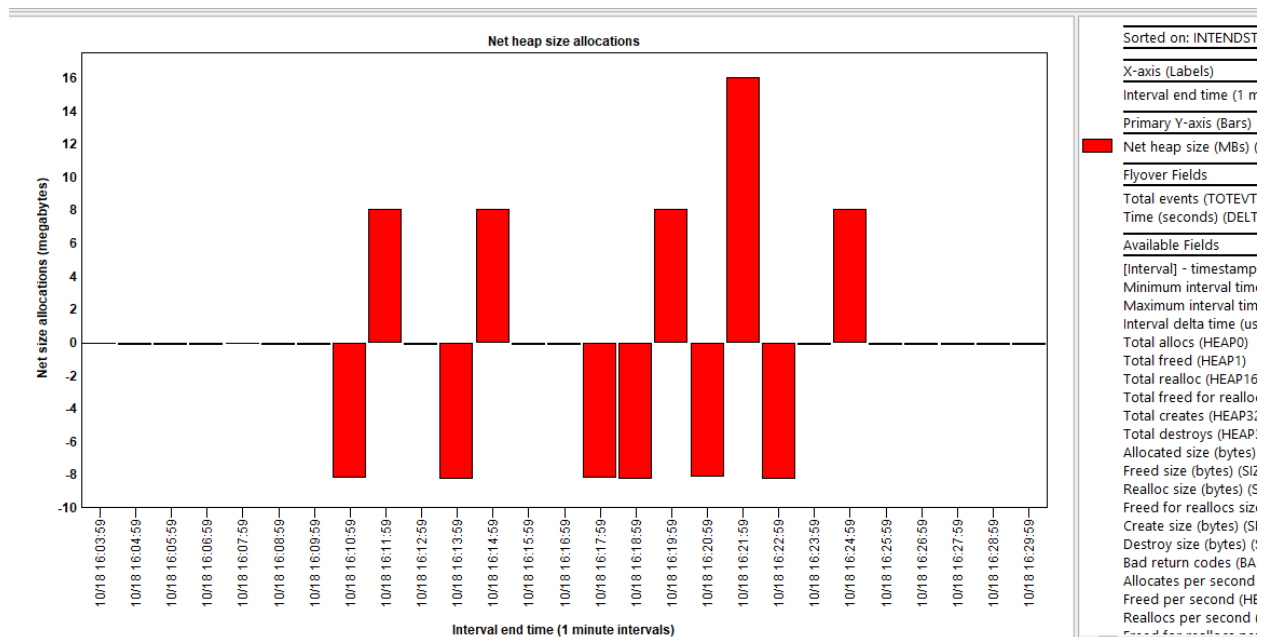
Report	Description	Tr
Net heap size allocations		
Heap operation rates		
Heap size averages		
Heap size rates		
Heap size totals		
Heap operations		
Heap failures		
Net heap size allocations rankings		
Heap operation rates rankings		
Heap size averages rankings		
Heap size rates rankings		
Heap size totals rankings		
Heap operations rankings		
Heap failures rankings		
Detail reports		

Heap event reports in table form

Heap storage

22.3.1 Net heap size allocations

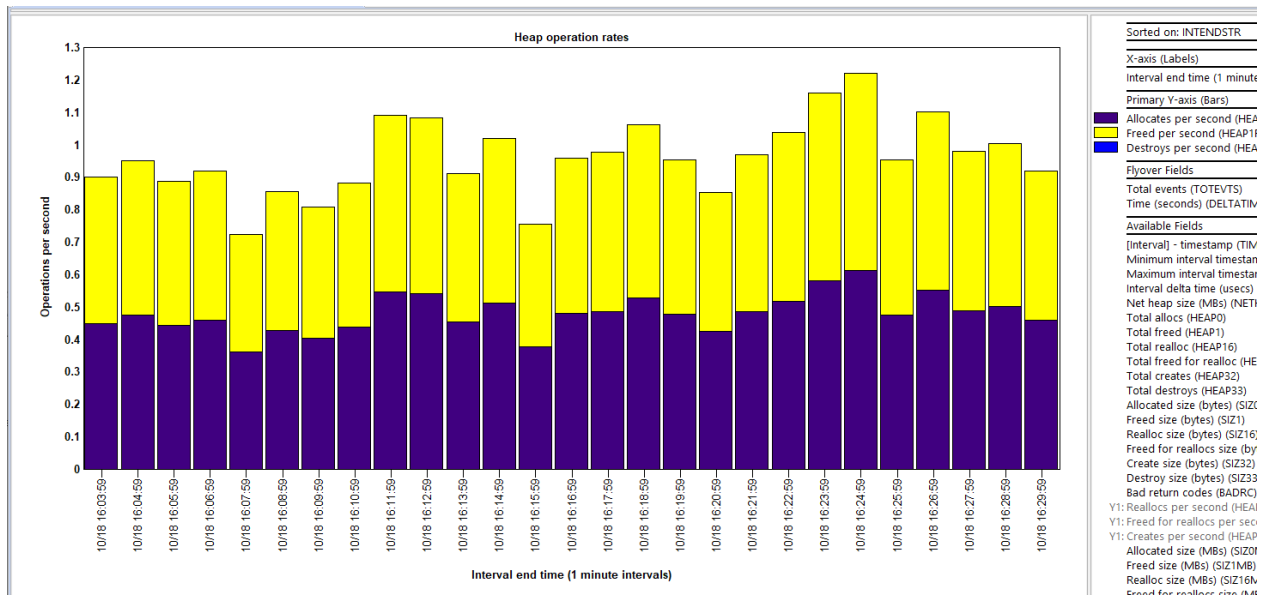
This graph shows over time the changes to heap size allocations (either positive or negative). The value is shown in megabytes.



Net heap size allocations

22.3.2 Heap operation rates

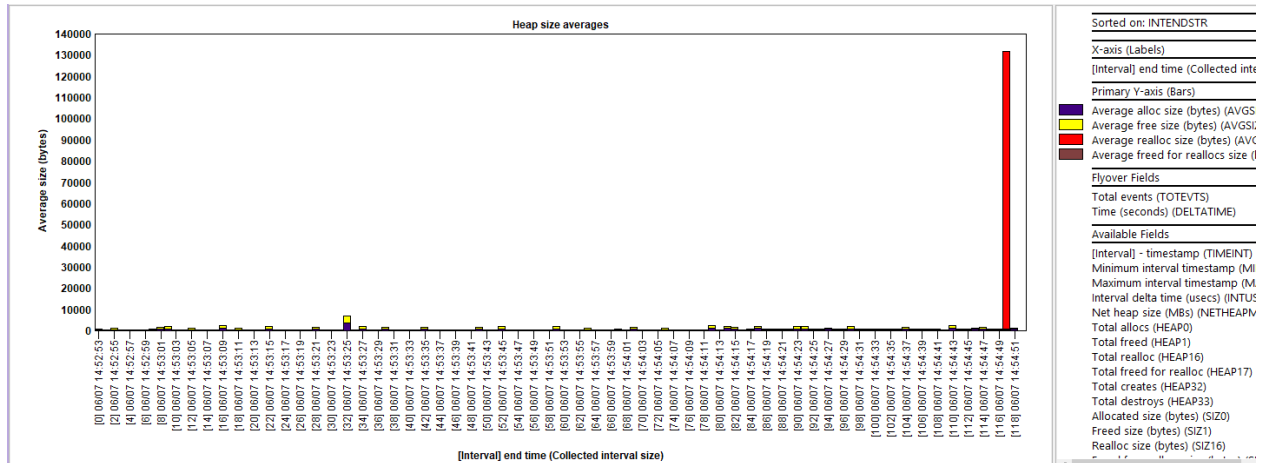
This graph shows 6 different types of heap operations occurring over time per second. The possible heap operations are: Allocates, freed, reallocs, freed for reallocs, creates and destroys.



Heap operation rates

22.3.3 Heap size averages

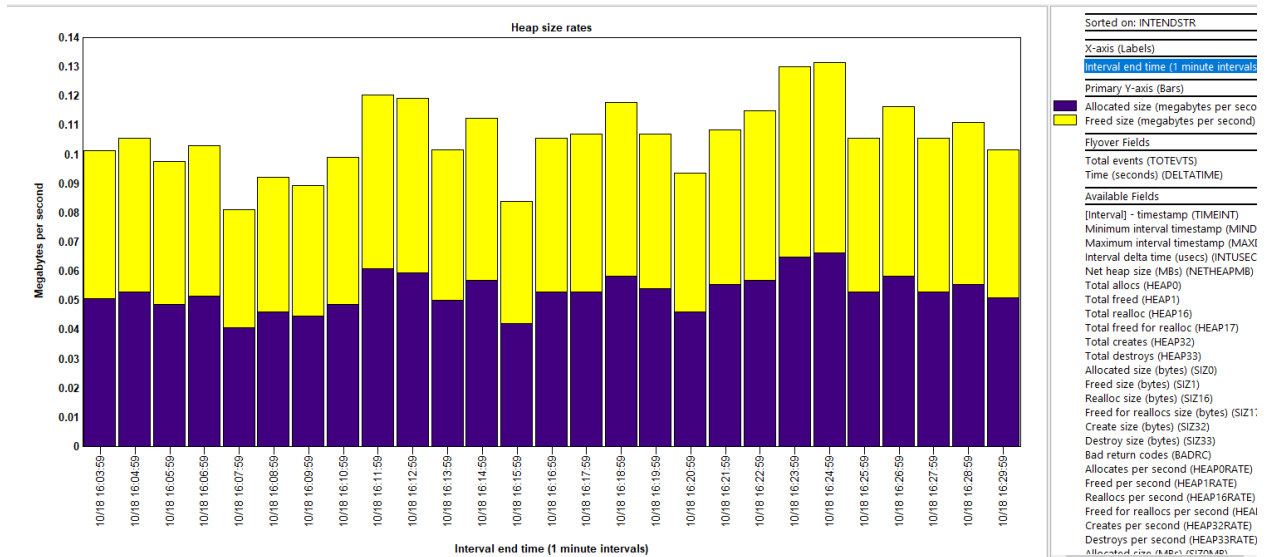
This graph contains average operation size (in bytes) for the same 6 types of operations shown in the previous graph.



Heap size averages

22.3.4 Heap size rates

This graph shows the same 6 operations discussed previously but shows the metric as a total size in megabytes per second.



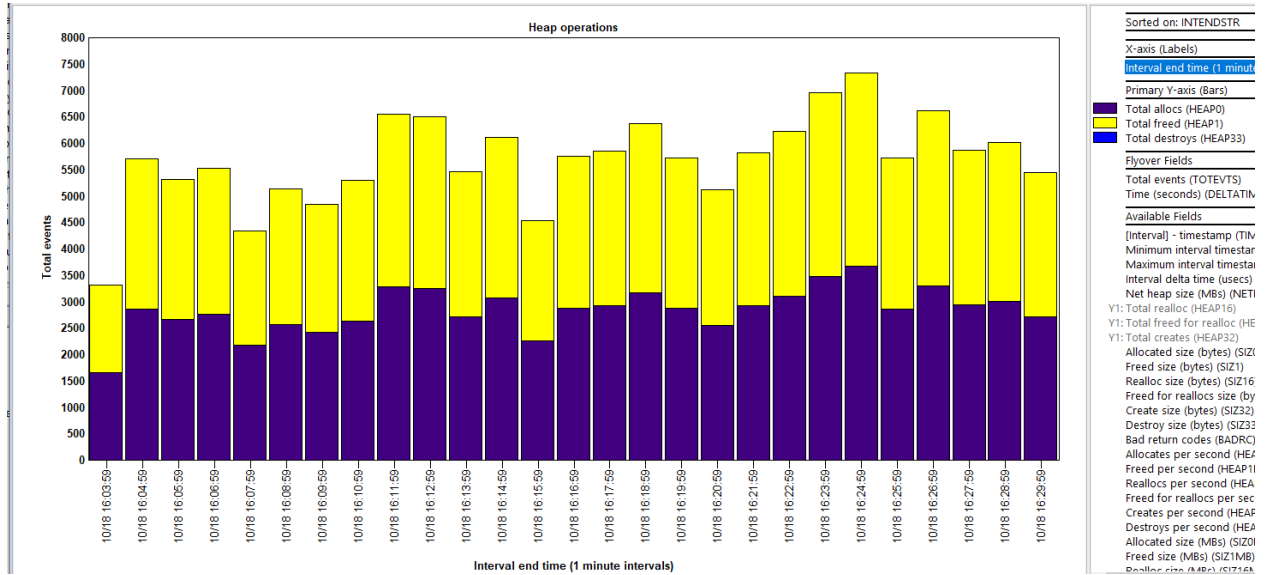
Heap size rates

22.3.5 Heap size totals

This graph is the same as the previous one except shows a total size in megabytes instead of a rate.

22.3.6 Heap operations

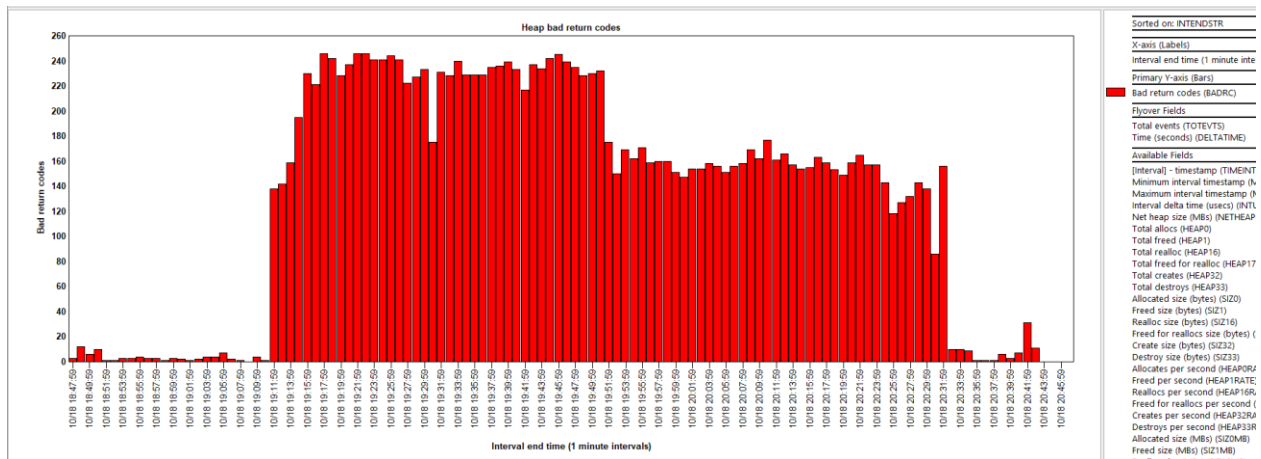
This graph shows a count of total heap operations for the possible 6 types over time.



Heap operations

22.3.7 Heap failures

This graph examines the number of occurrences where column QHPRET is not 0 in table QAYPEHEAP.

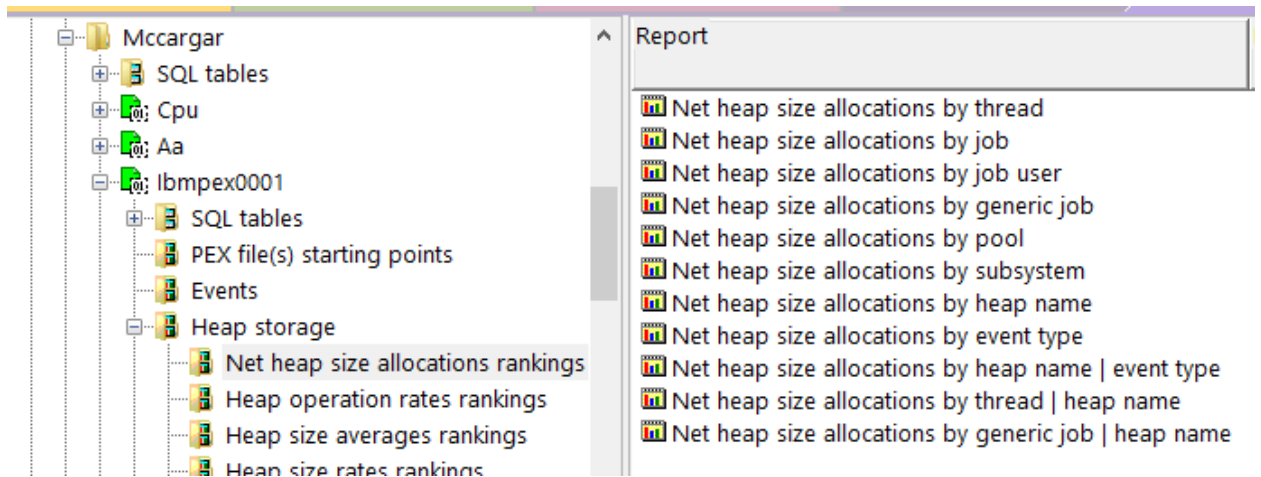


Heap failures

22.3.8 Net heap size allocations rankings

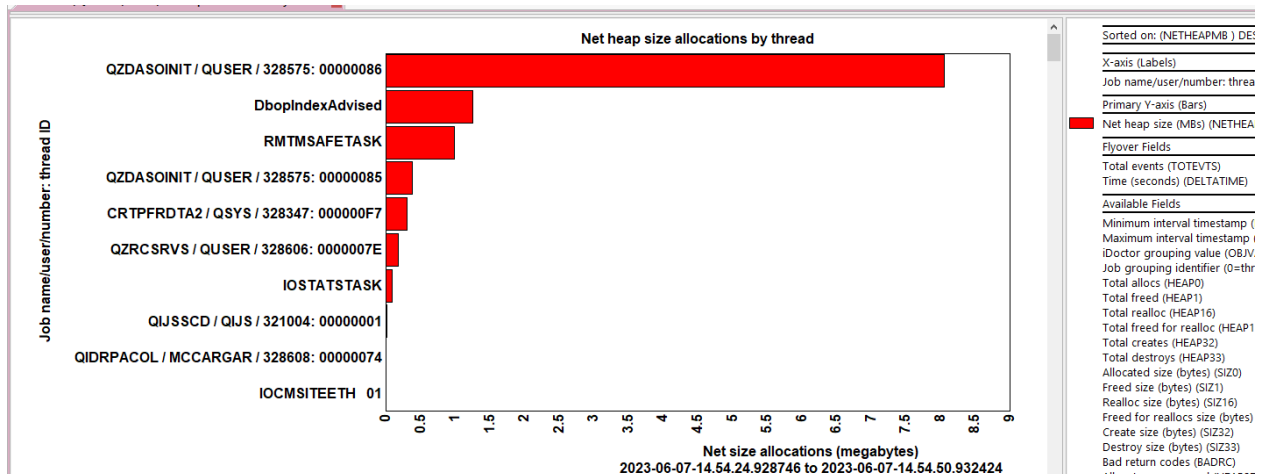
These graphs rank the net heap allocations by various possible ways.

Tip: Drill-down from these into Detail reports -> Heap storage to view more details behind the events for the selected bar(s).



Net heap size allocations rankings

An example follows:

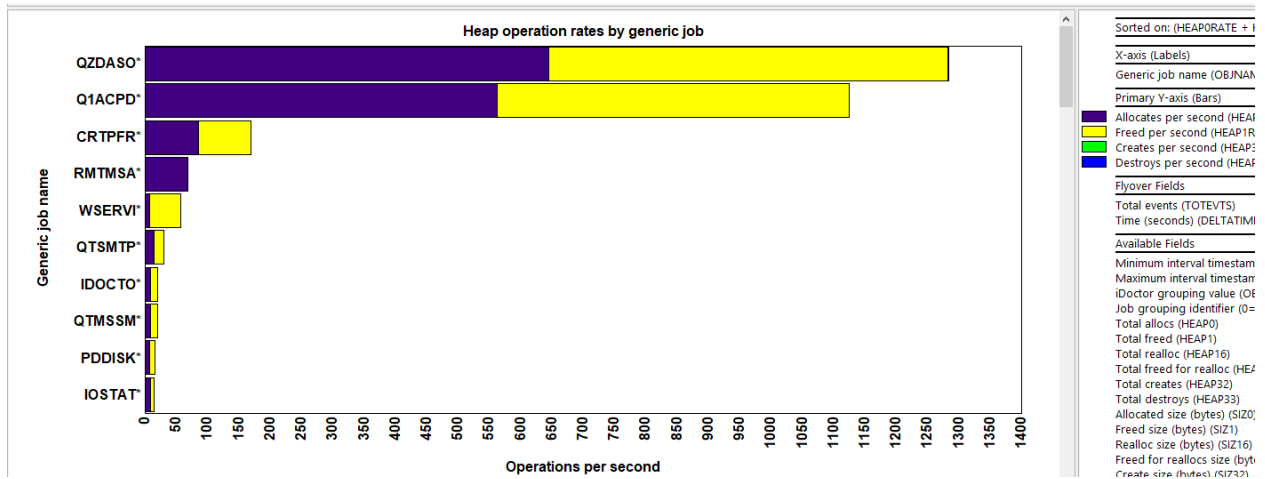


Heap size allocations by thread

22.3.9 Heap operation rates rankings

These graphs show the 6 types of heap operations as a rate per second grouped by one of several possible ways.

An example follows:

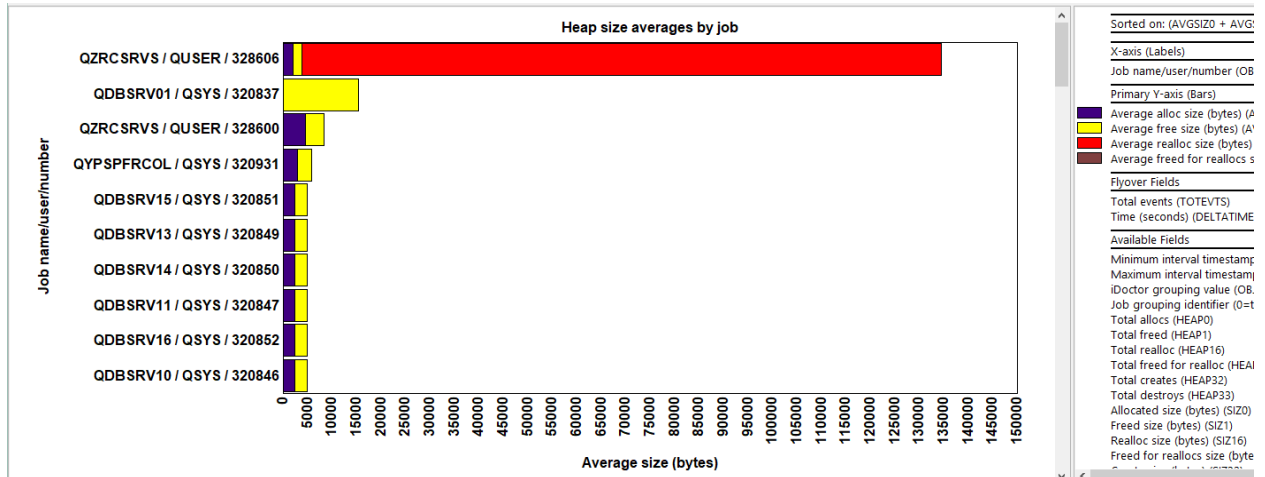


Heap operation rates by generic job

22.3.10 Heap size averages rankings

These graphs show the 6 types of heap operations as an average size (in bytes) grouped by one of several possible ways.

An example follows:

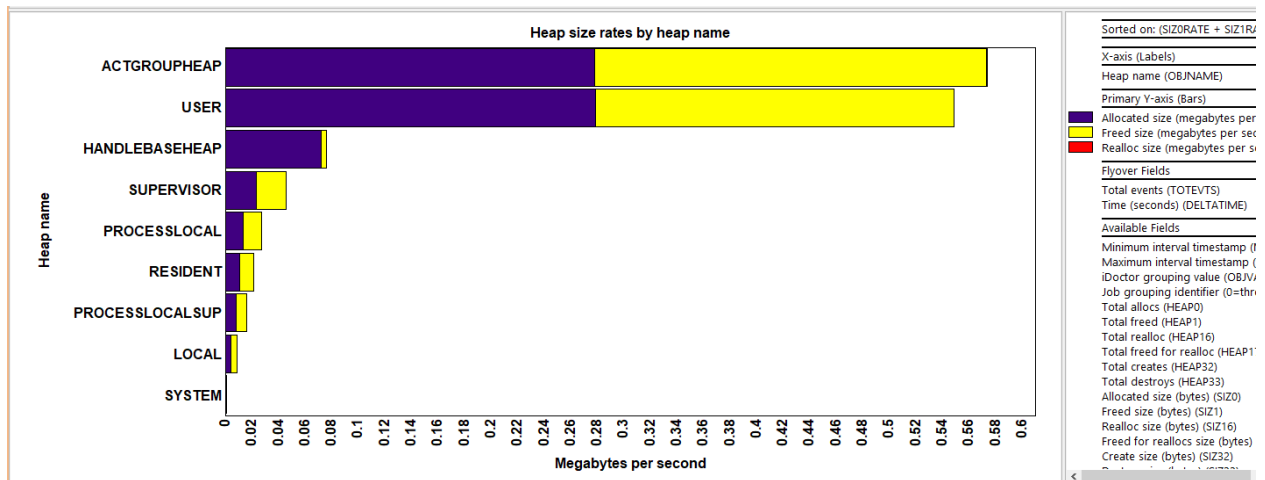


Heap size averages by job

22.3.11 Heap size rates rankings

This graph shows the same 6 operations discussed previously but shows the metric as a total size in megabytes per second grouped by 1 of several possible ways.

An example follows:

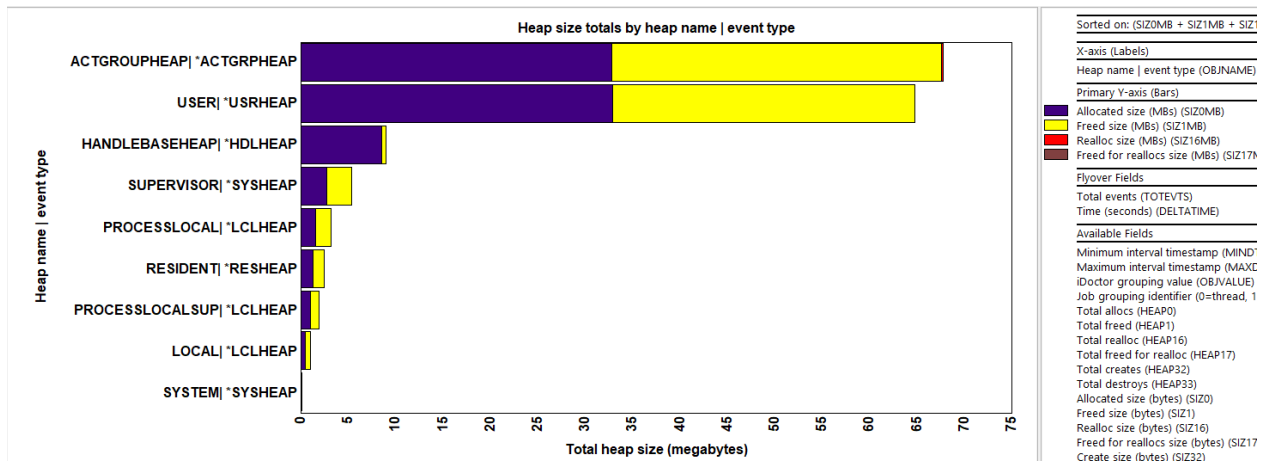


Heap size rates by heap name

22.3.12 Heap size totals rankings

This graph is the same as the previous one except shows a total size in megabytes instead of a rate.

An example follows:

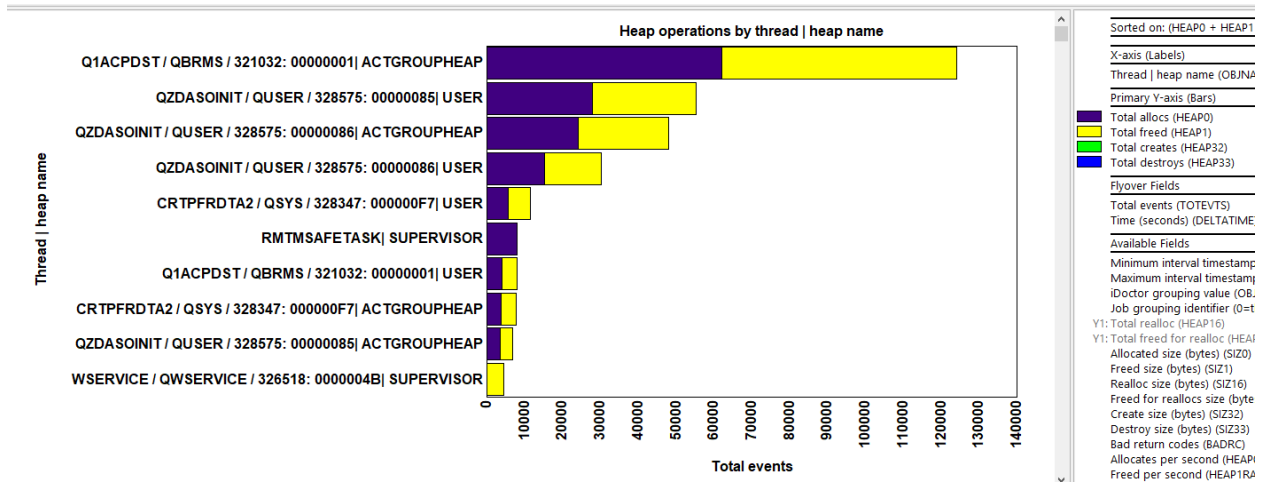


Heap size totals by heap name | event type

22.3.13 Heap operations rankings

This graph shows a count of total heap operations for the possible 6 types grouped by 1 of several possible ways.

An example follows:

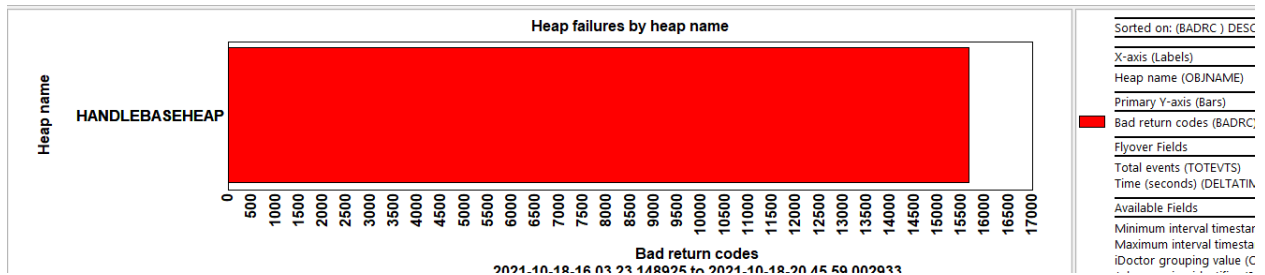


Heap operations by thread | heap name

22.3.14 Heap failures rankings

This graph examines the number of occurrences where column QHPRET is not 0 in table QAYPEHEAP and groups the data in 1 of several possible ways.

An example follows:



Heap failures by heap name

22.3.15 Detail reports

These reports give more details behind the events captured within the PEX collection.

Tip: You can access these reports as a drill-down from one of the graphs for selected time or grouping.

Qpdata

- SQL tables
- Actdtami
- Heap2
 - SQL tables
 - PEX file(s) starting points
 - Heap storage
 - Net heap size allocations rankings
 - Heap operation rates rankings
 - Heap size averages rankings
 - Heap size rates rankings
 - Heap size totals rankings
 - Heap operations rankings
 - Heap failures rankings
 - Detail reports

Report

- Heap event details
- Heap memory leak event details
- Heap memory leak call stacks
- Heap memory leak call stacks ordered by size
- Heap summary
- Heap counts overview

Detail reports

22.3.15.1 Heap event details

This report shows more details behind every heap event.

Idoc730/QPADATA/HEAP2/Heap summary - #1										Idoc730/QPADATA/HEAP2/Heap counts overview - #1										Idoc730/QPADATA/HEAP2/Heap event details - #1										Idoc730/QPADATA/HEAP2/Heap event details - #2									
Job name/user/number: thread ID (OBJNAME)	Timestamp (QITISP)	(Minimum) QRECN (QRECN)	Call stack QRECN (IAD_QRECN)	Heap name (QHPNAM)	Heap control segment address (QHPHCS)	Allocation start address (QHPASA)	Allocation size (bytes) (QHPASZ)	Op type: 0=alloc, 1 = free, 16=realloc, 17=free for realloc, 32=crt heap, 33=dst heap (QHPOPR)	Return code (QHPRET)	Miscellaneous text data (QHPMSC)																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.240548	193987	193987	PROCESSLOCAL	FFD8E2A485000000	CEFA4C4948000300	128		1	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.240623	193988	193988	ACTGROUPHEAP	FE992E7629000000	E627134874023F40	11232		1	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.240635	193989	193989	PROCESSLOCAL	FFD8E2A485000000	CEFA4C4948000280	128		1	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.240815	193990	193990	SUPERVISOR	CD72321384000000	F50016E5FF46B880	256		0	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.240819	193991	193991	SUPERVISOR	CD72321384000000	F50016E5FF450F00	128		0	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.240854	193992	193992	RESIDENT	C00000D573000000	C00001248EAB9700	128		0	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.240857	193993	193993	RESIDENT	C00000D573000000	C00001248EAB9700	1024		0	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.240867	193994	193994	RESIDENT	C00000D573000000	C00001248EAB9700	1024		1	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.240869	193995	193995	RESIDENT	C00000D573000000	C00001248EAB9700	128		1	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.240892	193996	193996	PROCESSLOCALSUP	F682911B96000000	DE1075EDE1000400	128		0	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.240943	193997	193997	PROCESSLOCALSUP	F682911B96000000	DE1075EDE1000400	128		1	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.241014	193998	193998	RESIDENT	C00000D573000000	C00001248EAB9700	1024		0	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.241079	193999	193999	RESIDENT	C00000D573000000	C00001248EAB9700	1024		1	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.241085	194000	194000	SUPERVISOR	CD72321384000000	F50016E5FF450F00	128		1	0																													
QIDRACOL / MCCARGAR / 328608: 00000074	2023-06-07-14.52.53.241087	194001	194001	SUPERVISOR	CD72321384000000	F50016E5FF46B880	256		1	0																													

Heap event details

22.3.15.2 Heap memory leak event details

This graph shows the heap event details but only for operations where data was allocated but never freed (at least within the PEX collection.)

Idoc730/QPADATA/HEAP2/Heap memory leak ev...												
Job name/user/number: thread ID (OBJNAME)	Timestamp (QITISP)	(Minimum) QRECN (QRECN)	Call stack QRECN (IAD_QRECN)	Heap name (QHPNAM)	Heap control segment address (QHPHCS)	Allocation start address (QHPASA)	Allocation size (bytes) (QHPASZ)	Op type: 0=alloc, 1 = free, 16=realloc, 17=free for realloc, 32=crt heap, 33=dst heap (QHPOPR)	Return code (QHPRET)	Miscellaneous text data (QHPMSC)		
ADMIN1 / QWEBADMIN / 321098: 00000045	2023-06-07-14:52:56.005626	340333	340333	SYSTEM	FE56686F1E000000	E5E44D4169304F80	128		0	0		
ADMIN1 / QWEBADMIN / 321098: 00000045	2023-06-07-14:52:56.005633	340334	340334	SYSTEM	FE56686F1E000000	E5E44D4169365F80	128		0	0		
WSERVICE / QWSERVICE / 326518: 00000084	2023-06-07-14:52:56.005638	340581	340581	SYSTEM	FE56686F1E000000	E5E44D416937D680	128		0	0		
WSERVICE / QWSERVICE / 326518: 00000084	2023-06-07-14:52:56.005642	340582	340582	SYSTEM	FE56686F1E000000	E5E44D4169383A80	128		0	0		
QYSPFRCOL / QSYS / 320931: 00000018	2023-06-07-14:53.00.031270	192444	192444	USER	EC198F8FA9000000	D3A77461F40D9180	128		0	0		
IOSTATASK	2023-06-07-14:53.00.031590	97851	97851	USER	DF1727822C000000	C6A50C54770EF680	128		0	0		
IOSTATASK	2023-06-07-14:53.00.031594	97852	97852	USER	DF1727822C000000	C6A50C547700A380	128		0	0		
IOSTATASK	2023-06-07-14:53.00.031698	97864	97864	USER	DF1727822C000000	C6A50C547718D880	128		0	0		
IOSTATASK	2023-06-07-14:53.00.031700	97865	97865	USER	DF1727822C000000	C6A50C547703A680	128		0	0		
IOSTATASK	2023-06-07-14:53.00.031802	97909	97909	USER	EC198F8FA9000000	D3A77461F4079C00	512		0	0		
IOSTATASK	2023-06-07-14:53.00.031805	97910	97910	USER	EC198F8FA9000000	D3A77461F427C480	128		0	0		
CRTPFRD2A / QSYS / 328347: 000000F7	2023-06-07-14:53.00.061306	194760	194760	SYSTEM	FE56686F1E000000	E5E44D416937D080	256		0	0		
CRTPFRD2A / QSYS / 328347: 000000F7	2023-06-07-14:53.00.084679	99899	99899	ACTGROUPHEAP	EFF73553E9000000	D7851A2634002400	724		0	0		
CRTPFRD2A / QSYS / 328347: 000000F7	2023-06-07-14:53.00.098621	103301	103301	USER	C545F8BCAD000000	E9486BECC2AC7000	4608		0	0		
CRTPFRD2A / QSYS / 328347: 000000F7	2023-06-07-14:53.00.131412	107571	107571	USER	CF6A1EAD60000000	E48686FF16F5700	3684		0	0		

This is ordered by the total number of allocations not deallocated per call stack.

Idoc730/QPADATA/HEAP2/Heap memory leak call stacks - #1										Idoc730/QPADATA/HEAP2/Heap memory leak call stacks - #2									
Allocations not deallocated (TOTALLEAK)	Bytes not deallocated (TOTALLEAKB)	Avg size (bytes) (AVGSIZE)	Call level (CALL_LEVEL)	Program library (PGMLIB)	Program name (PGMNAME)	Module library (MODLIB)	Module name (MODNAME)	Offset (ADDR_OFFSET)	Procedure (PROCEDURE)										
15	1920	128	1				DbPartitionHeap	000000FC	allocate_15DbPartitionHeapFUIT1										
15	1920	128	2				DbopIndexAdvised	000004D0	copyCommon_16DbopIndexAdvisedFRC16Dbop										
15	1920	128	3				DbopIndexAdvised	0000007C	_ct_16DbopIndexAdvisedFRC16DbopIndexAdv										
15	1920	128	4				DbopIndexAdvised	00000528	addToCache_16DbopIndexAdvisedCFv										
15	1920	128	5				DbopIndexAdvised	000002EC	signal_16DbopIndexAdvisedFP6Macout										
15	1920	128	6				DbopRunTimeInfo	000000CC	signalEvents_15DbopRunTimeInfoFUI										
15	1920	128	7				DbopRunTimeInfo	00000390	setClose_15DbopRunTimeInfoFIT1P3dcr										
15	1920	128	8				DbopExecQueryCleanup	00000314	DbopExecQueryCleanup_FP3dcr										
15	1920	128	9				#dbdacr	000003B4	#dbdacr										
15	1920	128	10				#cfmir	000000E8	#cfmir										
15	1920	128	11				cfscv0a	00000228	syscall_A_portal										
15	1920	128	12	QSYS	QDBCLOSE		QDBCLOSE	000049E8	QDBCLOSE										
15	1920	128	13	QSYS	QDMCLOSE		QDMCLOSE	00001598	QDMCLOSE										
15	1920	128	14	QSYS	QSQSBAS	QBUILDS1	QSQHDCLS	000034D8	SQHRDCLS										
15	1920	128	15	QSYS	QSQSBAS	QBUILDS1	QSQCLSCR	000012FC	SQCLOSE										
15	1920	128	16	QSYS	QSQSBAS	QBUILDS1	QSQCLSCR	00002A2C	SQCLSCSR										
14	1792	128	1				IoStatsRouter	00000094	_ct_27IoStatsTimerExpiredWhenDoneFUI										
14	1792	128	2				IoStatsRouter	00000054	startTimer_13IoStatsRouterFv										
14	1792	128	3				IoStatsRouter	000005A0	processRetrieveRequest_13IoStatsRouterFP14k										
14	1792	128	4				IoStatsRouter	00000254	processReqsoRequest_13IoStatsRouterFP14IoS										
14	1792	128	5				IoStatsAction	00000038	doIt_32IoStatsActionProcessReqsoRequestFv										
14	1792	128	6				IoStatsRouter	000003F0	IoStatsProcessRequest_Fv										
14	1792	128	7				rmInitialRoutine	0000005C	rmInitialRoutine										

Heap memory leak call stacks

22.3.15.4 Heap memory leak call stacks ordered by size

This report shows the call stacks for the heap allocations that were never freed within the PEX collection but sorted by total heap size of the suspected leaks.

22.3.15.5 Heap summary

This report summarizes the heap events by heap name.

Idoc730/QPADATA/HEAP2/Heap summary - #1																	
Total events (TOTEVTS)	Heap name (QHPNAM)	Net heap size (MBs) (NETHEAPMB)	Net heap operations (alloc/create - free/destroy) (NETLEAK)	Total allocs (HEAPO)	Total freed (HEAP1)	Total realloc (HEAP16)	Total freed for realloc (HEAP17)	Total creates (HEAP32)	Total destroys (HEAP33)	Allocated size (MBs) (SIZOMB)	Freed size (MBs) (SIZ1MB)	Realloc size (MBs) (SIZ16MB)	Freed for reallocs size (MBs) (SIZ17MB)	Create size (MBs) (SIZ32MB)	Destroy size (MBs) (SIZ33MB)	Bad return codes (BADRC)	
194676	ACTGROUPHEAP	-1.9206		146	97360	97213	1	1	50	51	32.7786	34.8238	.1246	.0001	0	0	0
108519	USER	1.0294		381	54450	54069	0	0	0	0	32.8988	31.8694	0	0	0	0	0
17018	SUPERVISOR	.0057		30	8524	8494	0	0	0	0	2.6931	2.6874	0	0	0	0	0
8879	PROCESSLOCAL	.0018		7	4443	4436	0	0	0	0	1.5813	1.5795	0	0	0	0	0
7707	PROCESSLOCALSUP	.0044		5	3856	3851	0	0	0	0	.9542	.9498	0	0	0	0	0
3087	RESIDENT	.0006		3	1545	1542	0	0	0	0	1.2238	1.2231	0	0	0	0	0
1330	LOCAL	0		0	665	665	0	0	0	0	.4932	.4932	0	0	0	0	0
704	HANDLEBASEHEAP	8.0289		12	357	346	0	0	1	0	8.5087	.4797	0	0	0	0	1
434	SYSTEM	.0017		14	224	210	0	0	0	0	.0526	.0509	0	0	0	0	0

Heap summary

22.3.15.6 Heap counts overview

This report summarizes the heap events over time.

Tip: This will group the data by the same default setting used in the overview graphs for time groupings set by using the clock icon on the toolbar of the main window.

Idoc730/QPADATA/HEAP2/Heap counts overview - #1												
Interval timestamp (TIMEINT)	Interval end timestamp (INTENDSTR)	Minimum interval timestamp (MINDTETIM)	Maximum interval timestamp (MAXDTETIM)	Time (seconds) (DELATIME)	Interval delta time (usecs) (INTUSECS)	Total heap allocations (TOTHEAPNEW)	Total heap deletes (TOTHEAPDLT)	Total heap creates (TOTHEAPCRT)	Total heap destroys (TOTHEAPDST)	Total allocations (megabytes) (SIZHEAPNEW)	Total deletes (megabytes) (SIZHEAPDLT)	Total creates (megabytes) (SIZHEAPCRT)
06/07 14:52:59	2023-06-07-14:52:59.999999	2023-06-07-14:52:53.000000	2023-06-07-14:52:59.999999	7	7000000	799	799	0	0	2189	2315	0
06/07 14:53:59	2023-06-07-14:53:59.999999	2023-06-07-14:53:00.000000	2023-06-07-14:53:59.999999	60	60000000	48210	48173	6	7	17.1125	17.7875	0
06/07 14:54:52	2023-06-07-14:54:52.999999	2023-06-07-14:54:00.000000	2023-06-07-14:54:52.999999	53	53000000	122415	121854	45	44	63.8529	56.1378	0

Heap counts overview

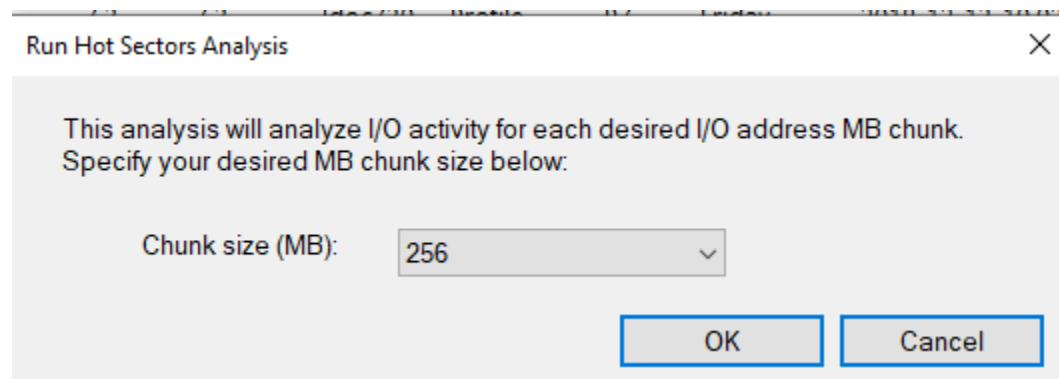
23 Hot Sectors

This analysis summarizes physical disk I/O statistics by chunk size.

Note: You must run the Physical disk I/O analysis before running this analysis.

23.1 Running the analysis

When running the analysis, the Run Hot Sectors Analysis window appears:



This allows you to specify the chunk size (in megabytes) used in the reports.

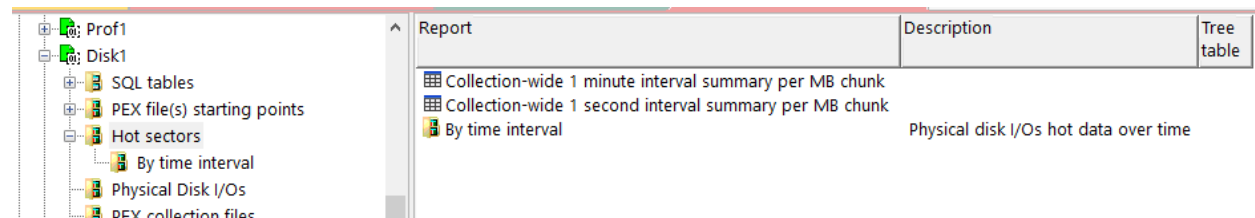
23.2 SQL Tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
Pexpdiohotsec_<MBR>	Hot data 1 second intervals
Pexpdiohotmin_<MBR>	Hot data 1 minute intervals

23.3 Hot sectors

This folder contains the graphs and reports available after the analysis has completed.



Hot sectors

23.3.1 Collection-wide 1 minute interval summary per MB chunk

This report summarizes several PDIO metrics by chunk or 1 MB sector and minute

CHUNK (CHUNK)	Interval end timestamp (INTENDSTR)	Total physical disk I/Os (TOTPDIO)	TOT_TIME (TOT_TIME)	TOT_HTIME (TOT_HTIME)	TOT_DQTIME (TOT_DQTIME)	Reads (LOCAL_READS)	TOT_HRD (TOT_HRD)	TOT_DQRD (TOT_DQRD)	Writes (LOCAL_WRITES)	TOT_HWRT (TOT_HWRT)	TOT_DQWRT (TOT_DQWRT)	Synchronous writes (WSTOT)	Asynchronous writes (WATOT)	Synchronous reads (RSTOT)	Asynchronous reads (RATOT)
000A	2018-05-11-11.18.53.870065	7	1208250	1208250	0	0	0	0	7	1208250	0	7	0	0	0
000A	2018-05-11-11.19.11.191593	1	129095	129095	0	0	0	0	1	129095	0	1	0	0	0
000A	2018-05-11-11.23.23.025406	1	133119	133119	0	0	0	0	1	133119	0	1	0	0	0
0000	2018-05-11-11.18.53.870833	154	22518803	22518803	0	0	0	0	154	22518803	0	124	30	0	0
0000	2018-05-11-11.19.57.343202	47	8664490	8664490	0	0	0	0	47	8664490	0	27	20	0	0
0000	2018-05-11-11.20.59.084723	69	12076578	12076578	0	0	0	0	69	12076578	0	53	16	0	0
0000	2018-05-11-11.21.53.542201	38	8083782	8083782	0	0	0	0	38	8083782	0	24	14	0	0
0000	2018-05-11-11.22.54.781097	54	10212089	10212089	0	0	0	0	54	10212089	0	35	19	0	0
0000	2018-05-11-11.23.23.025347	27	5820422	5820422	0	0	0	0	27	5820422	0	21	6	0	0
0001	2018-05-11-11.18.53.869818	11	9008143	9008143	0	1	6389419	0	10	2618724	0	2	8	0	0
0001	2018-05-11-11.20.13.889085	2	468770	468770	0	0	0	0	2	468770	0	0	2	0	0
0001	2018-05-11-11.21.24.121386	1	139968	139968	0	0	0	0	1	139968	0	0	1	0	0
0001	2018-05-11-11.22.39.262350	3	615270	615270	0	0	0	0	3	615270	0	0	3	0	0
0001	2018-05-11-11.23.23.052701	4	9017489	9017489	0	1	8595750	0	3	421739	0	1	2	0	0
0002	2018-05-11-11.18.53.866486	51	14468374	14468374	0	1	5510500	0	50	8957874	0	43	7	0	0
0002	2018-05-11-11.19.57.361091	18	39709272	39709272	0	7	37338831	0	11	2370441	0	4	7	0	0
0002	2018-05-11-11.20.59.083941	3	825260	825260	0	0	0	0	3	825260	0	2	1	0	0
0002	2018-05-11-11.21.35.976177	3	599524	599524	0	0	0	0	3	599524	0	2	1	0	0
0003	2018-05-11-11.23.23.025441	5	1150703	1150703	0	0	0	0	5	1150703	0	0	5	0	0

Collection-wide 1 minute interval summary per MB chunk

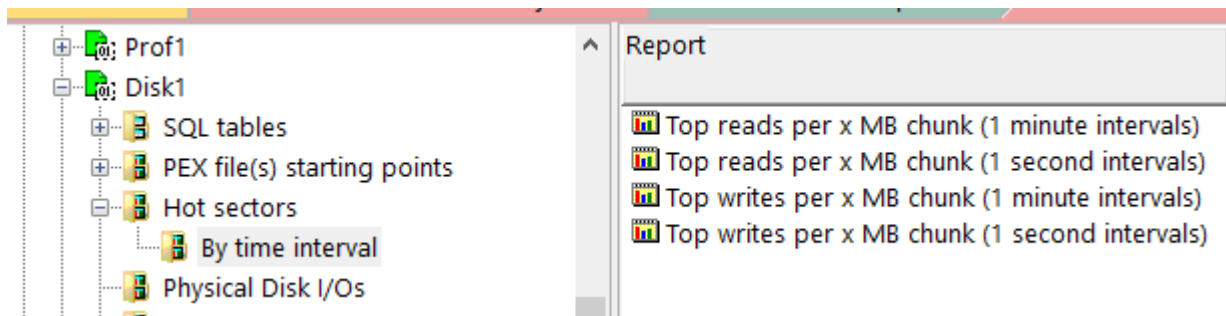
23.3.2 Collection-wide 1 second interval summary per MB chunk

This report is the same as the previous except uses 1 second groupings.

23.3.3 By time interval

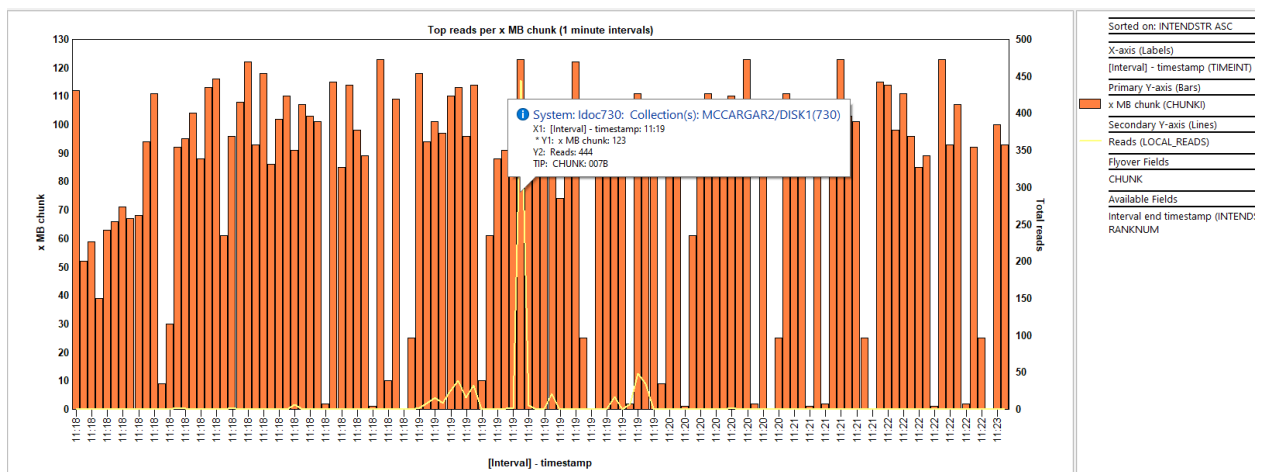
These graphs can be used to visually locate sectors with the most reads or writes.

The primary Y-axis shows the sector (in decimal) and the secondary Y-axis shows the total reads or writes.



Hot sectors -> by time interval

An example follows



Top reads per x MB chunk (1 minute intervals)

24 IFS API call detail

This analysis looks at 2 operating system events *IFSIO and *IFSOPEN to analyze IFS API calls occurring in the jobs specified in the PEX collection. These events are type 12, sub types 9 and 10 in the PEX data.

Note: This analysis does not examine the *IFSCOMP event.

24.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range to be configured. **Note:** The minimum time grouping setting does not apply to this analysis.

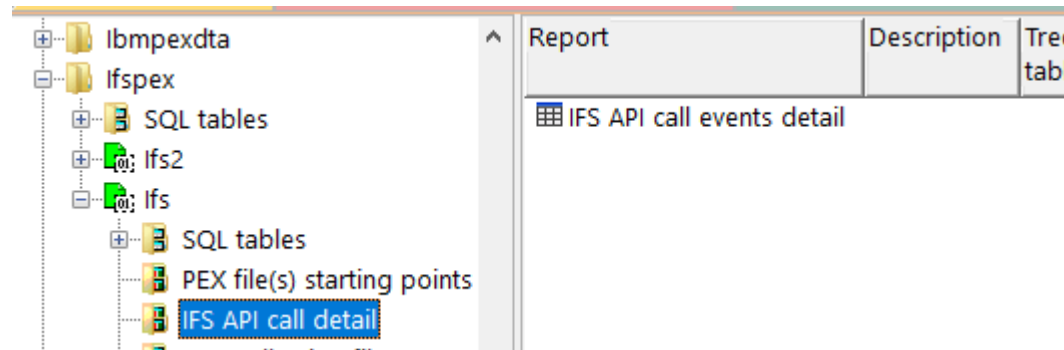
24.2 SQL Tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
PEXIFS_<MBR>	IFS API call detail report

24.3 IFS API call detail

After the analysis completes a folder will be created containing a single report.



IFS API call detail

24.3.1 IFS API call detail

This report contains the job calling the API, the API name, parameters used, return code and more.

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CtcprfT4/IFSPEX/IFS/IFS API call events detail - #1																	
CtcprfT4/IFSPEX/IFS/PEX EVENT MAPPING DATA - #1																	
CtcprfT4/IFSPEX/IFS/IFS API call events detail - #2																	
Job name/user/number: thread ID (OBJNAME)	Nanoseconds since collection started (QTTIMN)	(Minimum) QRECN (QRECN)	errno (ERRNO)	API name (API)	Return code (RC)	oflag (OFLAG)	mode (MODEV)	conversion ID (CONVERID)	language (LANG)	country (COUNTRY)	path CCSID (PATHCCSID)	path (IFSPATH)	number of bytes provided (NBYTDE)	number of bytes processed (NBYTEP)	number of vectors provided (NVECT)	new file descriptor (NEWFD)	request new file descriptor (REQD)
Q1ACPDST / QBRMS / 085694: 00000001	16272629484	84	0	write	0	0	0	0				0	187	187	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16272636228	85	0	close	0	0	0	0				0	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16273415804	86	0	open64	0	266	420	0	ENU	US	37	/QIBM/UserData/BRMS/logs/qbrms	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16273419058	87	0	lseek64	0	0	0	0				0	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16273516582	88	0	write	0	0	0	0				0	187	187	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16273523341	89	0	close	0	0	0	0				0	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16274238636	90	0	open64	0	266	420	0	ENU	US	37	/QIBM/UserData/BRMS/logs/qbrms	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16274242351	91	0	lseek64	0	0	0	0				0	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16274350990	92	0	write	0	0	0	0				0	154	154	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16274358320	93	0	close	0	0	0	0				0	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16274803181	94	0	open64	0	266	420	0	ENU	US	37	/QIBM/UserData/BRMS/logs/qbrms	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16274806490	95	0	lseek64	0	0	0	0				0	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16274903033	96	0	write	0	0	0	0				0	157	157	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16274909625	97	0	close	0	0	0	0				0	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16275037318	98	0	open64	0	266	420	0	ENU	US	37	/QIBM/UserData/BRMS/logs/qbrms	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16275040611	99	0	lseek64	0	0	0	0				0	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16275135507	100	0	write	0	0	0	0				0	94	94	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16275142333	101	0	close	0	0	0	0				0	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16275413833	102	0	open64	0	266	420	0	ENU	US	37	/QIBM/UserData/BRMS/logs/qbrms	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16275417064	103	0	lseek64	0	0	0	0				0	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16275513884	104	0	write	0	0	0	0				0	157	157	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16275520359	105	0	close	0	0	0	0				0	0	0	0	0	0
Q1ACPDST / QBRMS / 085694: 00000001	16276539781	106	0	open64	0	266	420	0	ENU	US	37	/QIBM/UserData/BRMS/logs/qbrms	0	0	0	0	0

IFS API call detail

25 Locks

This analysis examines the lock events which are event type 8 in the PEX data.

There are 4 sub types for lock events (excluding *USER):

Event type (QEVTY)	Event subtype (QEVSTY)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
8	1	*USER	Service
8	2	*LWEND	Seize Lock Long Seize Wait End
8	3	*OBJLK	Object Lock
8	4	*DBLK	Database Lock
8	5	*SPCLK	Space Lock

Lock events from QAYPEEVEVENT table

25.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

25.2 SQL Tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
PEXSL_<MBR>	Seize lock event detail table

25.3 Locks

This folder contains the graphs and reports available after the analysis has completed.

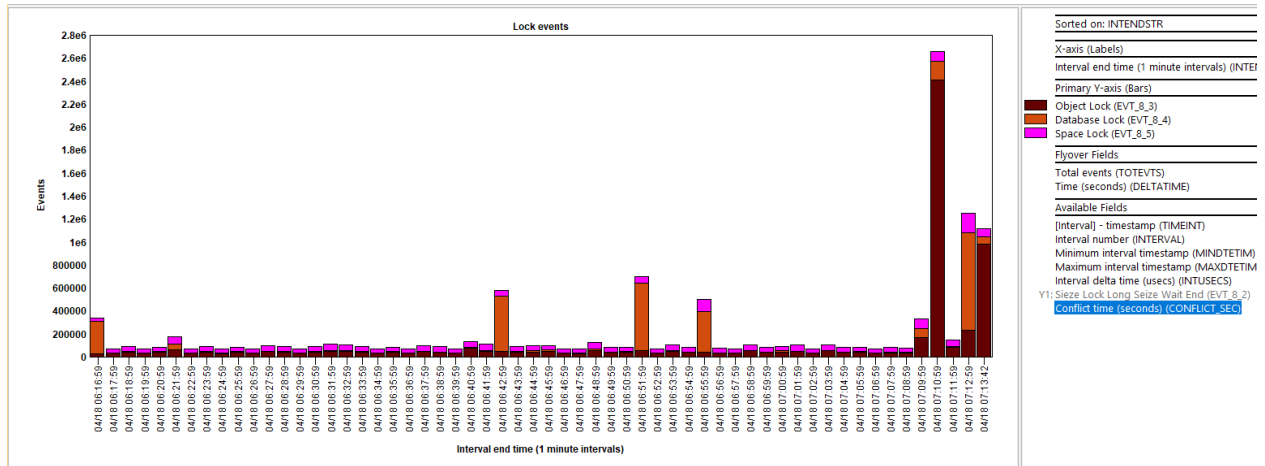
Tip: These graphs can be used as a drill-down into the Detail reports for the selected time or grouping.

Report	Description	Tr ta
SQL tables		
Split		
Split2		
ibmpex04		
SQL tables		
PEX file(s) starting points		
Call stacks		
Events		
Locks		
PEX collection files		
Server-side output files		
User-defined reports		
Lock events		
Object locks		
Database locks		
Space locks		
Conflict time		
Lock events rankings	Ranks all types of lock events	
Object lock rankings	Ranks the object lock events	
Database lock rankings	Ranks the database lock events	
Space lock rankings	Ranks the space lock events	
Conflict time rankings	Ranks the conflict time in various ways	
Detail reports	Detail reports showing the data and events in table format	

Locks

25.3.1 Lock events

This graph shows the total lock events occurring for each sub type over time.



Lock events

25.3.2 Object locks

This graph shows the object locks occurring over time.

25.3.3 Database locks

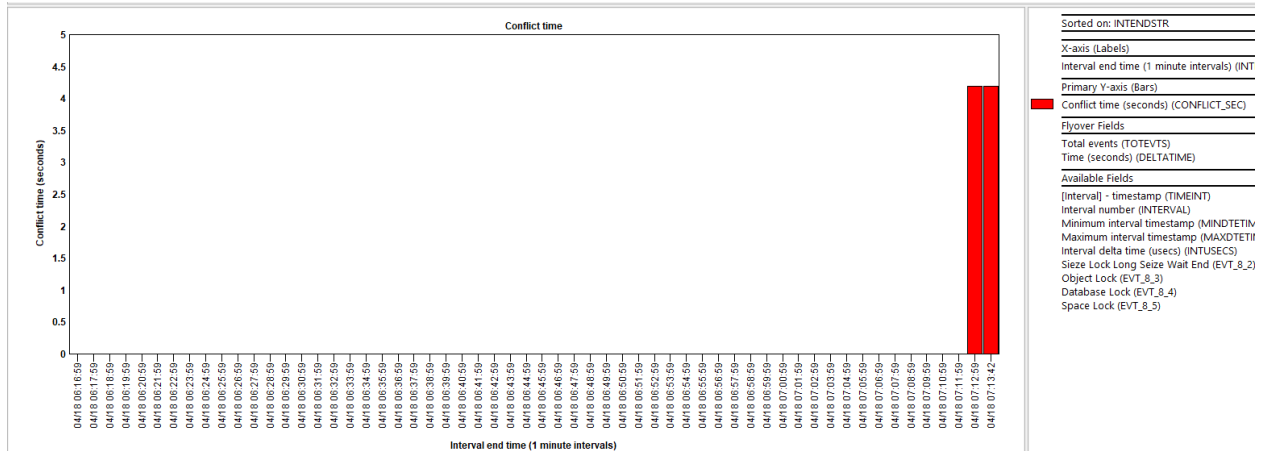
This graph shows the database locks occurring over time.

25.3.4 Space locks

This graph shows the space locks occurring over time.

25.3.5 Conflict time

This graph shows the conflict time found in the collection over time.

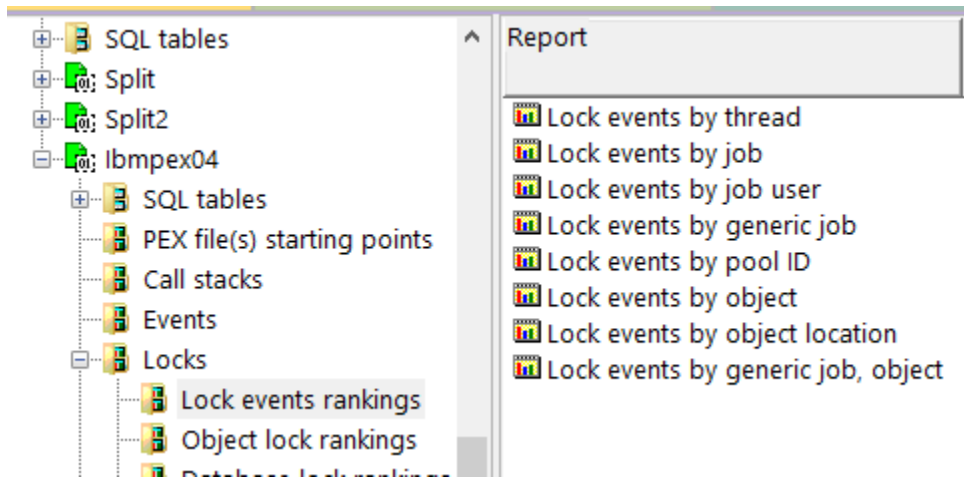


Conflict time

25.3.6 Lock events rankings

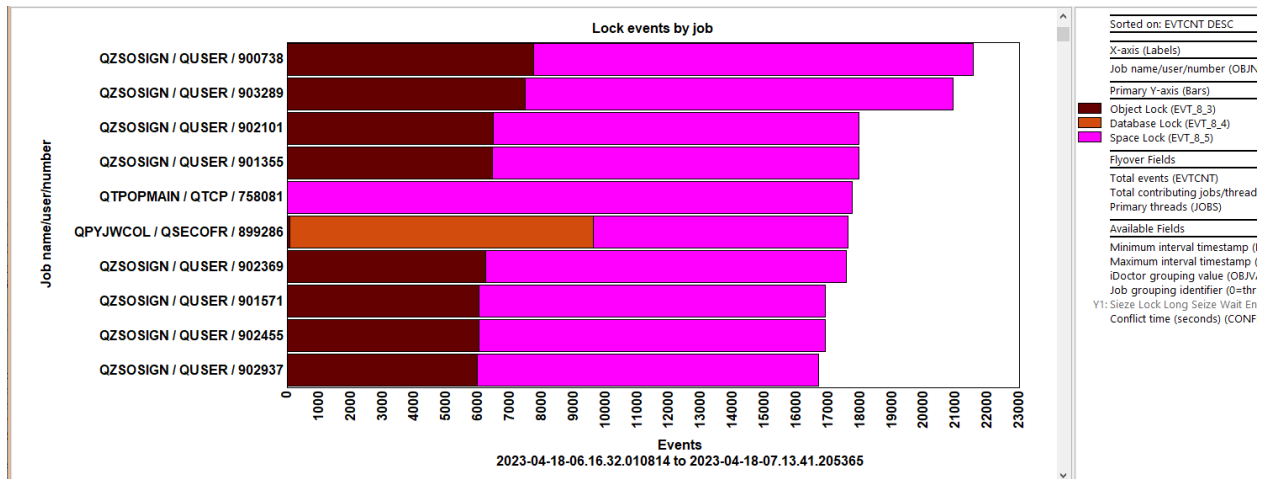
These graphs show the total lock events occurring for each sub type ranked by 1 of several possible ways.

You can also right-click and drill into the Detail reports for more options.



