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

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New Collection Services Metrics Overview

Collection Services Enhancements	Changed Files
Lug Requirements - 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	QAPMJOBOS QAPMJOBOS QAPMJOBMI QAPMJOBMI QAPMSYSTEM QAPMPOOLB
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	QAPMDISK
SQL Metrics - 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)	QAPMJOBOS QAPMSYSTEM QAITMON QAPMSQLPC (new)
System Monitor Support New function and data provided by Collection Services to facilitate both monitoring and data visualization via the IBM Navigator for i.	
Batch Model Analyze batch workloads and model changes in workload or resources	

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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

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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.

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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.

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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

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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

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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

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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
SQQRYRROQ	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
SQQRYNRROQ	Number of queries executed during the interval using runtime objects (for queries) where the runtime objects cannot be cached in the SQL plan cache
SQQRYNOROQ	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

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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

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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

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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

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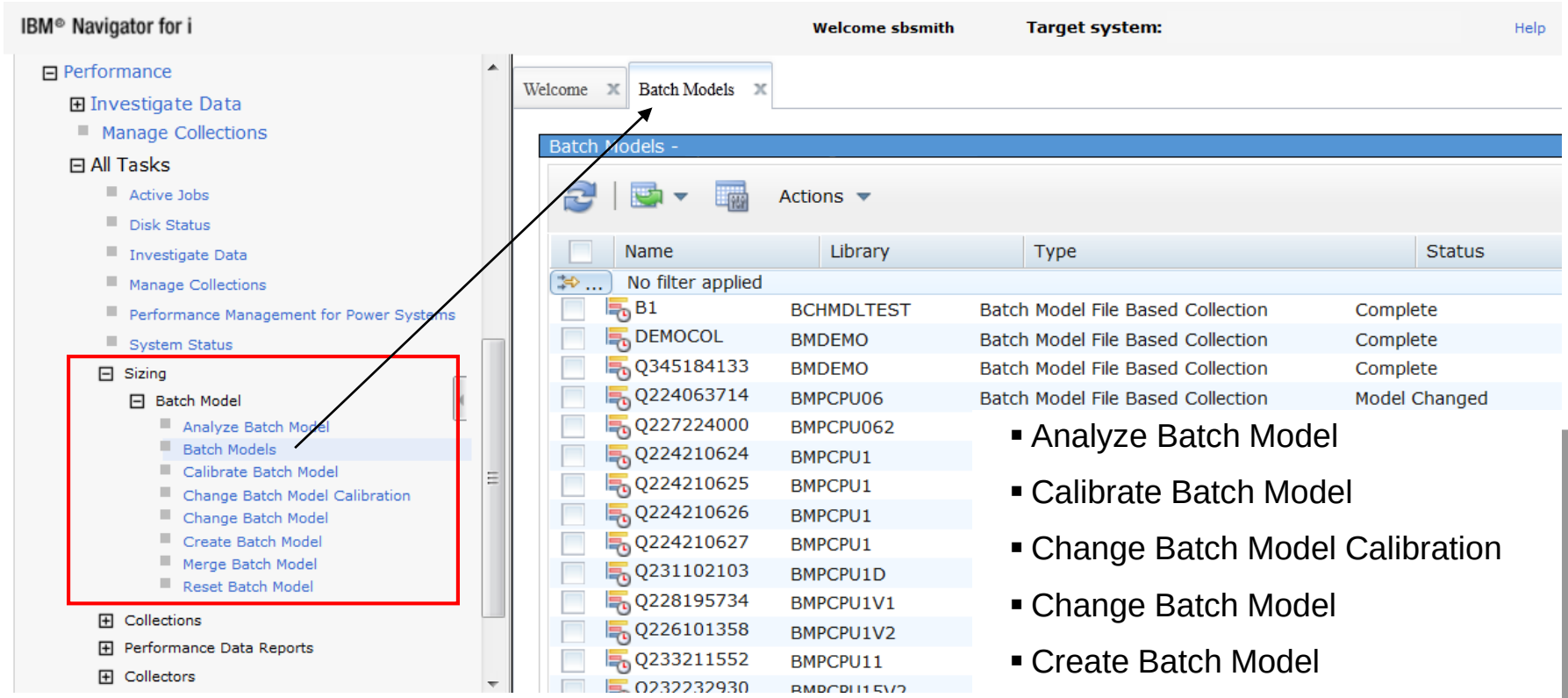
Batch Model

New function under Performance task in IBM Navigator for i



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

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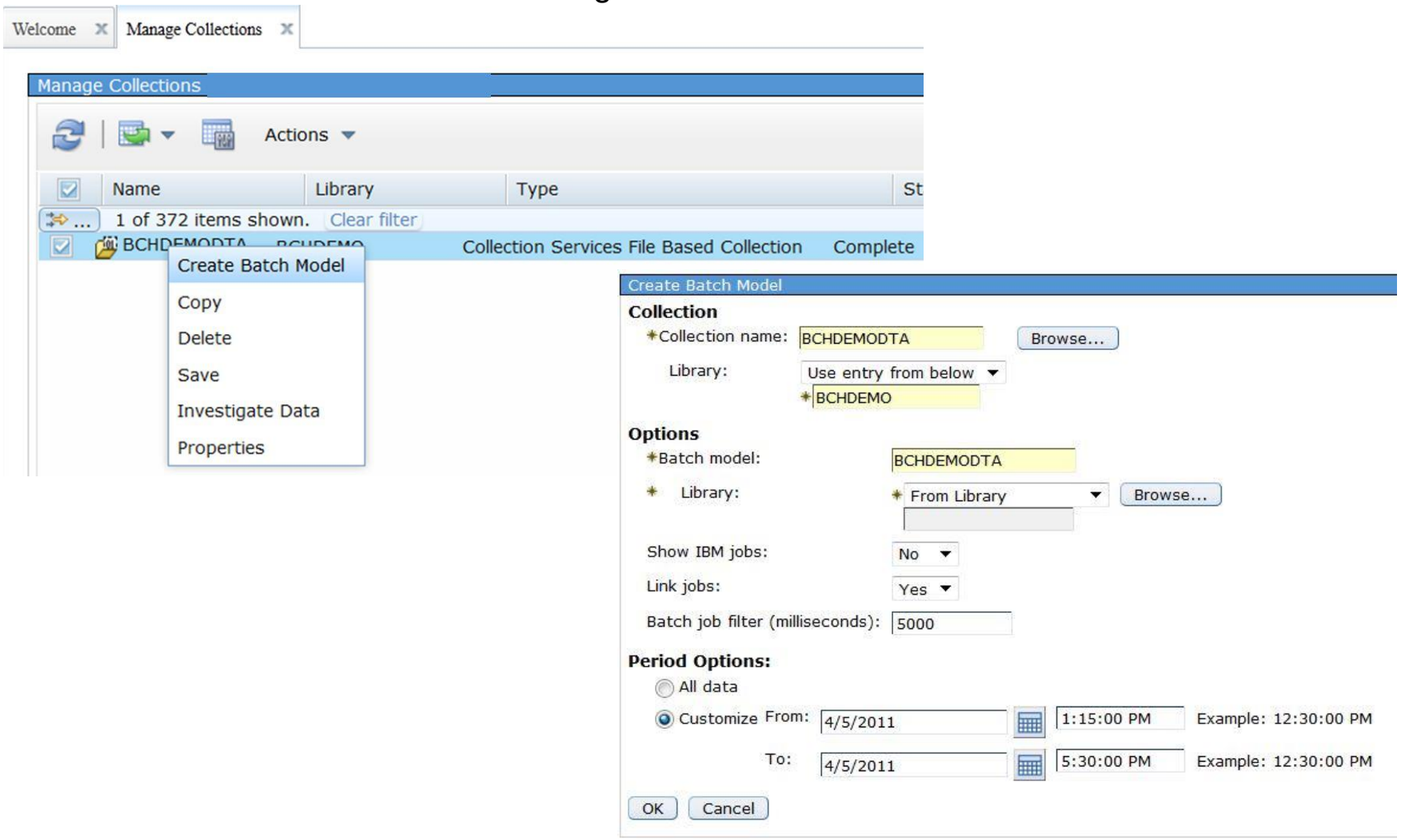
Batch Model
Create Batch Model

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



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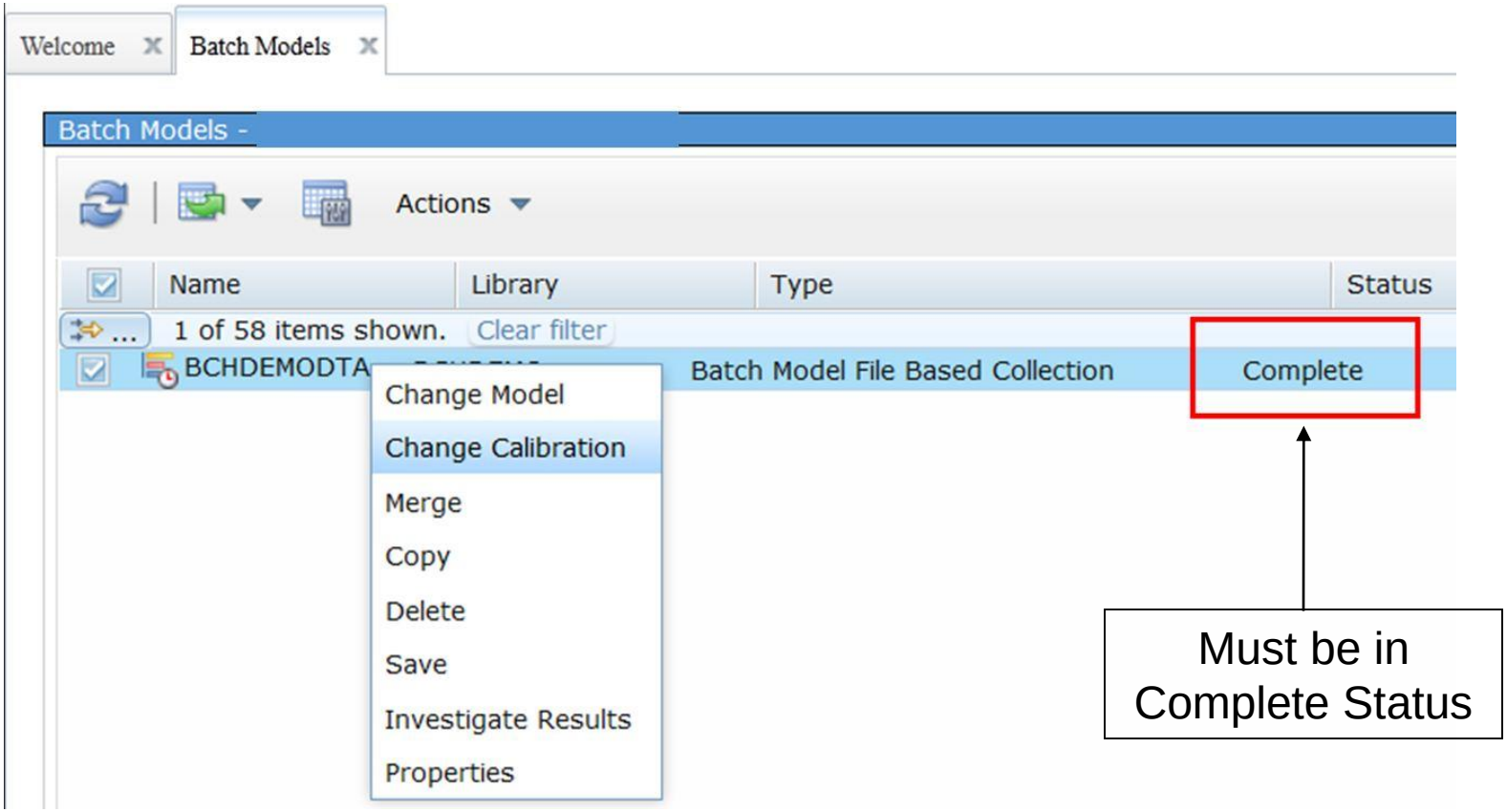
Batch Model

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



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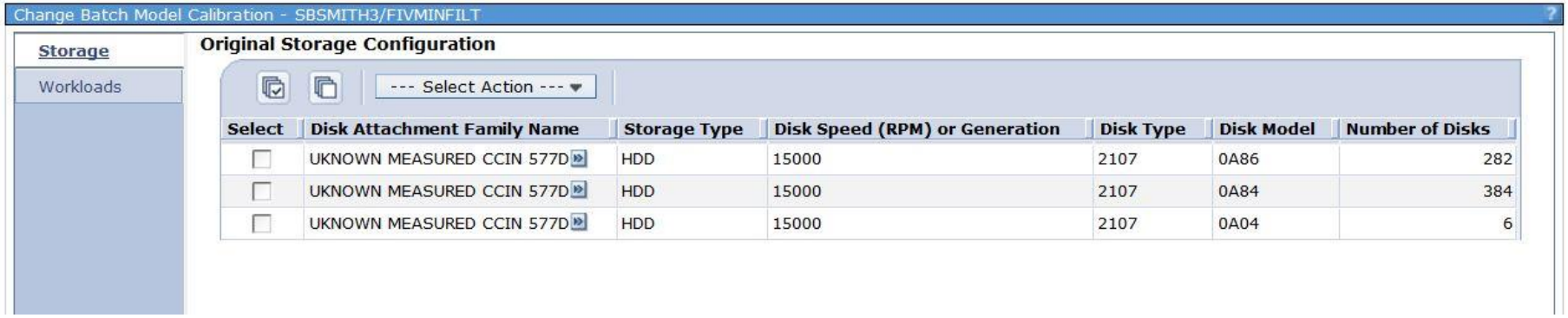
Batch Model

Change Batch Model Calibration

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



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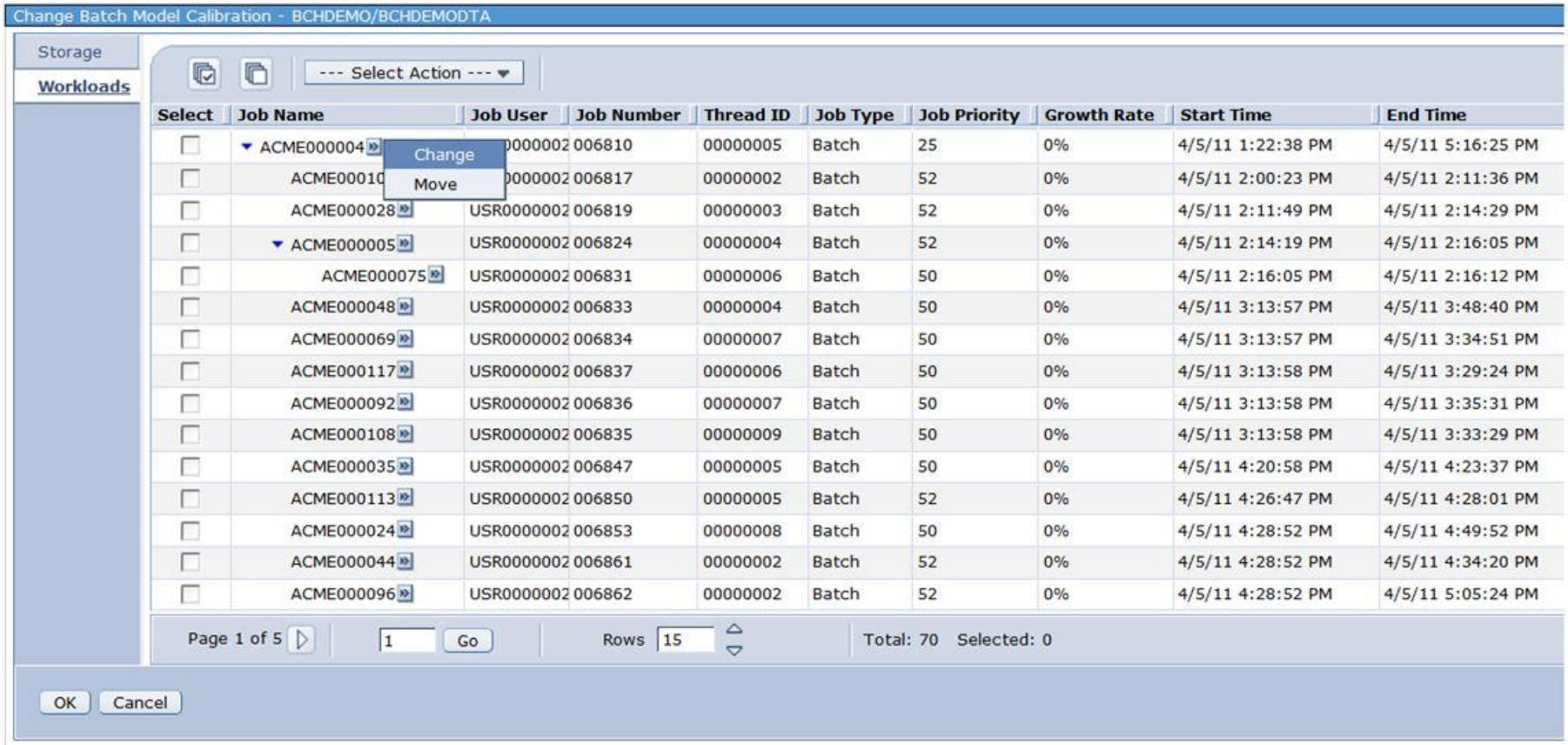
Batch Model

