



™

Collection Services & Performance Data Investigator - new metrics and other enhancements in 7.2

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Agenda

- New Collection Services Metrics
- Batch Model
- System Monitoring
- New PDI Perspectives
- Enhanced Left Hand Navigation

New Collection Services Metrics Overview

Collection Services Enhancements	Changed Files
<p>Lug Requirements</p> <ul style="list-style-type: none"> - Number of spool files created by a job - Number of jobs submitted or spawned by a job - Activation group metrics per thread: Groups created and PGM / SRVPGM activations created - Temporary storage metrics per job: allocated, deallocated, max allowed, peak, current - Temporary storage metrics for the system: OS, active jobs, ended jobs - Memory usage 	<p>QAPMJOBOS QAPMJOBOS QAPMJOBMI QAPMJOBMI QAPMSYSTEM QAPMPOOLB</p>
<p>Raid 10 support – new field to indicate level of mirrored protection. SSDs – New DSCAT value to identify unit is an SSD. Log Sense commands – new fields for counts and response times</p>	<p>QAPMDISK</p>
<p>SQL Metrics</p> <ul style="list-style-type: none"> - Job level activity metrics plus connection data for server jobs - System level SQL CPU time. - WRKSYSACT replaced DB CPU with SQL CPU - SQL plan cache collection category (*SQL) and file (QAPMSQLPC) 	<p>QAPMJOBOS QAPMSYSTEM QAITMON QAPMSQLPC (new)</p>
<p>System Monitor Support New function and data provided by Collection Services to facilitate both monitoring and data visualization via the IBM Navigator for i.</p>	
<p>Batch Model Analyze batch workloads and model changes in workload or resources</p>	

Temporary Storage Accounting

- IBM i 7.2 now tracks temporary storage usage in a new way that will accurately account for temporary storage for each job as well as accurately account for system functions that use temporary objects not scoped to a job.
- Existing support for ***temporary storage tracking*** should not be confused with the new support for ***temporary storage accounting***.
- **Temporary storage tracking**
 - Controlled by a bit in the object creation template
 - Turning this bit on means the temporary storage will not be “tracked” to the process (meaning that the object is not automatically destroyed when the process ends)
- **Temporary storage accounting**
 - Controlled by a new unsigned 2-byte integer temporary storage accounting selector field in the object creation template
 - For most temporary objects, the new field will not be set and have a value of zero
 - A zero value indicates that the temporary storage will be charged to the creating process
 - For temporary objects that are used beyond the scope of the creating process, the new field should be set to a non-zero value
 - A non-zero value identifies the global temporary storage accounting bucket to use to track the storage for the temporary object

Temporary Storage Accounting

Existing fields in QAPMJOBMI

JBPGA: Total number of 4096-byte units of temporary and permanent storage that have been allocated by the thread since the thread started.

JBPGD: Total number of 4096-byte units of temporary and permanent storage that have been deallocated by the thread since the thread started.

New fields in QAPMJOBMI

JBCURTMP: Current temporary storage. A snapshot of the total temporary storage charged to this job, expressed in 4096-byte units.

JBPEAKTMP: Peak temporary storage. The largest value that the total temporary storage charged to this job has ever been at any point within this job, expressed in 4096-byte units.

JBMAXTMP: Maximum temporary storage allowed. The largest value that peak temporary storage can be without notifying the operating system, expressed in 4096-byte units. This field will be zero if the job is allowed to use an unlimited amount of temporary storage.

JBTMPPGA: Total number of 4096-byte units of temporary storage that have been allocated by the thread since the thread started.

JBTMPPGD: Total number of 4096-byte units of temporary storage that have been deallocated by the thread since the thread started.

Temporary Storage Accounting

New fields in QAPMSYSTEM

SYOSTMP: Current temporary storage allocated for non database operations by IBM i. A snapshot of the total temporary storage currently allocated for non database operations across the system, expressed in 4096-byte units.

SYDBTMP: Current temporary storage allocated for database operations by IBM i. A snapshot of the total temporary storage currently allocated for database operations across the system, expressed in 4096-byte units.

SYAJOBTMP: Current temporary storage charged to active jobs. A snapshot of the total temporary storage currently charged to active jobs, expressed in 4096-byte units.

SYEJOBTMP: Current temporary storage charged to ended jobs. A snapshot of the total temporary storage currently charged to ended jobs, expressed in 4096-byte units.

SYUSERTMP: Current user temporary storage. A snapshot of the total user temporary storage currently allocated, expressed in 4096-byte units. Only the user temporary storage not charged to any job is accounted for here.

Memory Usage

- **Thread level (QAPMJOBMI):**
 - Pages marked easy to steal
- **Storage pool level metrics (QAPMPOOLB):**
 - Page activity (4K & 64K pages)
 - Pages aged
 - Pages stolen
 - Unused pages allocated
 - Page outs
 - Pageable pages
 - Synchronous I/O operations
 - Asynchronous I/O operations
 - 64K pages created
 - 64K pages broken up
 - Affinity metrics – where pages are being allocated
 - Page allocation attempts
 - Page affinity preference success
 - Page affinity preference misses in group
 - Page affinity preference misses off group

Job SQL Metrics (QAPMJOBOS)

▪ Job level activity metrics

- Number of SQL statements
- Number of SQL related database writes (logical)
- Number of SQL related database reads (logical)
- Number of SQL related database miscellaneous operations (logical)
- Number of SQL PAS compressions across all threads in this job
- Number of *SQLPKG compressions which were initiated by SQL activity in this job

▪ Connection metrics for SQL servers

(Optional information that a server may or may not provide. These fields will contain blank characters if the job isn't a server, the server does not support this information, or the server is waiting for a connection to be established. One server that does provide this information is the QSQSRVR SQL server mode server)

- Connected job name
- Connected job user
- Connected job number
- Connected thread identifier

SQL Plan Cache

- New collection category ***SQL**
- New file **QAPMSQLPC**

SQCURQRY	Total number of queries currently active
SQCURPLN	Total number of plans currently in the SQL plan cache
SQPCSIZE	The current size (in megabytes) of the SQL plan cache
SQPCLIMIT	The maximum size (in megabytes) that the SQL plan cache is allowed to be
SQPCTHRESH	The maximum size (shown as a percentage of the plan cache size limit) that the SQL plan cache is allowed to be before DB2 automatically manages the SQL plan cache and replaces older plans with new plans
SQCURSUBC	Total number of sub caches
SQCURMTI	Total number of Maintained Temporary Indexes (MTIs)
SQCURPRUNL	Total number of pruning event listeners
SQCURROQ	Total number of cached runtime objects (for queries) in the SQL plan cache

SQL Plan Cache

SQCURTROQ	Total number of cached runtime objects (for queries) in the SQL plan cache which may have retained part or all of the query answer set in a temporary copy
SQCURRROQ	Total number of reusable runtime objects (for queries) in the SQL plan cache
SQCURTEMP	Total amount of temporary storage (in megabytes) associated with the SQL plan cache
SQPLNBLT	Number of plans built during the interval
SQQRYYRROQ	Number of queries executed during the interval using runtime objects (for queries) where the runtime objects were candidates for being cached in the SQL plan cache for reuse by the same or other jobs
SQQRYYNRROQ	Number of queries executed during the interval using runtime objects (for queries) where the runtime objects cannot be cached in the SQL plan cache
SQQRYYNOROQ	Number of queries executed during the interval where a plan in the SQL plan cache was used but there were no cached runtime objects (for queries) available for use
SQPROBES	Number of times the plan cache was probed during the interval

SQL Plan Cache

SQMATCH	Number of times a plan cache probe found a match during the interval
SQNOMATCH	Number of times a plan cache probe was unable to find a match during the interval
SQPCWAKE	Number of times the plan cache woke up during the interval
SQPCNAP	Number of times the plan cache fell asleep during the interval
SQPLNPRUN	Number of plans pruned from the SQL plan cache during the interval due to plan cache size
SQPLNRMV	Number of obsolete plans removed from the SQL plan cache during the interval
SQOPEN	Number of full and pseudo opens that occurred during the interval
SQFOPEN	Number of full opens that occurred during the interval
SQFOPENROQ	Number of full opens that occurred during the interval which used both a plan and a cached runtime object from the SQL plan cache

SQL Plan Cache

SQPOPNHCLS	Number of queries that were hard closed during the interval
SQMTICRT	Number of Maintained Temporary Indexes (MTIs) created during the interval
SQMTIDLT	Number of Maintained Temporary Indexes (MTIs) deleted during the interval
SQAQPWAKE	Number of executing queries checked by Adaptive Query Processing (AQP) during the interval
SQAQPRPL	Number of runtime objects replaced because of Adaptive Query Processing (AQP)
SQFULLOPT	Number of full optimizations that occurred during the interval
SQREOPT	Number of reoptimizations that occurred during the interval when valid plans existed

Batch Model

- A tool based on Collection Services performance data that predicts batch workload run times, resources used, and duration of the “batch window”.
- Batch performance is important for many customers
- "What can I do to my system in order to meet my overnight batch run-time requirements? (also known as the Batch Window) "
- **What does it do?**
 - Helps you optimize workloads by locating times during the batch window when more efficient job scheduling can improve total system throughput
 - Models workload increases
 - Predicts the changes in throughput that will result from hardware upgrades (processor or disk)
 - Predicts run times for individual workloads and the overall batch window
 - Models batch workloads that are CPU or disk intensive
- **How does it work?**
 - Links individual workloads together to create an ordered series of workloads
 - Powered by an iterative analytic model that attempts to converge on a solution
 - Predicts utilization, throughput and response time for each workload

Batch Model

New function under Performance task in IBM Navigator for i

The screenshot shows the IBM Navigator for i interface. On the left, the 'Performance' task is expanded, and the 'Batch Model' sub-task is highlighted with a red box. An arrow points from this sub-task to the 'Batch Models' window on the right. The 'Batch Models' window displays a table of batch models with columns for Name, Library, Type, and Status.

Name	Library	Type	Status
No filter applied			
B1	BCHMDLTEST	Batch Model File Based Collection	Complete
DEMOCOL	BMDEMO	Batch Model File Based Collection	Complete
Q345184133	BMDEMO	Batch Model File Based Collection	Complete
Q224063714	BMPCPU06	Batch Model File Based Collection	Model Changed
Q227224000	BMPCPU062		
Q224210624	BMPCPU1		
Q224210625	BMPCPU1		
Q224210626	BMPCPU1		
Q224210627	BMPCPU1		
Q231102103	BMPCPU1D		
Q228195734	BMPCPU1V1		
Q226101358	BMPCPU1V2		
Q233211552	BMPCPU11		
Q232232930	BMPCPU115V2		

- Analyze Batch Model
- Calibrate Batch Model
- Change Batch Model Calibration
- Change Batch Model
- Create Batch Model
- Merge Batch Model
- Reset Batch Model

Batch Model

Create Batch Model

Create a new Batch Model from an existing Collection Services File Based Collection

The screenshot displays the 'Manage Collections' window with a table of collections. A context menu is open over the selected item 'BCHDEMOTA', and the 'Create Batch Model' option is highlighted. The 'Create Batch Model' dialog box is open, showing the following configuration:

- Collection:**
 - Collection name: BCHDEMOTA
 - Library: Use entry from below (BCHDEMO)
- Options:**
 - Batch model: BCHDEMOTA
 - Library: From Library
 - Show IBM jobs: No
 - Link jobs: Yes
 - Batch job filter (milliseconds): 5000
- Period Options:**
 - Customize (selected)
 - From: 4/5/2011 1:15:00 PM
 - To: 4/5/2011 5:30:00 PM

Batch Model

Change Batch Model Calibration

Calibration is needed when the model was unable to accurately model the measured data

- Change storage configuration
- Change workload characteristics
- Move workloads

The screenshot displays the 'Batch Models' interface. At the top, there are tabs for 'Welcome' and 'Batch Models'. Below the tabs is a toolbar with icons for refresh, save, and actions. The main area is a table with columns: Name, Library, Type, and Status. The table shows 1 of 58 items. The selected item is 'BCHDEMODTA' with a status of 'Complete'. A context menu is open over the item, listing actions: Change Model, Change Calibration, Merge, Copy, Delete, Save, Investigate Results, and Properties. A red box highlights the 'Complete' status in the table. A callout box with an arrow points to this status, containing the text 'Must be in Complete Status'.