Locks -> Lock events rankings

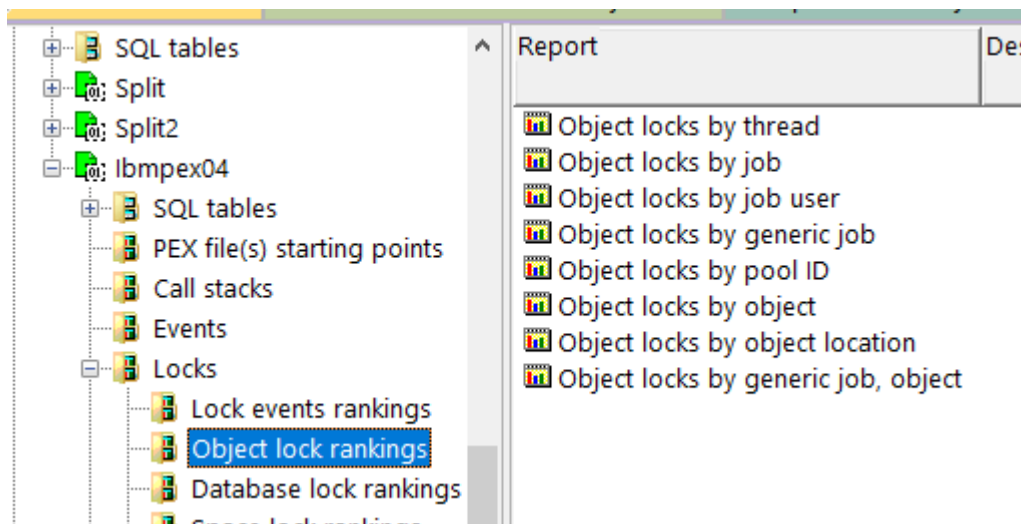
An example follows:



Lock events by job

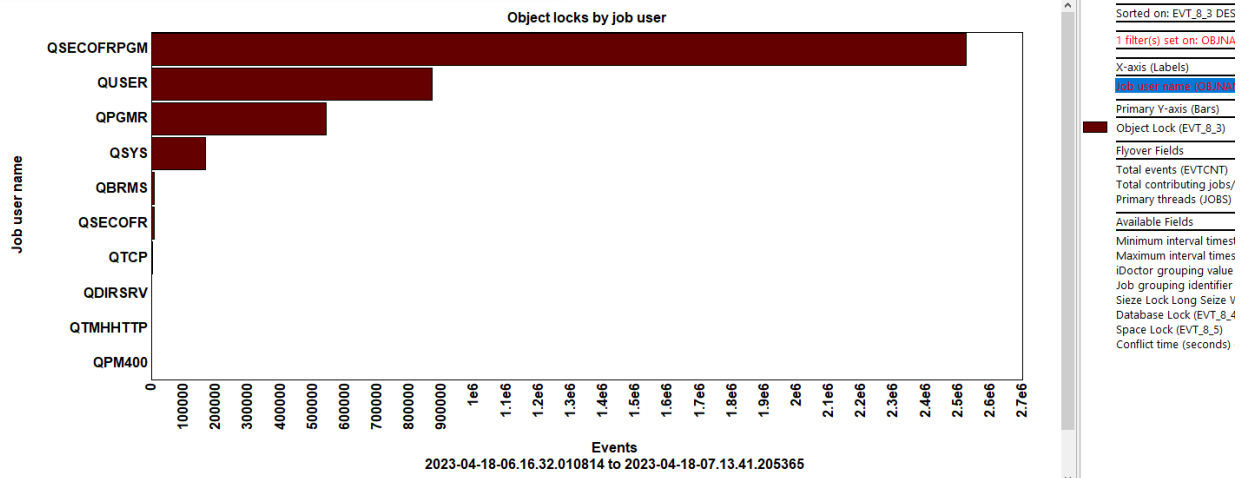
25.3.7 Object lock rankings

These graphs show the object locks events ranked by 1 of several possible ways.



Locks -> Object lock rankings

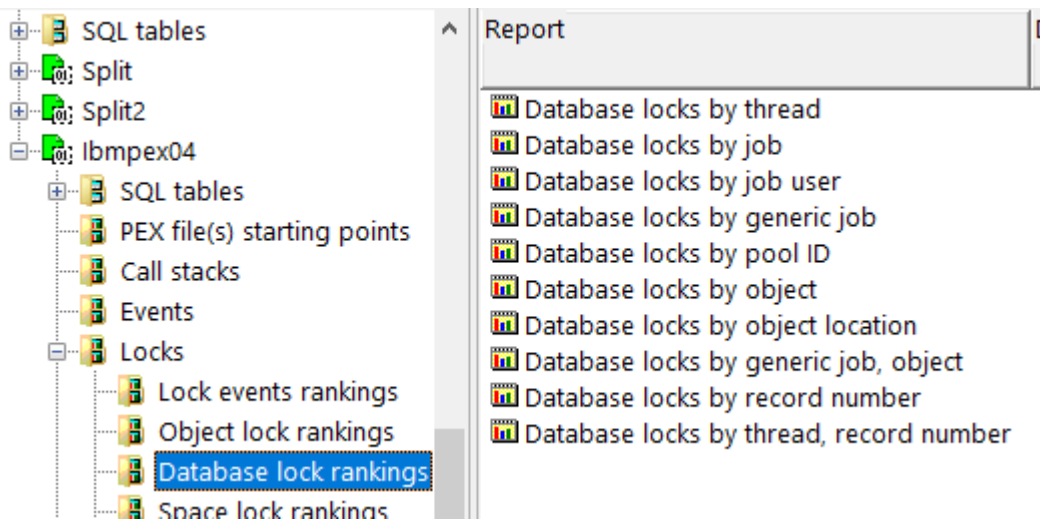
An example follows:



Object locks by job user

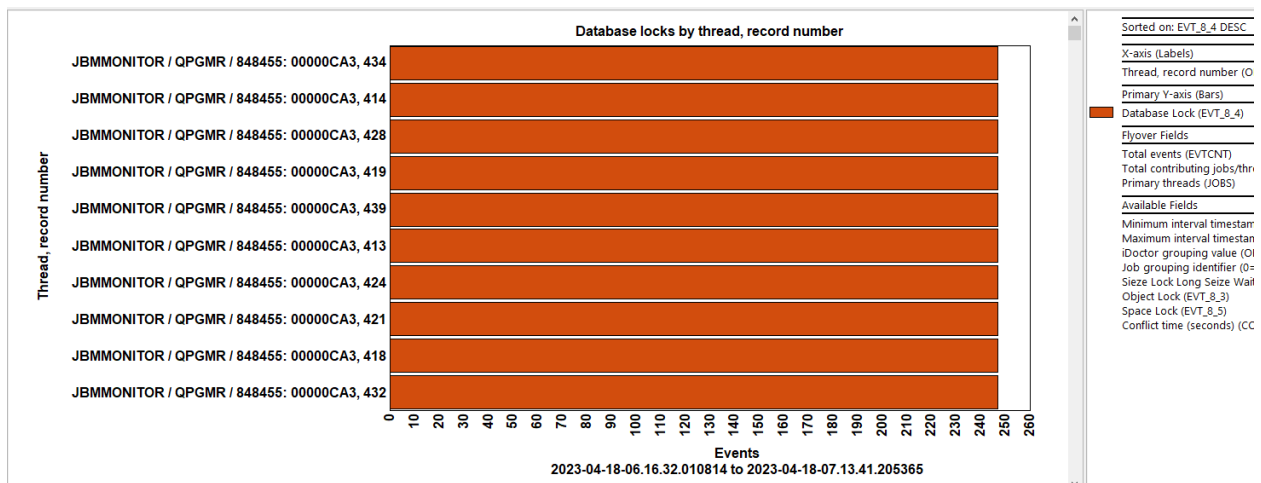
25.3.8 Database lock rankings

These graphs show the DB locks events ranked by 1 of several possible ways.



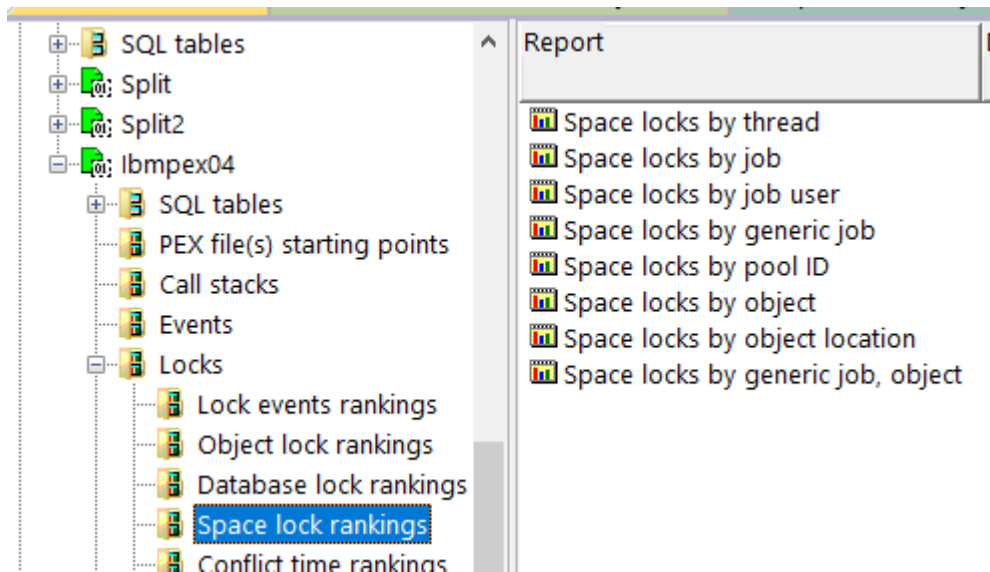
Locks -> Database lock rankings

An example follows:



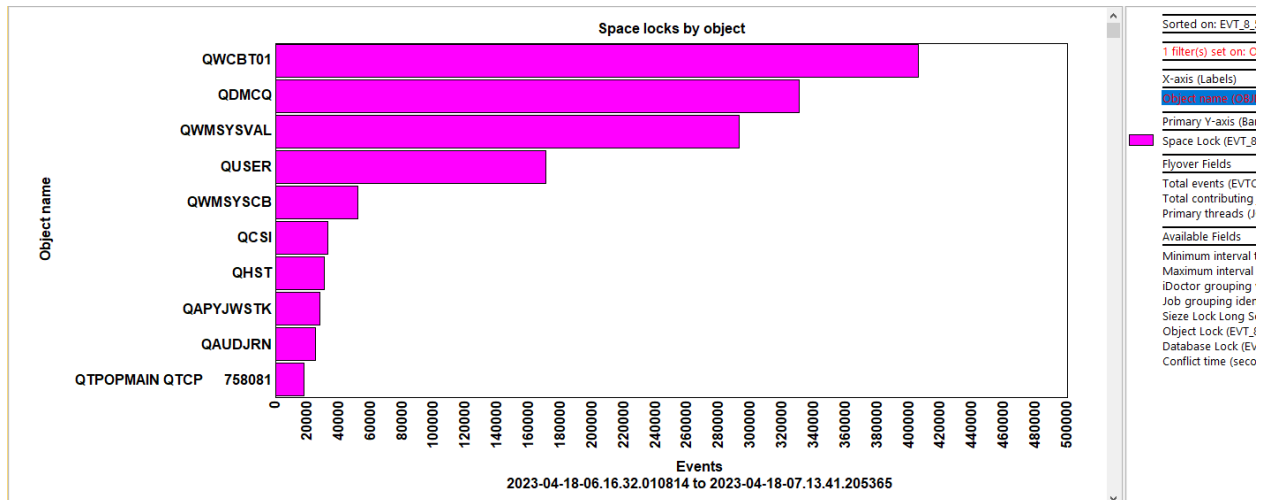
25.3.9 Space lock rankings

These graphs show the space locks events ranked by 1 of several possible ways.



Locks -> Space lock rankings

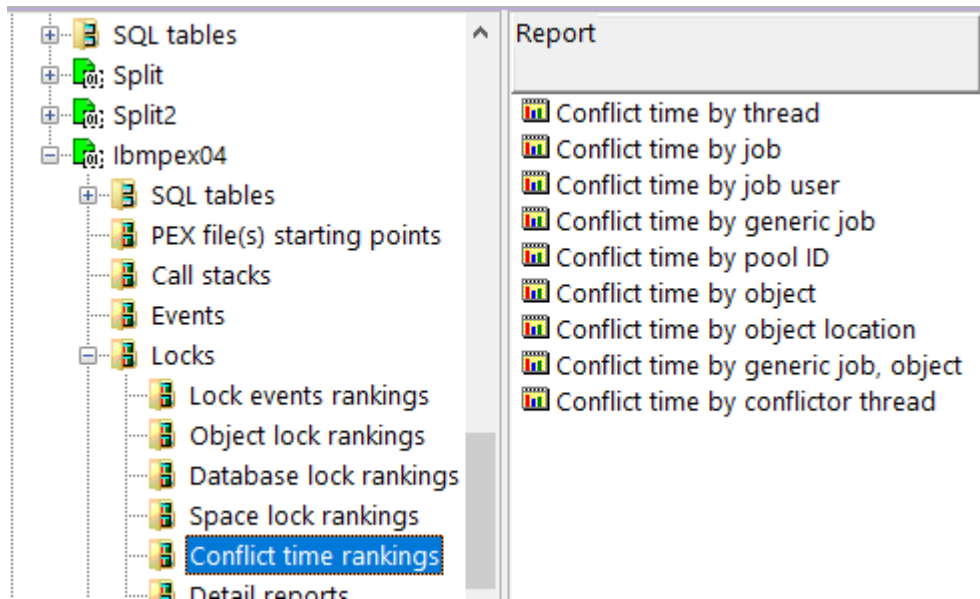
An example follows:



Space locks by object

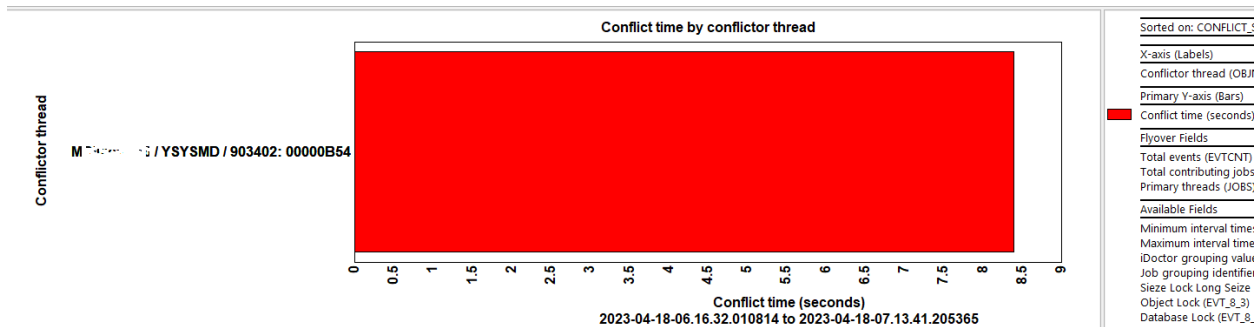
25.3.10 Conflict time rankings

These graphs show the conflict time (in seconds) ranked by 1 of several possible ways.



Locks -> Conflict time rankings

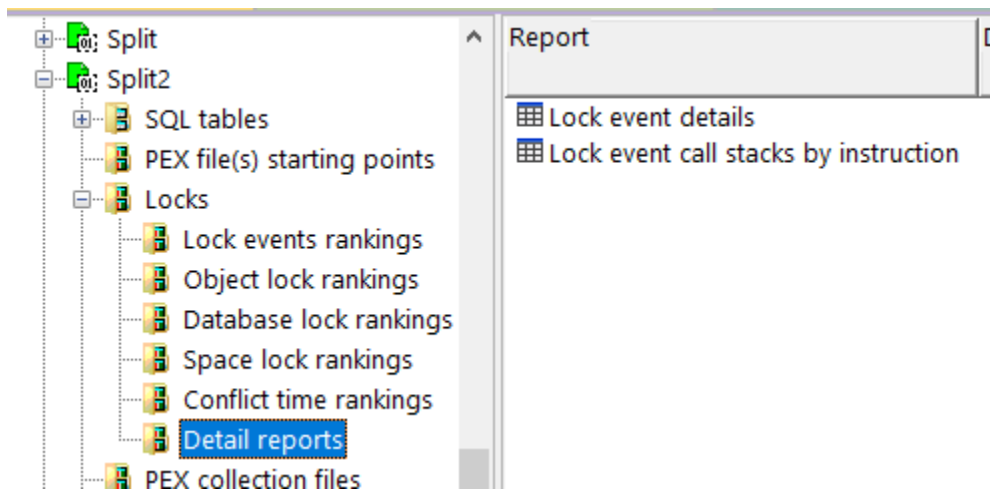
An example follows:



25.3.11 Detail reports

These reports give more details behind the events captured within the PEX collection.

Tip: You can access these reports as a drill-down from one of the graphs for the selected time or grouping.



Detail reports

26 Logical Database I/O

This analysis examines logical database I/Os captured using the operating system event *DBIO. This is event type 1, sub type 1 in the PEX files.

26.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

26.2 SQL tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
PEXDBIOSUM_<MBR>	LDIO interval summary
PEXDBIO_<MBR>	LDIO event details

26.3 Logical database I/O

This folder contains the graphs and reports available after the analysis has completed.

There are 3 main types of LDIO operations which are grouped together into “categories”:

1. Reads
2. Write
3. Others (Updates & Deletes)

These categories are used on the categorized graphs.

The logical database I/O totals and logical database I/O rates graphs are more advanced and show each individual subtype operation. The possible subtypes are:

- GTK – Keyed reads returning data
- GK1 – Keyed reads
- GTS – Sequential reads returning data
- GS1 – Sequential reads
- GTD – Direct reads returning data
- GD1 – Direct reads
- GTM – Blocked sequential reads
- UPD – Update
- DEL – Delete
- REL – Release
- PUT – Write

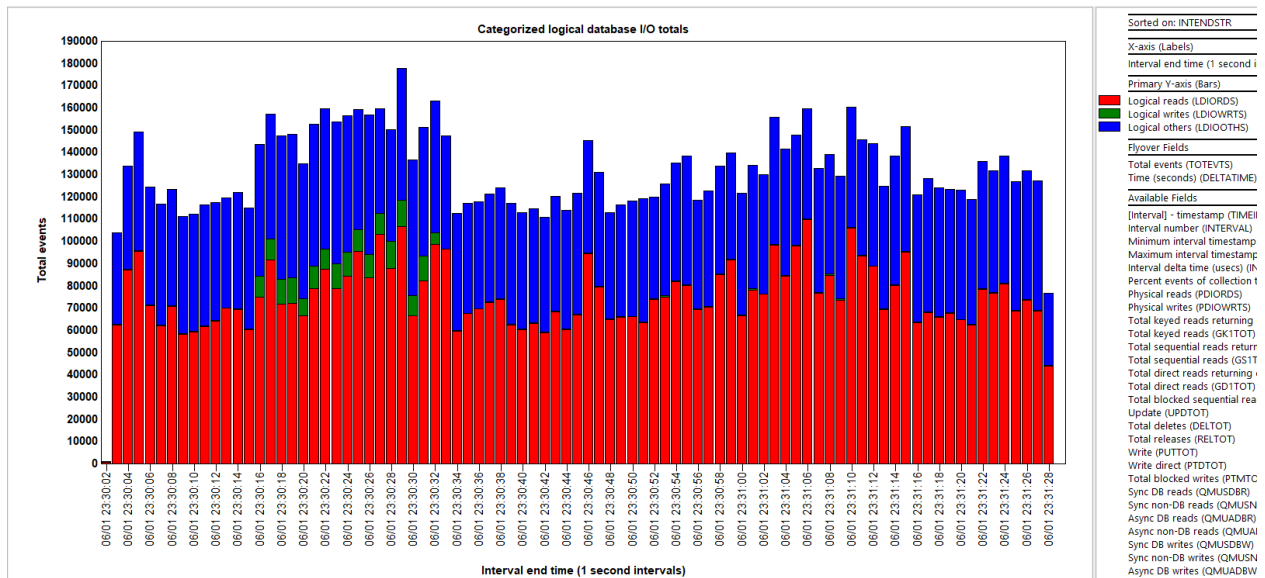
Tip: These graphs can be used as a drill-down into the Detail reports for the selected time or grouping.

	Report	Description	Tr
SQL tables			
PEX file(s) starting points			
Call stacks			
CPU profile			
Logical database I/O			
Categorized totals rank			
Categorized rates ranki			
Logical totals rankings			
Logical rates rankings			
Detail reports			
	Categorized logical database I/O totals		
	Categorized logical database I/O rates		
	Logical database I/O totals		
	Logical database I/O rates		
	Categorized totals rankings	Ranking graphs showing LDIO reads/writes/updates	
	Categorized rates rankings	Ranking graphs showing LDIO reads/writes/updates rates	
	Logical totals rankings	Ranking graphs showing LDIO operations	
	Logical rates rankings	Ranking graphs showing LDIO operations rates	
	Detail reports	Work with LDIO event data	

Logical database I/O

26.3.1 Categorized logical database I/O totals

This graph summarizes the LDIOs occurring per type over time.



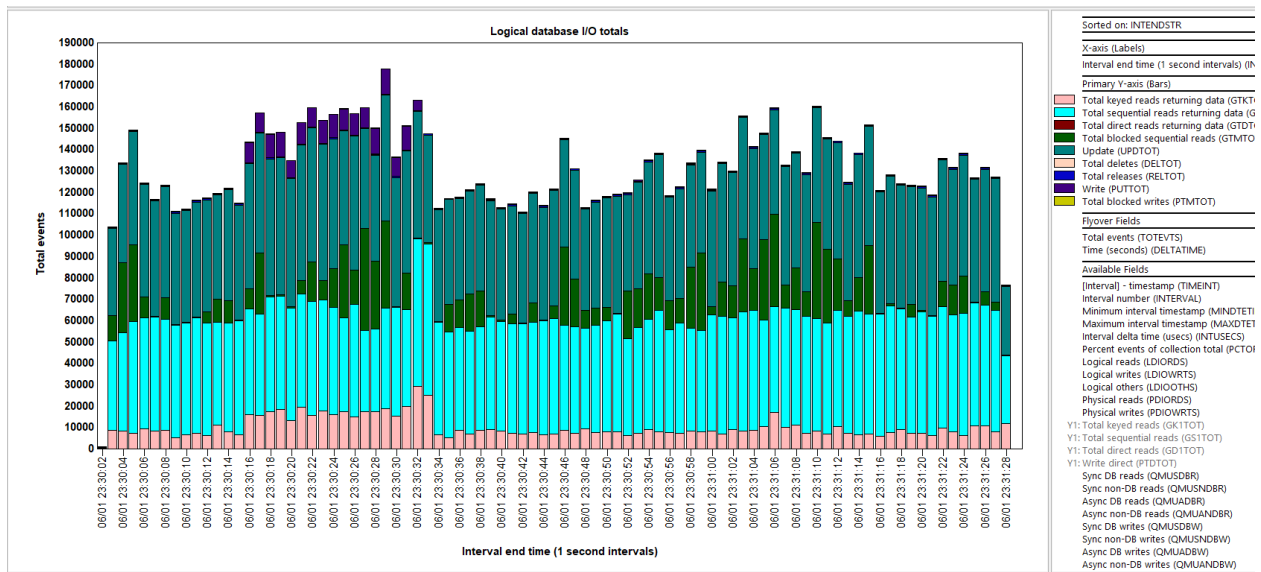
Categorized logical database I/O totals

26.3.2 Categorized logical database I/O rates

This graph is the same as the previous one except shows the values as a rate per second.

26.3.3 Logical database I/O totals

This graph shows the total contributions for each LDIO sub type found in the data.



Logical database I/O totals

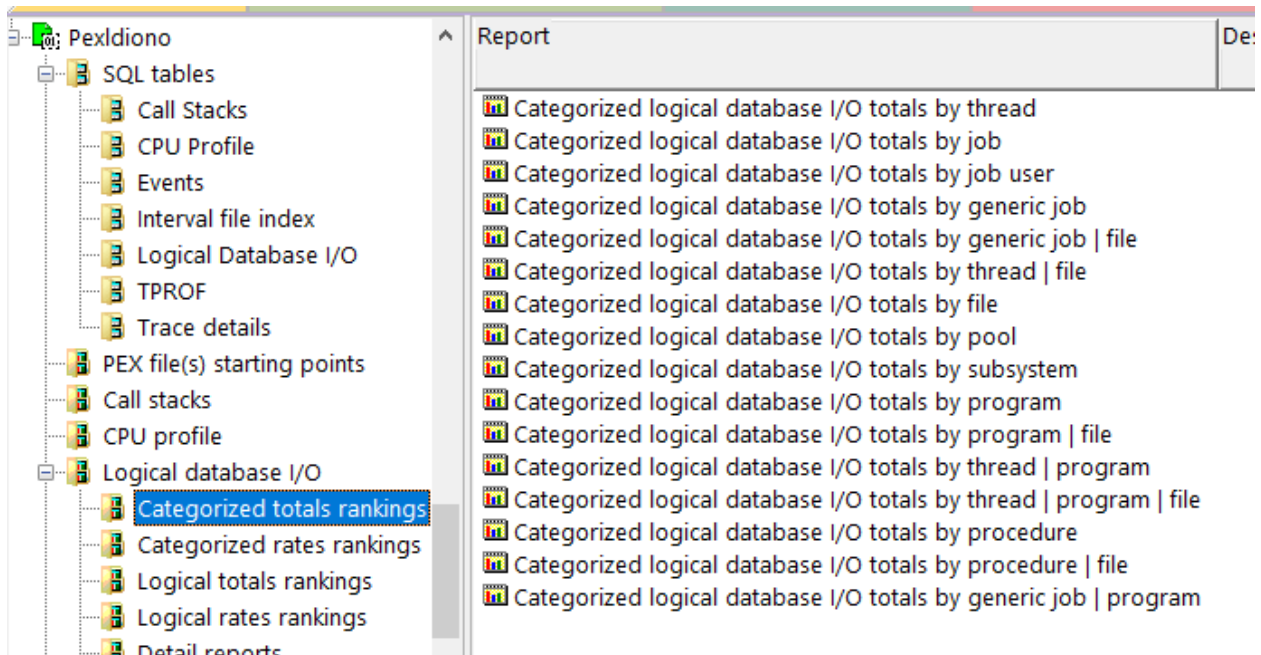
26.3.4 Logical database I/O rates

This graph is the same as the prior one except shows the values as a rate per second.

26.3.5 Categorized totals rankings

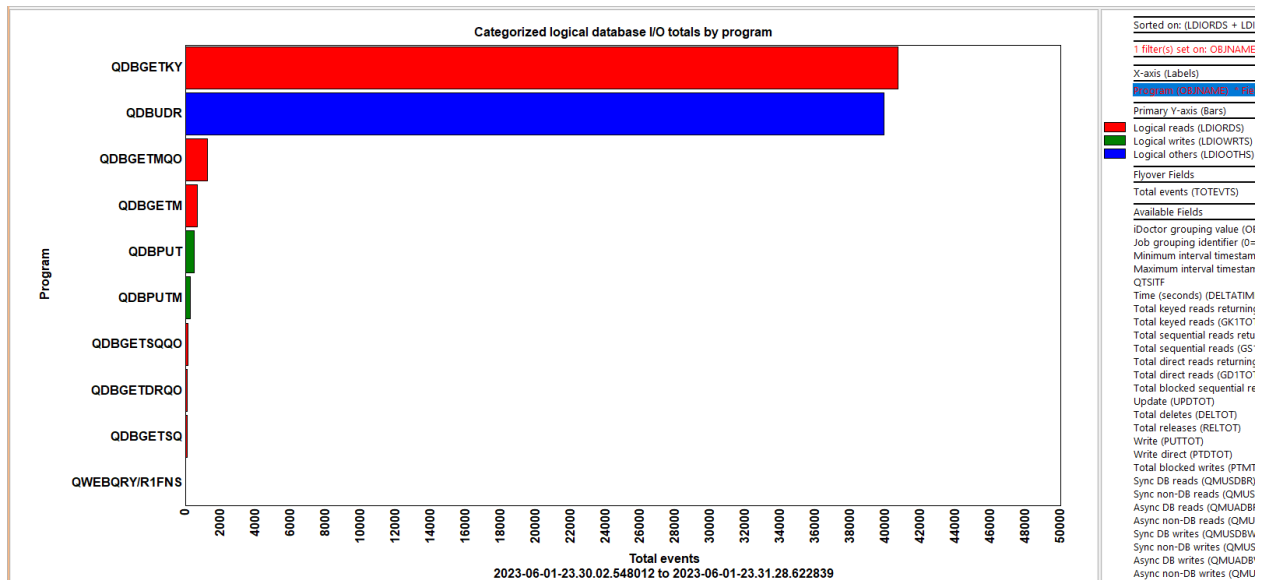
These graphs summarize the LDIOs occurring per category (reads, writes, others) and ranked by 1 of several possible ways.

You can also right-click and drill into the Detail reports for more options.



Logical database I/O -> Categorized totals rankings

An example follows:



Categorized logical database I/O totals by program

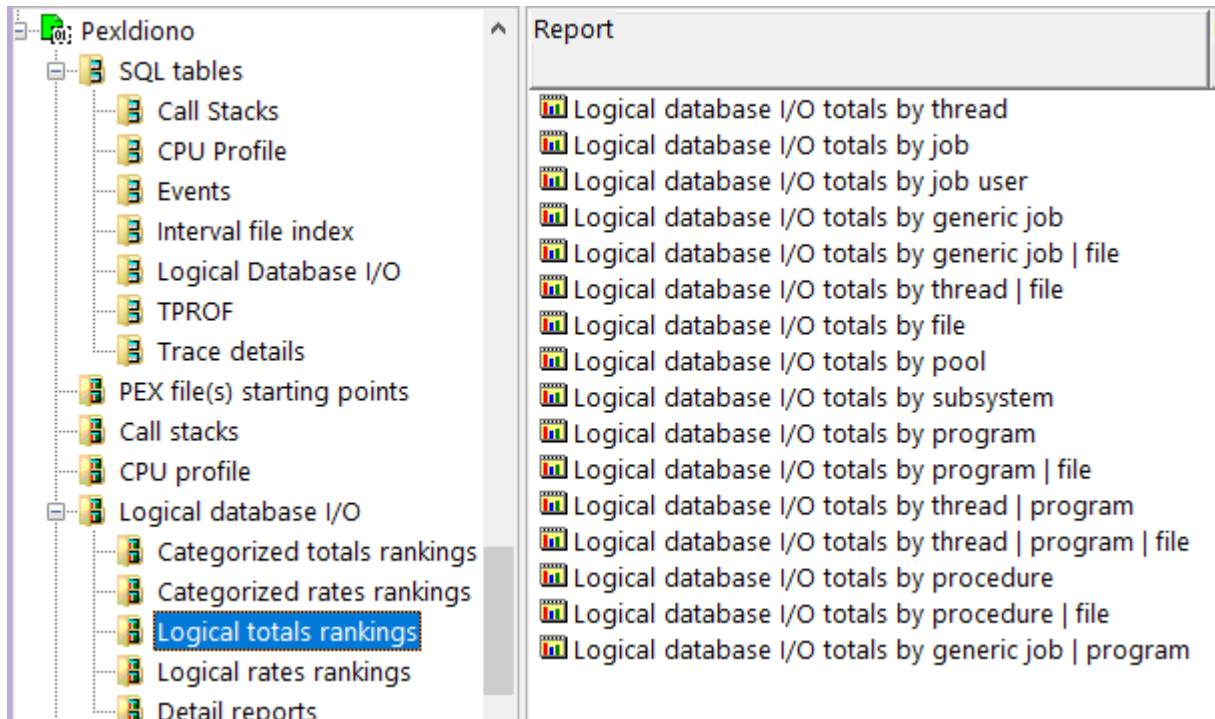
26.3.6 Categorized rates rankings

These graphs are the same as the previous ones except show their values as a rate per second.

26.3.7 Logical totals rankings

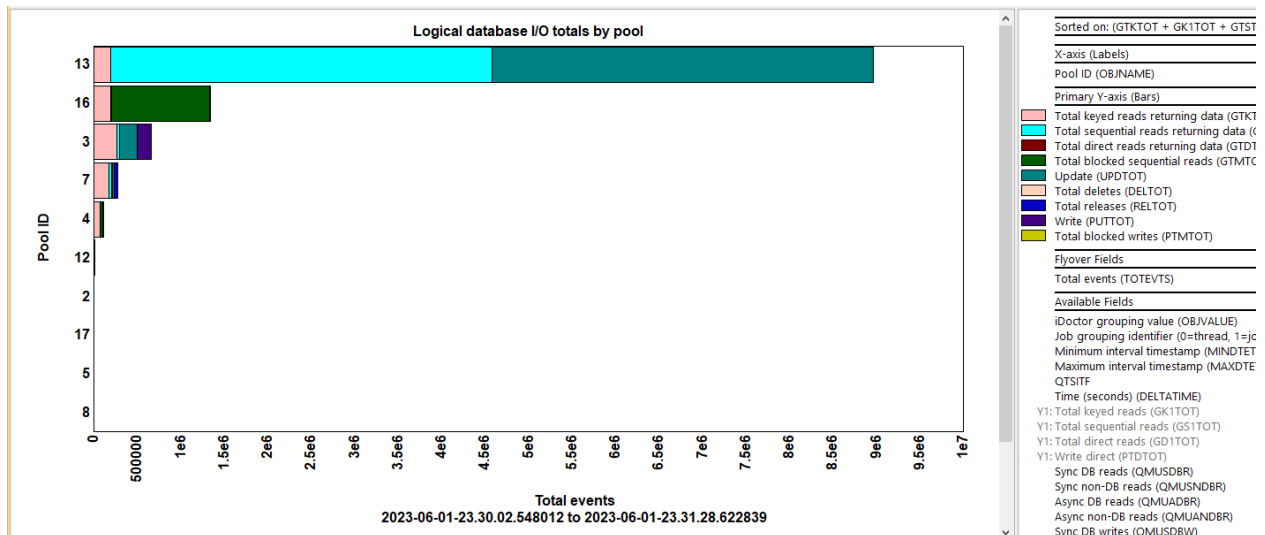
These graphs summarize the LDIOs occurring per type and ranked by 1 of several possible ways.

You can also right-click and drill into the Detail reports for more options.



Logical database I/O -> Logical totals rankings

An example follows:



Logical database I/O totals by pool

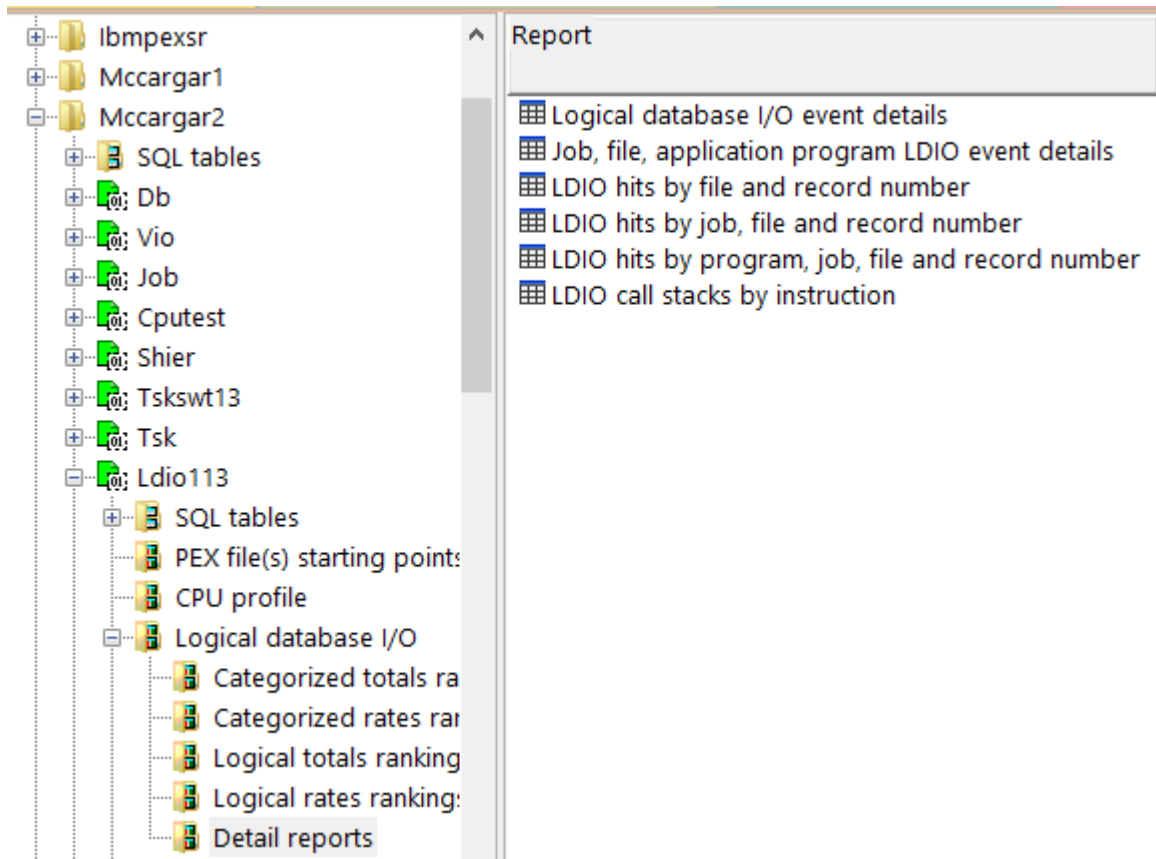
26.3.8 Logical rates rankings

These graphs are the same as the previous ones except show their values as a rate per second.

26.3.9 Detail reports

These reports give more details behind the events captured within the PEX collection.

Tip: You can access these reports as a drill-down from one of the graphs for the selected time or grouping.



Logical database I/O -> Detail reports

26.3.9.1 Logical database I/O event details

This report shows the details for the LDIO events. It includes the job that caused the event, operation type as well as the DB file information.

Taskcount (HEX) (QTIFTC)	Event timestamp (QTITSP)	(Minimum) QRECN (QRECN)	Call stack QRECN (IAD_QRECN)	Job name/user/number: thread ID (OBJNAME)	Operation Abbrev. (MODULE)	File Name (FNAME)	Library Name (LNAME)	Member Name (MNAME)	Requested Format Name (FMTNAME)	Option List Contents (OPTLIST)	TYPE_C (TYPE_)
00000000000004F8	2019-06-26-16.29.35.672259	2	2	QDBSRV14 / QSYS / 080350: 00000001	GTM	SYSIXADV	QSYS2	SYSIXADV	FORMAT0001	40404040	40
00000000000004F8	2019-06-26-16.29.35.672511	3	3	QDBSRV14 / QSYS / 080350: 00000001	GTM	SYSIXADV	QSYS2	SYSIXADV		40404040	40
00000000000004F8	2019-06-26-16.29.35.672590	4	4	QDBSRV14 / QSYS / 080350: 00000001	RLS	SYSIXADV	QSYS2	SYSIXADV		40404040	40
00000000000004F8	2019-06-26-16.29.35.672608	5	5	QDBSRV14 / QSYS / 080350: 00000001	RLS	SYSIXADV	QSYS2	SYSIXADV		40404040	40
00000000000004F9	2019-06-26-16.29.35.687156	14	14	QDBSRV15 / QSYS / 080351: 00000001	GTM	SYSIXADV	QSYS2	SYSIXADV	FORMAT0001	40404040	40
00000000000004F9	2019-06-26-16.29.35.687369	15	15	QDBSRV15 / QSYS / 080351: 00000001	GTM	SYSIXADV	QSYS2	SYSIXADV		40404040	40
00000000000004F9	2019-06-26-16.29.35.687428	16	16	QDBSRV15 / QSYS / 080351: 00000001	RLS	SYSIXADV	QSYS2	SYSIXADV		40404040	40
00000000000004F9	2019-06-26-16.29.35.687441	17	17	QDBSRV15 / QSYS / 080351: 00000001	RLS	SYSIXADV	QSYS2	SYSIXADV		40404040	40
0000000000000528	2019-06-26-16.30.13.051476	1171	1171	QSP200001 / QSYS / 080398: 00000001	GTK	QASPLINFO	QSQL	QASPLINFO	SPLFINFO	08030000	08
0000000000000528	2019-06-26-16.30.13.051579	1172	1172	QSP200001 / QSYS / 080398: 00000001	UPD	QASPLINFO	QSQL	QASPLINFO		40404040	40
0000000000000528	2019-06-26-16.30.13.055449	1173	1173	QSP200001 / QSYS / 080398: 00000001	GTK	QASPLINFO	QSQL	QASPLINFO	SPLFINFO	08030000	08
0000000000000528	2019-06-26-16.30.13.055536	1174	1174	QSP200001 / QSYS / 080398: 00000001	UPD	QASPLINFO	QSQL	QASPLINFO		40404040	40
0000000000000528	2019-06-26-16.30.13.091261	270	270	QSP200001 / QSYS / 080398: 00000001	GTK	QASPLINFO	QSQL	QASPLINFO	SPLFINFO	08030000	08
0000000000000528	2019-06-26-16.30.13.091346	271	271	QSP200001 / QSYS / 080398: 00000001	UPD	QASPLINFO	QSQL	QASPLINFO		40404040	40
0000000000000528	2019-06-26-16.30.13.092129	30	30	QSP200001 / QSYS / 080398: 00000001	GTK	QASPLINFO	QSQL	QASPLINFO	SPLFINFO	08030000	08
0000000000000528	2019-06-26-16.30.13.092244	31	31	QSP200001 / QSYS / 080398: 00000001	UPD	QASPLINFO	QSQL	QASPLINFO		40404040	40
0000000000000528	2019-06-26-16.30.13.119954	272	272	QSP200001 / QSYS / 080398: 00000001	GTK	QASPLINFO	QSQL	QASPLINFO	SPLFINFO	08030000	08
0000000000000528	2019-06-26-16.30.13.119984	273	273	QSP200001 / QSYS / 080398: 00000001	UPD	QASPLINFO	QSQL	QASPLINFO		40404040	40
0000000000000528	2019-06-26-16.30.13.133115	274	274	QSP200001 / QSYS / 080398: 00000001	GTK	QASPLINFO	QSQL	QASPLINFO	SPLFINFO	08030000	08
0000000000000528	2019-06-26-16.30.13.133190	275	275	QSP200001 / QSYS / 080398: 00000001	UPD	QASPLINFO	QSQL	QASPLINFO		40404040	40
0000000000000528	2019-06-26-16.30.13.149324	32	32	QSP200001 / QSYS / 080398: 00000001	GTK	QASPLINFO	QSQL	QASPLINFO	SPLFINFO	08030000	08
0000000000000528	2019-06-26-16.30.13.149374	33	33	QSP200001 / QSYS / 080398: 00000001	UPD	QASPLINFO	QSQL	QASPLINFO		40404040	40
0000000000000528	2019-06-26-16.30.13.150053	34	34	QSP200001 / QSYS / 080398: 00000001	GTK	QASPLINFO	QSQL	QASPLINFO	SPLFINFO	08030000	08

Logical database I/O event details

26.3.9.2 Job, file, application program LDIO event details

This report is like the previous one except includes fewer columns.

26.3.9.3 LDIO hits by file and record number

This report summarizes the total LDIOs occurring as a percentage of the total and groups the data by file and record number.

ldoc730/MCCARGAR2/LDIO1/LDIO hits by file and record number - #1					
Percent Hits (PCTHIT)	Total events (TOTEVTS)	Library Name (LNAME)	File Name (FNAME)	Member Name (MNAME)	Relative Rec Number (RECRN)
3.8265	45	QSYS2	QASQRESL	QASQRESL	0
2.3810	28	QSYS2	QSQPTABL	QSQPTABL	0
2.3810	28	QSYS2	SYSROUTINE	SYSROUTINE	93
2.3810	28	QSYS2	QASQRESL	QASQRESL	93
2.3810	28	QSYS2	QASQRESL	QASQRESL	91
1.3605	16	MCCARGAR2	QAIDRPACI	QA610PACI	0
1.3605	16	MCCARGAR2	QAYPERUNI	TPROF1	1
1.2755	15	QTEMP	MBRLIST	MBRLIST	0
.6803	8	QSYS2	SYSIXADV	SYSIXADV	0
.6803	8	QSYS2	SYSROUTINE	SYSROUTINE	552
.6803	8	QSYS2	QASQRESL	QASQRESL	552
.5952	7	QSYS2	QASQRESL	QASQRESL	412
.5952	7	MCCARGAR2	QAYPERUNI	DTAQ	0
.5952	7	QSYS2	SYSROUTINE	SYSROUTINE	412
.3401	4	QSPL	QASPLINFO	QASPLINFO	26434
.3401	4	QSPL	QASPLINFO	QASPLINFO	26431
.3401	4	QSPL	QASPLINFO	QASPLINFO	26433
.3401	4	QSPL	QASPLINFO	QASPLINFO	26432
.3401	4	QSPL	QASPLINFO	QASPLINFO	26432

LDIO hits by file and record number

26.3.9.4 LDIO hits by job, file and record number

This is similar to the previous report but also includes job information.

Idoc730/MCCARGAR2/LDIO1/LDIO hits by file and record number - #1				Idoc730/MCCARGAR2/LDIO1/LDIO hits by job, file and record number - #1			
Percent Hits (PCTHIT)	Total events (TOTEVTS)	Job name/user/number: thread ID (OBJNAME)	Library Name (LNAME)	File Name (FNAME)	Member Name (MNAME)	Relative Rec Number (RECRN)	
3.8265	45	QZDASOINIT / QUSER / 080687: 00000002	QSYS2	QASQRESL	QASQRESL	0	
2.3810	28	QZDASOINIT / QUSER / 080687: 00000002	QSYS2	QASQRESL	QASQRESL	93	
2.3810	28	QZDASOINIT / QUSER / 080687: 00000002	QSYS2	QSQPTABL	QSQPTABL	0	
2.3810	28	QZDASOINIT / QUSER / 080687: 00000002	QSYS2	QASQRESL	QASQRESL	91	
2.3810	28	QZDASOINIT / QUSER / 080687: 00000002	QSYS2	SYSROUTINE	SYSROUTINE	93	
1.3605	16	QZDASOINIT / QUSER / 080687: 00000002	MCCARGAR2	QAYPERUNI	TPROF1	1	
1.2755	15	QZDASOINIT / QUSER / 080687: 00000002	QTEMP	MBRLIST	MBRLIST	0	
1.1905	14	QZDASOINIT / QUSER / 080687: 00000002	MCCARGAR2	QAIDRPACI	QA610PACI	0	
.6803	8	QZDASOINIT / QUSER / 080687: 00000002	QSYS2	QASQRESL	QASQRESL	552	
.6803	8	QZDASOINIT / QUSER / 080687: 00000002	QSYS2	SYSROUTINE	SYSROUTINE	552	
.5952	7	QZDASOINIT / QUSER / 080687: 00000002	MCCARGAR2	QAYPERUNI	DTAQ	0	
.5952	7	QZDASOINIT / QUSER / 080687: 00000002	QSYS2	SYSROUTINE	SYSROUTINE	412	
.5952	7	QZDASOINIT / QUSER / 080687: 00000002	QSYS2	QASQRESL	QASQRESL	412	
.3401	4	QSPP200001 / QSYS / 080398: 00000001	QSPL	QASPLINFO	QASPLINFO	26431	
.3401	4	QSPP200001 / QSYS / 080398: 00000001	QSPL	QASPLINFO	QASPLINFO	26433	
.3401	4	QSPP200001 / QSYS / 080398: 00000001	QSPL	QASPLINFO	QASPLINFO	26434	
.3401	4	QSPP200001 / QSYS / 080398: 00000001	QSPL	QASPLINFO	QASPLINFO	26432	
.3401	4	QDBSRV14 / QSYS / 080350: 00000001	QSYS2	SYSIXADV	SYSIXADV	0	
.3401	4	QDBSRV15 / QSYS / 080351: 00000001	QSYS2	SYSIXADV	SYSIXADV	0	
.2551	3	QYPSFRCOL / QSYS / 080440: 0000001A	QUSRSYS	QAPZGRP	QAPZGRP	5286	
.2551	3	QYPSFRCOL / QSYS / 080440: 0000001A	QUSRSYS	QAPZGRP	QAPZGRP	4855	

LDIO hits by job, file and record number

26.3.9.5 LDIO hits by program, job, file and record number

This is similar to the previous report but also includes program library and program name.

Idoc730/MCCARGAR2/LDIO1/LDIO hits by file and record number - #1				Idoc730/MCCARGAR2/LDIO1/LDIO hits by job, file and record number - #1				Idoc730/MCCARGAR2/LDIO1/LDIO hits by program, job, file and record number - #1			
Percent Hits (PCTHIT)	Total events (TOTEVTS)	Job name/user/number: thread ID (OBJNAME)	Program library (QPRPQL)	Program name (QPRPGN)	Library Name (LNAME)	File Name (FNAME)	Member Name (MNAME)	Relative Rec Number (RECRN)			
3.8265	45	QZDASOINIT / QUSER / 080687: 00000002	QSYS	QDBGETKY	QSYS2	QASQRESL	QASQRESL	0			
2.3810	28	QZDASOINIT / QUSER / 080687: 00000002	QSYS	QDBGETKY	QSYS2	QASQRESL	QASQRESL	91			
2.3810	28	QZDASOINIT / QUSER / 080687: 00000002	QSYS	QDBGETKY	QSYS2	QASQRESL	QASQRESL	93			
2.3810	28	QZDASOINIT / QUSER / 080687: 00000002	QSYS	QDBGETMQO	QSYS2	QSQPTABL	QSQPTABL	0			
2.3810	28	QZDASOINIT / QUSER / 080687: 00000002	QSYS	QDBGETKY	QSYS2	SYSROUTINE	SYSROUTINE	93			
1.2755	15	QZDASOINIT / QUSER / 080687: 00000002	QSYS	QDBGETMQO	QTEMP	MBRLIST	MBRLIST	0			
1.1905	14	QZDASOINIT / QUSER / 080687: 00000002	QSYS	QDBGETMQO	MCCARGAR2	QAIDRPACI	QA610PACI	0			
.6803	8	QZDASOINIT / QUSER / 080687: 00000002	QSYS	QDBGETMQO	MCCARGAR2	QAYPERUNI	TPROF1	1			
.6803	8	QZDASOINIT / QUSER / 080687: 00000002	QIDRGU1	GETPEXVRM	MCCARGAR2	QAYPERUNI	TPROF1	1			
.6803	8	QZDASOINIT / QUSER / 080687: 00000002	QSYS	QDBGETKY	QSYS2	SYSROUTINE	SYSROUTINE	552			
.6803	8	QZDASOINIT / QUSER / 080687: 00000002	QSYS	QDBGETKY	QSYS2	QASQRESL	QASQRESL	552			
.5952	7	QZDASOINIT / QUSER / 080687: 00000002	QSYS	QDBGETKY	QSYS2	QASQRESL	QASQRESL	412			
.5952	7	QZDASOINIT / QUSER / 080687: 00000002	QSYS	QDBGETMQO	MCCARGAR2	QAYPERUNI	DTAQ	0			
.5952	7	QZDASOINIT / QUSER / 080687: 00000002	QSYS	QDBGETKY	QSYS2	SYSROUTINE	SYSROUTINE	412			
.2551	3	QYPSFRCOL / QSYS / 080440: 0000001A	QSYS	QDBGETKY	QUSRSYS	QAPZGRP	QAPZGRP	5286			
.2551	3	QYPSFRCOL / QSYS / 080440: 0000001A	QSYS	QDBGETKY	QUSRSYS	QAPZGRP	QAPZGRP	4855			
.1701	2	QYPSFRCOL / QSYS / 080440: 0000001A	QSYS	QDBGETKY	QUSRSYS	QAPZGRP	QAPZGRP	5029			
.1701	2	QYPSFRCOL / QSYS / 080440: 0000001A	QSYS	QDBGETKY	QUSRSYS	QAPZGRP	QAPZGRP	4914			
.1701	2	QYPSFRCOL / QSYS / 080440: 0000001A	QSYS	QDBGETKY	QUSRSYS	QAPZGRP	QAPZGRP	5176			
.1701	2	QYPSFRCOL / QSYS / 080440: 0000001A	QSYS	QDBGETKY	QUSRSYS	QAPZGRP	QAPZGRP	5283			

LDIO hits by program, job, file and record number

26.3.9.6 LDIO call stacks by instruction

If *FORMAT2 events were captured, this provides the most commonly occurring call stacks found in the collection.

Tip: It is sometimes useful to use this option as a drill-down from one of the ranking or overview graphs.

Total events (TOTEVTS)	Call level (LEVEL)	Program model (MODEL)	Program name (PGMNAM)	Module name (MODNAM)	Procedure name (PRCNAM)	Offset (ADDR_OFFSET)	Statement number (STMTNBR)	M (C
32723	1	ILE	QDBGETKY	QDBGETKY	EOP	00000000000003C4	8886	2
32723	2	ILE	QDBGETKY	QDBGETKY	FULLSETCURSOR	0000000000000548	8385	2
32723	3	ILE	QDBGETKY	QDBGETKY	QDBGETKY	0000000000001744	6392	2
32723	4	ILE	QSQDDL1	QSQSEQ	FIND_WITH_SEQUEN...	0000000000000DA4	6622	2
32723	5	ILE	QSQDDL1	QSQSEQ	FIND_RECORD	0000000000000154	6551	2
32723	6	ILE	QSQDDL1	QSQSEQ	SQL_Sequence	0000000000001EA8	6518	2
32723	7	ILE	QQQSRV1	QQQSEQ	SQSEQF_ACTNAME	0000000000000204	4223	2
32723	8	ILE	QQQSRV1	QQQSEQ	SQSEQF_VERIFYINTE...	0000000000000048	6272	2
32723	9	ILE	QQQSRV1	QQQSEQ	QQ_SEQSEQ_CALL	0000000000000864	7534	2
32723	10	ILE	QQQSRVE1	QQQRFRSH	QQQREFRESH	0000000000001A44	30297	2
32723	11	ILE	QSQRUN2	QSQVALUE	SLINTO	0000000000000217C	13332	2
32723	12	ILE	QSQRUN2	QSQVALUE	F_ASSIGNL	0000000000000340C	16619	2
32723	13	ILE	QSQRUN2	QSQVALUE	SQL_ValuesInto	00000000000007198	16165	2
32723	14	ILE	QSQRROUTE	QSQRROUTE	FASTPATH_PROC	0000000000000BB20	25090	2
32723	15	ILE	QSQRROUTE	QSQRROUTE	QSQRROUTE	00000000000002BF4	16138	2
32723	16	ILE	BCOUSRLIB/GLP017	GLP017	GENERARXML	0000000000000F08	1011	2
24381	1	ILE	QDBGETM	QDBGETM	FEEDBACK	00000000000005F8	7664	2
24381	2	ILE	QDBGETM	QDBGETM	QDBGETM	00000000000004940	7548	2
24381	3	OPM	QCLDMIO	QCLDMIO	QCLDMIO	00000000000001CE8	185	2
24381	4	ILE	ADCMLIBPRO/ADC1...	ADC194	ADC194	00000000000000600	800	2
24381	5	ILE	ADCMLIBPRO/ADC1...	ADC194	_CL_PEP	00000000000000164	0	2
24381	6	ILE	ADCMLIBPRO/ADP1...	ADP193	ADP193	00000000000001724	69	2
24381	7	ILE	ADCMLIBPRO/ADP1...	ADP193	_QRNP_PEP_AD193	00000000000000118	0	2
24381	8	ILE	ADCMLIBPRO/ADC4...	ADC461	ADC461	00000000000001808	4600	2
24381	9	ILE	ADCMLIBPRO/ADC4...	ADC461	_CL_PEP	00000000000000170	0	2
24381	10	OPM	ADCMLIBPRO/ADC1...	ADC190	ADC190	000000000000009D8	31	2
24381	11	OPM	QCMD	QCMD	QCMD	00000000000003FE8	456	2
20445	1	ILE	QDBGETKY	QDBGETKY	QDBGETKY	00000000000004020	7220	2
20445	2	ILE	QDBGETKY	QDBGETKY	QDBGETKY	0000000000000250	150	2

LDIO call stacks by instruction

27 Net Size Changes

This analysis is a 2nd analysis (the other is called ASM) that focuses on auxillary storage management events and deals with size changes to objects and segments.

27.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

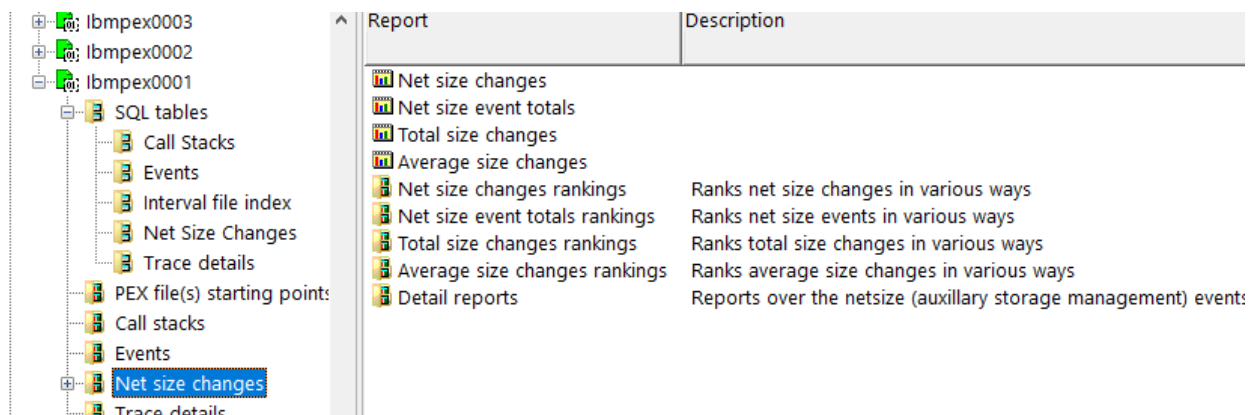
27.2 SQL tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
PEXASMSUM_<MBR>	Net size interval summary table
PEXASM_<MBR>	Net size events table

27.3 Net size changes

This folder contains the graphs and reports available after the analysis has completed.



Net size changes

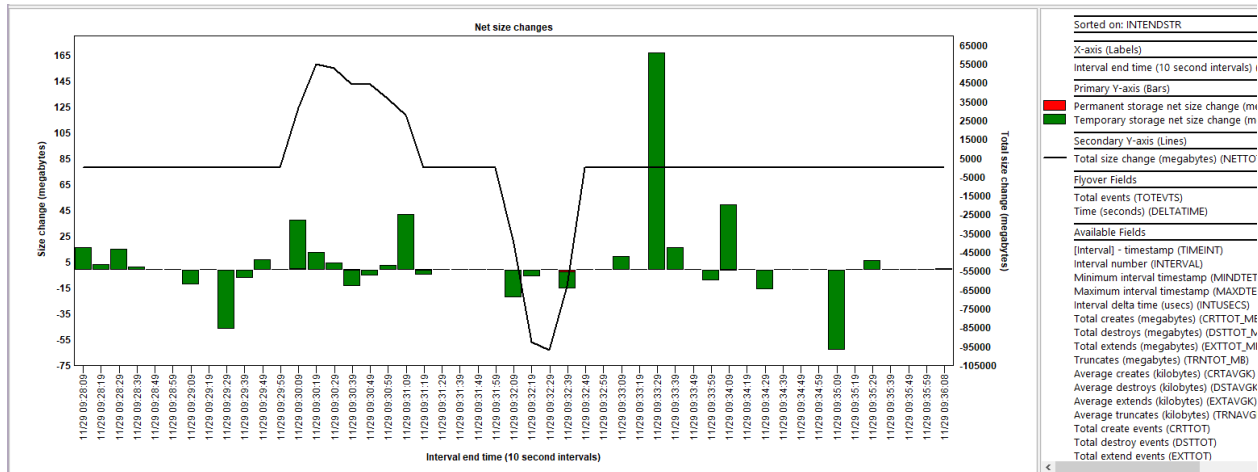
Tip: These graphs can be used as a drill-down into the Detail reports for the selected time or grouping.

27.3.1 Net size changes

This graph shows the net changes to permanent and temporary storage in megabytes over time.

Note: The difference between the total size change and the sum of the values shown on the Y1-axis indicates the total size change that is **unknown** as far as whether it occurred in permanent or temporary storage.

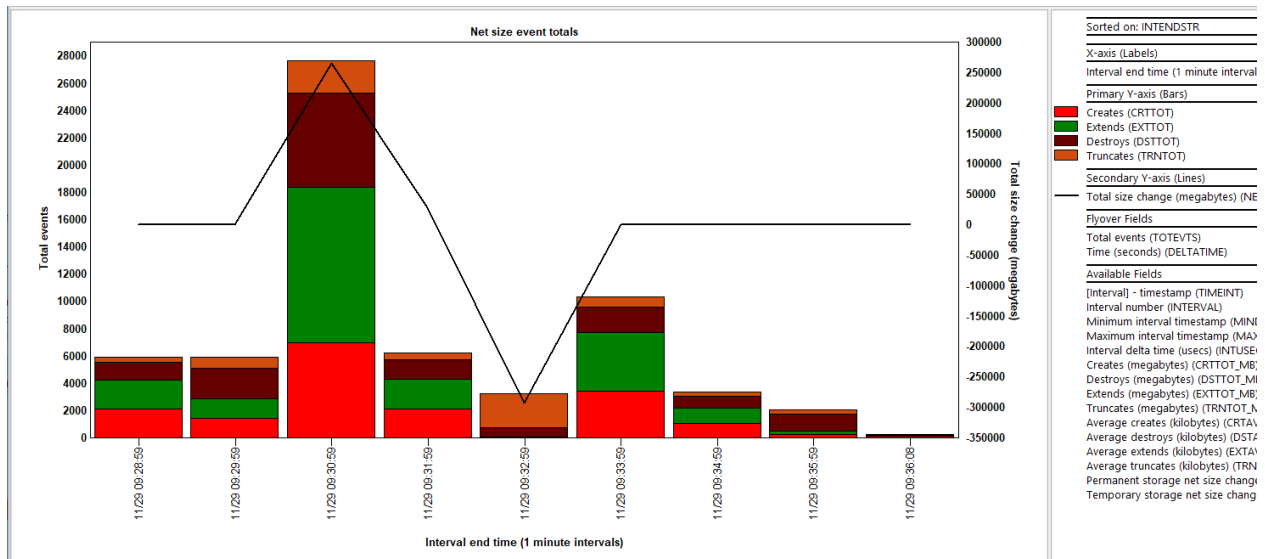
Tip: In this example, the permanent storage values exist but are so small are not visible. To see them right-click the graph legend on the green value (temp storage) and use the remove from graph menu.



Net size changes

27.3.2 Net size event totals

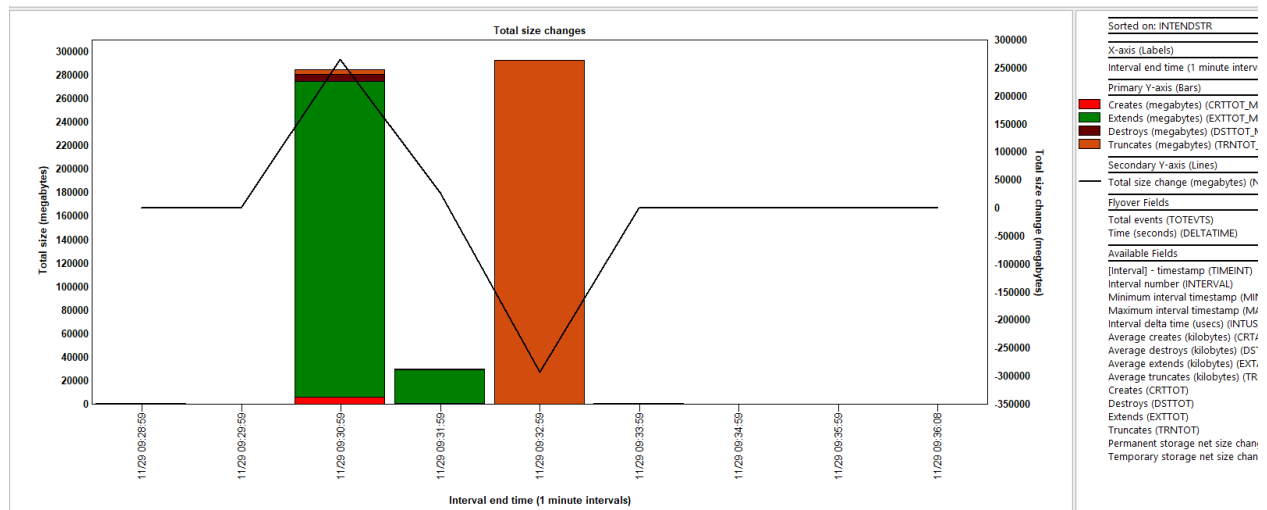
This graph summarizes the total events per type over time.



Net size event totals

27.3.3 Total size changes

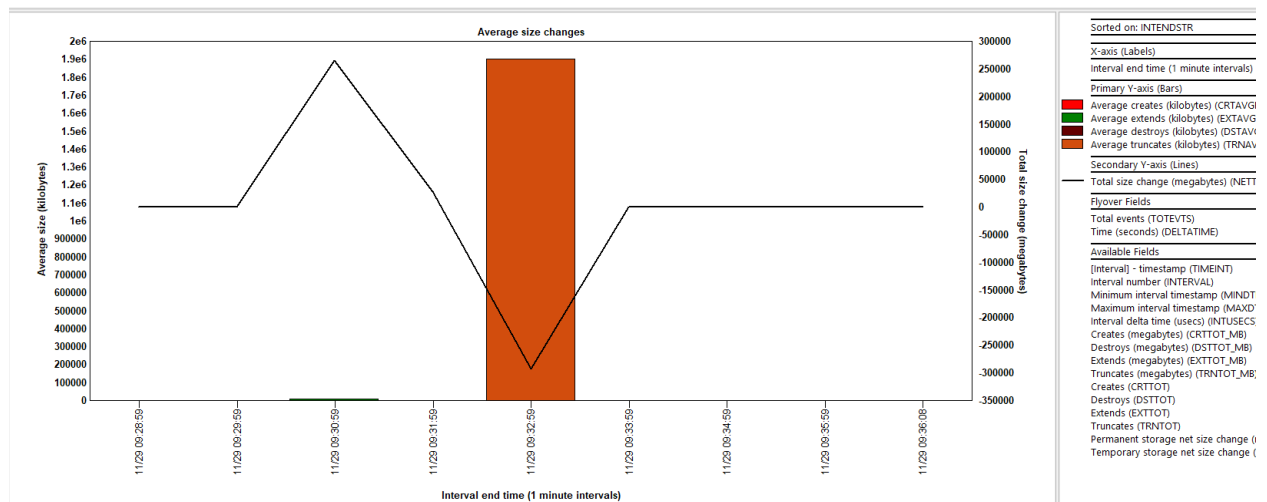
This graph shows total size changes per event type over time.



Total size changes

27.3.4 Average size changes

This graph shows the average size changes per event type over time.

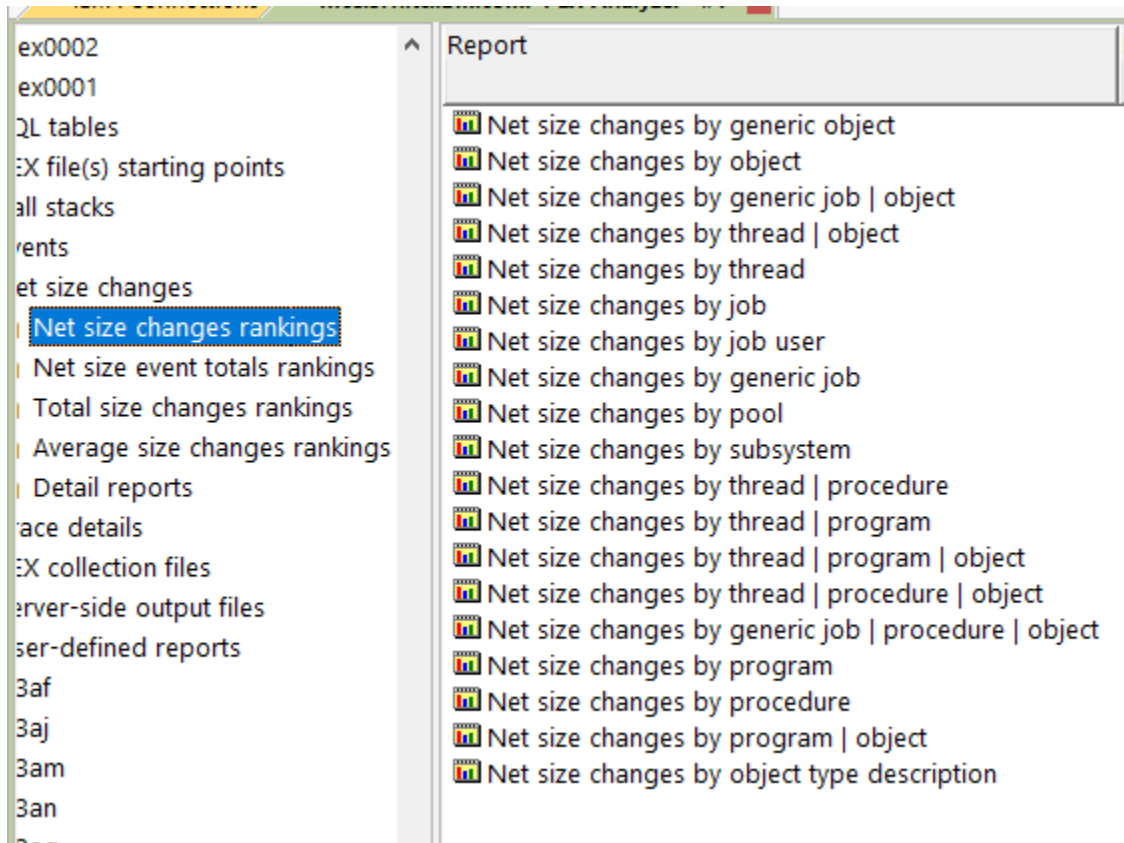


Average size changes

27.3.5 Net size changes rankings

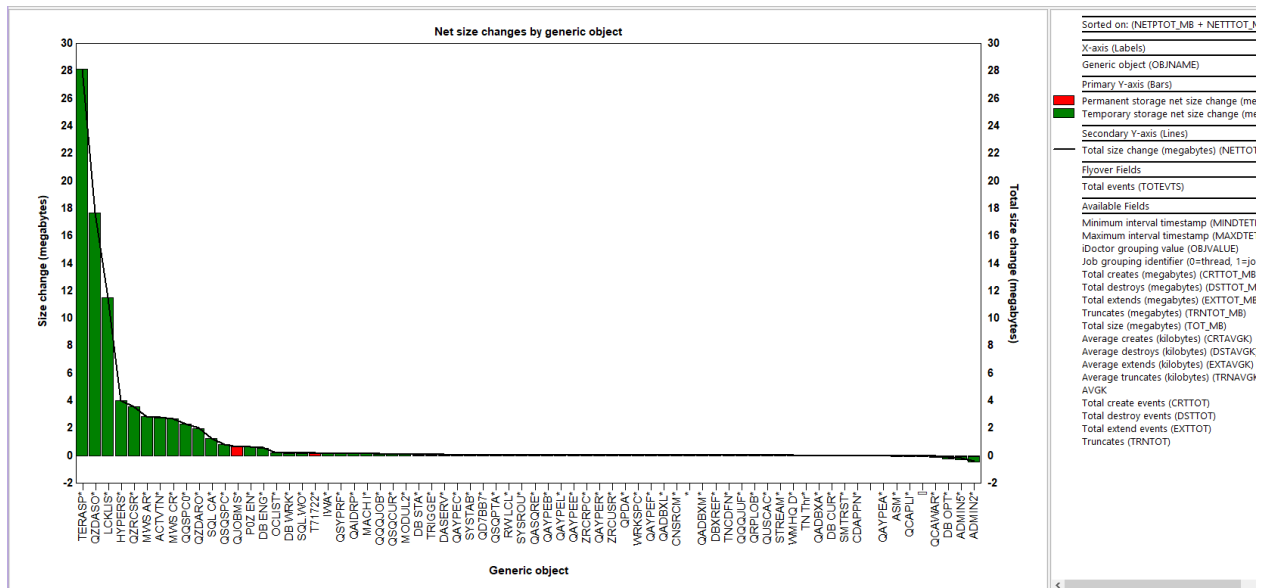
These graphs summarize the net size changes for perm and temp storage ranked by 1 of several possible ways.