Change Batch Model Calibration

- Change or Move Workloads



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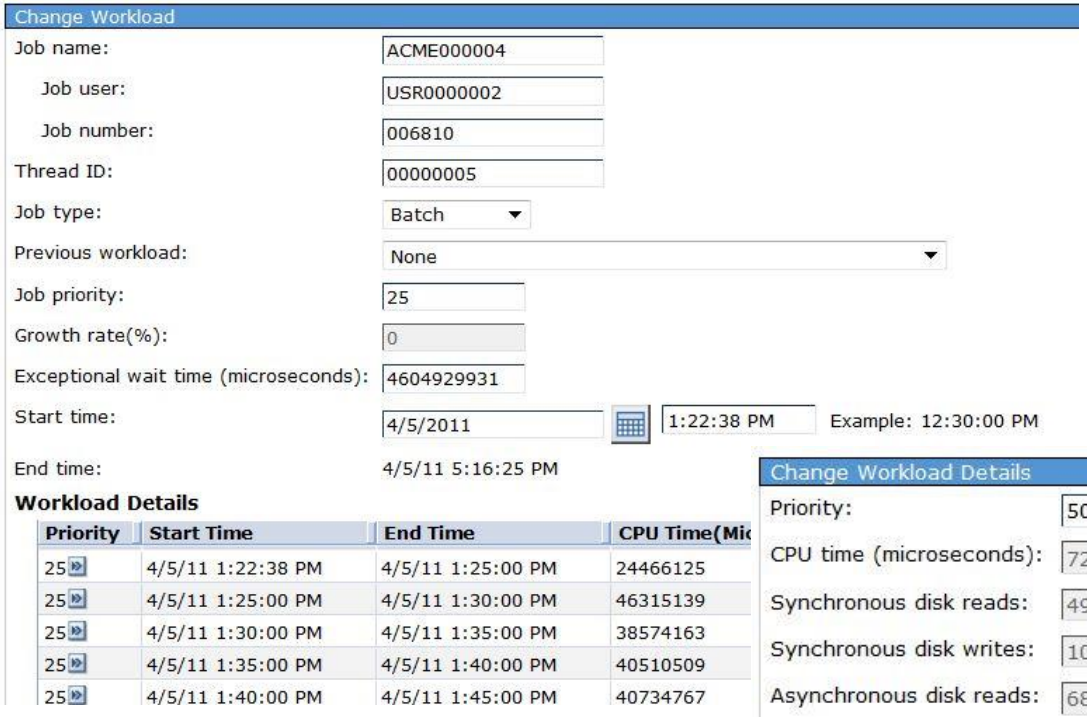
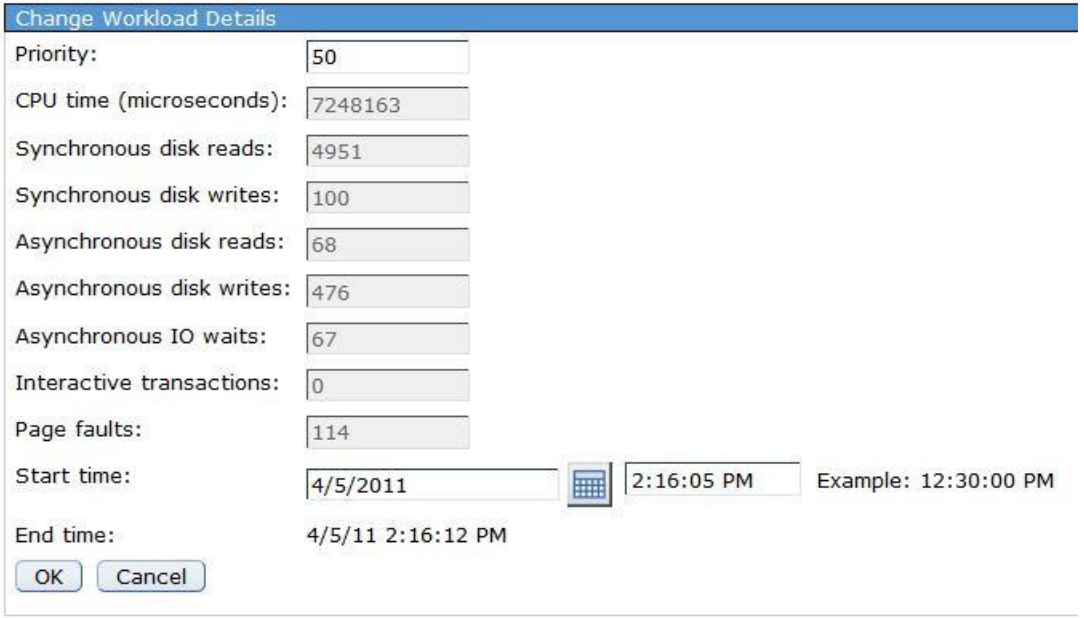
Batch Model

Change Batch Model Calibration





Change Workload &

Change Workload Details

Can change the following:

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

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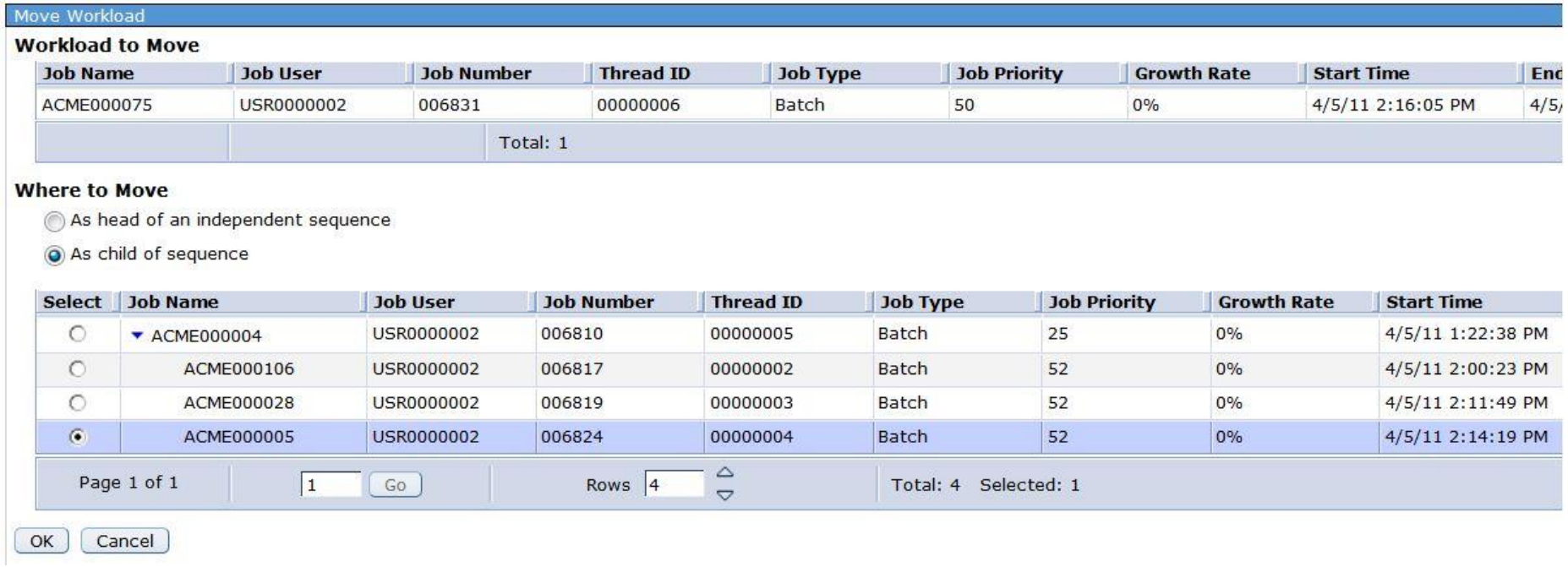
Batch Model

Change Batch Model Calibration

Use “Move Workload” if workloads are not linked correctly



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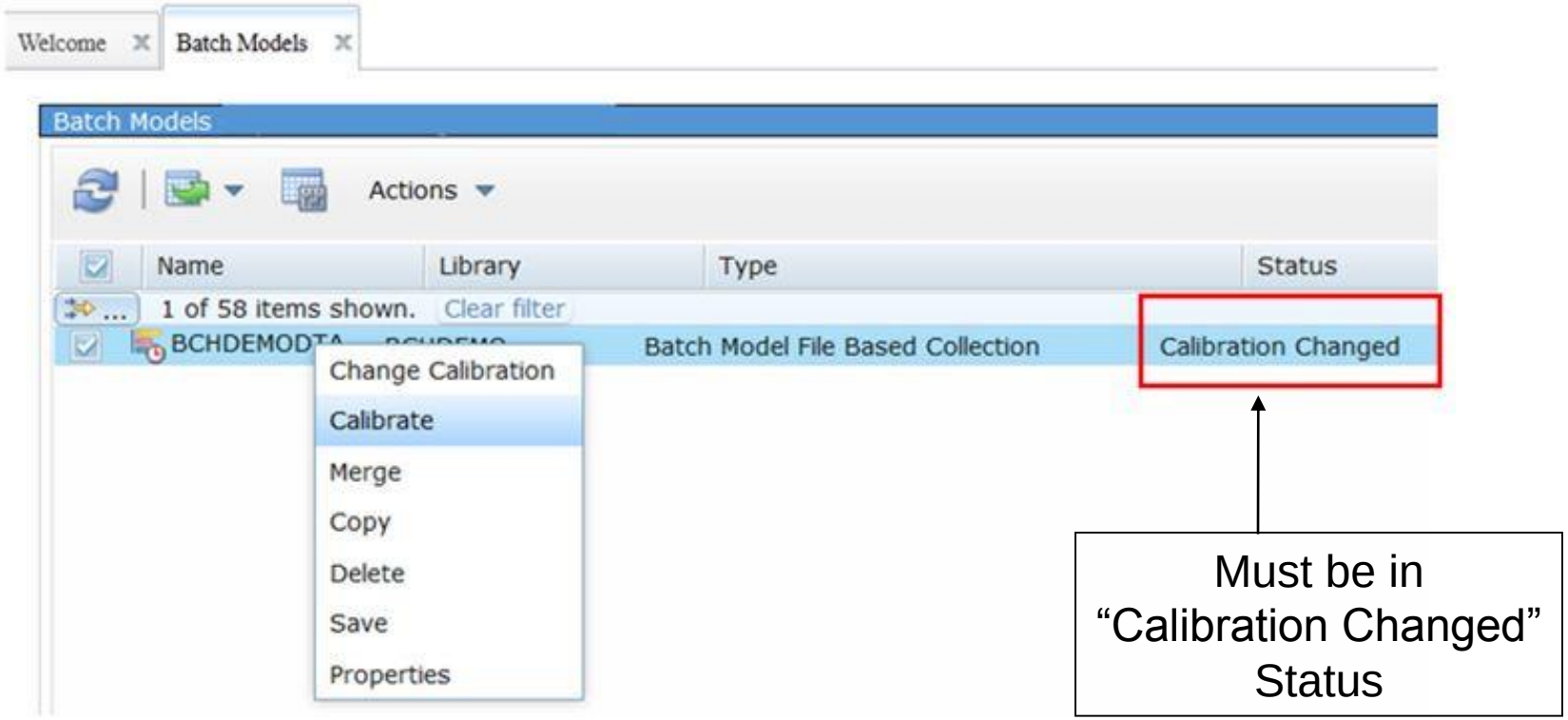
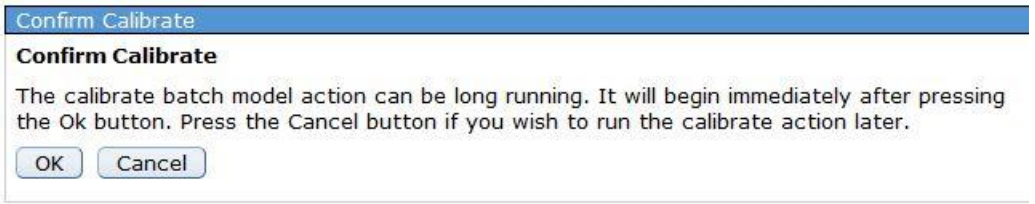
Batch Model

Calibrate Batch Model





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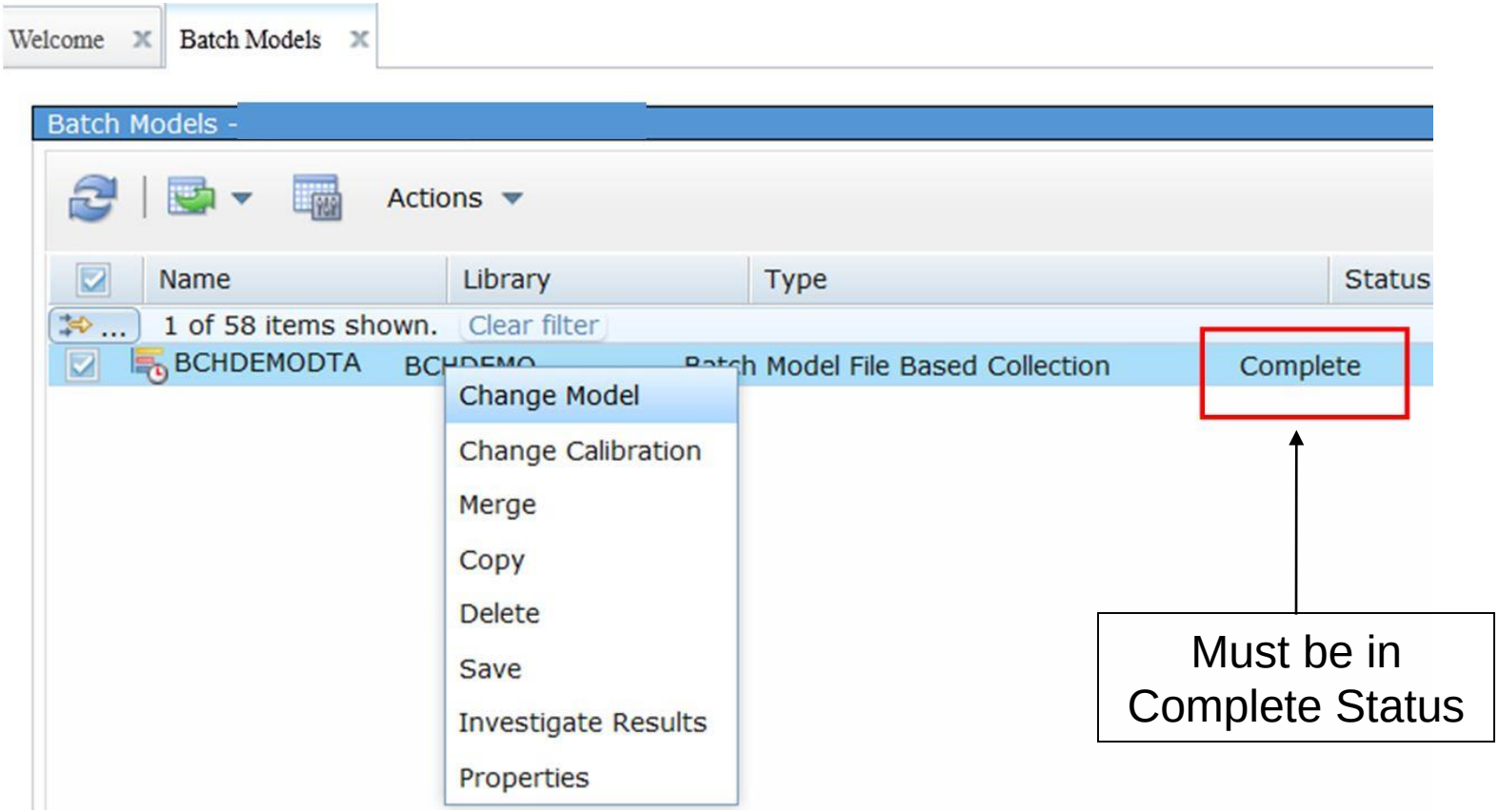
Batch Model
Change Batch Model

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



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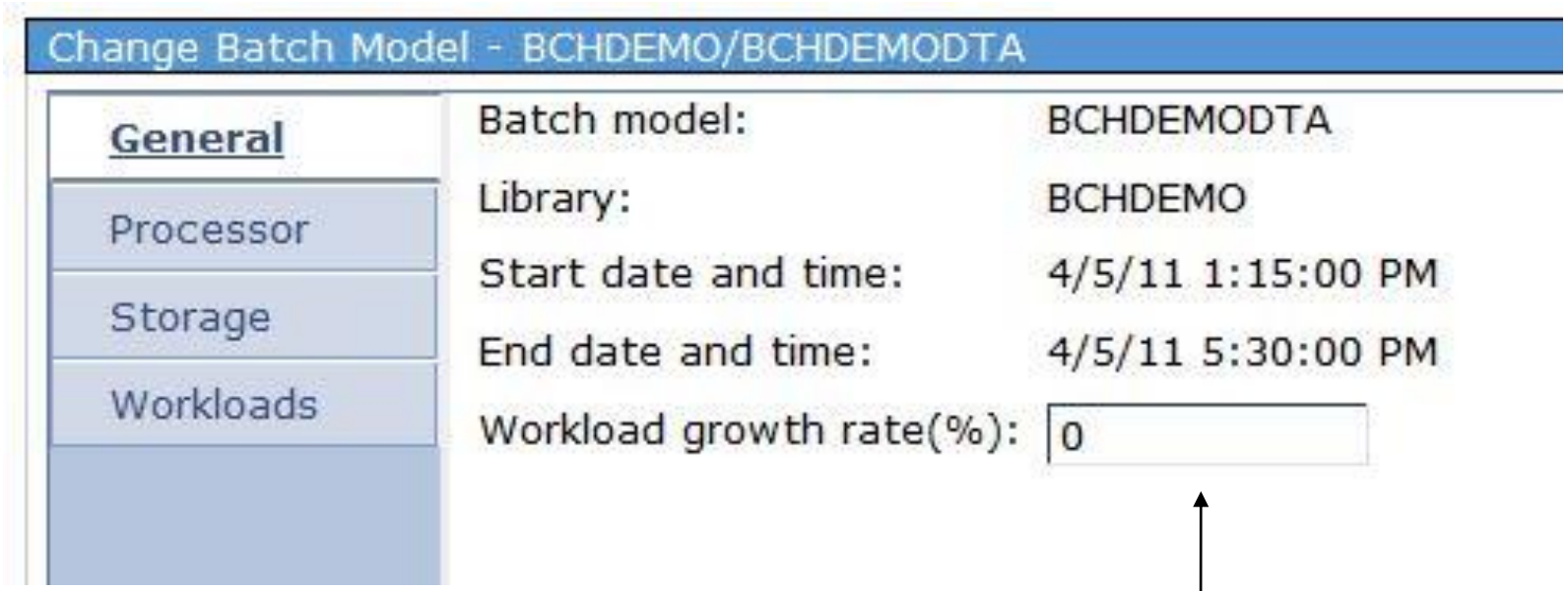
Batch Model

Change Batch Model – Growth



Increase or decrease growth rate of work done by all jobs

Workload growth rate(%): 5 = 5% increase

Workload growth rate(%): -5 = 5% decrease

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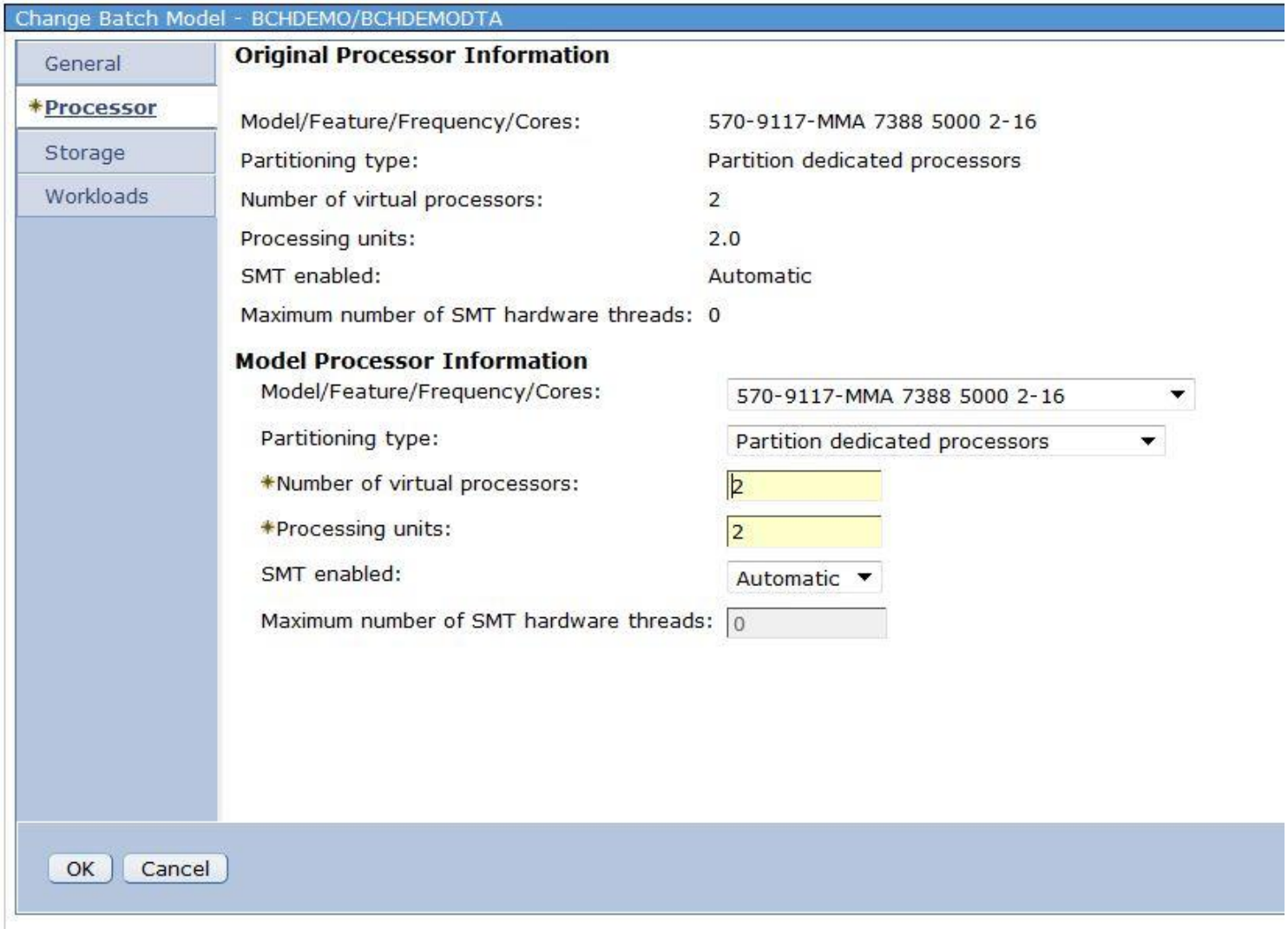
Batch Model

