

iDoctor Updates (April – August 2018)

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Agenda

- Overview
- Cover the latest GUI updates and enhancements for this period
- Questions?

Overview

- iDoctor is a suite of **dynamic** performance tools offered by the Global Support Center.
- We cover all areas of performance but historically focused more on low-level details.
- Started in V4R5 with the PEX GUI plug-in for Operations Navigator it now consists of 8 external and 2 IBM internal components.

Dynamic on demand

- iDoctor was originally created to help IBM support solve performance problems.
- Working on unique customer problems requires a high-level of flexibility and ability to add or change functions quickly and easily.
- Feedback from iDoctor users continues to help shape the enhancements added on an ongoing basis.

Support

- Supported currently at IBM i V6R1 or higher.
 - iDoctor support for V6R1 and 7.1 IBM i will end in early 2019.



August 2018 (1325) – Fixed several broken graphs in CSI

- Under Job counts graphs -> net jobs breakdown rankings
 - Net jobs breakdown by subsystem
- Under IFS graphs -> IFS read total rankings
 - IFS read totals by thread, current user
- Under CPU Graphs folder:
 - CPU utilization breakdown by core vs total CPU utilization
 - CPU utilization breakdown by core

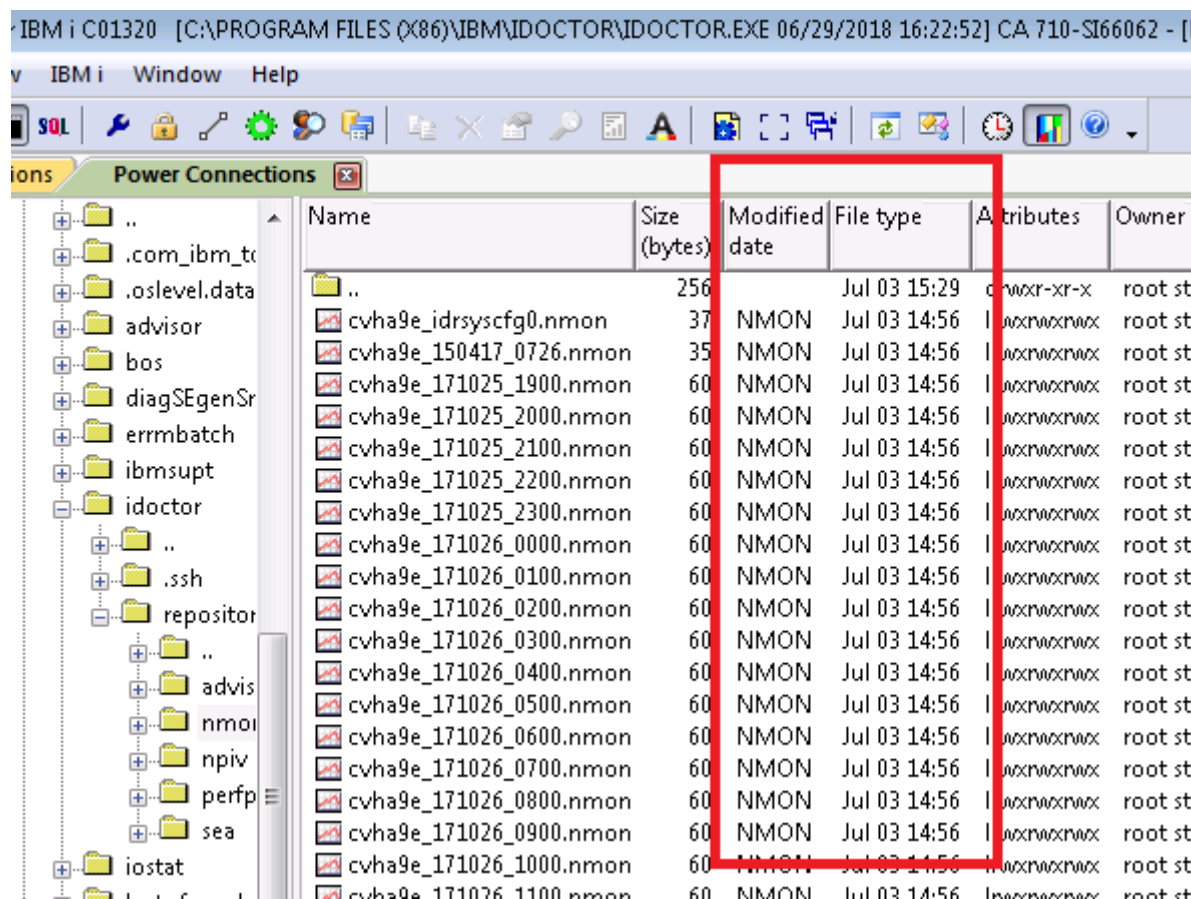


July 2018 (1323) – Primary keys removed from JW Job Summary

- A user was experiencing check constraint errors on the tables built by this analysis, so removed these keys for now in order to resolve and investigate further.
- CPF502F occurred on the SQL insert of data on the 1st table.

July 2018 (1322) – VIOS columns flipped in directories

- When connected to a VIOS using Power Connections and looking at directories, the File type and Modified date column data were flipped around.

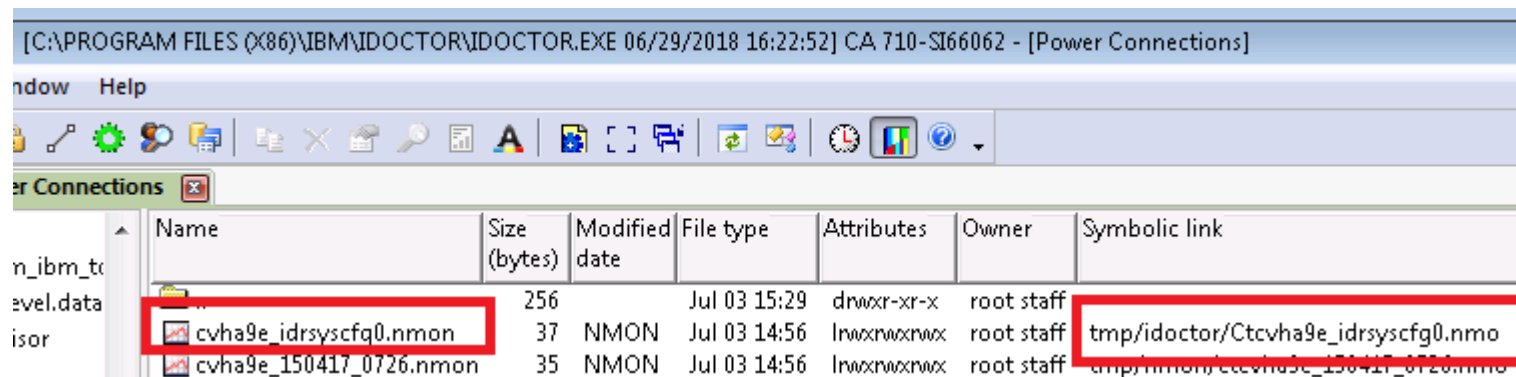