You can also right-click and drill into the Detail reports for more options.



Net size changes -> Net size changes rankings

An example follows:

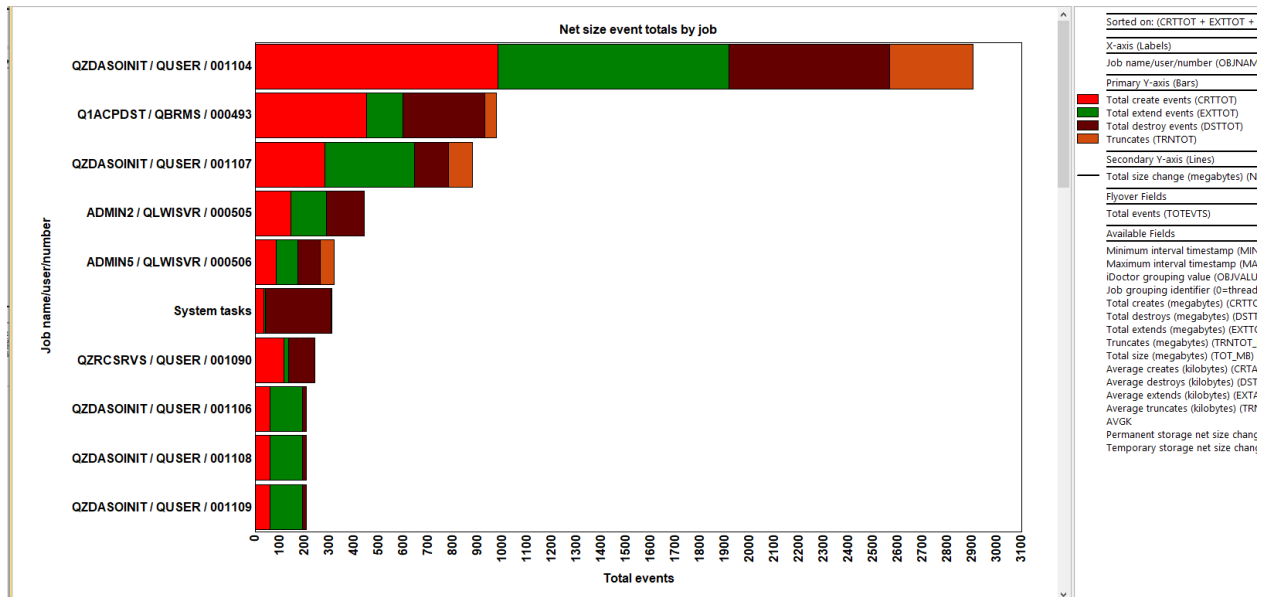


Net size changes by generic object

27.3.6 Net size event totals rankings

This graph summarizes the total events per type ranked by 1 of several possible ways.

An example follows:

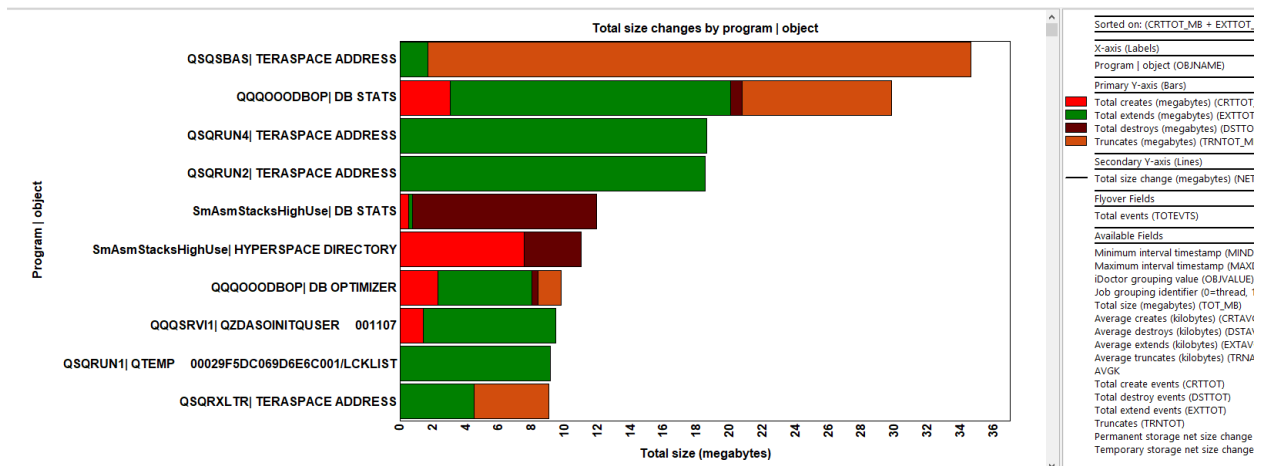


Net size event totals by job

27.3.7 Total size changes rankings

This graph shows total size changes per event type ranked by 1 of several possible ways.

An example follows:

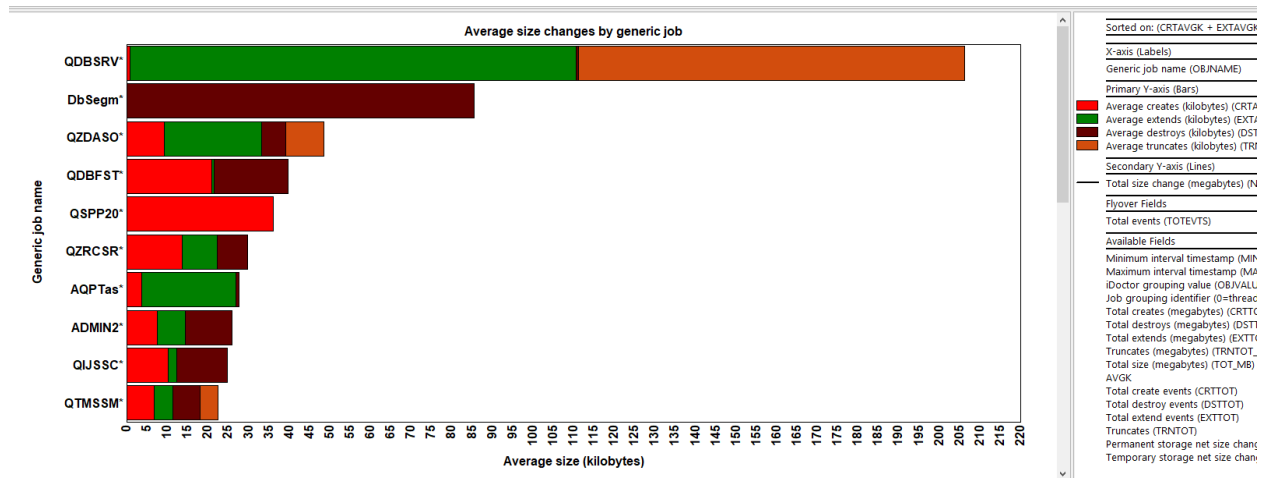


Total size changes by program | object

27.3.8 Average size changes rankings

This graph shows average size changes per event type ranked by 1 of several possible ways.

An example follows:



Average size changes by generic job

27.3.9 Detail reports

These reports give more details behind the events captured within the PEX collection.

Tip: You can access these reports as a drill-down from one of the graphs for the selected time or grouping.

Report	Description
Storage event details	
Storage event details (SMTRMOD file format)	
Storage event summary by program	
Storage event summary by program, job/thread	
Storage event summary by object	
Storage event summary by object, job/thread	
ASM event details with call stack drill downs	Double-click for a call stack
ASM summary by object and segment type	
ASM activity by extent pool	
ASM activity by extent pool with request size	
Modules driving ASM activity	
Net size call stacks by instruction	

Net size changes -> Detail reports

27.3.9.1 Storage event details

This report shows the several fields behind the ASM events captured in the collection.

Idoc730/MCCARGAR2/ASM/Storage event details - #1												
Call stack QRECN (IAD_QRECN)	(Minimum) QRECN (QRECN)	Event type (flyover) (EVENT)	Call Stack Exists (flyover) (CSTK)	QRYTNAM2 (QRYTNAM2)	Operation (OPR)	IO length (bytes) (BYTELEN)	NAMEONLY (NAMEONLY)	Object type (OBJTYPE)	Segment type (SEGTYPE)	OBJSEDESC (OBJSEDESC)	LICMOD (LICMOD)	MIM (MIM)
0	11851	4-5		RMDELETETASKP000 00000196	FSZ S	4096	QZDASOINITQUSER 001109	1AEF	208A	TEMPORARY - PROCESS CTL SPACE	SMSEGMNT	UNK
0	11852	4-5		RMDELETETASKP000 00000196	FSZ S	4096	QZDASOINITQUSER 001109	1AEF	208A	TEMPORARY - PROCESS CTL SPACE	SMSEGMNT	UNK
11853	11853	4-6	Y	RMDELETETASKP000 00000196	TRN S	8192	MODUL2 STATIC STORE	0000	208B	MODULA-2 STATIC STORAGE	M2RSSVT	UNK
11854	11854	4-6	Y	RMDELETETASKP000 00000196	TRN S	28672	IWA	0000	0087	IWA/Stack segment	RM000023	UNK
0	11855	4-5		RMDELETETASKP000 00000196	FSZ S	16384	MAHANDLEMAPPER SEG	0000	2190	MA Handle Mapper	SMSEGMNT	UNK
0	11856	4-5		RMDELETETASKP000 00000196	FSZ S	4096	DESCRIPTOR TABLE SEG	0000	210C	DESCRIPTOR TABLE	SMSEGMNT	UNK
0	5271	4-5		RMDELETETASKP000 00000196	FSZ S	4096	QZRCRSVS QUSER 001110	1AEF	208A	TEMPORARY - PROCESS CTL SPACE	SMSEGMNT	UNK
0	5272	4-5		RMDELETETASKP000 00000196	FSZ S	4096	QZRCRSVS QUSER 001110	1AEF	208A	TEMPORARY - PROCESS CTL SPACE	SMSEGMNT	UNK
5273	5273	4-6	Y	RMDELETETASKP000 00000196	TRN S	8192	MODUL2 STATIC STORE	0000	208B	MODULA-2 STATIC STORAGE	M2RSSVT	UNK
5274	5274	4-6	Y	RMDELETETASKP000 00000196	TRN S	28672	IWA	0000	0087	IWA/Stack segment	RM000023	UNK
0	5275	4-5		RMDELETETASKP000 00000196	FSZ S	16384	MAHANDLEMAPPER SEG	0000	2190	MA Handle Mapper	SMSEGMNT	UNK
0	5276	4-5		RMDELETETASKP000 00000196	FSZ S	4096	DESCRIPTOR TABLE SEG	0000	210C	DESCRIPTOR TABLE	SMSEGMNT	UNK
0	9428	4-5		RMDELETETASKP000 00000196	FSZ S	4096	QZRCRSVS QUSER 001099	1AEF	208A	TEMPORARY - PROCESS CTL SPACE	SMSEGMNT	UNK
0	9429	4-5		RMDELETETASKP000 00000196	FSZ S	4096	QZRCRSVS QUSER 001099	1AEF	208A	TEMPORARY - PROCESS CTL SPACE	SMSEGMNT	UNK

Storage event details

27.3.9.2 Storage event details (SMTRMOD file format)

This report is like the previous one, except contains many additional columns.

27.3.9.3 Storage event summary by program

This report is a summary of the ASM events by operation grouped by program and MI module.

It includes the event count and total size and average size.

Idoc730/MCCARGAR2/ASM/Storage event summary by program - #1					
Storage (net size) event count (OPR_COUNT)	Operation (OPR)	Total storage events size (megabytes) (OPRSIZE_MB)	Average storage event size (kilobytes) (AVGOPRSIZEKB)	Program name (QPRPGN)	MIMOD (MIMOD)
1443	FSZ S	3028.3750	2149.0340		QDBSSUDF2
734	EXT S	5.6328	7.8583	UNKNOWN	UNKNOWN
696	CRT S	12.5664	18.4885	QQQOOODBOP	QQQOOODBOP
553	FSZ S	46.3086	85.7505		UNKNOWN
553	EXT S	28.0391	51.9204	QQQOOODBOP	QQQOOODBOP
495	DST S	41.4844	85.8182	UNKNOWN	UNKNOWN
370	CRT S	8.1367	22.5189	QQQSRVI1	QQQSRVI1
307	TRN S	51.0625	170.3192	QSQSBAS	QSQSBAS
268	CRT S	23.0273	87.9851	UNKNOWN	UNKNOWN
267	FSZ S	94.5000	362.4270		QQQOOODBOP
259	DST S	1.3516	5.3436	QQQOOODBOP	QQQOOODBOP
242	DST S	3.3359	14.1157	QDMCLOSE	QDMCLOSE
229	TRN S	8.7422	39.0917	QQQSRVI1	QQQSRVI1
217	FSZ S	.8750	4.1290		QDBXRDDM
217	CRT S	.8594	4.0553	QDBXRDDM	QDBXRDDM
216	DST S	.8438	4	QDBXRDDM	QDBXRDDM
190	FSZ S	4.8867	26.3368		QQQQEXIT

Storage event summary by program

27.3.9.4 Storage event summary by program, job/thread

This report is like the previous one except it also groups by job/thread.

Idoc730/MCCARGAR2/ASM/Storage event summary by program - #1				Idoc730/MCCARGAR2/ASM/Storage event summary by program, job/thread - #1			
Storage (net size) event count (OPR_COUNT)	Operation (OPR)	Total storage events size (megabytes) (OPR_SIZE_MB)	Average storage event size (kilobytes) (AVGOPR_SIZEKB)	Program name (QPRPGN)	MIMOD (MIMOD)	QRYTNAM2 (QRYTNAM2)	TDEBIG (TDEBIG)
1443	FSZ S	3028.3750	2149.0340		QDBSSUDF2	QZDASOINIT QUSER	001104 Y 0000000000000009 0000000000017F21
355	EXT S	20.8320	60.0901	QQQO00DBOP	QQQO00DBOP	QZDASOINIT QUSER	001104 Y 0000000000000009 0000000000017F21
324	CRT S	5.4727	17.2963	QQQO00DBOP	QQQO00DBOP	Q1ACPDST QBRMS	000493 Y 0000000000000001 00000000000003F1
267	CRT S	5.9570	22.8464	QQQO00DBOP	QQQO00DBOP	QZDASOINIT QUSER	001104 Y 0000000000000009 0000000000017F21
258	DST S	21.6094	85.7674	UNKNOWN	DbSegmentMonitor	0000025D	000000000000025D 0000000000017F21
217	CRT S	.8594	4.0553	QDBXRDDM	QDBXRDDM	QZDASOINIT QUSER	001104 Y 0000000000000009 0000000000017F21
217	FSZ S	.8750	4.1290		QDBXRDDM	QZDASOINIT QUSER	001104 Y 0000000000000009 0000000000017F21
216	DST S	.8438	4	QDBXRDDM	QDBXRDDM	QZDASOINIT QUSER	001104 Y 0000000000000009 0000000000017F21
201	CRT S	4.3789	22.3085	QQQSRV11	QQQSRV11	QZDASOINIT QUSER	001104 Y 0000000000000009 0000000000017F21
177	FSZ S	54.5195	315.4124		QQQO00DBOP	QZDASOINIT QUSER	001104 Y 0000000000000009 0000000000017F21
161	TRN S	6.8711	43.7019	QQQSRV11	QQQSRV11	QZDASOINIT QUSER	001104 Y 0000000000000009 0000000000017F21
139	EXT S	5.2109	38.3885	QQQO00DBOP	QQQO00DBOP	Q1ACPDST QBRMS	000493 Y 0000000000000001 00000000000003F1
126	DST S	.4922	4	QQQO00DBOP	QQQO00DBOP	Q1ACPDST QBRMS	000493 Y 0000000000000001 00000000000003F1
120	EXT S	7.7344	66	QSQPROC	QSQPROC	QZDASOINIT QUSER	001104 Y 0000000000000009 0000000000017F21
110	TRN S	13.4609	125.3091	QSQSBA5	QSQSBA5	QZDASOINIT QUSER	001104 Y 0000000000000009 0000000000017F21
95	DST S	1.9141	20.6316	QDMCLOSE	QDMCLOSE	Q1ACPDST QBRMS	000493 Y 0000000000000001 00000000000003F1
95	CRT S	1.8789	20.2526	QQQSRV11	QQQSRV11	QZDASOINIT QUSER	001107 Y 0000000000000005 0000000000017F72
92	CRT S	.7188	8	QLILIST	QLILIST	QZDASOINIT QUSER	001104 Y 0000000000000009 0000000000017F21
92	CRT S	.9805	10.9130	QQQO00DBOP	QQQO00DBOP	QZDASOINIT QUSER	001107 Y 0000000000000005 0000000000017F72
90	DST S	.6250	7.3737	QQQO00DBOP	QQQO00DBOP	QZDASOINIT QUSER	001104 Y 0000000000000009 0000000000017F21

Storage event summary by program, job/thread

27.3.9.5 Storage event summary by object

This report is a summary of the ASM events by operation grouped by object including object type and segment type.

It includes the event count and total size and average size.

Storage (net size) event count (OPR_COUNT)	Operation (OPR)	Total storage events size (megabytes) (OPR_SIZE_MB)	Average storage event size (kilobytes) (AVGOPR_SIZEKB)	Object name [objtype/segtype] (NAMETYPE)
626	EXT S	3.3477	5.4760	ACTVTN PROC REF TBL 0000
501	EXT S	65.5703	134.0200	TERASPACE ADDRESS 0000
318	CRT S	3.8594	12.4277	DB STATS 0000
306	FSZ S	9.9609	33.3333	ADMIN2 QLWISVR 000505 1AEF
288	DST S	12.0469	42.8333	DB STATS 0000
222	EXT S	17.3438	80	DB STATS 0000
183	CRT S	2.4688	13.8142	DB OPTIMIZER 0000
180	FSZ S	5.8594	33.3333	ADMIN5 QLWISVR 000506 1AEF
172	TRN S	37.4375	222.8837	TERASPACE ADDRESS 0000
165	EXT S	5.9766	37.0909	DB OPTIMIZER 0000
153	DST S	4.9805	33.3333	ADMIN2 QLWISVR 000505 1AEF
148	CRT S	3.7578	26	QZDASOINITQUSER 001104 1AEF
145	DST S	7.1953	50.8138	DB OPTIMIZER 0000
141	CRT S	3.1211	22.6667	ADMIN2 QLWISVR 000505 1AEF
125	EXT S	1.8398	15.0720	DB ENGINE CONTROL 0000
107	FSZ S	56.2539	538.3551	STREAM POOL CONTAINR 0000
105	CRT S	1.2852	12.5333	DB ENGINE CONTROL 0000
103	CRT S	.9805	9.7476	DB WRK SG FRM ?DBSID 0000
99	EXT S	6.0820	62.9091	QSQSPCOB00000004 19EF
99	EXT S	6.2148	64.2828	QSQSPCOB00000005 19EF
98	DST S	.9531	9.9592	DB WRK SG FRM ?DBSID 0000

Storage event summary by object

27.3.9.6 Storage event summary by object, job/thread

This report is like the previous one except it also groups by job/thread.

Idoc730/MCCARGAR2/ASM/Storage event summary by object, job/thread - #1									
Storage (net size) event count (OPR_COUNT)	Operation (OPR)	Total storage events size (megabytes) (OPR_SIZE_MB)	Average storage event size (kilobytes) (AVGOPR_SIZEKB)	Object name [objtype/segtype] (NAME/TYPE)			QRYTNAME2 (QRYTNAME2)		TDEBIG (TDEBIG)
149	EXT S	14.5742	100.1611	DB STATS	0000		QZDASOINIT QUSER	001104 Y 0000000000000009	0000000000017F21
148	CRT S	3.7578	26	QZDASOINITQUSER	001104	1AEF	QZDASOINIT QUSER	001104 Y 0000000000000009	0000000000017F21
109	CRT S	1.4375	13.5046	DB STATS	0000		Q1ACPDST QBRMS	000493 Y 0000000000000001	00000000000003F1
106	EXT S	.6445	6.2264	ACTVTN PROC REF TBL	0000		QZDASOINIT QUSER	001107 Y 0000000000000005	0000000000017F72
103	EXT S	4.1992	41.7476	DB OPTIMIZER	0000		QZDASOINIT QUSER	001104 Y 0000000000000009	0000000000017F21
103	CRT S	1.2539	12.4660	DB STATS	0000		QZDASOINIT QUSER	001104 Y 0000000000000009	0000000000017F21
97	EXT S	14.2656	150.5979	TERASPACE ADDRESS	0000		QZDASOINIT QUSER	001104 Y 0000000000000009	0000000000017F21
92	EXT S	5.7969	64.5217	QSQSPCOB000000011	19EF		QZDASOINIT QUSER	001104 Y 0000000000000009	0000000000017F21
90	EXT S	.4922	5.6000	ACTVTN PROC REF TBL	0000		QZDASOINIT QUSER	001106 Y 000000000000000F	0000000000017F71
90	EXT S	.4922	5.6000	ACTVTN PROC REF TBL	0000		QZDASOINIT QUSER	001109 Y 0000000000000003	0000000000017F74
90	EXT S	.4922	5.6000	ACTVTN PROC REF TBL	0000		QZDASOINIT QUSER	001108 Y 0000000000000002	0000000000017F73
88	EXT S	.6367	7.4091	DB ENGINE CONTROL	0000		QZDASOINIT QUSER	001104 Y 0000000000000009	0000000000017F21
87	CRT S	1.1094	13.0575	DB OPTIMIZER	0000		QZDASOINIT QUSER	001104 Y 0000000000000009	0000000000017F21
86	DST S	10.7578	128.0930	DB STATS	0000		DbSegmentMonitor	0000025D	000000000000025D
83	DST S	6.8281	84.2410	DB OPTIMIZER	0000		DbSegmentMonitor	0000025D	000000000000025D
78	EXT S	.3789	4.9744	ACTVTN PROC REF TBL	0000		QZRCRSVS QUSER	001111 Y 0000000000000006	0000000000017F76
78	EXT S	.3789	4.9744	ACTVTN PROC REF TBL	0000		QZRCRSVS QUSER	001110 Y 0000000000000025	0000000000017F75

Storage events summary by object, job/thread

27.3.9.7 ASM event details with call stack drill-down

This report is like the Storage event details report except only includes events that include a call stack.

Tip: Double-click, then click the Call-stack tab to access the call stack.

Idoc730/MCCARGAR2/ASM/ASM event details - #1														
Event type (flyover) (EVENT)	(Minimum) QRECN (QRECN)	Call stack QRECN (IAD_QRECN)	QRYTNAME2 (QRYTNAME2)	Operation (OPR)	IO length (bytes) (BYTLEN)	NAMEONLY (NAMEONLY)	Object type (OBJTYPE)	Segment type (SEGTYPE)	OBJ/SEGDESC (OBJ/SEGDESC)	LICMOD (LICMOD)	MIMOD (MIMOD)	DATETIME (DATETIME)	Program library (QPRPQI)	
4-6	11853	11853	RMDELETETASKP000 00000196	TRN S	8192	MODUL2 STATIC STORE	0000	2088	MODULA-2 STATIC STORAGE	M2RSSVT	UNKNOWN	2017-06-27-12:21:07.563864		
4-6	11854	11854	RMDELETETASKP000 00000196	TRN S	28672	IWA	0000	0087	IWA/Stack segment	RM000023	UNKNOWN	2017-06-27-12:21:07.563901		
4-6	5273	5273	RMDELETETASKP000 00000196	TRN S	8192	MODUL2 STATIC STORE	0000	2088	MODULA-2 STATIC STORAGE	M2RSSVT	UNKNOWN	2017-06-27-12:21:07.569987		
4-6	5274	5274	RMDELETETASKP000 00000196	TRN S	28672	IWA	0000	0087	IWA/Stack segment	RM000023	UNKNOWN	2017-06-27-12:21:07.570008		
4-6	9430	9430	RMDELETETASKP000 00000196	TRN S	8192	MODUL2 STATIC STORE	0000	2088	MODULA-2 STATIC STORAGE	M2RSSVT	UNKNOWN	2017-06-27-12:21:07.585268		
4-2	11070	11070	SCPF QSYS 000000 Y 000000000000000001	CRT S	8192	QHST17177AQSYS	QHST17177A	0DEF	0001	DB2 OPERATIONAL CURSOR	DBDUPCR	QDMCOPEN	2017-06-27-12:21:07.571596	QSYS
4-2	11071	11071	SCPF QSYS 000000 Y 000000000000000001	CRT S	4096	DB STATS	0000	211E	DB STATS	DB8FMGR	QDBGETSQ	2017-06-27-12:21:07.571755	QSYS	
4-2	11072	11072	SCPF QSYS 000000 Y 000000000000000001	CRT S	4096	DB STATS	0000	2088	DB STATS	DBCCRR	QDBGETSQ	2017-06-27-12:21:07.571776	QSYS	
4-3	11074	11074	SCPF QSYS 000000 Y 000000000000000001	DST S	8192	QHST17177AQSYS	QHST17177A	0DEF	0001	DB2 OPERATIONAL CURSOR	CFDESTO	QDMCLOSE	2017-06-27-12:21:07.571839	QSYS
4-3	11076	11076	SCPF QSYS 000000 Y 000000000000000001	DST S	4096	DB STATS	0000	2088	DB STATS	DBDCR	QDMCLOSE	2017-06-27-12:21:07.571858	QSYS	
4-3	11077	11077	SCPF QSYS 000000 Y 000000000000000001	DST S	4096	DB STATS	0000	211E	DB STATS	DB8FMGR	QDMCLOSE	2017-06-27-12:21:07.571871	QSYS	
4-2	11078	11078	SCPF QSYS 000000 Y 000000000000000001	CRT S	8192	QHST17177AQSYS	QHST17177A	0DEF	0001	DB2 OPERATIONAL CURSOR	DBDUPCR	QDMCOPEN	2017-06-27-12:21:07.571914	QSYS
4-4	11079	11079	SCPF QSYS 000000 Y 000000000000000001	EXT S	8192	QHST17177AQSYS	QHST17177A	0DEF	0001	DB2 OPERATIONAL CURSOR	SOMOD	QDBOPEN	2017-06-27-12:21:07.571954	QSYS
4-3	11870	11870	SCPF QSYS 000000 Y 000000000000000001	DST S	16384	QHST17177AQSYS	QHST17177A	0DEF	0001	DB2 OPERATIONAL CURSOR	CFDESTO	QDMCLOSE	2017-06-27-12:21:07.576055	QSYS
4-2	9695	9695	SCPF QSYS 000000 Y 000000000000000001	CRT S	8192	QHST17177AQSYS	QHST17177A	0DEF	0001	DB2 OPERATIONAL CURSOR	DBDUPCR	QDMCOPEN	2017-06-27-12:21:07.765104	QSYS
4-2	9696	9696	SCPF QSYS 000000 Y 000000000000000001	CRT S	4096	DB STATS	0000	211E	DB STATS	DB8FMGR	QDBGETSQ	2017-06-27-12:21:07.765234	QSYS	
4-2	9697	9697	SCPF QSYS 000000 Y 000000000000000001	CRT S	4096	DB STATS	0000	2088	DB STATS	DBCCRR	QDBGETSQ	2017-06-27-12:21:07.765253	QSYS	
4-3	9699	9699	SCPF QSYS 000000 Y 000000000000000001	DST S	8192	QHST17177AQSYS	QHST17177A	0DEF	0001	DB2 OPERATIONAL CURSOR	CFDESTO	QDMCLOSE	2017-06-27-12:21:07.765324	QSYS
4-3	9701	9701	SCPF QSYS 000000 Y 000000000000000001	DST S	4096	DB STATS	0000	2088	DB STATS	DBDCR	QDMCLOSE	2017-06-27-12:21:07.765357	QSYS	
4-3	9702	9702	SCPF QSYS 000000 Y 000000000000000001	DST S	4096	DB STATS	0000	211E	DB STATS	DB8FMGR	QDMCLOSE	2017-06-27-12:21:07.765375	QSYS	
4-2	9703	9703	SCPF QSYS 000000 Y 000000000000000001	CRT S	8192	QHST17177AQSYS	QHST17177A	0DEF	0001	DB2 OPERATIONAL CURSOR	DBDUPCR	QDMCOPEN	2017-06-27-12:21:07.765445	QSYS
4-4	9704	9704	SCPF QSYS 000000 Y 000000000000000001	EXT S	8192	QHST17177AQSYS	QHST17177A	0DEF	0001	DB2 OPERATIONAL CURSOR	SOMOD	QDBOPEN	2017-06-27-12:21:07.765510	QSYS
4-3	5716	5716	SCPF QSYS 000000 Y 000000000000000001	DST S	16384	QHST17177AQSYS	QHST17177A	0DEF	0001	DB2 OPERATIONAL CURSOR	CFDESTO	QDMCLOSE	2017-06-27-12:21:07.767836	QSYS
4-4	10753	10753	QDBSRV04 QSYS 000348 Y 000000000000000001	EXT S	262144	TERASPACE ADDRESS	0000	0000	*UNKNOWN	SMPLASPC	QSQRUN4	2017-06-27-12:20:43.804916		
4-4	10754	10754	QDBSRV04 QSYS 000348 Y 000000000000000001	EXT S	262144	TERASPACE ADDRESS	0000	0000	*UNKNOWN	SMPLASPC	QSQRUN2	2017-06-27-12:20:43.805549		
4-6	10755	10755	QDBSRV04 QSYS 000348 Y 000000000000000001	TRN S	229376	TERASPACE ADDRESS	0000	0000	*UNKNOWN	SMPLASPC	QSQBAS	2017-06-27-12:20:43.806125	QSYS	
4-6	10756	10756	QDBSRV04 QSYS 000348 Y 000000000000000001	TRN S	229376	TERASPACE ADDRESS	0000	0000	*UNKNOWN	SMPLASPC	OSQSBAS	2017-06-27-12:20:43.806174	QSYS	

ASM event details with call stack drill-down

27.3.9.8 ASM summary by object and segment type

This report summarizes the events by object and segment type and sorts the data by the same fields.

Idoc730/MCCARGAR2/ASM/ASM summary by object and segment type - #2						
Object type (OBJTYPE)	Segment type (SEGTYPE)	OBJSEGDESC (OBJSEGDESC)	SID type (SIDTYPE)	Total events (TOTEVTS)	Total size (megabytes) (TOT_MB)	Total size change (megabytes) (NETTOT_MB)
0AEF	0001	TEMPORARY - QUEUE	T	227	1.0039	.0195
0AEF	0002	TEMPORARY - QUEUE	T	1	.0078	.0078
0AEF	002D	TEMPORARY - QUEUE	T	2	.0078	.0078
0B90	0001	PHYSICAL FILE MBR - DATA PART	DP	1	.0117	0
0B90	0003	PHYSICAL FILE MBR - DATA PART	DP	403	2470.2617	.0078
0B90	0010	PHYSICAL FILE MBR - DATA PART	DP	64	.2500	0
0B90	0013	PHYSICAL FILE MBR - DATA PART	DP	135	418.0078	0
0B90	0014	PHYSICAL FILE MBR - DATA PART	DP	1	.0039	0
0B90	0015	PHYSICAL FILE MBR - DATA PART	DP	2	.2813	0
0B90	002B	PHYSICAL FILE MBR - DATA PART	DP	682	78.4414	0
0B90	20B1	PHYSICAL FILE MBR - DATA PART	DT	4	.0625	.0625
0B90	2147	PHYSICAL FILE MBR - DATA PART	T	16	.1250	.0625
0C90	000B	DB2 ACCESS PATH	DP	6	.6250	0
0C90	0001	DB2 ACCESS PATH	DP	127	6.9219	0
0C90	0002	DB2 ACCESS PATH	D	173	1.3516	0

ASM summary by object and segment type

27.3.9.9 ASM activity by extent pool

Idoc730/MCCARGAR2/ASM/ASM summary by object and segment type - #2										Idoc730/MCCARGAR2/ASM/ASM activity by extent pool - #1							
Storage (net size) event count (OPR_COUNT)	Operation (OPR)	L0 (L0)	L1 (L1)	L2 (L2)	L3 (L3)	L4 (L4)	L5 (L5)	L6 (L6)	L0_1 (L0_1)	L0_2 (L0_2)	L0_3 (L0_3)	L0_4 (L0_4)	L0_5 (L0_5)	L0_6 (L0_6)	L0_7 (L0_7)	TRACE_DURATION_SECONDS (TRACE_DURATION_SECONDS)	
4196		2810	1233	526	334	201	169	257	892	897	277	258	227	127	132	300	
2612	EXT S	1369	897	299	203	198	10	6	889	144	46	223	15	42	10	300	
2597	CRT S	2005	637	94	41	8	14	10	910	625	223	37	172	34	4	300	
2104	DST S	1589	499	189	57	16	20	6	734	535	137	34	102	35	12	300	
712	TRN S	267	169	178	300	24	1	3	155	15	10	6	79	0	2	299	

ASM activity by extent pool

27.3.9.10 ASM activity by extent pool with request size

Storage (net size) event count (OPR_COUNT)	Pages in segment (QAMPGS)	Operation (OPR)	L0 (L0)	L1 (L1)	L2 (L2)	L3 (L3)	L4 (L4)	L5 (L5)	L6 (L6)	L0_1 (L0_1)	L0_2 (L0_2)	L0_3 (L0_3)	L0_4 (L0_4)	L0_5 (L0_5)	L0_6 (L0_6)	L0_7 (L0_7)	TRACE_DURATION_SECONDS (TRACE_DURATION_SECONDS)
818	2		818	0	0	0	0	0	0	0	818	0	0	0	0	0	300
807	1	CRT S	807	0	0	0	0	0	0	807	0	0	0	0	0	0	299
727	1	EXT S	727	0	0	0	0	0	0	727	0	0	0	0	0	0	299
611	2	CRT S	611	0	0	0	0	0	0	0	611	0	0	0	0	0	300
592	1	DST S	592	0	0	0	0	0	0	592	0	0	0	0	0	0	297
517	2	DST S	517	0	0	0	0	0	0	0	517	0	0	0	0	0	300
502	1		502	0	0	0	0	0	0	502	0	0	0	0	0	0	297
229	9		229	229	0	0	0	0	0	229	0	0	0	0	0	0	299
216	4	EXT S	216	0	0	0	0	0	0	0	0	0	216	0	0	0	293
198	3	CRT S	198	0	0	0	0	0	0	0	0	198	0	0	0	0	300
172	5	CRT S	172	0	0	0	0	0	0	0	0	0	0	172	0	0	297
160	3		160	0	0	0	0	0	0	0	0	160	0	0	0	0	297
137	25	EXT S	137	137	137	0	0	0	0	137	0	0	0	0	0	0	299

ASM activity by extent pool with request size

27.3.9.11 Modules driving ASM activity

This report summarizes the ASM events by LIC or MI module.

Tip: This only shows extends and creates (event sub type 2 and 4). Modify the SQL statement to include truncates and destroys if desired (3 and 6.)

```

Idoc730/MCCARGAR2/ASM/Modules driving ASM activity - #1 x
with t as (
SELECT TIDX.qrecn qrecn, qampgs, case qtisty when 2 then 'CRT S'
when 3 then 'DST S' when 4 then 'EXT S' when 6 then 'TRN S' end
opr, qtisp
FROM QTEMP/QAYPEASM_MCCARGAR2_ASM A LEFT OUTER JOIN
QTEMP/QAYPETIDX_MCCARGAR2_ASM TIDX ON A.QRECNO = TIDX.QRECNO LEFT OUTER JOIN
QTEMP/QAYPESEGI_MCCARGAR2_ASM SEGI ON A.QOBJKEY = SEGI.QOBJKEY LEFT OUTER JOIN
QTEMP/QAYPETASKI_MCCARGAR2_ASM TASKI ON QTIFTC = QTSTCT left outer join
QTEMP/QAYPEIAD_MCCARGAR2_ASM IAD on IAD.QRECNO = A.QRECNO
WHERE QTITSP >= '2017-06-27-12.20.40.221720' AND QTITSP <= '2017-06-27-12.25.40.444148'
AND 1=1
AND qtity=4 and qtisty in (2, 4))
, t1 as (
select qrecn, qampgs, opr, qtisp

```

Modules driving ASM activity SQL statement with event type selection criteria

Storage (net size) event count (OPR_COUNT)	Operation (OPR)	Pages in segment (QAMPGS)	LIC module RU name (LICMOD)	MIMOD (MIMOD)	Resource event type (QTITY)	Resource event subtype (QTISTY)
430	EXT S	1	AIRAWSEG		4	4
211	CRT S	1	DBSTM01B	QQQOOODBOP	4	2
168	EXT S	4	SMPLASPC		4	4
139	CRT S	5	PM000003	QQQSRV11	4	2
128	CRT S	2	SOCRT	QLILIST	4	2
98	CRT S	1	DBSEGMENT	QQQOOODBOP	4	2
93	EXT S	1	DBSEGMENT	QQQOOODBOP	4	4
92	CRT S	3	SOCRT	QQQSRV11	4	2
89	EXT S	25	EXDFTHND	QSQRPROC	4	4
86	EXT S	2	AIRAWSEG		4	4
83	CRT S	2	DBUPCALL	QQQOOODBOP	4	2
77	CRT S	1	PM000003	QP2USER2	4	2
72	CRT S	1	QMSIZCLC	QDBXRDDM	4	2
72	CRT S	1	QMCRTMIQ	QDBXRDDM	4	2
72	CRT S	1	QMSUPSEG	QDBXRDDM	4	2
54	CRT S	2	SOCRT	QDFCDF	4	2
49	CRT S	2	DBDUPCR	QDMCOPEN	4	2
47	EXT S	25	EXDFTHND	QSQRCHK	4	4
47	CRT S	2	SOCRT	QDBXRDDM	4	2

Modules driving ASM activity

27.3.9.12 Net size call stacks by instruction

This report groups the call stacks together for the ASM events found in the collection.

Tip: You can access this report as a drill-down from one of the graphs described previously.

IBM iDoctor for IBM i

Idoc730/MCCARGAR2/ASM/Net size call stacks by instruction - #1						
Total events (TOTEVTS)	Event subtype description (short) (QEVSSN)	Call level (LEVEL)	Program model (MODEL)	Program name (PGMNAM)	Module name (MODNAM)	Procedure name (PRCNAM)
506	*EXDSEG	1	LIC		SmAsmStacksHighUse	smasmswitchstackandcall
506	*EXDSEG	2	LIC		AiRawSeg	pCommit_8AiRawSegFl
506	*EXDSEG	3	LIC		AiRawSeg	Allocate_8AiRawSegFul
506	*EXDSEG	4	LIC		AiArenStg	Allocate_10AiArenStgFul
506	*EXDSEG	5	LIC		AiEagerActivator	pConstructActivation_16AiEagerActivatorFP11AiPgProgramP8AiActGrpIP18AiPgActivationInfoUIT5
506	*EXDSEG	6	LIC		AiEagerActivator	pAllocateActivation_16AiEagerActivatorFP11AiPgProgramP8AiActGrpUIUt
506	*EXDSEG	7	LIC		AiEagerActivator	pFindAndUpgradeSrvPgmActivation_16AiEagerActivatorFR10AiActGraphP11AiPgProgramP12AiActivationUI
506	*EXDSEG	8	LIC		AiEagerActivator	pBuildDepGraph_16AiEagerActivatorFR10AiActGraphP11AiPgProgram
506	*EXDSEG	9	LIC		AiEagerActivator	pCreateActivation_16AiEagerActivatorFP11AiPgProgram
506	*EXDSEG	10	LIC		AiEagerActivator	activate_16AiEagerActivatorFv
506	*EXDSEG	11	LIC		AiUpCallProgram	pActivatePgm_15AiUpCallProgramFP5AiPgmP9AiProcessR14AiIcbClearAreaRii
506	*EXDSEG	12	LIC		AiUpCallProgram	targetProgramActivation_15AiUpCallProgramFR14AiIcbClearAreaIP16AiMachinePgmCall
506	*EXDSEG	13	LIC		AiUpCallProgram	machineProgramCall_15AiUpCallProgramFP16AiMachinePgmCall
506	*EXDSEG	14	LIC		AiUpCallPortalMach	aimach_program_call_portal
506	*EXDSEG	15	LIC		pmInitiateProcess	pmInitiateProcessUnderTarget_Fv
258	*DLTSEG	1	LIC		SmAsmStacksHighUse	smasmswitchstackandcall
258	*DLTSEG	2	LIC		DbSegment	sDestroySegment_9DbSegmentFPvUI
258	*DLTSEG	3	LIC		DbSegment	sMonitor_Q2_9DbSegment5CacheFRPQ2_9DbSegment5Cache
258	*DLTSEG	4	LIC		rmInitialRoutine	rmInitialRoutine
156	*EXDSEG	1	LIC		SmAsmStacksHighUse	smasmswitchstackandcall
156	*EXDSEG	2	LIC		SmPlaSpace	doPlaFunction_19SmPlaSpaceAllocatorFv
156	*EXDSEG	3	LIC		PmHsAddressSpace	performSmPlaSpaceOperation_16PmHsAddressSpaceFR10SmPlaSpaceIN22
156	*EXDSEG	4	LIC		PmHsStgExtent	allocateStorage_13PmHsStgExtentFUIT1Q2_4PmHs11StgMgmtCtrlQ2_4PmHs11ProtectMode
156	*EXDSEG	5	LIC		PmHsMiAllocator	allocateStorage_15PmHsMiAllocatorFUIT1R18PmHsAddressContext
156	*EXDSEG	6	LIC		PmHsMiAllocator	handle8AExcp_15PmHsMiAllocatorFUIR37Ex008AProcessLocalAddressingViolationR15SlicMiExceptionR18PmHsAd
156	*EXDSEG	7	LIC		PmHsMemObj	handle8AExcp_10PmHsMemObjFUIR37Ex008AProcessLocalAddressingViolationR15SlicMiExceptionP10PmHsExtent
156	*EXDSEG	8	LIC		PmHsHyperspace	process8AExcp_14PmHsHyperspaceFUIR37Ex008AProcessLocalAddressingViolationR15SlicMiExceptionR13PmHsV
156	*EXDSEG	9	LIC		PmHsHyperspace	process8AExcp_14PmHsHyperspaceFR37Ex008AProcessLocalAddressingViolationR15SlicMiException
156	*EXDSEG	10	LIC		ExDefaultHandlersHighUse	ExDefaultHandlers_FR15SystemExceptionR15SlicMiException
156	*EXDSEG	11	LIC		ExExceptHighUse	realDoThrow_FPC16realDoThrowInput
156	*EXDSEG	12	LIC		ExExceptHighUse	_DoThrow

Net size call stacks by instruction

28 Page faults

This analysis examines the page fault events. These are event type 6 in the PEX data.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
6	1	FAULTVT	*USER	Service
6	2	FAULTVT	*STR	Page Fault Start
6	3	FAULTVT	*ENDOK	Page Fault End OK
6	4	FAULTVT	*ENDERR	Page Fault End with Error

Page fault events from QAYPEEVENT

Tip: If you specify page fault start events with *FORMAT2, this will include a call stack.

Note: Some graphs show an average page fault time metric. This requires that end events are captured and not just the page fault start event or the value will always be 0.

28.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

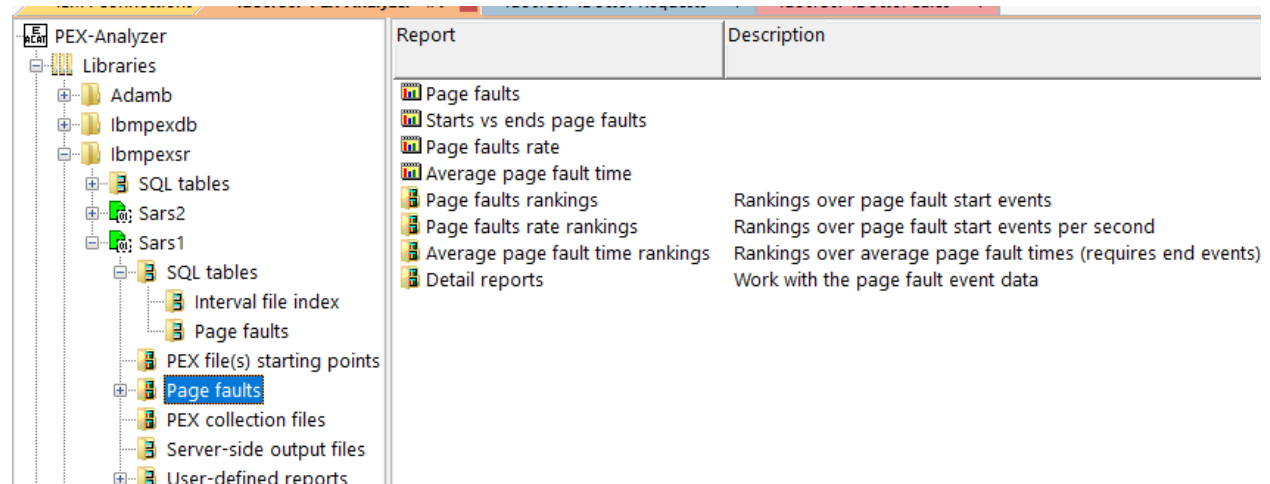
28.2 SQL tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
PEXFLT_<MBR>	Page faults interval summary table
PEXFLT2_<MBR>	Page faults events table

28.3 Page faults

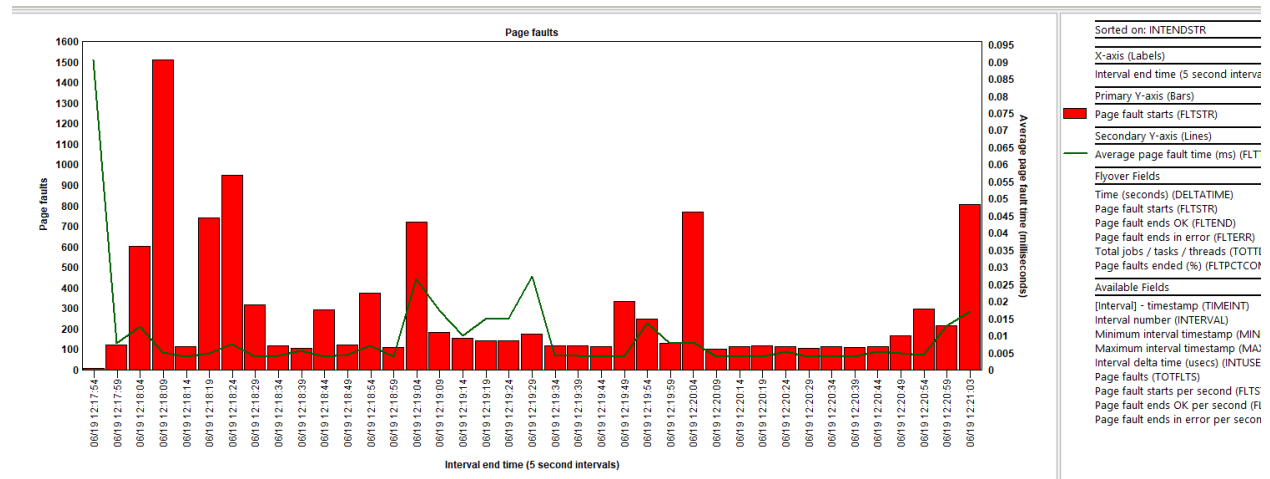
This folder contains the graphs and reports available after the analysis has completed.



Page faults

28.3.1 Page faults

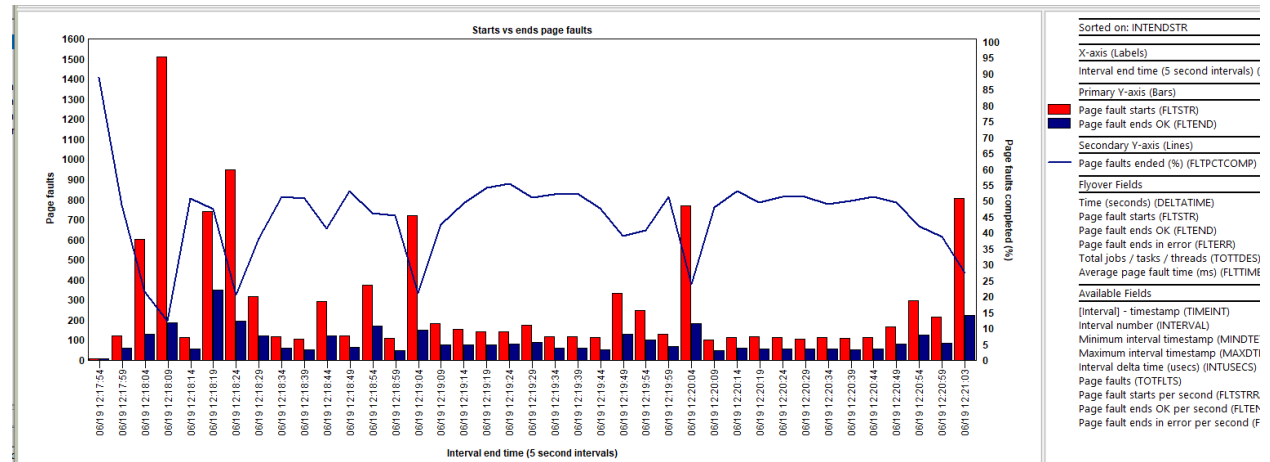
This graph shows the page fault starts and any “page fault ends with error” events occurring only. It does not show page fault end OK events. The Y2-axis displays the average time (in milliseconds) but only if the end events were captured.



Page faults

28.3.2 Starts vs ends page faults

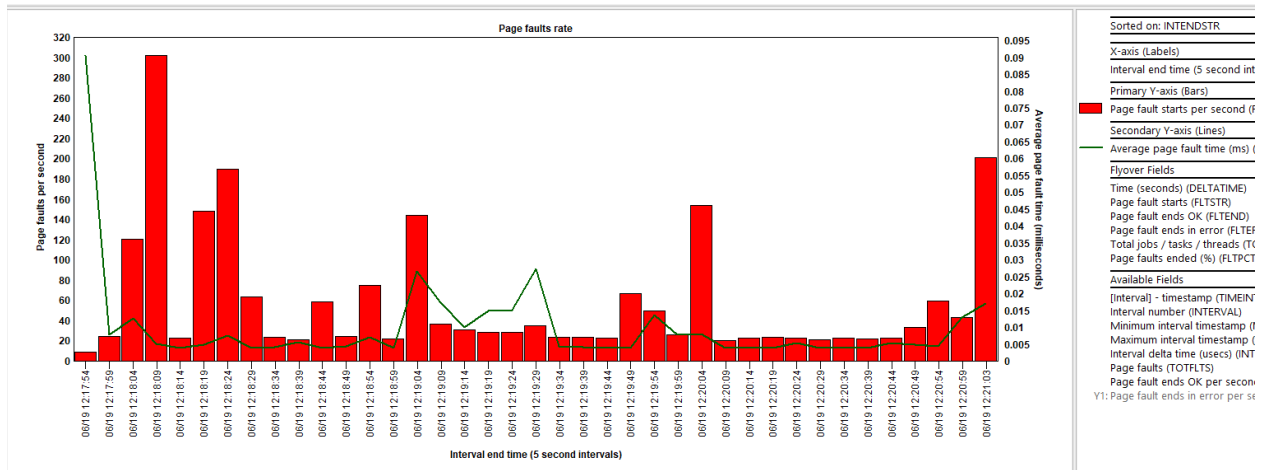
This graph compares starts vs end page faults with side-by-side bars. Page faults ends with error may also rarely appear. The Y2-axis just shows the completion percentage.



Starts vs ends page faults

28.3.3 Page faults rate

This graph shows the page fault rate per second.

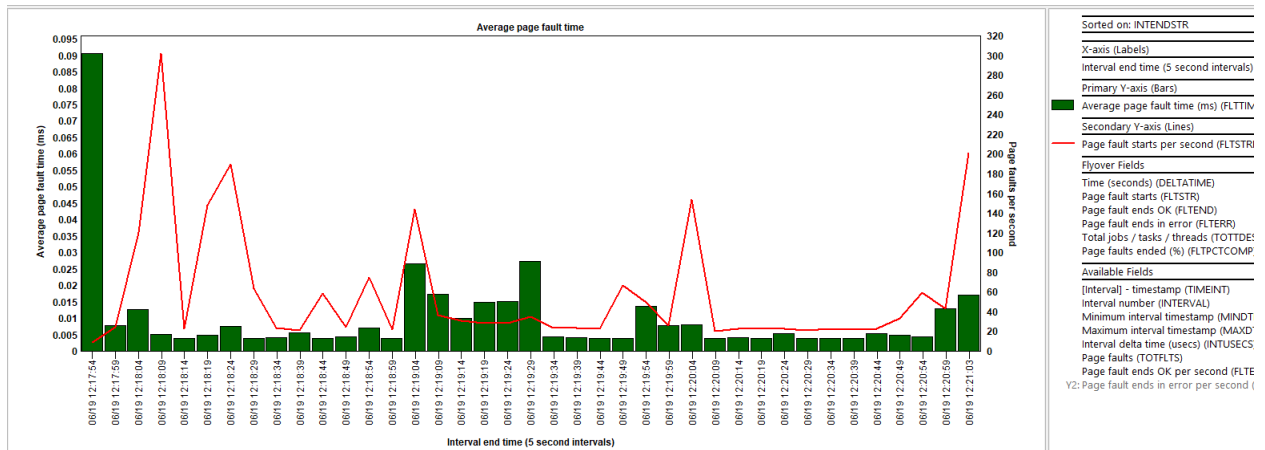


Page faults rate

28.3.4 Average page fault time

This graph shows the average page fault time in milliseconds.

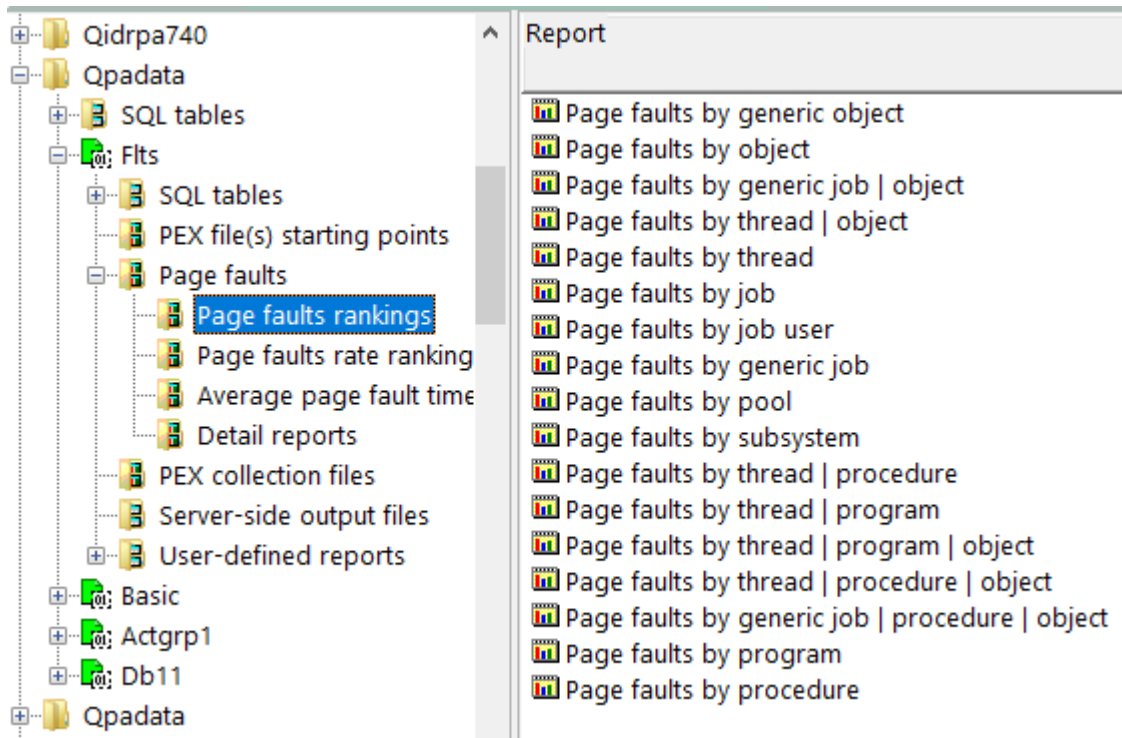
Tip: If no data appears, then page fault end events were likely not captured.



Average page fault time

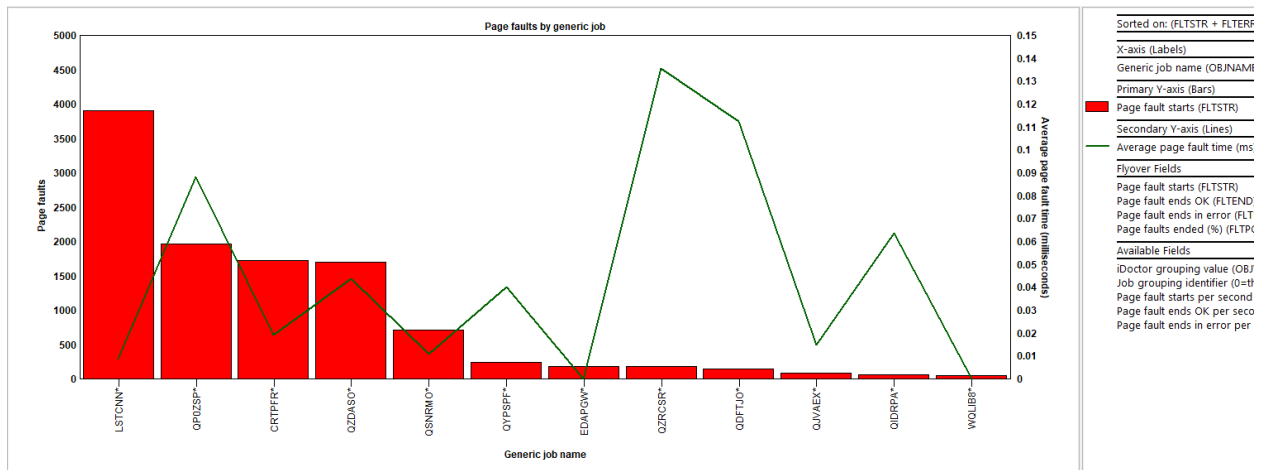
28.3.5 Page faults rankings

These graphs show the page fault starts and any "page fault ends with error" events occurring and ranked by 1 of several possible ways. It does not show page fault end OK events.



Page faults -> Page faults rankings

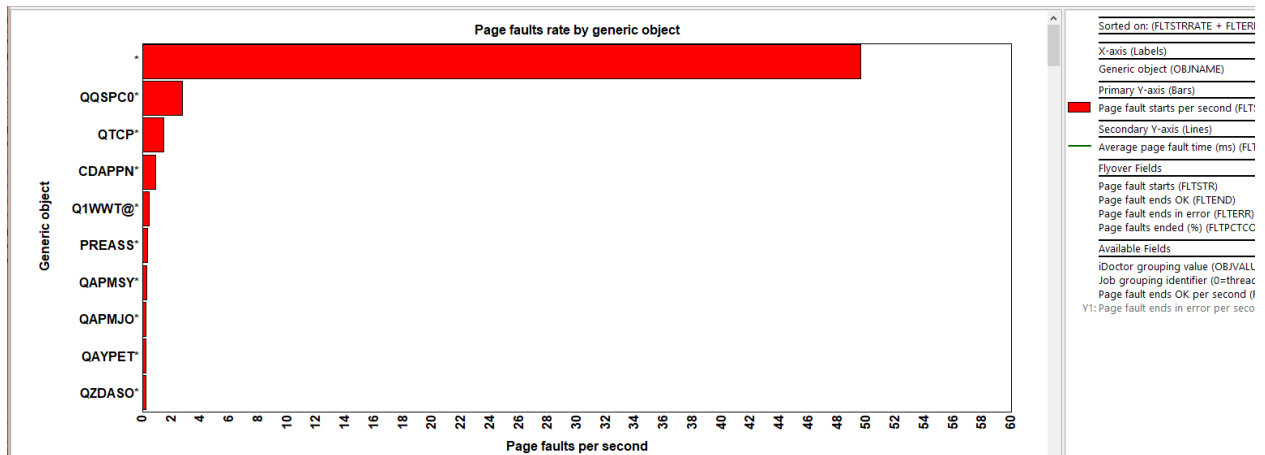
An example follows:



Page faults by generic job

28.3.6 Page faults rate rankings

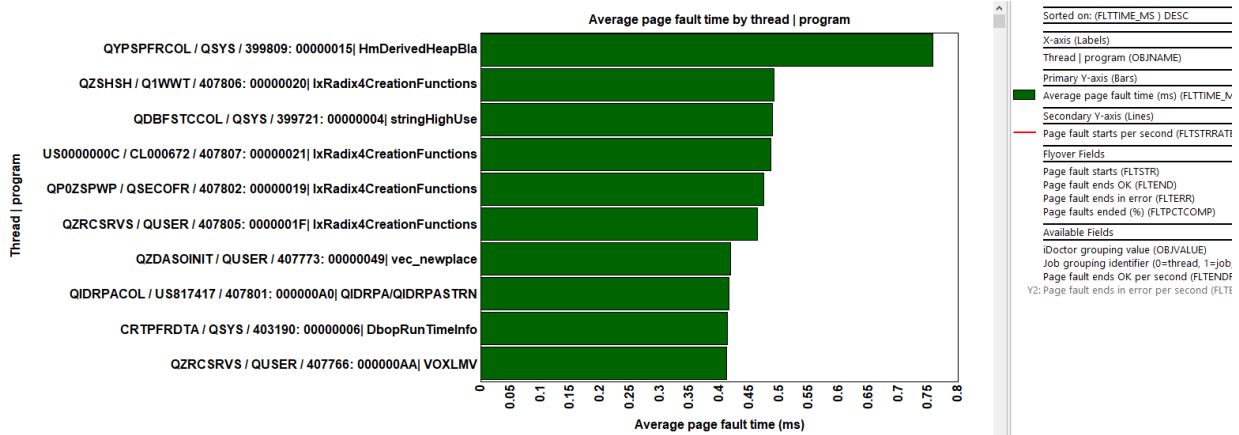
These graphs show the page fault rate per second and ranked by 1 of several possible ways.



Page faults rate by generic object

28.3.7 Average page fault time rankings

This graph shows the average page fault time in milliseconds and ranked by 1 of several possible ways.

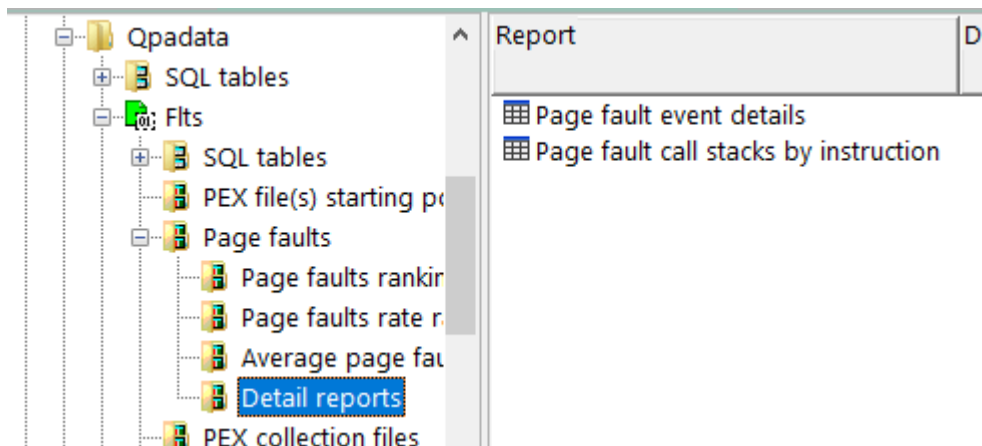


Average page fault time rankings

28.3.8 Detail reports

These reports give more details behind the events captured within the PEX collection.

Tip: You can access these reports as a drill-down from one of the graphs for the selected time or grouping.



Page faults -> Detail reports

28.3.8.1 Page fault event details

This report shows all the available details behind the page fault events.

Tip: If IAD_QRECN is not 0 then a call stack is available by double-clicking and then using the call stack tab.

(Minimum) QRECN (QRECN)	Call stack QRECN (IAD_QRECN)	Resource event type (QITTY)	Resource event subtype (QITSTY)	Job name/user/number: thread ID (OBJ.NAME)	Taskcount (HEX) (QTIFTC)	Nanoseconds since collection started (QITTIMN)	Timestamp (QITISP)	Average page fault time (ms) (FLTTIME_MS)	Page fault type (QPGSTYP_END)	Exception id (QPGEXC_END)	Next instruction address (QPGNIA)	Key ins (QI)
4217	4217	6	2	QYPSFRCOL / QSYS / 399809: 00000015	000000000000091C	185130862468	2023-06-19-12.21.00.035797	.7571	0	1	FFFFFFFFF0C48F4	FF
2001	2001	6	2	QZSHSH / Q1WWT / 407806: 00000020	000000000000083C8	26953011339	2023-06-19-12.18.21.857946	.4916	0	1	FFFFFFFFFC8E9F04	FF
212	212	6	2	QDBFSTCCOL / QSYS / 399721: 00000004	00000000000000665	6466875335	2023-06-19-12.18.01.371810	.4894	0	1	FFFFFFFFF0E0E28	FF
3287	3287	6	2	US000000C / CL000672 / 407807: 00000021	000000000000083D3	125095103521	2023-06-19-12.20.00.000038	.4856	0	1	FFFFFFFFFC8E9F04	FF
790	790	6	2	QP0ZSPWP / QSECOFR / 407802: 00000019	000000000000083C0	13961920648	2023-06-19-12.18.08.866855	.4739	0	1	FFFFFFFFFC8E9F04	FF
86	86	6	2	QZRCRSRV / 407805: 0000001F	000000000000083C8	25811491250	2023-06-19-12.18.20.716426	.4635	0	1	FFFFFFFFFC8E9F04	FF
9297	9297	6	2	QIDRPACOL / US817417 / 407801: 000000A0	00000000000008367	187772215275	2023-06-19-12.21.02.677150	.4474	0	1	0A7AD29942014860	0A
2829	2829	6	2	QZDASOINIT / QUSER / 407773: 00000040	000000000000082FD	90850056390	2023-06-19-12.19.25.754991	.4372	0	1	FFFFFFFFFE35449C	FF
9580	9580	6	2	QZDASOINIT / QUSER / 407773: 00000040	000000000000082FD	81993254148	2023-06-19-12.19.16.898189	.4310	0	1	FFFFFFFFFB3EC610	FF
13209	13209	6	2	QZDASOINIT / QUSER / 407773: 00000040	000000000000082FD	83820543273	2023-06-19-12.19.18.725478	.4230	0	1	FFFFFFFFFB3EC610	FF
12928	12928	6	2	QZDASOINIT / QUSER / 407773: 00000040	000000000000082FD	71996519625	2023-06-19-12.19.06.901454	.4209	0	1	FFFFFFFFFB35449C	FF
7795	7795	6	2	QZDASOINIT / QUSER / 407773: 00000049	000000000000083D0	117446700507	2023-06-19-12.19.52.351635	.4184	0	1	FFFFFFFFFB27F408	FF
5300	5300	6	2	CRTPFRDTA / QSYS / 403190: 00000006	00000000000004FA5	5216084324	2023-06-19-12.18.00.121019	.4128	0	1	FFFFFFFFFBD8593C	FF
5304	5304	6	2	QDBFSTCCOL / QSYS / 399721: 00000005	00000000000000666	5353551437	2023-06-19-12.18.00.258486	.4127	0	1	FFFFFFFFFC326A48	FF
9914	9914	6	2	QZRCRSRV / QUSER / 407766: 000000AA	000000000000082E8	3113883041	2023-06-19-12.17.58.018818	.4116	0	1	FFFFFFFFFC326A48	FF
726	726	6	2	QDBFSTCCOL / QSYS / 399721: 00000004	00000000000000665	6467406250	2023-06-19-12.18.01.372341	.4094	0	1	FFFFFFFFFC326A48	FF
5302	5302	6	2	QDBFSTCCOL / QSYS / 399721: 00000005	00000000000000666	5353106867	2023-06-19-12.18.00.258041	.4089	0	1	FFFFFFFFF0E0E28	FF
2896	2896	6	2	QZDASOINIT / QUSER / 407773: 00000040	000000000000082FD	93579769562	2023-06-19-12.19.28.484704	.3997	0	1	FFFFFFFFFE35449C	FF
15027	15027	6	2	QIDRPACOL / US817417 / 407801: 000000A0	00000000000008367	187840262757	2023-06-19-12.21.02.745197	.3926	0	1	3DDBE22FAC004280	3C
12822	12822	6	2	QZDASOINIT / QUSER / 407773: 00000040	000000000000082FD	68161997593	2023-06-19-12.19.03.066932	.3886	0	1	FFFFFFFFFE35449C	FF
2863	2863	6	2	QZDASOINIT / QUSER / 407773: 00000040	000000000000082FD	92132719345	2023-06-19-12.19.27.037654	.3885	0	1	1B09C98B02019368	1B
4725	4725	6	2	QDBFSTCCOL / QSYS / 399721: 00000005	00000000000000666	5352693671	2023-06-19-12.18.00.257628	.3879	0	1	FFFFFFFFFC326A48	FF
5060	5060	6	2	QIDRPACOL / US817417 / 407801: 000000A0	00000000000008367	83592154	2023-06-19-12.17.54.988527	.3847	0	1	0A7AD29942010058	0A
12903	12903	6	2	QZDASOINIT / QUSER / 407773: 00000040	000000000000082FD	70636294210	2023-06-19-12.19.05.541229	.3845	0	1	1B09C98B02019368	1B

Page fault event details

28.3.8.2 Page fault call stacks by instruction

This report groups the page fault start call stacks together for the events found in the collection.