Change Batch Model – Processor



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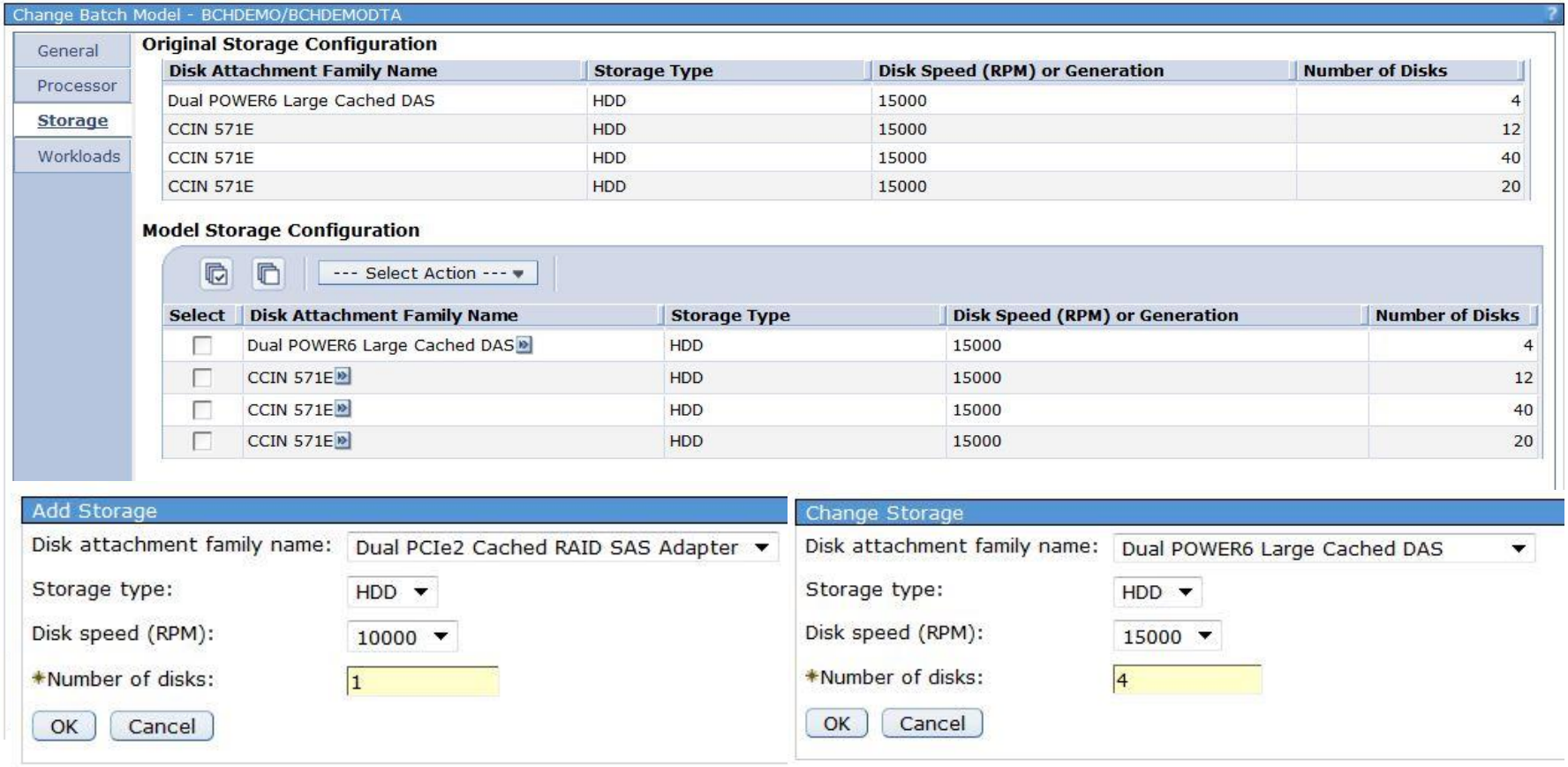
Batch Model

Change Batch Model – Storage

- Add, Change, or Delete Disk Configurations



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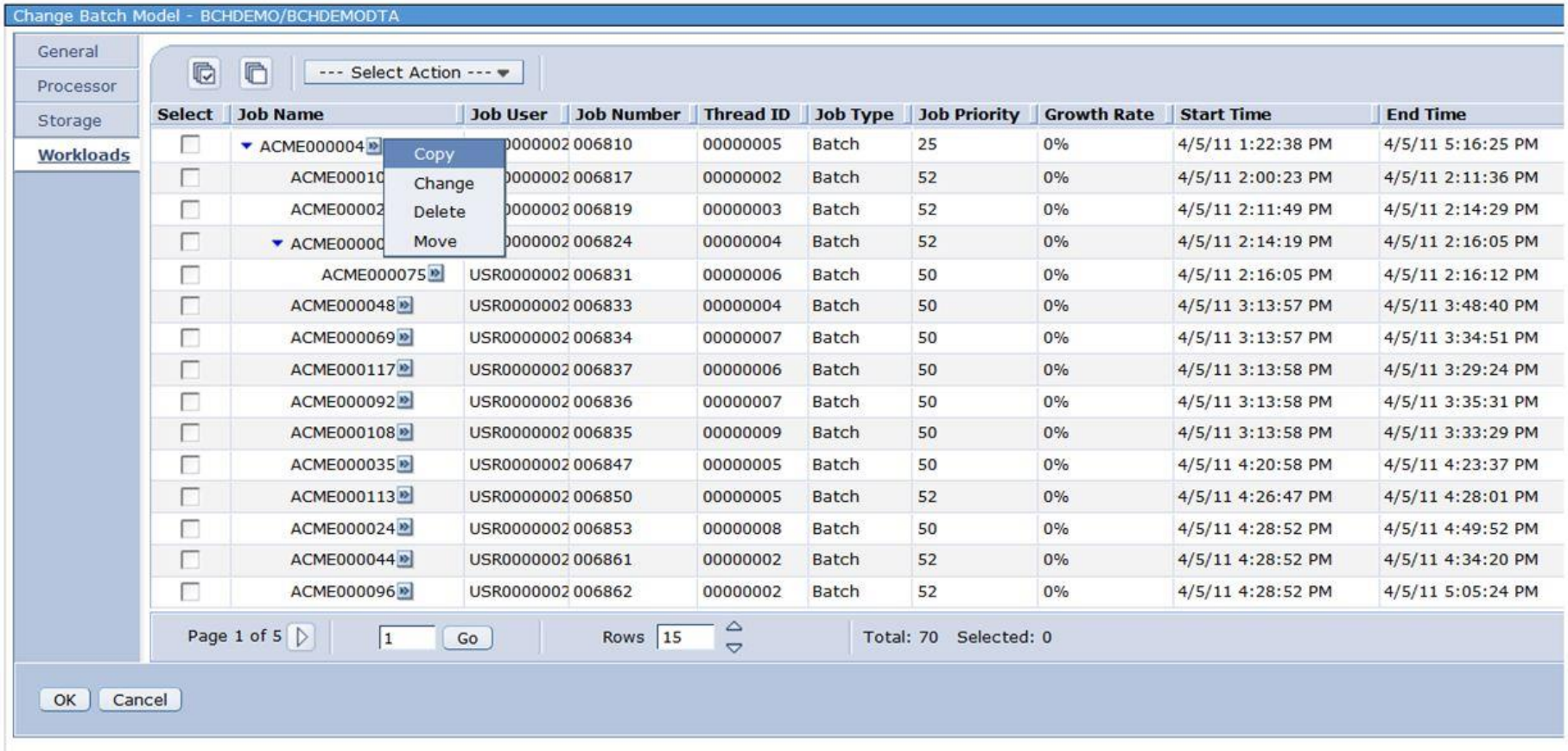
Batch Model

Change Batch Model – Workloads

- Copy, Change, Delete, or Move Workloads



Select	Job Name	Job User	Job Number	Thread ID	Job Type	Job Priority	Growth Rate	Start Time	End Time
☐	ACME000004	0000002	006810	00000005	Batch	25	0%	4/5/11 1:22:38 PM	4/5/11 5:16:25 PM
☐	ACME00010	0000002	006817	00000002	Batch	52	0%	4/5/11 2:00:23 PM	4/5/11 2:11:36 PM
☐	ACME00002	0000002	006819	00000003	Batch	52	0%	4/5/11 2:11:49 PM	4/5/11 2:14:29 PM
☐	ACME00000	0000002	006824	00000004	Batch	52	0%	4/5/11 2:14:19 PM	4/5/11 2:16:05 PM
☐	ACME000075	USR0000002	006831	00000006	Batch	50	0%	4/5/11 2:16:05 PM	4/5/11 2:16:12 PM
☐	ACME000048	USR0000002	006833	00000004	Batch	50	0%	4/5/11 3:13:57 PM	4/5/11 3:48:40 PM
☐	ACME000069	USR0000002	006834	00000007	Batch	50	0%	4/5/11 3:13:57 PM	4/5/11 3:34:51 PM
☐	ACME000117	USR0000002	006837	00000006	Batch	50	0%	4/5/11 3:13:58 PM	4/5/11 3:29:24 PM
☐	ACME000092	USR0000002	006836	00000007	Batch	50	0%	4/5/11 3:13:58 PM	4/5/11 3:35:31 PM
☐	ACME000108	USR0000002	006835	00000009	Batch	50	0%	4/5/11 3:13:58 PM	4/5/11 3:33:29 PM
☐	ACME000035	USR0000002	006847	00000005	Batch	50	0%	4/5/11 4:20:58 PM	4/5/11 4:23:37 PM
☐	ACME000113	USR0000002	006850	00000005	Batch	52	0%	4/5/11 4:26:47 PM	4/5/11 4:28:01 PM
☐	ACME000024	USR0000002	006853	00000008	Batch	50	0%	4/5/11 4:28:52 PM	4/5/11 4:49:52 PM
☐	ACME000044	USR0000002	006861	00000002	Batch	52	0%	4/5/11 4:28:52 PM	4/5/11 4:34:20 PM
☐	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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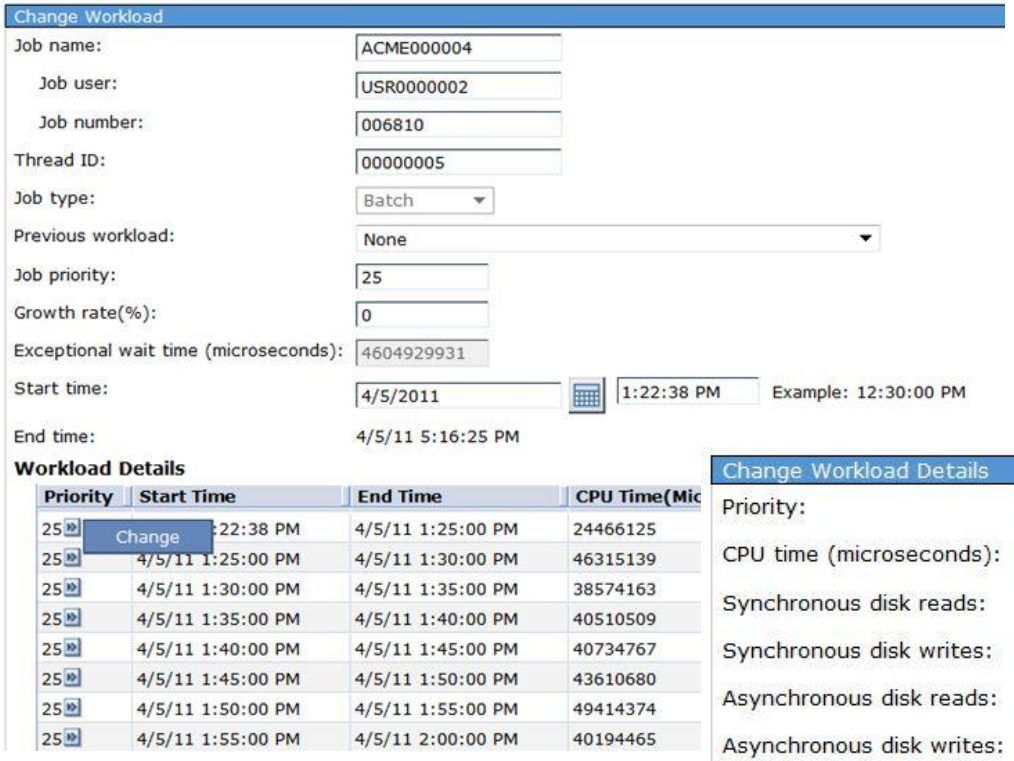
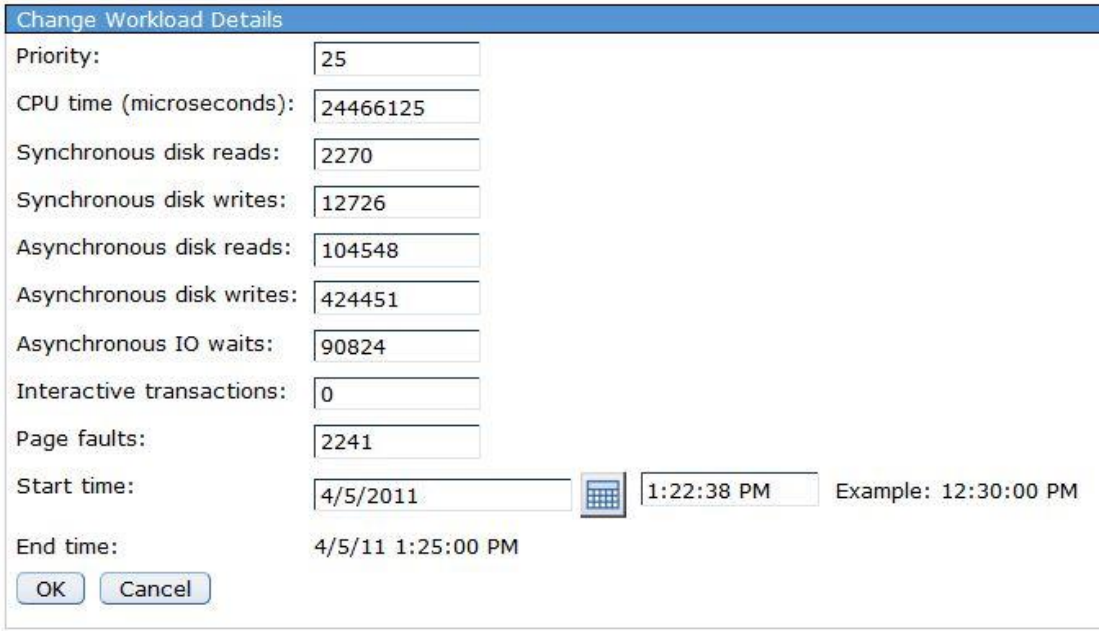
Batch Model

Change Batch Model – Workloads



Change Workload &

Change Workload Details



Can change

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

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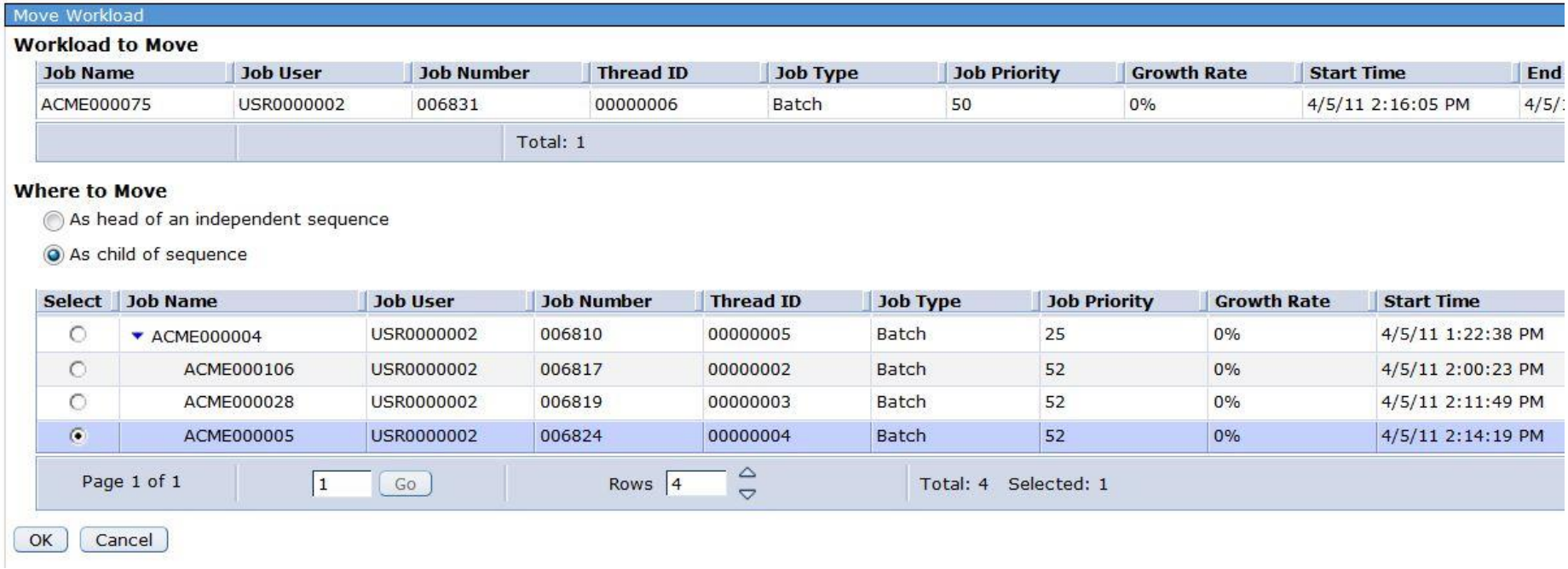
Batch Model