Name	Library	Type	Status
BCHDEMODTA		Batch Model File Based Collection	Complete

Batch Model

Change Batch Model Calibration

- Change Storage Configuration for:
 - Unknown Disk Attachment Families
 - Incorrectly categorized disk types (wrong family name, type, speed, or generation)

Change Batch Model Calibration - SBSMITH3/FIVMINFILT

Storage

Workloads

Original Storage Configuration

--- Select Action ---

Select	Disk Attachment Family Name	Storage Type	Disk Speed (RPM) or Generation	Disk Type	Disk Model	Number of Disks
<input type="checkbox"/>	UNKNOWN MEASURED CCIN 577D	HDD	15000	2107	0A86	282
<input type="checkbox"/>	UNKNOWN MEASURED CCIN 577D	HDD	15000	2107	0A84	384
<input type="checkbox"/>	UNKNOWN MEASURED CCIN 577D	HDD	15000	2107	0A04	6

Batch Model

Change Batch Model Calibration

- Change or Move Workloads

Change Batch Model Calibration - BCHDEMO/BCHDEMOTA

Storage

Workloads

--- Select Action ---

Select	Job Name	Job User	Job Number	Thread ID	Job Type	Job Priority	Growth Rate	Start Time	End Time
<input type="checkbox"/>	▼ ACME000004	0000002	006810	00000005	Batch	25	0%	4/5/11 1:22:38 PM	4/5/11 5:16:25 PM
<input type="checkbox"/>	ACME00010	0000002	006817	00000002	Batch	52	0%	4/5/11 2:00:23 PM	4/5/11 2:11:36 PM
<input type="checkbox"/>	ACME000028	USR0000002	006819	00000003	Batch	52	0%	4/5/11 2:11:49 PM	4/5/11 2:14:29 PM
<input type="checkbox"/>	▼ ACME000005	USR0000002	006824	00000004	Batch	52	0%	4/5/11 2:14:19 PM	4/5/11 2:16:05 PM
<input type="checkbox"/>	ACME000075	USR0000002	006831	00000006	Batch	50	0%	4/5/11 2:16:05 PM	4/5/11 2:16:12 PM
<input type="checkbox"/>	ACME000048	USR0000002	006833	00000004	Batch	50	0%	4/5/11 3:13:57 PM	4/5/11 3:48:40 PM
<input type="checkbox"/>	ACME000069	USR0000002	006834	00000007	Batch	50	0%	4/5/11 3:13:57 PM	4/5/11 3:34:51 PM
<input type="checkbox"/>	ACME000117	USR0000002	006837	00000006	Batch	50	0%	4/5/11 3:13:58 PM	4/5/11 3:29:24 PM
<input type="checkbox"/>	ACME000092	USR0000002	006836	00000007	Batch	50	0%	4/5/11 3:13:58 PM	4/5/11 3:35:31 PM
<input type="checkbox"/>	ACME000108	USR0000002	006835	00000009	Batch	50	0%	4/5/11 3:13:58 PM	4/5/11 3:33:29 PM
<input type="checkbox"/>	ACME000035	USR0000002	006847	00000005	Batch	50	0%	4/5/11 4:20:58 PM	4/5/11 4:23:37 PM
<input type="checkbox"/>	ACME000113	USR0000002	006850	00000005	Batch	52	0%	4/5/11 4:26:47 PM	4/5/11 4:28:01 PM
<input type="checkbox"/>	ACME000024	USR0000002	006853	00000008	Batch	50	0%	4/5/11 4:28:52 PM	4/5/11 4:49:52 PM
<input type="checkbox"/>	ACME000044	USR0000002	006861	00000002	Batch	52	0%	4/5/11 4:28:52 PM	4/5/11 4:34:20 PM
<input type="checkbox"/>	ACME000096	USR0000002	006862	00000002	Batch	52	0%	4/5/11 4:28:52 PM	4/5/11 5:05:24 PM

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OK Cancel

Batch Model

Change Batch Model Calibration

Change Workload & Change Workload Details

Change Workload

Job name:

Job user:

Job number:

Thread ID:

Job type:

Previous workload:

Job priority:

Growth rate(%):

Exceptional wait time (microseconds):

Start time: Example: 12:30:00 PM

End time:

Workload Details

Priority	Start Time	End Time	CPU Time(Mic
25	4/5/11 1:22:38 PM	4/5/11 1:25:00 PM	24466125
25	4/5/11 1:25:00 PM	4/5/11 1:30:00 PM	46315139
25	4/5/11 1:30:00 PM	4/5/11 1:35:00 PM	38574163
25	4/5/11 1:35:00 PM	4/5/11 1:40:00 PM	40510509
25	4/5/11 1:40:00 PM	4/5/11 1:45:00 PM	40734767

Change Workload Details

Priority:

CPU time (microseconds):

Synchronous disk reads:

Synchronous disk writes:

Asynchronous disk reads:

Asynchronous disk writes:

Asynchronous IO waits:

Interactive transactions:

Page faults:

Start time: Example: 12:30:00 PM

End time:

Can change the following:

- Priority
- Job type
- Exceptional wait time
- Start time

Batch Model

Change Batch Model Calibration

Use “Move Workload” if workloads are not linked correctly

Move Workload

Workload to Move

Job Name	Job User	Job Number	Thread ID	Job Type	Job Priority	Growth Rate	Start Time	End
ACME000075	USR0000002	006831	00000006	Batch	50	0%	4/5/11 2:16:05 PM	4/5/
		Total: 1						

Where to Move

As head of an independent sequence
 As child of sequence

Select	Job Name	Job User	Job Number	Thread ID	Job Type	Job Priority	Growth Rate	Start Time
<input type="radio"/>	▼ ACME000004	USR0000002	006810	00000005	Batch	25	0%	4/5/11 1:22:38 PM
<input type="radio"/>	ACME000106	USR0000002	006817	00000002	Batch	52	0%	4/5/11 2:00:23 PM
<input type="radio"/>	ACME000028	USR0000002	006819	00000003	Batch	52	0%	4/5/11 2:11:49 PM
<input checked="" type="radio"/>	ACME000005	USR0000002	006824	00000004	Batch	52	0%	4/5/11 2:14:19 PM

Page 1 of 1 Rows Total: 4 Selected: 1

Batch Model

Calibrate Batch Model

The screenshot shows a software interface for managing batch models. At the top, there are tabs for 'Welcome' and 'Batch Models'. Below this is a toolbar with icons for refresh, save, and a calendar, along with an 'Actions' dropdown menu. The main area is a table with columns: Name, Library, Type, and Status. The table shows 1 of 58 items, with a search filter 'Clear filter'. The selected item is 'BCHDEMODTA' in the 'BCHDEMO' library, with the type 'Batch Model File Based Collection' and the status 'Calibration Changed'. A context menu is open over the selected item, listing actions: Change Calibration, Calibrate, Merge, Copy, Delete, Save, and Properties. A red box highlights the 'Calibration Changed' status in the table, and a callout box with an arrow points to it, containing the text: 'Must be in "Calibration Changed" Status'.

Confirm Calibrate

Confirm Calibrate

The calibrate batch model action can be long running. It will begin immediately after pressing the Ok button. Press the Cancel button if you wish to run the calibrate action later.

OK Cancel

Batch Model

Change Batch Model

- Model workload growth, processor, storage, and/or other workload changes

The screenshot shows the IBM Batch Models interface. At the top, there are tabs for 'Welcome' and 'Batch Models'. Below the tabs is a toolbar with icons for refresh, save, and actions. The main area is a table with columns: Name, Library, Type, and Status. The table shows 1 of 58 items shown. A row is highlighted with a context menu open, and the 'Complete' status is highlighted with a red box. A callout box points to the 'Complete' status with the text 'Must be in Complete Status'.

Name	Library	Type	Status
BCHDEMOTA	BCHDEMO	Batch Model File Based Collection	Complete

Must be in Complete Status

Batch Model

Change Batch Model – Growth

Change Batch Model - BCHDEMO/BCHDEMOTA	
General	Batch model: BCHDEMOTA
Processor	Library: BCHDEMO
Storage	Start date and time: 4/5/11 1:15:00 PM
Workloads	End date and time: 4/5/11 5:30:00 PM
	Workload growth rate(%): <input type="text" value="0"/>

Workload growth rate(%): = 5% increase

Workload growth rate(%): = 5% decrease

Increase or decrease
growth rate of work
done by all jobs

Batch Model

Change Batch Model – Processor

Change Batch Model - BCHDEMO/BCHDEMOTA

General	Original Processor Information
*Processor	Model/Feature/Frequency/Cores: 570-9117-MMA 7388 5000 2-16 Partitioning type: Partition dedicated processors Number of virtual processors: 2 Processing units: 2.0 SMT enabled: Automatic Maximum number of SMT hardware threads: 0
Storage	
Workloads	
	Model Processor Information Model/Feature/Frequency/Cores: <input style="width: 100%;" type="text" value="570-9117-MMA 7388 5000 2-16"/> Partitioning type: <input style="width: 100%;" type="text" value="Partition dedicated processors"/> *Number of virtual processors: <input style="width: 100%;" type="text" value="2"/> *Processing units: <input style="width: 100%;" type="text" value="2"/> SMT enabled: <input style="width: 100%;" type="text" value="Automatic"/> Maximum number of SMT hardware threads: <input style="width: 100%;" type="text" value="0"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Batch Model

Change Batch Model – Storage

- Add, Change, or Delete Disk Configurations

Change Batch Model - BCHDEMO/BCHDEMOTA

General

Processor

Storage

Workloads

Original Storage Configuration

Disk Attachment Family Name	Storage Type	Disk Speed (RPM) or Generation	Number of Disks
Dual POWER6 Large Cached DAS	HDD	15000	4
CCIN 571E	HDD	15000	12
CCIN 571E	HDD	15000	40
CCIN 571E	HDD	15000	20

Model Storage Configuration

--- Select Action ---

Select	Disk Attachment Family Name	Storage Type	Disk Speed (RPM) or Generation	Number of Disks
<input type="checkbox"/>	Dual POWER6 Large Cached DAS	HDD	15000	4
<input type="checkbox"/>	CCIN 571E	HDD	15000	12
<input type="checkbox"/>	CCIN 571E	HDD	15000	40
<input type="checkbox"/>	CCIN 571E	HDD	15000	20

Add Storage

Disk attachment family name: Dual PCIe2 Cached RAID SAS Adapter

Storage type: HDD

Disk speed (RPM): 10000

*Number of disks: 1

Change Storage

Disk attachment family name: Dual POWER6 Large Cached DAS

Storage type: HDD

Disk speed (RPM): 15000

*Number of disks: 4

Batch Model

Change Batch Model – Workloads

- Copy, Change, Delete, or Move Workloads

Change Batch Model - BCHDEMO/BCHDEMODTA

General
Processor
Storage
Workloads

--- Select Action ---

Select	Job Name	Job User	Job Number	Thread ID	Job Type	Job Priority	Growth Rate	Start Time	End Time
<input type="checkbox"/>	▼ ACME00004	0000002	006810	00000005	Batch	25	0%	4/5/11 1:22:38 PM	4/5/11 5:16:25 PM
<input type="checkbox"/>	ACME00010	0000002	006817	00000002	Batch	52	0%	4/5/11 2:00:23 PM	4/5/11 2:11:36 PM
<input type="checkbox"/>	ACME00002	0000002	006819	00000003	Batch	52	0%	4/5/11 2:11:49 PM	4/5/11 2:14:29 PM
<input type="checkbox"/>	▼ ACME00000	0000002	006824	00000004	Batch	52	0%	4/5/11 2:14:19 PM	4/5/11 2:16:05 PM
<input type="checkbox"/>	ACME000075	USR0000002	006831	00000006	Batch	50	0%	4/5/11 2:16:05 PM	4/5/11 2:16:12 PM
<input type="checkbox"/>	ACME000048	USR0000002	006833	00000004	Batch	50	0%	4/5/11 3:13:57 PM	4/5/11 3:48:40 PM
<input type="checkbox"/>	ACME000069	USR0000002	006834	00000007	Batch	50	0%	4/5/11 3:13:57 PM	4/5/11 3:34:51 PM
<input type="checkbox"/>	ACME000117	USR0000002	006837	00000006	Batch	50	0%	4/5/11 3:13:58 PM	4/5/11 3:29:24 PM
<input type="checkbox"/>	ACME000092	USR0000002	006836	00000007	Batch	50	0%	4/5/11 3:13:58 PM	4/5/11 3:35:31 PM
<input type="checkbox"/>	ACME000108	USR0000002	006835	00000009	Batch	50	0%	4/5/11 3:13:58 PM	4/5/11 3:33:29 PM
<input type="checkbox"/>	ACME000035	USR0000002	006847	00000005	Batch	50	0%	4/5/11 4:20:58 PM	4/5/11 4:23:37 PM
<input type="checkbox"/>	ACME000113	USR0000002	006850	00000005	Batch	52	0%	4/5/11 4:26:47 PM	4/5/11 4:28:01 PM
<input type="checkbox"/>	ACME000024	USR0000002	006853	00000008	Batch	50	0%	4/5/11 4:28:52 PM	4/5/11 4:49:52 PM
<input type="checkbox"/>	ACME000044	USR0000002	006861	00000002	Batch	52	0%	4/5/11 4:28:52 PM	4/5/11 4:34:20 PM
<input type="checkbox"/>	ACME000096	USR0000002	006862	00000002	Batch	52	0%	4/5/11 4:28:52 PM	4/5/11 5:05:24 PM

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OK Cancel

Batch Model

Change Batch Model – Workloads

Change Workload & Change Workload Details

Change Workload

Job name:

Job user:

Job number:

Thread ID:

Job type:

Previous workload:

Job priority:

Growth rate(%):

Exceptional wait time (microseconds):

Start time: Example: 12:30:00 PM

End time:

Workload Details

Priority	Start Time	End Time	CPU Time(Mic)
25	Change 1:22:38 PM	4/5/11 1:25:00 PM	24466125
25	4/5/11 1:25:00 PM	4/5/11 1:30:00 PM	46315139
25	4/5/11 1:30:00 PM	4/5/11 1:35:00 PM	38574163
25	4/5/11 1:35:00 PM	4/5/11 1:40:00 PM	40510509
25	4/5/11 1:40:00 PM	4/5/11 1:45:00 PM	40734767
25	4/5/11 1:45:00 PM	4/5/11 1:50:00 PM	43610680
25	4/5/11 1:50:00 PM	4/5/11 1:55:00 PM	49414374
25	4/5/11 1:55:00 PM	4/5/11 2:00:00 PM	40194465

Change Workload Details

Priority:

CPU time (microseconds):

Synchronous disk reads:

Synchronous disk writes:

Asynchronous disk reads:

Asynchronous disk writes:

Asynchronous IO waits:

Interactive transactions:

Page faults:

Start time: Example: 12:30:00 PM

End time:

Can change

- Priority
- Growth rate
- Start time
- CPU time
- Reads/writes
- IO waits
- Transactions
- Page faults

Batch Model

Change Batch Model – Workloads

- Unlink from all other workloads
- Change link to another workload

Move Workload

Workload to Move

Job Name	Job User	Job Number	Thread ID	Job Type	Job Priority	Growth Rate	Start Time	End	
ACME000075	USR0000002	006831	00000006	Batch	50	0%	4/5/11 2:16:05 PM	4/5/11 2:16:05 PM	
		Total: 1							

Where to Move

As head of an independent sequence
 As child of sequence

Select	Job Name	Job User	Job Number	Thread ID	Job Type	Job Priority	Growth Rate	Start Time
<input type="radio"/>	▼ ACME000004	USR0000002	006810	00000005	Batch	25	0%	4/5/11 1:22:38 PM
<input type="radio"/>	ACME000106	USR0000002	006817	00000002	Batch	52	0%	4/5/11 2:00:23 PM
<input type="radio"/>	ACME000028	USR0000002	006819	00000003	Batch	52	0%	4/5/11 2:11:49 PM
<input checked="" type="radio"/>	ACME000005	USR0000002	006824	00000004	Batch	52	0%	4/5/11 2:14:19 PM

Page 1 of 1

1

Go
Rows

4

Total: 4 Selected: 1

Batch Model

Analyze Batch Model

Welcome x Manage Collections x

Manage Collections -

Actions

Name	Library	Type	Status
2 of 383 items shown. Clear filter			
<input checked="" type="checkbox"/> BCHDEMOTA	BCHDEMO	Batch Model File Based Collection	Model Changed
<input type="checkbox"/> BCHDEMOTA	BC	Collection Services File Based Collection	Complete

- Change Model
- Analyze
- Merge
- Copy
- Delete
- Save
- Properties

Must be in
"Model Changed"
Status

Confirm Analyze

Confirm Analyze

The analyze batch model action can be long running. It will begin immediately after pressing the Ok button. Press the Cancel button if you wish to run the analyze action later.