Tip: You can access this report as a drill-down from one of the graphs described previously.

Itiv740.Itc.ibm.com/QPADATA/FLTS/Page fault call stacks by instruction - #1					
Total events (TOTEVTS)	Call level (LEVEL)	Program model (MODEL)	Program name (PGMNAME)	Module name (MODNAME)	Procedure name (PRCNAME)
1796	1	LIC		RmslLockMiObject	rmsllockmiobject
1796	3	LIC		#cfmir	#cfmir
1796	4	LIC		cfscv0a	syscall_A_portal
1796	5	OPM	QUSRTVUS	QUSRTVUS	QUSRTVUS
1796	6	ILE	QGDPRLOG/LSTC>NNSTS	LSTC>NNSTS	LSTC>NNSTS
1796	7	ILE	QGDPRLOG/LSTC>NNSTS	LSTC>NNSTS	_CL_PEP
1796	8	OPM	QCMD	QCMD	QCMD
1796	1	LIC		#mnmoda	#mnmoda
1796	2	LIC		#mnmoda	#mnmoda
1796	3	LIC		#cfmir	#cfmir
1796	4	LIC		cfscv0a	syscall_A_portal
1796	5	OPM	QLIINSRT	QLIINSRT	QLIINSRT
1796	6	OPM	QUSCRTUS	QUSCRTUS	QUSCRTUS
1796	7	ILE	QGDPRLOG/LSTC>NNSTS	LSTC>NNSTS	LSTC>NNSTS
1796	8	ILE	QGDPRLOG/LSTC>NNSTS	LSTC>NNSTS	_CL_PEP
1796	9	OPM	QCMD	QCMD	QCMD
1269	1	LIC		tiaasm	tia_fault
320	1	LIC		stringHighUse	copyWithTagsPrefill_FCPvPCvUIPv
320	2	LIC		PmHsStgExtent	cloneStorage_13PmHsStgExtentFUIT1PvQ2_4PmHs11ProtectModePcQ2_4PmHs14ExecutableCode
320	3	LIC		PaseAllocator	do_handle52Excp_13PaseAllocatorFUIR15SystemExceptionR11PaseMappingR18PmHsAddressContext
320	4	LIC		PaseAllocator	handle52Excp_13PaseAllocatorFUIR31Ex0052HardwareStorageProtectionR15SlicMiExceptionR18PmHsAddressContext
320	5	LIC		PmHsMemObj	handle52Excp_10PmHsMemObjFUIR31Ex0052HardwareStorageProtectionR15SlicMiExceptionP10PmHsExtent
320	6	LIC		PmHsHyperspace	process52Excp_14PmHsHyperspaceFUIR31Ex0052HardwareStorageProtectionR15SlicMiExceptionR13PmHsMemberPt
320	7	LIC		PmHsHyperspace	process52Excp_14PmHsHyperspaceFR31Ex0052HardwareStorageProtectionR15SlicMiException
320	8	LIC		ExDefaultHandlersHighUse	ExDefaultHandlers_FR15SystemExceptionR15SlicMiException
320	9	LIC		ExExceptHighUse	realDoThrow_FPC16realDoThrowInput

Page fault call stacks by instruction

29 Physical Disk I/Os

This analysis examines the disk events. These are event type 5 in the PEX data.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
5	1	DSKEVT	*USER	Service
5	2	DSKEVT	*READSTR	Read Start
5	3	DSKEVT	*READEND	Read End
5	4	DSKEVT	*WRTSTR	Write Start
5	5	DSKEVT	*WRTEND	Write End
5	6	DSKEVT	*PGREADSTR	Page Read Start
5	7	DSKEVT	*PGREADEND	Page Read End
5	8	DSKEVT	*PGWRTSTR	Page Write Start
5	9	DSKEVT	*PGWRTEND	Page Write End
5	10	DSKEVT	*CMPALCSTR	Comp Alc Start
5	11	DSKEVT	*CMPALCEND	Comp Alc End
5	12	DSKEVT	*CMPDLCSTR	Comp Dlc Start
5	13	DSKEVT	*CMPDLCEND	Comp Dlc End
5	14	DSKEVT	*RMTWRTSTR	Remote Write Start
5	15	DSKEVT	*RMTWRTEND	Remote Write End
5	16	DSKEVT	*RMTPGWRTSTR	Remote Page Write Start
5	17	DSKEVT	*RMTPGWRTEND	Remote Page Write End
5	18	DSKEVT	*LOGSENSEND	Log sense end

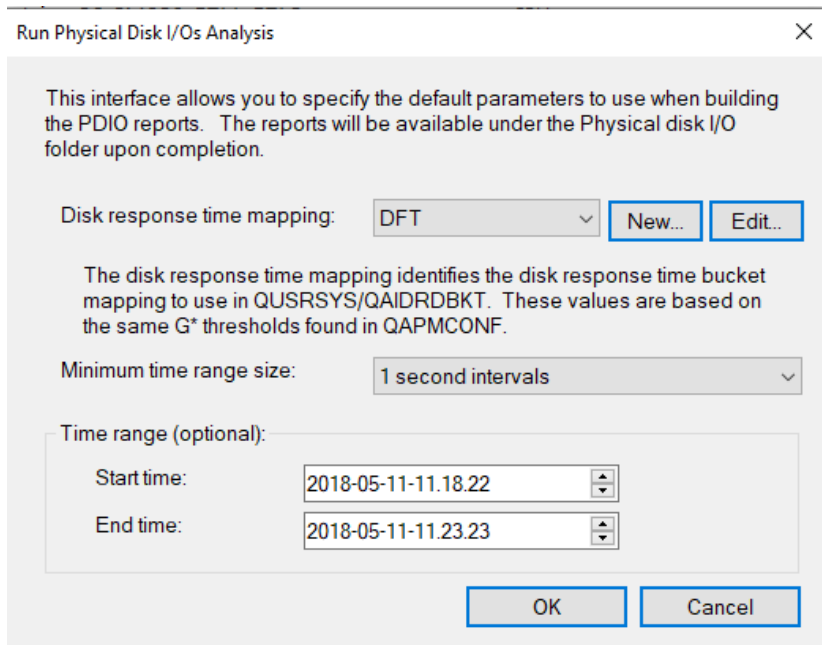
Disk events from QAYPEEVENT at 7.3

Tip: Only event subtypes 3, 5 and 15 are used by this analysis. The other disk events are not yet analyzed but some events like *READSTR, *WRTSTR do not need to be captured and are obsolete.

Note: This analysis has a special requirement that file QAPMHDWR exist in the same library as the PEX collection. This is normally captured if you are using QMGTOOLS/STRPSC to collect PEX data or can be manually copied from the active Collection Services collection data library.

29.1 Running the analysis

When running the analysis, a window like the following appears:



Run Physical Disk I/Os Analysis

This interface allows you to specify the default parameters to use when building the PDIO reports. The reports will be available under the Physical disk I/O folder upon completion.

Disk response time mapping: DFT New... Edit...

The disk response time mapping identifies the disk response time bucket mapping to use in QUSRSYS/QAIDRDBKT. These values are based on the same G* thresholds found in QAPMCONF.

Minimum time range size: 1 second intervals

Time range (optional):

Start time: 2018-05-11-11.18.22

End time: 2018-05-11-11.23.23

OK Cancel

This interface allows for the creation and specification of the the disk response time mappings used in the advanced graphs. These mappings are stored in QUSRSYS/QAIDRDBKT. Click the Edit button to modify a mapping or the New button to create a new mapping.

The minimum time range size has 3 possible settings and applies to the overview graphs:

- 1) 1 second intervals (default)
- 2) 1/10th second intervals
- 3) 1/100th second intervals

Tip: Using 1 second intervals is typically recommended, unless the extra granularity is required, but these other options will take longer to create.

29.2 SQL tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
PEXPDI001_<MBR>	PDIO event details
PEXPDI002_<MBR>	PDIO event details (copy)
PEXPDI0DBKT_<MBR>	Response time bucket mapping
PEXPDI0ISUM_<MBR>	Interval summary per ASP
PEXPDI0OBJ_<MBR>	PDIO object summary

29.3 Physical Disk I/Os

This folder contains the graphs and reports available after the analysis has completed.

Several different ranking graph groupings are available, which behave similarly in design to the job groupings. Like elsewhere in iDoctor, the rankings can be accessed either as drill-down from an overview chart for a desired time-period or on their own as a starting point.

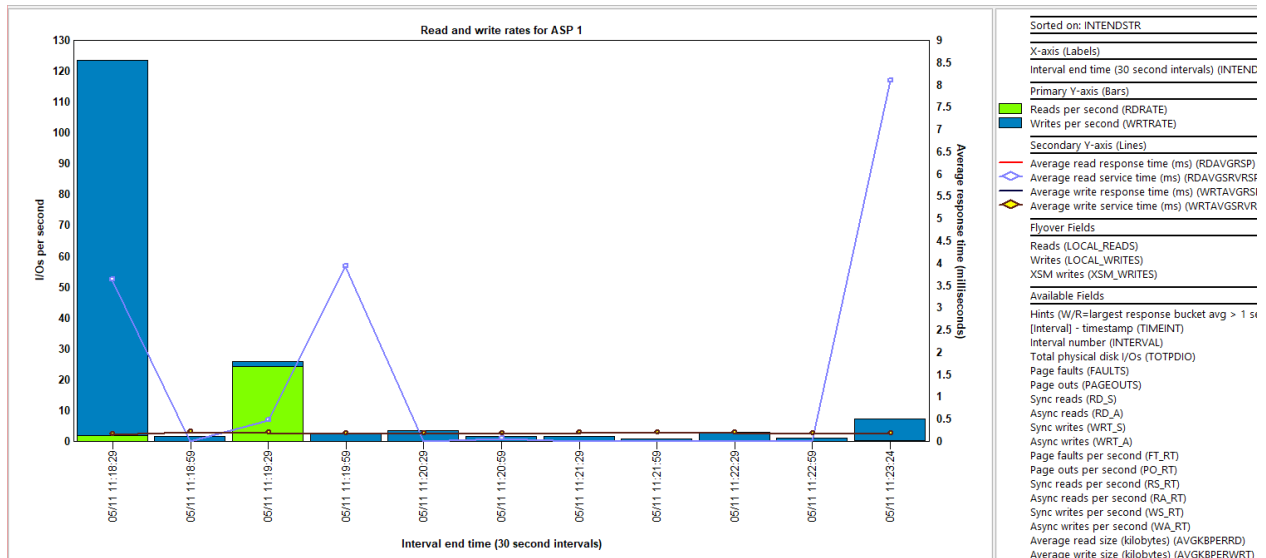
Note: <<QDDASP>> refers to the ASP number which is a parameter. If **Preferences -> Confirm -> Confirm ASP selection when opening disk graphs** is checked you will be prompted for the desired ASP. Uncheck this preference to avoid the prompt and always use ASP 1.

Pre-summarized PDIO stats ranked by object.
Detail reports showing the data and events in table format
These graphs utilize 11 response time buckets instead of 6.

Physical Disk I/Os

29.3.1 Read and write rates for ASP <<QDDASP>>

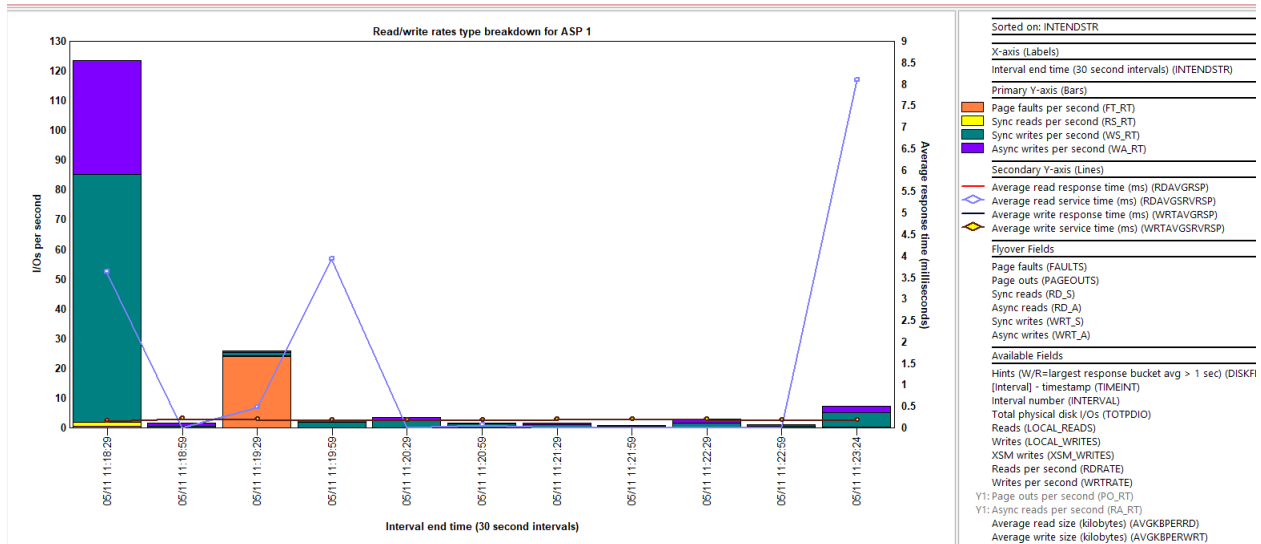
This graph shows the reads per second and writes per second over time. The 2nd Y-axis displays read and write average response and service times.



Read and write rates for ASP <<QDDASP>>

29.3.2 Read/write rates type breakdown for ASP <<QDDASP>>

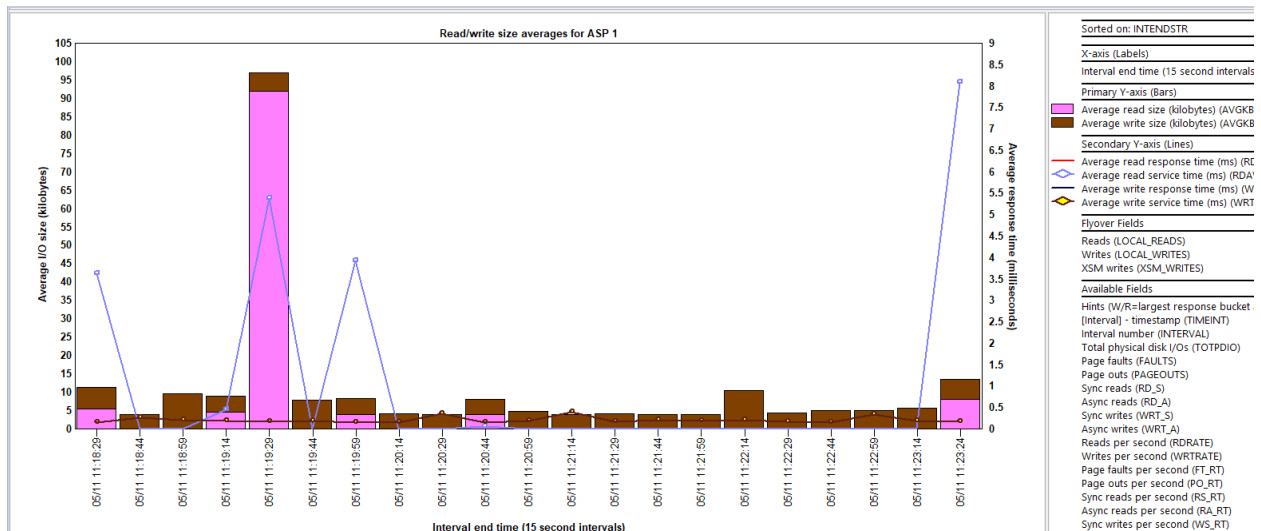
This graph is the same as the previous one except breaks up the rates by type of I/O operation. There are 6 I/O operations which are listed in the graph legend.



Read/write rates type breakdown for ASP <<QDDASP>>

29.3.3 Read/write size averages for ASP <<QDDASP>>

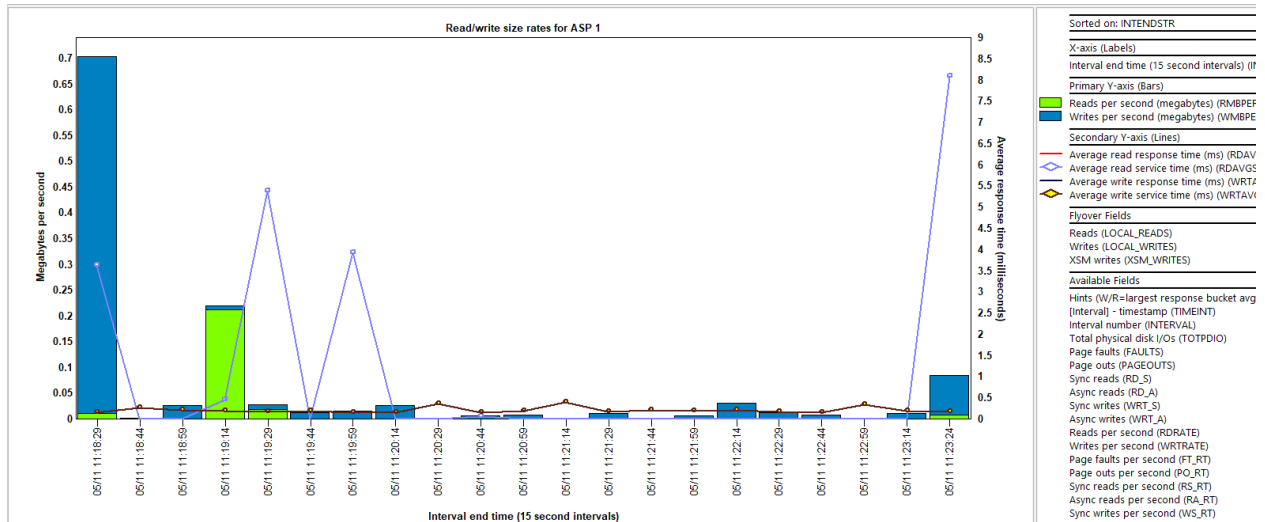
This graph shows the average I/O size (in kilobytes) for reads and writes. The 2nd Y-axis displays read and write average response and service times.



Read/write size averages for ASP <<QDDASP>>

29.3.4 Read/write size rates for ASP <<QDDASP>>

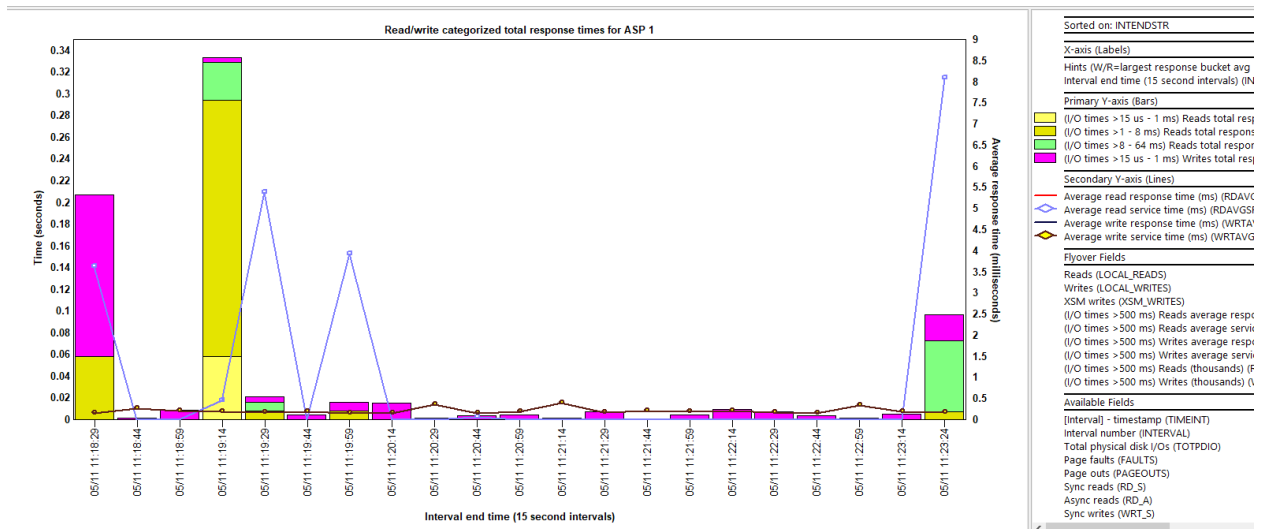
This report displays the size of all disk reads and disk writes as megabytes per second over time. The 2nd Y-axis displays read and write average response and service times.



Read/write size rates for ASP <<QDDASP>>

29.3.5 Read/write categorized total response times for ASP <<QDDASP>>

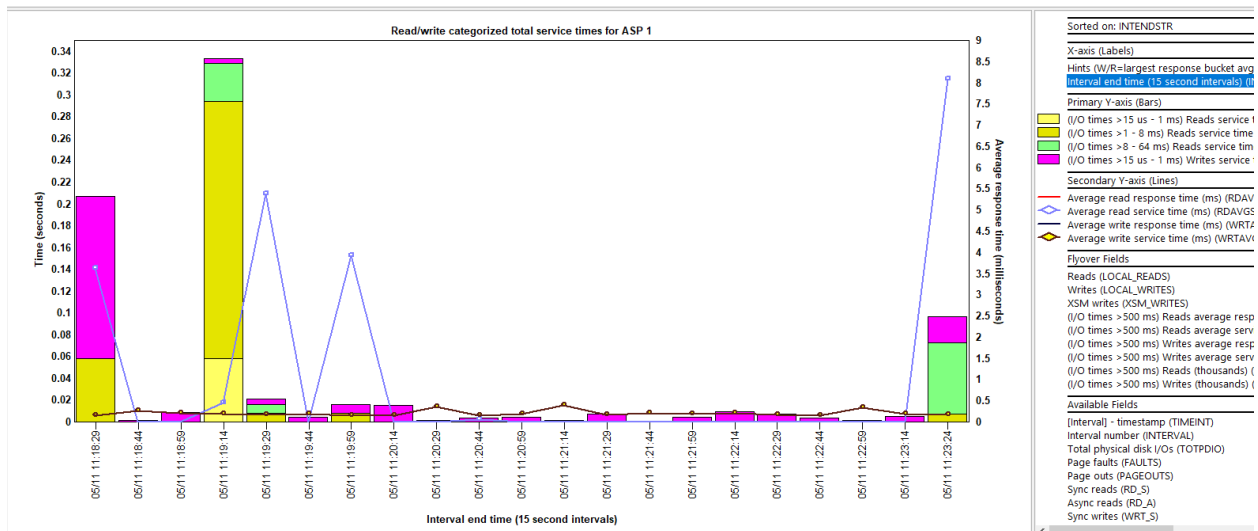
This graph adds up the total response times for reads and writes and shows them with different colors based on the six response time buckets. The 2nd Y-axis displays read and write average response and service times.



Read/write categorized total response times for ASP <<QDDASP>>

29.3.6 Read/write categorized total service times for ASP <<QDDASP>>

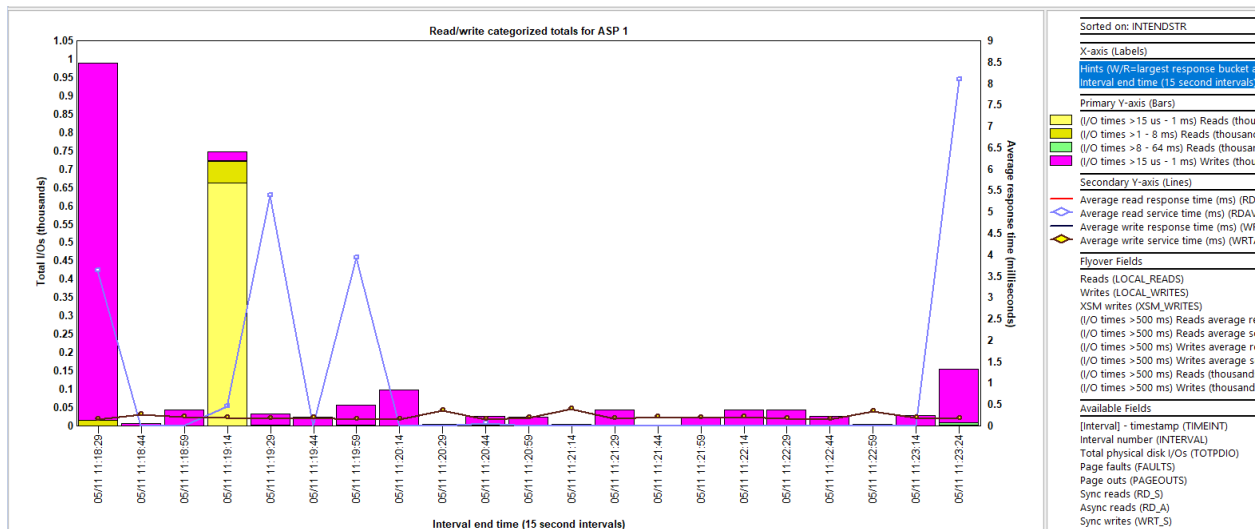
This graph adds up the total services times for reads and writes and shows them with different colors based on the six response time buckets. The 2nd Y-axis displays read and write average response and service times.



Read/write categorized total service times for ASP <<QDDASP>>

29.3.7 Read/write categorized totals for ASP <<QDDASP>>

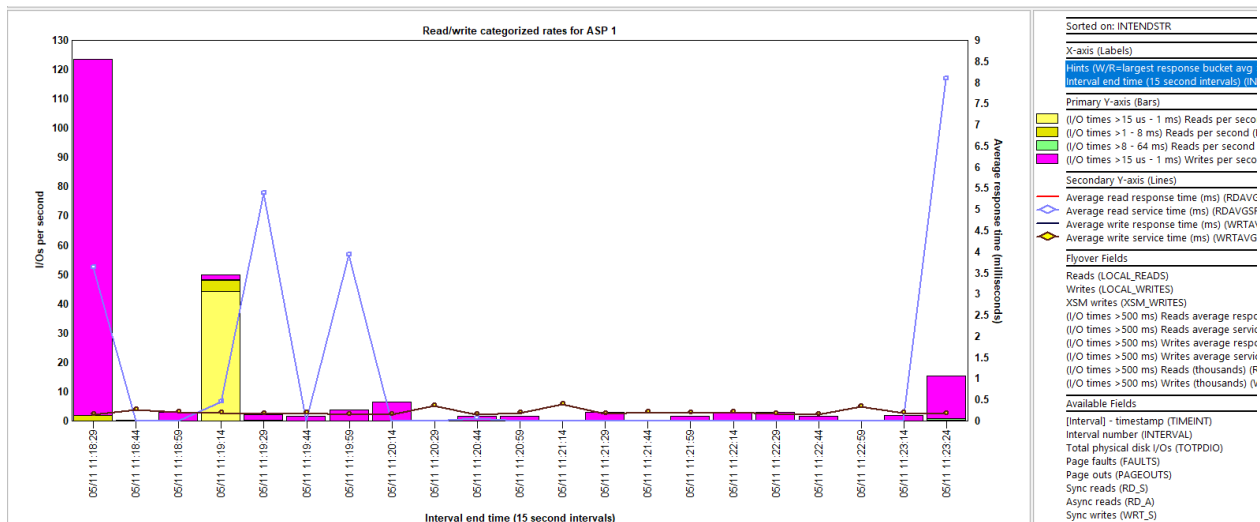
This graph shows the total I/O counts for reads and writes with different colors based on the six response time buckets. The 2nd Y-axis displays read and write average response and service times.



Read/write categorized totals for ASP <<QDDASP>>

29.3.8 Read/write categorized rates for ASP <<QDDASP>>

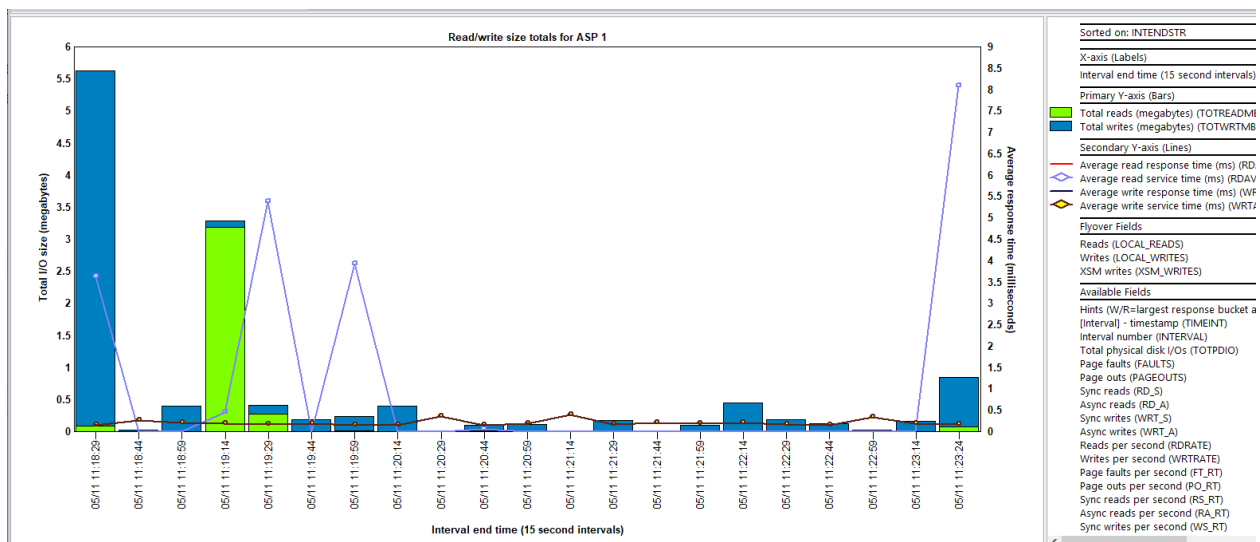
This graph shows the I/Os per second for reads and writes with different colors based on the six response time buckets. The 2nd Y-axis displays read and write average response and service times.



Read/write categorized rates for ASP <<QDDASP>>

29.3.9 Read/write size totals for ASP <<QDDASP>>

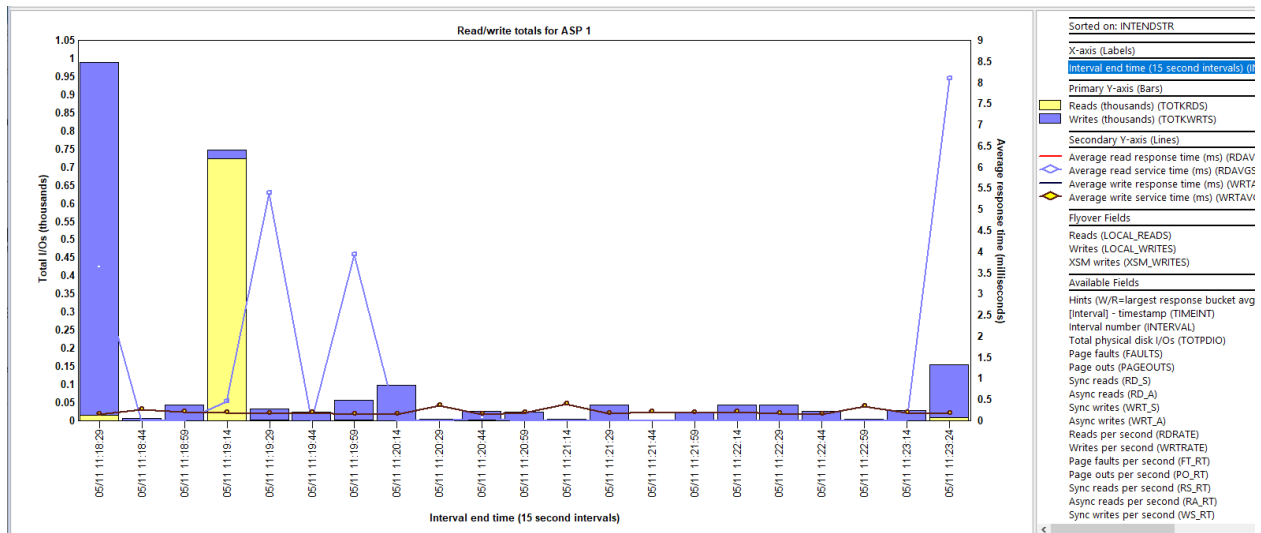
This graph displays the total I/O size (in megabytes) for reads and writes that occurred over time. The 2nd Y-axis displays read and write average response and service times.



Read/write size totals for ASP <<QDDASP>>

29.3.10 Read/write totals for ASP <<QDDASP>>

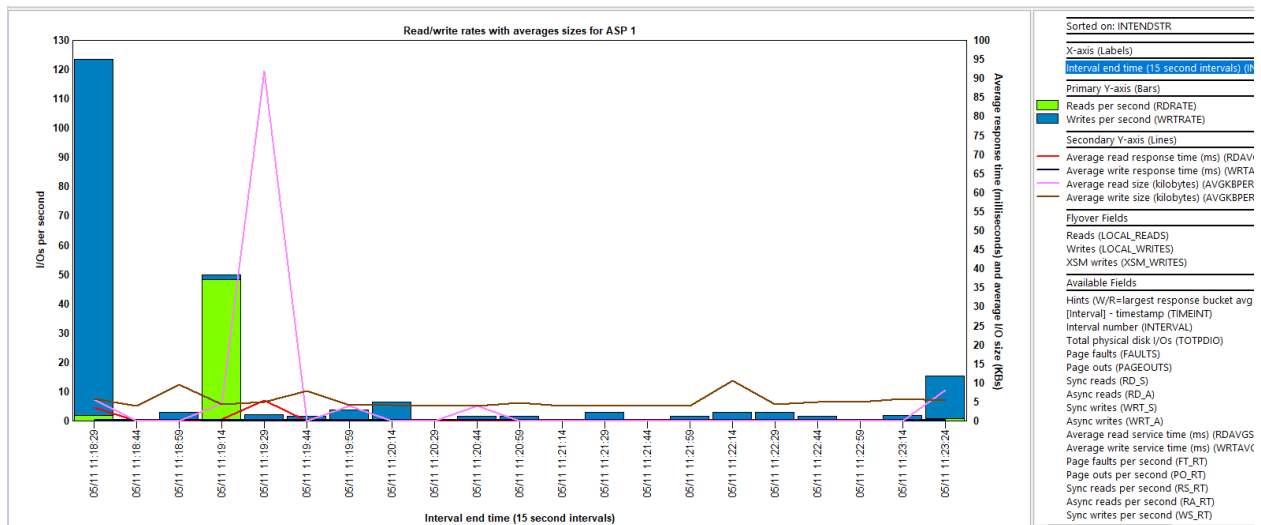
This graph displays the total number of reads and writes along with the average response and service times on the 2nd Y-axis.



Read/write totals for ASP <<QDDASP>>

29.3.11 Read/write rates with averages sizes for ASP <<QDDASP>>

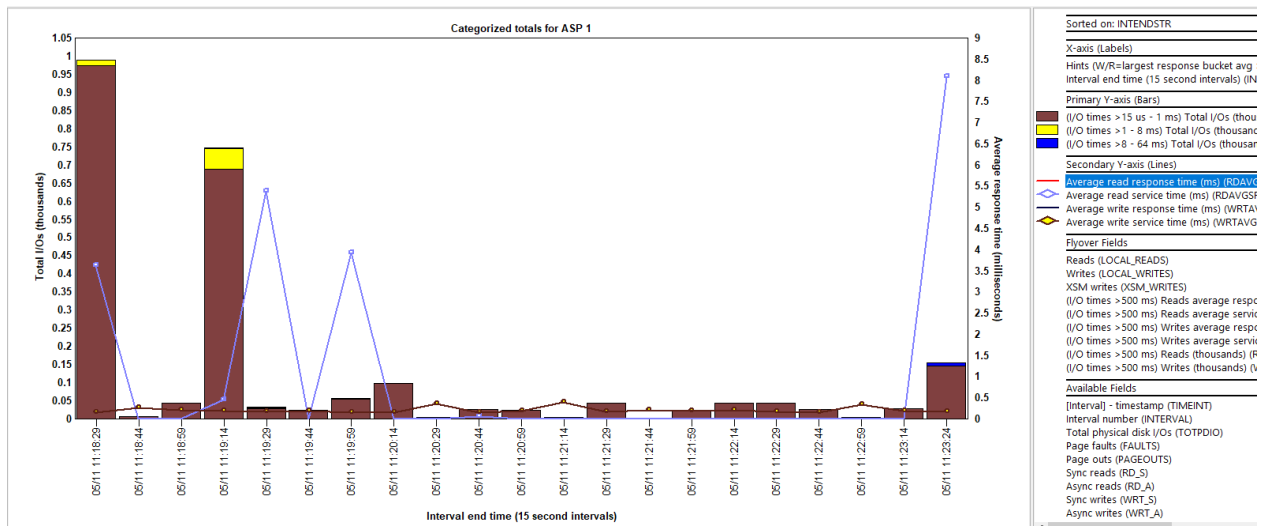
This graph is the same as the Read and write rates graph except shows the average I/O size (in kilobytes) for reads and writes as well as the average response times on the secondary Y-axis.



Read/write rates with averages sizes for ASP <<QDDASP>>

29.3.12 Categorized totals for ASP <<QDDASP>>

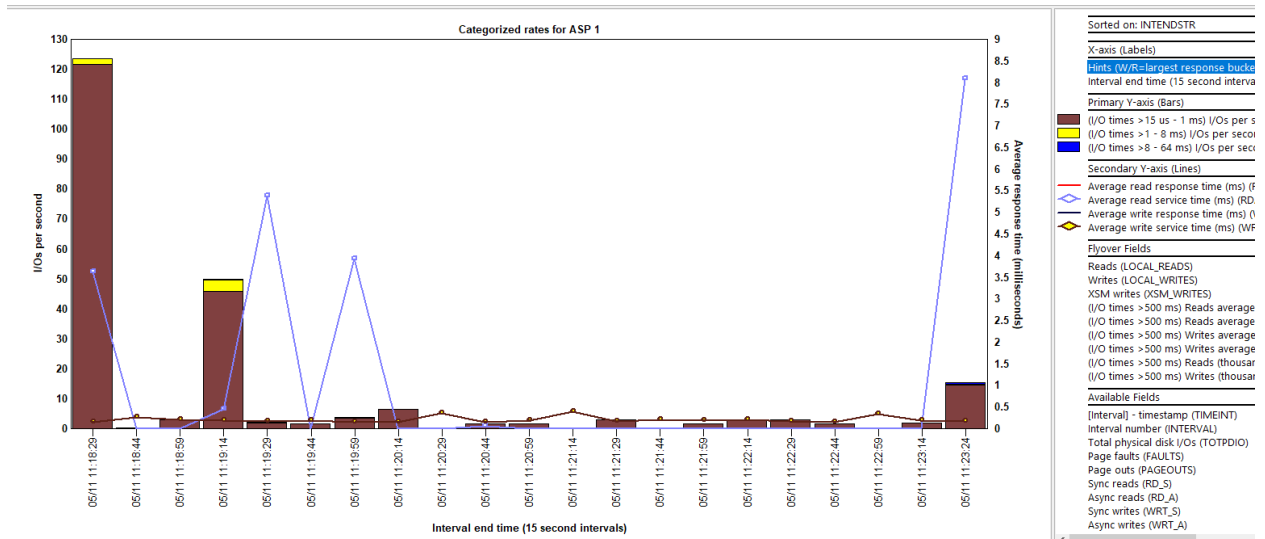
This graph combines reads and writes counts together and shows them with different colors based on the six response time buckets. The 2nd Y-axis displays read and write average response and service times.



Categorized totals for ASP <<QDDASP>>

29.3.13 Categorized rates for ASP <<QDDASP>>

This graph is the same as the previous except shows the Y1 values as a rate per second.

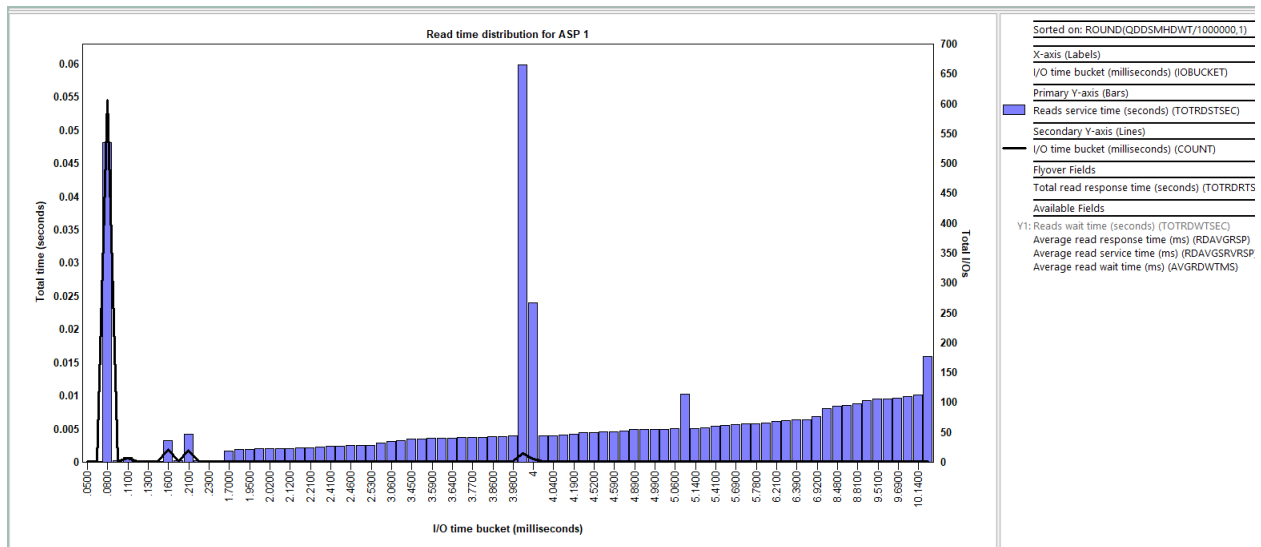


Categorized rates for ASP <<QDDASP>>

29.3.14 Read time distribution for ASP <<QDDASP>>

This graph shows the total read service time and number of reads occurring within each .1 millisecond response time bucket.

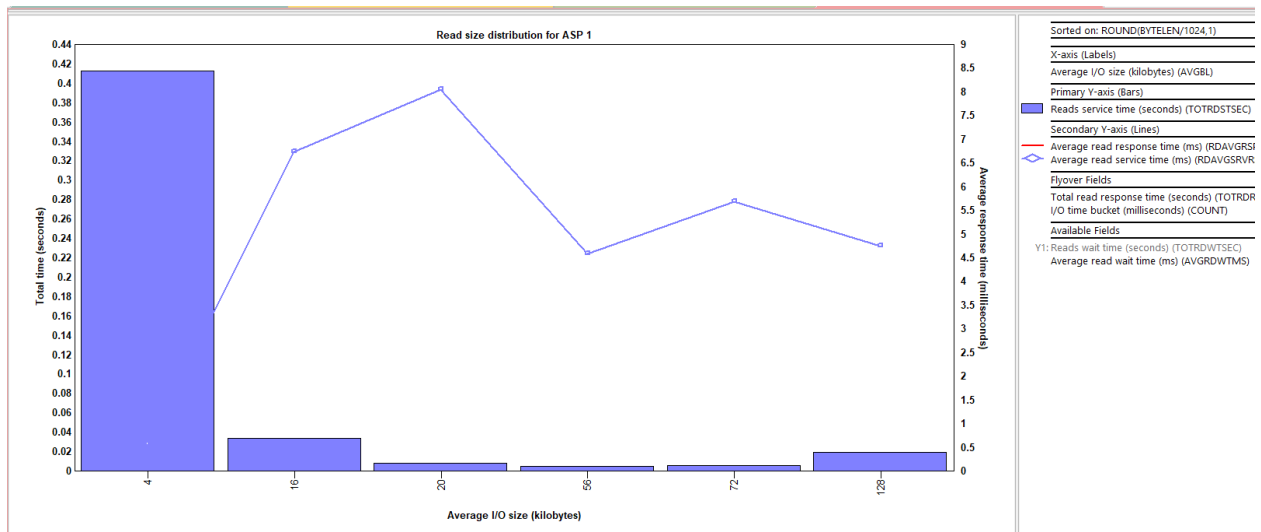
Note: Gaps in the data where no I/Os occurred within each .1 millisecond time are not shown, so the X-axis can be misleading.



Read time distribution for ASP <<QDDASP>>

29.3.15 Read size distribution for ASP <<QDDASP>>

This graph shows the total read service time for each read I/O size (in kilobytes). The Y2 axis shows average read response times.

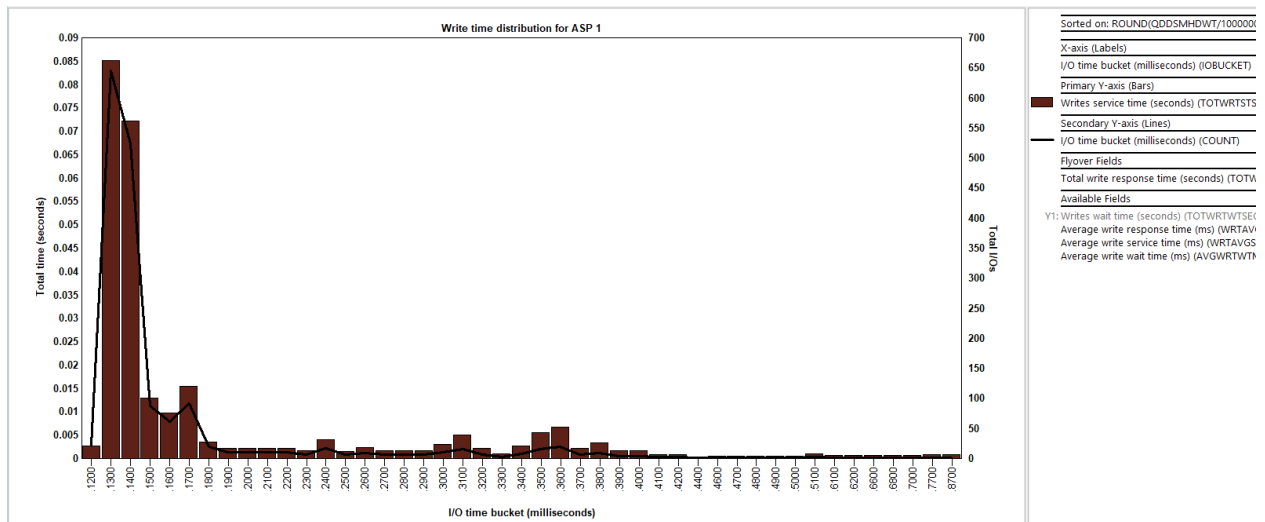


Read size distribution for ASP <<QDDASP>>

29.3.16 Write time distribution for ASP <<QDDASP>>

This graph shows the total write service time and number of writes occurring within each .1 millisecond response time bucket.

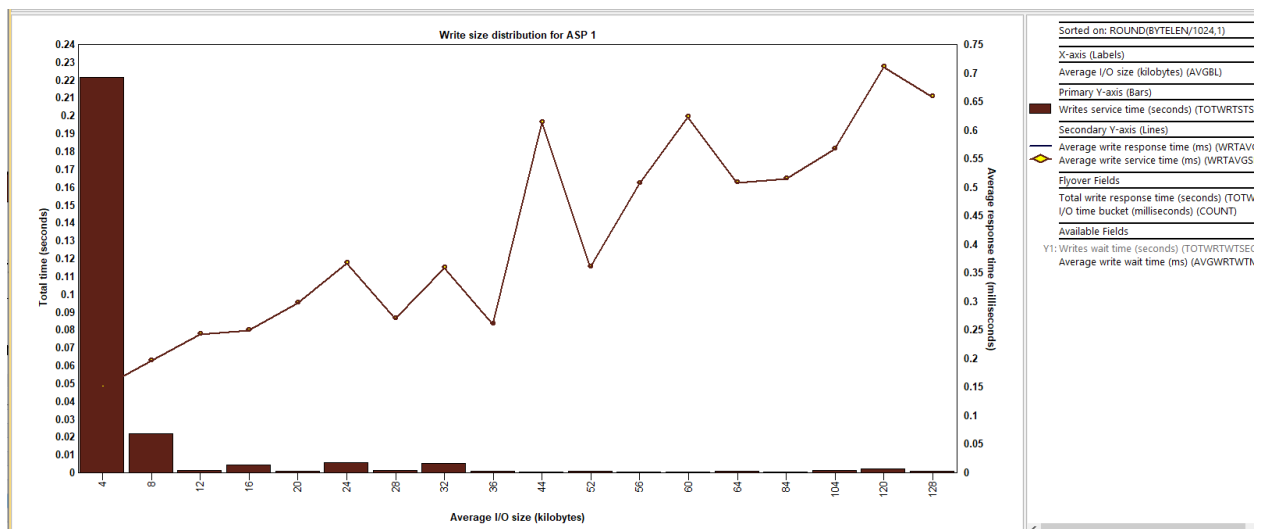
Note: Gaps in the data where no I/Os occurred within each .1 millisecond time are not shown, so the X-axis can be misleading.



Write time distribution for ASP <<QDDASP>>

29.3.17 Write size distribution for ASP <<QDDASP>>

This graph shows the total write service time for each write I/O size (in kilobytes). The Y2 axis shows average write response times.



Write size distribution for ASP <<QDDASP>>

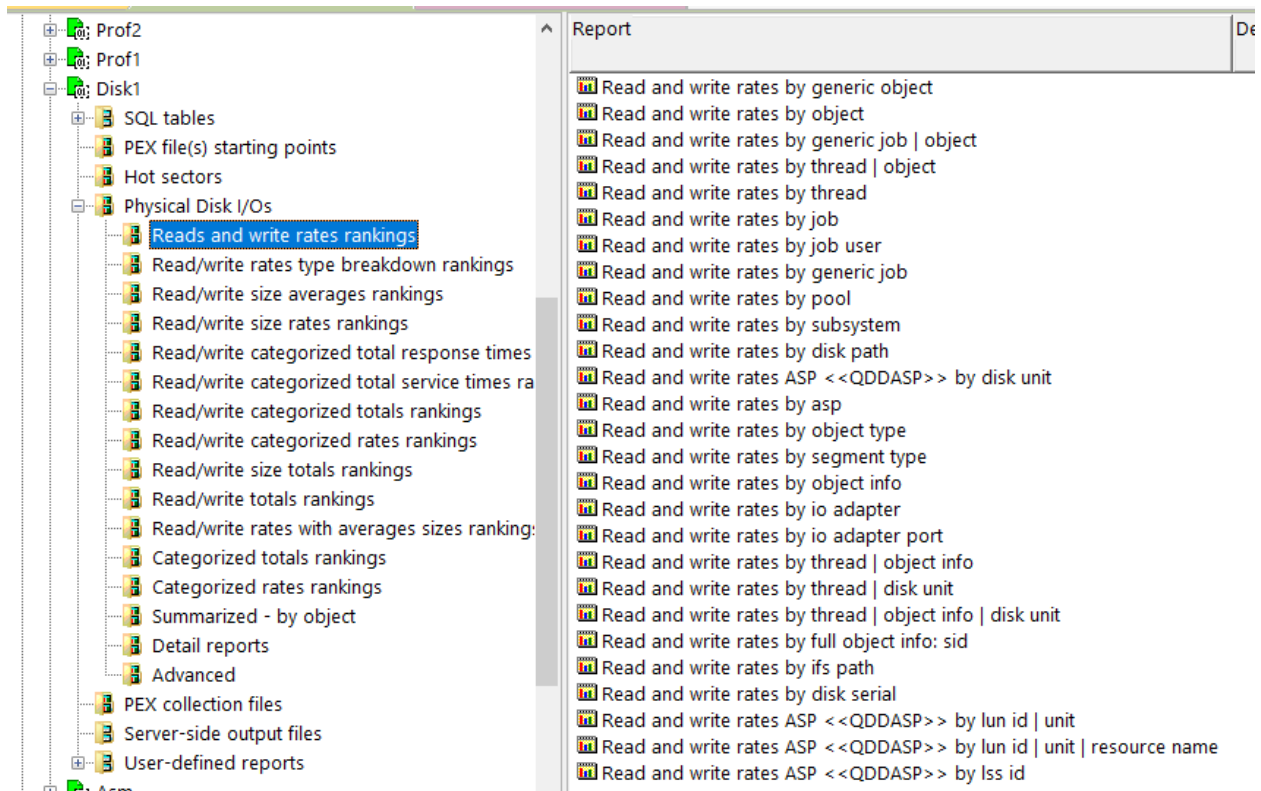
29.3.18 Reads and write rates rankings

This graph shows the reads per second and writes per second ranked by one of the available disk groupings. The optional 2nd Y-axis displays various average response and service times.

Tip: You can drill down into any of these ranking graphs from the disk overview graphs by selecting the desired time and right-clicking and choosing the 1st menu.

Tip: Some X-axis labels can be quite long and might be truncated in the graph. To control how many characters are shown on these labels use **Preferences -> Display -> X-axis label length** limit settings.

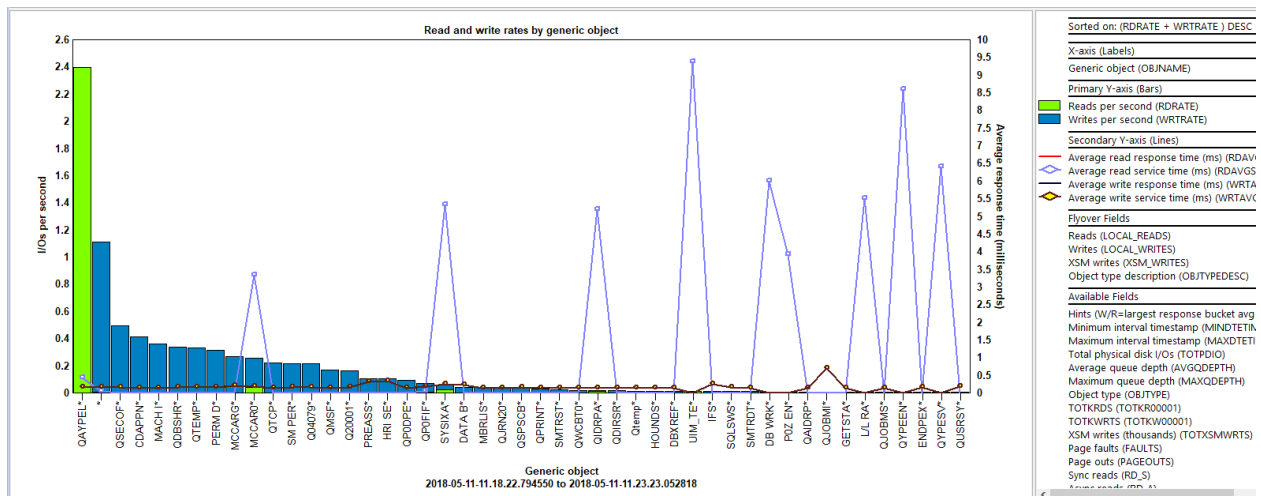
Tip: Use the **Toggle graph format** toolbar button in the Data Viewer to switch the look of the graph from vertical to horizontal bars if desired.



Physical Disk I/Os -> Reads and writes rates rankings

29.3.18.1 Read and write rates by generic object

This graph groups the metrics by generic object name. The generic object name length is controlled by **Preferences -> Data Viewer -> Name length for generic name grouping graphs.**



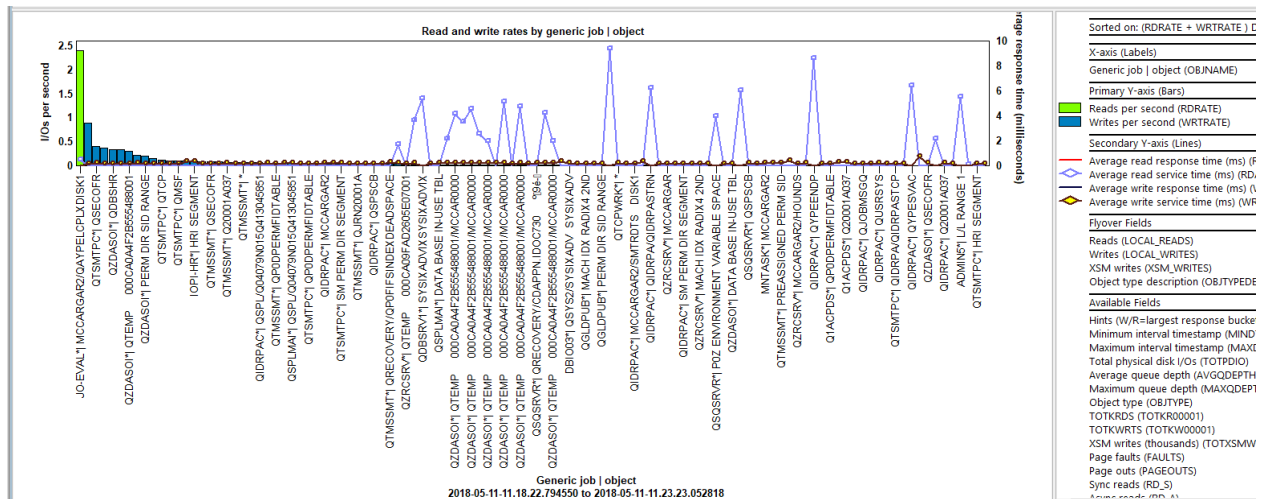
Read and write rates by generic object

29.3.18.2 Read and write rates by object

Same as the previous except each individual object name is shown.

29.3.18.3 Read and write rates by generic job | object

This graph groups the metrics by generic job name and unique object name. The generic job name length is controlled by **Preferences -> Data Viewer -> Name length for generic name grouping graphs.**



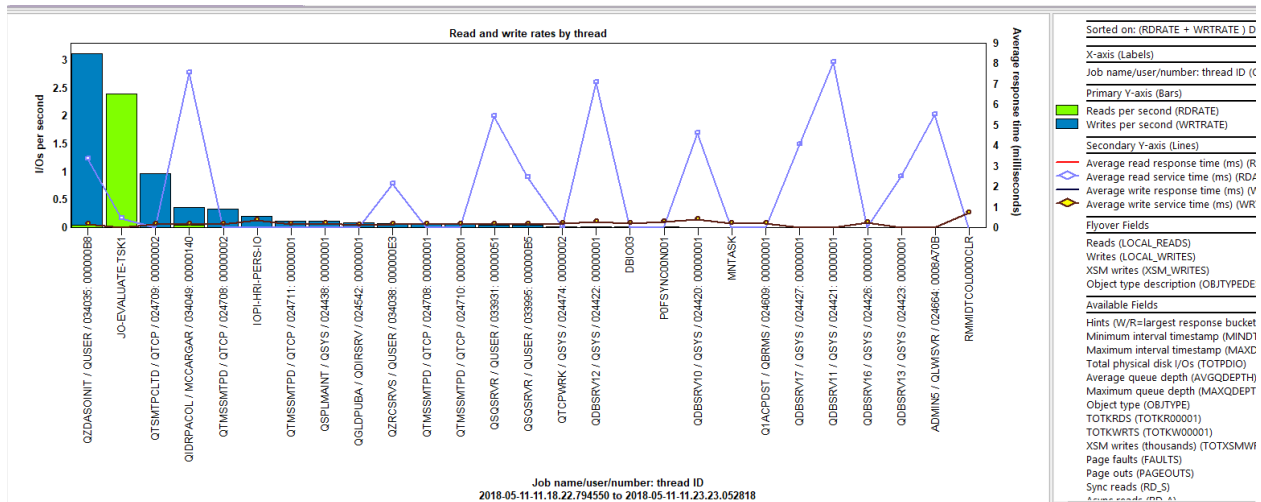
Read and write rates by generic job | object

29.3.18.4 Read and write rates by thread | object

This graph is the same as the previous except replaces generic job with specific job/name/user: thread.

29.3.18.5 Read and write rates by thread

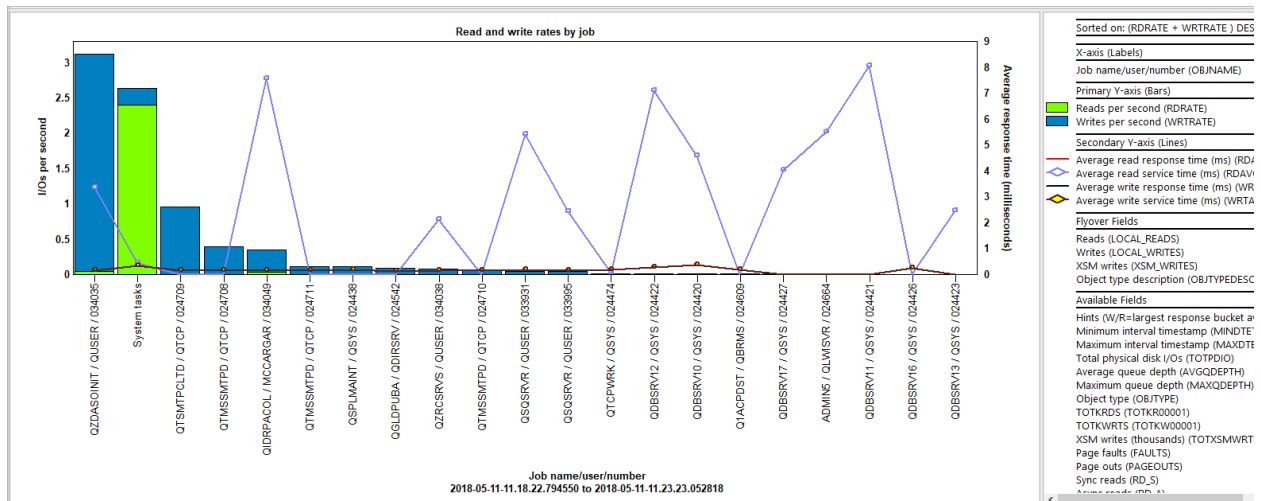
This graph groups the metrics by job / user / number: thread ID.



Read and write rates by thread

29.3.18.6 Read and write rates by job

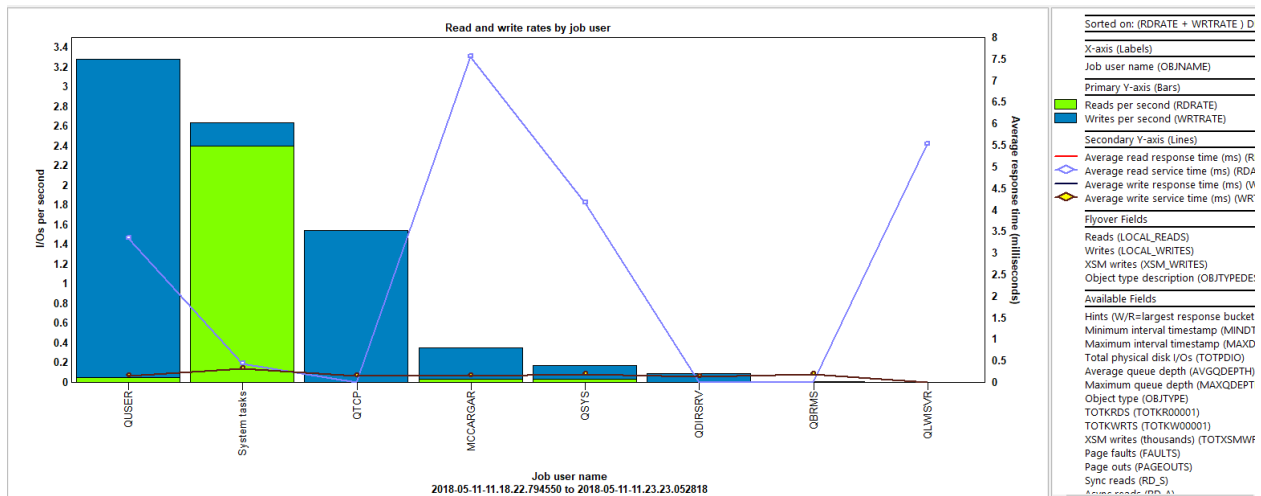
This graph groups the metrics by job / user / number.



Read and write rates by job

29.3.18.7 Read and write rates by job user

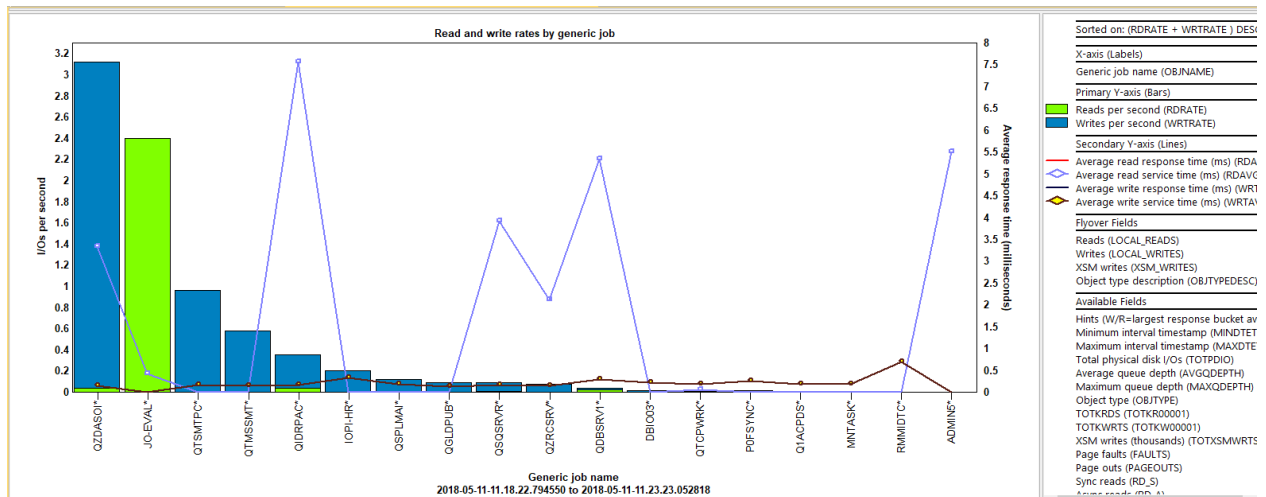
This graph groups the metrics by job user name.