Change Batch Model – Workloads

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



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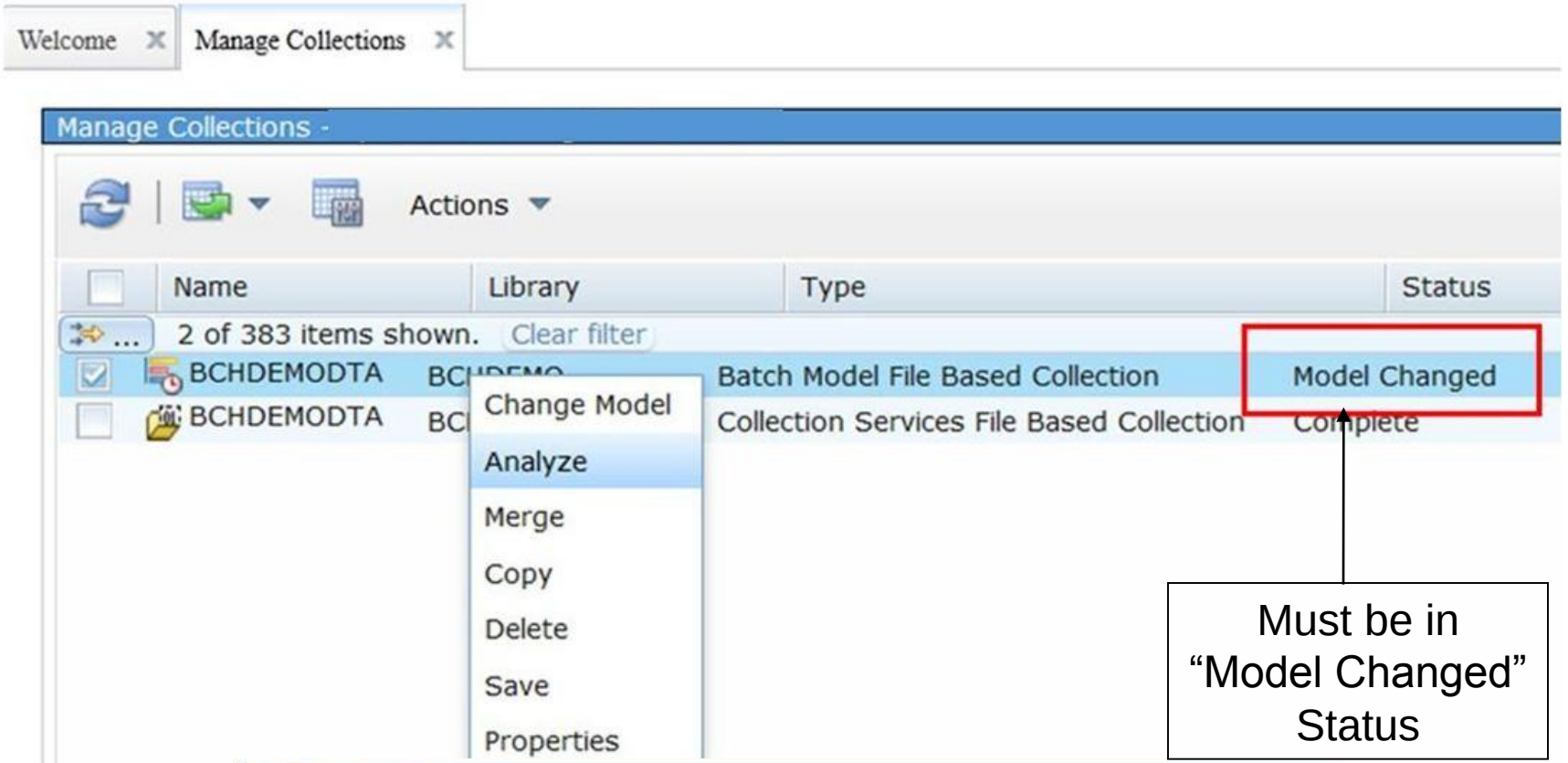
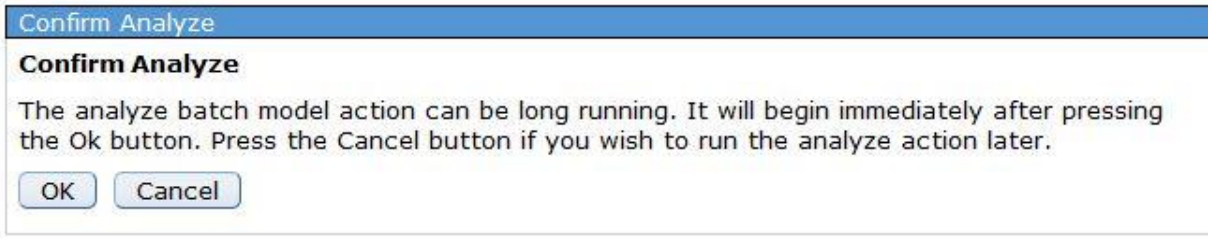
Batch Model

Analyze Batch Model





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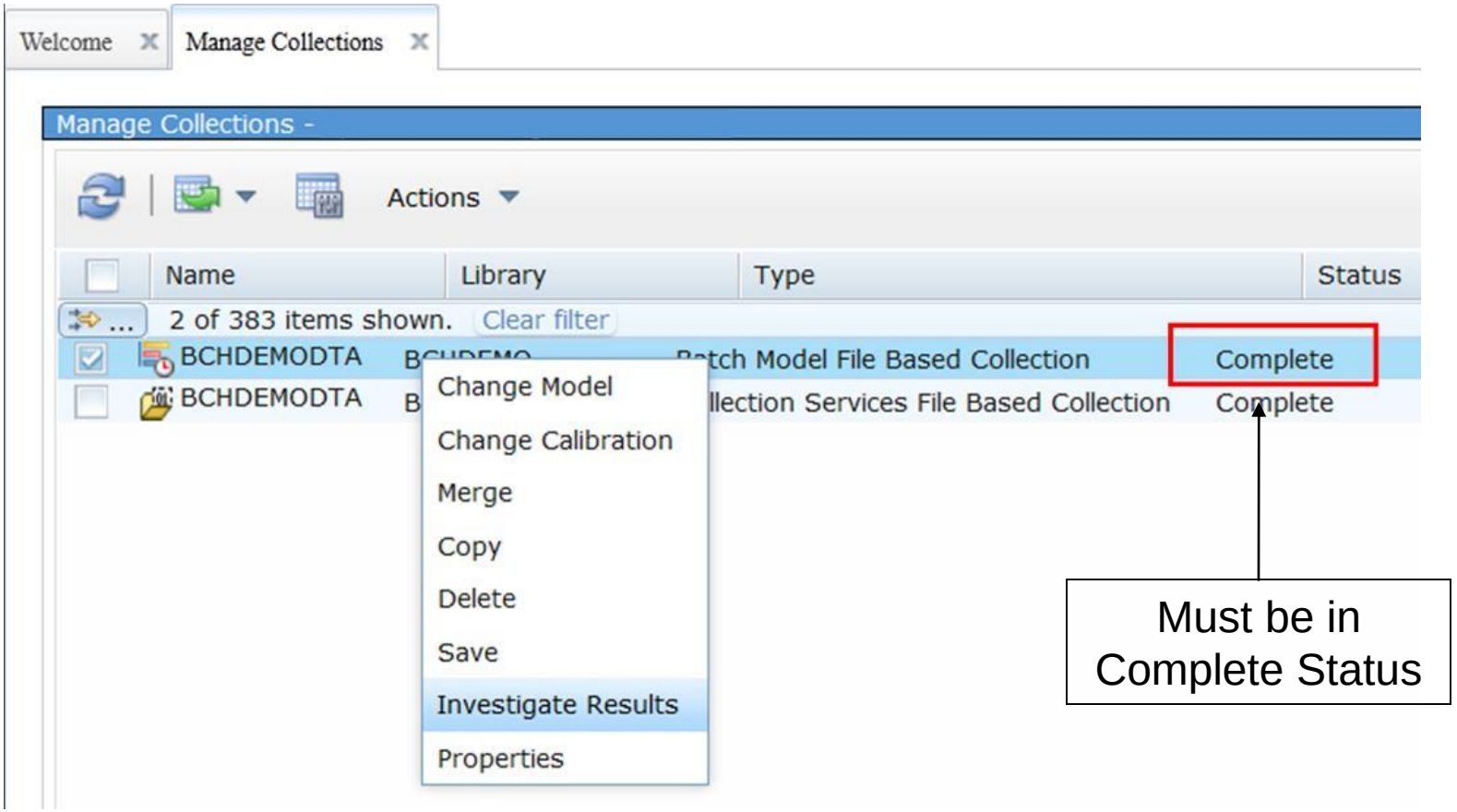
Batch Model
Investigate Results

View the model results



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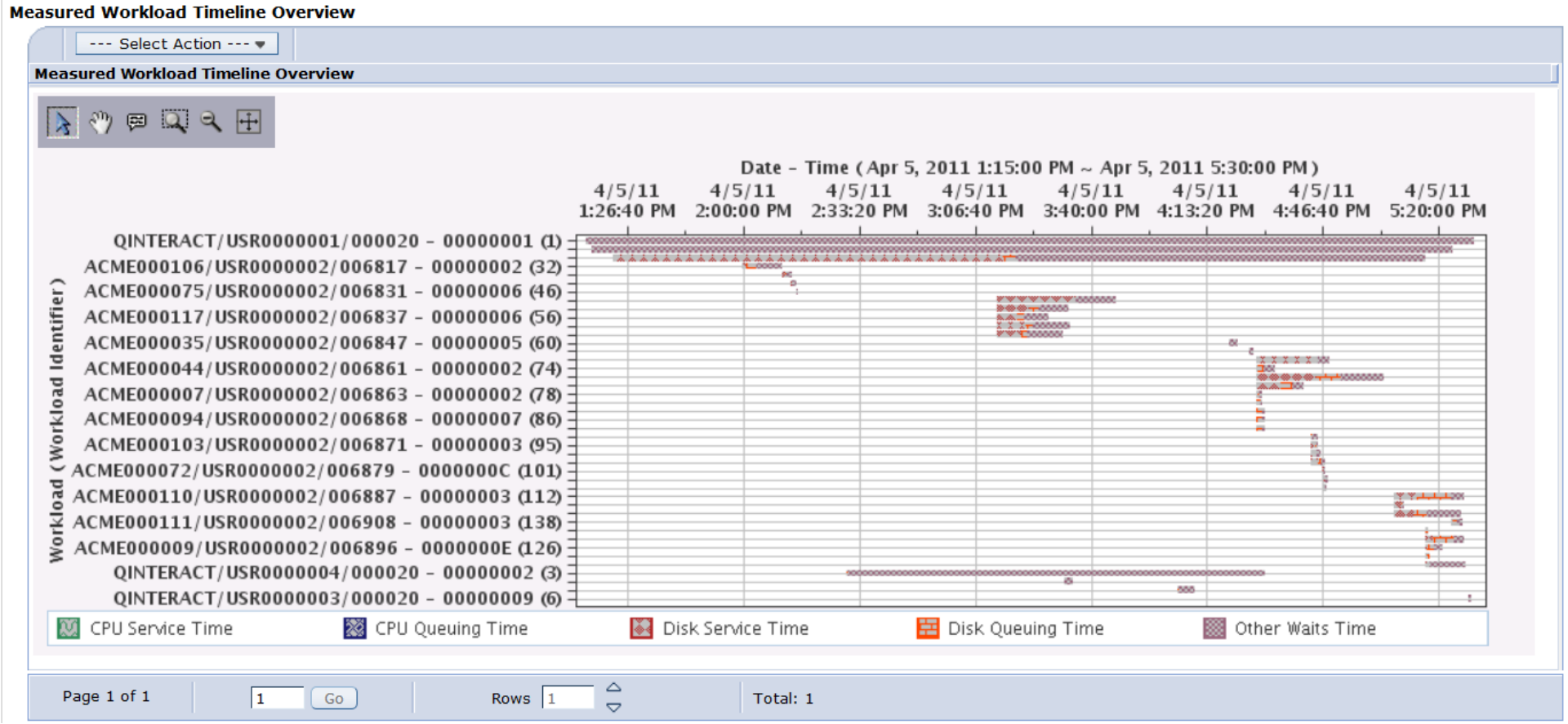
Batch Model
Workload Timeline Overview

Compare Measured vs Modeled Workload Timelines



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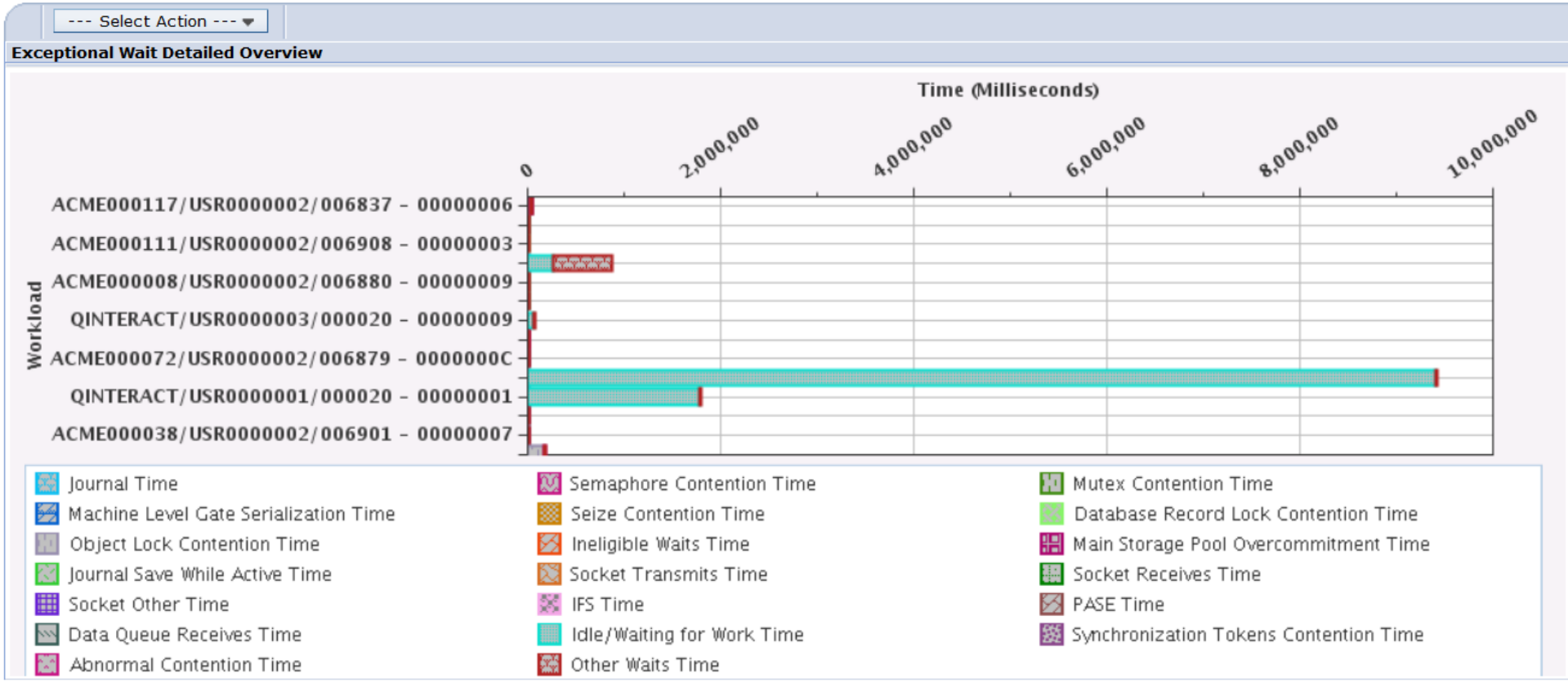
Batch Model

Exceptional Wait Detailed Overview

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



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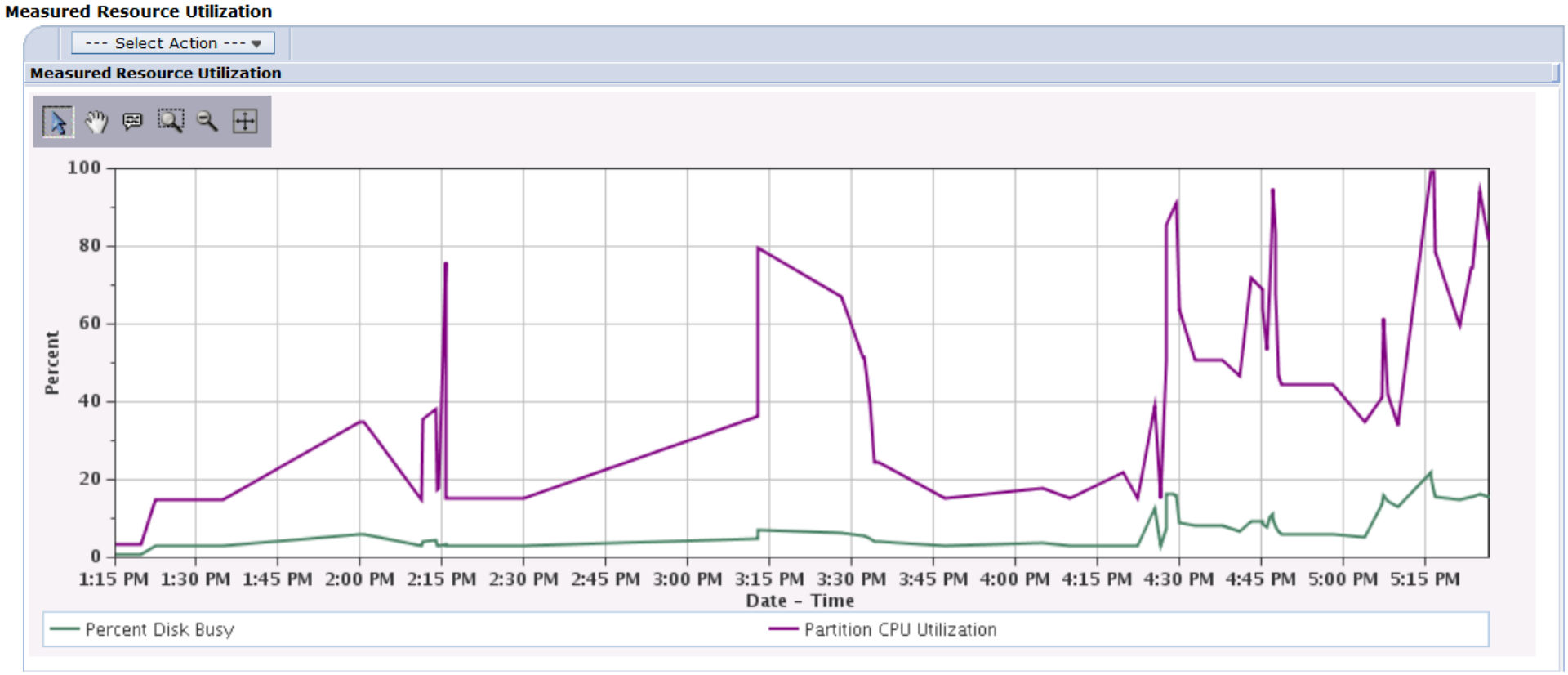
Batch Model
Resource Utilization Overview