OK Cancel

Batch Model

Investigate Results

View the model results

The screenshot shows the 'Manage Collections' window with a table of collections. A context menu is open over the 'Complete' status of the first row. A red box highlights the 'Complete' status, and an arrow points from a text box below to it.

Name	Library	Type	Status
BCHDEMODTA	BCHDEMO	Batch Model File Based Collection	Complete
BCHDEMODTA	B	Collection Services File Based Collection	Complete

Context Menu Options:

- Change Model
- Change Calibration
- Merge
- Copy
- Delete
- Save
- Investigate Results
- Properties

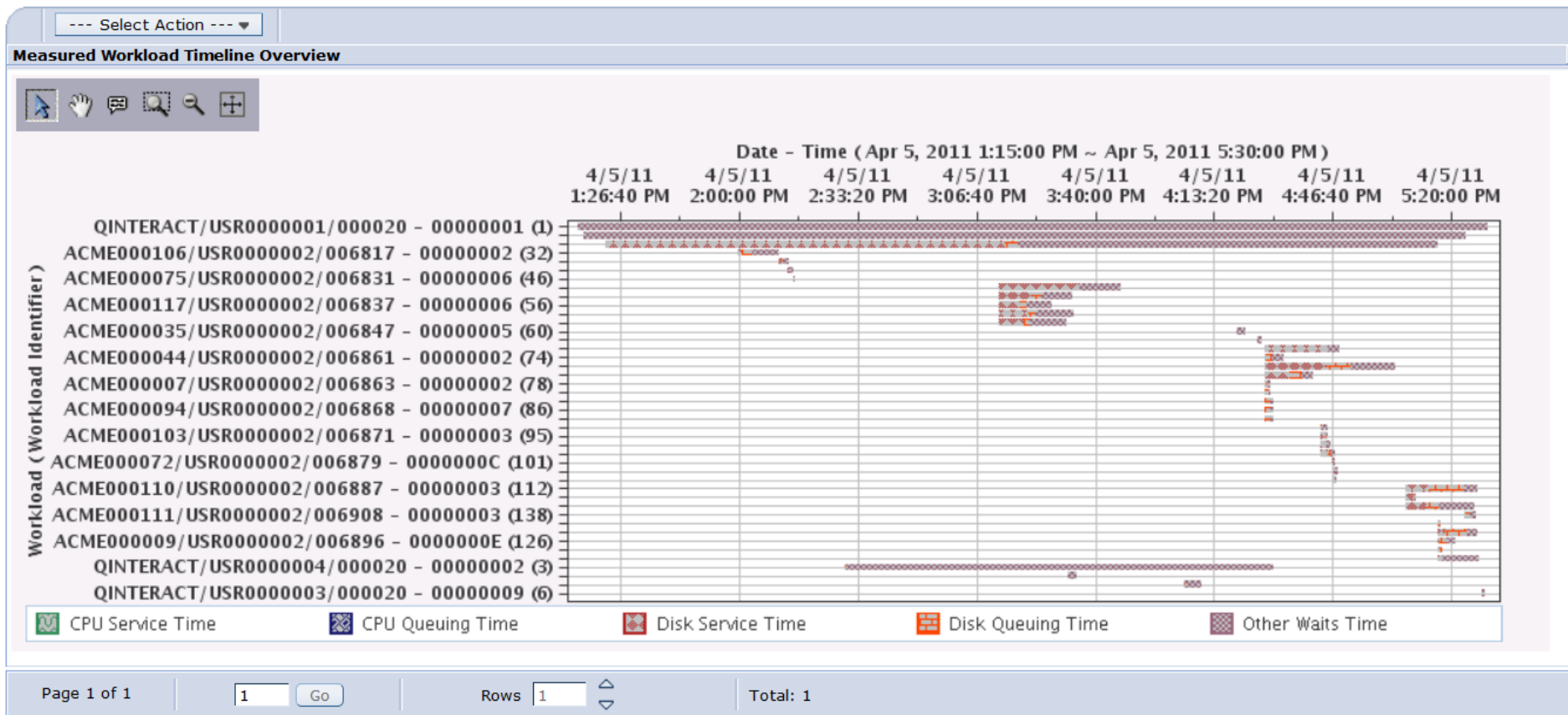
Must be in Complete Status

Batch Model

Workload Timeline Overview

Compare Measured vs Modeled Workload Timelines

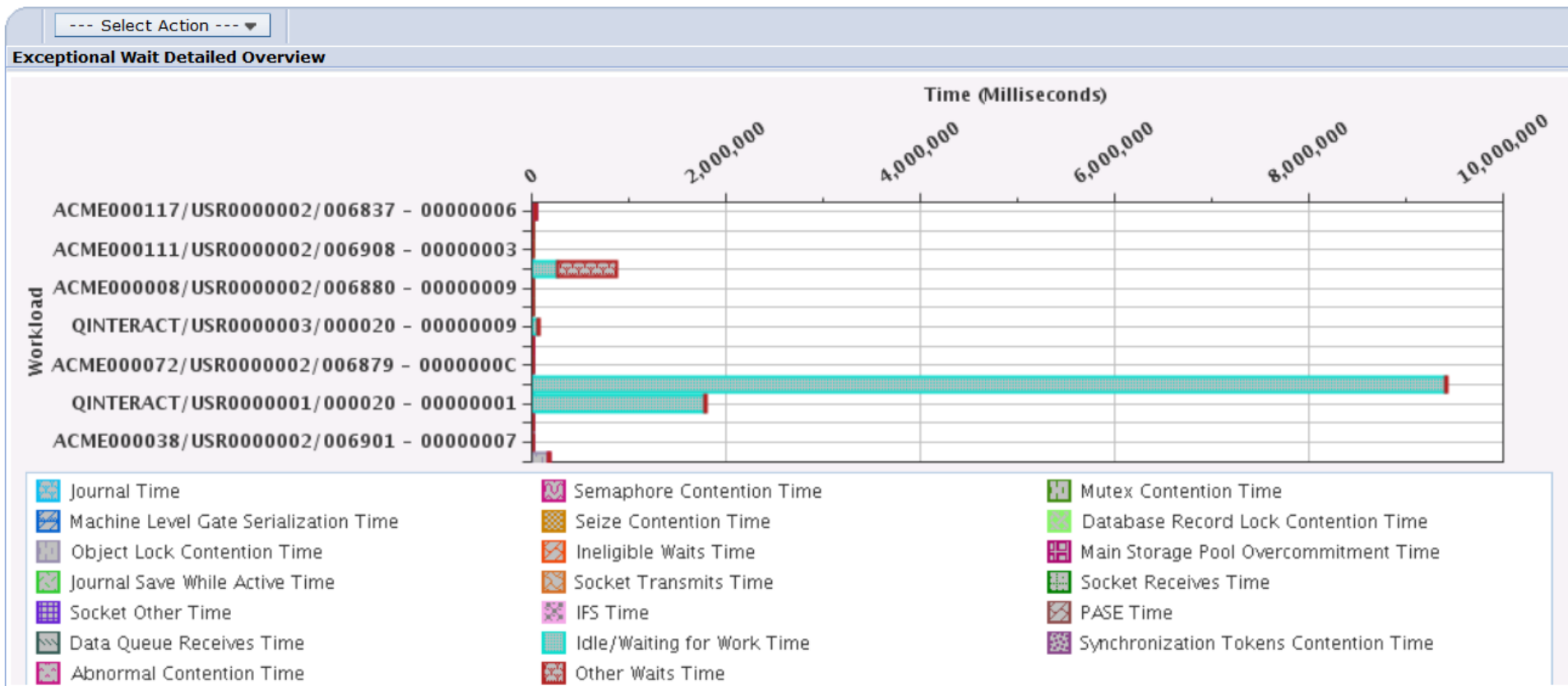
Measured Workload Timeline Overview



Batch Model

Exceptional Wait Detailed Overview

Investigate the waits that make up the “exceptional wait” time

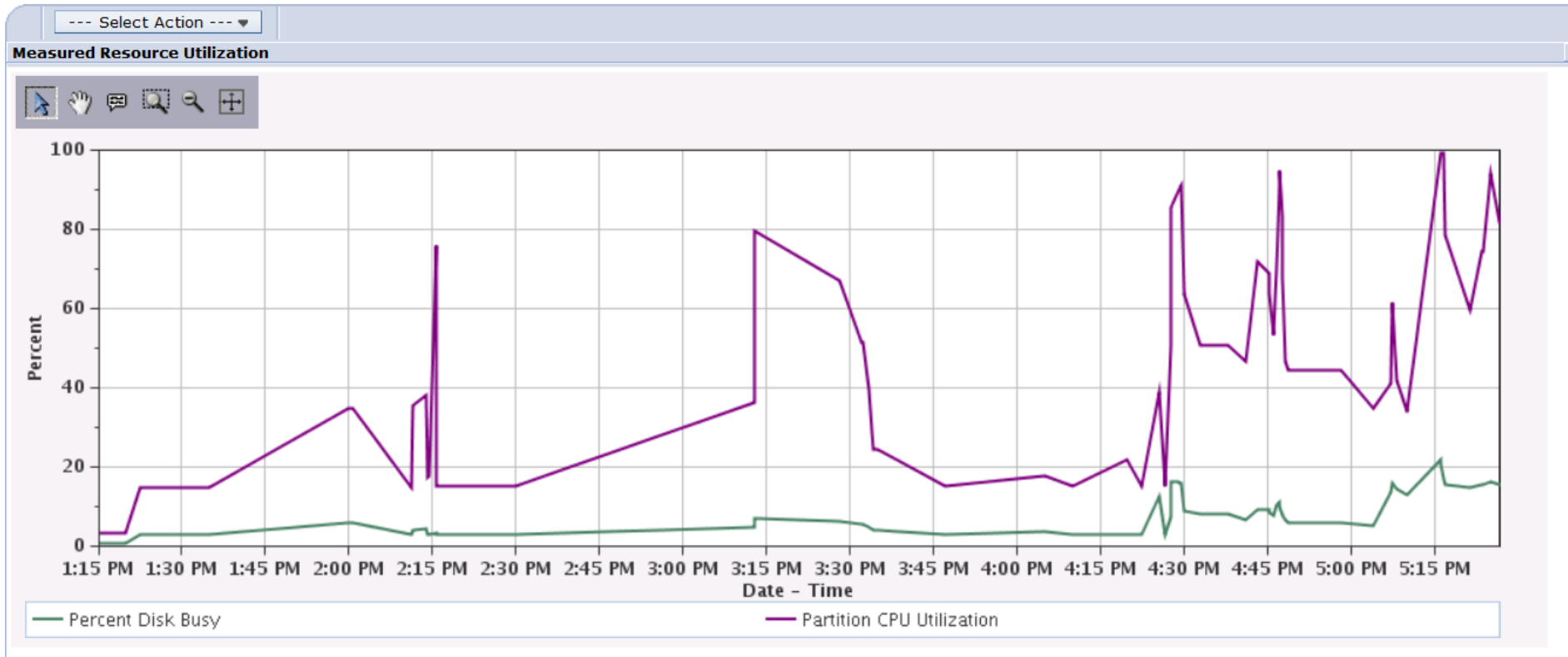


Batch Model

Resource Utilization Overview

Compare the Measured vs Modeled Resource Utilization

Measured Resource Utilization



System Monitoring

Collection Services can be configured to collect system monitor data 24x7.
(System policy for “real-time” data collection)

- Data to support system monitoring can be available without depending on a monitor function.
 - CS starts at IPL, data is available at IPL
- Similar to Management Central, a monitor can tell Collection Services what data it needs and that data is collected and stored in the *MGTCOL just like before.

```

Configure Perf Collection (CFGPFRCOL)
Type choices, press Enter.
Default interval . . . . . 15.00      *SAME, .25, .50, 1.0, 5.0...
Collection library . . . . . QPERDATA  Name, *SAME
Default collection profile . . . *STANDARDP  *SAME, *MINIMUM, *STANDARD...
Cycle time . . . . . 000000      Time, *SAME
Cycle interval . . . . . 24        *SAME, 1-24 hours
*MGTCOL retention period:
  Number of units . . . . . 00120    *SAME, 1-720, *PERM
  Unit of time . . . . . *HOURS  *HOURS, *DAYS
Enable system monitoring . . . > *YES  *SAME, *YES, *NO
Create standard database files *YES  *SAME, *YES, *NO

F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display  F24=More keys
Bottom
  
```

```

Configure Perf Collection (CFGPFRCOL)
Type choices, press Enter.
System monitor categories:
Categories to process . . . . > *SYSLVL  Name, *SAME, *SYSMONDFT...
Time interval (in minutes) . . > .25    0.25, 0.5, 1, 5
Categories to process . . . . > *POOL    Name, *APPN, *CMNBASE...
Time interval (in minutes) . . > .5     0.25, 0.5, 1, 5
Categories to process . . . . > *DISK    Name, *APPN, *CMNBASE...
Time interval (in minutes) . . > 1.00   0.25, 0.5, 1, 5
Categories to process . . . . > *CMNBASE  Name, *APPN, *CMNBASE...
Time interval (in minutes) . . > 1.00   0.25, 0.5, 1, 5
+ for more values -
***

F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel  F13=How to use this display
F24=More keys
Bottom
  