Read and write rates by job user

29.3.18.8 Read and write rates by generic job

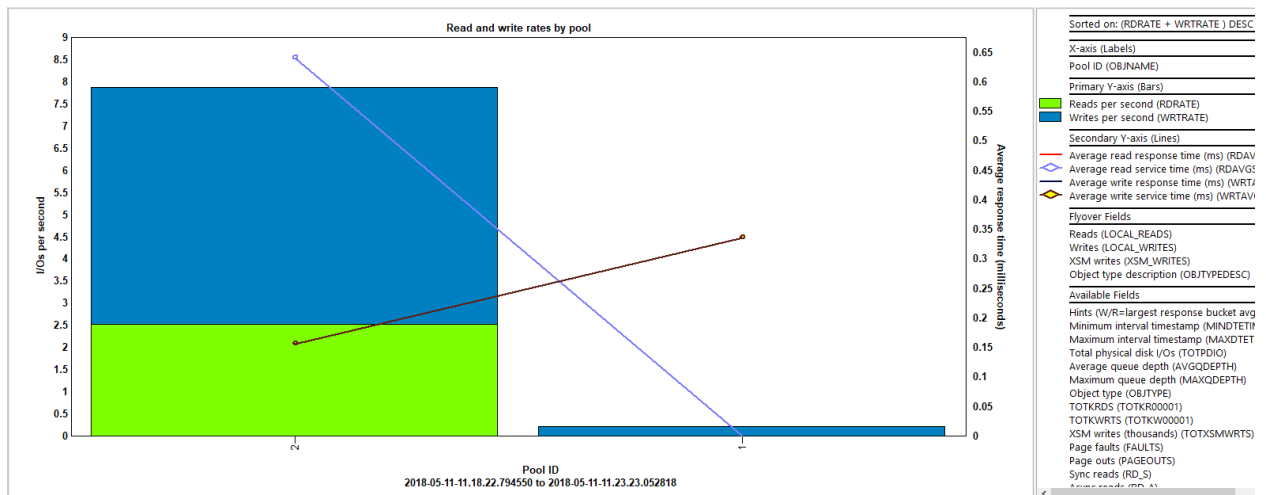
This graph groups the metrics by generic job name.



Read and write rates by generic job

29.3.18.9 Read and write rates by pool

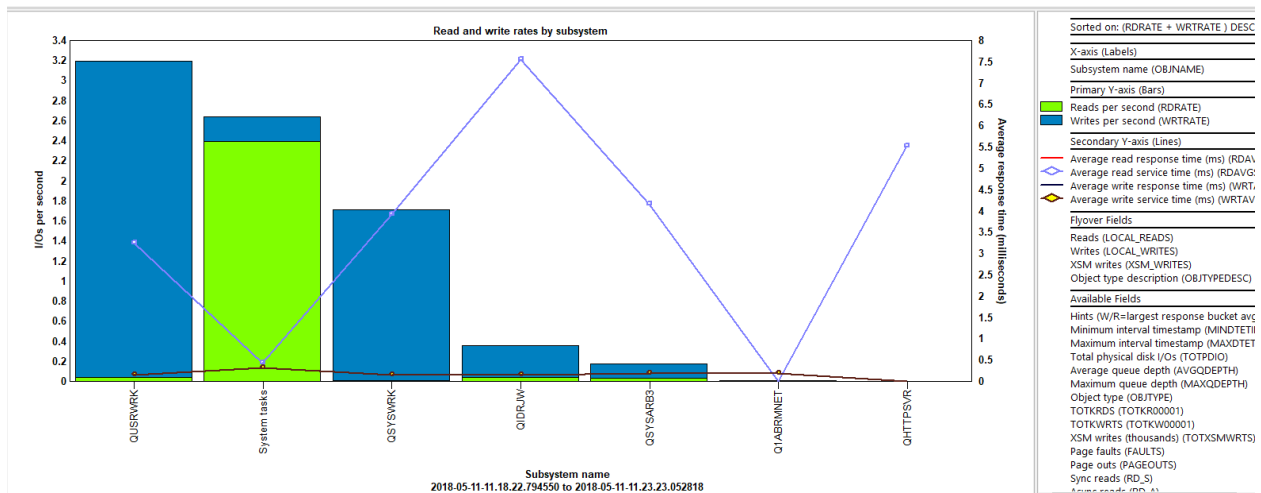
This graph groups the metrics by the pool number that the job was running in for the I/O operations occurring.



Read and write rates by pool

29.3.18.10 Read and write rates by subsystem

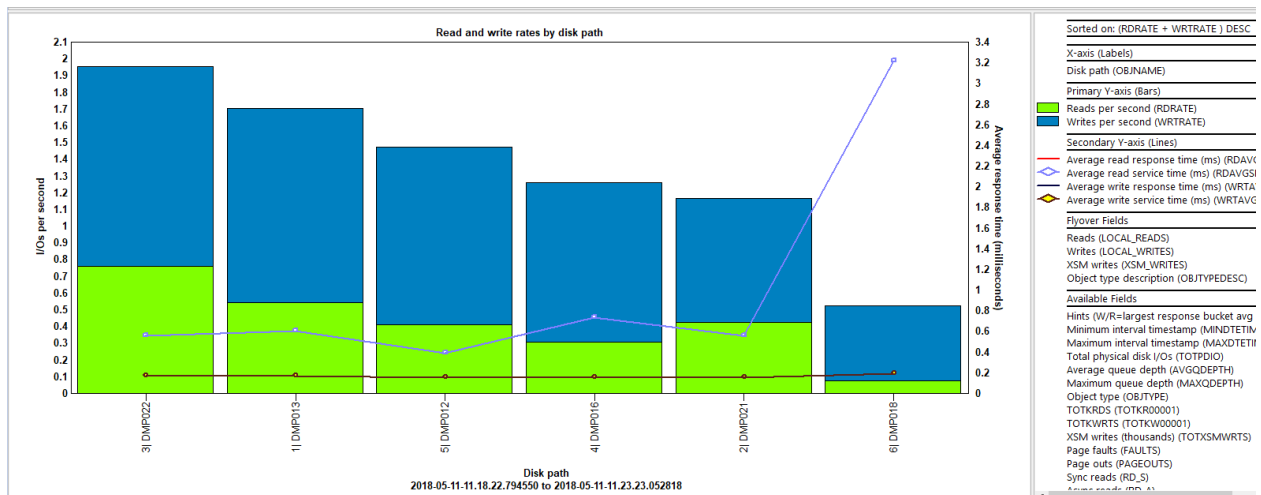
Same as the previous except replace pool with subsystem.



Read and write rates by subsystem

29.3.18.11 Read and write rates by disk path

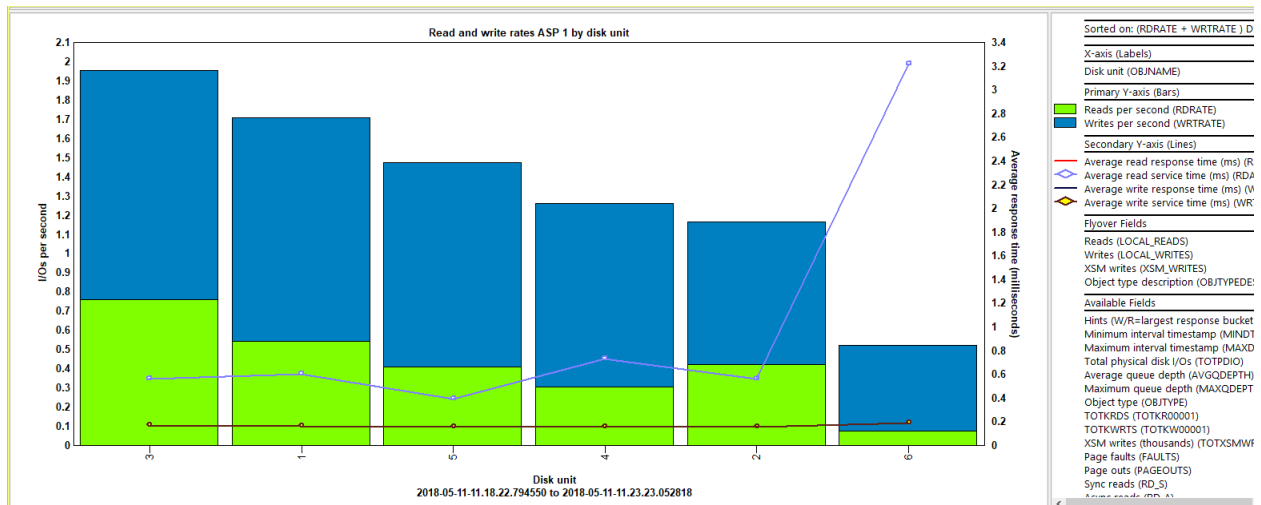
This graph groups the data by disk unit number and device resource name.



Read and write rates by disk path

29.3.18.12 Read and write rates ASP <<QDDASP>> by disk unit

This graph groups the data by disk unit. It also uses ASP filtering to restrict the results.



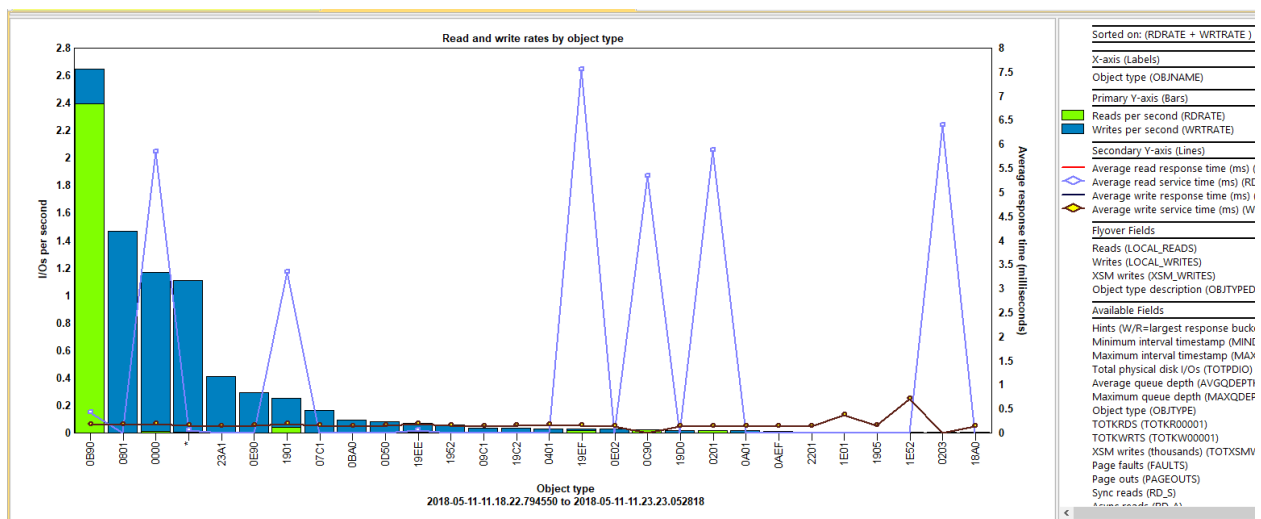
Read and write rates ASP <<QDDASP>> by disk unit

29.3.18.13 Read and write rates by asp

This graph groups the data by ASP.

29.3.18.14 Read and write rates by object type

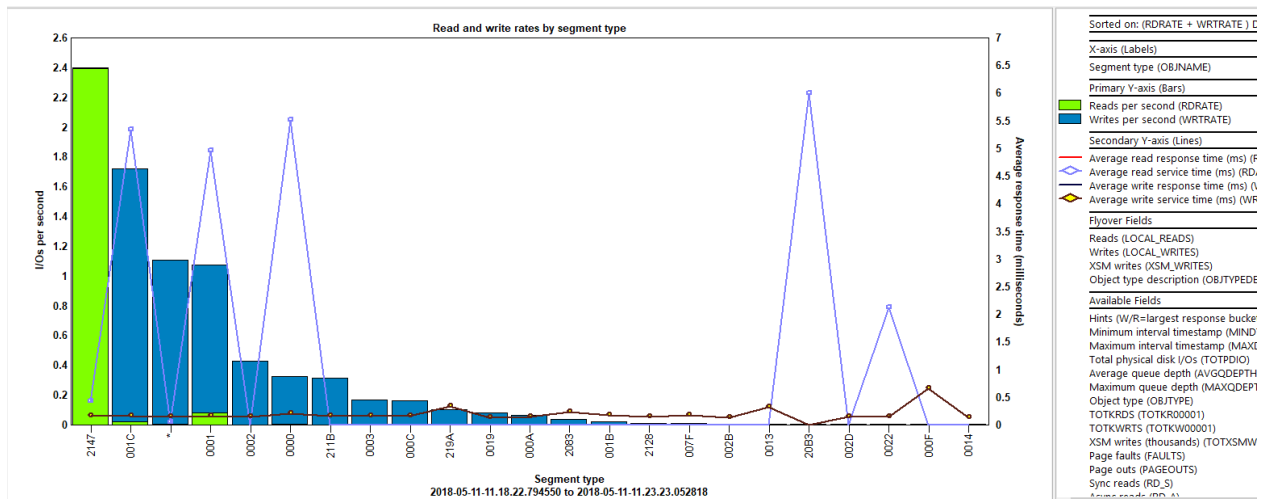
This graph groups the data by IBM i object type (in hex.) Descriptions for these can be found by using the graph flyover or see table qidrgui/qaidrot.



Read and write rates by object type

29.3.18.15 Read and write rates by segment type

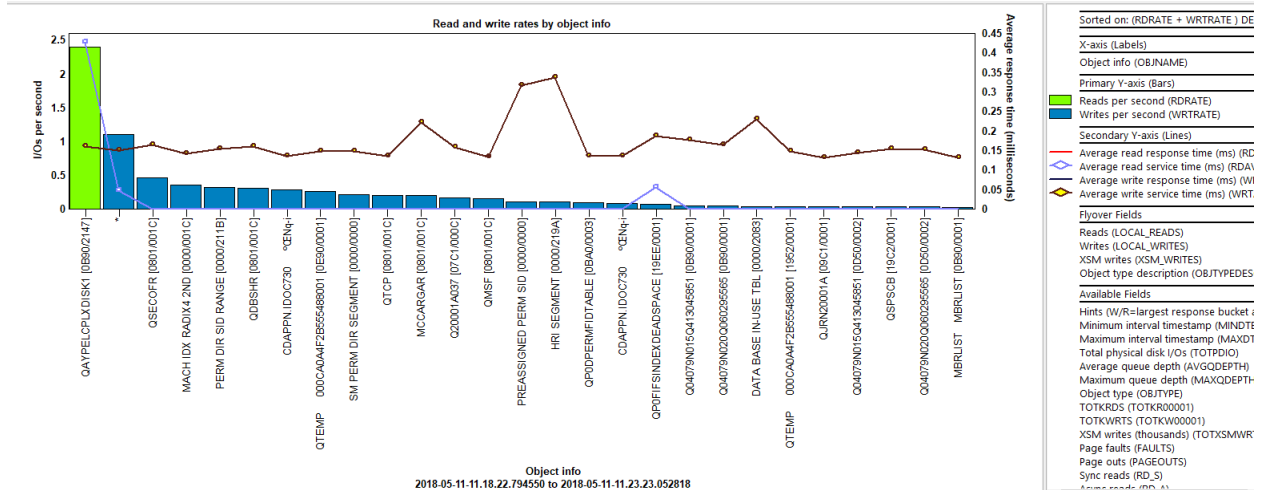
This graph groups the data by IBM i segment type (in hex.) Descriptions for these can be found by using the graph flyover or see table qidrgui/qaidrst.



Read and write rates by segment type

29.3.18.16 Read and write rates by object info

This graph groups the data by object name and object type, segment type.



Read and write rates by object info

29.3.18.17 Read and write rates by io adapter

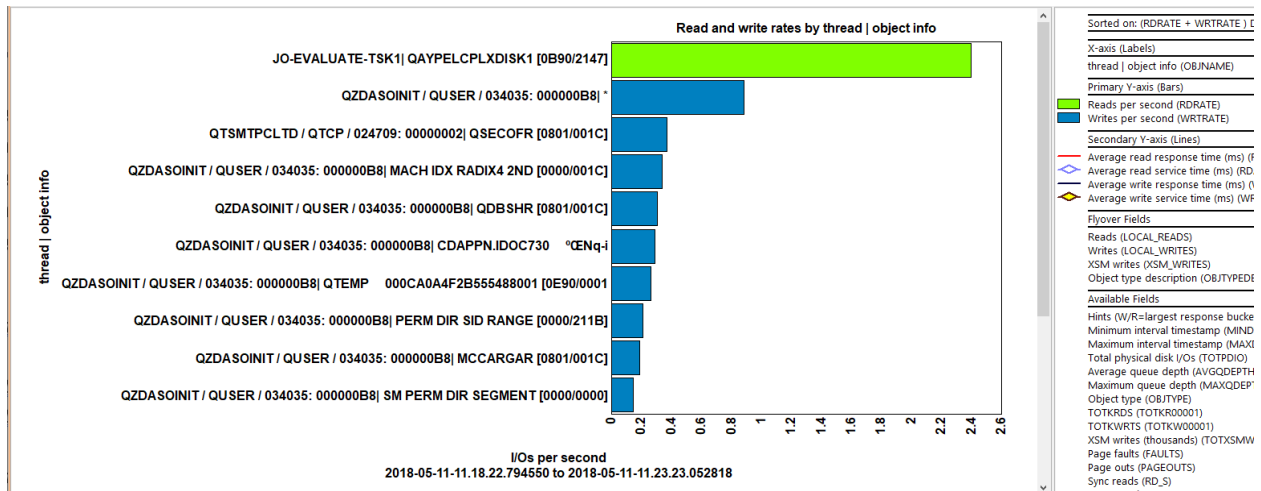
This graph groups the data by IO adapter (IOA.)

29.3.18.18 Read and write rates by io adapter port

This graph groups the data by IO adapter (IOA) and port.

29.3.18.19 Read and write rates by thread | object info

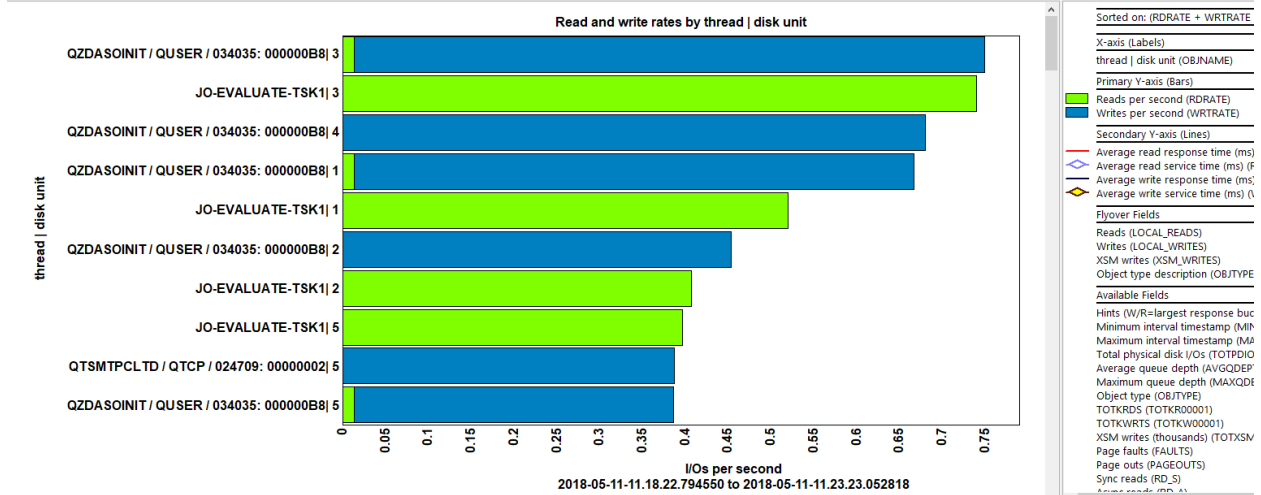
This graph groups the data by job name, user, number: thread ID and object name, object type and segment type.



Read and write rates by thread | object info

29.3.18.20 Read and write rates by thread | disk unit

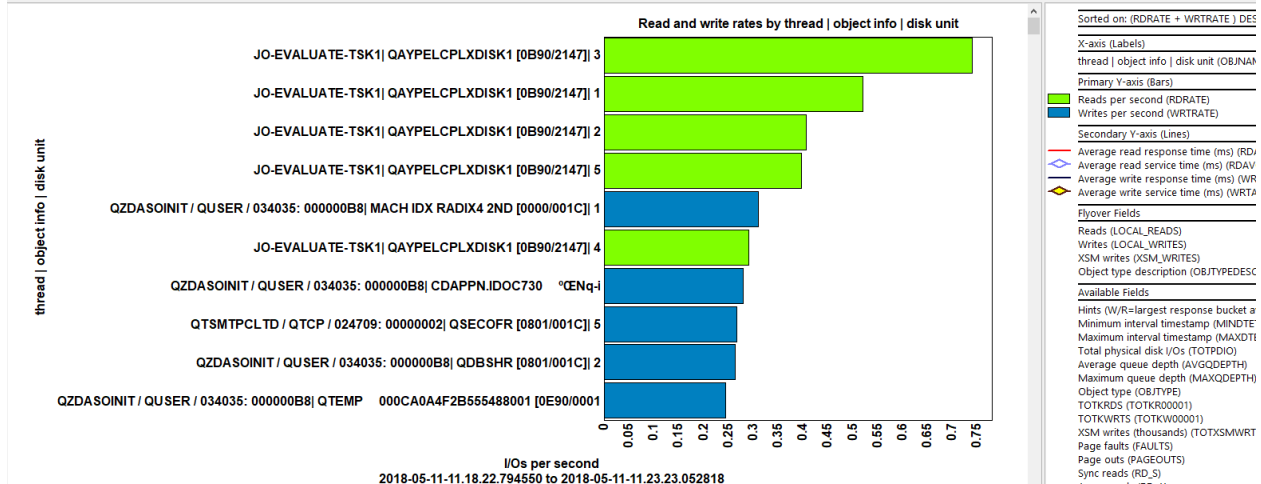
This graph groups the data by job name, user, number: thread ID and disk unit.



Read and write rates by thread | disk unit

29.3.18.21 Read and write rates by thread | object info | disk unit

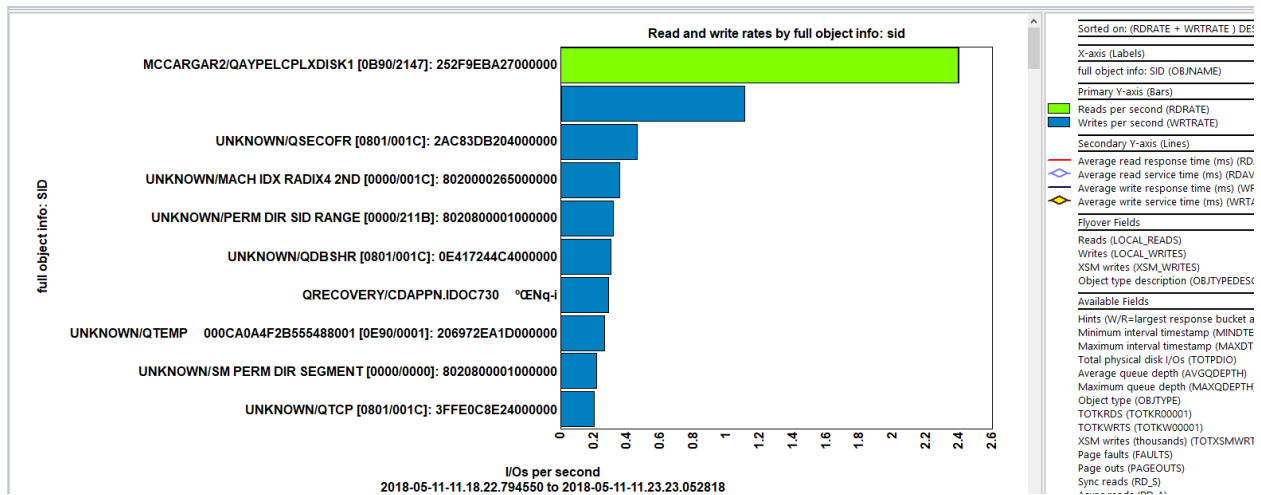
Same as previous graph except also includes object info (object name and object type, segment type.)



Read and write rates by thread | object info | disk unit

29.3.18.22 Read and write rates by full object info: sid

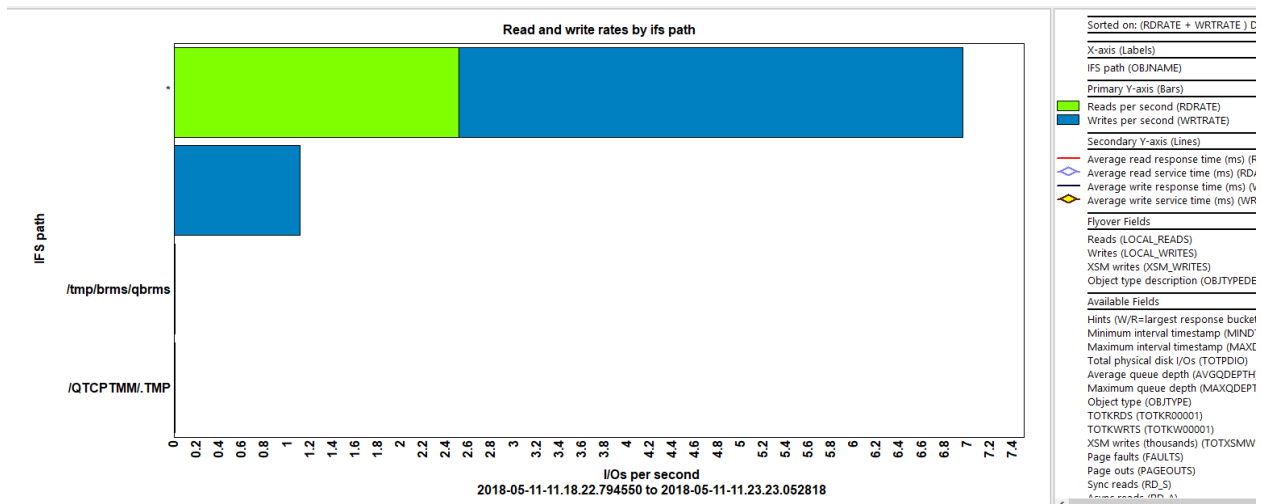
This graph groups the data by object library name, object name, object type, segment type and SID (segment address.)



Read and write rates by full object info: sid

29.3.18.23 Read and write rates by ifs path

This graph groups the data by IFS path.



Read and write rates by ifs path

29.3.18.24 Read and write rates by disk serial

This graph groups the data by disk serial number.

29.3.18.25 Read and write rates ASP <<QDDASP>> by lun id | unit

This graph groups the data by LUN ID and disk unit.

Note: If no data appears, then the data was likely not taken from a DS LUN system. Only data for disk type 2107 is shown.

29.3.18.26 Read and write rates ASP <<QDDASP>> by lun id | unit | resource name

This graph groups the data by LUN ID, disk unit and device resource name.

Note: If no data appears, then the data was likely not taken from a DS LUN system. Only data for disk type 2107 is shown.

29.3.18.27 Read and write rates ASP <<QDDASP>> by Lss id

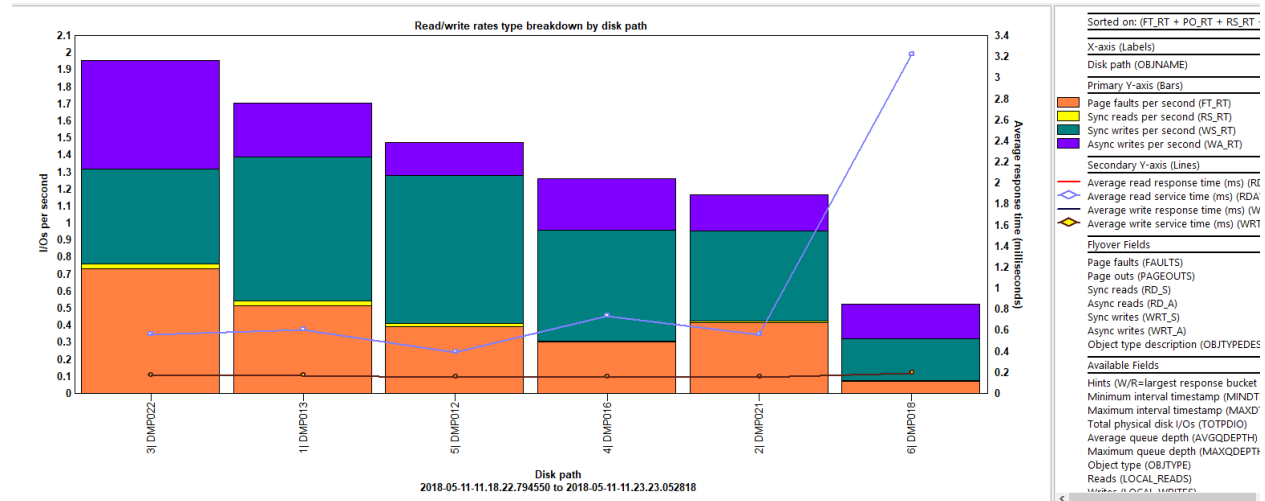
This graph groups the data by LSS ID. This is defined as bytes 4 and 5 from the disk serial number.

Note: If no data appears, then the data was likely not taken from a DS LUN system. Only data for disk type 2107 is shown.

29.3.19 Read/write rates type breakdown rankings

This graph is the same as the previous one except breaks up the rates by type of I/O operation. There are 6 I/O operations which are listed in the graph legend. For more information about the various groupings see the [Reads and writes rates rankings](#) section.

An example follows:

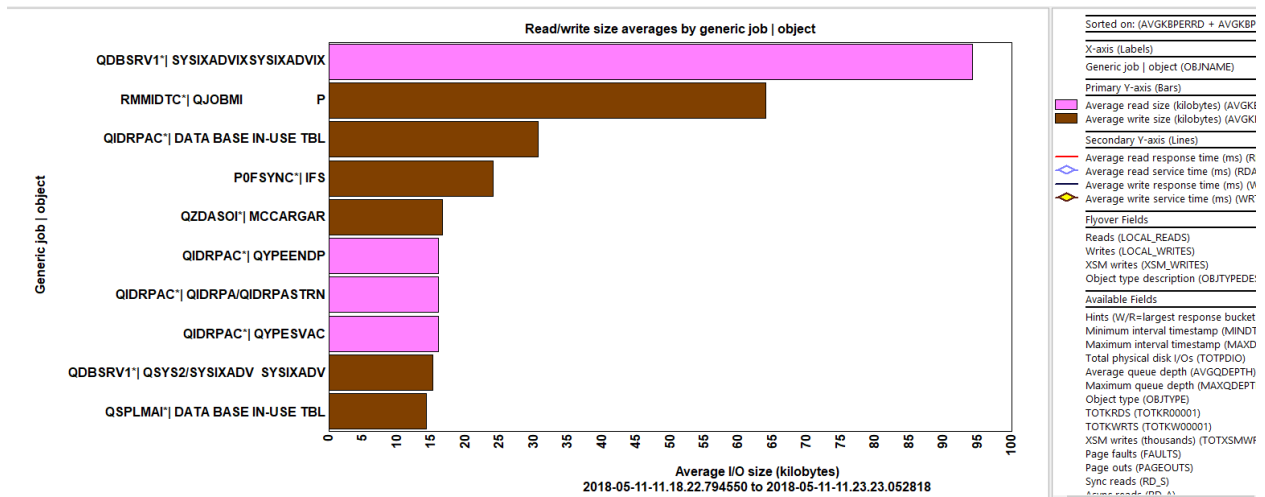


Read/write rates type breakdown by disk path

29.3.20 Read/write size averages rankings

This graph shows the average I/O size (in kilobytes) for reads and writes. The 2nd Y-axis displays read and write average response and service times. For more information about the various groupings see the [Reads and writes rates rankings](#) section.

An example follows:



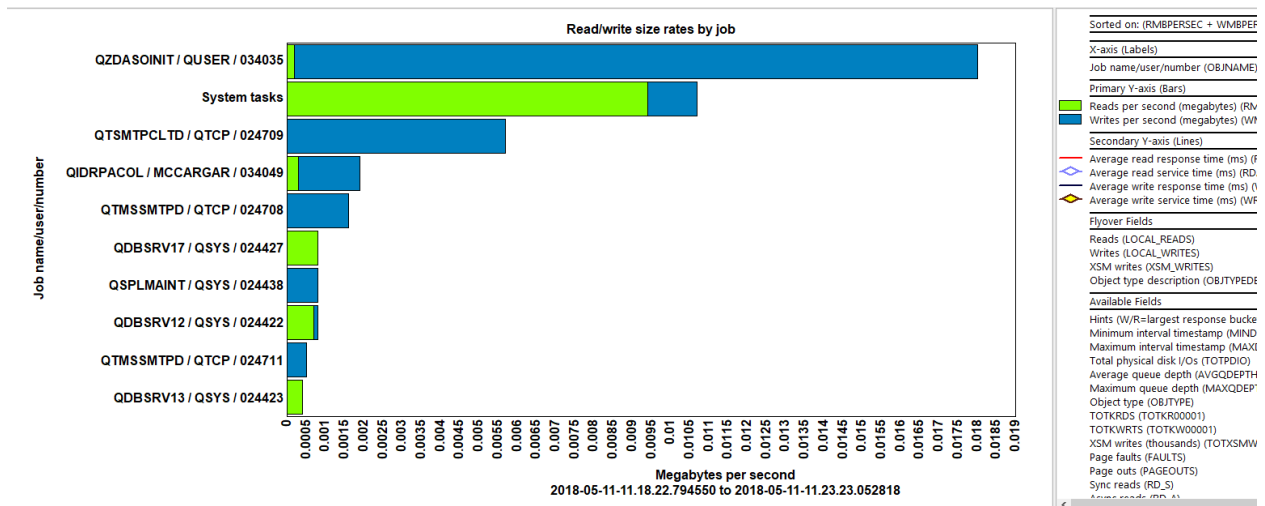
Read/write size averages by generic job | object

29.3.21 Read/write size rates rankings

This report displays the size of all reads and writes as megabytes per second. The 2nd Y-axis displays read and write average response and service times.

For more information about the various groupings see the [Reads and writes rates rankings](#) section.

An example follows:



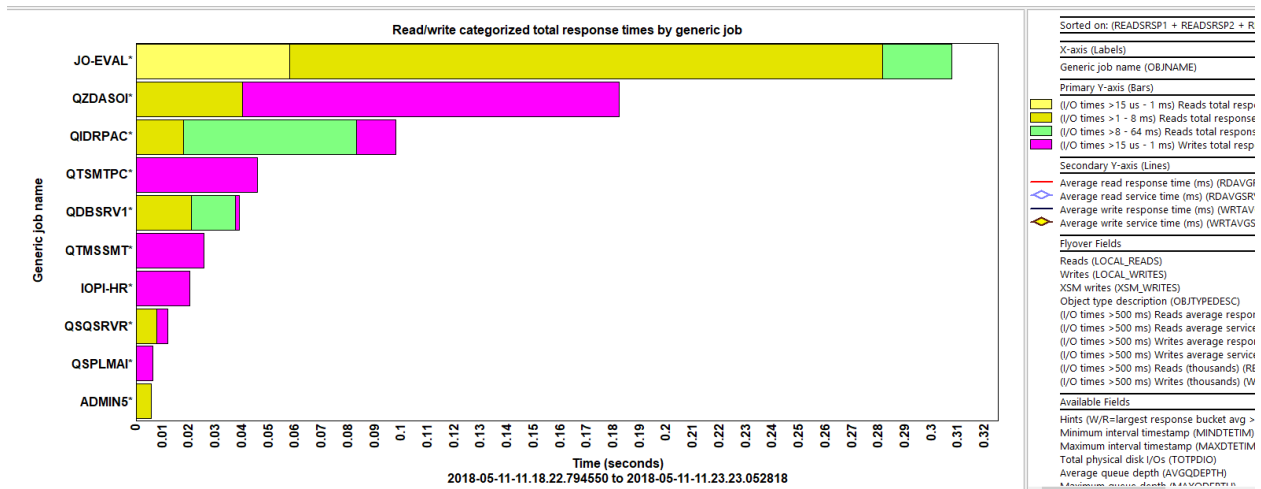
Read/write size rates by job

29.3.22 Read/write categorized total response times rankings

This graph adds up the total response times for reads and writes and shows them with different colors based on the six response time buckets. The 2nd Y-axis displays read and write average response and service times.

For more information about the various groupings see the [Reads and writes rates rankings](#) section.

An example follows:



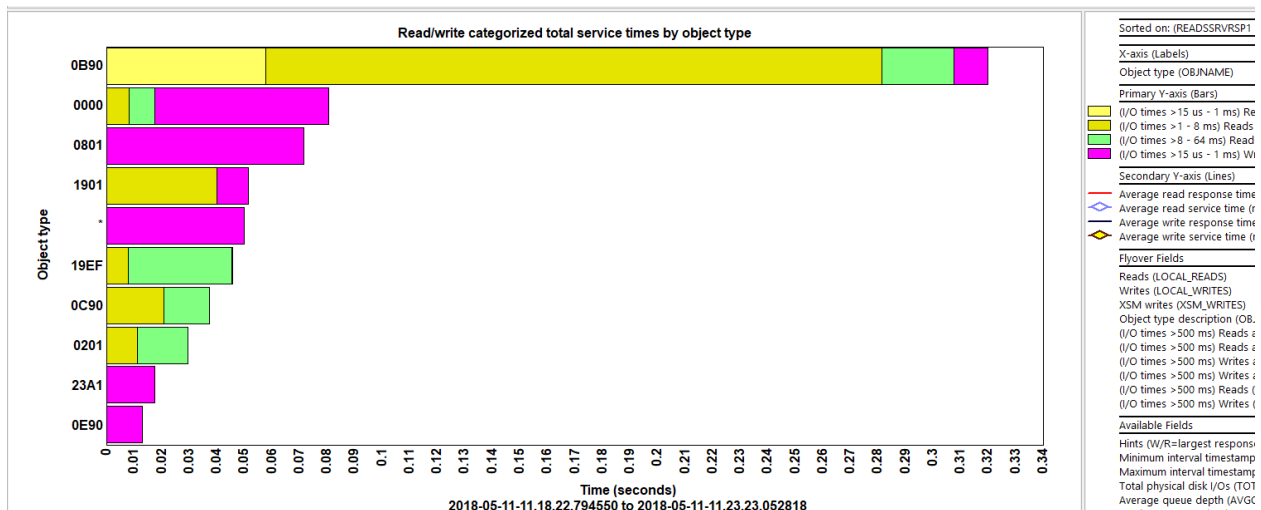
Read/write categorized total response times by generic job

29.3.23 Read/write categorized total service times rankings

This graph adds up the total services times for reads and writes and shows them with different colors based on the six response time buckets. The 2nd Y-axis displays read and write average response and service times.

For more information about the various groupings see the [Reads and writes rates rankings](#) section.

An example follows:



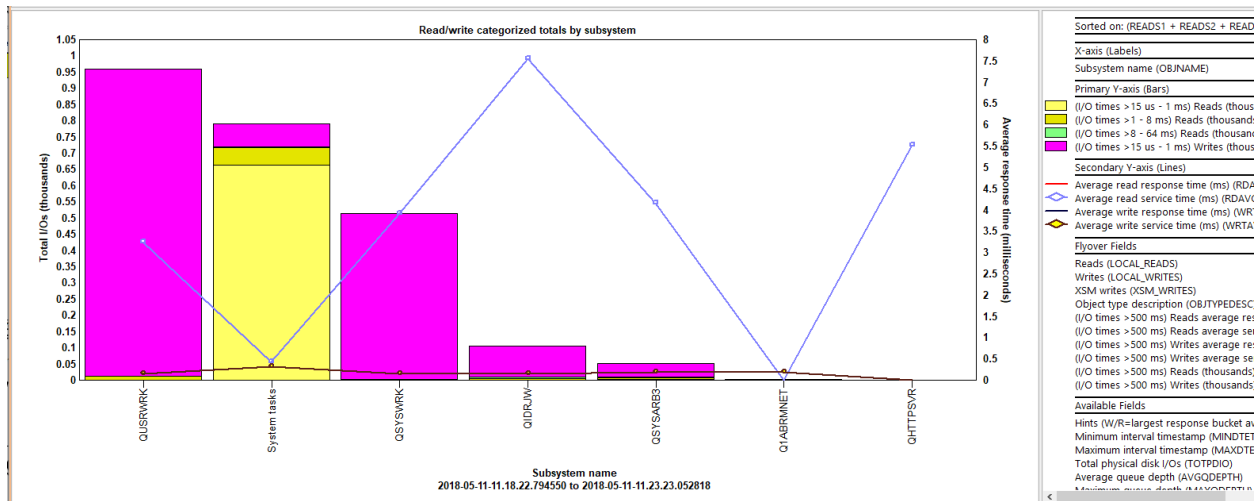
Read/write categorized total service times by object type

29.3.24 Read/write categorized totals rankings

This graph shows the total I/O counts for reads and writes with different colors based on the six response time buckets. The 2nd Y-axis displays read and write average response and service times.

For more information about the various groupings see the [Reads and writes rates rankings](#) section.

An example follows:



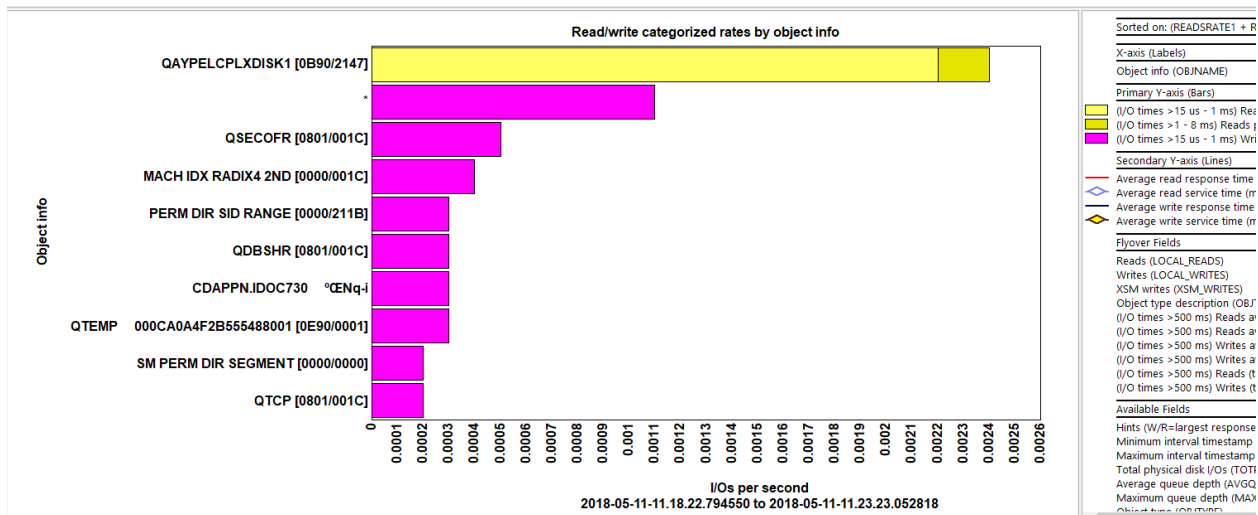
Read/write categorized totals by subsystem

29.3.25 Read/write categorized rates rankings

This graph shows the I/Os per second for reads and writes with different colors based on the six response time buckets. The 2nd Y-axis displays read and write average response and service times.

For more information about the various groupings see the [Reads and writes rates rankings](#) section.

An example follows:



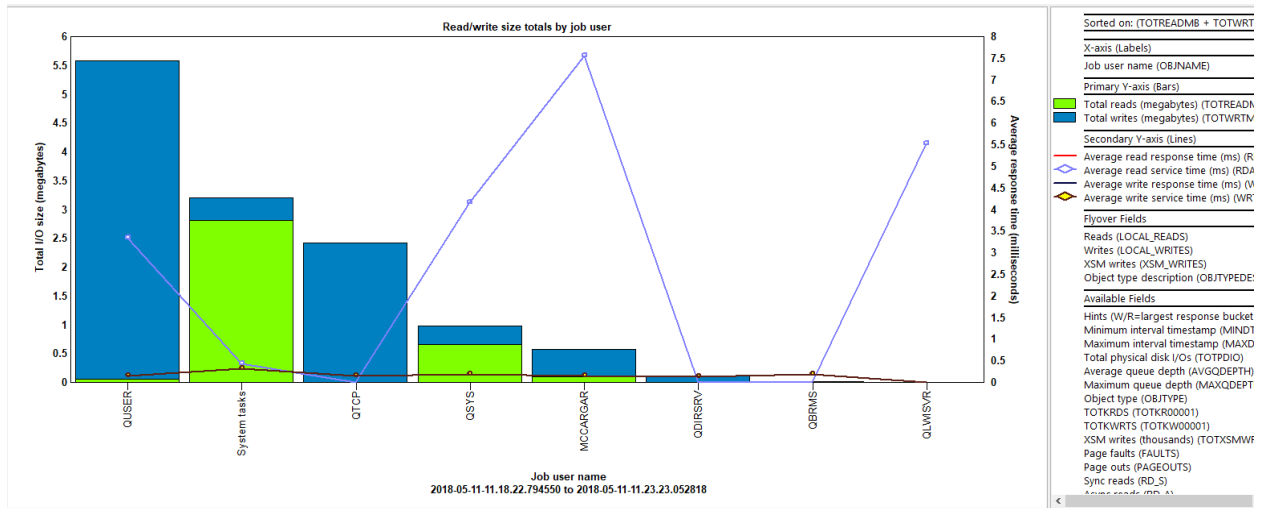
Read/write categorized rates by object info

29.3.26 Read/write size totals rankings

This graph displays the total I/O size (in megabytes) for reads and writes. The 2nd Y-axis displays read and write average response and service times.

For more information about the various groupings see the [Reads and writes rates rankings](#) section.

An example follows:



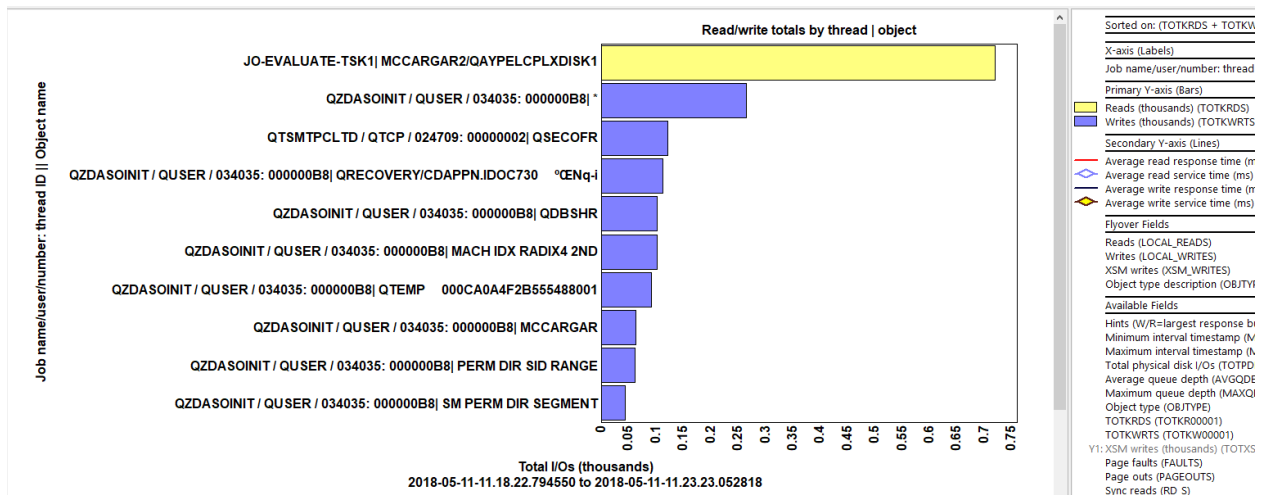
Read/write size totals by job user

29.3.27 Read/write totals rankings

This graph displays the total number of reads and writes along with the average response and service times on the 2nd Y-axis.

For more information about the various groupings see the [Reads and writes rates rankings](#) section.

An example follows:



Read/write totals by thread | object

29.3.28 Read/write rates with averages sizes rankings

This graph is the same as the Read and write rates graph except shows the average I/O size (in kilobytes) for reads and writes as well as the average response times on the secondary Y-axis.

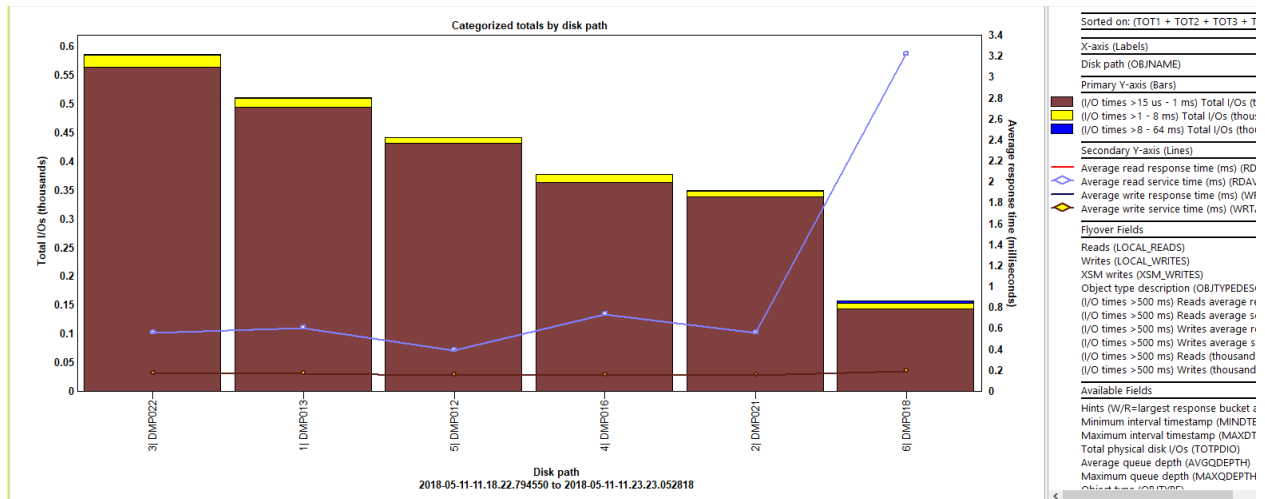
For more information about the various groupings see the [Reads and writes rates rankings](#) section.

29.3.29 Categorized totals rankings

This graph shows the total I/O counts for reads and writes with different colors based on the six response time buckets. The 2nd Y-axis displays read and write average response and service times.

For more information about the various groupings see the [Reads and writes rates rankings](#) section.

An example follows:



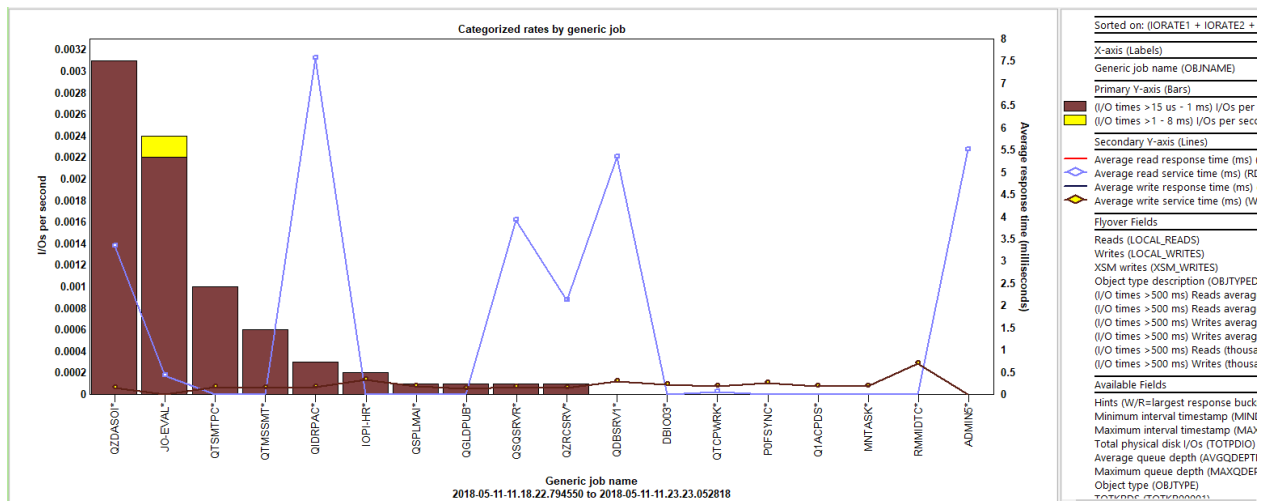
Categorized totals by disk path

29.3.30 Categorized rates rankings

This graph is the same as the previous except shows the Y1 values as a rate per second.

For more information about the various groupings see the [Reads and writes rates rankings](#) section.

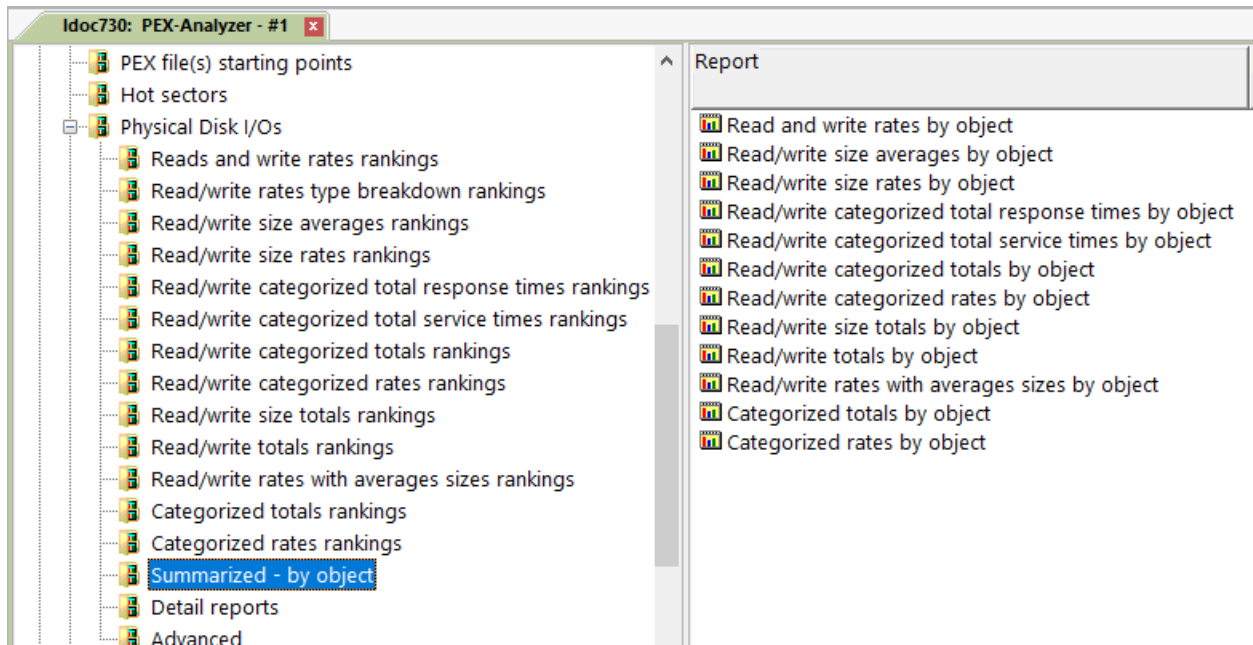
An example follows:



Categorized rates by generic job

29.3.31 Summarized - by object

This folder contains ranking graphs by object. The data is presummarized when the analysis runs so will return results faster than the other graphs found previously.

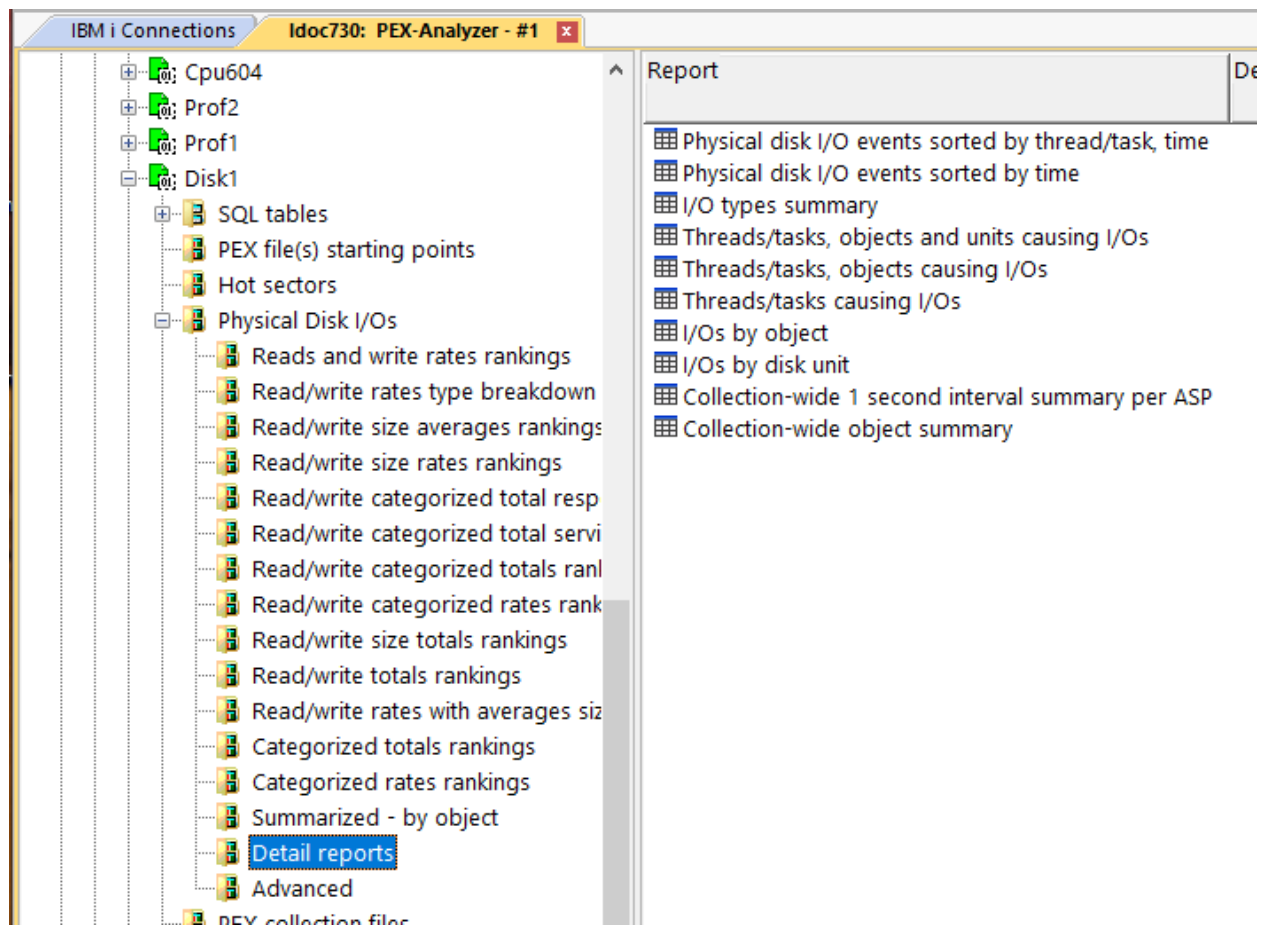


Physical Disk I/Os -> Summarized - by object

29.3.32 Detail reports

This folder contains table-based reports and provide more details behind the disk events captured in the collection.

Tip: These reports can be accessed as a drill-down from one of the overview or ranking graphs described previously for a selected time range or grouping using the Detail reports menu when right-clicking a graph's bar.



Physical Disk I/Os -> Detail reports

29.3.33 Advanced

This folder contains additional disk graphs that are less frequently used. The graphs labeled **“Advanced”** are the graphs that display 11 response time buckets for reads and/or writes instead of 6. These are like the categorized graphs covered previously but intended for advanced users. The Y2-axis is more complicated as well and contains 5 values instead of 4.

Tip: In some situations, the X-axis label on the advanced graphs will show an “R” for reads and/or “W” for writes if the average response time exceeded 1 second in the largest response time bucket. But at 7.3 and earlier this will always occur if any values exist in the largest response time bucket.

IBM i Connections Idoc730: PEX-Analyzer - #1 Idoc730: Collection Services Investigator - #1

- Cpu604
- Prof2
- Prof1
- Disk1
 - SQL tables
 - PEX file(s) starting points
 - Hot sectors
 - Physical Disk I/Os
 - Reads and write rates rankings
 - Read/write rates type breakdown rankir
 - Read/write size averages rankings
 - Read/write size rates rankings
 - Read/write categorized total response t
 - Read/write categorized total service tim
 - Read/write categorized totals rankings
 - Read/write categorized rates rankings
 - Read/write size totals rankings
 - Read/write totals rankings
 - Read/write rates with averages sizes rar
 - Categorized totals rankings
 - Categorized rates rankings
 - Summarized - by object
 - Detail reports
 - Advanced**
 - PEX collection files

Report

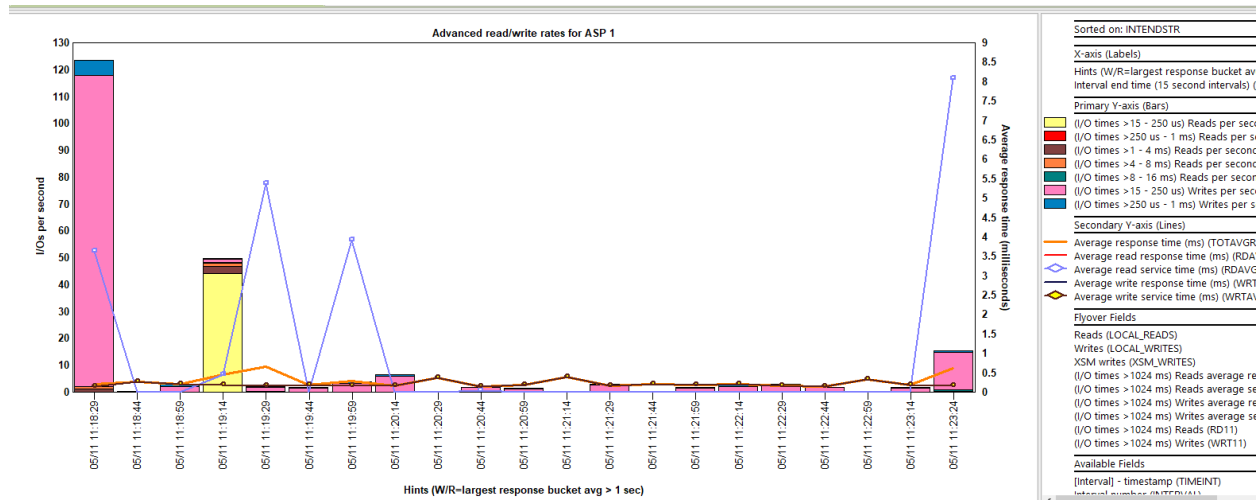
- Advanced read/write rates for ASP <<QDDASP>>
- Advanced write rates for ASP <<QDDASP>>
- Advanced read rates for ASP <<QDDASP>>
- Advanced read/write response times for ASP <<QDDASP>>
- Advanced write response times for ASP <<QDDASP>>
- Advanced read response times for ASP <<QDDASP>>
- Advanced read/write service times for ASP <<QDDASP>>
- Advanced write service times for ASP <<QDDASP>>
- Advanced read service times for ASP <<QDDASP>>
- Advanced read/write totals for ASP <<QDDASP>>
- Advanced write totals for ASP <<QDDASP>>
- Advanced read totals for ASP <<QDDASP>>
- Advanced read/write rates rankings
- Advanced write rates rankings
- Advanced read rates rankings
- Advanced total response times rankings
- Advanced write response times rankings
- Advanced read response times rankings
- Advanced total service times rankings
- Advanced write service times rankings
- Advanced read service times rankings
- Advanced read/write totals rankings
- Advanced write totals rankings
- Advanced read totals rankings

Description

- Advanced r
- Advanced v
- Advanced r
- Advanced t
- Advanced v
- Advanced r
- Advanced t
- Advanced v
- Advanced r
- Advanced r
- Advanced v
- Advanced r
- Advanced v
- Advanced r
- Advanced v
- Advanced r
- Advanced v
- Advanced r

Physical Disk I/Os -> Advanced

An example follows:



Advanced read/write rates for ASP 1

30 SARs

This analysis examines the Segment address register (SAR) events. These are a type of low-level disk event. SARs are event type 9 in the PEX data and the data for these events is created in table QAYPESAR.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
9	1	SAREVT	*USER	Service
9	2	SAREVT	*CLR	Clear
9	3	SAREVT	*CLRPIN	Clear Pin
9	4	SAREVT	*EXCHCLR	Exchange Clear
9	5	SAREVT	*READ	Read
9	6	SAREVT	*READASYNC	Read Asynchronous
9	7	SAREVT	*READASYNCCALL	Read Asynchronous Track Call
9	8	SAREVT	*READPIN	Read Pin
9	9	SAREVT	*EXCHREAD	Exchange Read
9	10	SAREVT	*EXCHREADASYNC	Exchange Read Asynchronous
9	11	SAREVT	*EXCHREADASYNCCALL	Reserved
9	12	SAREVT	*WRT	Write
9	13	SAREVT	*WRTASYNC	Write Asynchronous
9	14	SAREVT	*WRTASYNCCALL	Reserved
9	15	SAREVT	*WRTASYNCMSGQ	Reserved
9	16	SAREVT	*WRTASYNCMSGQLAST	Reserved
9	17	SAREVT	*WRTASYNCTASK	Reserved
9	18	SAREVT	*WRTASYNCWAIT	Reserved
9	19	SAREVT	*WRTRMV	Write Remove
9	20	SAREVT	*WRTPGOUT	Write For Page Out
9	21	SAREVT	*RMV	Remove
9	22	SAREVT	*UNPIN	Reserved
9	23	SAREVT	*UNPINRMV	Unpin Remove
9	24	SAREVT	*UNPINWRT	Reserved
9	25	SAREVT	*ENDOK	End Successful
9	26	SAREVT	*ENDERR	End with Error

SAR events from QAYPEEVENT at 7.2

30.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

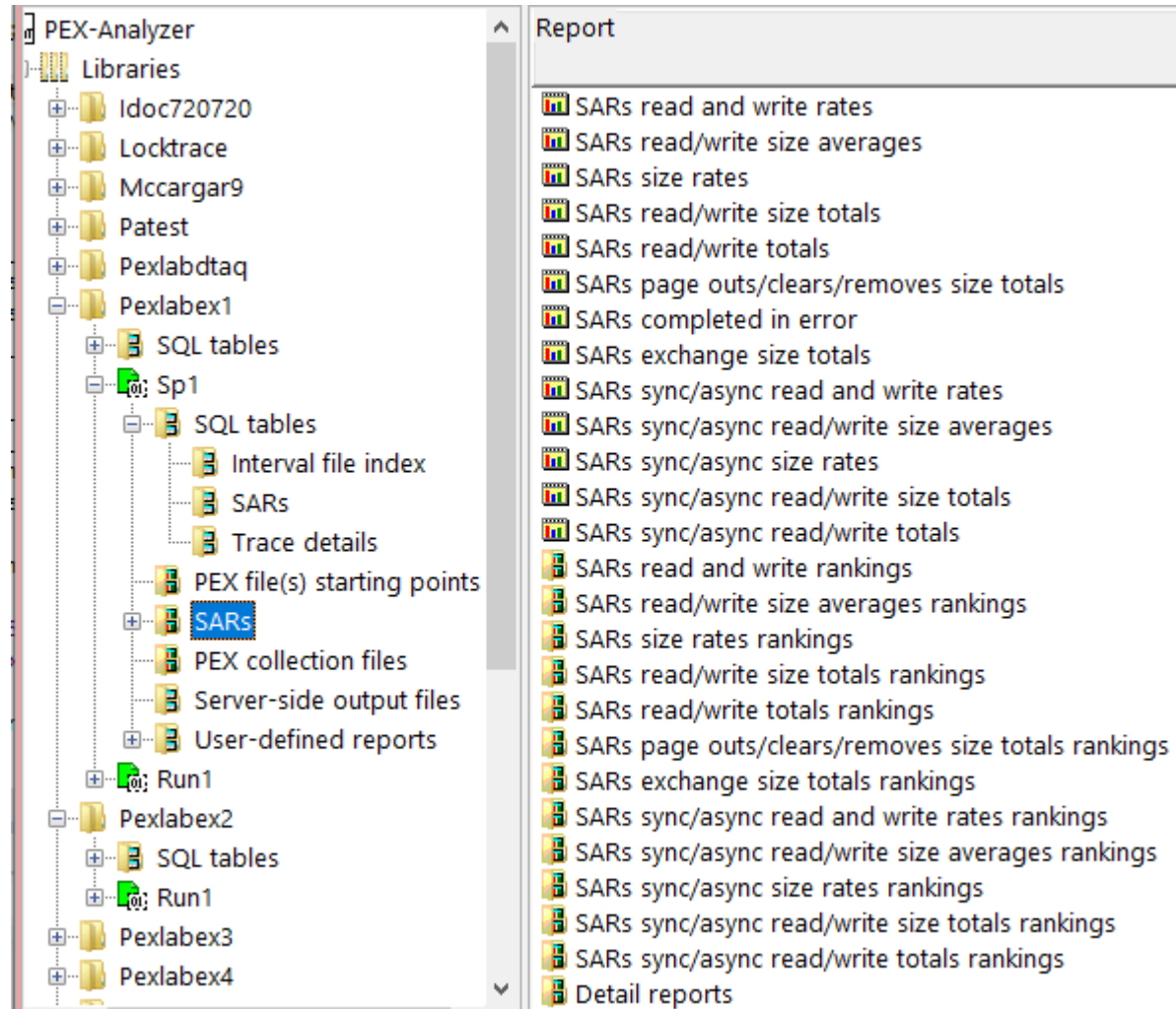
30.2 SQL tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
PEXSAR_<MBR>	SAR event details
PEXSARISUM_<MBR>	SAR interval summary

30.3 SARs

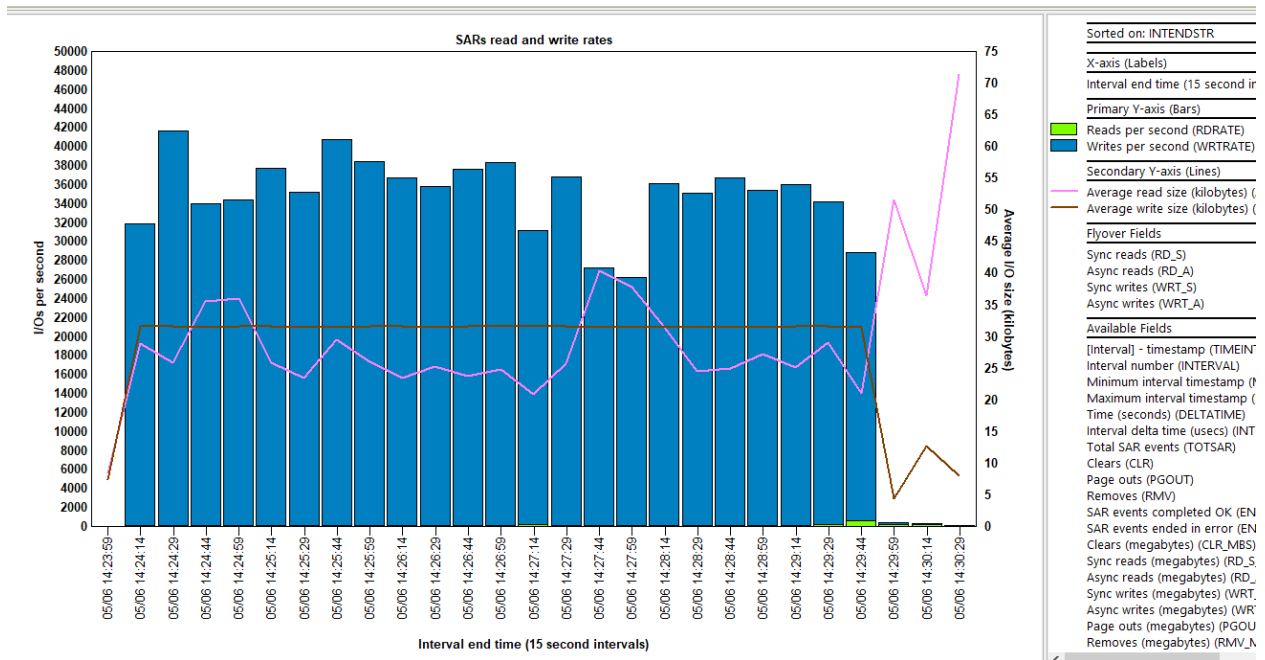
This folder contains the graphs and reports available after the analysis has completed.