Compare the Measured vs Modeled Resource Utilization



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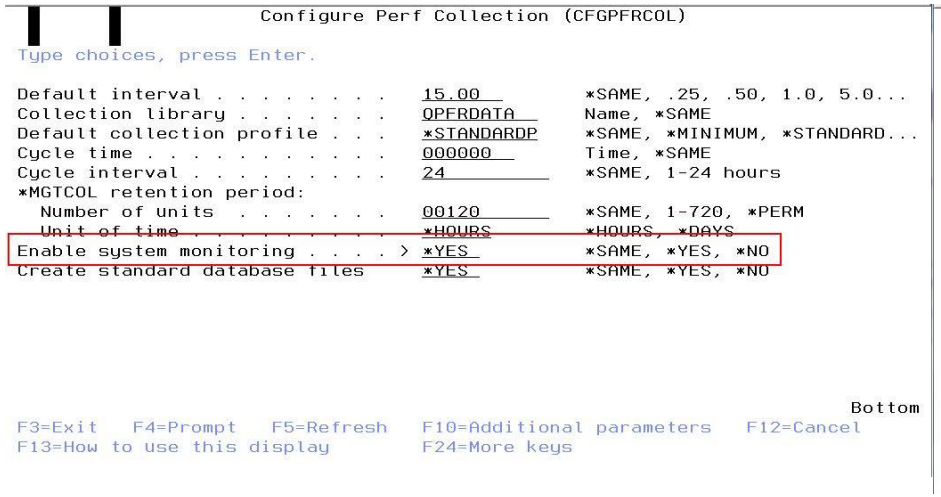
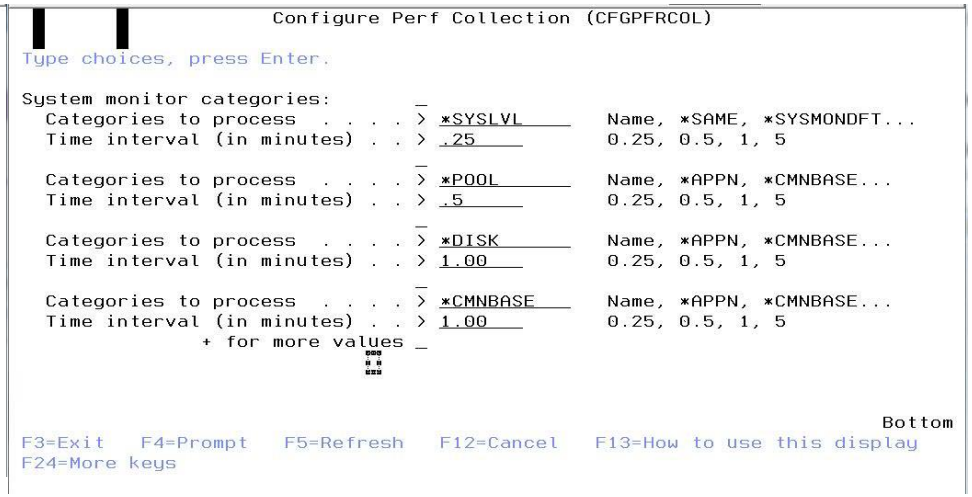
System Monitoring

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.





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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
  - CFGPFRCOL option to produce in standard data collection
  - Includes metrics supported by Management Central and more.

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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

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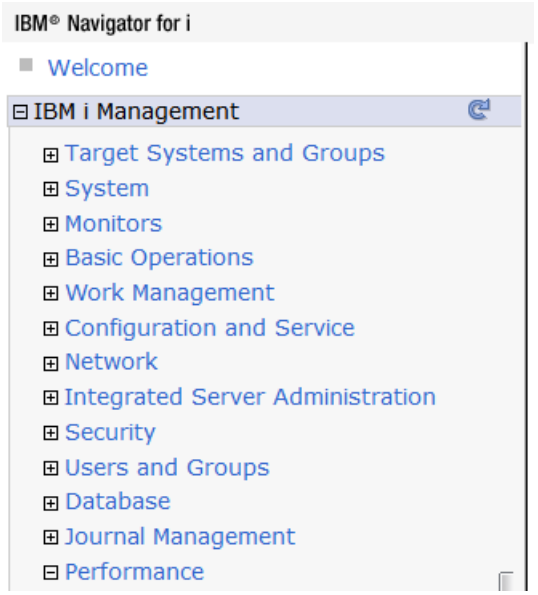
System Monitoring

- 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

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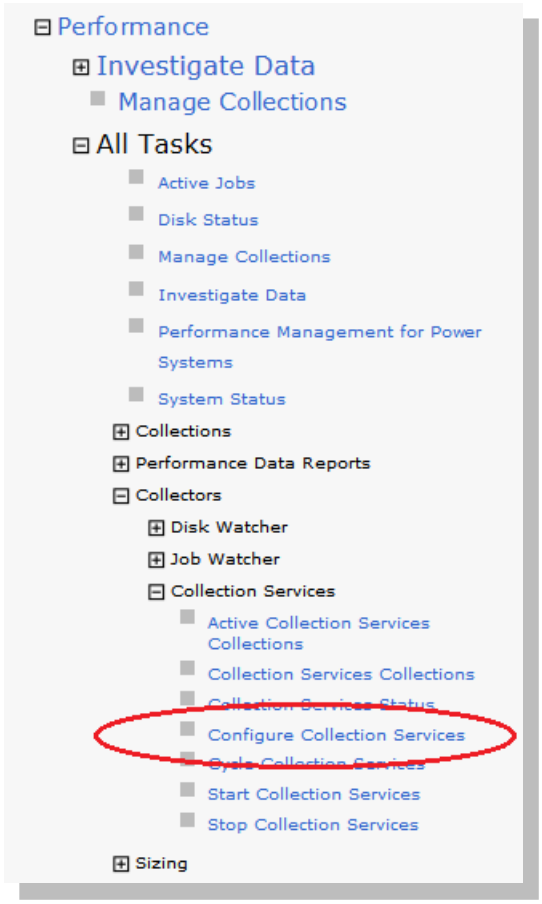
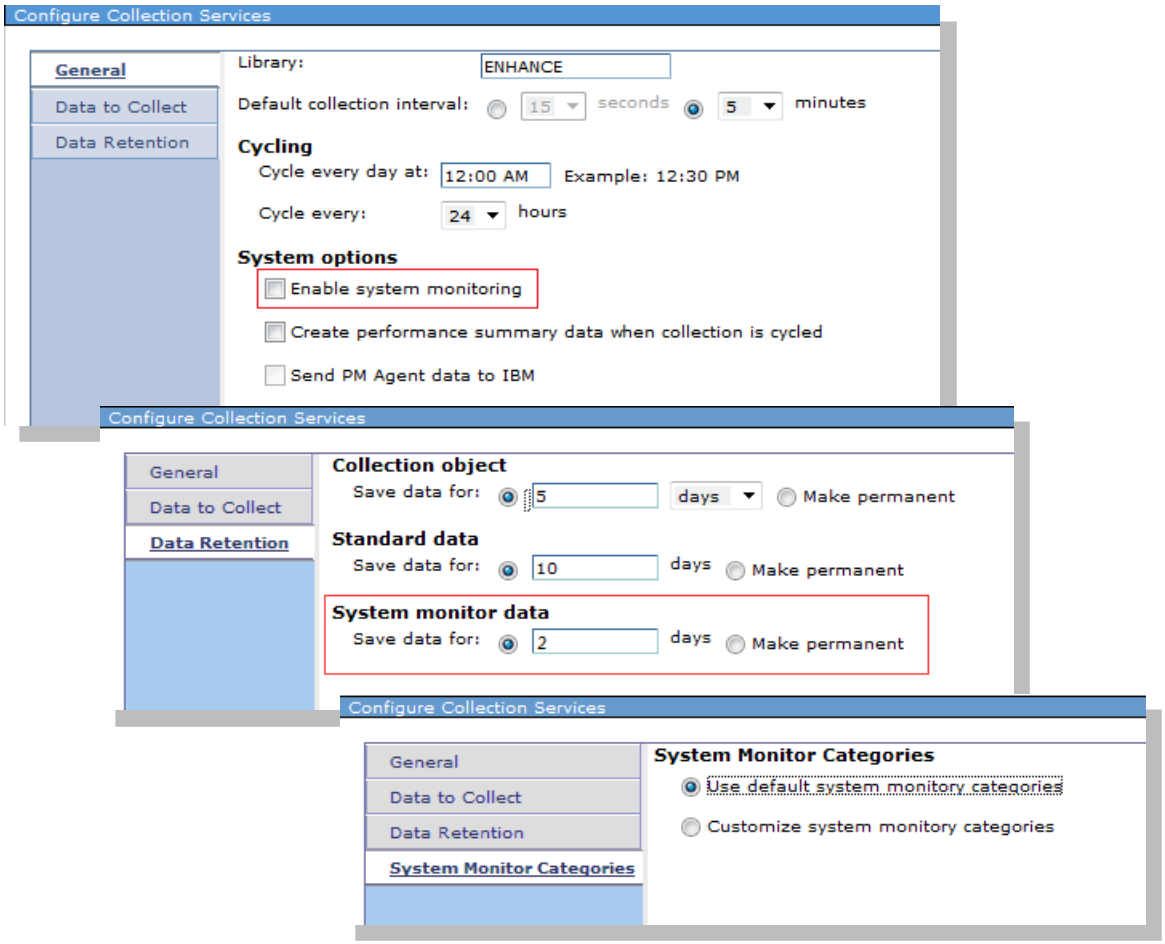
System Monitoring

Configure Collection Services GUI updated for the System Monitor support:





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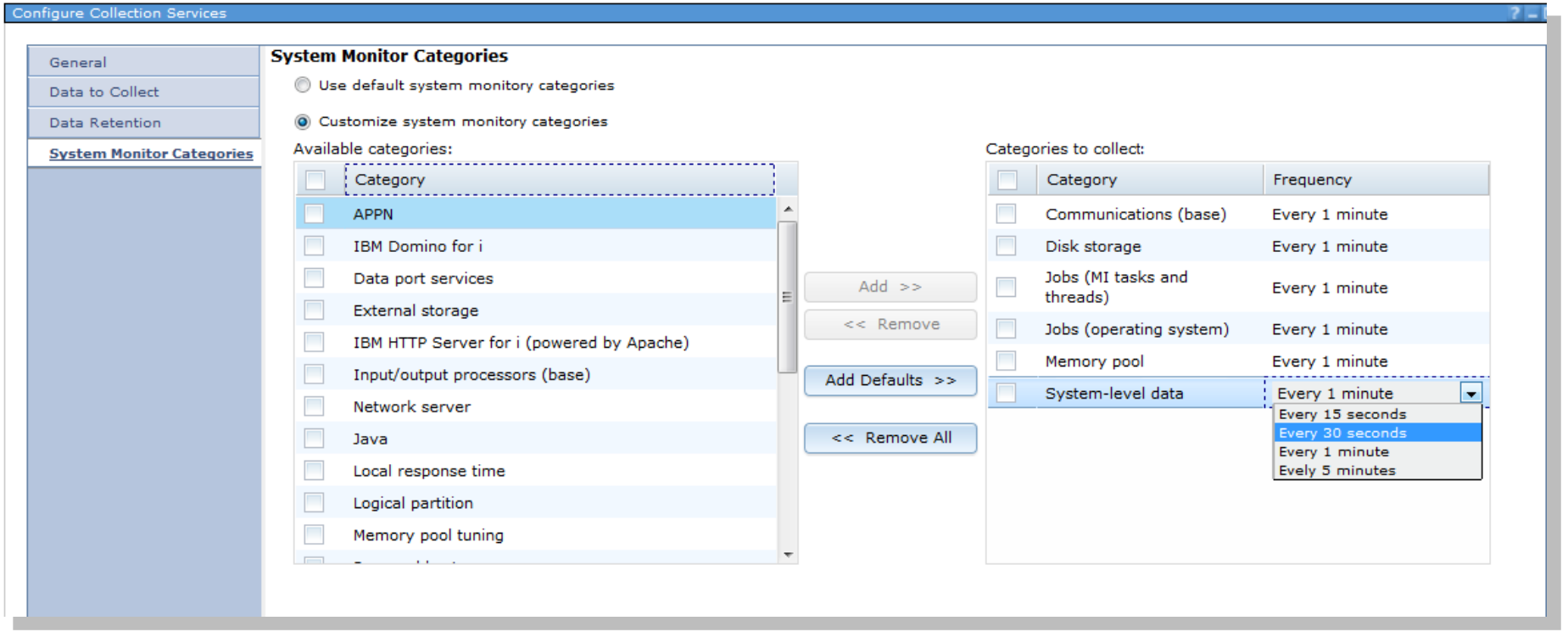
System Monitoring

Customize System Monitor categories



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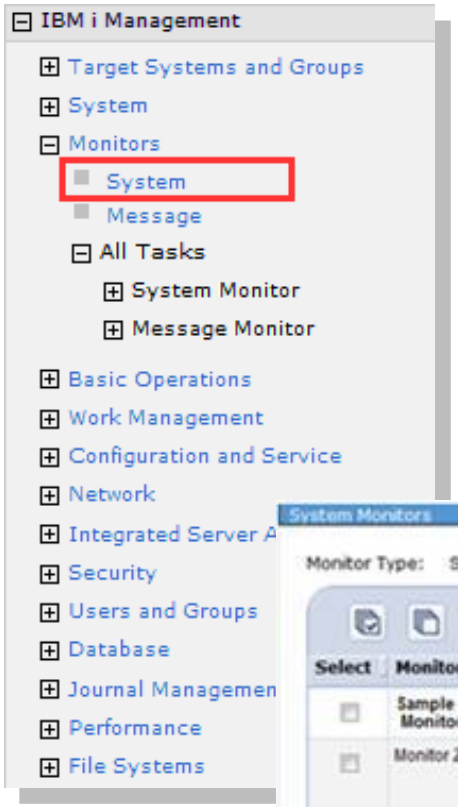
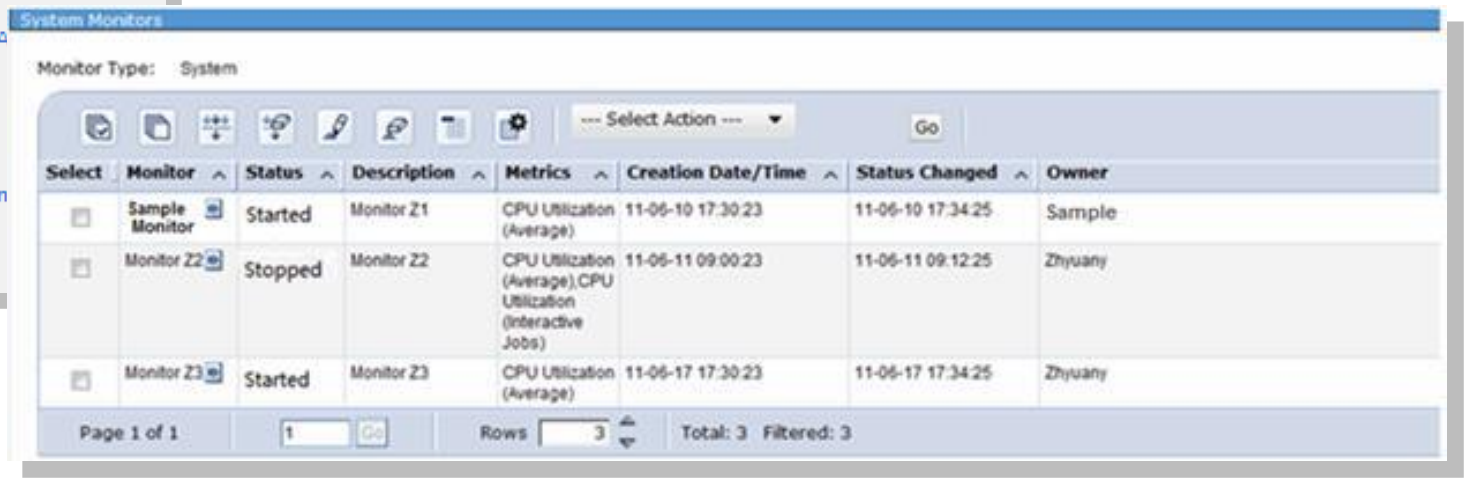
System Monitor GUI through IBM Navigator for i



- 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



List of system monitors on the system

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System Monitor Metrics – page 1

Metric Groups	Metric Description
CPU Utilization	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: CPU Utilization (Average) CPU Utilization (Interactive Jobs) CPU Utilization(Uncapped) CPU Utilization(SQL)
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.

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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)	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. 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.

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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.