```

System Monitoring

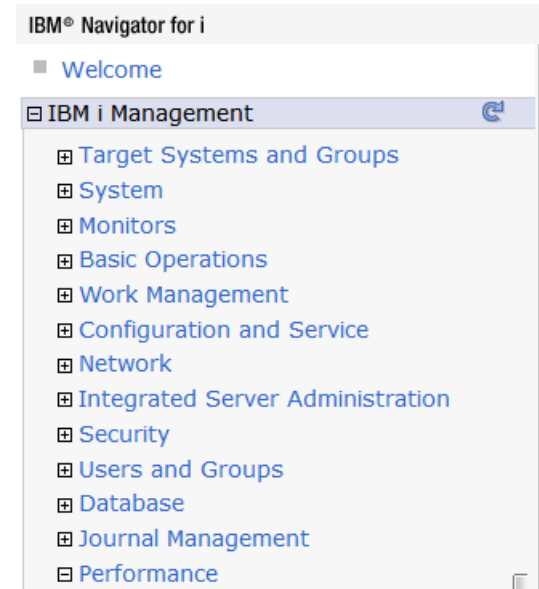
- **System Monitor data is exported to database files** (no longer private as in Management Central)
 - Data is shared between the monitoring function and visualization (Performance Investigator).
 - Data is available to any consumer and can be used for more in depth analysis as necessary.
- **System Monitor support creates a second database file collection**
 - Independent of the Standard database file collection (CRTPFRDTA).
 - If enabled, a CRTPFRDTA 2 job is submitted to produce this “System Monitor” collection
 - Only contains data (files) related to categories selected for system monitoring.
 - Database file interval is 15 seconds. Data will be present based on category collection interval.
 - Has its own retention period (expiration similar to standard file collections)
 - Existing PDI perspectives can be used with this collection providing all needed data is present.
- **System Monitor metrics are derived** (do not exist in base performance data).
 - Are a function of selection, grouping, and other calculations (rates, percents, max)
- **System Monitor metrics are now produced by Collection Services**
 - Existing CS files are used for drill down and detail data
 - New files contain metrics defined for system monitoring along with other supporting data
 - CRTPFRDTA option to produce these files if run manually
 - CFGPFCOL option to produce in standard data collection
 - Includes metrics supported by Management Central and more.

System Monitoring

- **QAPMSMCMN** (*CMNBASE) : Line and LAN metrics.
 - Breakdown: Lines and LANs
 - Still have ability to exclude unwanted lines
 - Line count, avg / max utilization, avg kilobits received and sent, line with highest utilization
- **QAPMSMDSK** (*DISK) : Disk metrics.
 - Breakdown: all units, system ASP, user ASPs, IASPs
 - Number of entries in data, avg / max busy & device name, avg & max capacity used & device name
 - Total capacity available and used
 - For both reads and writes: Ops, avg response & service time, max response time, max device name
- **QAPMSMJMI** (*JOBMI) : Job metrics dependent on the MI.
 - Breakdown: Interactive and Batch
 - Job count, total and max unscaled CPU consumed and percent and job, Interactive transaction rate
- **QAPMSMJOS** (*JOBOS) : Job metrics dependent on the OS.
 - Job count, Batch LIO rate, avg/max interactive response time & job,
 - Spool file creation rate, count and name of job creating most.
- **QAPMSMPOL** (*POOL) : Pool metrics.
 - Machine pool fault rate, count of user pools, avg / max user pool fault rate and pool
- **QAPMSMSYS** (*SYSLVL) : System metrics.
 - Scaled and unscaled: Configured, uncapped, and virtual CPU percent
 - Speed percent, virtual & physical shared pool percent
 - Temp storage used and percent, unscaled SQL CPU percent

System Monitoring

- Providing System Monitoring support in IBM Navigator for I
 - Configure Collection Services GUI support
 - under Performance task
 - Configure and Manage Monitors
 - New Monitor task
 - Systems subtask
 - Display System Monitor Metrics
 - In Performance Data Investigator



Start IBM Navigator for i - Point your browser to <http://systemName:2001>

System Monitoring

Configure Collection Services GUI updated for the System Monitor support:

- [-] Performance
 - [-] Investigate Data
 - [-] Manage Collections
 - [-] All Tasks
 - [-] Active Jobs
 - [-] Disk Status
 - [-] Manage Collections
 - [-] Investigate Data
 - [-] Performance Management for Power Systems
 - [-] System Status
 - [-] Collections
 - [-] Performance Data Reports
 - [-] Collectors
 - [-] Disk Watcher
 - [-] Job Watcher
 - [-] Collection Services
 - [-] Active Collection Services
 - [-] Collections
 - [-] Collection Services Collections
 - [-] Collection Services Status
 - [-] **Configure Collection Services**
 - [-] Cycle Collection Services
 - [-] Start Collection Services
 - [-] Stop Collection Services
 - [-] Sizing

Configure Collection Services

General

Library:

Default collection interval: 15 seconds 5 minutes

Cycling

Cycle every day at: Example: 12:30 PM

Cycle every: hours

System options

Enable system monitoring

Create performance summary data when collection is cycled

Send PM Agent data to IBM

Configure Collection Services

General

Data to Collect

Data Retention

Collection object

Save data for: days Make permanent

Standard data

Save data for: days Make permanent

System monitor data

Save data for: days Make permanent

Configure Collection Services

General

Data to Collect

Data Retention

System Monitor Categories

Use default system monitor categories

Customize system monitor categories

System Monitoring

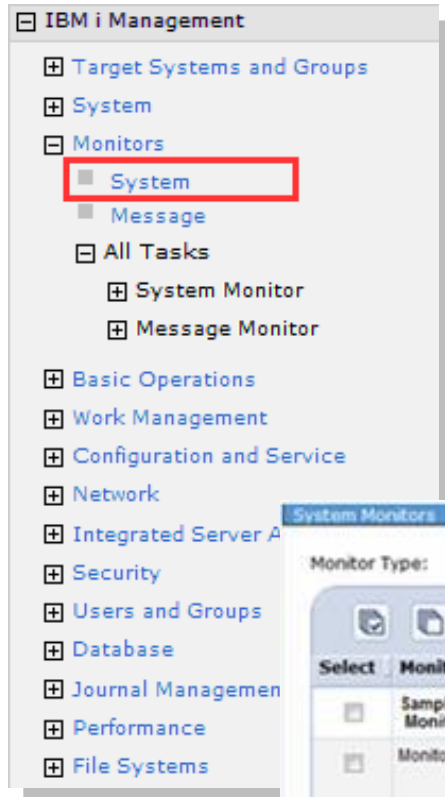
Customize System Monitor categories

Configure Collection Services

General	<h3>System Monitor Categories</h3> <p> <input type="radio"/> Use default system monitor categories <input checked="" type="radio"/> Customize system monitor categories </p> <p>Available categories:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 95%;">Category</th> </tr> </thead> <tbody> <tr><td><input type="checkbox"/></td><td>Category</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>APPN</td></tr> <tr><td><input type="checkbox"/></td><td>IBM Domino for i</td></tr> <tr><td><input type="checkbox"/></td><td>Data port services</td></tr> <tr><td><input type="checkbox"/></td><td>External storage</td></tr> <tr><td><input type="checkbox"/></td><td>IBM HTTP Server for i (powered by Apache)</td></tr> <tr><td><input type="checkbox"/></td><td>Input/output processors (base)</td></tr> <tr><td><input type="checkbox"/></td><td>Network server</td></tr> <tr><td><input type="checkbox"/></td><td>Java</td></tr> <tr><td><input type="checkbox"/></td><td>Local response time</td></tr> <tr><td><input type="checkbox"/></td><td>Logical partition</td></tr> <tr><td><input type="checkbox"/></td><td>Memory pool tuning</td></tr> </tbody> </table>			Category	<input type="checkbox"/>	Category	<input checked="" type="checkbox"/>	APPN	<input type="checkbox"/>	IBM Domino for i	<input type="checkbox"/>	Data port services	<input type="checkbox"/>	External storage	<input type="checkbox"/>	IBM HTTP Server for i (powered by Apache)	<input type="checkbox"/>	Input/output processors (base)	<input type="checkbox"/>	Network server	<input type="checkbox"/>	Java	<input type="checkbox"/>	Local response time	<input type="checkbox"/>	Logical partition	<input type="checkbox"/>	Memory pool tuning
			Category																									
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<input checked="" type="checkbox"/>			APPN																									
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<input type="checkbox"/>	Logical partition																											
<input type="checkbox"/>	Memory pool tuning																											
Data to Collect																												
Data Retention																												
System Monitor Categories																												

	Category	Frequency
<input type="checkbox"/>	Communications (base)	Every 1 minute
<input type="checkbox"/>	Disk storage	Every 1 minute
<input type="checkbox"/>	Jobs (MI tasks and threads)	Every 1 minute
<input type="checkbox"/>	Jobs (operating system)	Every 1 minute
<input type="checkbox"/>	Memory pool	Every 1 minute
<input checked="" type="checkbox"/>	System-level data	Every 1 minute Every 15 seconds Every 30 seconds Every 1 minute Every 5 minutes

System Monitor GUI through IBM Navigator for i



- Configuration and management
 - Select what you want to monitor
 - Set monitoring intervals
 - Set thresholds and actions taken when a threshold is reached
 - Manage event logs history
 - Threshold & Trigger actions

System Monitors

Monitor Type: System

Select	Monitor	Status	Description	Metrics	Creation Date/Time	Status Changed	Owner
<input type="checkbox"/>	Sample Monitor	Started	Monitor Z1	CPU Utilization (Average)	11-06-10 17:30:23	11-06-10 17:34:25	Sample
<input type="checkbox"/>	Monitor Z2	Stopped	Monitor Z2	CPU Utilization (Average), CPU Utilization (Interactive Jobs)	11-06-11 09:00:23	11-06-11 09:12:25	Zhyuany
<input type="checkbox"/>	Monitor Z3	Started	Monitor Z3	CPU Utilization (Average)	11-06-17 17:30:23	11-06-17 17:34:25	Zhyuany

Page 1 of 1 1 Rows 3 Total: 3 Filtered: 3

List of system monitors on the system

System Monitor Metrics – page 1

Metric Groups	Metric Description
CPU Utilization	<p>The percentage of available processing unit time consumed by jobs on your system. Choose from the following types of CPU Utilization metrics for use in your monitors:</p> <p>CPU Utilization (Average)</p> <p>CPU Utilization (Interactive Jobs)</p> <p>CPU Utilization(Uncapped)</p> <p>CPU Utilization(SQL)</p>
Interactive Response Time (Average and Maximum)	The response time that interactive jobs experience on your system.
Transaction Rate (Interactive)	The number of transactions per second completed on your system by interactive (Job type = 'I') jobs.
Batch Logical Database I/O	The average number of logical database input/output (I/O) operations currently performed by batch (Job type = 'B') jobs on the system.
Disk Arm Utilization (Average and Maximum)	The disk unit busy percent.
Disk Storage (Average and Maximum)	The percentage of disk arm storage that is full on your system during the time you collect the data.
Communications Line Utilization (Average and Maximum)	The amount of data that was actually sent and received on all your system communication lines.
LAN Utilization (Maximum and Average)	The amount of data that was actually sent and received on all your local area network (LAN) communication lines.

System Monitor Metrics – page 2

Metric Groups	Metric Description
Machine Pool Faults	The number of faults per second occurring in the machine pool on the system.
User Pool Faults (Maximum and Average)	The total amount of temporary storage (megabytes) in use within the system. This includes both system and user temporary storage.
Spool File Creation Rate	The number of spool files being created per second.
Shared Processor Pool Utilization (Virtual and Physical)	<p>Virtual shared pool CPU percent. The amount of CPU consumed in the virtual shared pool by all part ions using the pool relative to the CPU available within the pool.</p> <p>Physical shared pool CPU percent. The amount of CPU consumed in the physical shared pool by all part ions using the pool relative to the CPU available within the pool.</p>

System Monitor GUI through IBM Navigator for i

- Configure a new system monitor.
- Change a system monitor configuration.
- Delete a system monitor.
- Start/Stop a system monitor.
- Create a new monitor based on an existing monitor.
- Capture events and trigger actions when a threshold is reached.
- List an event log of a selected system monitor.
- List all event logs of all system monitors.
- Display an event log properties.
- Delete an event log.
- Investigate monitor data using PDI.

New Monitor

System Monitors

Monitor type: System

--- Select Action ---

- New Monitor
- Event Log
- Table Actions

Select	Monitor	Status	Description	Metrics	Status Change
<input type="checkbox"/>	Monitor Z1	Started	Monitor Z1	CPU Util (Average)	11-06-10 17:34:...
<input type="checkbox"/>	Monitor Z2	Stopped	Monitor Z2	CPU Utilization (Average), CPU Utilization (Interactive Jobs)	11-06-11 09:00:23
<input type="checkbox"/>	Monitor Z3	Started	Monitor Z3	CPU Utilization (Average)	11-06-17 17:30:23

Page 1 of 1 1 Go Rows 3 Total: 3 Filtered: 3

New Monitor – Name & Description

New Monitor - General Information

General

* Name:

Description:

< Back Next > Finish Cancel

Metrics

Available metrics:

Select	Metrics
<input type="checkbox"/>	Batch Logical Database I/O
<input type="checkbox"/>	CPU Utilization (Interactive Jobs)
<input type="checkbox"/>	Communications Line Utilization (Average)
<input type="checkbox"/>	Communications Line Utilization (Maximum)
<input type="checkbox"/>	Disk Arm Utilization (Average)
<input type="checkbox"/>	Disk Arm Utilization (Maximum)
<input type="checkbox"/>	Disk Storage (Average)
<input type="checkbox"/>	Disk Storage (Maximum)
<input type="checkbox"/>	Interactive Response Time (Average)
<input type="checkbox"/>	Interactive Response Time (Maximum)
<input type="checkbox"/>	LAN Utilization (Average)
<input type="checkbox"/>	Machine Pool Faults

Add -->

Metrics to monitor:

Select	Metrics
<input type="checkbox"/>	CPU Utilization (Average) Configure

Remove <--

< Back Next > Finish Cancel

Monitor Metrics Information Configure

System Monitor - Configure Metric

The screenshot shows the 'Configure Metric' dialog box for 'CPU Utilization (Average)'. The dialog is titled 'Configure Metric' and has a blue header bar. The main content area is white and contains the following elements:

- Metric name:** 'CPU Utilization (Average)'
- Collection interval:** A dropdown menu set to '15 seconds'.
- Threshold1:** A section with a checkbox 'Enable threshold' (unchecked), a 'Trigger' dropdown set to '>=' with a value of '0' and unit 'percent', a 'Duration' spinner set to '1' and unit 'intervals', an 'Operation system command' field with a 'Prompt...' button, a 'Reset' dropdown set to '<' with a value of '0' and unit 'percent', another 'Duration' spinner set to '1' and unit 'intervals', and another 'Operation system command' field with a 'Prompt...' button.
- Threshold2:** A section with a checkbox 'Enable threshold' (unchecked), a 'Trigger' dropdown set to '>=' with a value of '0' and unit 'percent', a 'Duration' spinner set to '1' and unit 'intervals', an 'Operation system command' field with a 'Prompt...' button, a 'Reset' dropdown set to '<' with a value of '0' and unit 'percent', another 'Duration' spinner set to '1' and unit 'intervals', and another 'Operation system command' field with a 'Prompt...' button.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom left.