SARs

30.3.1 SARs read and write rates

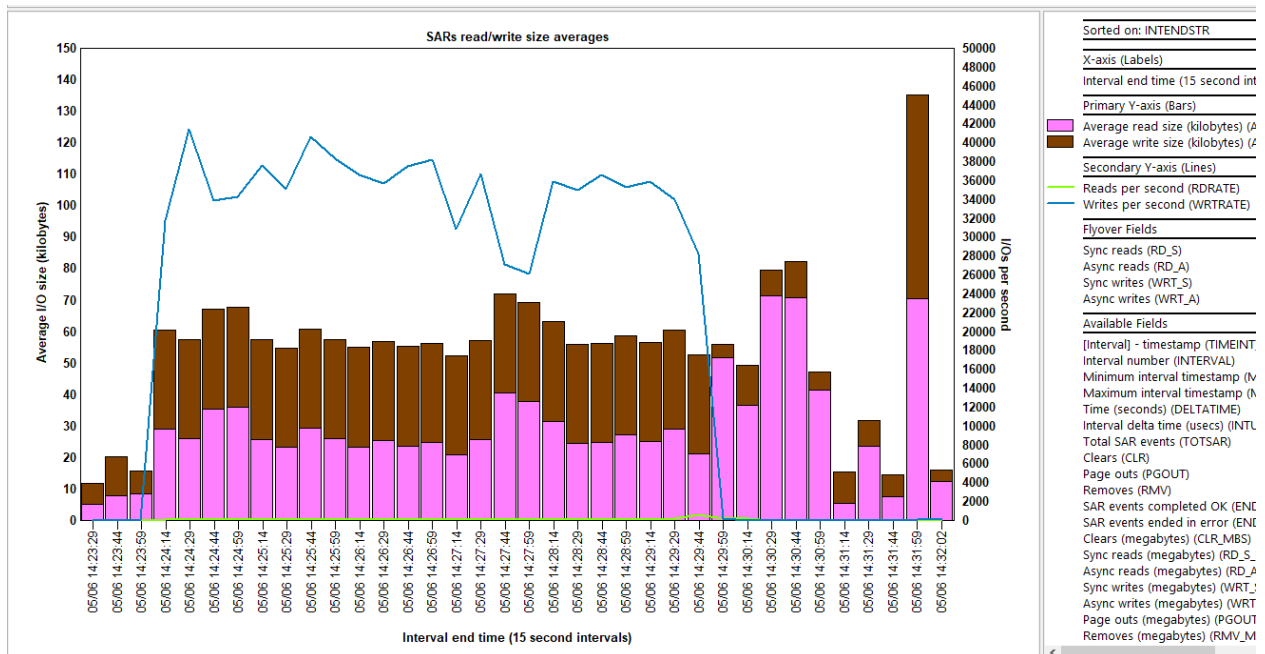
This graph shows SAR reads per second and writes per second over time. The 2nd Y-axis displays read and write average size (in kilobytes.)



SARs read and write rates

30.3.2 SARs read/write size averages

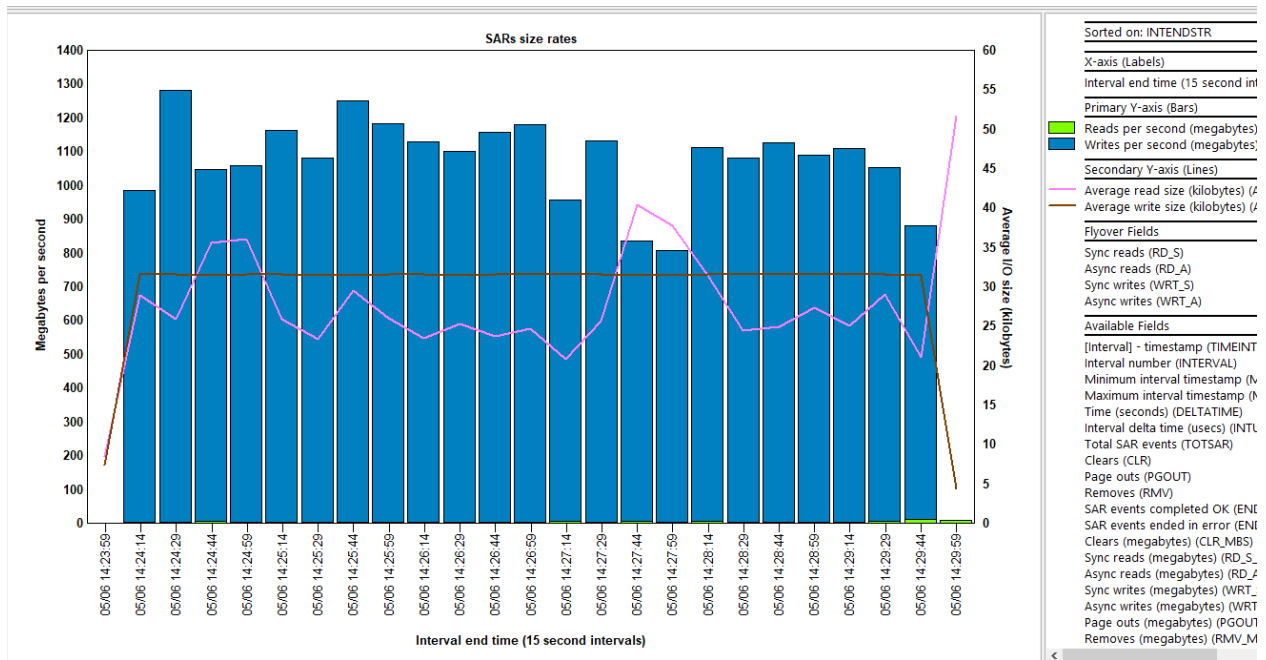
This graph is like the previous graph except flips the Y1 and Y2 axes around.



SARs read/write size averages

30.3.3 SARs size rates

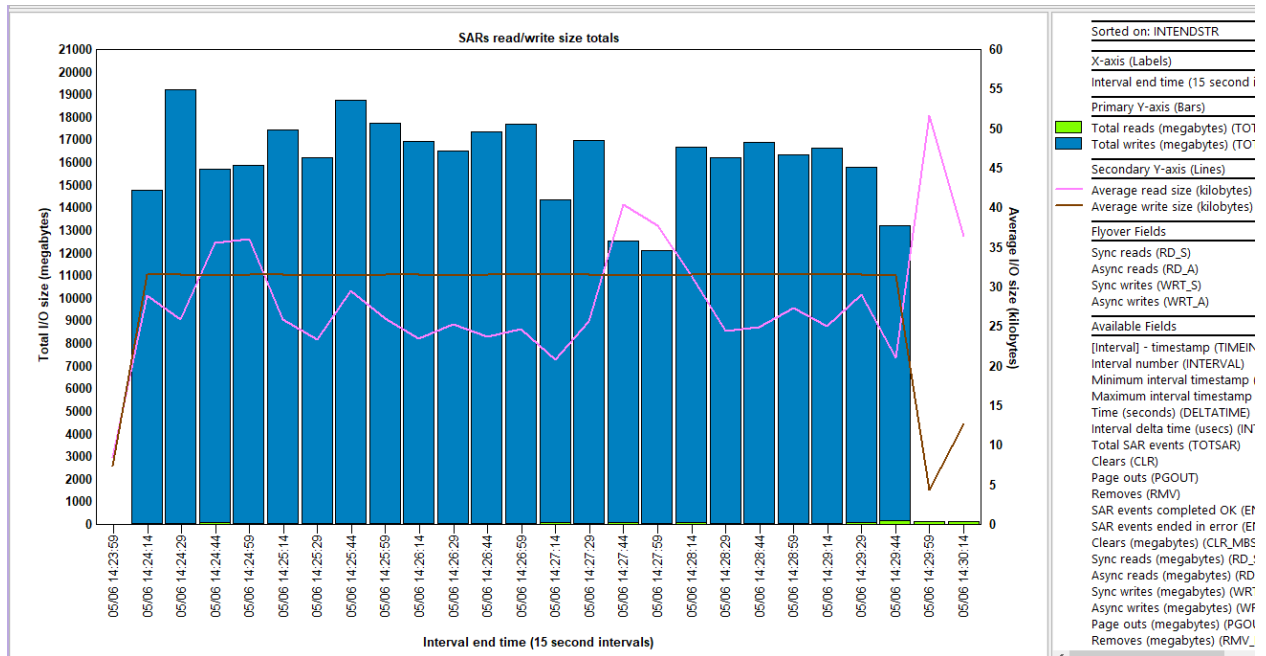
This graph displays the size of all SAR reads and writes as megabytes per second over time. The 2nd Y-axis displays read and write average size (in kilobytes.)



SARs size rates

30.3.4 SARs read/write size totals

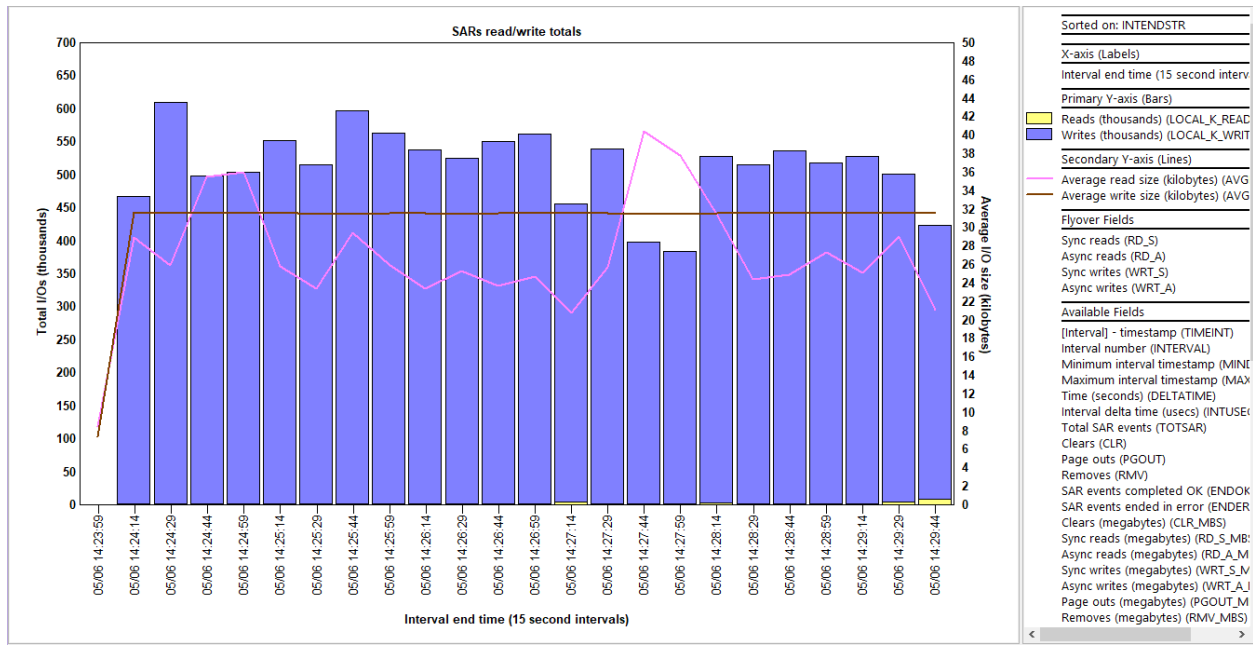
This graph displays the total SARs I/O size (in megabytes) for reads and writes that occurred over time. The Y2-axis displays read and write average size (in kilobytes.)



SARs read/write size totals

30.3.5 SARs read/write totals

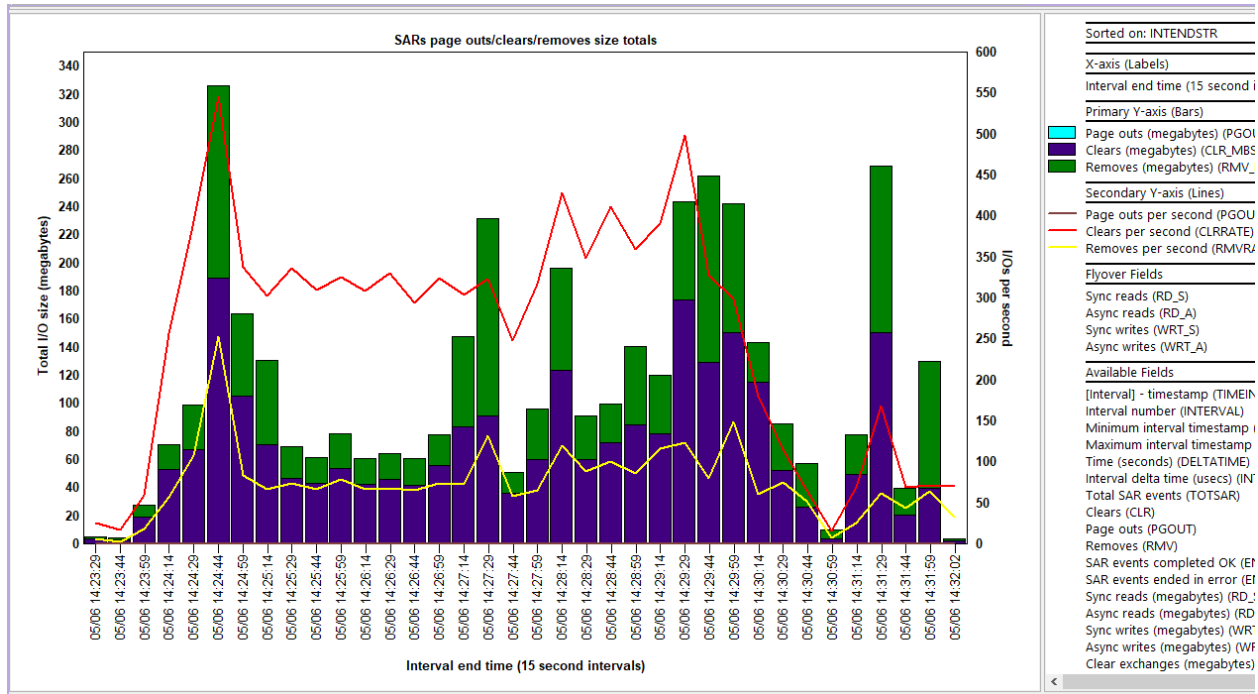
This graph displays the SARs reads and writes (in thousands) along with the average size on the optional Y2 axis.



SARs read/write totals

30.3.6 SARs page outs/clears/removes size totals

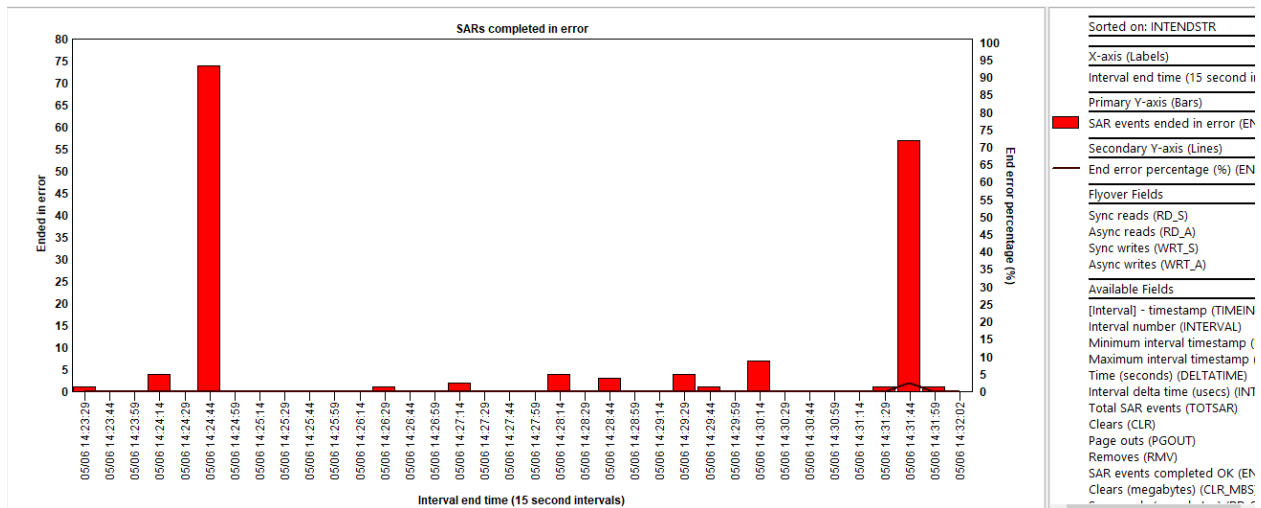
This graph shows the total size (in megabytes) for page outs, clears and remove operations. The optional Y2-axis shows a count of operations as a rate per second for each type.



SARs page outs/clears/removes size totals

30.3.7 SARs completed in error

This graph shows the number of SARs that completed in error over time. The Y2-axis shows the error percentage of the total events.

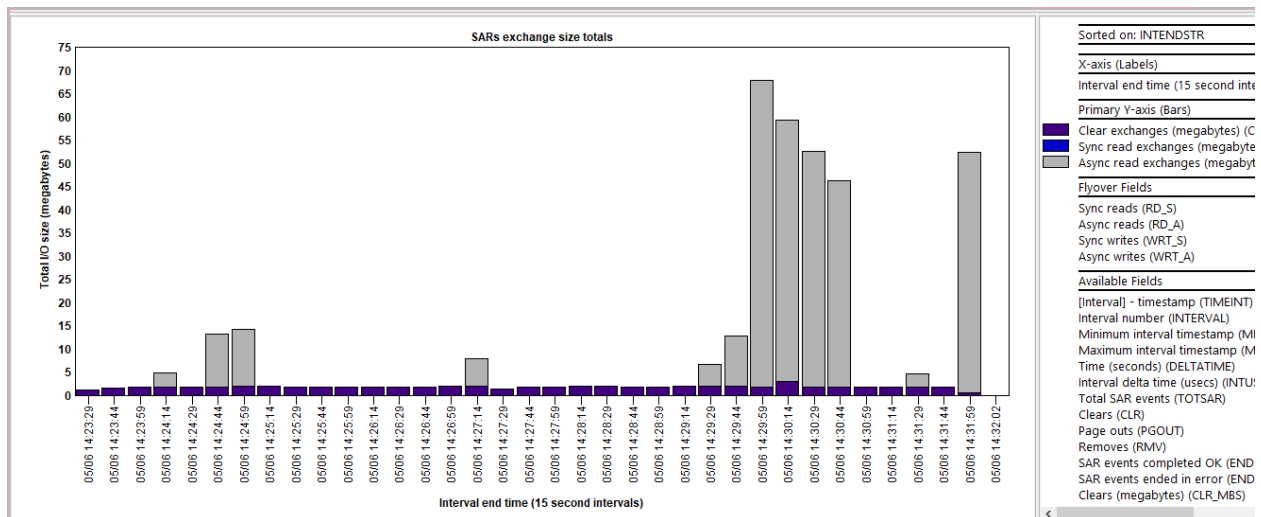


SARs completed in error

30.3.8 SARs exchange size totals

This graph shows the total size of 3 types of exchange operations in megabytes:

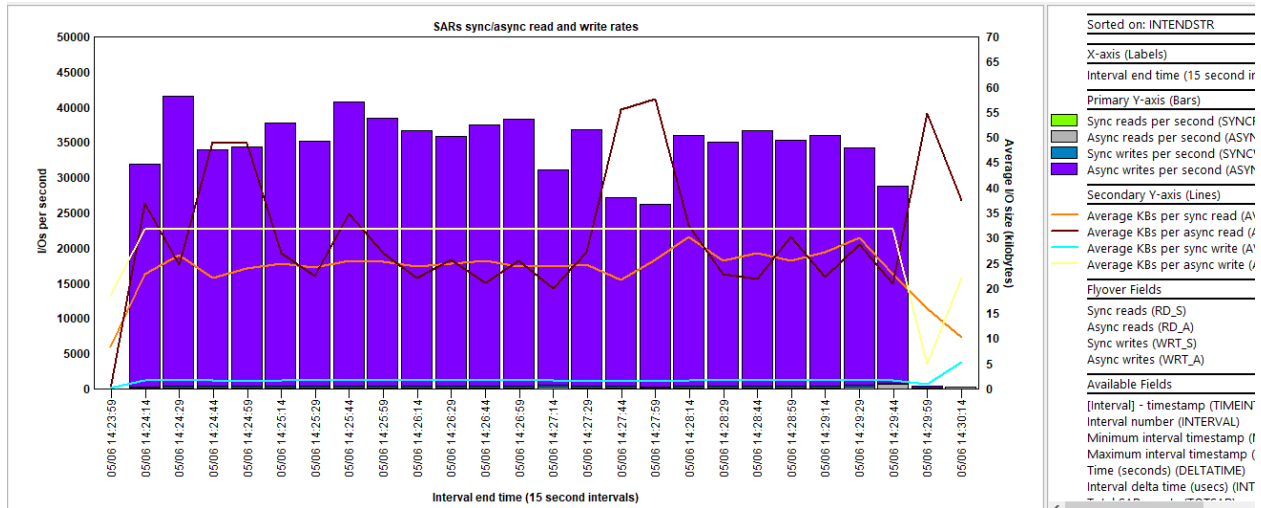
- 1) Clears
- 2) Sync reads
- 3) Async reads



SARs exchange size totals

30.3.9 SARs sync/async read and write rates

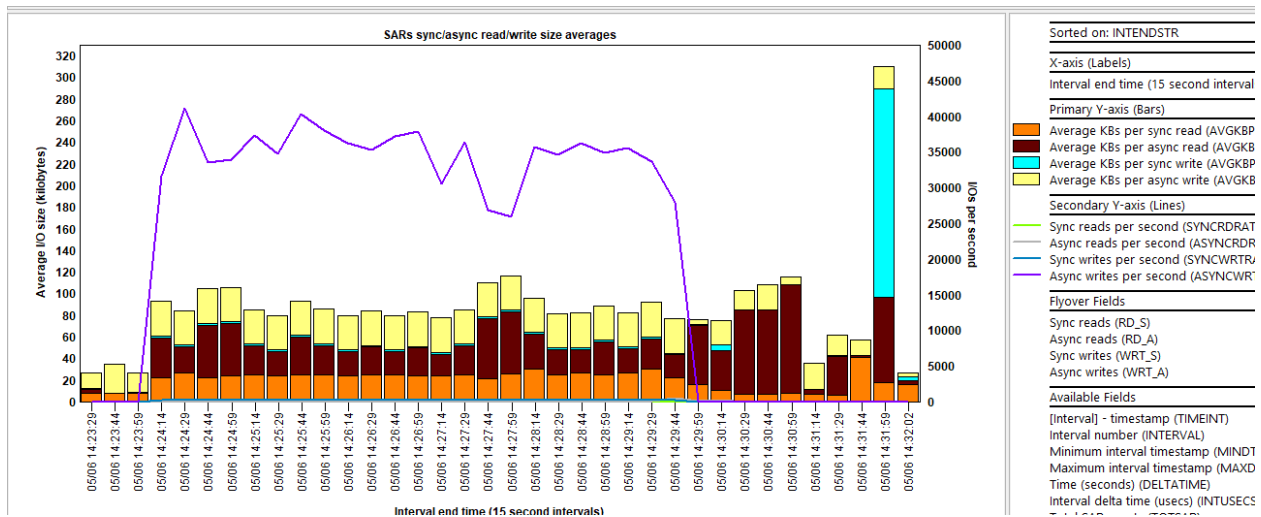
This graph is like the [SARs read and write rates](#) graph except breaks down the operations by synchronous vs asynchronous.



SARs sync/async read and write rates

30.3.10 SARs sync/async read/write size averages

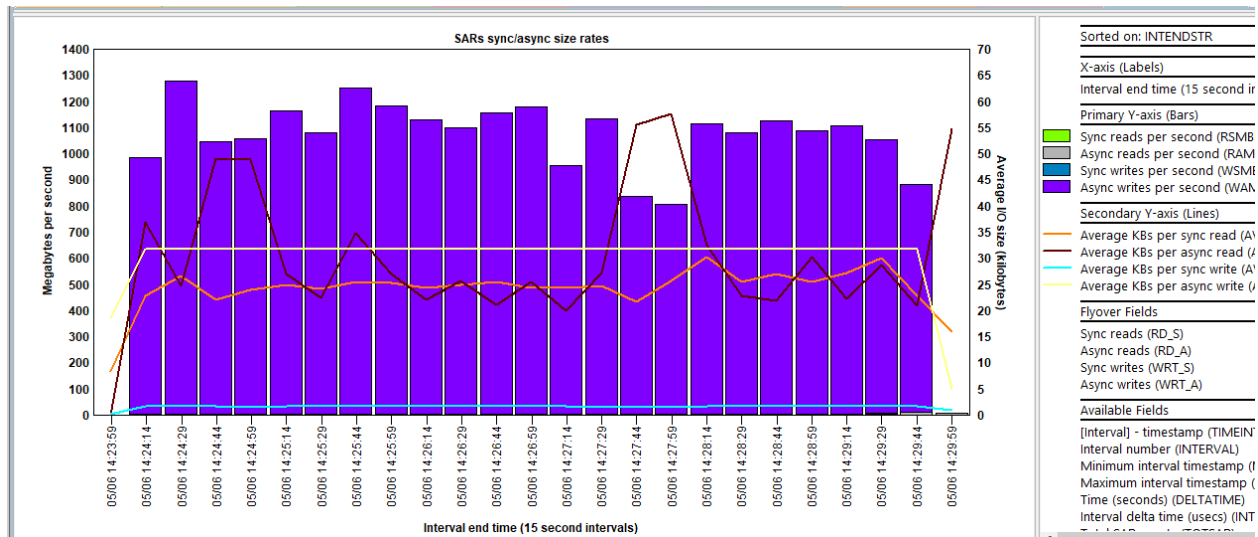
This graph is like the previous graph except flips the Y1 and Y2 axes around.



SARs sync/async read/write size averages

30.3.11 SARs sync/async size rates

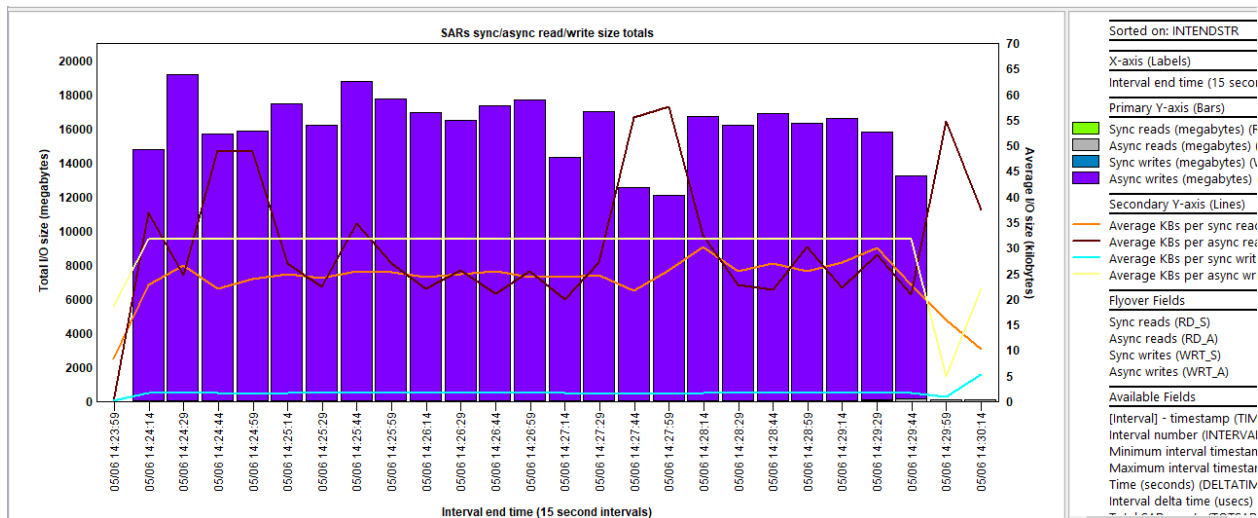
This graph is like the [SARs size rates](#) graph except breaks down the operations by synchronous vs asynchronous.



SARs sync/async size rates

30.3.12 SARs sync/async read/write size totals

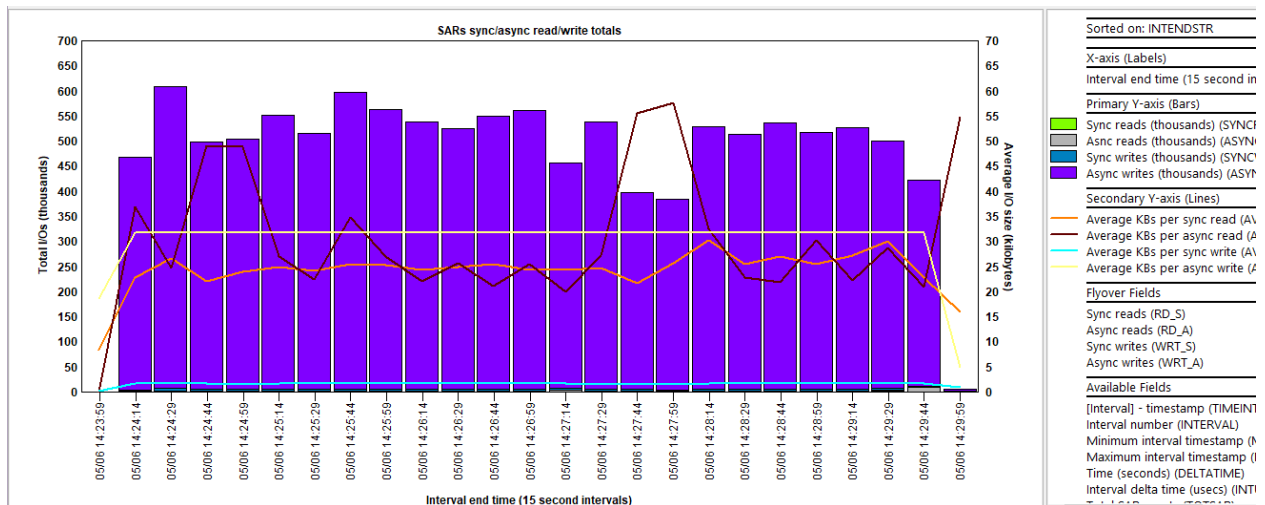
This graph is like the [SARs read/write size totals](#) graph except breaks down the operations by synchronous vs asynchronous.



SARs sync/async read/write size totals

30.3.13 SARs sync/async read/write totals

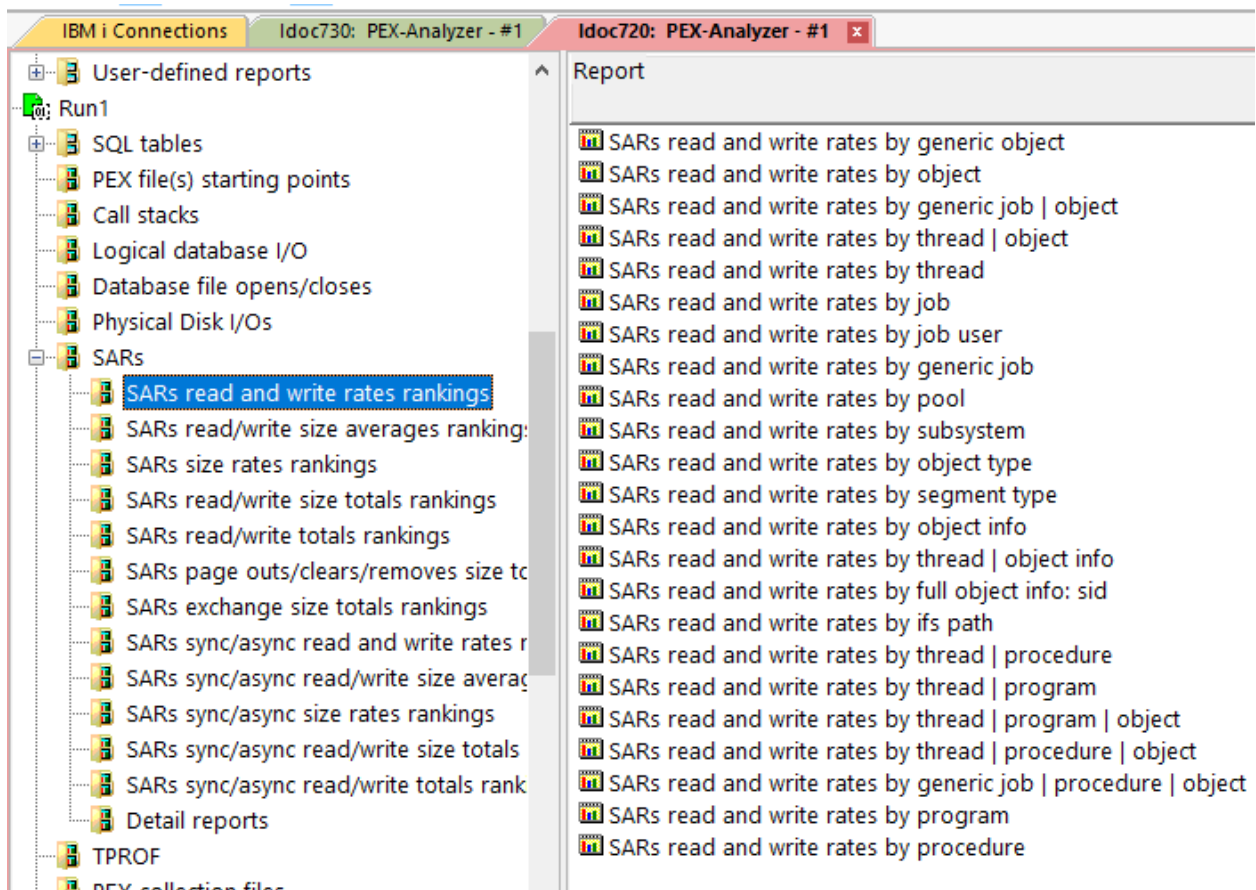
This graph is like the [SARs read/write totals](#) graph except breaks down the operations by synchronous vs asynchronous.



SARs sync/async read/write totals

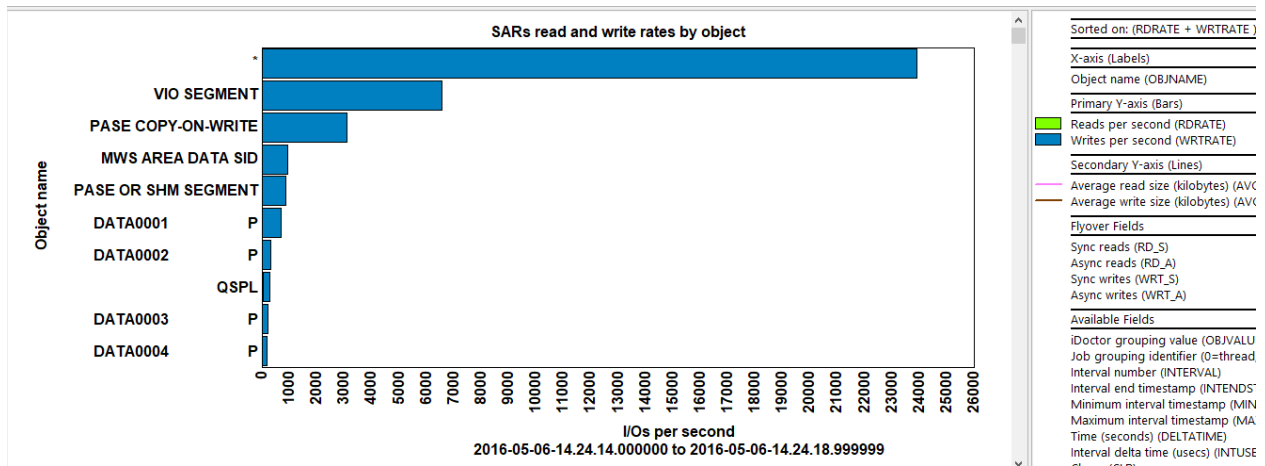
30.3.14 SARs read and write rates rankings

This graph ranks the SARs reads and writes as a rate per second by 1 of several possible ways.



SARs -> SARs read and write rates rankings

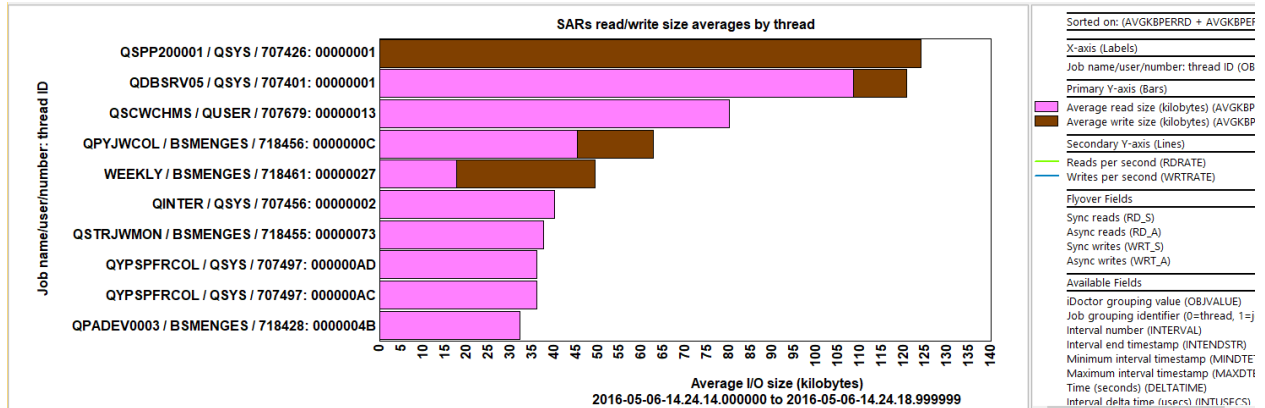
An example follows:



SARs read and write rates by object

30.3.15 SARs read/write size averages rankings

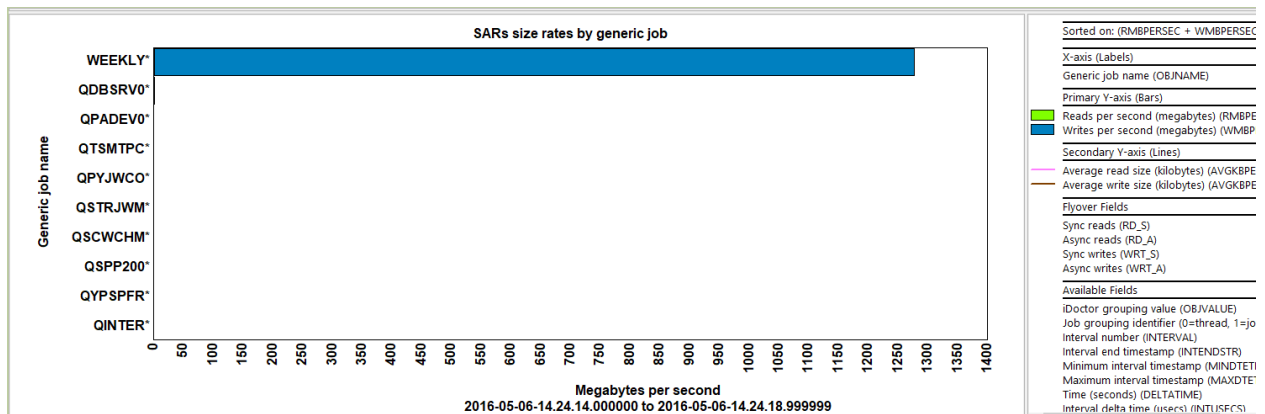
This graph is like the previous graph except flips the Y1 and Y2 axes around.



SARs read/write size averages by thread

30.3.16 SARs size rates rankings

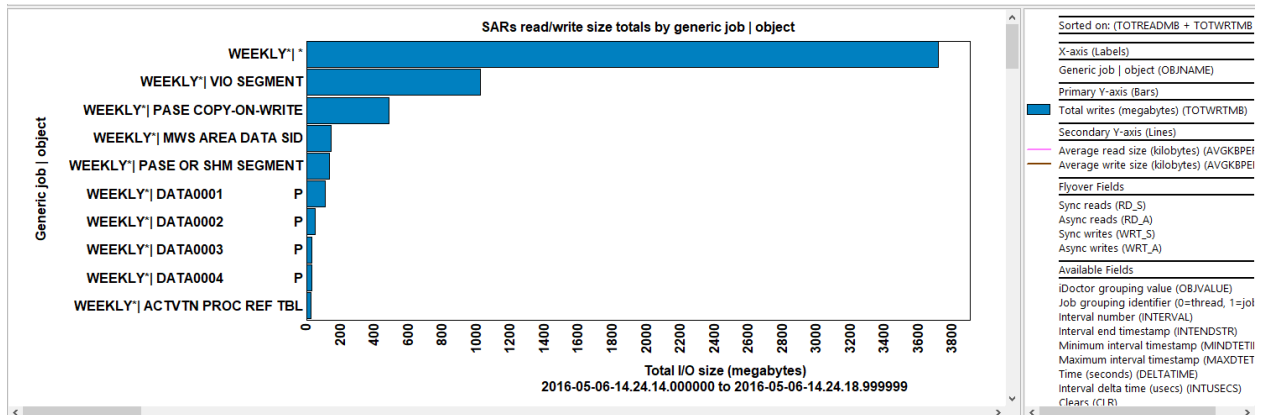
This graph displays the size of all SAR reads and writes as megabytes per second. The optional 2nd Y-axis displays read and write average size (in kilobytes.)



SARs size rates by generic job

30.3.17 SARs read/write size totals rankings

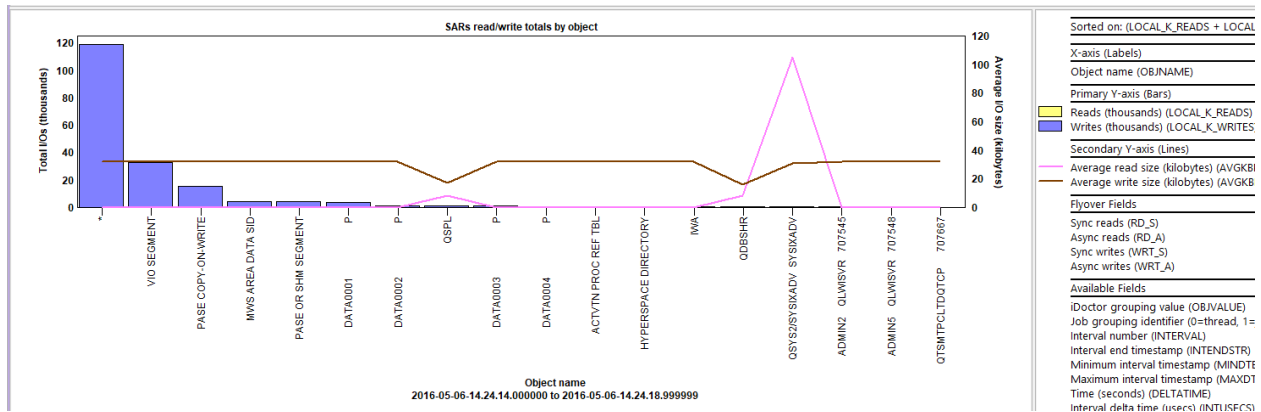
This graph displays the total SARs I/O size (in megabytes) for reads and writes that occurred. The optional Y2-axis displays read and write average size (in kilobytes.)



SARs read/write size totals by generic job | object

30.3.18 SARs read/write totals rankings

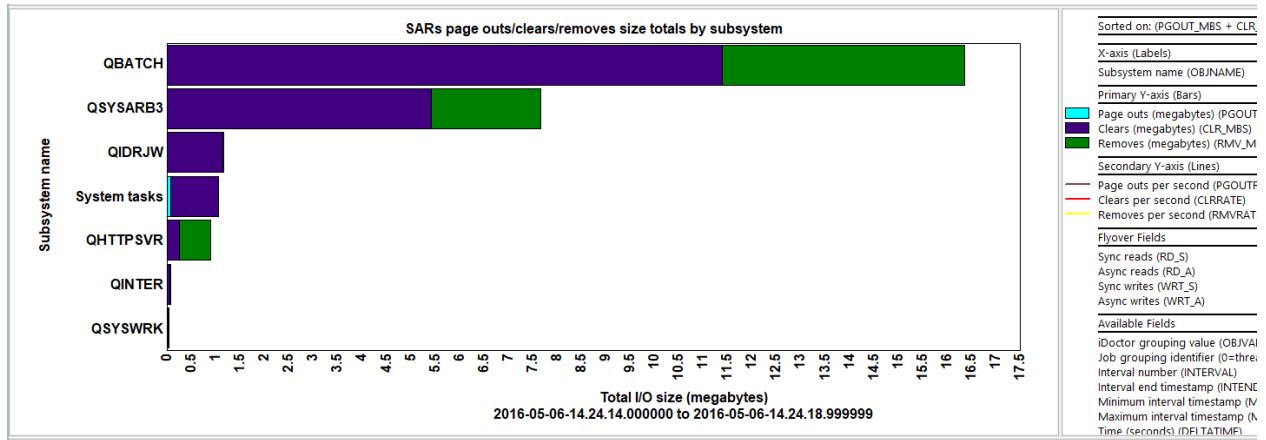
This graph displays the SARs reads and writes (in thousands) along with the average size on the optional Y2 axis.



SARs read/write totals rankings

30.3.19 SARs page outs/clears/removes size totals rankings

This graph shows the total size (in megabytes) for page outs, clears and remove operations. The optional Y2-axis shows a count of operations as a rate per second for each type.

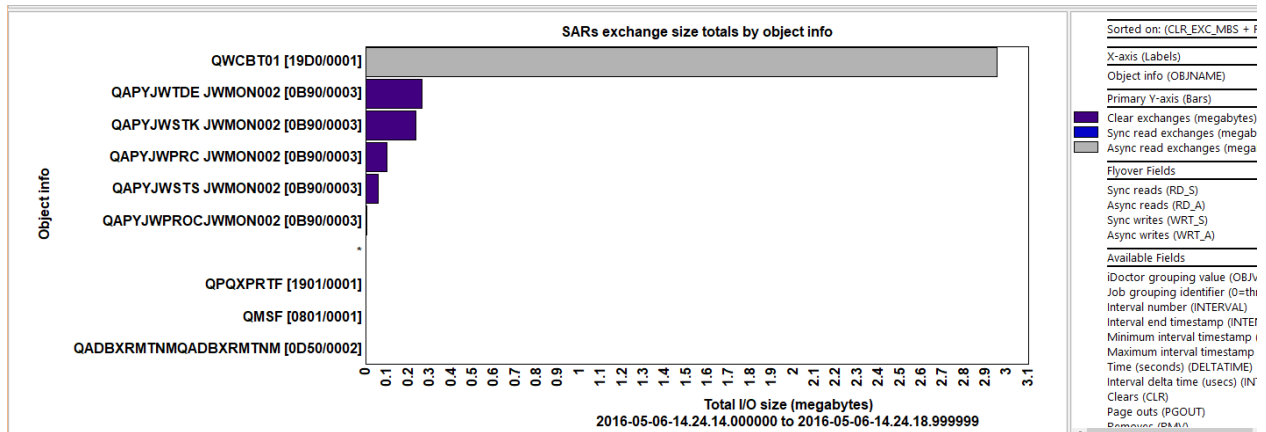


SARs page outs/clears/removes size totals by subsystem

30.3.20 SARs exchange size totals rankings

This graph shows the total size of 3 types of exchange operations in megabytes:

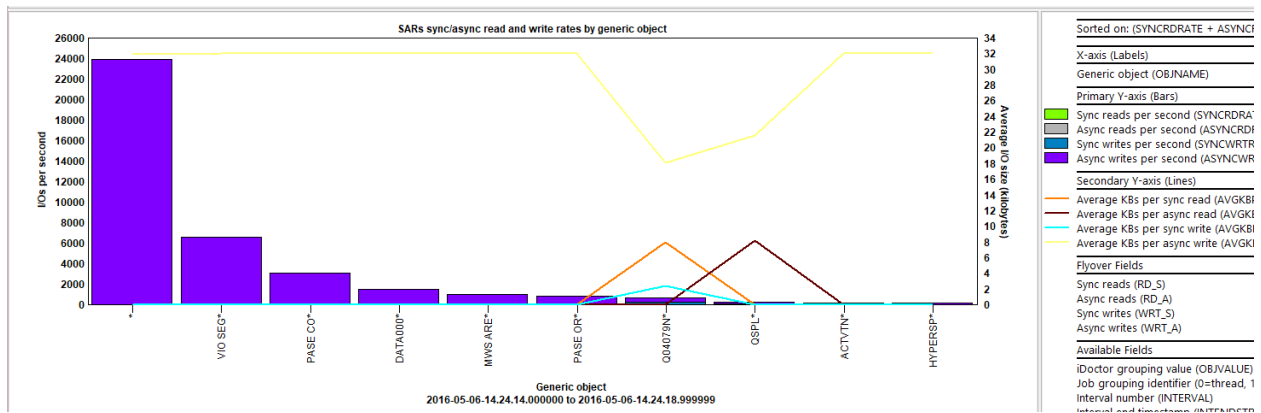
- 1) Clears
- 2) Sync reads
- 3) Async reads



SARs exchange size totals by object info

30.3.21 SARs sync/async read and write rates rankings

This graph is like the [SARs read and write rates rankings](#) graph except breaks down the operations by synchronous vs asynchronous.



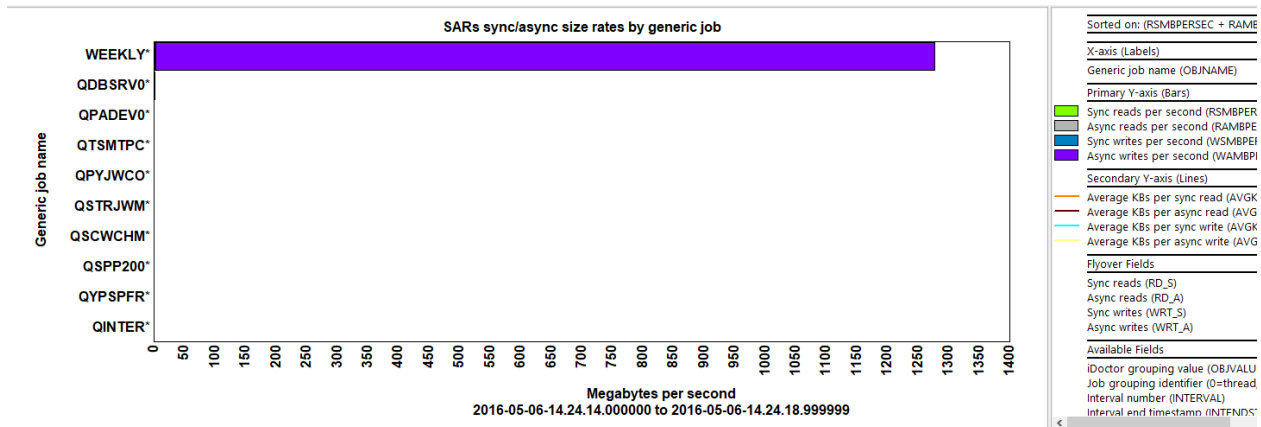
SARs sync/async read and write rates by generic object

30.3.22 SARs sync/async read/write size averages rankings

This graph is like the previous graph except flips the Y1 and Y2 axes around.

30.3.23 SARs sync/async size rates rankings

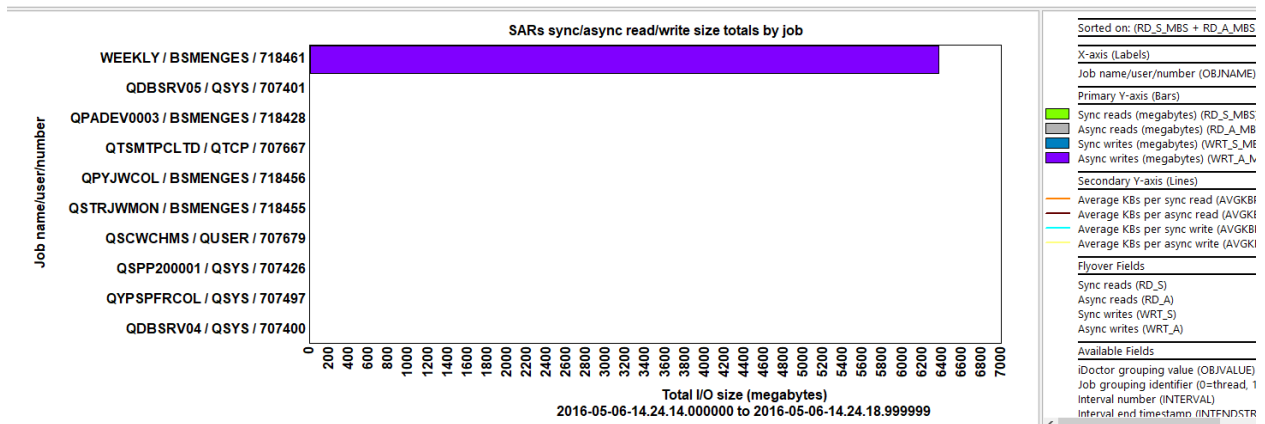
This graph is like the [SARs size rates rankings](#) graph except breaks down the operations by synchronous vs asynchronous.



SARs sync/async size rates rankings

30.3.24 SARs sync/async read/write size totals rankings

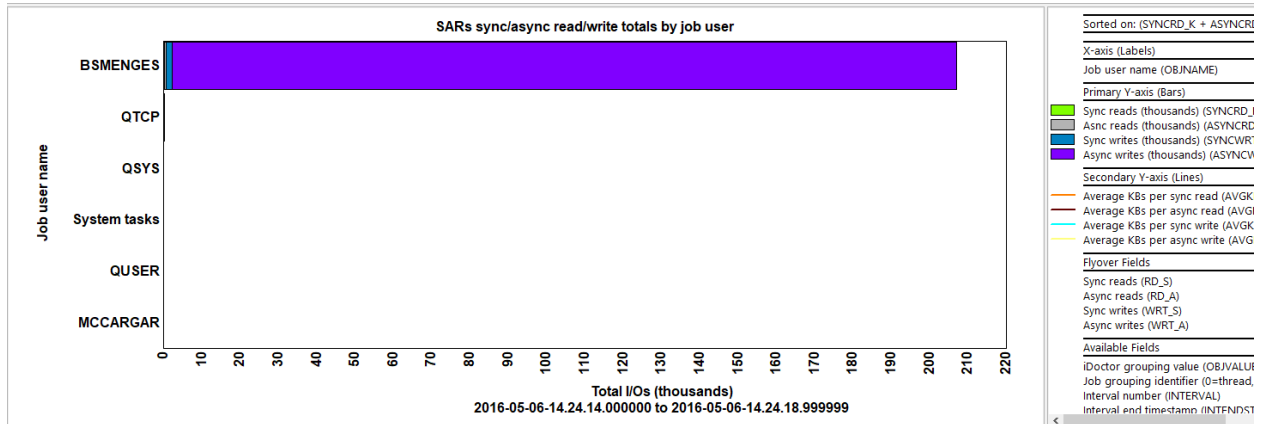
This graph displays the total SARs I/O size (in megabytes) for synchronous and asynchronous reads and writes that occurred. The optional Y2-axis displays read and write average size for both sync and async operations (in kilobytes.)



SARs sync/async read/write size totals by job

30.3.25 SARs sync/async read/write totals rankings

This graph displays the total SARs operations for synchronous and asynchronous reads and writes that occurred. The optional Y2-axis displays read and write average size for both sync and async operations (in kilobytes.)



SARs sync/async read/write totals by job user

30.3.26 Detail reports

This folder contains table-based reports and provide more details behind the SARs events captured in the collection.

Tip: These reports can be accessed as a drill-down from one of the overview or ranking graphs described previously for a selected time range or grouping using the Detail reports menu when right-clicking a graph's bar.

The screenshot displays the IBM iDoctor application interface. On the left, a tree view shows the hierarchy of data sources. The 'Sp1' node is expanded, revealing sub-nodes for 'SQL tables', 'Interval file index', 'SARs', 'Trace details', 'PEX file(s) starting points', and another 'SARs' node. The second 'SARs' node is further expanded, listing various report categories such as 'SARs read and write rates', 'SARs read/write size average', 'SARs size rates rankings', 'SARs read/write size total', 'SARs read/write totals rank', 'SARs page outs/clears/refresh', 'SARs exchange size totals', 'SARs sync/async read and write', 'SARs sync/async read/write', 'SARs sync/async size rates', 'SARs sync/async read/write', and 'SARs sync/async read/write'. The 'Detail reports' item at the bottom of this list is highlighted with a blue selection box. On the right side, a 'Report' panel lists the available reports for the selected category. These reports include: 'SAR events sorted by thread/task, time', 'SAR events sorted by time', 'SAR total sizes by event type', 'SAR events by library/object for DBPM Server tasks', 'SAR events by segment, object, program/procedure', 'SAR write events by segment, object, program/procedure', and 'SAR read events by segment, object, program/procedure'.

SQL tables

Sp1

SQL tables

Interval file index

SARs

Trace details

PEX file(s) starting points

SARs

SARs read and write rates

SARs read/write size average

SARs size rates rankings

SARs read/write size total

SARs read/write totals rank

SARs page outs/clears/refresh

SARs exchange size totals

SARs sync/async read and write

SARs sync/async read/write

SARs sync/async size rates

SARs sync/async read/write

SARs sync/async read/write

Detail reports

Report

- SAR events sorted by thread/task, time
- SAR events sorted by time
- SAR total sizes by event type
- SAR events by library/object for DBPM Server tasks
- SAR events by segment, object, program/procedure
- SAR write events by segment, object, program/procedure
- SAR read events by segment, object, program/procedure

Detail reports

31 Save/Restore

This analysis examines the save/restore OS event. This is event type 12 subtype 21 in the PEX data.

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
12	21	OSEVT	*SAVRST	*SAVRST=Mi Event 21

*SAVRST event from QAYPEEVEVENT at 7.3

31.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

31.2 SQL Tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
PEXSR_<MBR>	SR event details

31.3 Save/Restore

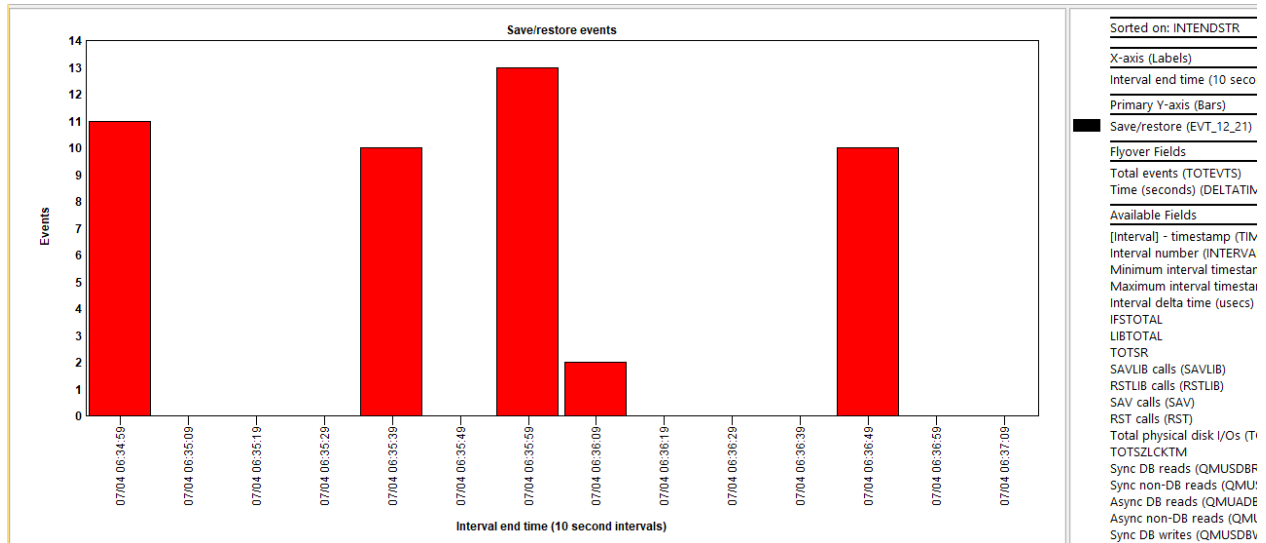
This folder contains the graphs and reports available after the analysis has completed.

Report	Description
Save/restore events	
Save/restore command starts	
Save/restore events rankings	Ranks the total save/restore events in various ways
Save/restore command starts rankings	Ranks the number of save/restore commands started in various ways
Save/restore longest duration rankings	This graph indicates which save/restore commands took the longest.
Detail reports	Detailed reports over the save / restore events

Save/Restore

31.3.1 Save/restore events

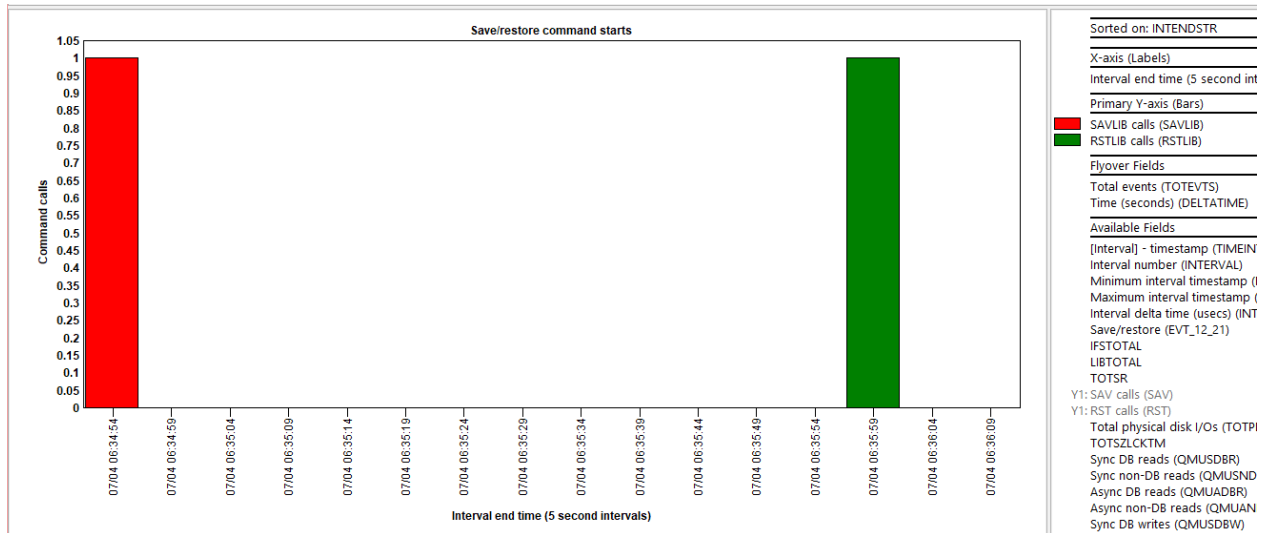
This graph shows the *SAVRST events that occurred in the collection over time.



Save/restore events

31.3.2 Save/restore command starts

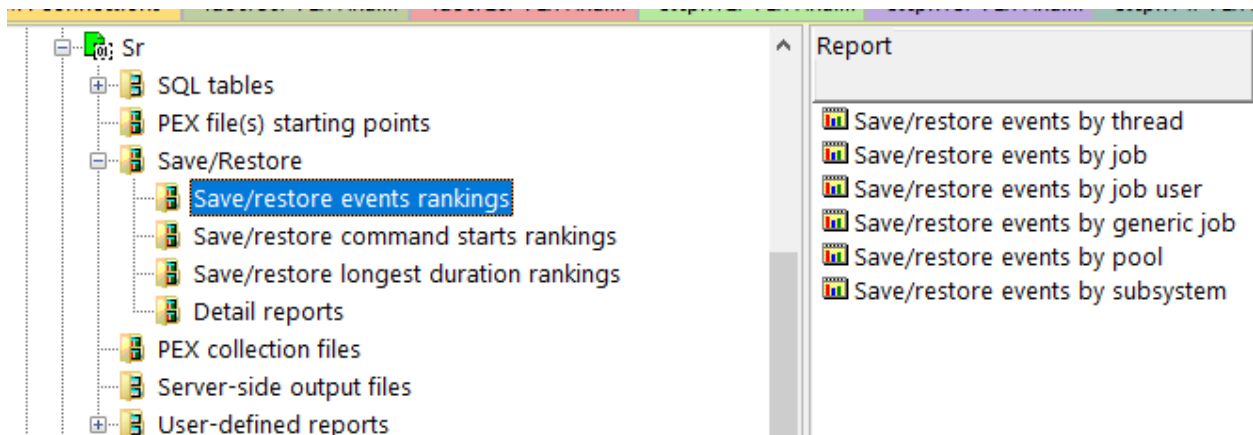
This graph shows which save/restore commands occurred and when in the collection over time.