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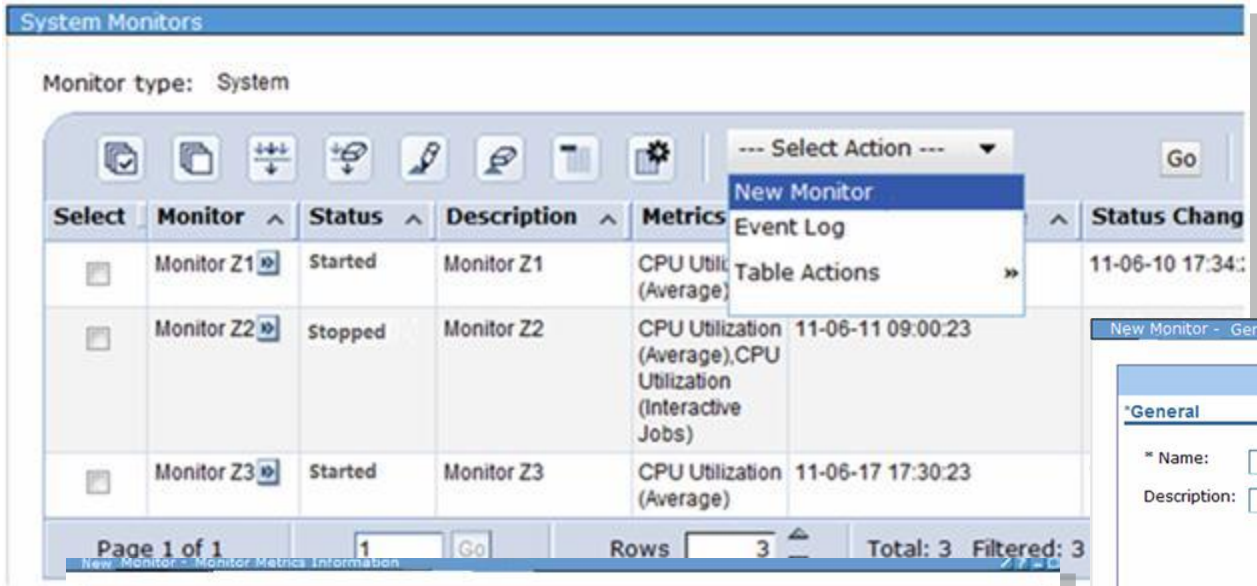
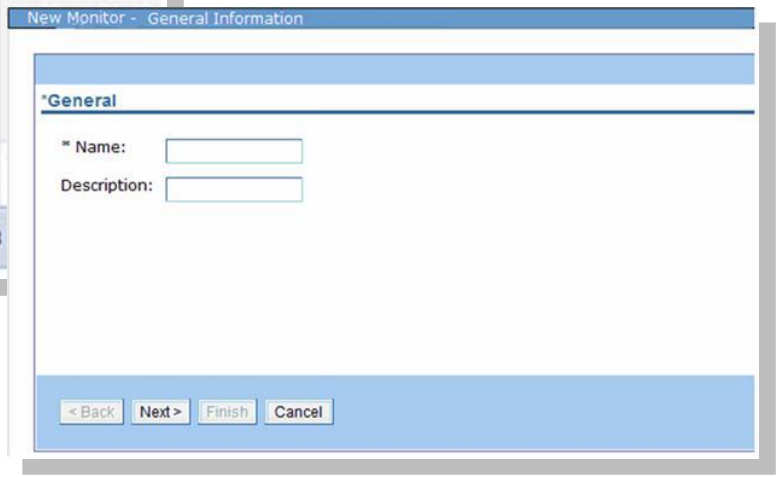
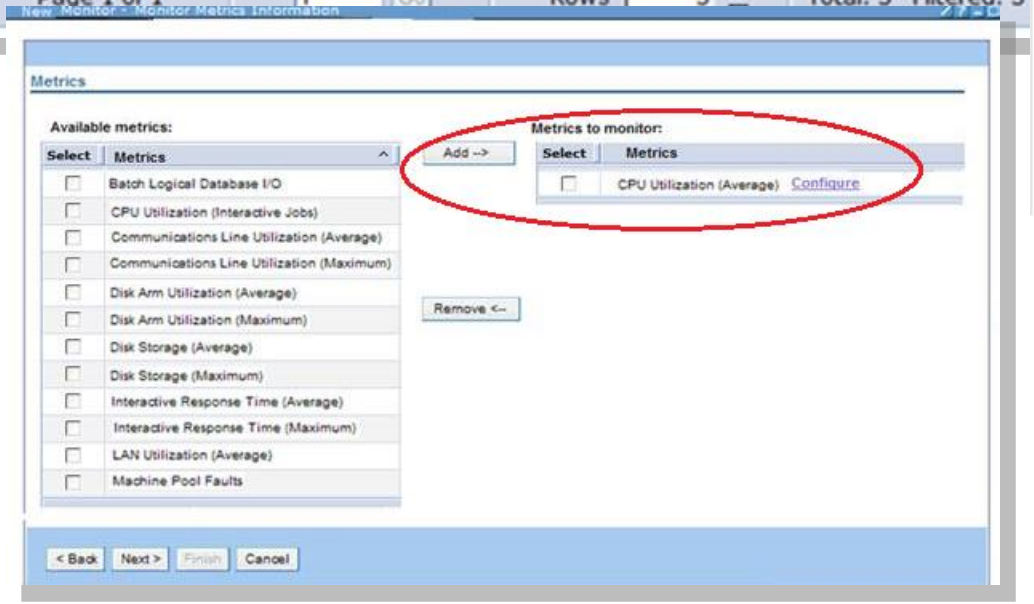
New Monitor



New Monitor – Name & Description





Monitor Metrics Information

Configure

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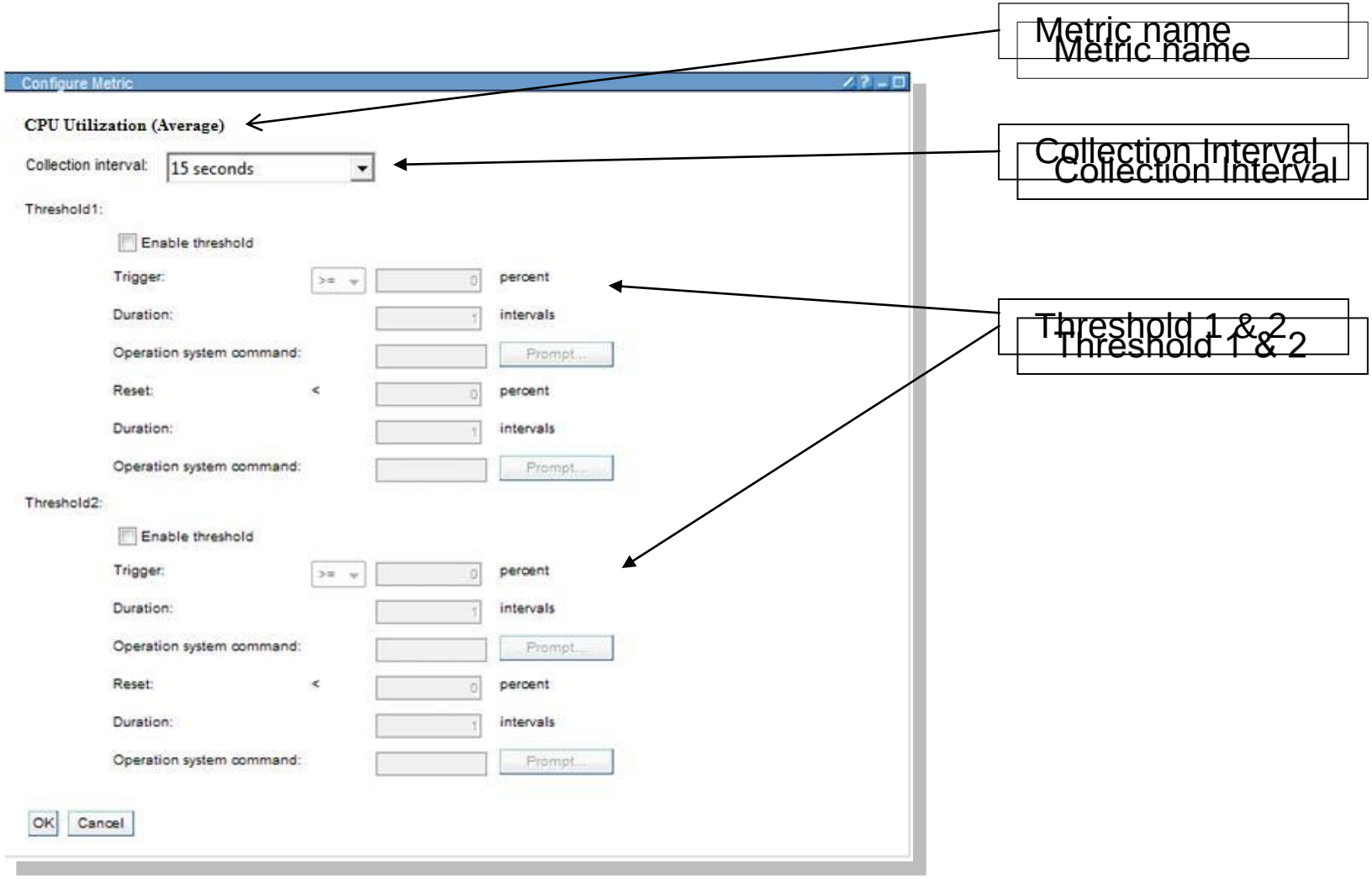
System Monitor - Configure Metric



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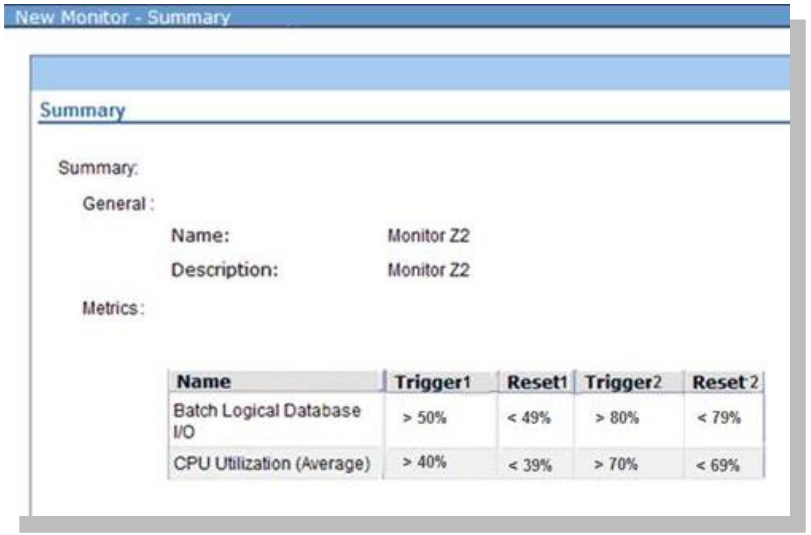
Configure Metric - Thresholds

- **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.



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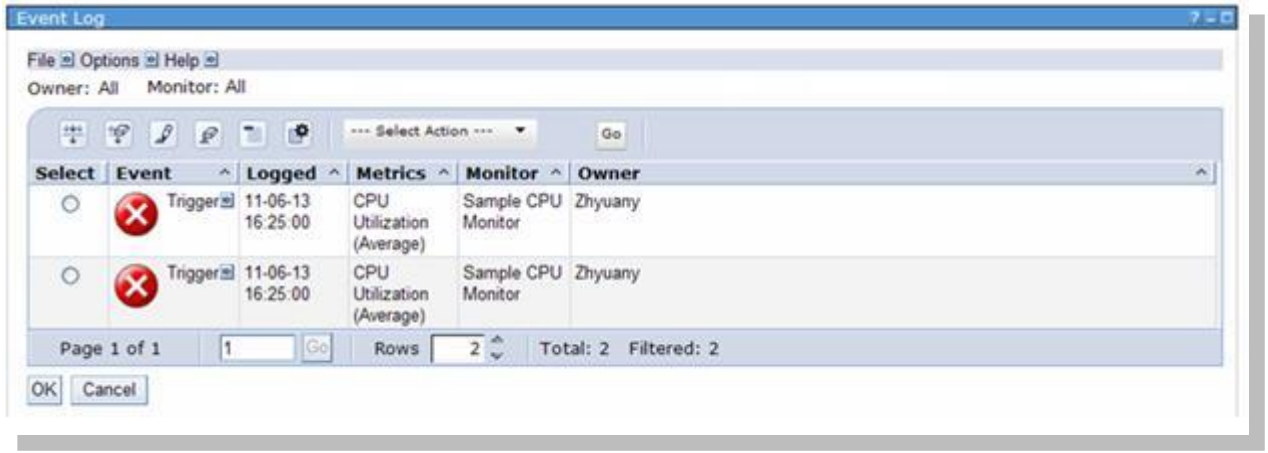
System Monitors

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

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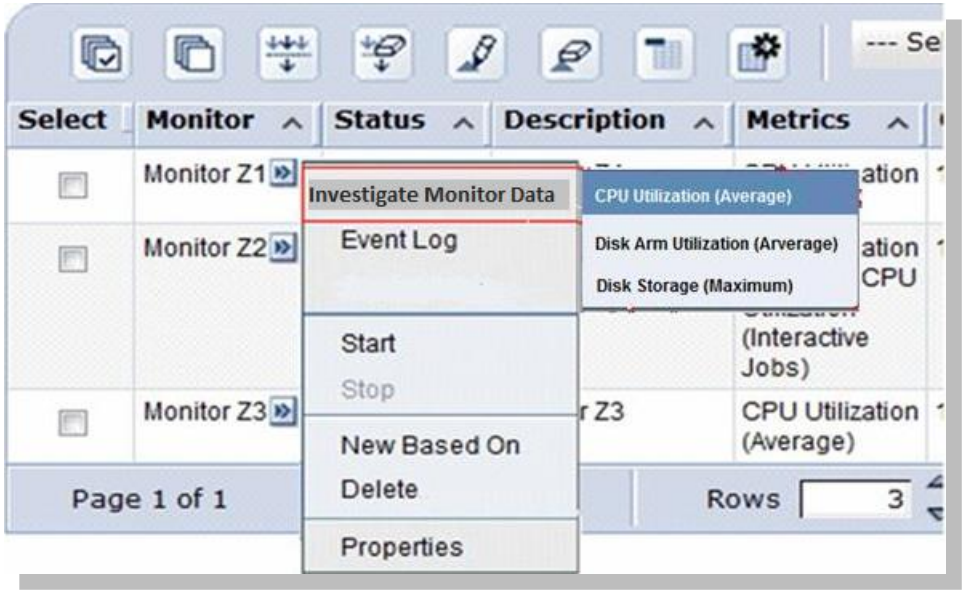
System Monitor Graphs in PDI

Display Graphs in PDI

New Perspective Package



Investigate Monitor Data

Launch from System Monitor GUI

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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)

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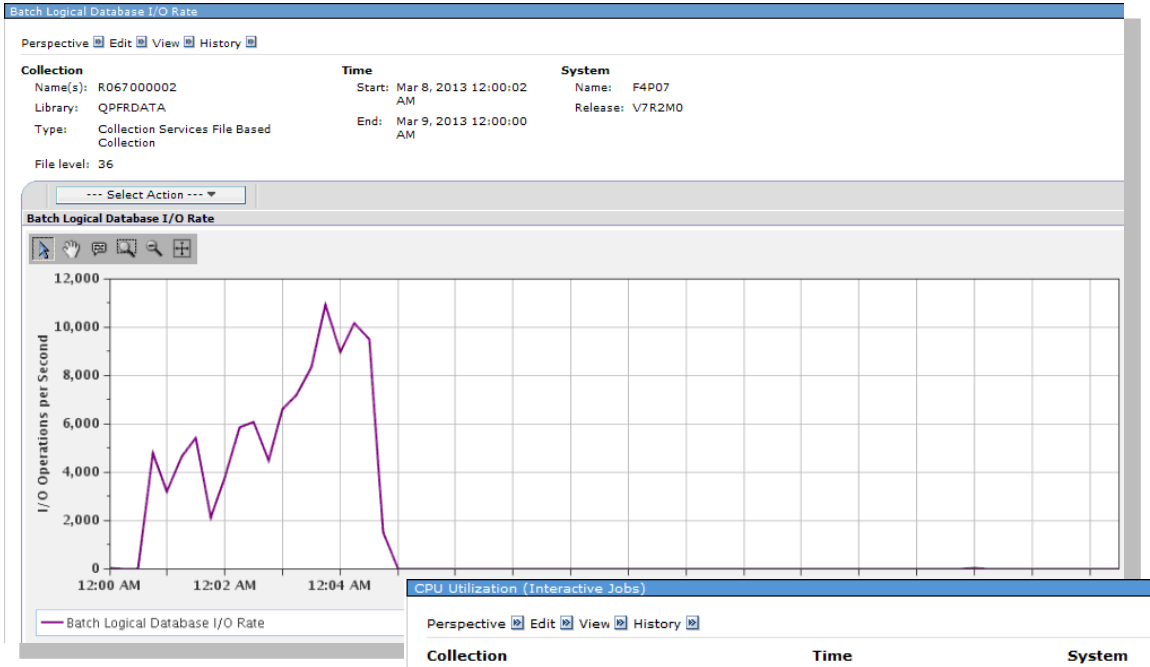
System Monitor Graphs in PDI



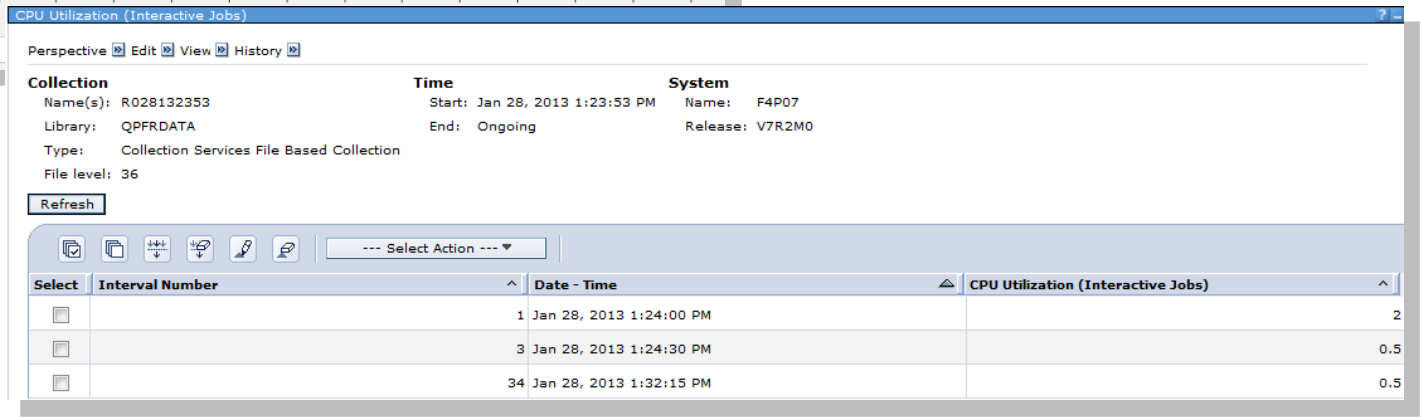


Table data behind the chart

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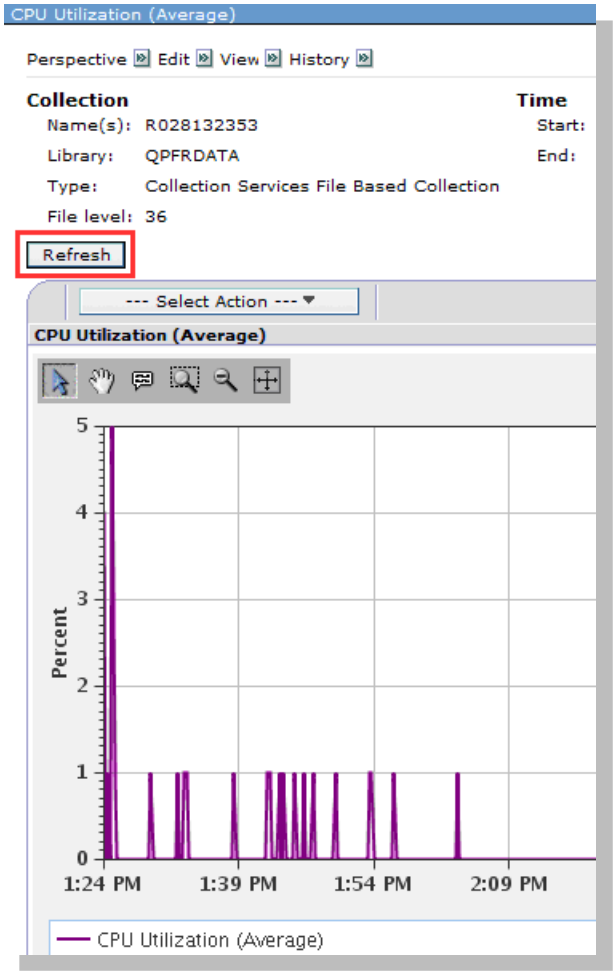
System Monitor - Refresh



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

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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