Annotations with arrows point to the following elements:

- Metric name:** Points to the 'CPU Utilization (Average)' text.
- Collection Interval:** Points to the '15 seconds' dropdown.
- Threshold 1 & 2:** Points to the '0 percent' values in the 'Threshold1' and 'Threshold2' sections.

Configure Metric - Thresholds

- **Threshold** - A setting for a metric that is being collected by a monitor.
 - Allows you to specify **actions** to be taken when:
 - a specified value (called the trigger value) is reached
 - a second value (called the reset value) is reached
 - An **event** is added to the Event Log whenever the trigger value or the reset value is reached.
 - Set up to two thresholds for each metric that the monitor is collecting.
- **Trigger**
 - considered bad (usually high but can be low)
- **Reset**
 - consider good (opposite of trigger)

When a threshold is reached, IBM Navigator for i captures this event and executes actions.

New Monitor - Summary

Summary

Summary:

General:

Name: Monitor Z2

Description: Monitor Z2

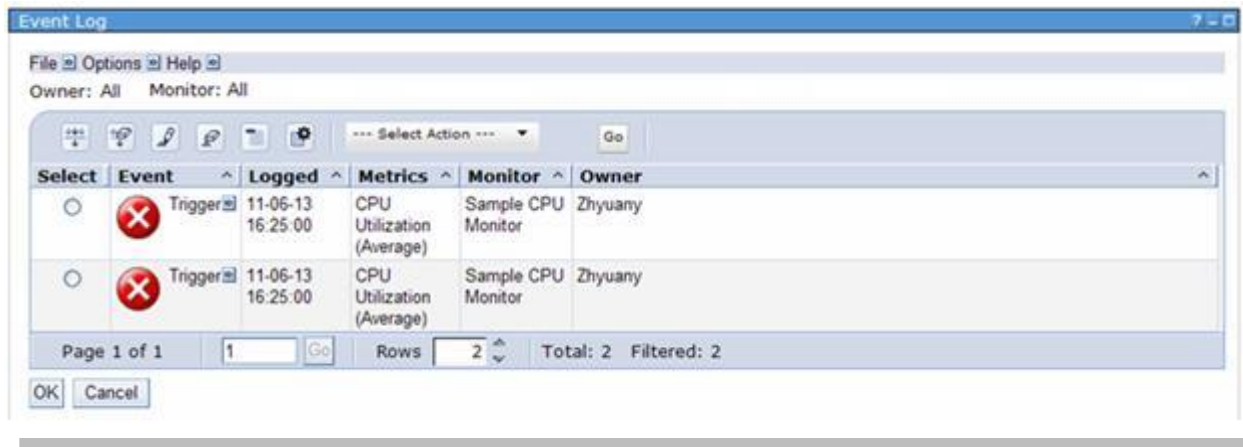
Metrics:

Name	Trigger1	Reset1	Trigger2	Reset2
Batch Logical Database I/O	> 50%	< 49%	> 80%	< 79%
CPU Utilization (Average)	> 40%	< 39%	> 70%	< 69%

System Monitors

Actions for each system monitor:

- Properties – Display all the attributes of this system monitor.
- Investigate Monitor Data - Show chart of the metrics data of the monitor with PDI
- Event Log - Show the Event Log List of this monitor on the system
- Start - Start this system monitor
- Stop - Stop this system monitor
- New Based on.. - Create a new system monitor based on this system monitor
- Delete - Delete this system monitor

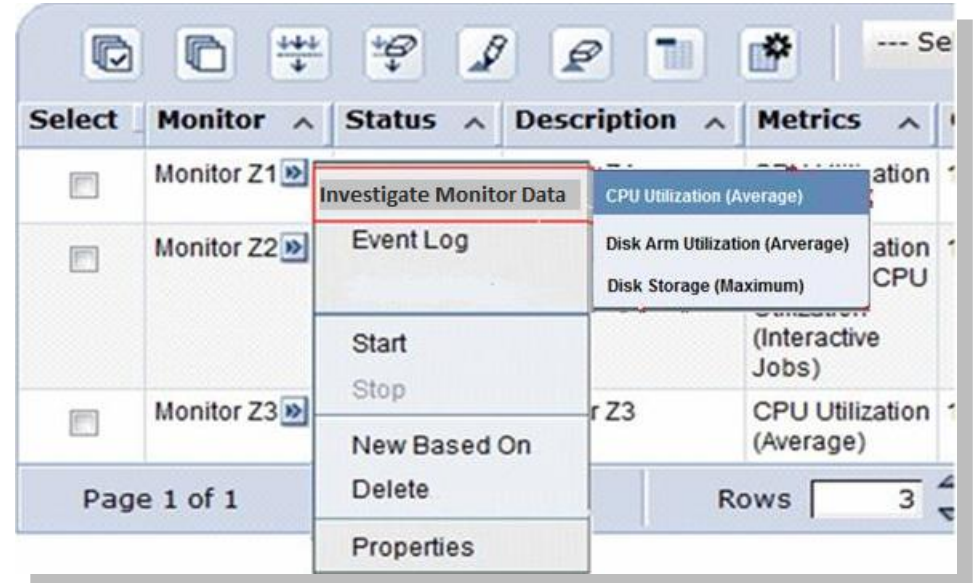
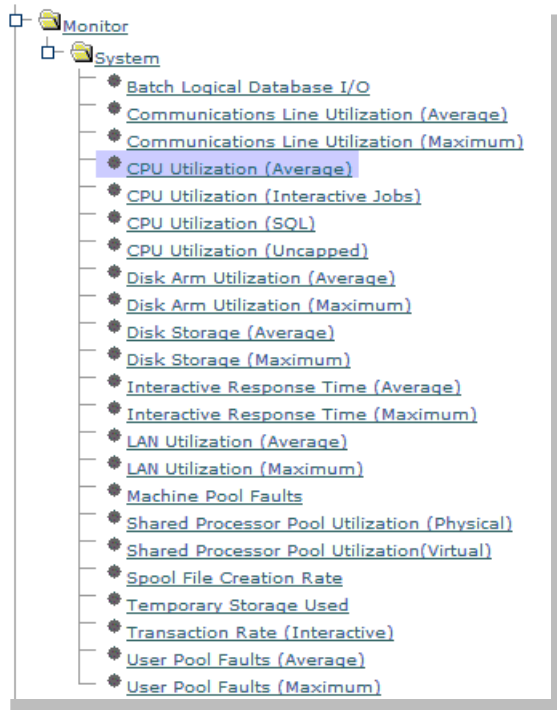


Event Logs –
Show for the System or
one Monitor

System Monitor Graphs in PDI

Display Graphs in PDI

New Perspective Package



Investigate Monitor Data

Launch from System Monitor GUI

System Monitor PDI Package

System Monitor package provides 23 lightweight perspectives for System Monitor functions

- Batch Logical Database I/O Rate
- Communications Line Utilization (Average)
- Communications Line Utilization (Maximum)
- CPU Utilization (Average)
- CPU Utilization (Interactive Jobs)
- CPU Utilization (SQL)
- CPU Utilization (Uncapped)
- Disk Arm Utilization (Average)
- Disk Arm Utilization (Maximum)
- Disk Storage Utilization (Average)
- Disk Storage Utilization (Maximum)
- Interactive Response Time (Average)
- Interactive Response Time (Maximum)
- LAN Utilization (Average)
- LAN Utilization (Maximum)
- Machine Pool Faults Rate
- Shared Processor Pool Utilization (Physical)
- Shared Processor Pool Utilization (Virtual)
- Spool File Creation Rate
- Temporary Storage Utilization
- Transaction Rate (Interactive)
- User Pool Faults Rate (Average)
- User Pool Faults Rate (Maximum)

System Monitor Graphs in PDI

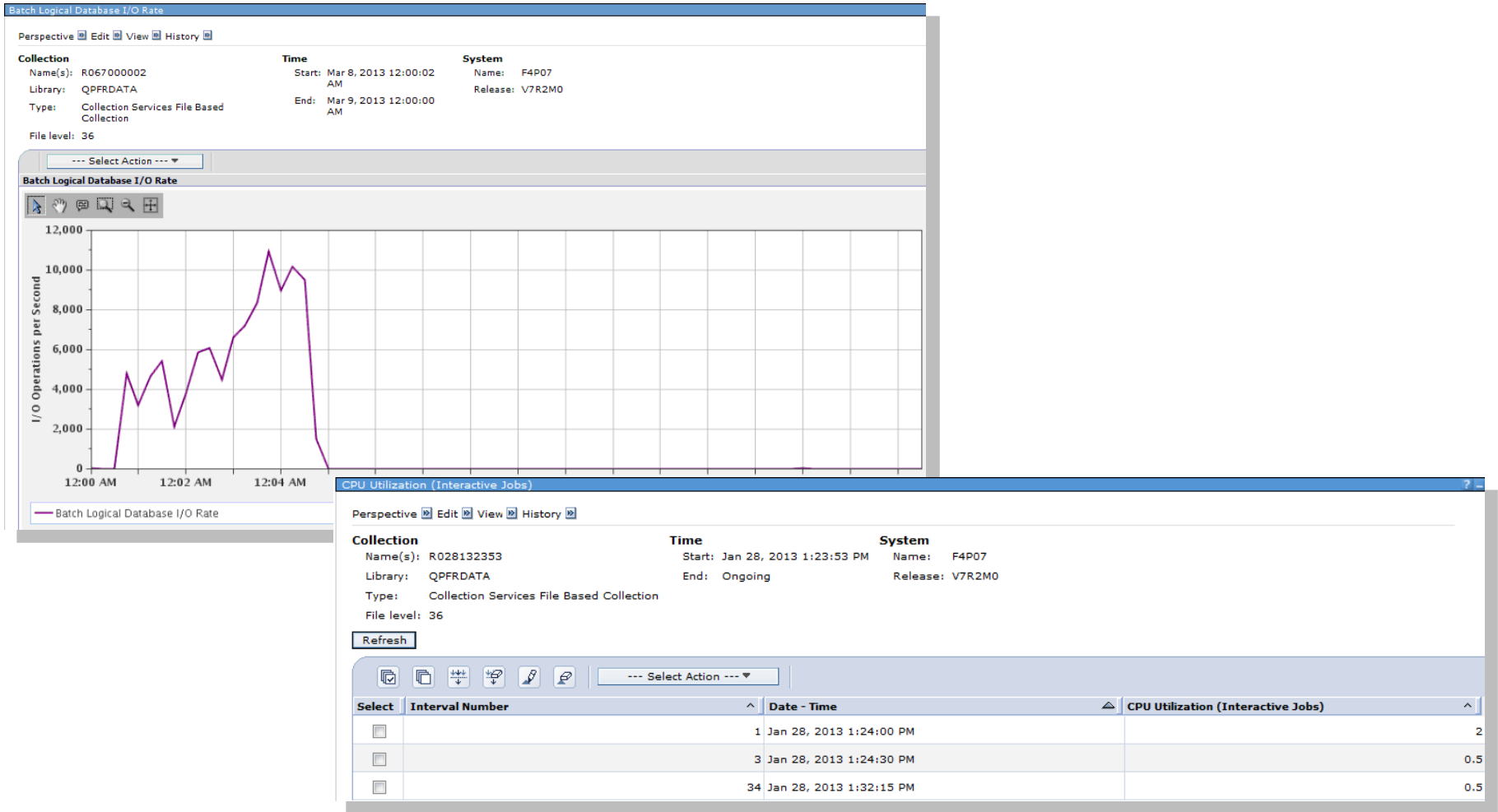
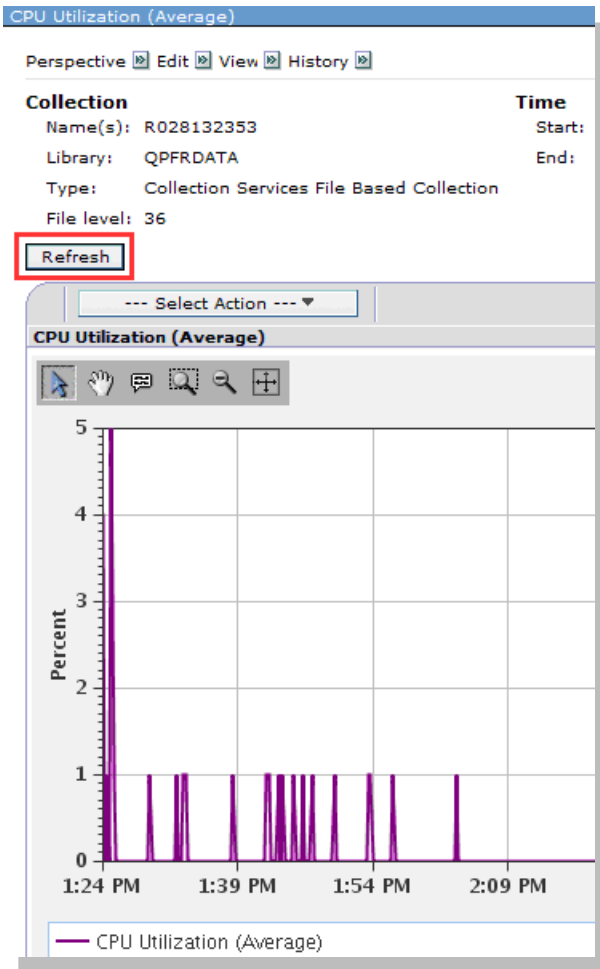