Save/restore command starts

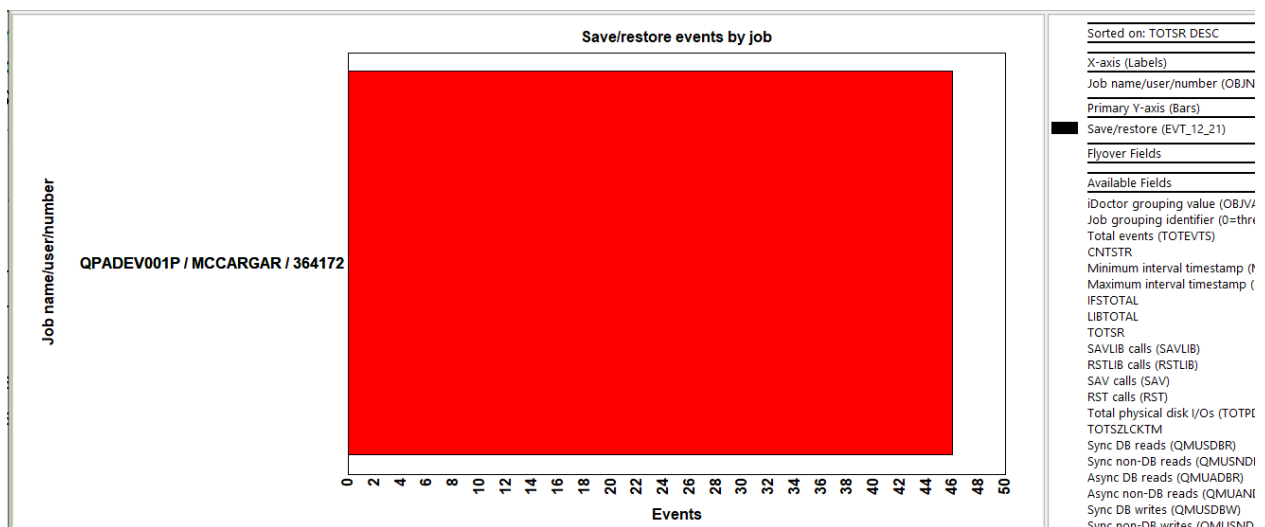
31.3.3 Save/restore events rankings

This graph shows the *SAVRST events that occurred in the collection ranked by 1 of several possible ways.



Save/Restore -> Save/restore events rankings

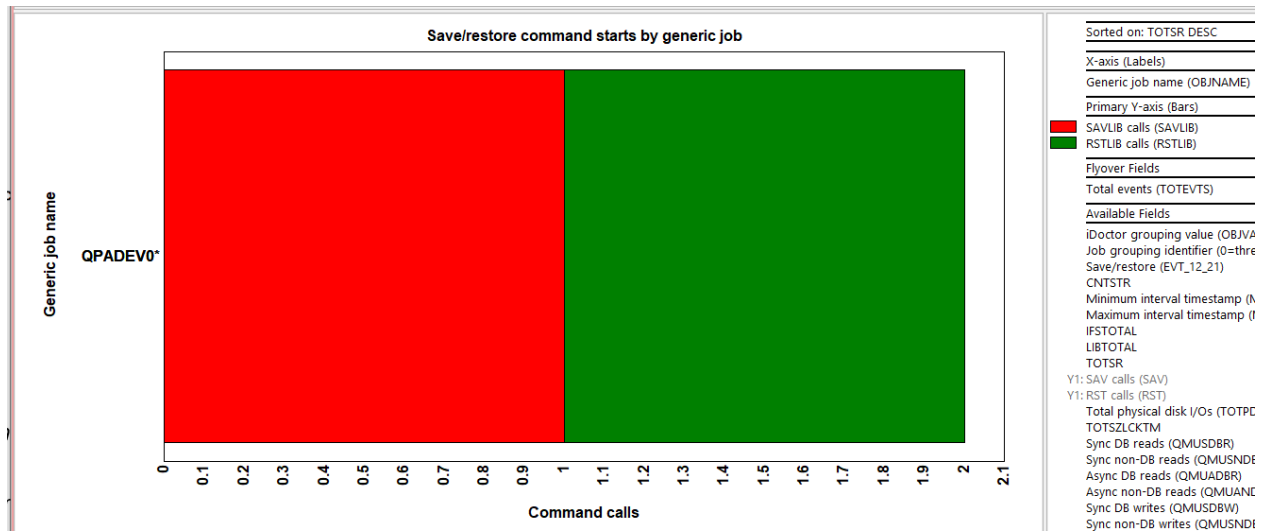
An example follows:



Save/restore events by job

31.3.4 Save/restore command starts rankings

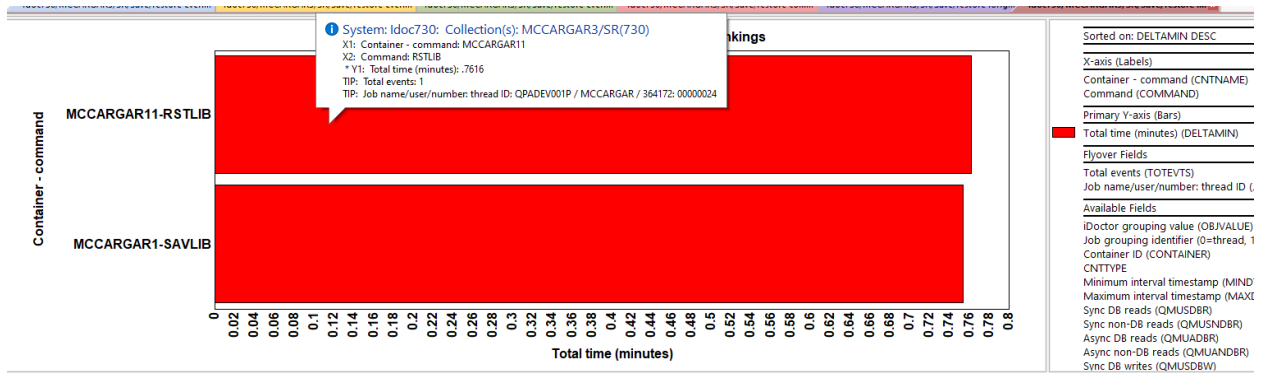
This graph shows which save/restore commands occurred and when in the collection ranked by 1 of several possible ways.



Save/restore command starts by generic job

31.3.5 Save/restore longest duration rankings

This graph ranks the save/restore operations by total duration. The X-axis label indicates the container and command. The flyover shows the job information.

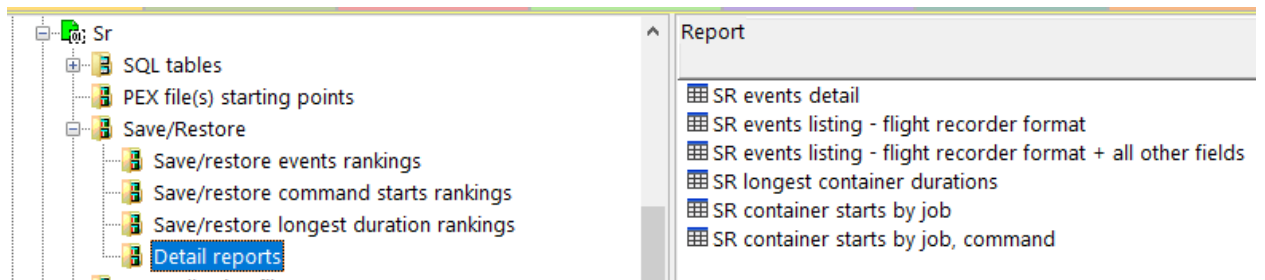


Save/restore longest duration rankings

31.3.6 Detail reports

This folder contains table-based reports and provide more details behind the save/restore events captured in the collection.

Tip: These reports can be accessed as a drill-down from one of the overview or ranking graphs described previously for a selected time range or grouping using the Detail reports menu when right-clicking a graph's bar.



Save/Restore -> Detail reports

32 Stats Hier for Selected Job

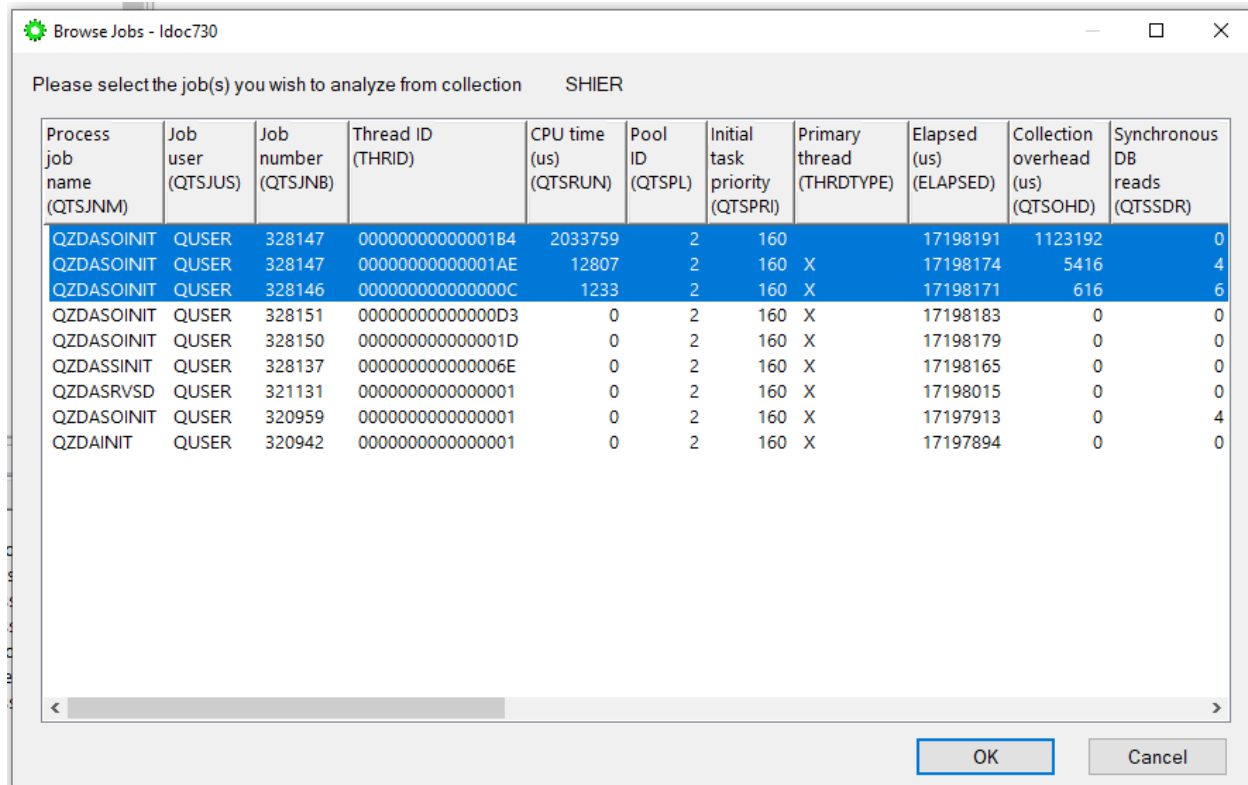
This analysis is used to create statistical hierarchical reports for a specific job.

Note: Do **NOT** collect statistical hierarchical data for the entire system. This will capture a huge amount of data and possibly could crash your system. This type of analysis should be done against a limited set of jobs only per PEX collection.

Note: Currently the analysis only supports PEX stats counters 1-4 and does not yet include counters 5-8.

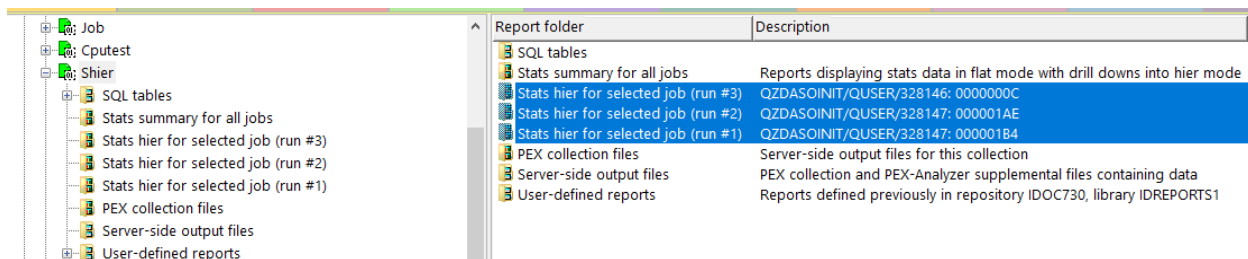
32.1 Running the analysis

When running the analysis, a report will appear within a Browse Jobs window allowing the user to pick the desired job(s) to analyze. More than 1 can be selected which will create a different report for each job selected.



Browse Jobs

After the analysis has completed, folders will appear, 1 for each job selected such as in the following example:



Stats hier for selected job run folders #1, #2, #3

32.2 SQL Tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
PEXSTATSHIER_<MBR>_<N>	Stats hier for selected job
	Note: The SQL table comment will contain the job information selected. <N> is a number 1 or higher based on the next available value in the current library.

32.3 Stats hier for selected job (run #N)

This folder contains the reports available for the analysis and specific job selected when it was ran.

2 flavors of reports showing identical data are available, a tree table, and just a regular table. This is indicated by the “tree table” column having a value of **Yes**.

Job	Report	Description	Tree table
Job			
Cputest			
Shier			
SQL tables			
Stats summary for all jobs			
Stats hier for selected job (run #3)			
Stats hier for selected job (run #2)			
Stats hier for selected job (run #1)			
PEX collection files			

Stats hier for selected job (run #1)

Note: The tree tables will not perform well in some situations if there is too much data and may appear to hang the GUI as they are being created. If that happens and you don't want to wait, then end iDoctor.exe in the Windows Task manager and use the non-tree table versions.

32.3.1 Simplified stats hier for <JOB> - Tree table

This tree table report has a reduced set of columns and uses the tree table format. The shows the amount of elapsed time and CPU time per program/module/procedure call level within the job.

The tree table format allows for certain branches to be expanded or collapsed as desired, typically focusing on the areas with the highest CPU usage.

Tip: Right-click a specific program/procedure call level for additional analysis options under the **Selected program** or **Selected procedure** menu.

Level	Library name	Program name	MI complex instruction	Module name	Procedure name	Times called	Calls made	Calls to MI complex instructions	Inline elapsed us	Inline CPU us	Cumulative Elapsed us	Cumulative CPU us	Reference ID	Caller reference ID
0	QSYS	QLESPI		QLECRTH	LE_Create_Thread2_FP12crtth...	0	1	0	.7380	0	100% - 13.84...	100% - 91...	1	0
1	QSYS	QQQOOUPCL		QQQOOUPCL	DbopThreadMain_FP14Dbop...	0	156	0	9,010,479.4...	397.3530	100% - 13.84...	100% - 91...	2	1
2	QSYS	QQQOOUPCL		QQQOOUPCL	DBOPUPCALLUDF	105	102	0	200.5370	50.5950	.1% - 9,717.7...	.4% - 3.46...	3	2
3	QSYS	QQQOOUPCL		QQQOOUPCL	DbopUDTFCall_FP11DbopUDF...	51	51	0	88.4820	15.7070	34.8% - 4.82...	99.6% - 90...	32	2
4	QSYS	QQQOOUPCL		QQQOOUPCL	DBOPUPCALLUDF	51	51	0	150.3900	50.6440	34.8% - 4.82...	99.6% - 90...	33	32
5	QSYS	QQQSVRTN		QQINVUDF	QQINVOKEUDF	51	201	0	316.3730	93.8350	34.8% - 4.82...	99.6% - 90...	34	33
6	QSYS	QQQSVRTN		QQINVUDF	BUILDUDFARMS	51	0	0	99.2670	38.4000	.0% - 99.2670	.0% - 38.4...	35	34
7	QSYS	QSQSBA52		QSQUDFPR	SQPreUDF	51	102	51	233.3670	65.2590	.0% - 421.9920	.0% - 96.1...	36	34
8	QSYS	QQQSVRTN		QQINVUDF	IMPLEMENTUDTFNSQE	48	240	0	1,120.9350	520.4370	34.5% - 4.81...	99.5% - 90...	41	34
9	QSYS	QQQSVRTN		QQINVUDF	UDTFOPENCALL	48	96	0	406.9740	178.2340	34.5% - 4.77...	98% - 892...	42	41
10	QSYS	QQQSVUSR		QQQCUSER	QQINVOKEUSER	144	144	0	392.3610	119.4060	.3% - 37.954...	1.4% - 12...	4,645	41
11	QSYS	QQQSVRTN		QQINVUDF	SETUPFORNEXTUDTFCALL	48	96	0	122.8880	23	.0% - 768.2320	.0% - 172...	4,744	41
12	QSYS	QSQSBA52		QSQUDFPO	SQPostUDF	51	51	51	159.9450	40.8590	.0% - 244.6640	.0% - 57.5...	4,753	34

Simplified stats hier for QZDASOINIT/QUSER/328147: 000001B4

32.3.2 Stats hier for <JOB> - Tree table

This report is like the previous report but contains many additional columns including IO counts and event counters.

32.3.3 Simplified stats hier for <JOB>

This report contains the same data as the tree table report version, but in a flat table instead.

Idoc730/MCCARGAR2/SHER/Simplified stats hier for QZDASOINIT/QUSER/328147... #2														
Level (CALLVL)	Library name (LIBNAM)	Program name (PGMNAM)	MI complex instruction (MICPXNM)	Module name (MODNAM)	Procedure name (PRCNAM)	Times called (CALLCOUNT)	Calls made (CALLMADE)	Calls to MI complex instructions (CALLMICPX)	Inline elapsed us (INELPUS)	Inline CPU us (INCPUUS)	Cumulative Elapsed us (CUELPUUS)	Cumulative CPU us (CUCPUUS)	Reference ID (REFID)	Caller reference ID (CLRREFID)
0	QSYS	QLESPI		QLECRTH	LE_Create_Thread2_FP12crth_parm_t	0	1	0	.7380	0	13841001.1150	910561.9660	1	0
1	QSYS	QQQOOOUPCL		QQQOOOUPCL	DbopThreadMain_FP14DbopThreadParm	0	156	0	9010479.4140	397.3530	13841000.3760	910561.9660	2	1
2	QSYS	QQQOOOUPCL		QQQOOOCALL	DBOPUPCALLUDF	105	102	0	200.5370	50.5950	9717.7200	3465.1930	3	2
3	QSYS	QQQSVRTN		QQINNUDF	QQINNUKEUDF	102	510	0	730.5250	235.1640	9517.1830	3414.5970	4	3
4	QSYS	QQQSVRTN		QQINNUDF	BUILDUDFPARMS	102	0	0	110.6580	32.5190	110.6580	32.5190	5	4
4	QSYS	QSQSBAS2		QSQUDFPR	SQPreUDF	102	102	102	328.3350	96.5620	618.7940	149.4100	6	4
5	QSYS	QSQSBAS		QSQSETUP	SQSETUP	102	102	0	152.2100	31.1640	221.8690	42.6830	7	6
6	QSYS	QSQSBAS		QSQSETUP	BLDTCOL	102	0	0	69.6580	11.5190	69.6580	11.5190	8	7
5	QSYS	QSQSBAS	*DBMAINT			102	0	0	68.5890	10.1640	68.5890	10.1640	9	6
4	QSYS	QQQSVUSR		QQQCUSER	QQINVOKEUSER	102	102	0	378.7030	151.0700	7118.9310	2810.2770	10	4
5	QSYS	QQQSVUSR		QQQCUSER	CALLUDFPROCEDURE	102	102	0	412.7790	169.3670	6740.2280	2659.2070	11	10
6	QIDRGUI	GETCHGDTE		GETCHGDTE	GETCHGDTE	102	102	0	415.0480	169.1320	6327.4490	2489.8390	12	11
7	QSYS	QUSROBJD		QUSROBJD	QUSROBJD	102	102	0	374.2510	146.2420	5912.4000	2320.7070	13	12
8	QSYS	QLRTVOB		QLRTVOB	QLRTVOB	102	306	918	1443.5440	429.3040	5538.1480	2174.4640	14	13
9			*RSLVSP			204	0	0	1094.4210	544.5310	1094.4210	544.5310	15	14
9			*MATPTR			204	0	0	265.8180	92.0460	265.8180	92.0460	16	14
9			*TESTAU			204	0	0	215.3430	63.5460	215.3430	63.5460	17	14
9			*LOCK			102	0	0	302.3590	136.5850	302.3590	136.5850	18	14
9			*MATSOBJ			102	0	0	260.5410	114.6010	260.5410	114.6010	19	14
9	QSYS	QWCSCVTR		QWCSCVTR	QWCSCVTR	204	0	0	571.8160	257.8820	571.8160	257.8820	20	14
IdocPA.mdb QAIRSQL table SUM STATSHIER 1402														

Simplified stats hier for QZDASOINIT/QUSER/328147: 000001B4

32.3.4 Stats hier for <JOB>

This report contains the same data as the tree table report version, but in a flat table instead.

Idoc730/MCCARGAR2/SHER/Simplified stats hier for QZDASOINIT/QUSER/328147: 000001B4 - #2																					
Level (CALLVL)	Partial count status (PCSTS)	Library name (LIBNAM)	Program name (PGMNAM)	MI complex instruction (MICPXNM)	Module name (MODNAM)	Procedure name (PRCNAM)	Times called (CALLCOUNT)	Calls made (CALLMADE)	Calls to MI complex instructions (CALLMICPX)	Inline elapsed us (INELPUS)	Inline CPU us (INCPUUS)	Cumulative Elapsed us (CUELPUUS)	Cumulative CPU us (CUCPUUS)	Inline percent CPU (INPCPUUS)	Inline CPU us per call (INCPUUS)	Inline counter 1 (INCOUNT1)	Inline percent counter 1 (INPCOUNT1)	Inline counter 2 (INCOUNT2)	Inline percent counter 2 (INPCOUNT2)	Inline counter 3 (INCOUNT3)	Inline percent counter 3 (INPCOUNT3)
0	Y	QSYS	QLESPI		QLECRTH	LE_Create_Thread2_FP12crth_parm_t	0	1	0	.7380	0	13841001.1150	910561.9660	.0000	0	0	0	0	0	0	0
1	Y	QSYS	QQQOOOUPCL		QQQOOOUPCL	DbopThreadMain_FP14DbopThreadParm	0	156	0	9010479.4140	397.3530	13841000.3760	910561.9660	.0436	0	0	0	0	0	0	0
2	N	QSYS	QQQOOOUPCL		QQQOOOCALL	DBOPUPCALLUDF	105	102	0	200.5370	50.5950	9717.7200	3465.1930	.0056	.4819	0	0	0	0	0	0
3	N	QSYS	QQQSVRTN		QQINNUDF	QQINVOKEUDF	102	510	0	730.5250	235.1640	9517.1830	3414.5970	.0258	2.3055	0	0	0	0	0	0
4	N	QSYS	QQQSVRTN		QQINNUDF	BUILDUDFPARMS	102	0	0	110.6580	32.5190	110.6580	32.5190	.0036	.3188	0	0	0	0	0	0
4	N	QSYS	QSQSBAS2		QSQUDFPR	SQPreUDF	102	102	102	328.3350	96.5620	618.7940	149.4100	.0106	.9467	0	0	0	0	0	0
5	N	QSYS	QSQSBAS		QSQSETUP	SQSETUP	102	102	0	152.2100	31.1640	221.8690	42.6830	.0034	.3955	0	0	0	0	0	0
6	N	QSYS	QSQSBAS		QSQSETUP	BLDTCCL	102	0	0	69.6580	11.5190	69.6580	11.5190	.0013	.1129	0	0	0	0	0	0
5	N	QSYS	QSQSBAS	*DBMAINT			102	0	0	68.5890	10.1640	68.5890	10.1640	.0011	.0996	0	0	0	0	0	0
4	N	QSYS	QQQSVUSR		QQQCUSER	QQINVOKEUSER	102	102	0	378.7030	151.0700	7118.9310	2810.2770	.0166	1.4811	0	0	0	0	0	0
5	N	QSYS	QQQSVUSR		QQQCUSER	CALLUDFPROCEDURE	102	102	0	412.7790	169.3670	6740.2280	2659.2070	.0186	1.6605	0	0	0	0	0	0
6	N	QIDRGUI	GETCHGDTE		GETCHGDTE	GETCHGDTE	102	102	0	415.0480	169.1320	6327.4490	2489.8390	.0186	1.6582	0	0	0	0	0	0
7	N	QSYS	QUSROBJD		QUSROBJD	QUSROBJD	102	102	0	374.2510	146.2420	5912.4000	2320.7070	.0161	1.4337	0	0	0	0	0	0
8	N	QSYS	QLRTVOB		QLRTVOB	QLRTVOB	102	306	918	1443.5440	429.3040	5538.1480	2174.4640	.0471	4.2089	0	0	0	0	0	0
9	N			*RSLVSP			204	0	0	1094.4210	544.5310	1094.4210	544.5310	.0298	2.6693	0	0	0	0	0	0
9	N			*MATPTR			204	0	0	265.8180	92.0460	265.8180	92.0460	.0191	.4512	0	0	0	0	0	0
9	N			*TESTAU			204	0	0	215.3430	63.5460	215.3430	63.5460	.0070	.3115	0	0	0	0	0	0
9	N			*LOCK			102	0	0	302.3590	136.5850	302.3590	136.5850	.0150	1.3391	0	0	0	0	0	0
9	N			*MATSOBJ			102	0	0	260.5410	114.6010	260.5410	114.6010	.0126	1.1235	0	0	0	0	0	0

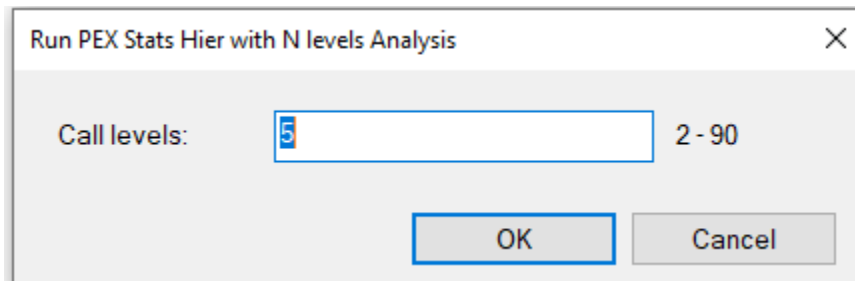
Stats hier for QZDASOINIT/QUSER/328147: 000001B4

33 Stats Hier with N call levels

This analysis examines the stats hierarchical data and summarizes the data by examining the relationship between a specific number of call levels at a time.

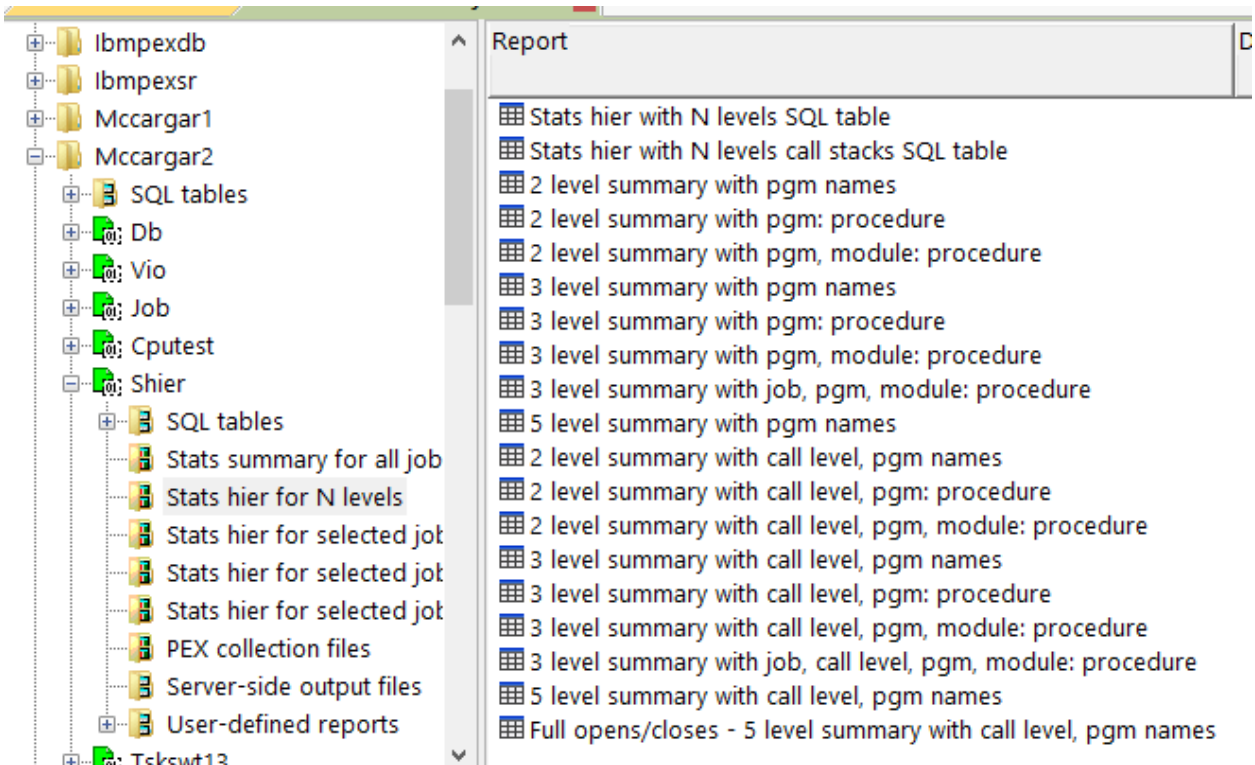
33.1 Running the analysis

When running the analysis the Run PEX Stats Hier with N levels analysis window appears to allow the user to indicate the desired number of call levels to summarize.



33.2 Stats hier for N levels

This folder shows the reports provided by the analysis.



Stats hier for N levels

An example follows:

IBM iDoctor for IBM i

Idoc730/MCCARGAR2/SHER/2 level summary with pgm names - #1																			
PGM1 (PGM1)	Program library/name - procedure level 2 (PGM2)	Times called (CALLCOUNT)	Calls made (CALLMADE)	Calls to MI complex instructions (CALLMIOPX)	Inline CPU us (INCPUUS)	Inline elapsed us (INELPUS)	Inline sync DB I/Os (INSD)	Inline async DB I/Os (INAD)	Inline sync non-DB I/Os (INSN)	Inline async non-DB I/Os (INAN)	Cumulative CPU us (CUCPUUS)	Cumulative Elapsed us (CUELPLUS)	Cumulative sync DB I/Os (CUSD)	Cumulative async DB I/Os (CUAD)	Cumulative sync non-DB I/Os (CUSN)	Cumulative async non-DB I/Os (CUAN)	TBT0 (TBT0)	TBT1 (TBT1)	N (N)
QZDASOINT	QZDASOINT	0	2	0	0	5260	0	0	0	0	8007.4800	26116310.7540	0	0	0	0	0777F13B84002098	0777F13B840023D8	
QZDASRV	QZDASOINT	0	200	0	26.4560	143.3100	0	0	0	0	8007.4800	26116310.2280	0	0	0	0	0600C003DF0F4A80	0777F13B84002098	
QZDASRV	QZDASRV	66	140	0	30.9450	153.4110	0	0	0	0	893.6440	21259922.7100	0	0	0	0	0600C003DF0F4C28	0600C003DF0F4C28	
QZBSCOMM	QZDASRV	66	264	0	62.8230	263.4260	0	0	0	0	200.5730	21258380.4320	0	0	0	0	17240002FA0133E0	0600C003DF0F4C28	
QSOSRV1	QZBSCOMM	132	0	132	28.2030	181.5730	0	0	0	0	125.1480	21258033.0770	0	0	0	0	08C4A07035011028	17240002FA0133E0	
*SOCKETOP	QSOSRV1	132	0	0	96.9450	21257851.5030	0	0	0	0	96.9450	21257851.5030	0	0	0	0	0000000000000000	08C4A07035011028	
QQQOOOUPCL	QLESPI	0	156	0	397.3530	9010479.4140	0	0	0	0	910561.9660	13841000.3760	0	0	6788	2738	28E20C6E550191F8	3C0D00F368008F30	
QQQOOODBOP	QQQOOODBOP	2338656	1831200	0	333252.5940	2763174.3200	0	0	0	0	1138179.2940	9440037.9820	0	0	0	0	286840A34C2C63B8	286840A34C2C63B8	
QZDASRV	QZDASRV	66	126	0	18.8740	123.7450	0	0	0	0	7009.3070	4855849.1790	0	0	0	0	0600C003DF1010A8	0600C003DF0F4A80	
QZDASRV	QZDASRV	48	195	0	36.2430	177.7930	0	0	0	0	6934.4210	4855368.9850	0	0	0	0	0600C003DF101358	0600C003DF1010A8	
QZDASRV	QZDASRV	48	48	0	15.5610	74.3720	0	0	0	0	6853.9330	4854994.7080	0	0	0	0	0600C003DF1012C0	0600C003DF101358	
QZDASRV	QZDASRV	48	99	0	58.5240	176.9460	0	0	0	0	6838.3700	4854860.3350	0	0	0	0	0600C003DF112558	0600C003DF1012C0	
QSQRUN2	QSQRUN2	114	339	0	308.1950	840.5060	0	0	0	0	8762.6530	4851004.2200	0	0	0	0	2FC34383F90E8D48	2FC34383F90E8D48	
QDBGETMQO	QSQRUN2	114	342	114	239.1930	778.6050	0	0	0	0	8319.7670	4849305.0130	0	0	0	0	0C89F65C8E005370	2FC34383F90E8D48	
*DBMAINT	QDBGETMQO	114	0	0	7990.9740	4848173.9930	0	0	0	0	7990.9740	4848173.9930	0	0	0	0	0000000000000000	0C89F65C8E005370	
QSQRROUTX	QSQRROUTX	36	177	45	87.9590	288.0560	0	0	0	0	3712.6600	4834636.7150	0	0	0	0	0C808467580582E8	0C80846758058418	
QZDASRV	QZDASRV	12	105	0	15.9270	81.4600	0	0	0	0	3128.8390	4833496.9520	0	0	0	0	0600C003DF118480	0600C003DF112558	
QSQRROUTX	QSQRROUTX	15	42	0	10.0750	46.4800	0	0	0	0	3042.7890	4832546.6290	0	0	0	0	0C8084675805C088	0C808467580582E8	
QSQRUN2	QSQRROUTX	12	12	0	9.7950	29.3830	0	0	0	0	2778.8230	4831751.0860	0	0	0	0	2FC34383F90E8F0F	0C8084675805C088	
QSQRUN2	QSQRUN2	12	297	0	66.1380	280.1940	0	0	0	0	2769.0260	4831721.7020	0	0	0	0	2FC34383F90E8F0F	2FC34383F90E8F0F	
QQQSVRTN	QQQOOOUPCL	153	711	0	328.9990	1046.8980	0	0	0	0	910047.6650	4830081.5520	0	0	6788	2738	04612A37CF071D60	28E20C6E550198E0	
QZDASRV	QZDASRV	3	18	0	7.6460	24.9640	0	0	0	0	2150.2400	4827173.6460	0	0	0	0	0600C003DF1184C0	0600C003DF1184C0	
QSQRROUTX	QZDASRV	3	6	0	3.2940	10.9740	0	0	0	0	1947.5920	4825343.7070	0	0	0	0	0C80846758056418	0600C003DF1184C0	
QSQRUN2	QSQRUN2	63	12	0	12.0080	58.8440	0	0	0	0	1945.5360	4825682.2080	0	0	0	0	2FC34383F90E8A20	2FC34383F90E8F18	
QQQSVUSR	QQQSVUSR	294	294	0	472.3660	1202.6730	0	0	0	0	907491.2380	4822070.5990	0	0	6788	2738	1E98E537AF0186A8	1E98E537AF018600	
QQQOOOUPCL	QQQOOOUPCL	51	51	0	15.7070	88.4820	0	0	0	0	906699.4190	4820803.2420	0	0	6788	2738	28E20C6E55018F48	28E20C6E550191F8	
QQQOOOUPCL	QQQOOOUPCL	51	51	0	50.6440	150.3900	0	0	0	0	906683.7120	4820714.7590	0	0	6788	2738	28E20C6E550198E0	28E20C6E55018F48	
QQQSVRTN	QQQSVRTN	48	240	0	520.3370	1120.9350	0	0	0	0	906347.1870	4819482.0720	0	0	6788	2738	04612A37CF07AEC0	04612A37CF071D60	
QIDRPATF2	QQQSVUSR	192	720	0	1453.8110	3160.0240	0	0	0	0	904529.0300	4814540.4750	0	0	6788	2738	0035984074004858	1E98E537AF0186A8	
QQQSVRTN	QQQSVRTN	48	96	0	178.2340	406.9740	0	0	0	0	892719.8120	4776938.2510	0	0	6788	2738	04612A37CF07D028	04612A37CF07AEC0	
QQQSVUSR	QQQSVRTN	48	48	0	99.7810	236.9680	0	0	0	0	892116.4370	4778005.0480	0	0	6788	2738	1E98E537AF018600	04612A37CF07D028	
QSQRROUTE	QIDRPATF2	192	1728	336	847.1560	2706.6690	0	0	0	0	887343.5780	4764351.2440	0	0	6788	2738	208962396F0725D0	0035984074004858	
QQQOOODBOP	QQQOOODBOP	13824	129984	0	17968.3470	107828.1730	0	0	0	0	487851.6910	3161976.5900	0	0	0	0	286840A34C2578F0	286840A34C2578F0	

2 level summary with pgm names

34 Stats Summary for All Jobs

This analysis is used to analyze either stats flat or stats hierarchical data in a stats flat report format.

Tip: These reports support use of the stats counters 1-8 to count specific events occurring. See the ADDPEXDFN command for more information.

34.1 Running the analysis

When running the analysis, no prompt appears since no parameters apply.

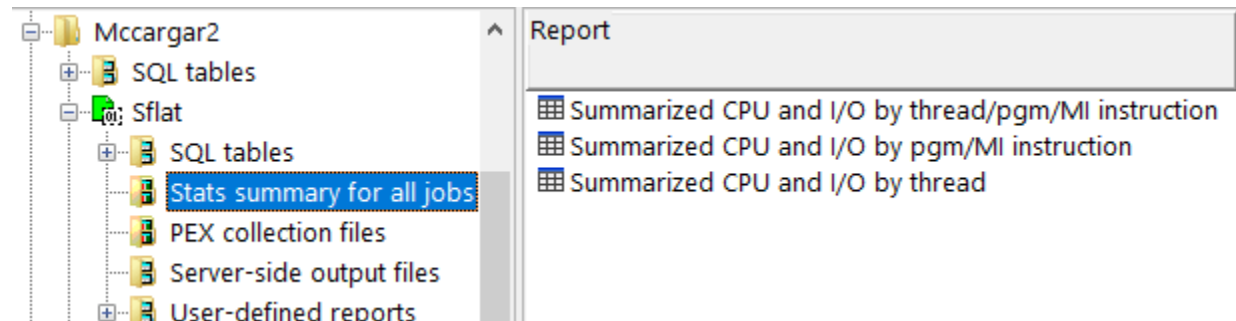
34.2 SQL Tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
PEXSTATSSUM_<MBR>	Summarized CPU and I/O by thread
PEXSTATSSUMPG_<MBR>	Summarized CPU and I/O by pgm/MI instruction
PEXSTATSSUMJB_<MBR>	Summarized CPU and I/O by thread/pgm/MI instruction

34.3 Stats summary for all jobs

This folder shows the reports provided by the analysis. Each report links to 1 of the SQL tables generated.



Stats summary for all jobs

34.3.1 Summarized CPU and I/O by thread/pgm/MI instruction

This report provides CPU and I/O statistics grouped by thread, program and MI instruction.

Process job name (QTSJNM)	Job user (QTSJUS)	Job number (QTSJNB)	Initial thread Y or N (QTSITF)	Inline CPU percent of job total (JOBCTPCT)	Inline elapsed time percent of job total (ELPCT)	Taskcount (TSKCNT)	MI complex instruction (MICPXNM)	Library name (LIBNAM)	Program name (PGMNAM)	Module name (MODNAM)	Procedure name (PRCNAMST)	Times called (QSTINVT)	Number of procedures called (QSTCCT)	Calls to MI complex instr (QSTXCT)	Inline CPU us (INLCPU)	Cumulative CPU us (CUMCPU)	In el us (I)
QZDASOINIT	QUSER	364461	N	13.1645	1.7283	000000000000045A3	*DBMAINT					1480	0	0	156895.2180	156895.2180	
QZDASOINIT	QUSER	364461	N	3.7719	1.4050	000000000000045A3		QSYS	QQQVFMF	QQQVFMF	QQQVFMF	189	314370	0	44953.6110	117050.3570	
QZDASOINIT	QUSER	364461	N	3.5706	3.2302	000000000000045A3	*CRTS					1591	0	0	42554.8550	42554.8550	
QZDASOINIT	QUSER	364461	N	3.1014	.4504	000000000000045A3	*RSIVSP					19398	0	0	36962.4600	36962.4600	
QZDASOINIT	QUSER	364461	N	2.4120	2.3352	000000000000045A3	*DESS					1400	0	0	28746.4680	28746.4680	
QZDASOINIT	QUSER	364461	N	2.2539	2.9087	000000000000045A3	*SETACST					7679	0	0	26862.7300	26862.7300	
QZDASOINIT	QUSER	364461	N	1.9441	.5357	000000000000045A3		QSYS	QC2UTIL1	QC2ALLOC	do_free_default...	71098	0	0	23169.7570	23169.7570	
QZDASOINIT	QUSER	364461	N	1.8707	.5299	000000000000045A3		QSYS	QC2UTIL1	QC2ALLOC	do_malloc_defa...	71098	0	0	22295.5700	22295.5700	
QZDASOINIT	QUSER	364461	N	1.5359	.1957	000000000000045A3	*MODS					1642	0	0	18305.2730	18305.2730	
QZDASOINIT	QUSER	364461	N	1.3479	.2094	000000000000045A3		QSYS	QSQRCHK	QSQRCHK	SQRESOLVEFUN...	4032	8757	0	16063.9580	21665.4490	
QZDASOINIT	QUSER	364461	N	1.2892	.2837	000000000000045A3		QSYS	QQQVFMF	QQQVFMF	PROCESSCOLU...	21420	18585	0	15364.9430	16632.6910	
QZDASOINIT	QUSER	364461	N	1.1834	.1680	000000000000045A3		QSYS	QLIIST	QLIIST	QLIIST	382	0	6685	14104.3670	40483.2300	
QZDASOINIT	QUSER	364461	N	.9693	.4690	000000000000045A3		QSYS	QQQOQOBOP	QQQOQOATTR	_ls_FR13Dbop...	39942	79884	0	11552.4170	17893.1440	

Summarized CPU and I/O by thread/pgm/MI instruction

34.3.2 Summarized CPU and I/O by pgm/MI instruction

This report provides CPU and I/O statistics grouped by program and MI instruction.

Idoc730/MCCARGAR2/SFLAT/Summarized CPU and I/O by thread/pgm/MI instruction - #1										Idoc730/MCCARGAR2/SFLAT/Summarized CPU and I/O by pgm/MI instruction - #1									
Job name (QJTSJNM)	Job user (QJTSJUS)	Job number (QJTSJNB)	Job thread id (QJTSJTH)	Initial thread Y or N (QJTSJTF)	Inline CPU percent of total (NETCPUPTCT)	Inline elapsed time percent of total (ELPPCT)	Taskcount (TSCCNT)	Total procedures (PROCCOUNT)	Procedure type: MI or LIC (QJTSPTY)	Times called (QJTSINV)	Calls made (QJSTCCT)	MI complex instruction count (QJSTXCT)	Inline CPU usecs (INLCPU)	Cumulative CPU usecs (CUMCPU)	Inline elapsed usecs (INLELP)	Cumulative elapsed usecs (CUMLELP)	Inline synchronous DB reads (QJSDR)	Inline synchronous non-DB reads (QJSDNR)	Inline synchronous DB writes (QJSDW)
*DBMAINT	QSYS	QQQVMT	QQQVMT	QQQVMT	18	13.3645	3.1016	1773	6	0	166757.6190	166956.9610	685628.5870	6863513.2330	0	7	24		
*CRTS	QSYS	QQQVMT	QQQVMT	QQQVMT	2	3.6045	1.098	190	314480	0	44076.5500	117113.2370	243022.2710	619783.4320	0	0			
*RSLVSP	QSYS	QQQVMT	QQQVMT	QQQVMT	6	3.4394	2.530	1616	0	0	42916.1540	42916.1540	559204.3090	559204.3090	0	0			
*DESS	QSYS	QQQVMT	QQQVMT	QQQVMT	23	3.1206	.0623	20210	0	0	38938.4320	38938.4320	137735.8620	137735.8620	0	10			
*SETACST	QSYS	QQQVMT	QQQVMT	QQQVMT	8	2.3338	.1831	1424	0	0	29120.8230	29120.8230	404738.3260	404738.3260	0	0			
	QSYS	QQQVMT	QQQVMT	QQQVMT	10	2.1966	.2465	7820	0	0	27408.8550	27408.8550	544936.3700	544936.3700	0	195			
	QSYS	QQQVMT	QQQVMT	QQQVMT	21	1.8660	.0421	71534	0	0	23321.2010	23321.2010	93061.9850	93061.9850	0	0			
*MODS	QSYS	QQQVMT	QQQVMT	QQQVMT	16	1.8064	.0417	71536	0	0	22539.8210	22539.8210	92220.5520	92220.5520	0	0			
	QSYS	QQQVMT	QQQVMT	QQQVMT	4	1.4815	.0154	1707	0	0	18485.9940	18485.9940	34132.3460	34132.3460	0	0			
	QSYS	QQQVMT	QQQVMT	QQQVMT	1	1.2873	.0164	4032	8757	0	16063.9580	21665.4490	36143.4290	69270.1600	0	0			
	QSYS	QQQVMT	QQQVMT	QQQVMT	2	1.2315	.0222	21423	18588	0	15386.7120	16684.7350	48977.6820	60820.2350	0	0			
	QSYS	QQQVMT	QQQVMT	QQQVMT	4	1.1399	.0132	385	0	6727	14223.7900	40732.0660	29238.6640	80691.4550	0	0			
	QSYS	QQQVMT	QQQVMT	QQQVMT	2	.9261	.0366	39958	79916	0	11556.9790	17900.2060	80985.6810	132216.8080	0	0			
*DESMOJ	QSYS	QQQVMT	QQQVMT	QQQVMT	4	.8961	.0092	391	0	0	11181.9320	11181.9320	20305.2560	20305.2560	0	0			
	QSYS	QQQVMT	QQQVMT	QQQVMT	21	.8866	.0185	39803	2	1	11063.1100	11074.3690	40796.1700	40823.3950	0	0			
	QSYS	QQQVMT	QQQVMT	QQQVMT	2	.8790	.0107	254	7116	126	10968.6430	667455.8740	23621.8550	3093767.3930	0	0			

34.3.3 Summarized CPU and I/O by thread

This report provides CPU and I/O statistics grouped by thread.

Idoc730/MCCARGAR2/SFLAT/Summarized CPU and I/O by thread - #1																
Process job name (QJTSJNM)	Job user (QJTSJUS)	Job number (QJTSJNB)	Job thread id (QJTSJTH)	Initial thread Y or N (QJTSJTF)	Inline CPU percent of total (NETCPUPTCT)	Inline elapsed time percent of total (ELPPCT)	Taskcount (TSCCNT)	Total procedures (PROCCOUNT)	Procedure type: MI or LIC (QJTSPTY)	Times called (QJTSINV)	Calls made (QJSTCCT)	MI complex instruction count (QJSTXCT)	Inline CPU usecs (INLCPU)	Inline elapsed usecs (INLELP)	Inline software counter 1 (QJSDW1)	Inline software counter 2 (QJSDW2)
QZDASOINIT	QUSER	364461	0000000000000016	N	95.5154	6.4107	000000000000045A3	1065	M	2493208	2381339	111870	1191802.2380	14170859.0530	0	0
QIDPRACOL	MCCARGAR	364465	0000000000000036	Y	1.4302	7.7969	000000000000045A6	989	M	5726	3544	2187	17846.4690	17235083.7370	0	0
QZDASOINIT	QUSER	364461	0000000000000010	Y	.7497	6.3923	000000000000045A4	302	M	11834	11370	468	9355.0740	14130232.4660	0	0
QZRCRSRV5	QUSER	364460	0000000000000040	Y	.3065	1.0749	00000000000004583	478	M	2523	1322	1207	3824.4360	2376170.5100	0	0
QZRCRSRV5	QUSER	364455	0000000000000055	Y	.1886	7.7680	00000000000004547	82	M	1487	697	794	2353.6870	17171260.9380	0	0
QTPORMAIN	QJTC	363168	0000000000000001	Y	.1572	4.5510	0000000000000808C	44	M	2796	2053	744	1962.1340	10060137.6380	0	0
QPFRAJ	QSYS	362902	0000000000000001	Y	.1373	.0014	00000000000000518	7	M	9	0	9	1713.7160	3118.8510	0	0
QZRCRSRV5	QUSER	364467	0000000000000057	Y	.1292	.0115	00000000000004583	285	M	1102	674	410	1612.8040	25496.2240	0	0
QSQSRVR	QUSER	364259	0000000000000028	Y	.1212	.0026	00000000000003851	180	M	2423	2228	195	1512.7750	5718.0300	0	0
QSLPSVR	QSYS	363169	0000000000000003	N	.1205	7.6861	00000000000008010	6	M	795	798	0	1503.7240	16990202.7780	0	0
QZRCRSRV5	QUSER	364466	0000000000000046	Y	.1150	.0110	00000000000004582	285	M	1102	674	410	1435.6790	24380.3140	0	0
QZDASOINIT	QUSER	364461	0000000000000017	N	.0707	.0498	00000000000004580	27	M	32	22	9	882.2470	109974.5410	0	0
QDBSRV14	QSYS	362889	0000000000000001	Y	.0700	.0048	0000000000000508	196	M	1319	1202	108	873.3700	10525.9930	0	0
QDBSRV15	QSYS	362890	0000000000000001	Y	.0636	4.7636	0000000000000505C	196	M	1315	1199	107	793.8590	10529959.0940	0	0
QZDASOINIT	QUSER	364456	0000000000000026	Y	.0603	6.3879	00000000000004549	179	M	1498	1394	108	752.3990	14120506.2430	0	0
QDBSRV10	QSYS	362885	0000000000000001	Y	.0588	4.7636	00000000000005057	196	M	1319	1202	108	734.2570	10529953.2070	0	0
QZDASOINIT	QUSER	364461	0000000000000018	N	.0578	.0435	00000000000004581	27	M	32	22	9	721.1090	96164.7030	0	0
QDBSRV13	QSYS	362888	0000000000000001	Y	.0571	4.7639	0000000000000505A	193	M	1287	1174	104	713.4470	10530637.4980	0	0
QSP200001	QSYS	362937	0000000000000001	Y	.0558	.0421	00000000000005038	19	M	148	84	64	696.3580	93089.8310	0	0

Summarized CPU and I/O by thread

35 Taskswitch

This analysis examines the Taskswitch events. These events are fired whenever a task (job) transitions between run/idle states and is the most complex analysis provided.

To collect taskswitch, the following events should be included:

Event type (QEVTY)	Event subtype (QEVSTY)	Event type description (short) (QEVSN)	Event subtype description (short) (QEVSSN)	Event subtype description (QEVSLN)
3	6	BASEVT	*TASKSWTIN	Task Switch In
3	7	BASEVT	*TASKSWTOUT	Task Switch Out
3	8	BASEVT	*PMCO	Performance Measurement Counter Overflow
3	11	BASEVT	*TASKSWTOUTQ	Task Switch Out Queueing
3	12	BASEVT	*TASKSWTOUTINT	Task Switch Out Interrupt
3	22	BASEVT	*TASKAVAIL	Task Available For Dispatch

Taskswitch and PMCO events from QAYPEEVEVENT at 7.4

Note: Many drill-downs exist within this analysis some of which may not work properly depending on the report they are initiated from. Contact idoctor@us.ibm.com if you need assistance with something specific.

35.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range and minimum time grouping to be configured.

35.2 SQL tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
PEXQAYPETSWSW_TNX_<MBR>	Taskswitch transaction file
PEXQAYPETSWSW_INT_<MBR>	Taskswitch one second index
PEXQAYPETIDX_OOS_<MBR>	Index for QAYPETIDX AFD records out of sequence (OOS)
PEXQAYPETIDX_01_<MBR>	Taskswitch events TIDX file

35.3 Taskswitch

This folder contains the graphs and reports available after the Taskswitch analysis has completed.

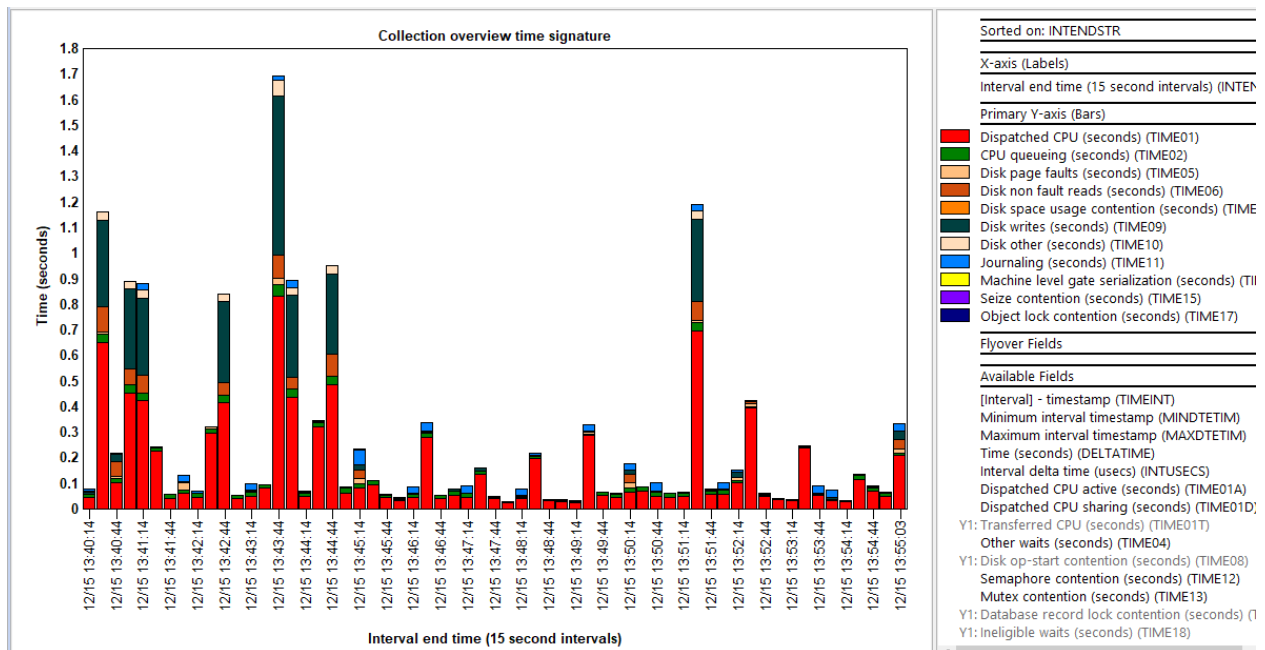
Report	Description
Collection overview time signature	
Seizes and locks time signature	
Disk time signature	
Transaction waits by thread	Reports over the taskswich transactions grouped by thread
Transaction waits by object	Reports over the taskswich transactions grouped by object
Detail reports	Reports over taskswich events after analysis

Taskswich

35.3.1 Collection overview time signature

This graph shows the wait bucket times for the most interesting wait buckets using the taskswich data in the collection. This is the same graph as shown in Job Watcher or Collection Services Investigator but does not include CPU utilization.

Note: Although the wait buckets themselves are not captured by PEX, they are derived from the enum (specific wait type) and duration of each wait. If the 1/10th or 1/100th second interval options are used, then very detailed wait analysis is possible but normally only rarely needed.



Collection overview time signature

35.3.2 Seizes and locks time signature

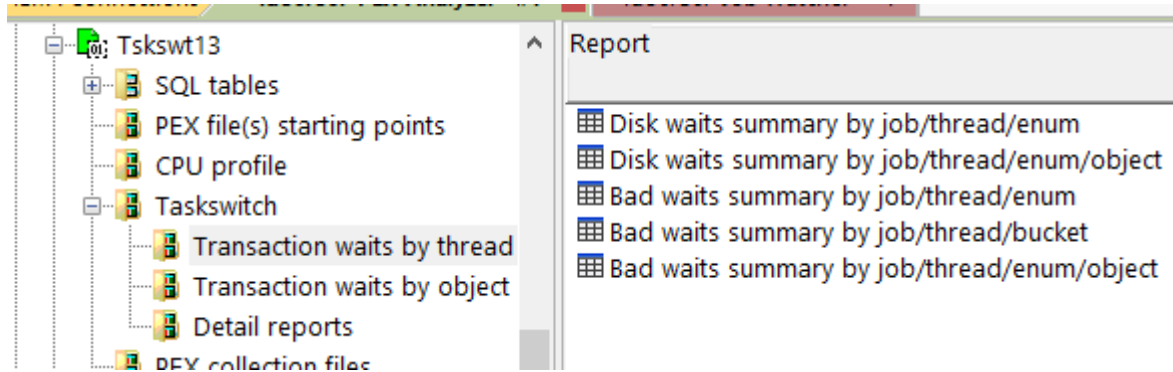
This graph is the same as the Collection overview time signature but only shows seize contention, database record locks and object lock contention wait buckets.

35.3.3 Disk time signature

This graph is the same as the Collection overview time signature but only shows disk-related wait buckets.

35.3.4 Transaction waits by thread

This folder contains reports that analyze waits by thread.



Taskswitch -> Transaction waits by thread

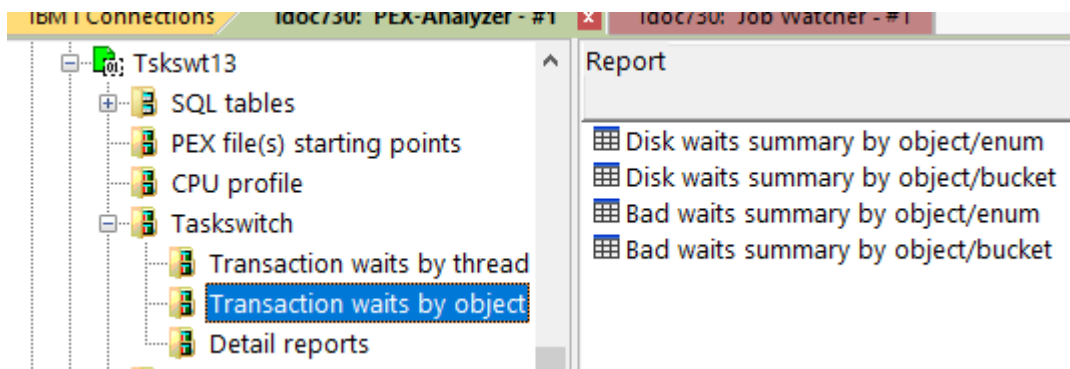
An example follows:

Job name/user/number: thread ID (OBJ.NAME)	Job/thread identifier (TDE/taskcount) (TNX_TDE)	Wait type enum (TNX_WT_ENUM)	Total taskswitch transactions (TOT_CNT)	Waiting time (seconds) (TNX_WAITSECS)	Average time (seconds) (AVG_SECS)	Maximum time (seconds) (MAX_SECS)	LIC priority range (TNX_PTY_RANGE)	Existed at start: Y or N (QTSXST)
QZDASOINIT / QUSER / 273450: 000000CB	00000000005346DE	SWT-167	9494	1.363030472	.000143567566041	.000778544	160 - 1	N
QZDASOINIT / QUSER / 273450: 000000CA	0000000000534691	SWT-167	6064	.855109088	.000141014031662	.000817944	160 - 150	Y
QZDASOINIT / QUSER / 273450: 000000CC	00000000005346E6	SWT-167	1895	.271603944	.000143326619525	.000705840	160 - 150	N
QZDASOINIT / QUSER / 273450: 000000CB	00000000005346DE	SRD-158	225	.268408512	.001192926720000	.017775464	160	N
QZDASOINIT / QUSER / 273450: 000000CA	0000000000534691	SRD-158	144	.257523352	.001788356611111	.014329800	160	Y
QTSMTPLCLTD / QTCP / 251899: 00000001	00000000000009EB	JBO-50	80	.191546336	.002394329200000	.025020712	190 - 1	Y
QZDASOINIT / QUSER / 273450: 000000CB	00000000005346DE	DSM-72	905	.153986096	.000170150382320	.000789496	150 - 1	N
QZDASOINIT / QUSER / 273450: 000000CB	00000000005346DE	GTA-174	530	.130632496	.000246476407547	.002079520	160 - 150	N
QIDRPACOL / MCCARGAR / 273468: 00000089	0000000000534693	SRD-158	12	.101837704	.008486475333333	.016757680	150	Y
QTMSSMTPLD / QTCP / 251898: 00000003	00000000000009E9	JBO-50	54	.100739144	.001865539703703	.025022016	190 - 1	Y
QZDASOINIT / QUSER / 273450: 000000CA	0000000000534691	DSM-72	576	.094880000	.000164722222222	.000677416	150	Y
QZDASOINIT / QUSER / 273450: 000000CA	0000000000534691	GTA-174	340	.080450192	.000236618211764	.001313400	160 - 150	Y
QTSMTPLCLTD / QTCP / 251899: 00000001	00000000000009EB	SWT-167	546	.077556000	.000142043956043	.000712024	190 - 1	Y
QZDASOINIT / QUSER / 273450: 000000CC	00000000005346E6	SRD-158	45	.071159352	.001581318933333	.006788280	160	N
QSPFP00001 / QSYS / 251656: 00000001	0000000000000635	JBO-50	49	.063582136	.001297594612244	.025019544	155 - 1	Y
QIDRPACOL / MCCARGAR / 273468: 00000089	0000000000534693	SFT-161	6	.055469648	.009244941333333	.011273872	150	Y
QYUSCMCRMD / QSYS / 251797: 00000005	00000000000007FE	JBO-50	10	.051164552	.005116455200000	.025021744	190 - 1	Y
POFSYNCO0N001	00000000000002E9	JBO-50	5	.050455792	.010091158400000	.025020640	239 - 1	Y

Disk waits summary by job/thread/enum

35.3.5 Transaction waits by object

This folder contains reports that analyze waits by object.



Taskswitch -> Transaction waits by object

An example follows:

Idoc730/MCCARGAR2/TSKSWT13/Disk waits summary by object/bucket - #1						
Object name (QSGONM)	Wait bucket (BLOCKBCKT)	Number of threads / tasks (TDEHITS)	Total taskswitch transactions (TOT_CNT)	Waiting time (seconds) (TNX_WAITSECS)	Average time (seconds) (AVG_SECS)	Maximum time (seconds) (MAX_SECS)
CDAPPN.IDOC730		9	3	.431461632	.000130272231884	.000778544
PERM DIR SID RANGE		9	15	.420285024	.000137303176739	.000773088
QDBSHR		9	6	.400403160	.000134408580060	.000736296
MACH IDX RADIX4 2ND		9	8	.372702320	.000136022744525	.000479104
MCCARGAR		9	7	.140640080	.000137076101364	.000717088
UIM_TEMPORARY_WORKSPACE		6	2	.134523368	.005605140333333	.016757680
SM PERM DIR SEGMENT		9	11	.063824488	.000137849866090	.000714832
QSECOFR		9	4	.041584160	.000134576569579	.000178584
QP0Z251790		5	1	.036245096	.004530637000000	.005518880
ACTVTN PROC REF TBL		5	2	.028292336	.009430778666666	.015255080
QTCP		9	5	.023363464	.000136628444444	.000712024
Q04079N009Q559377443		9	2	.022337480	.000366188196721	.010656120
QP0Z251923		5	1	.018412352	.004603088000000	.006168112

Disk waits summary by object/bucket

35.3.6 Detail reports

These reports give more details behind the events captured within the PEX collection.

Note: Many drill-down options are provided from these reports but are not documented. They are intended for advanced users.

Taskswitch -> Detail reports

An example follows:

Idoc730/MCCARGAR2/TSKSWT13/Disk waits summary by object/bucket - #1													
Idoc730/MCCARGAR2/TSKSWT13/Taskswitch wait summary - #1													
Wait type (WAITTYPE)	Wait type enum (WT_ENUM)	Event count (EVENTCNT)	Total time (seconds) (TOTALTIME)	Average time (seconds) (AVGTIME)	Maximum time (seconds) (MAXTIME)	Job/thread identifier (TDE/taskcount) (TNX_TDE)	Job name/user/number: thread ID (JTTHREAD)	(Minimum) QRECN (QRECN)	QTTIMN (QTTIMN)	QTVWAO (QTVWAO)	Start time (STARTTIME)	End time (ENDTIME)	QTVWDC (QTVWDC)
U74	U74-374	43323	83899.090143	1.936594	5339.999621	00000000000000A8E	QNAW/MNSRV / QWBEADMIN / 251923: 00000019	332283	339765813740	C96B71A88F01E220	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	U74
QQu	QQu-6	7721	31223.299307	4.043944	901.090156	0000000000000298	MNTASK	402585	900577190000	FFFFFFFF52DEDA40	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	QQu
SWW	SWW-223	3778	22754.311311	6.022845	899.999772	00000000000033C0	QHTTP / QTMHHTTP / 273296: 00000139	32924	298010125593	C890CE3640DE190	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	SWW
QMo	QMo-342	398	18286.864199	45.946894	898.004894	000000000000081F	QTCPRWK / QSYS / 251659: 00000002	218471	462491458917	FA5DDB8C1C2000100	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	QMo
Mcw	Mcw-351	1388	14415.226197	10.385609	897.989141	0000000000000533CE	QVSPFRCOL / QSYS / 251691: 0000023C	326745	298010502759	C893892F9C00BE50	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	Mcw
QTB	QTB-4	45117	9527.769130	.211179	900.524307	0000000000000032D	DbDasdMeterMonit	245784	757455488849	E7FC41AE35FFFC0	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	QTB
QCo	QCo-1	2475	8409.278649	3.397688	1258.291189	0000000000000024D	SKFASTTIMER-010	357939	549131791281	FFFFFFFFF84765710	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	QCo
QRQ	QRQ-19	1358	8372.344200	6.165201	766.420941	00000000000000318	DpbnServer046	258460	736182767470	C00001248E92E480	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	QRQ
QUW	QUW-5	374	8187.833997	21.892604	1801.130054	0000000000000028A	SMBALANCETASK	260040	39004029041	C000008FADFF650	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	QUW
JUW	JUW-200	105	6033.151903	60.030018	60.030018	00000000000000970	ADMWJ / QJWISVR / 251858: 0000002F	167538	104453361687	D6A4A8E4340CC8B	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	JUW
QMd	QMd-341	18	5536.451764	307.580653	2832.225475	00000000000000706	QVSPFRCOL / QSYS / 251691: 00000001	388235	736159420482	3F28A59C97000100	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	QMd
EMw	EMw-330	108	5412.618366	50.116836	463.051391	00000000000000631	QDBFSTCCOL / QSYS / 251652: 00000001	388280	736233004312	D65A2217AE0A5980	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	EMw
STR	STR-214	181	2130.680731	11.777116	402.818846	00000000000053427A	QZDASOINVT / QUSER / 273438: 00000048	236931	677177909349	C8908CE3648D8390	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	STR
QSC	QSC-13	23	1898.008911	82.522126	293.053327	0000000000000022E	RMNODBALANCER	267720	49134568750	FFFFFFFFF84A42F90	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	QSC
DBX	DBX-406	61	1812.481266	29.712807	307.200023	000000000000004C8	DIROU001	294150	198341921410	C562A18107FF9FC0	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	DBX
U62	U62-362	4470	1801.298126	.402974	.530703	000000000000009C2	QSLPSVR / QSYS / 251888: 00000001	72371	48999460992	D6A4B8B798FF528	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	U62
MW	MW-353	358	900.242021	2.514642	3.030020	0000000000000096E	QTSMTSPRVD / QTCP / 251889: 00000004	248034	803160227646	DAAF53D432002060	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	MW
LAS	LAS-221	7	128.785624	18.397946	68.269110	00000000000000846	TNSRIOCMPORT	167703	106363670812	C8908CE364003F90	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	LAS
LTR	LTR-215	38	69.740151	1.835267	41.855783	0000000000003438F	QZCRSVS / QUSER / 273452: 0000006D	244459	727879772906	C8908CE3648D8B10	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	LTR
QMr	QMr-340	12	60.444908	5.037075	51.154881	00000000000040409	QPADEV024 / IDOCOR / 270203: 000000A8	265014	29007681126	C5857A2A55000100	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	QMr
SWT	SWT-167	19003	2.721691	.000143	.010656	00000000000034693	QIDRPACOL / MCCARGAR / 273468: 000000B9	255839	900455428593	0835383F2A001000	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	SWT
CPUQ	CPUQ	135463	855229	.000006	.000028	00000000000000123	RMTHSASFATASK	358672	561757755695	0000000000000000	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	CPUQ
Srd	Srd-158	442	7.44513	.001684	.017775	000000000000346DE	QZDASOINVT / QUSER / 273450: 000000CB	309261	227857440427	2366FC642D007000	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	Srd
JBo	JBo-50	254	.557950	.002196	.025022	000000000000009F0	QTMSSMTDP / QTCP / 251901: 00000001	219173	481337602810	C00001248E925C50	2022-12-15-13.40.02.102750	2022-12-15-13.55.02.608186	JBo

Taskswitch wait summary

36 TCP/IP communications

This analysis examines the TCP/IP communication events and is intended for advanced users.

36.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range to be configured. **Note:** The minimum time grouping setting does not apply to this analysis.