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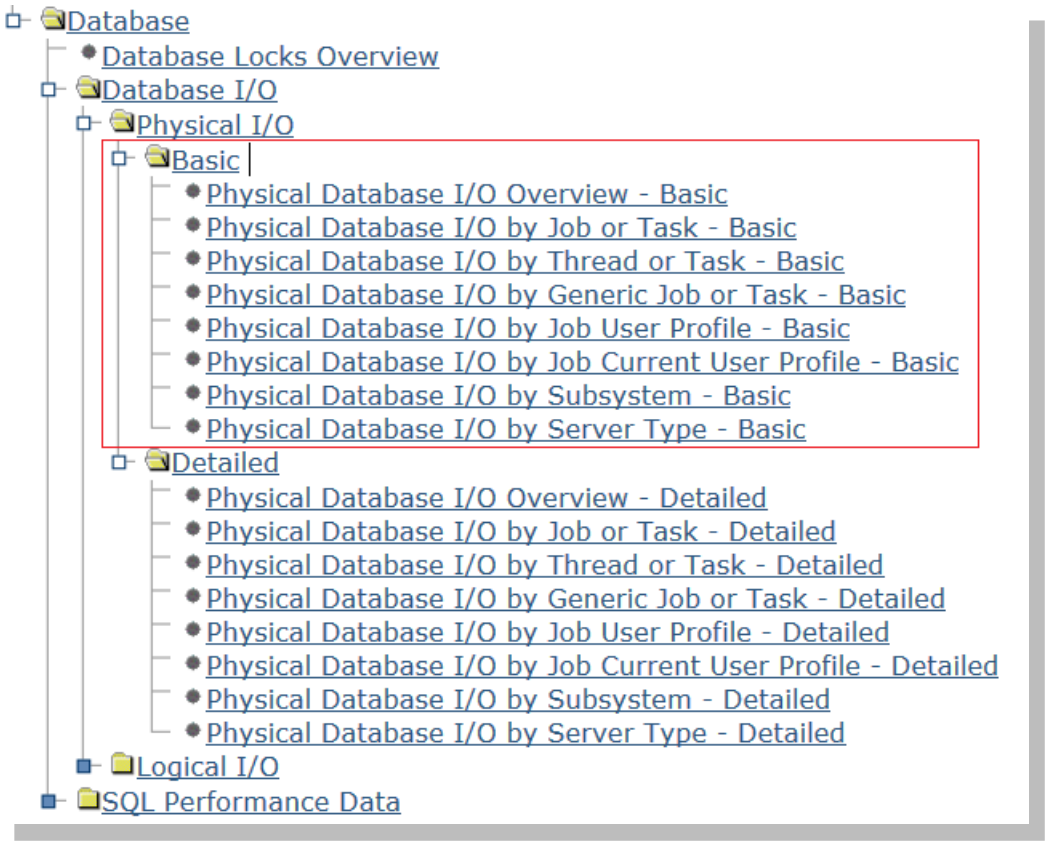
Database Package – Additional Perspective Groups

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

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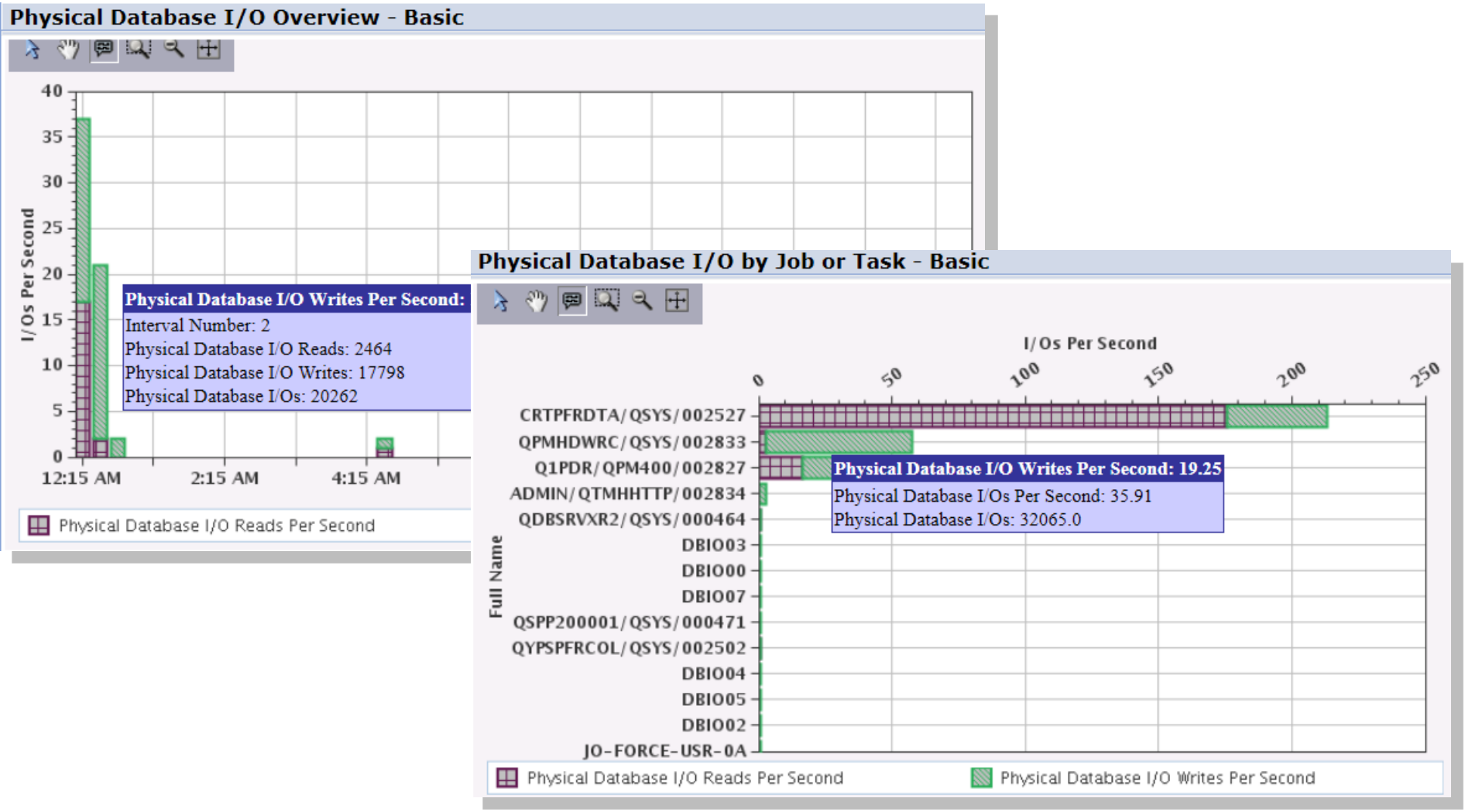
Physical Database I/O – Basic



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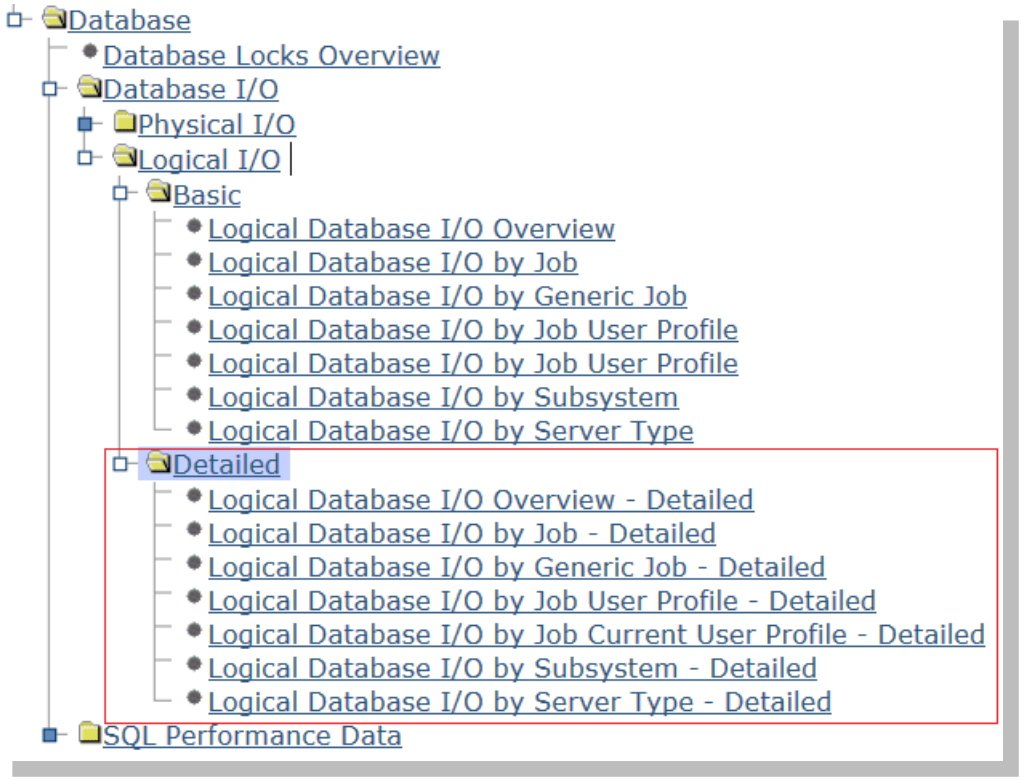
Database Package – Additional Perspective Groups

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

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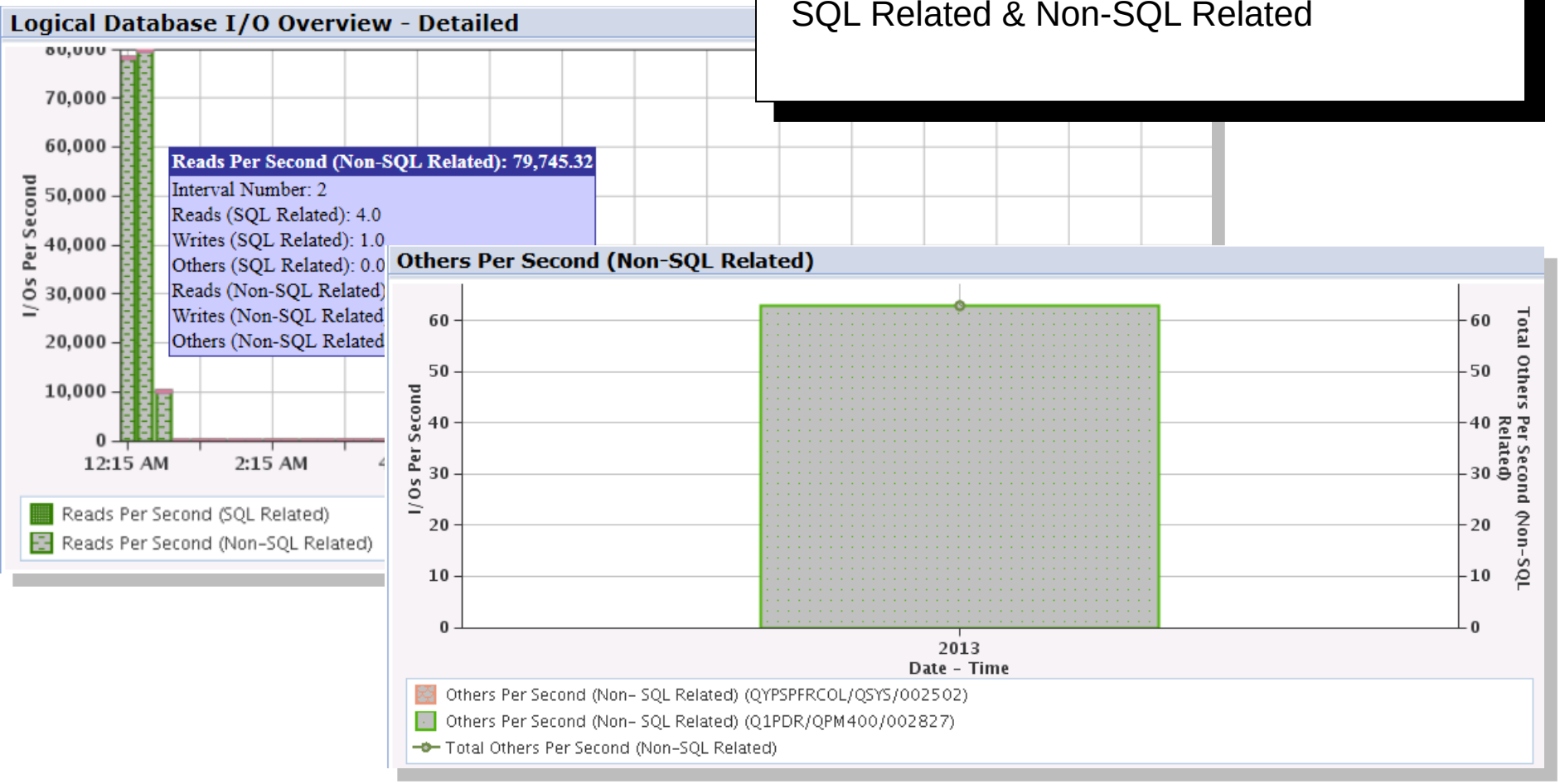
Logical Database I/O – Detailed

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

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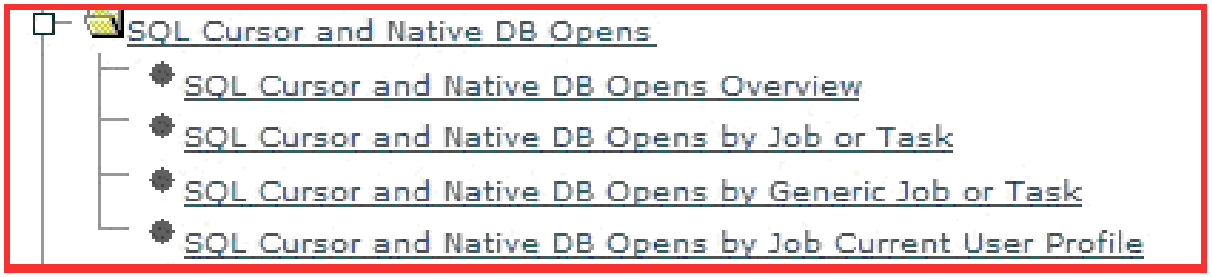
Database Package – Additional Perspective Groups

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

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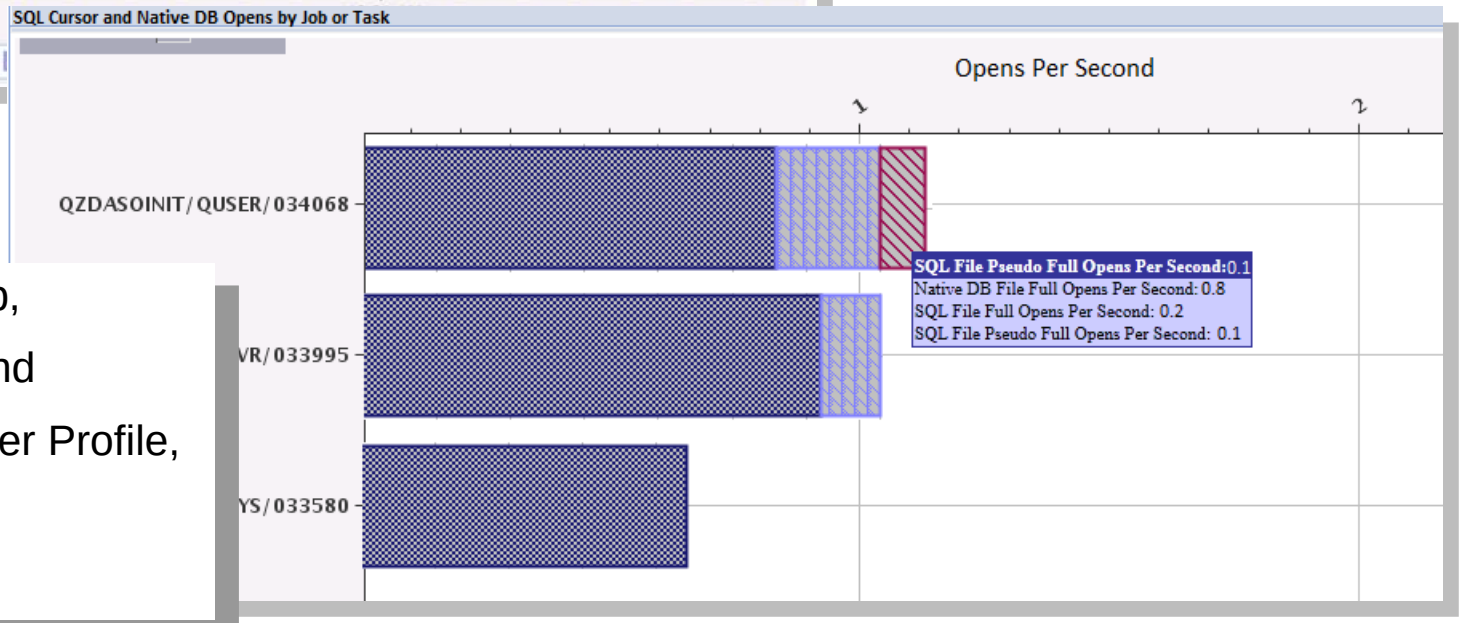
SQL Cursor and Native DB Opens

Native database (non-SQL) File Full Opens,

SQL File Full Opens,

SQL File Pseudo Full Opens as rates per second



Drilldown to by Job,

By Generic Job, and

By Job Current User Profile,

Then for Jobs or

For One Job, etc

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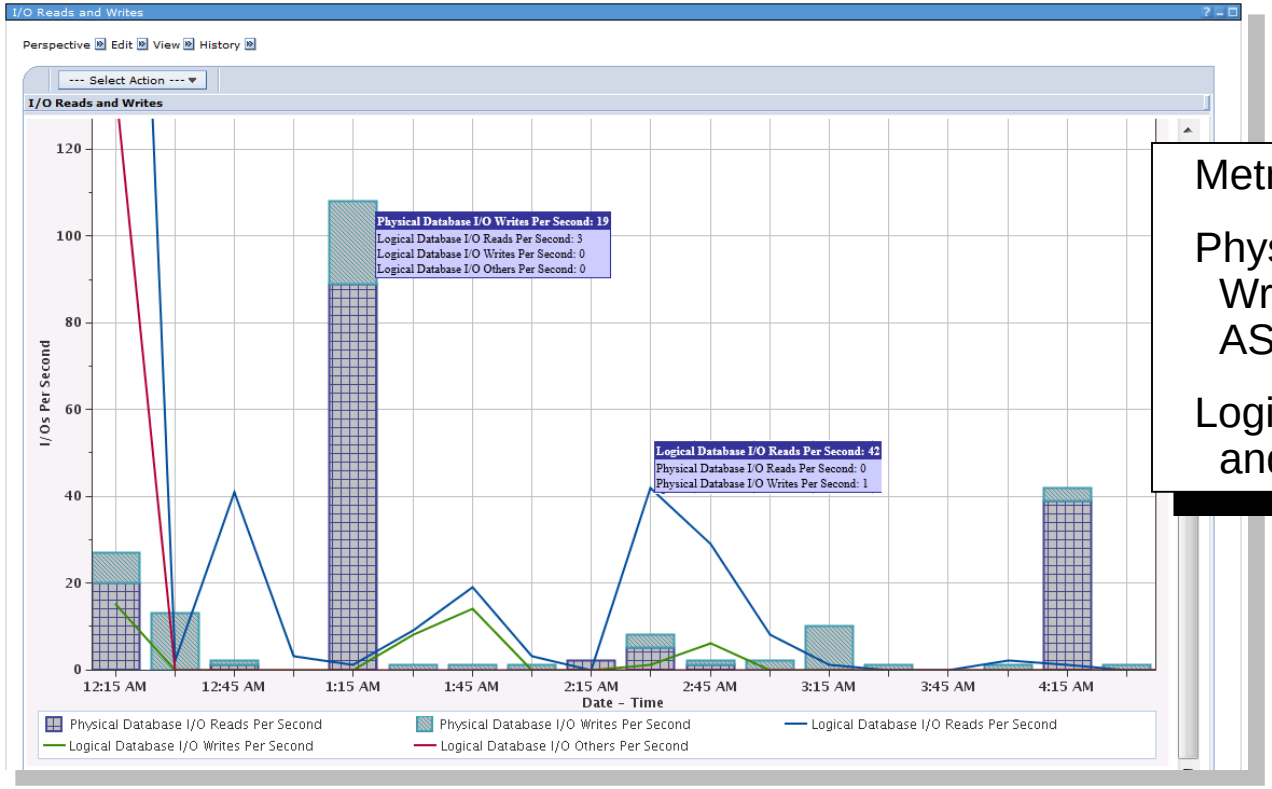
Database Package – I/O Reads and Writes