Table data behind the chart

System Monitor - Refresh



Refresh button is visible when displaying the currently active collected monitor data

The current chart will be refreshed with the latest monitored data from the active real time CS collection

New PDI Perspectives

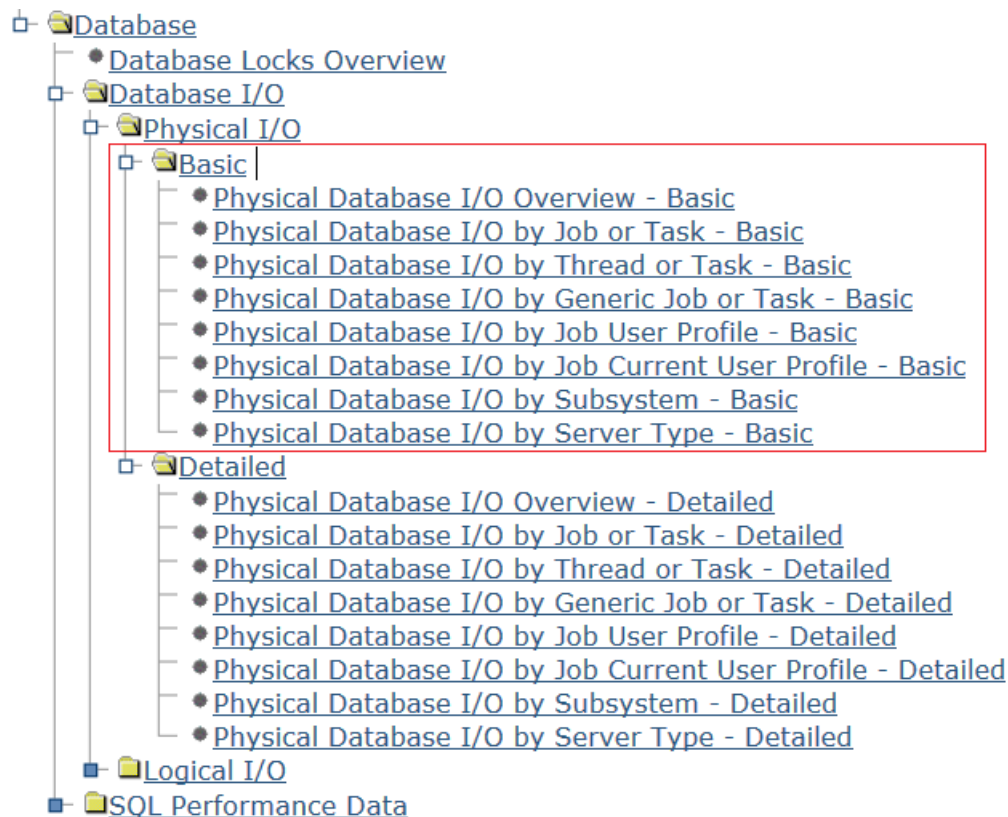
- Database Package - Additions
 - Added in 6.1 & 7.1 as PTFs this year.
 - IBM Performance Tools Manager Feature (PT1 Option 1) is required

- Health Indicators
 - Database Health Indicators Chart

- Job Watcher
 - Logical DB I/O – Detailed Perspectives

Database Package – Additional Perspective Groups

Physical Database I/O – Basic



Detailed were added in 7.1
Fall PTF

Basic – Provide more
overview data, not broken
down

Two metrics charted:

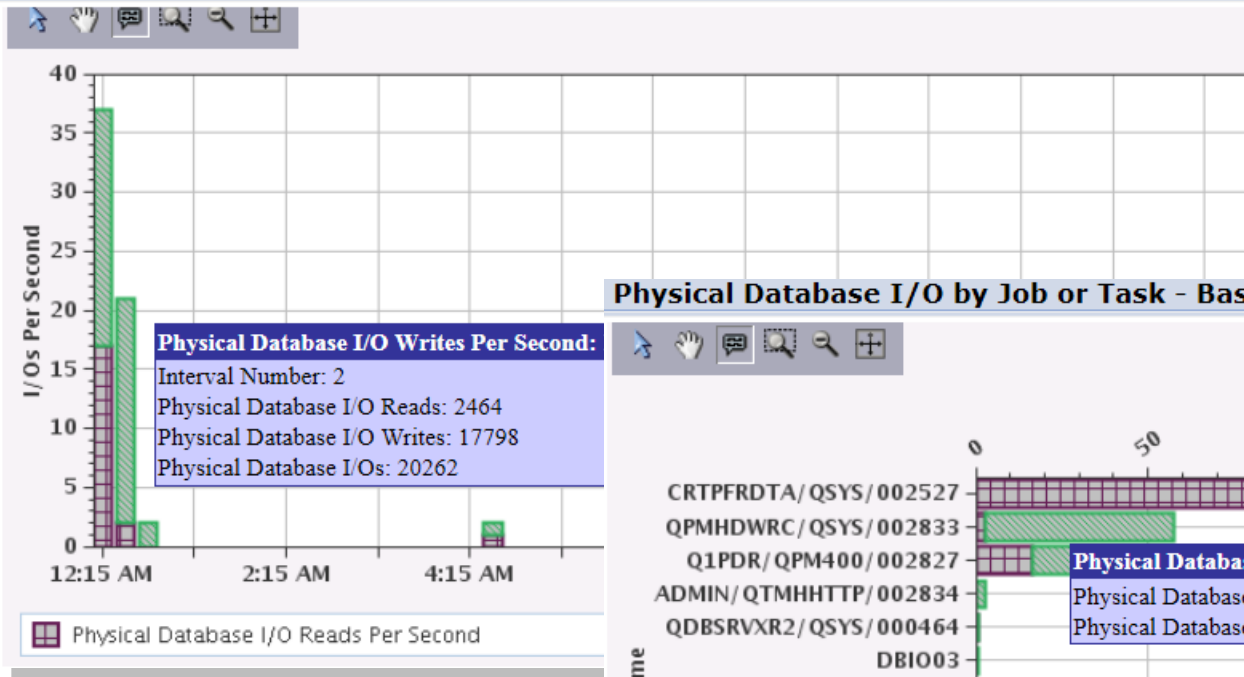
**Physical Database I/O
Reads per second**

**Physical Database I/O
Writes per second**

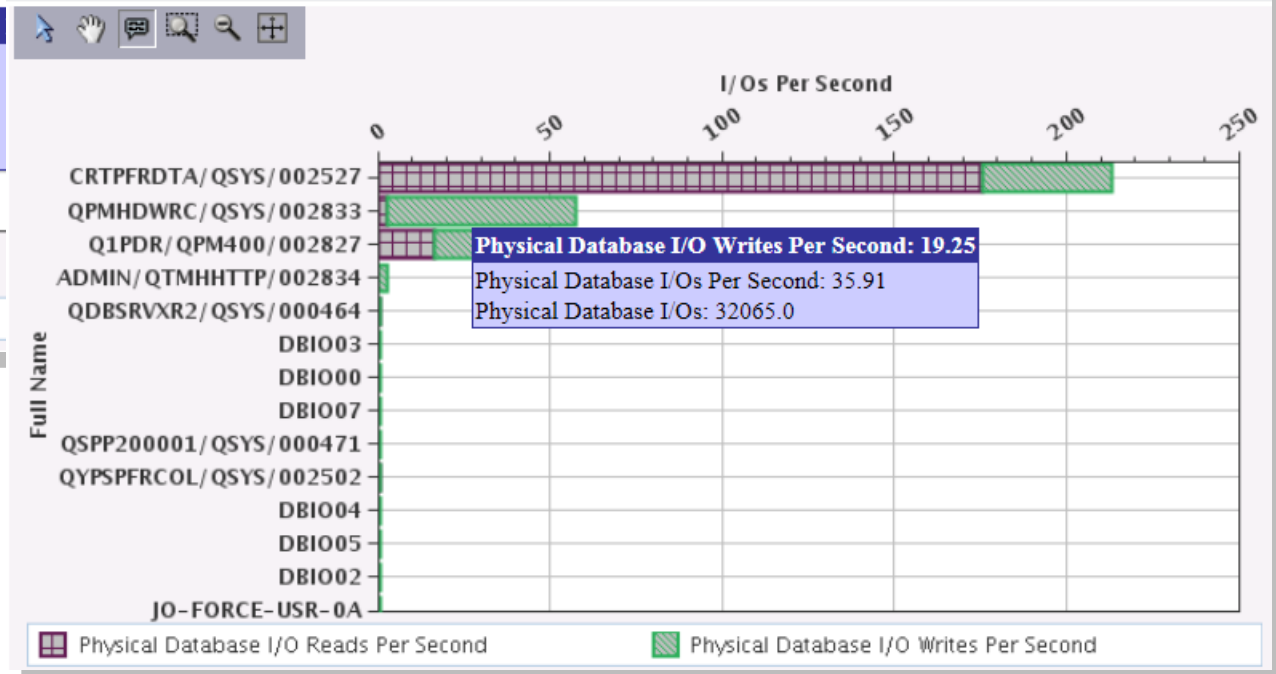
Detailed charts - add breakdown by Sync/Async, SQL & Non-SQL