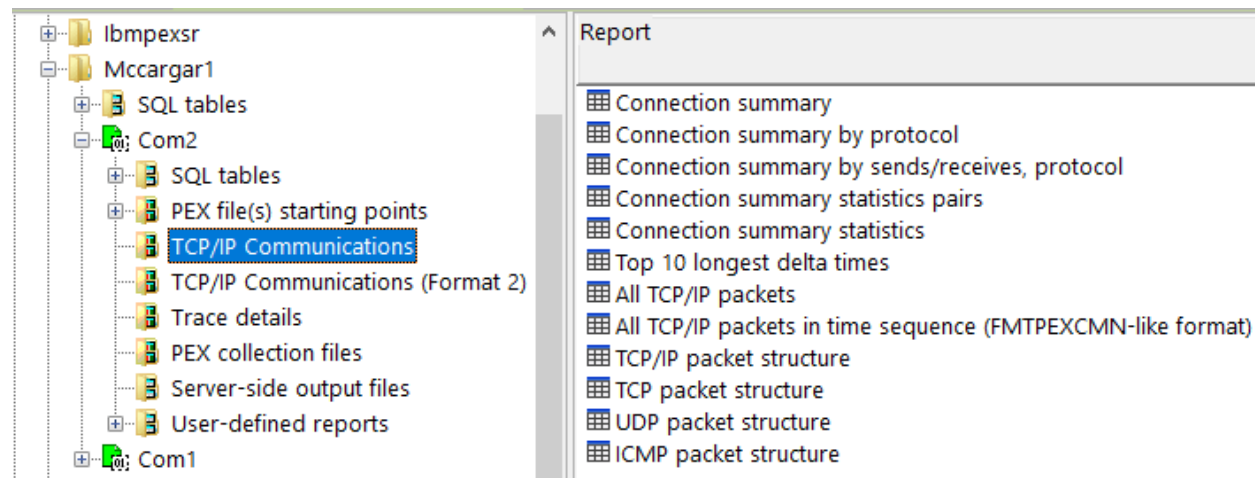
36.2 SQL Tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
Pexcmntcpsum_<MBR>	Comtrace summary
Pexcmncnsum_<MBR>	Connection summary
Pexcmntrcout_<MBR>	FMTPEXCMN output
Pexcmncnv_<MBR>	Hex conversion output
Pexcmnicmp_<MBR>	ICMP packet data
Pexcmnudp_<MBR>	UDP packet data
Pexcmntcp_<MBR>	TCP packet data

36.3 TCP/IP communications

This folder contains the reports available after the analysis has completed.



An example follows:

Idoc730/MCCARGAR1/COM2/Connection summary - #2							
Total packets (PACKETS)	Source port (SRCPORT)	Destination port (DESTPORT)	Source (SRCIPCONV)	Destination (DESTIPCONV)	Minimum interval timestamp (MINDTETIM)	Maximum interval timestamp (MAXDTETIM)	Source (SR)
164	0	0			2023-03-27-05.19.43.122581	2023-03-27-05.20.27.259887	
47	8471	64936	9.5.68.29	9.10.75.187	2023-03-27-05.19.46.278317	2023-03-27-05.20.27.229591	00
36	64936	8471	9.10.75.187	9.5.68.29	2023-03-27-05.19.46.278310	2023-03-27-05.20.27.229585	00
21	8471	64934	9.5.68.29	9.10.75.187	2023-03-27-05.19.46.268082	2023-03-27-05.20.27.197149	00
19	8475	64926	9.5.68.29	9.10.75.187	2023-03-27-05.19.46.232656	2023-03-27-05.20.27.183126	00
18	64926	8475	9.10.75.187	9.5.68.29	2023-03-27-05.19.46.233479	2023-03-27-05.20.27.235504	00
12	64934	8471	9.10.75.187	9.5.68.29	2023-03-27-05.19.46.268075	2023-03-27-05.20.27.197143	00
2	8473	16567	127.0.0.1	127.0.0.1	2023-03-27-05.19.52.935998	2023-03-27-05.19.52.936002	00
2	16567	8473	127.0.0.1	127.0.0.1	2023-03-27-05.19.52.936012	2023-03-27-05.19.52.936013	00
2	64950	8475	9.10.75.187	9.5.68.29	2023-03-27-05.20.27.145635	2023-03-27-05.20.27.190461	00
2	44191	8475	127.0.0.1	127.0.0.1	2023-03-27-05.19.58.244426	2023-03-27-05.19.58.244426	00
2	8475	44191	127.0.0.1	127.0.0.1	2023-03-27-05.19.58.244415	2023-03-27-05.19.58.244418	00
1	8475	64950	9.5.68.29	9.10.75.187	2023-03-27-05.20.27.146502	2023-03-27-05.20.27.146502	00

Connection summary

37 TCP/IP communications format 2

This analysis examines the TCP/IP communication format 2 events and is intended for advanced users.

Note: It will only appear if *FORMAT2 communication events were captured.

37.1 Running the analysis

When running the analysis, the [PEX Analysis Time Filtering](#) window appears that allows the desired analysis time range to be configured. **Note:** The minimum time grouping setting does not apply to this analysis.

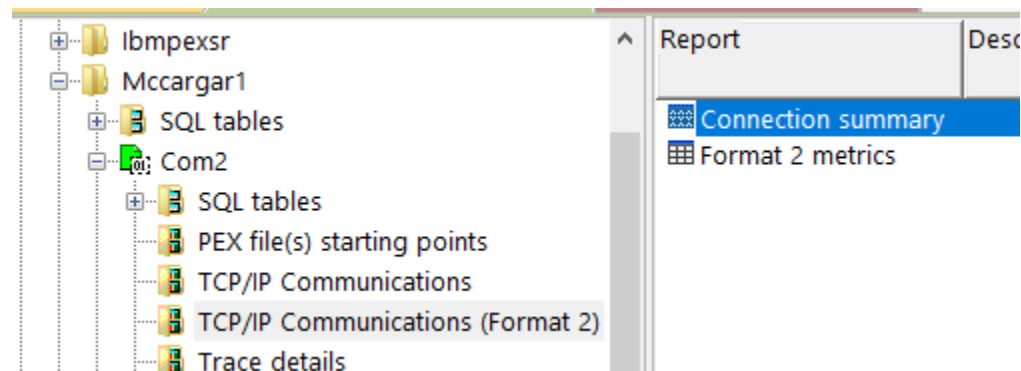
37.2 SQL Tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
Pex2cmncnv_<MBR>	Hex conversion output
Pex2cmnhexin_<MBR>	Hex conversion input

37.3 TCP/IP communications (format 2)

This folder contains the reports available after the analysis has completed.



An example follows:

Idoc730/MCCARGAR1/COM2/Format 2 metrics - #2																
(Minimum) QRECN (QRECN)	1st unACKed seq nbr (SNDUNA)	Seq nbr of next byte to send (SNDNXT)	Seq nbr of next byte app will send (USRSNDNXT)	Congestion window size (CGSTWIND)	Send window size (SNDWIND)	Slow start threshold (SSTHRESH)	Send queue length (SENDQLEN)	Expected seq nbr of next inbound byte (RCVNXT)	Receive window size (RCVWIND)	Right window edge advertised (RCVADV)	Receive queue length (RCVQLEN)	Consecutive dup packets received (RCVDUPPKT)	Round trip time (ms) (RTT)	Smoothed round trip time (ms) (SRTT)	Round trip time variance (ms) (RTTVAR)	Current time (ms) (CURRE)
1	2403163513	2403163513	2403163513	122304	2102272	16445440	0	883358279	65535	883423814	0	0	0	32	10	
2	2403163513	2403163513	2403163537	122304	2102272	16445440	24	883358279	65535	883423814	0	0	0	32	10	
5	2403163537	2403163537	2403163537	122328	2102272	16445440	0	883358357	65535	883423892	0	0	0	32	10	
6	2403163537	2403163537	2403163561	122328	2102272	16445440	24	883358357	65535	883423892	0	0	0	32	10	
9	2403163561	2403163561	2403163561	122352	2102272	16445440	0	883359776	65535	883425311	0	0	0	32	10	
10	2403163561	2403163561	2403164961	122352	2102272	16445440	1400	883359776	65535	883425311	0	0	0	32	10	
13	2403164961	2403164961	2403164961	123752	2100736	16445440	0	883360451	65535	883425986	0	0	0	32	10	
14	2403164961	2403164961	2403165617	123752	2100736	16445440	656	883360451	65535	883425986	0	0	0	32	10	
17	2412019930	2412019930	2412019930	5980	262656	16445440	0	44172163	65535	44237601	0	0	500	114	165	
21	2412019930	2412019930	2412020159	5980	262656	16445440	229	44172163	65535	44237601	0	0	500	114	165	
21	2403156398	2403156398	2403156398	117280	2100736	16445440	0	883355927	65535	883421462	0	0	0	32	10	
22	2403156398	2403156398	2403161409	117280	2100736	16445440	5011	883355927	65535	883421462	0	0	0	32	10	
25	2403161409	2403161409	2403161409	120200	2102272	16445440	0	883356017	65535	883421552	0	0	0	32	10	
26	2403161409	2403161409	2403161433	120200	2102272	16445440	24	883356017	65535	883421552	0	0	0	32	10	
29	2404999177	2404999177	2404999177	29207	261376	16445440	0	836961250	65535	837026785	0	0	0	32	10	
30	2404999177	2404999177	2404999359	29207	261376	16445440	182	836961250	65535	837026785	0	0	0	32	10	

Format 2 metrics

38 Top CPU Burners

This analysis examines the call stacks provided by the *PMCO format 2 event to determine which non-Q named programs (if applicable/available) were burning the most CPU.

38.1 Running the analysis

When running the analysis, no prompt appears since no parameters apply.

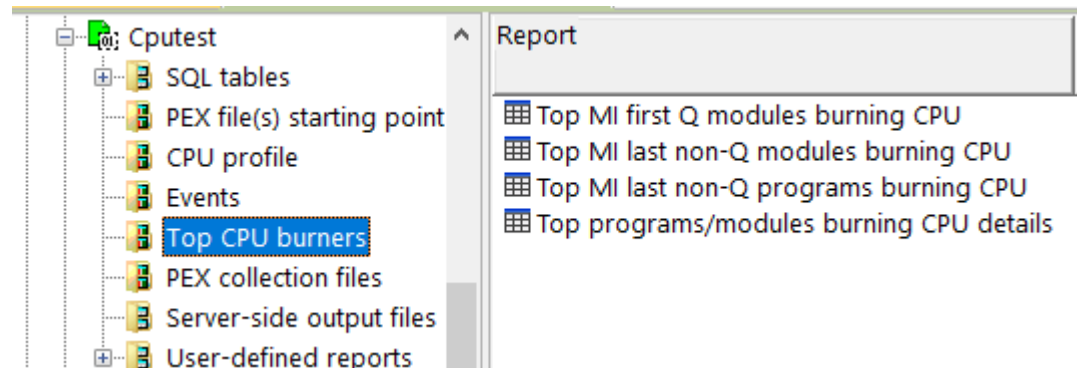
38.2 SQL tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
Pexburnfnqm_<MBR>	Top MI first Q modules burning CPU
Pexburnnqm_<MBR>	Top MI last non-Q modules burning CPU
Pexburnnqp_<MBR>	Top MI last non-Q programs burning CPU
Pexburn_<MBR>	Top programs/modules burning CPU details

38.3 Top CPU burners

This folder contains the reports available after the analysis has completed.



Top CPU burners

An example follows:

Idoc730/MCCARGAR2/CPUTEST/Top MI last non-Q programs burning CPU - #1					
Total hits (HITSCUMM)	Total jobs / tasks / threads (TOTDES)	Last NON-Q pgm TBT address (LASTNONQPGMPRKEY)	Program name (PGMNAM)	Module name (QPRMNM)	Procedure name (QPRPNM)
63	17	0000000000000000	UNKNOWN/UNKNOWN	UNKNOWN	UNKNOWN
53	3	286840A34C2A2478	QQQOOODBOP	QQQOOOINV	CALLDBMAINTFOROPENOROPTIMIZE
48	8	FFFFFFFF49A70358		TDWaitState	waitState
46	2	372551EB480360A8	QC2UTIL1	QC2ALLOC	do_free_default_FPv
44	5	372551EB48034D20	QC2UTIL1	QC2ALLOC	do_malloc_default_FUL
36	14	37A10CCB64017AF0	QP2USER2	QP2API	runpase_common_FiPvT2
31	1	2F89F37E9C4F3FC8	QQQVFMF	QQQVFMF	QQQVFMF
29	1	1F38C89282010A58	QDFCDF	QDFCDF	QDFCDF
24	4	FFFFFFFF497AC3B0		rmInitialRoutine	rmInitialRoutine
18	5	FFFFFFFF49D70480		SmRemoveRequest	redrive_15SmRemoveRequestFv
18	1	2F950C39CD004660	QDFRECOV	QDFRECOV	QDFRECOV
17	1	245D91FC010193D0	QLILIST	QLILIST	QLILIST
16	2	2C86F27B170EAD80	QSQDDL1	QSQACTNM	RESOLVE_TO_FILE
14	3	223AD1CEE00B420	QMHPDEH	QMHPDEH	QMHPDEH
14	2	2F89F37E9C518D70	QQQVFMF	QQQVFMF	PROCESSCOLUMNMASK
14	5	0047DD70FC00B978	QWCSRTZR	QWCSRTZR	QWCSRTZR
13	2	2CF857773F022440	QLEAWI	QLEPM	Q LE leBdyEpilog2
13	4	FFFFFFFF490F0C88		#qustack	qu_run_on_res_stack
12	2	FFFFFFFFD24D9F60		LIModuleStorage	__vc_15LIModuleStorageFRC16LISectionAddr
12	1	33F330DA3A07FFA0	QQQSRV11	QQQRLSPC	DEALLOCATESPACE
12	2	35715ED1F8018E18	QSZGTPRD	QSZGTPRD	QSZGTPRD
12	4	3778E5212B01F938	QMHRTMSS	QMHRTMSS	QMHRTMSS
11	4	FFFFFFFF40F1F230		SmWriteCommonResourceLinkUse	redrive_15SmWriteCommonResourceLinkUse

Top MI last non-Q programs burning CPU

39 TPROF

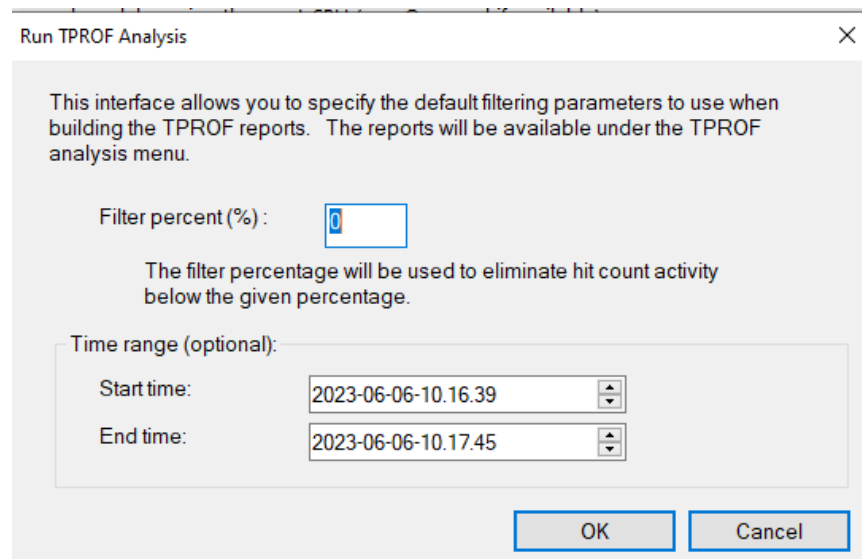
This analysis ranks CPU consumption by jobs, programs, modules, procedures, and MI instructions. It also identifies which components in the OS are consuming the most CPU.

The analysis is constructed using the PEX PMCO (Performance Measurement Counter Overflow) event. If type 2 of this event is collected, then call stack (with 16 call levels of data) are also captured. The call stack data is also utilized by this analysis (if available) and shows what the call stack looked like for any desired program/procedure/mi instruction.

Note: The tree tables provide hierarchical levels that can be expanded/collapsed but do not perform well if too much data has been captured.

39.1 Running the analysis

When running the analysis, the following prompt appears:



The image shows a screenshot of a Windows-style dialog box titled "Run TPROF Analysis". The dialog has a close button (X) in the top right corner. Inside the dialog, there is a text block that reads: "This interface allows you to specify the default filtering parameters to use when building the TPROF reports. The reports will be available under the TPROF analysis menu." Below this text, there is a label "Filter percent (%):" followed by a text input field containing the number "0". Underneath the input field, a smaller text block states: "The filter percentage will be used to eliminate hit count activity below the given percentage." Further down, there is a label "Time range (optional):" followed by a group box containing two time selection controls. The "Start time:" control shows the date and time "2023-06-06-10.16.39" with up and down arrow buttons. The "End time:" control shows the date and time "2023-06-06-10.17.45" with up and down arrow buttons. At the bottom right of the dialog, there are two buttons: "OK" and "Cancel".

Run TPROF Analysis

Note: The filter percent allows you to reduce the results shown and eliminate data below a certain PMCO hit percentage. But specifying a value too high can cause no results to be created in which case the TPROF folder will not appear when the analysis completes.

39.2 SQL tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
Qaypeproci_<MBR>	QAYPEPROCI including an ID column indicating OS component
Pextprofcomp1_<MBR>	Hits by OS component/procedure
Pextprofcomp2_<MBR>	Hits by OS component
Pextprofs6_<MBR>	Hits by SDAR/procedure
Pextprofs5_<MBR>	Hits by statement
Pextprofs4_<MBR>	Hits by program
Pextprofs3_<MBR>	Hits by program/module
Pextprofs2_<MBR>	Hits by job/task/program/module
Pextprofs1_<MBR>	Hits by job-thread/task
Pextprof2_<MBR>	Hits by job-thread/task/procedure
Pextprof1_<MBR>	Hits by job/task/procedure
Pextprof_<MBR>	Hits by procedure
Pexmcli_<MBR>	SDAR hits by procedure/object

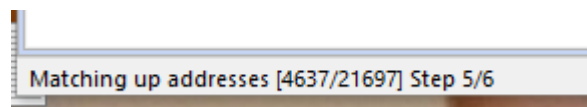
39.3 TPROF

This folder contains the reports available after the analysis has completed.

Note: Most reports contain additional drill-down options. Right-click on a selected row for more options.

The call stack drill-down options will only work if *PMCO format 2 was collected.

Tip: Some tree reports can be long running and the GUI may appear to hang while they are running. In some cases, the tree reports should NOT be used if too many PMCO events were captured. The status bar in the Data Viewer will update to indicate the current status, but otherwise the GUI will be unresponsive when these reports are being built.



Data Viewer status bar example when building a large tree report

Report	Description	Tree table
Hits by procedure		
Hits by job-thread/task/procedure		
Hits by job-thread/task		
Hits by job/program/module		
Hits by job/procedure		
Hits by program/module		
Hits by program		
Hits by statement		
Hits by job/task		Yes
Hits by task		Yes
Hits by job-thread		Yes
Hits by job/program		Yes
Hits by task/program		Yes
Hits by job-thread/procedure		Yes
Hits by task/procedure		Yes
Hits by job-thread/component/procedure		Yes
Hits by task/component/procedure		Yes
Hits by program model		Yes
Hits by component		Yes
Hits by MI program library		Yes
Hits by system data address register/procedure		
Hits by generic task name		Yes

TPROF folder

39.3.1 Hits by procedure

This report shows PMCO hits by program/module/procedure.

Tip: Selected a procedure and right-click for several additional drill down options.

Total hits (HITCNT)	Percent Hits (PCTHIT)	Program library (QPRPQL)	Program name (QPRPGN)	Module name (QPRMNM)	Procedure name (QPRPNM)	Instruction address (STRADR)	Proci table addr (QPR)
130870	28.62%	LIC	CFINTLNK	cfintlnk	chrscv	FFFFFFFFF080710	FFFF
9398	2.05%	LIC	RTCFLZ11	Cflz1	findMatch_17Cflz1HistoryTableCPUCn21UIRUI	FFFFFFFFF82667C28	FFFF
9178	2.00%	LIC	MASOLMFA	MasoLockMbMutexFast	masombmutexlockfast	FFFFFFFFF0780A0	FFFF
8597	1.88%	QSYS	QSQPLEXD	QSQPLEXD	QSQPLEXD	0B74D0986700238C	0B74
8022	1.75%	LIC	MASOMIRT	MasoMiRouter	masouser_call_MASO_router	FFFFFFFFF078A80	FFFF
7854	1.71%	LIC	MASOMMFA	MasoUnlockMbMutexFast	masombmutexunlockfast	FFFFFFFFF078270	FFFF
6982	1.52%	QSYS	QC2IFS	QC2IGETC	_C_IFS_fgetc	23772D98DB00A304	2377
6943	1.51%	LIC	HMFREHS	#hmfreh	#hmfreh	FFFFFFFFFC176D28	FFFF
5853	1.28%	LIC	RTCFLZ11	Cflz1	removeHistoryForCharPair_17Cflz1HistoryTableFuUI	FFFFFFFFF82668590	FFFF
4658	1.01%	LIC	HMALCHS	#hmalchs	#hmalchs	FFFFFFFFFC179068	FFFF
4559	.99%	LIC	STRHU4K	stringHighUse4K	cfmemset4K	FFFFFFFFF9010	FFFF
3988	.87%	LIC	VOXILUD	VOXILUD	VOXILUD_ComputeLocalPropertiesForReachingDefinitions	FFFFFFFFFC0790CC	FFFF
2874	.62%	LIC	HvPageTa	HvPageTable	HvPageTable	0000000000555C20	800C
2705	.59%	LIC	CFSCV	#cfscv	scv0	FFFFFFFFF003020	FFFF
2559	.55%	LIC	HvModelP	HvModelPower7	HvModelPower7	0000000000021190	800C
2552	.55%	LIC	RTCFLZ11	Cflz1	addHistoryEntry_17Cflz1HistoryTableFPUCt1UI	FFFFFFFFF826680F8	FFFF
2413	.52%	LIC	SMMSUBH	SmlMainStorageSubPoolHighUse	stealPage_205mMainStorageSubPoolFQ2_175mMainStoragePool95mMspListQ2_205mMainStorageSubPool165mMspAging...	FFFFFFFFF82ABE468	FFFF
2389	.52%	LIC	LLMODSTG	LlModuleStorage	findTheModuleThatContainsThisAddressNonconst_15LlModuleStorageFRC16LlSectionAddress	FFFFFFFFFD23E0ADC	FFFF
2317	.50%	LIC	STRHU	stringHighUse	do_copyMemoryLarge	FFFFFFFFF06EF68	FFFF
2107	.46%	QSYS	QC2IFS	QC2IGETC	_C_IFS_fgetc	23772D98DB00A304	2377

Hits by procedure

39.3.2 Hits by job-thread/task/procedure

This report shows PMCO hits by job-thread (or task)/program/module/procedure.

Idoc720/QPEXDATA/PEXABC081/Hits by job-thread/task/procedure - #1											
Total hits (HITCNT)	Percent Hits (PCTHIT)	Process job name (QTSJNM)	Job user (QTSJUS)	Job number (QTSJNB)	QTSTHI (QTSTHI)	Taskcount (HEX) (QTIFTC)	Task name (QTSNM)	Program library (QPRPQL)	Program name (QPRPGN)	Module name (QPRMNM)	Procedure name (QPRPNM)
117197	25.63%	QZRCRSVS	QUSER	128673	00000000000000D5	00000000007EF147		LIC	CFINTLNK	cfintlnk	drfscv
9711	2.12%	Q1ACPDST	QBRMS	112813	0000000000000001	000000000000083D		LIC	CFINTLNK	cfintlnk	drfscv
8993	1.96%	QZRCRSVS	QUSER	128673	00000000000000D5	00000000007EF147		LIC	MASOLMFA	MasoLockMbMutexFast	masombmutexlockfast
8514	1.86%	QZRCRSVS	QUSER	128673	00000000000000D5	00000000007EF147		QSYS	QSQPLEXD	QSQPLEXD	QSQPLEXD
7847	1.71%	QZRCRSVS	QUSER	128673	00000000000000D5	00000000007EF147		LIC	MASOMIRT	MasoMiRouter	masouser_call_MASO_router
7696	1.68%	QZRCRSVS	QUSER	128673	00000000000000D5	00000000007EF147		LIC	MASOUMFA	MasoUnlockMbMutexFast	masombmutexunlockfast
6982	1.52%	QZRCRSVS	QUSER	128673	00000000000000D5	00000000007EF147		QSYS	QC2IFS	QC2IGETC	_C_IFS_fgetc
4357	.95%	QZRCRSVS	QUSER	128673	00000000000000D5	00000000007EF147		LIC	STRHU4K	stringHighUse4K	dfmemset4K
3985	.87%	QZRCRSVS	QUSER	128673	00000000000000D5	00000000007EF147		LIC	VOXILUD	VOXILUD	VOXILUD_ComputeLocalPropertiesForReac
3745	.81%	Q1ACPDST	QBRMS	112813	0000000000000001	000000000000083D		LIC	HMFREHS	#hmfreh	#hmfreh
3319	.72%				0000000000000000	00000000007EF2D3	LDIOM	LIC	RTCLZ1I	Cflz1	findMatch_17Cflz1HistoryTableCFPUcN21U
3087	.67%				0000000000000000	00000000007EF292	LDIOM	LIC	RTCLZ1I	Cflz1	findMatch_17Cflz1HistoryTableCFPUcN21U
2678	.58%	QZRCRSVS	QUSER	128673	00000000000000D5	00000000007EF147		LIC	HMFREHS	#hmfreh	#hmfreh
2240	.48%	Q1ACPDST	QBRMS	112813	0000000000000001	000000000000083D		LIC	HMALCHS	#hmalchs	#hmalchs
2197	.48%	QZRCRSVS	QUSER	128673	00000000000000D5	00000000007EF147		QSYS	OC2IFS	OC2IGETC	C IFS cheap foetc

Hits by job-thread/task/procedure

39.3.3 Hits by job-thread/task

This report shows PMCO hits by job-thread or system task.

Idoc720/QPEXDATA/PEXABC081/Hits by job-thread/task - #1									
Total hits (HITCNT)	Percent Hits (PCTHIT)	Process job name (QTSJNM)	Job user (QTSJUS)	Job number (QTSJNB)	QTSTHI (QTSTHI)	Taskcount (HEX) (QTIFTC)	Task name (QTSNM)	Rank ID (for sorting) (RANKID)	Task count (QTSTCT)
315534	69.01%	QZRCRSVS	QUSER	128673	00000000000000D5	00000000007EF147		1	00000000007EF147
27998	6.12%	Q1ACPDST	QBRMS	112813	0000000000000001	000000000000083D		2	000000000000083D
15795	3.45%	IDRBUILD	MCCARGAR	128708	000000000000003C	00000000007EF246		3	00000000007EF246
6654	1.45%				0000000000000000	00000000007EF2D3	LDIOM	4	00000000007EF2D3
6435	1.40%				0000000000000000	00000000007EF292	LDIOM	5	00000000007EF292
4132	.90%	ADMIN	QTMHHTTP	128761	00000000000001FE	00000000007EF397		6	00000000007EF397
3682	.80%	QZDASOINIT	QUSER	128752	0000000000000135	00000000007EF39A		7	00000000007EF39A
3644	.79%	QZDASOINIT	QUSER	128752	0000000000000137	00000000007EF3BF		8	00000000007EF3BF
3178	.69%				0000000000000000	0000000000000301	#w#a#i#t#T#a#s#k	9	0000000000000301
2543	.55%	QTSMTPLTD	QTCP	112898	0000000000000001	00000000000009A0		10	00000000000009A0
2516	.55%				0000000000000000	00000000007EF2B9	LDIOM	11	00000000007EF2B9
2514	.54%				0000000000000000	00000000007EF2AC	LDIOM	12	00000000007EF2AC
2178	.47%	QTSMTPSRVD	QTCP	112889	000000000000002C	0000000000000978		13	0000000000000978
2105	.46%				0000000000000000	0000000000000323	RMTMSAFETASK	14	0000000000000323

Hits by job-thread/task

39.3.4 Hits by job/program/module

This report shows PMCO hits by job-thread (or task)/program/module.

Idoc720/QPEXDATA/PEXABC081/Hits by job/program/module - #1											
Total hits (HITCNT)	Percent Hits (PCTHIT)	Process job name (QTSJNM)	Job user (QTSJUS)	Job number (QTSJNB)	Taskcount (HEX) (QTIFTC)	Task name (QTSNM)	Program library (QPRPQL)	Program name (QPRPGN)	Module name (QPRMNM)	PGMMDL (PGMMDL)	Res (f) sc (F)
117454	25.69%	QZRCRSRV	QUSER	128673	00000000007EF147		LIC	CFINTLNK	cfintlnk	LIC	
9731	2.12%	Q1ACPDST	QBRMS	112813	00000000000083D		LIC	CFINTLNK	cfintlnk	LIC	
9179	2.00%	QZRCRSRV	QUSER	128673	00000000007EF147		QSYS	QC2IFS	QC2IGETC	ILE	
8993	1.96%	QZRCRSRV	QUSER	128673	00000000007EF147		LIC	MASOLMFA	MasoLockMbMutexFast	LIC	
8514	1.86%	QZRCRSRV	QUSER	128673	00000000007EF147		QSYS	QSQPLEXD	QSQPLEXD	OPM	
7847	1.71%	QZRCRSRV	QUSER	128673	00000000007EF147		LIC	MASOMIRT	MasoMiRouter	LIC	
7696	1.68%	QZRCRSRV	QUSER	128673	00000000007EF147		LIC	MASOUMFA	MasoUnlockMbMutexFast	LIC	
7690	1.68%	QZRCRSRV	QUSER	128673	00000000007EF147		LIC	VOXILUD	VOXILUD	LIC	
6599	1.44%				00000000007EF2D3	LDIOM	LIC	RTCFLZ1I	Cflz1	LIC	
6365	1.39%				00000000007EF292	LDIOM	LIC	RTCFLZ1I	Cflz1	LIC	
6144	1.34%	QZRCRSRV	QUSER	128673	00000000007EF147		LIC	STRHU4K	stringHighUse4K	LIC	
3745	.81%	Q1ACPDST	QBRMS	112813	00000000000083D		LIC	HMFREHS	#hmfreh	LIC	
2962	.64%	QZRCRSRV	QUSER	128673	00000000007EF147		LIC	SMMSSUBH	SmMainStorageSubPoolHighUse	LIC	
2942	.64%	QZRCRSRV	QUSER	128673	00000000007EF147		LIC	VOXRACLR	VOXRACLR	LIC	
2678	.58%	QZRCRSRV	QUSER	128673	00000000007EF147		LIC	HMFREHS	#hmfreh	LIC	
2485	.54%				00000000007EF2B9	LDIOM	LIC	RTCFLZ1I	Cflz1	LIC	
2478	.54%				00000000007EF2AC	LDIOM	LIC	RTCFLZ1I	Cflz1	LIC	
2292	.50%	QZRCRSRV	QUSER	128673	00000000007EF147		LIC	AIUPCPGM	AiUpcallProgram	LIC	
2240	.48%	Q1ACPDST	QBRMS	112813	00000000000083D		LIC	HMALCHS	#hmalchs	LIC	
2106	.48%	QZRCRSRV	QUSER	128673	00000000007EF147		LIC	SMBDHI	SmBndDescriptorHighUse	LIC	

Hits by job/program/module

39.3.5 Hits by job/procedure

This report shows PMCO hits by job (or task)/program/module/procedure.

Idoc720/QPEXDATA/PEXABC081/Hits by job/procedure - #1									
Total hits (HITCNT)	Percent Hits (PCTHIT)	Process job name (QTSJNM)	Job user (QTSJUS)	Job number (QTSJNB)	Task name (QTSNM)	Program library (QPRPQL)	Program name (QPRPGN)	Module name (QPRMNM)	Procedure name (QPRPNM)
117197	25.63%	QZRCRSRV	QUSER	128673		LIC	CFINTLNK	cfintlnk	cfrcscv
9711	2.12%	Q1ACPDST	QBRMS	112813		LIC	CFINTLNK	cfintlnk	cfrcscv
8993	1.96%	QZRCRSRV	QUSER	128673		LIC	MASOLMFA	MasoLockMbMutexFast	masombmutexlockfast
8514	1.86%	QZRCRSRV	QUSER	128673		QSYS	QSQPLEXD	QSQPLEXD	QSQPLEXD
7847	1.71%	QZRCRSRV	QUSER	128673		LIC	MASOMIRT	MasoMiRouter	masouser_call_MASO_router
7696	1.68%	QZRCRSRV	QUSER	128673		LIC	MASOUMFA	MasoUnlockMbMutexFast	masombmutexunlockfast
6982	1.52%	QZRCRSRV	QUSER	128673		QSYS	QC2IFS	QC2IGETC	_C_IFS_fgetc
4357	.95%	QZRCRSRV	QUSER	128673		LIC	STRHU4K	stringHighUse4K	cfmemset4K
3985	.87%	QZRCRSRV	QUSER	128673		LIC	VOXILUD	VOXILUD	VOXILUD_ComputeLocalPropertiesForReachingDefinitions
3745	.81%	Q1ACPDST	QBRMS	112813		LIC	HMFREHS	#hmfreh	#hmfreh
3319	.72%				LDIOM	LIC	RTCFLZ1I	Cflz1	findMatch_17Cflz1HistoryTableCFPUCn21UIRUI
3087	.67%				LDIOM	LIC	RTCFLZ1I	Cflz1	findMatch_17Cflz1HistoryTableCFPUCn21UIRUI
2678	.58%	QZRCRSRV	QUSER	128673		LIC	HMFREHS	#hmfreh	#hmfreh
2240	.48%	Q1ACPDST	QBRMS	112813		LIC	HMALCHS	#hmalchs	#hmalchs
2197	.48%	QZRCRSRV	QUSER	128673		QSYS	QC2IFS	QC2IGETC	_C_IFS_cheap_fgetc
1977	.43%	QZRCRSRV	QUSER	128673		LIC	HMALCHS	#hmalchs	#hmalchs
1875	.41%	QZRCRSRV	QUSER	128673		LIC	HvPageTa	HvPageTable	HvPageTable
1844	.40%	QZRCRSRV	QUSER	128673		LIC	VOXGOITP	VOXGOITP	VOXGOITP_InitializetranspAndTransp

Hits by job/procedure

39.3.6 Hits by program/module

This report shows PMCO hits by program/module.

Idoc720/QPEXDATA/PEXABC081/Hits by program/module - #1						
Total hits (HITCNT)	Percent Hits (PCTHIT)	Program library (QPRPQL)	Program name (QPRPGN)	Module name (QPRMNM)	PGMMDL (PGMMDL)	Rank ID (for sorting) (RANKID)
131959	28.86%	LIC	CFINTLNK	cfintlnk	LIC	1
23752	5.19%	LIC	RTCFLZ1I	Cflz1	LIC	2
9179	2.00%	QSYS	QC2IFS	QC2IGETC	ILE	3
9178	2.00%	LIC	MASOLMFA	MasoLockMbMutexFast	LIC	4
8597	1.88%	QSYS	QSQPLEXD	QSQPLEXD	OPM	5
8022	1.75%	LIC	MASOMIRT	MasoMiRouter	LIC	6
7854	1.71%	LIC	MASOUMFA	MasoUnlockMbMutexFast	LIC	7
7707	1.68%	LIC	VOXILUD	VOXILUD	LIC	8
7076	1.54%	LIC	STRHU4K	stringHighUse4K	LIC	9
6943	1.51%	LIC	HMFREHS	#hmfreh	LIC	10
4658	1.01%	LIC	HMALCHS	#hmalchs	LIC	11
4245	.92%	LIC	SMMSSUBH	SmMainStorageSubPoolHighUse	LIC	12
4026	.88%	LIC	STRHU	stringHighUse	LIC	13
3735	.81%	LIC	QUGATEBH	QuGateCodeBlaHighUse	LIC	14
3194	.69%	LIC	SMPDHU	SmPageDescriptorHighUse	LIC	15
3131	.68%	LIC	AIUPCPGM	AiUpcallProgram	LIC	16
3026	.66%	LIC	SMVPNLCK	SmVpnLock	LIC	17
2946	.64%	LIC	VOXRACLR	VOXRACLR	LIC	18
2874	.62%	LIC	HvPageTa	HvPageTable	LIC	19
2729	.59%	LIC	RMSLSZAD	RmslSeizeAddr	LIC	20
2705	.59%	LIC	CFSCV	#cfscv	LIC	21
2611	.57%	QSYS	QC2UTIL1	QC2ALLOC	ILE	22
2559	.55%	LIC	HvModelP	HvModelPower7	LIC	23
2456	.53%	LIC	IXRAD4HT	IxRadix4HighestUse	LIC	24

Hits by program/module

39.3.7 Hits by program

This report shows PMCO hits by program.

Idoc720/QPEXDATA/PEXABC081/Hits by program - #1					
Total hits (HITCNT)	Percent Hits (PCTHIT)	Program library (QPRPQL)	Program name (QPRPGN)	PGMMDL (PGMMDL)	Rank ID (for sorting) (RANKID)
131959	28.86%	LIC	CFINTLNK	LIC	1
23752	5.19%	LIC	RTCFLZ1I	LIC	2
15499	3.39%	QSYS	QCZPXLC	ILE	3
11050	2.41%	QSYS	QC2IFS	ILE	4
9178	2.00%	LIC	MASOLMFA	LIC	5
8597	1.88%	QSYS	QSQPLEXD	OPM	6
8022	1.75%	LIC	MASOMIRT	LIC	7
7854	1.71%	LIC	MASOUMFA	LIC	8
7707	1.68%	LIC	VOXILUD	LIC	9
7076	1.54%	LIC	STRHU4K	LIC	10
6943	1.51%	LIC	HMFREHS	LIC	11
4658	1.01%	LIC	HMALCHS	LIC	12
4245	.92%	LIC	SMMSSUBH	LIC	13
4026	.88%	LIC	STRHU	LIC	14
3735	.81%	LIC	QUGATEBH	LIC	15
3194	.69%	LIC	SMPDHU	LIC	16
3131	.68%	LIC	AIUPCPGM	LIC	17
3117	.68%	QSYS	QC2UTIL1	ILE	18
3026	.66%	LIC	SMPVPI CK	LIC	19

Hits by program

39.3.8 Hits by statement

This report shows PMCO hits by procedure/statement number or PASE line number.

Idoc720/QPEXDATA/PEXABC081/Hits by statement - #1										
Total Hits (HITCNT)	Percent Hits (PCTHIT)	Instruction address (STRADR)	QBSPLN (QBSPLN)	(HEX) Statement number or PASE line number (HEXQBSPLN)	QBSPL (QBSPL)	Program library (QPRPQL)	Program name (QPRPGN)	PGMMDL (PGMMDL)	Procedure name (QPRPNM)	Rank ID (for sorting) (RANKID)
3896	.85%	FFFFFFFFF0807C8	184	00000088	2669		CFINTLNK	LIC	crfscv	1
3518	.76%	FFFFFFFFF82667D94	372	00000174	984		RTCFLZ1I	LIC	findMatch_17Cflz1HistoryTableCFPUcN21UIRUI	2
3459	.75%	FFFFFFFFF081350	3136	00000C40	464		CFINTLNK	LIC	crfscv	3
3015	.65%	FFFFFFFFF07BAA0	32	00000020	2333		MASOMIRT	LIC	masouser_call_MASO_router	4
2965	.64%	FFFFFFFFF081354	3140	00000C44	464		CFINTLNK	LIC	crfscv	5
2933	.64%	FFFFFFFFF080710	0	00000000	88592		CFINTLNK	LIC	crfscv	6
2200	.48%	FFFFFFFFF07B174	212	000000D4	464		MASOLMFA	LIC	masombmutexlockfast	7
1954	.42%	FFFFFFFFF07B400	400	00000190	686		MASOUMFA	LIC	masombmutexunlockfast	8
1605	.35%	FFFFFFFFF07BB6C	236	000000EC	35336		MASOMIRT	LIC	masouser_call_MASO_router	9
1594	.34%	FFFFFFFFF079278	696	000002B8	684		VOXILUD	LIC	VOXILUD_ComputeLocalPropertiesForReachingDefinitions	10
1567	.34%	FFFFFFFFF07B2B4	68	00000044	795		MASOUMFA	LIC	masombmutexunlockfast	11
1526	.33%	FFFFFFFFF07B0E4	68	00000044	35563		MASOLMFA	LIC	masombmutexlockfast	12
1500	.32%	000000000002130C	604	0000025C	1880		HvModelP	LIC	HvModelPower7	13
1462	.31%	FFFFFFFFFD23E0BA4	292	00000124	76		LLMODSTG	LIC	findTheModuleThatContainsThisAddressNonconst_15LIModuleStorageFRC16LISectionAddress	14

Hits by statement

39.3.9 Hits by job/task (tree)

This report shows PMCO hits by job.

Note: All system tasks are grouped together as 1 'LIC Tasks' value on this report.

In cases where multiple job users or job numbers exist, those can be expanded within the tree.

Idoc720/QPEXDATA/PEXABC081/Hits by job/task - #1							
Full name (FULLNAME_0)	Total hits (HITSCUMM)	Total CPU seconds (CPUSECS)	Initial task priority (QTSPRI)	Pool ID (QTSPL)	Existed at start: Y or N (QTSXST)	Existed at stop: Y or N (QTSXSP)	Proce name (QTS.
⊕ Total	100% - 456,751						
⊕ QZRCRSVS	69.48% - 317,357						
LIC Tasks	8.99% - 41,068	26.7932	254	2	Y	Y	
Q1ACPDST / QBRMS / 112813	6.13% - 27,998	15.7533	170	2	Y	Y	Q1A
IDRBUILD / MCCARGAR / 128708	3.46% - 15,795	8.8849	190	2	N	N	IDRB
⊕ QZDASOINIT	3% - 13,716						
⊕ ADMIN	1.15% - 5,238						
⊕ QPYJWCOL	.73% - 3,317						
QTSMTPLD / QTCP / 112898	.69% - 3,141	1.4083	190	2	Y	Y	QTSI
QSTRJWMON / MCCARGAR / 128763	.61% - 2,805	.6774	141	2	N	Y	QSTI
QTSMTPSRVD / QTCP / 112889	.50% - 2,279	1.2153	190	2	Y	Y	QTSI
⊕ QENDPEX	.49% - 2,235						
⊕ QTMSSMTPD	.46% - 2,100						
QSTRDWMON / MCCARGAR / 128766	.43% - 1,946	.4515	141	2	N	Y	QSTI
QSLPSVR / QSYS / 112888	.39% - 1,791	.8887	150	2	Y	Y	QSLI
⊕ QIDRRMVJW1	.31% - 1,425						
CRTPFRTA / QSYS / 128323	.26% - 1,197	.6674	190	2	Y	Y	CRTF
QSRVMON / QSYS / 112771	.26% - 1,184	.3535	190	2	Y	Y	QSR

Hits by job/task (tree)

39.3.10 Hits by task (tree)

This report breaks down the LIC tasks portion found on the previous report.

Idoc720/QPEXDATA/PEXABC081/Hits by task - #1						
Full name (FULLNAME_0)	Total hits (HITSCUMM)	Total CPU seconds (CPUSECS)	Initial task priority (QTSPRI)	Pool ID (QTSPL)	Existed at start: Y or N (QTSXST)	Existed at stop: Y or N (QTSXSP)
⊕ Total	100% - 41,569					
LDIOM	57.82% - 24,036	3.7744	74	2	N	N
#w#a#i#t#t#a#s#k	22.49% - 9,350	26.7932	254	1	Y	Y
RMTMSAFETASK	5.06% - 2,105	1.1580	0	1	Y	Y
DbopIndexAdvised	3.31% - 1,378	.7689	240	2	Y	Y
MLTHREAD	1.21% - 501	.1633	236	2	Y	Y
LDDOIM	.80% - 334	.0296	74	2	N	N
SMXCSPRVSR	.73% - 302	.1772	79	2	Y	Y
IOCMETHLINE 01	.64% - 268	.1496	20	2	Y	Y
AQPtask000	.53% - 221	.1224	70	2	Y	Y
SMBSCAVENGER	.51% - 210	.1216	39	2	Y	Y
SMIOSTCPGFST0001	.41% - 172	.0978	1	1	Y	Y
CTLPXM02060100-S	.39% - 163	.0928	40	1	Y	Y
LDLOIM	.33% - 137	.0213	74	2	N	N
DbSegmentMonitor	.28% - 118	.0621	240	2	Y	Y
SMIOSTCPGFST0000	.24% - 100	.0655	1	1	Y	Y

Hits by task (tree)

39.3.11 Hits by job-thread (tree)

This report is the same as the Hits by job/task report except provides an additional drill-down into threads.

Idoc720/QPEXDATA/PEXABC081/Hits by job-thread - #1					
Full name (FULLNAME_0)	Total hits (HITSCUMM)	Total CPU seconds (CPUSECS)	Initial task priority (QTSPRI)	Pool ID (QTSPL)	Existed at start: Y or N (QTSXST)
[-] Total	100% - 415,182				
[-] QZRCRSVS	76.44% - 317,357				
[-] QUSER	76.44% - 317,357				
[-] 128673	76.02% - 315,610				
[-] 000000D5	76% - 315,534	178.8376	160	2	N
[-] 000000D7	.01% - 26	.0147	160	2	N
[-] 000000D6	.01% - 26	.0136	160	2	N
[-] 000000D8	.01% - 24	.0133	160	2	N
[-] 128676	.08% - 350				
[-] 128674	.07% - 275				
[-] 128744	.05% - 222				
[-] 128675	.05% - 196				
[-] 128725	.04% - 176				
[-] 128673	.04% - 176				

Hits by job-thread (tree)

39.3.12 Hits by job/program (tree)

This report groups the data by job and also includes a 2-character generic program name level to add with summarizing the results against similarly named programs.

Idoc720/QPEXDATA/PEXABC081/Hits by job-thread - #1					
Idoc720/QPEXDATA/PEXABC081/Hits by job/program - #1					
Full name (FULLNAME_0)	Total hits (HITSCUMM)	Total CPU seconds (CPUSECS)	Initial task priority (QTSPRI)	Pool ID (QTSPL)	Exist Y or N
[-] Total	100% - 415,182				
[-] QZRCRSVS	76.44% - 317,357				
[-] QUSER	76.44% - 317,357				
[-] 128673	76.02% - 315,610				
[-] CF*	30.07% - 124,858				
[-] VO*	11.85% - 49,189				
[-] QC*	7.53% - 31,278				
[-] MA*	6.02% - 25,003				
[-] QS*	3.64% - 15,106				
[-] SM*	3.56% - 14,766				
[-] ST*	1.95% - 8,113				
[-] AI*	1.61% - 6,704				
[-] HV*	1.60% - 6,662				
[-] HM*	1.51% - 6,268				
[-] QU*	.89% - 3,712				

Hits by job/program showing generic 2 character program names.

Idoc720/QPEXDATA/PEXABC081/Hits by job-thread - #1							
Idoc720/QPEXDATA/PEXABC081/Hits by job/program - #1							
Full name (FULLNAME_0)	Total hits (HITSCUMM)	Total CPU seconds (CPUSECS)	Initial task priority (QTSPRI)	Pool ID (QTSPL)	Existed at start: Y or N (QTSXST)	Existed at stop: Y or N (QTSXSP)	P
▣ Total	100% - 415,182						
▣ QZRCRSRVS	76.44% - 317,357						
▣ QUSER	76.44% - 317,357						
▣ 128673	76.02% - 315,610						
▣ CF*	30.07% - 124,858						
▣ CFINTLNK	28.29% - 117,454	178.8376	160	2	N	N	
▣ CFSCV	.43% - 1,788	178.8376	160	2	N	N	
▣ CFSCV0E	.33% - 1,381	178.8376	160	2	N	N	
▣ CFGRBLA	.18% - 765	178.8376	160	2	N	N	
▣ CFSCVOV	.13% - 527	178.8376	160	2	N	N	
▣ CFSCV0F	.12% - 490	178.8376	160	2	N	N	
▣ CFSCV0A	.08% - 324	178.8376	160	2	N	N	
▣ CFGRPBL	.07% - 282	178.8376	160	2	N	N	
▣ CFMIR	.06% - 254	178.8376	160	2	N	N	
▣ CFSCV06	.05% - 201	178.8376	160	2	N	N	
▣ CFSCV22	.05% - 196	178.8376	160	2	N	N	
▣ CFSCV1E	.04% - 172	178.8376	160	2	N	N	

Hits by job/program (tree) fully expanded

39.3.13 Hits by task/program (tree)

This report is the same as the previous one except shows data for system tasks instead.

39.3.14 Hits by job-thread/procedure (tree)

This report shows PMCO hits by job-thread, program/module/procedure.

Note: If PMCO events were captured against the whole system or many different jobs/threads it is likely that this will perform too poorly to be usable and the non-tree table version should be used instead.

Idoc730/MCCARGAR2/CPUTEST/Hits by job-thread/procedure - #1							
Full name (FULLNAME_0)	Total hits (HITSCUMM)	Total CPU seconds (CPUSECS)	Initial task priority (QTSPRI)	Pool ID (QTSPL)	Existed at start: Y or N (QTSXST)	Existed at stop: Y or N (QTSXSP)	P
▣ Total	100% - 108						
▣ QZDASOINIT	51.85% - 56						
▣ QUSER	51.85% - 56						
▣ 328234	51.85% - 56						
▣ 00000182	51.85% - 56						
▣ CF*	18.52% - 20						
▣ CFINTLNK.cfrfscv	18.52% - 20	.4312	160	2	Y	Y	
▣ QQ*	17.59% - 19						
▣ RM*	15.74% - 17						
▣ Q1ACPDST	48.15% - 52						

Hits by job-thread/procedure

39.3.15 Hits by task/procedure (tree)

This report shows PMCO hits by system task, LIC module/procedure.

Idoc720/QPEXDATA/PEXABC081/Hits by task/procedure - #1						
Full name (FULLNAME_0)	Total hits (HITSCUMM)	Total CPU seconds (CPUSECS)	Initial task priority (QTSPRI)	Pool ID (QTSPL)	Existed at start: Y or N (QTSXST)	Exi: Y o N
⊕ Total	100% - 41,569					
⊕ #w#a#i#t#T#a#s#k	5.80% - 2,412					
⊖ RMTMSAFETASK	5.06% - 2,105					
⊖ QU*	2.38% - 989					
QUTREEB.matchNextBinary_6QuTreeFP13...	.48% - 199	1.1580	0	1 Y	Y	
QUTREEQB.vDequeue_15QuTreeQueueC...	.17% - 72	1.1580	0	1 Y	Y	
QUGATEBH.lockExclusiveSys_10QuGateC...	.15% - 61	1.1580	0	1 Y	Y	
QUGATEB.unlockExclusiveSys_10QuGateC...	.13% - 56	1.1580	0	1 Y	Y	
QULLISTB.pMatchKeyed_13QuBaseMess...	.11% - 44	1.1580	0	1 Y	Y	
QUGATEBH.lockExclusive_10QuGateCode...	.10% - 43	1.1580	0	1 Y	Y	
QUTREEQB.vFindFirst_15QuTreeQueueCo...	.10% - 41	1.1580	0	1 Y	Y	
QUGATEBH.lockExclusive_10QuGateCode...	.07% - 31	1.1580	0	1 Y	Y	
QUGATE.qbasegate_unlocks	.07% - 31	1.1580	0	1 Y	Y	
QUWTOBJ.longWaitInterrupt_20QuBaseL...	.07% - 29	1.1580	0	1 Y	Y	
QUGATE.qbasegate_locks	.07% - 29	1.1580	0	1 Y	Y	
QUTREEQC.pUnlock_15QuTreeQueueCo...	.06% - 26	1.1580	0	1 Y	Y	
QUDISPR.qutde_block_trace	.06% - 26	1.1580	0	1 Y	Y	
QUSTBLOH.block_23QuSingleTaskBlocker...	.06% - 25	1.1580	0	1 Y	Y	

Hits by task/procedure (tree)

39.3.16 Hits by job-thread/component/procedure (tree)

This report is the same as the Hits by job-thread/procedure report except contains an additional level to break the data down by OS component.

Tip: You can find the component descriptions and filters that define them applicable to QAYPEPROCI in library QIDRPA table COMPONENTS.

Note: If too many PMCO events were captured against the whole system or many different jobs/threads it is likely that this will perform too poorly to be usable.

Idoc730/MCCARGAR2/CPUTEST/Hits by job-thread/component/procedure - #1				
Full name (FULLNAME_0)	Total hits (HITSCUMM)	Total CPU seconds (CPUSECS)	Initial task priority (QTSPRI)	Pool I (QTSP)
[-] Total	100% - 108			
[-] QZDASOINIT	51.85% - 56			
[-] QUSER	51.85% - 56			
[-] 328234	51.85% - 56			
[-] 00000182	51.85% - 56			
[-] SLIC Common Functions	18.52% - 20			
[-] CFINTLNK.cfrfscv	18.52% - 20	.4312	160	
[-] XPF DB2/400 Query Optimizer	17.59% - 19			
[-] SLIC Seize/Release	15.74% - 17			
[-] Q1ACPDST	48.15% - 52			

Hits by job-thread/component/procedure (tree)

39.3.17 Hits by task/component/procedure (tree)

This report is the same as the Hits by task/procedure report except contains an additional level to break the data down by OS component.

Idoc720/QPEXDATA/PEXABC081/Hits by task/procedure - #1							
Idoc720/QPEXDATA/PEXABC081/Hits by task/component/procedure - #1							
Full name (FULLNAME_0)	Total hits (HITSCUMM)	Total CPU seconds (CPUSECS)	Initial task priority (QTSPRI)	Pool ID (QTSP)	Existed at start: Y or N (QTSXST)	Existed at stop: Y or N (QTSXSP)	Task (QTS)
[-] Total	100% - 41,569						
[-] w#a#i#t#T#a#s#k	5.55% - 2,306						
[-] RMTMSAFETASK	5.06% - 2,105						
[-] SLIC Queuing	2.38% - 989						
[-] SLIC Hypervisor	.72% - 300						
[-] SLIC Task Dispatcher	.59% - 245						
[-] SLIC Resource Management: Timer Man...	.47% - 195						
[-] SLIC Process Management	.29% - 119						
[-] SLIC Heap	.23% - 94						
[-] SLIC Resource Management: Process M...	.19% - 78						
[-] SLIC Glue Code	.07% - 31						
[-] SLIC Seize/Release	.04% - 16						
[-] SLIC IO Fast Attach	.03% - 14						
[-] SLIC Common Functions	.03% - 14						
[-] SLIC Resource Management	.02% - 9						

Hits by task/component/procedure (tree)

39.3.18 Hits by program model (tree)

This report shows PMCO hits by program model, generic program name and program.

Idoc720/QPEXDATA/PEXABC081/Hits by task/procedure - #1		Idoc720/QPEXDATA/PEXABC081/Hits by task/component/procedure		
Full name (FULLNAME_0)	Total hits (HITSCUMM)	Program library (QPRPQL)	Program name (QPRPGN)	Module name (QPRMNM)
[-] Total	100% - 456,692			
[-] LIC	84.58% - 386,291			
[-] CF*	31.78% - 145,148			
[-] CFINTLNK.cfrfscv	28.66% - 130,870			cfintlnk
[-] CFSCV.scv0	.59% - 2,705			#cfscv
[-] CFSCV0E.syscall_E_portal	.43% - 1,970			cfscv0e
[-] CFSCVOV.cfscvov	.24% - 1,100			#cfscvov
[-] CFINTLNK.crfi_dar_dsisr	.24% - 1,087			cfintlnk
[-] CFSCV0F.syscall_F_portal	.23% - 1,030			cfscv0f
[-] CFSCV0A.syscall_A_portal	.18% - 828			cfscv0a
[-] CFGRBLA.bla_Gennaker	.15% - 706			#cfgrbla
[-] CFMIR.#cfmir	.15% - 683			#cfmir
[-] CFOCHKR.#cfochkr	.11% - 507			#cfochkr
[-] CFGRPBL.bzeroeao_Gennaker	.08% - 356			#cfgrpbl
[-] CFSCV03.svsall 3 portal	.07% - 310			cfscv03

Hits by program model (tree)

39.3.19 Hits by component (tree)

This report shows PMCO hits by OS component.

Idoc720/QPEXDATA/PEXABC081/Hits by component - #1			
Full name (FULLNAME_0)	Total hits (HITSUMM)	Program model (PGMMODEL)	Program name (QPRP)
± Total	100% - 456,692		
± SLIC Common Functions	31.48% - 143,750		
± SLIC Translator (Program Model)	11.34% - 51,788		
± SLIC Other	9.15% - 41,810		
± SLIC Mutex	5.65% - 25,803		
± SLIC Storage Management	5.54% - 25,300		
± MI Other	4.08% - 18,651		
± XPF C Runtime I/O	3.50% - 15,986		
± XPF SQL	3.34% - 15,263		
± SLIC Hypervisor	3.18% - 14,512		
± SLIC String Functions	2.45% - 11,176		
± SLIC Database	2.38% - 10,881		
± SLIC Activation/Invocation	2.16% - 9,879		
± SLIC Queuing	2.10% - 9,589		
± SLIC Index	1.48% - 6,773		
± SLIC Glue Code	1.44% - 6,575		
± SLIC Seize/Release	1.27% - 5,785		
± SLIC Task Dispatcher	.77% - 3,504		
± XPF DB2/400 Query Optimizer	.70% - 3,199		
± SLIC IO Fast Attach	.57% - 2,615		
± XPF Performance Explorer	.54% - 2,472		
± XPF WS Printers	.43% - 1,945		
± SLIC Queue Space	.40% - 1,820		
± SLIC Heap	.39% - 1,797		
± SLIC Authority Management	.39% - 1,769		
± SLIC Exception Management	.38% - 1,716		
± XPF Database Other	.34% - 1,573		
± XPF Posix	.34% - 1,546		
± XPF Command Analyzer	.31% - 1,418		
± SLIC POSIX	.26% - 1,189		

Hits by component (tree)

39.3.20 Hits by MI program library

This report shows PMCO hits by MI program library/program.

Idoc720/QPEXDATA/PEXABC081/Hits by MI program library - #1			
Full name (FULLNAME_0)	Total hits (HITSCUMM)	Component description (COMPONENT)	Program model (MODEL)
Total	100% - 69,550		
QSYS	81.68% - 56,808		
QBRM	1.58% - 1,096		
QHTTPSVR	.81% - 563		
QICSS	.54% - 377		
QIDRGUI	.15% - 102		
QTCP	.13% - 93		
QRPGL	.02% - 15		
JIJC	.01% - 10		
QIDRWCH	.01% - 5		
QSQL	.00% - 3		
IDOCJW720	.00% - 3		
QIJS	.00% - 2		
QSYS2	.00% - 1		

Hits by MI program library

39.3.21 Hits by system data address register/procedure

This report shows PMCO hits by system data address register and procedure.

Note: With build 1623+ this report is no longer a tree table for performance reasons. Avoid using this report at older builds since it will likely hang your session.

Idoc730/MCCARGAR2/TPROFI/Hits by system data address register/procedure - #1					
Total hits (HITSCUMM)	QBSDAR (QBSDAR)	PGMINFO (PGMINFO)	Program library (QPRPQL)	Program name (QPRPGN)	Procedure name (QPRPNM)
257	000000030C3A98	/java/util/zip/ZipFile.getZipEntry(Ljava/lang/String;)Ljava/util/zip/ZipEntry;	LIC		java/util/zip/ZipFile.getZipEntry(Ljava/lang
101	09001000A0263220	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
71	09001000A02654C8	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
70	0000000193FF87E0	libpthreads.a(shr_xpg5_64.o)/global_unlock_ppc_mp	LIC	libpthreads.a(shr_xpg5_64.o)	global_unlock_ppc_mp
66	00000001950C3D80	libpthreads.a(shr_xpg5_64.o)/global_unlock_ppc_mp	LIC	libpthreads.a(shr_xpg5_64.o)	global_unlock_ppc_mp
51	00000001B011F540	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
50	09001000A02632C0	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
50	0000000416DC2E04	/org/eclipse/osgi/storage/bundlefile/ZipBundleFile.getEntry(Ljava/lang/String;)Lorg/eclipse/osgi/storage/bundlefile/ZipB	LIC	org/eclipse/osgi/storage/bundlefile/ZipB	
49	09001000A0264720	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
47	0000000193FF87E0	libpthreads.a(shr_xpg5_64.o)/global_lock_ppc_mp_eh	LIC	libpthreads.a(shr_xpg5_64.o)	global_lock_ppc_mp_eh
44	09001000A02650E0	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
42	09001000A0262840	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
41	00000001B011D24C	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
36	000000019772C398	libpthreads.a(shr_xpg5_64.o)/global_unlock_ppc_mp	LIC	libpthreads.a(shr_xpg5_64.o)	global_unlock_ppc_mp
36	09001000A02628A0	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
34	000000030C3A98	/org/eclipse/osgi/storage/bundlefile/ZipBundleFile.getEntry(Ljava/lang/String;)Lorg/eclipse/osgi/storage/bundlefile/ZipB	LIC	org/eclipse/osgi/storage/bundlefile/ZipB	
34	09001000A02665E0	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
33	000000018008A218	libpthreads.a(shr_xpg5_64.o)/global_unlock_ppc_mp	LIC	libpthreads.a(shr_xpg5_64.o)	global_unlock_ppc_mp
32	09001000A02629F8	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
32	0000000193FF87E0	libpthreads.a(shr_xpg5_64.o)/_mutex_lock	LIC	libpthreads.a(shr_xpg5_64.o)	_mutex_lock
30	09001000A02639A0	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
29	00000001B011FEC0	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
28	09001000A0262E90	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
28	00000001B011F538	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
28	800010000A25F8B0	HvVirtualProcDispRtns	Q123456789	HvVirtual	HvVirtualProcDispRtns
28	09001000A0263520	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop
26	09001000A0262DD8	libj9vm27.so/bytecodeLoop	LIC	libj9vm27.so	bytecodeLoop

Hits by system data address register/procedure

39.3.22 Hits by generic task name

This report shows PMCO hits by generic task name.

Idoc730/MCCARGAR2/TPROF1/Hits by generic task name - #1		
Full name (FULLNAME_0)	Total hits (HITSCUMM)	Gen nar (GE
+ Total	100% - 645	
#W*	77.83% - 502	#W
RM*	8.53% - 55	RM
VI*	4.65% - 30	VI*
PO*	4.50% - 29	PO
SM*	4.19% - 27	SM
XM*	.16% - 1	XM
SK*	.16% - 1	SK

Hits by generic task name

40 Trace details

This analysis examines the events in any trace-based collection and produces a file that merges data across many PEX files into 1 row. This analysis was previously known as SMTRMOD in older versions of PEX Analyzer.

40.1 Running the analysis

When running the analysis, no prompt appears with build 1623+ since no parameters apply. In older builds, the PEX Analysis Time Filtering window appears but has no effect.

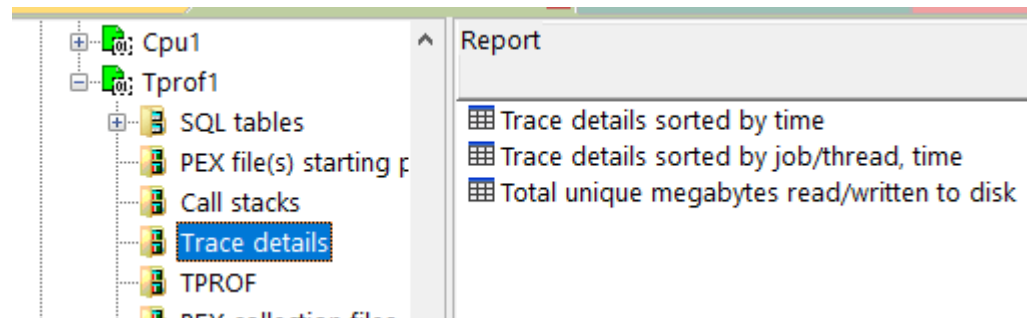
40.2 SQL Tables

The list of SQL tables generated by the analysis is shown below:

SQL table	Description
PEXSMTRMOD_<MBR>	Main event details
PEXSMTRSIDS_<MBR>	QRECN to SID address mapping
PEXSMTRPGMS_<MBR>	QRECN to instruction address/suspend point address mapping
PEXSMTROBJ_<MBR>	QRECN to segment/object information mapping

40.3 Trace details

This folder contains the reports available after the analysis has completed.



Trace details

An example follows:

Mac78/MCCARGA2/TR007/trace details sorted by time - #2																						
(Minimum) GREEN (GREEN)	Resource event type (CITY)	Resource event subtype (CITYST)	EVENTTYPE (EVENTTYPE)	Taskcount / TDE (TDE)	SID address (SIDADDR)	Full address (FULLADDR)	NAMEONLY (NAMEONLY)	Object type (OBJTYPE)	Segment type (SEGTYPE)	Object name (objtype/segtype) (NAMATYPE)	SID type (SIDTYPE)	Operation (OPR)	IO length (BYTES) (BYTELEN)	Disk unit (UNIT)	UC module RU name (UCMOD)	UC module and offset (UCMODOFF)	MIMMOD (MIMMOD)	Mi module and offset (MIMMODOFF)	POOL (POOL)	ASP (ASP)		
1	3	8	P	001E0668	0000000000000000	000000000000000000	PREASSIGNED TEMP SID	0000	FFFF	PREASSIGNED TEMP SID	0000	DT	PMCO	0	000	PDCVNTD	PDCVNTD 000A44			00	00	
13205	3	8	P	00000107	0000000000000000	000000000000000000		0000	0000		0000	T	PMCO	0	000	RMPRLRPT	RMPRLRPT 000558			00	00	
3	3	8	P	001E05AA	0000000000000000	000000000000000000	QCANPARS	0201	0022	QCANPARS	0201	P	PMCO	0	000			QCANPARS	QCANPARS 00318C	00	00	
15206	3	8	P	00000101	0000000000000000	000000000000000000	PREASSIGNED TEMP SID	0000	0000	PREASSIGNED TEMP SID	0000	T	PMCO	0	000	SMWSSUBP	SMWSSUBP 00165C			00	00	
15206	3	8	P	001E05AA	0000000000000000	000000000000000000		0000	0000		0000	P	PMCO	0	000	Inducard	Inducard 00026C			00	00	
15207	3	8	P	001E05CC	0000000000000000	000000000000000000		0000	0000		0000	P	PMCO	0	000	Inducard	Inducard 00026C			00	00	
4	3	8	P	001E05CC	0000000000000000	000000000000000000	QCAPLIST	19FC	0001	QCAPLIST	19FC	T	PMCO	0	000			QCANPARS	QCANPARS 003190	00	00	
5	3	8	P	001E05CC	0000000000000000	000000000000000000	SEIZE LOCK RANGE	0000	2081	SEIZE LOCK RANGE	0000	T	PMCO	0	000	RMISLSZAD	RMISLSZAD 000210			00	00	
6	3	8	P	001E05CC	0000000000000000	000000000000000000	L/L RANGE 1	0000	0000	L/L RANGE 1	0000	P	PMCO	0	000	DECRAPGN	DECRAPGN 000610			00	00	
7	3	8	P	001E05CC	0000000000000000	000000000000000000	L/L RANGE 1	0000	0000	L/L RANGE 1	0000	P	PMCO	0	000	SMAS0124	SMAS0124 000774			00	00	
8	3	8	P	001E05CC	0000000000000000	000000000000000000	L/L RANGE 1	0000	0000	L/L RANGE 1	0000	P	PMCO	0	000	IOODPERF	IOODPERF 0026FC			00	00	
24501	3	8	P	000002D0	0000000000000000	000000000000000000	IWA	0000	0087	IWA	0000	T	PMCO	0	000	DOFNDIN	DOFNDIN 0005F8			00	00	
9	3	8	P	001E05CC	0000000000000000	000000000000000000	PREASSIGNED TEMP SID	0000	FFFF	PREASSIGNED TEMP SID	0000	DT	PMCO	0	000	PDCVNTD	PDCVNTD 000A4C			00	00	
10	3	8	P	001E05CC	0000000000000000	000000000000000000	SEIZE LOCK RANGE	0000	2081	SEIZE LOCK RANGE	0000	T	PMCO	0	000	RMISLSZAD	RMISLSZAD 0018C4			00	00	
11	3	8	P	001E05CC	0000000000000000	000000000000000000	QHLPSYS	0401	0001	QHLPSYS	0401	P	PMCO	0	000	LLGLUE	LLGLUE 0004D4			00	00	
12	3	8	P	001E05CC	0000000000000000	000000000000000000	ACTVTN PROC REF TBL	0000	20D7	ACTVTN PROC REF TBL	0000	T	PMCO	0	000	QSVCLANUP	QSVCLANUP 0005D0	QSVCLANUP	QSVCLANUP 0005D0	00	00	
13	3	8	P	001E05CC	0000000000000000	000000000000000000	QZDASOINTQUSER	042839	1A8F	QZDASOINTQUSER	042839	1A8F	T	PMCO	0	000	QSQRLX	QSQRLX 02621C	QSQRLX	QSQRLX 02621C	00	00
14	3	8	P	001E05CC	0000000000000000	000000000000000000		0000	0000		0000	T	PMCO	0	000	SMWSSUBH	SMWSSUBH 001880			00	00	

Trace details sorted by time