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

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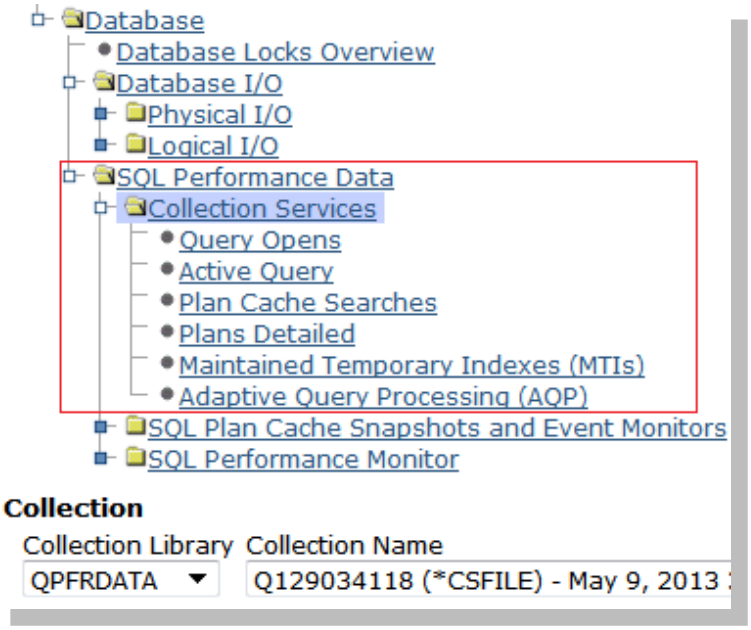
Database Package – Additional Perspective Groups

SQL Performance Data



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

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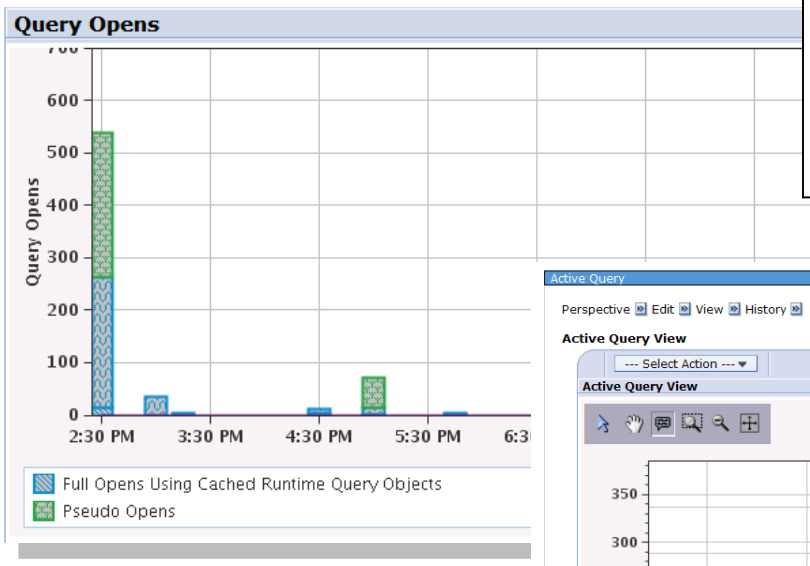
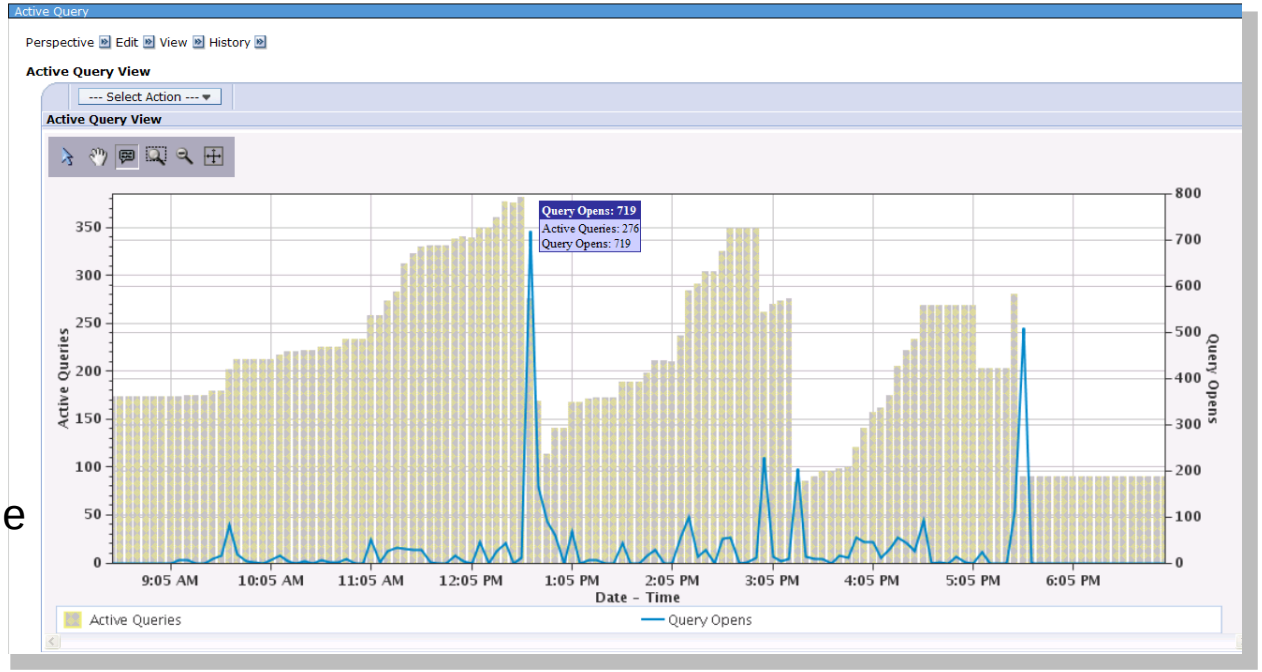
SQL Performance Data

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

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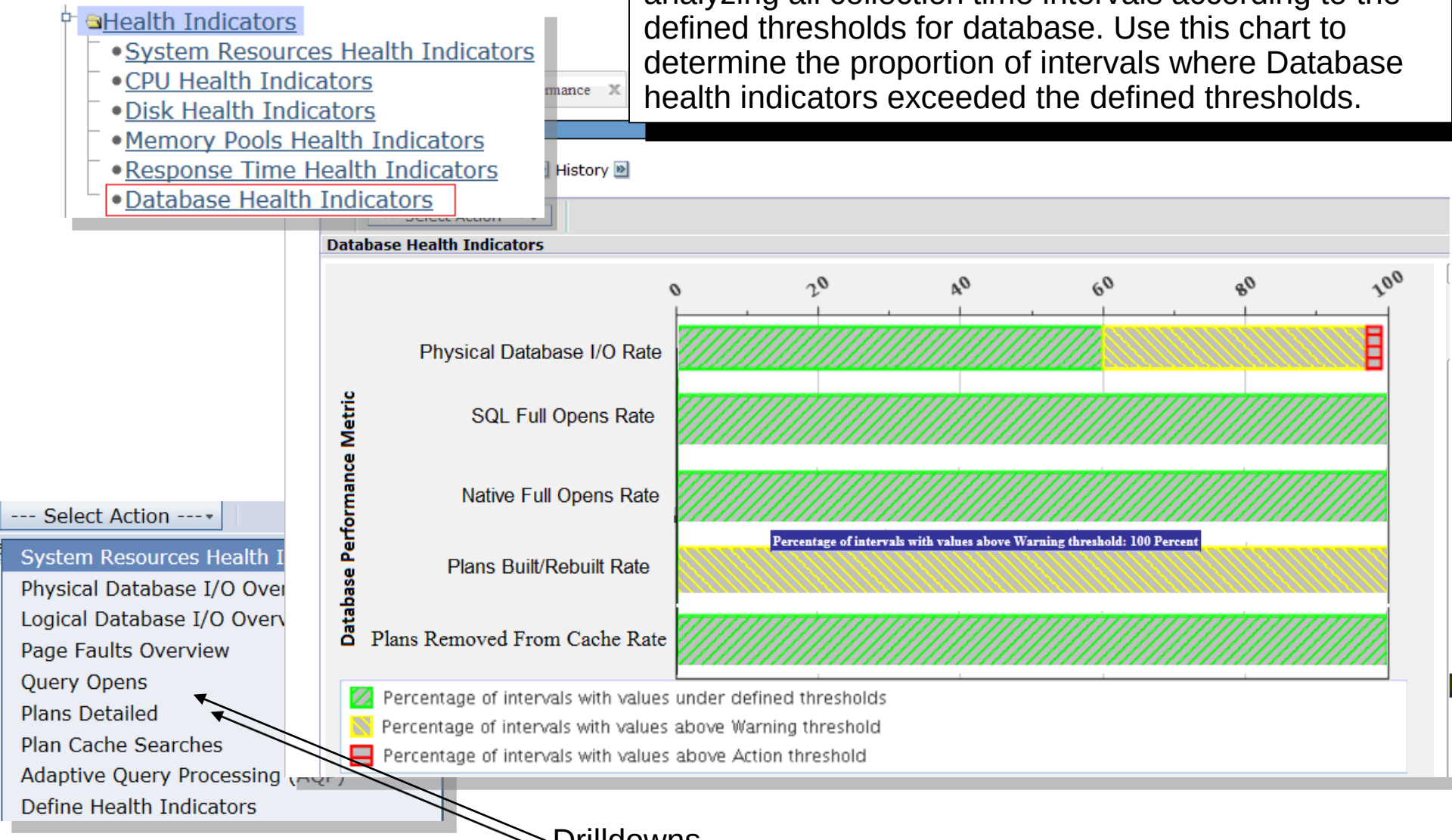
Database Health Indicators

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.



Drilldowns

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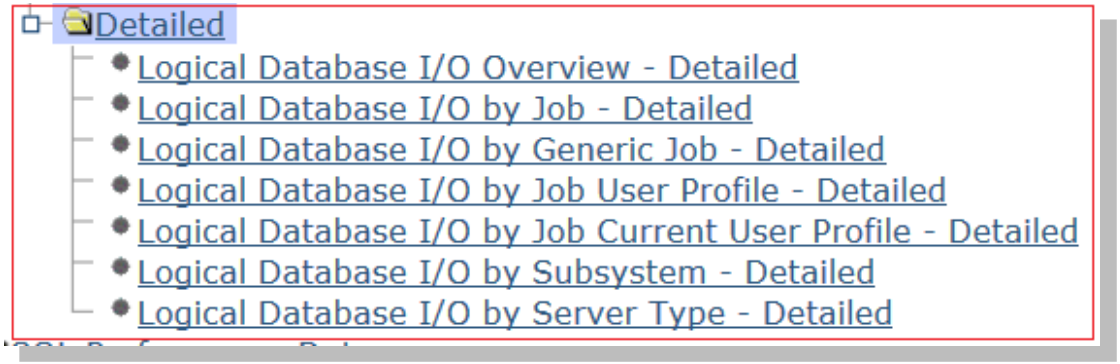
Job Watcher Package – Additional Perspectives Goup

Logical DB I/O - Detailed



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

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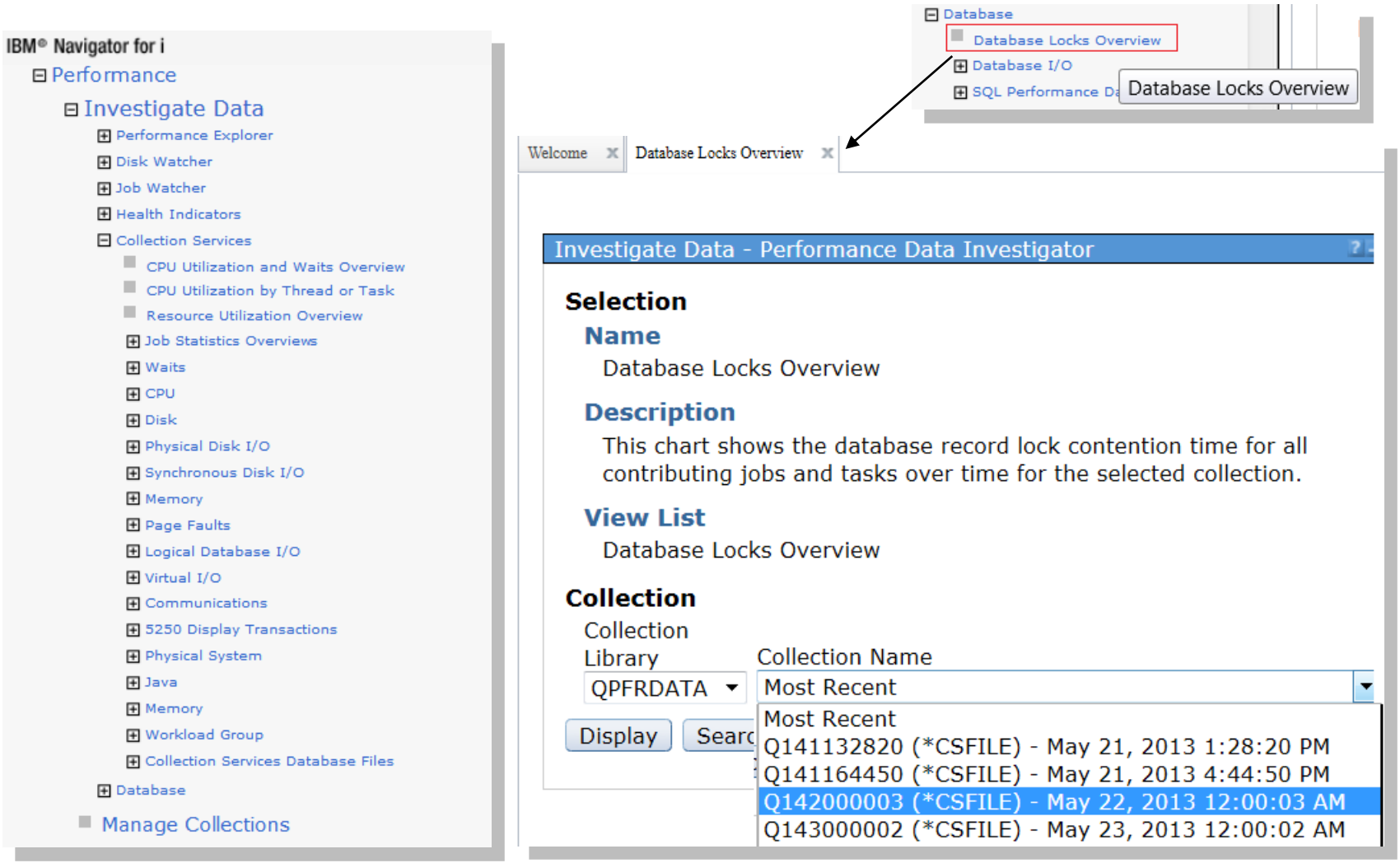
Enhanced Left Hand Navigation

PDI Perspectives Tree



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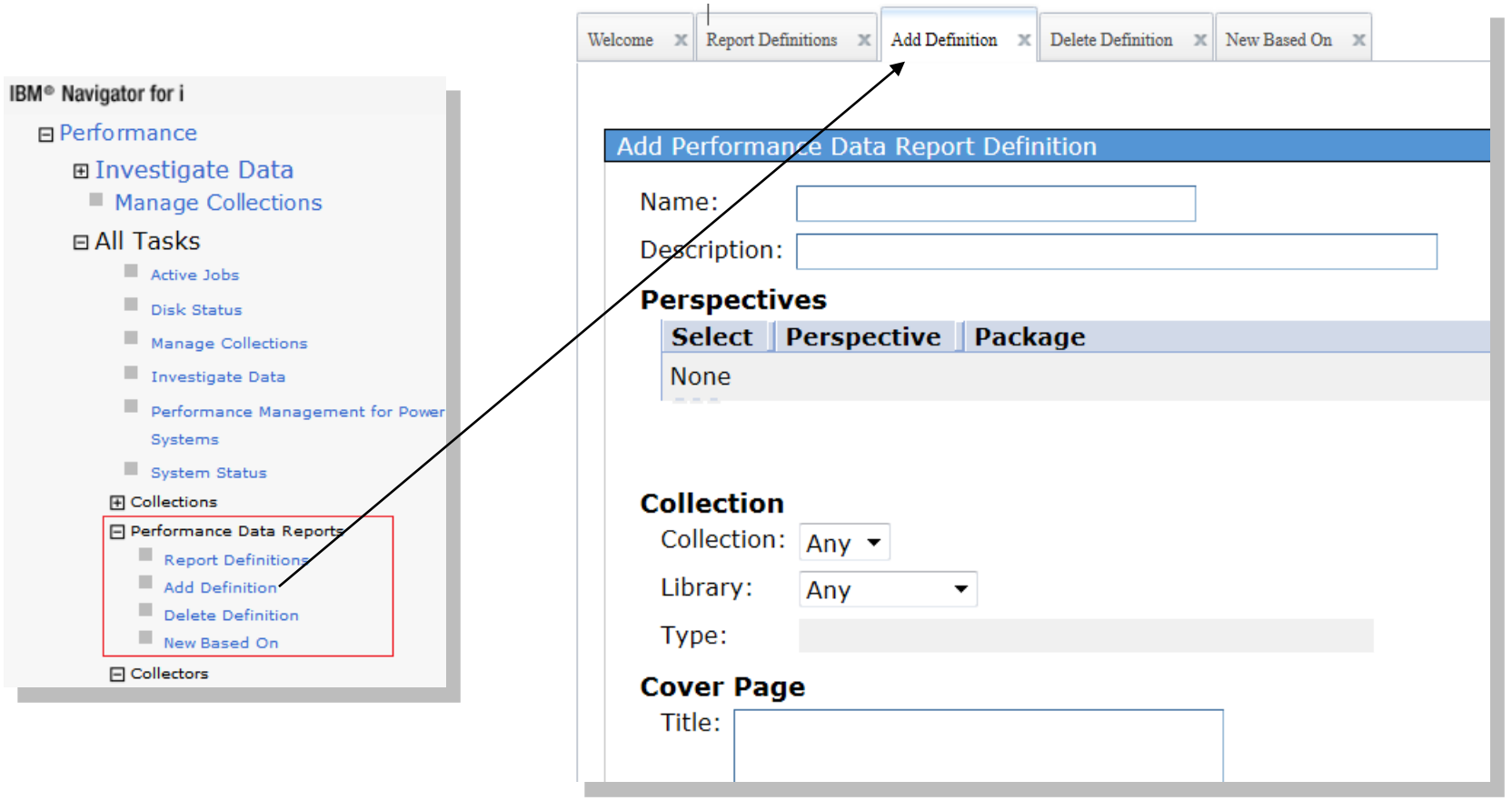
Enhanced Left Hand Navigation

Performance Data Report actions



Click on the action to start a new tab.

Get to the action you want more quickly.

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Thank You

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