Physical Database I/O – Basic

Physical Database I/O Overview - Basic

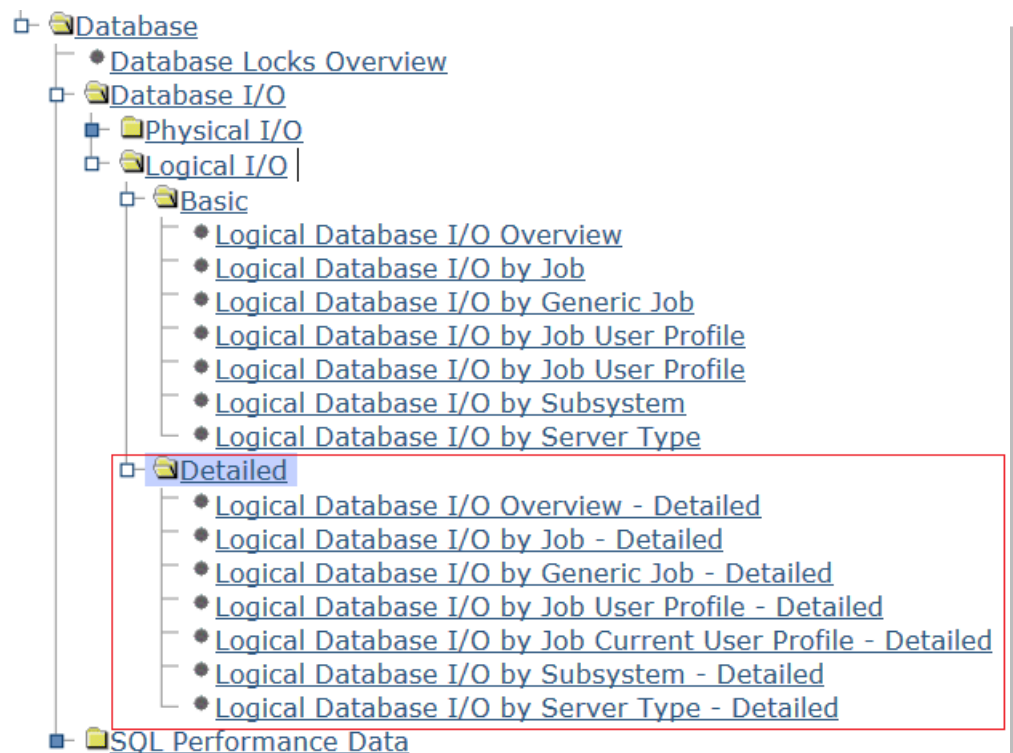


Physical Database I/O by Job or Task - Basic



Database Package – Additional Perspective Groups

Logical Database I/O – Detailed



Basic are the same as have been available in Collection Services

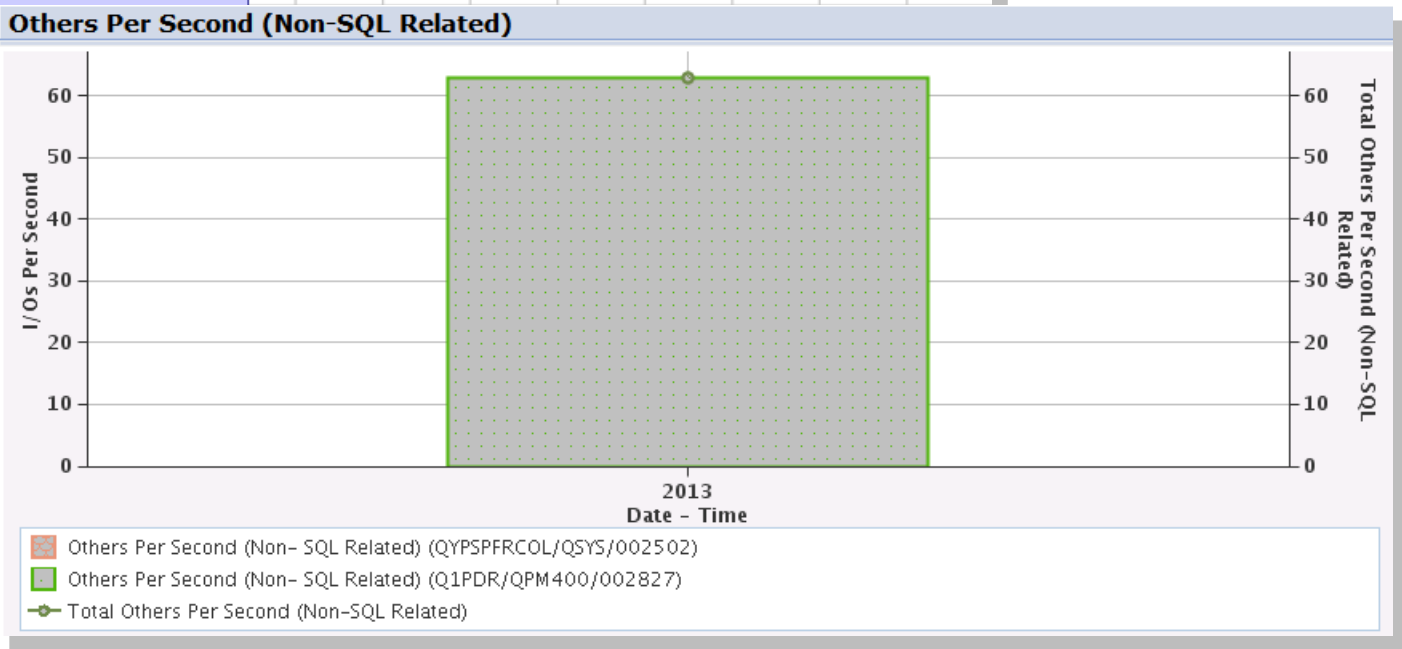
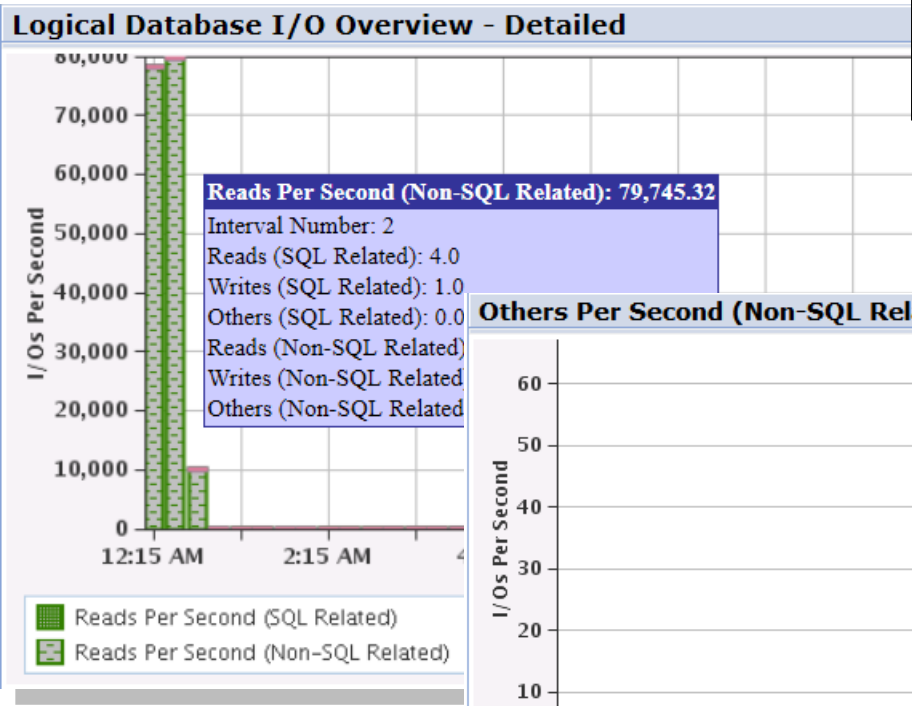
Detailed – Provide more breakdown of the data added in QAPMJOBOS

Logical database I/O by SQL related and non-SQL related read, write and all other I/O requests.

9 new charts – 7 on perspective list plus 2 new drilldowns

Logical Database I/O – Detailed

Reads, Writes & All Other I/O Requests
SQL Related & Non-SQL Related

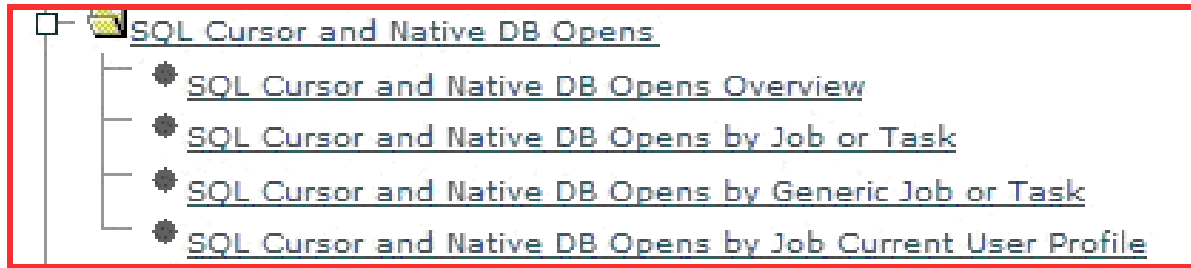


- Drilldown to Database I/O for One Job and
- Database I/O for Jobs – 7 views: All I/Os for Jobs, Reads, Writes, Others, SQL & Non-SQL

Database Package – Additional Perspective Groups

SQL Cursor and Native DB Opens

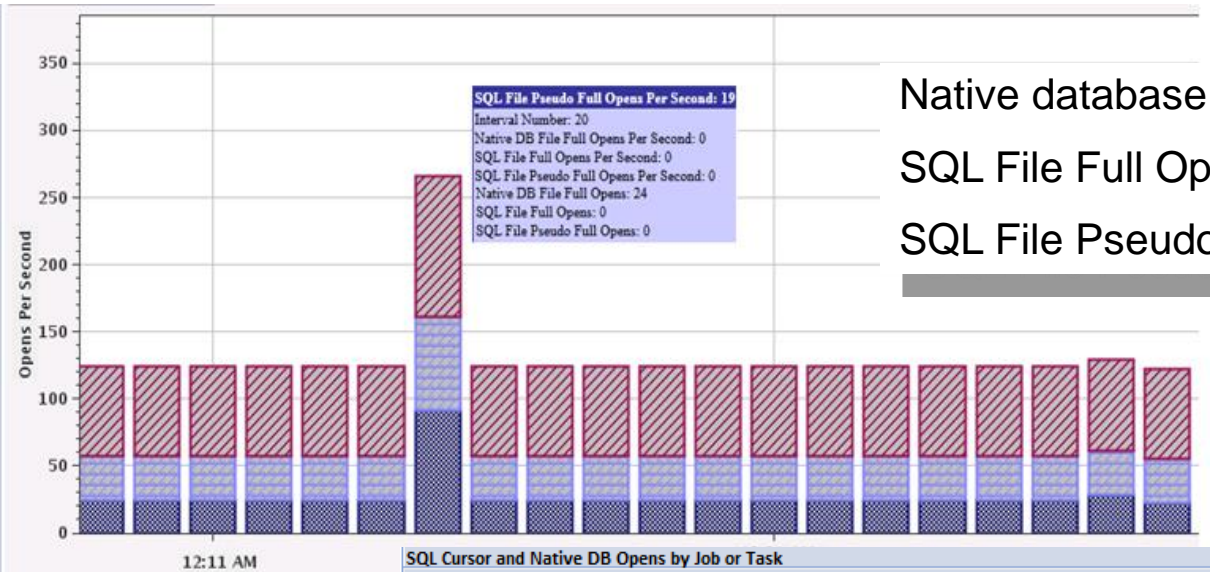
Charts that show SQL Cursor and Native DB Opens metrics in various ways.



SQL Full open count data added by CS in 7.1

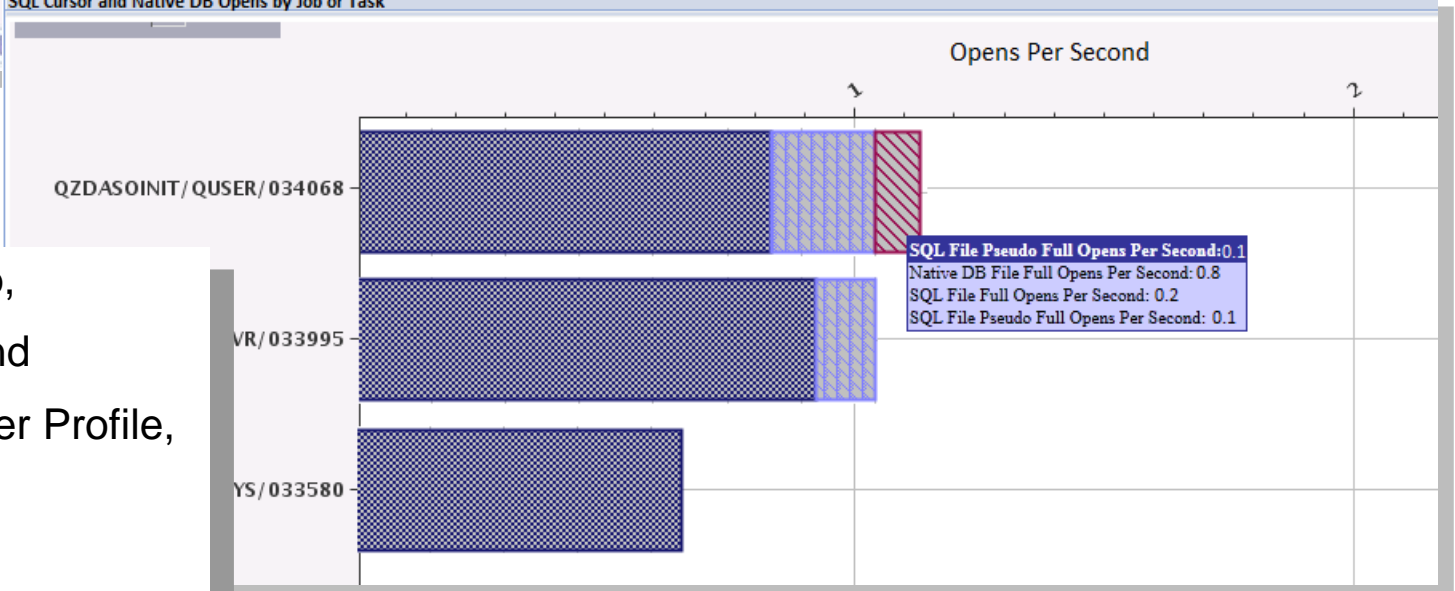
SQL Cursor and Native DB Opens

Native database (non-SQL) File Full Opens, SQL File Full Opens, SQL File Pseudo Full Opens as rates per second



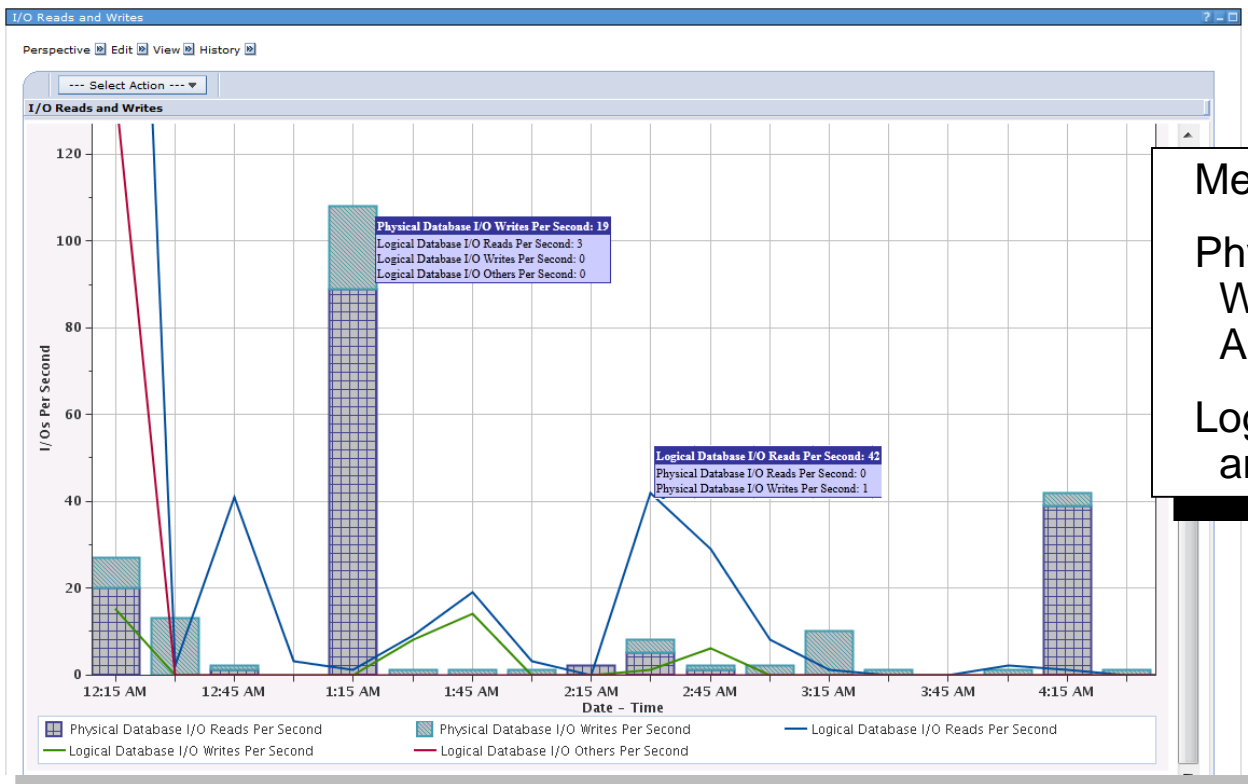
SQL Cursor and Native DB Opens by Job or Task

Native DB File Full Opens Per Second



Drilldown to by Job,
 By Generic Job, and
 By Job Current User Profile,
 Then for Jobs or
 For One Job, etc

Database Package – I/O Reads and Writes



Metrics:

Physical DB I/O Reads & Writes split by Sync and ASync

Logical DB I/O Reads, Writes and other I/O

Utilizes new CS data available in 7.2 – JOBMI & JOBOS

Database Package – Additional Perspective Groups

SQL Performance Data

The screenshot shows a tree view of the Database Package perspective. The 'SQL Performance Data' folder is expanded, and its sub-folders are listed. The 'Collection Services' folder is highlighted with a red box. Below the tree is a 'Collection' table with the following data:

Collection Library	Collection Name
QPFRDATA	Q129034118 (*CSFILE) - May 9, 2013

Views:

Query Opens

Active Queries

Plan Cache Searches – plans found and plans not found

Plans Detailed

Maintained Temporary Indexes (MTIs) – created and deleted over time

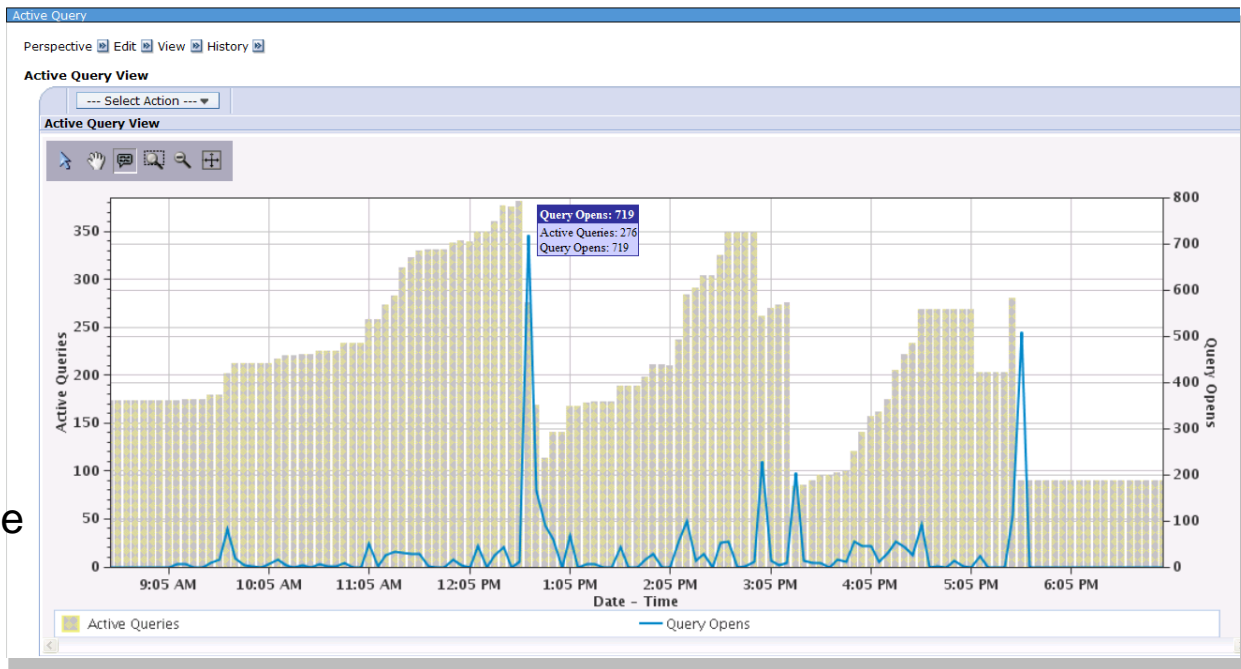
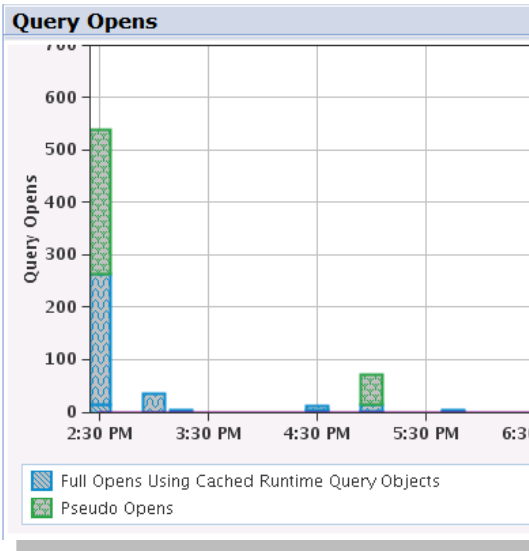
Adaptive Query Processing (AQP)

New Interval SQL plan cache data provided by Collection Services in 7.2 - QAPMSQLPC

SQL Performance Data

Query Opens

This chart shows the number of full and pseudo query opens that occurred over time for the selected collection or collections. The number of queries that were hard closed during this time is also shown.



Active Query View

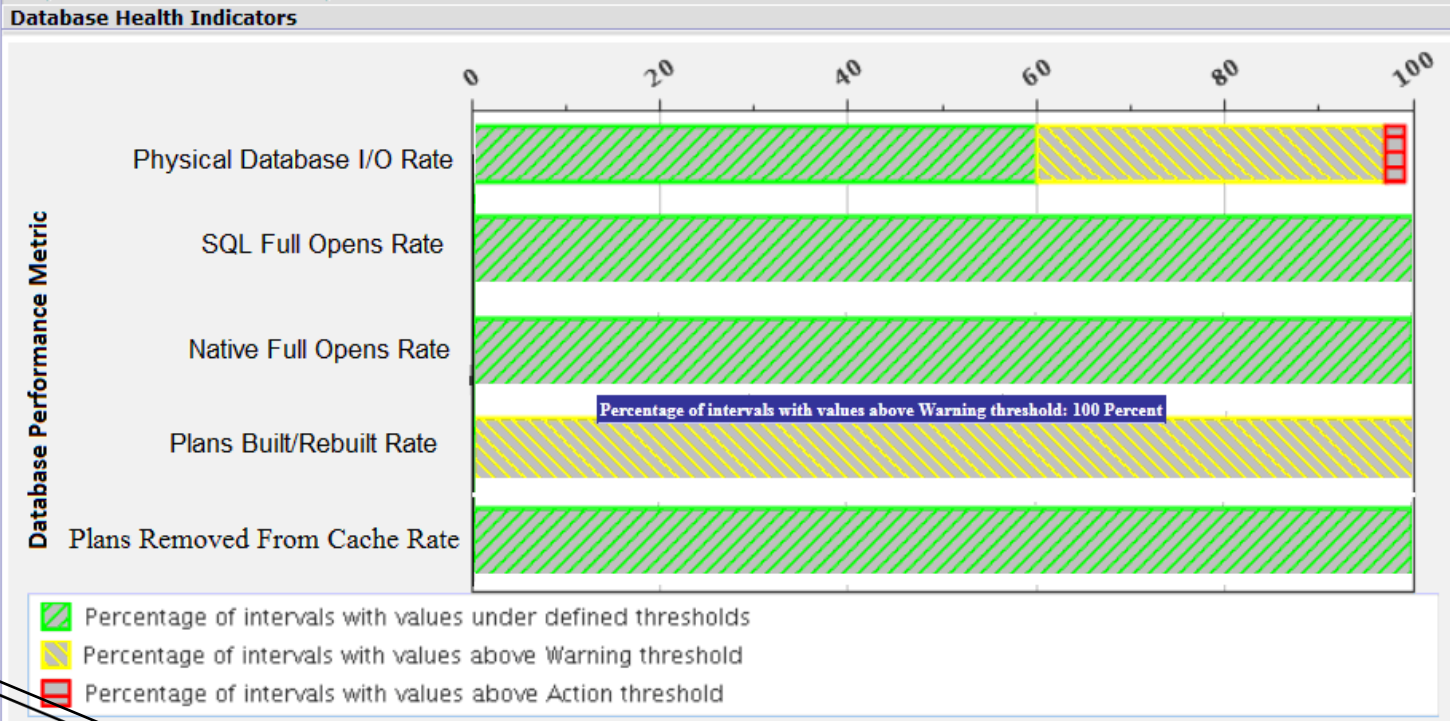
Total number of active queries over time for the collection

New Interval SQL plan cache data provided by Collection Services in 7.2 - QAPMSQLPC

Database Health Indicators

This chart shows Database health indicators by analyzing all collection time intervals according to the defined thresholds for database. Use this chart to determine the proportion of intervals where Database health indicators exceeded the defined thresholds.

- Health Indicators
 - System Resources Health Indicators
 - CPU Health Indicators
 - Disk Health Indicators
 - Memory Pools Health Indicators
 - Response Time Health Indicators
 - Database Health Indicators

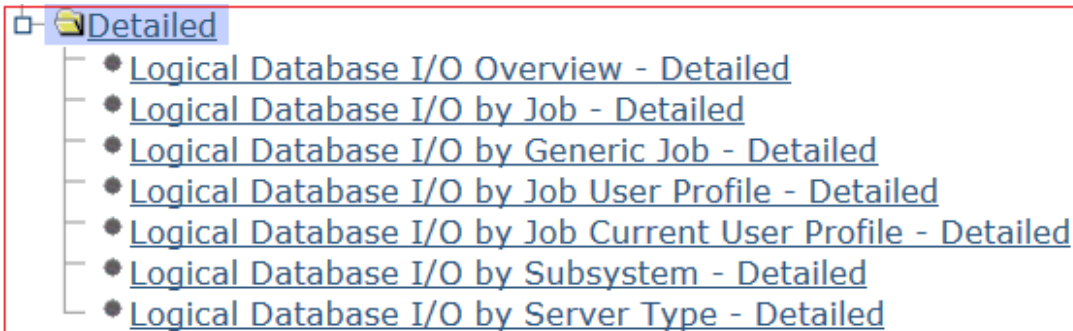


- Select Action ---
- System Resources Health I
 - Physical Database I/O Over
 - Logical Database I/O Over
 - Page Faults Overview
 - Query Opens
 - Plans Detailed
 - Plan Cache Searches
 - Adaptive Query Processing
 - Define Health Indicators

Drilldowns

Job Watcher Package – Additional Perspectives Goup

Logical DB I/O - Detailed

- 
- A screenshot of a navigation menu for the 'Logical DB I/O - Detailed' section. The menu is enclosed in a red rectangular border. At the top left, there is a small square icon followed by a folder icon and the text 'Detailed'. Below this, there is a list of seven items, each preceded by a bullet point and a small square icon. The items are: 'Logical Database I/O Overview - Detailed', 'Logical Database I/O by Job - Detailed', 'Logical Database I/O by Generic Job - Detailed', 'Logical Database I/O by Job User Profile - Detailed', 'Logical Database I/O by Job Current User Profile - Detailed', 'Logical Database I/O by Subsystem - Detailed', and 'Logical Database I/O by Server Type - Detailed'. All text in the list is underlined.
- [Logical Database I/O Overview - Detailed](#)
 - [Logical Database I/O by Job - Detailed](#)
 - [Logical Database I/O by Generic Job - Detailed](#)
 - [Logical Database I/O by Job User Profile - Detailed](#)
 - [Logical Database I/O by Job Current User Profile - Detailed](#)
 - [Logical Database I/O by Subsystem - Detailed](#)
 - [Logical Database I/O by Server Type - Detailed](#)

Job Watcher Package requires IBM Performance Tools Job Watcher (PT1 Option 3)

Enhanced Left Hand Navigation

PDI Perspectives Tree

IBM® Navigator for i

- [-] Performance
 - [-] Investigate Data
 - [-] Performance Explorer
 - [-] Disk Watcher
 - [-] Job Watcher
 - [-] Health Indicators
 - [-] Collection Services
 - [-] CPU Utilization and Waits Overview
 - [-] CPU Utilization by Thread or Task
 - [-] Resource Utilization Overview
 - [-] Job Statistics Overview
 - [-] Waits
 - [-] CPU
 - [-] Disk
 - [-] Physical Disk I/O
 - [-] Synchronous Disk I/O
 - [-] Memory
 - [-] Page Faults
 - [-] Logical Database I/O
 - [-] Virtual I/O
 - [-] Communications
 - [-] 5250 Display Transactions
 - [-] Physical System
 - [-] Java
 - [-] Memory
 - [-] Workload Group
 - [-] Collection Services Database Files
 - [-] Database
 - [-] Manage Collections

The screenshot shows the 'Database Locks Overview' page. On the left, a tree view shows the navigation path: Database > Database Locks Overview. The main content area is titled 'Investigate Data - Performance Data Investigator' and contains the following sections:

- Selection**
 - Name**: Database Locks Overview
- Description**

This chart shows the database record lock contention time for all contributing jobs and tasks over time for the selected collection.
- View List**
 - Database Locks Overview
- Collection**
 - Collection: QPFRDATA
 - Collection Name: Most Recent

Collection Name	Time
Most Recent	
Q141132820 (*CSFILE)	May 21, 2013 1:28:20 PM
Q141164450 (*CSFILE)	May 21, 2013 4:44:50 PM
Q142000003 (*CSFILE)	May 22, 2013 12:00:03 AM
Q143000002 (*CSFILE)	May 23, 2013 12:00:02 AM

Enhanced Left Hand Navigation

Performance Data Report actions

The screenshot displays the IBM Navigator for i interface. On the left, the navigation pane shows a tree structure under 'Performance Data Reports' with a red box highlighting the 'Add Definition' action. An arrow points from this action to the 'Add Definition' tab in the main window's tab bar. The main window shows the 'Add Performance Data Report Definition' form with fields for Name, Description, Perspectives (a table with columns Select, Perspective, Package), Collection (Collection, Library, Type), and Cover Page (Title).

IBM® Navigator for i

- Performance
 - Investigate Data
 - Manage Collections
 - All Tasks
 - Active Jobs
 - Disk Status
 - Manage Collections
 - Investigate Data
 - Performance Management for Power Systems
 - System Status
 - Collections
 - Performance Data Reports**
 - Report Definitions
 - Add Definition**
 - Delete Definition
 - New Based On
 - Collectors

Welcome x Report Definitions x **Add Definition** x Delete Definition x New Based On x

Add Performance Data Report Definition

Name:

Description:

Perspectives

Select	Perspective	Package
	None	

Collection

Collection:

Library:

Type:

Cover Page

Title:

Click on the action to start a new tab.

Get to the action you want more quickly.

Thank You