The screenshot shows a window titled "IBM i C01320" with a "Power Connections" pane. The pane displays a directory listing for a VIOS. The columns are: Name, Size (bytes), Modified date, File type, Attributes, and Owner. A red box highlights the "Modified date" and "File type" columns, which contain swapped data. For example, the first row shows a directory entry with a size of 256 bytes, a "Modified date" of "Jul 03 15:29", and a "File type" of "dwxr-xr-x".

Name	Size (bytes)	Modified date	File type	Attributes	Owner
..	256	Jul 03 15:29	dwxr-xr-x		root st
cvha9e_idrsyscfg0.nmon	37	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_150417_0726.nmon	35	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171025_1900.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171025_2000.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171025_2100.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171025_2200.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171025_2300.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171026_0000.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171026_0100.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171026_0200.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171026_0300.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171026_0400.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171026_0500.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171026_0600.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171026_0700.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171026_0800.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171026_0900.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171026_1000.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st
cvha9e_171026_1100.nmon	60	NMON	Jul 03 14:56	lwxrwxrwx	root st

July 2018 (1322) – VIOS symbolic links were incorrect

- When listing files on a VIOS that are symbolic links, the symbolic link path was incorrect. It was missing the 1st and last characters. This caused the inability to open files (using the Open local file option.)

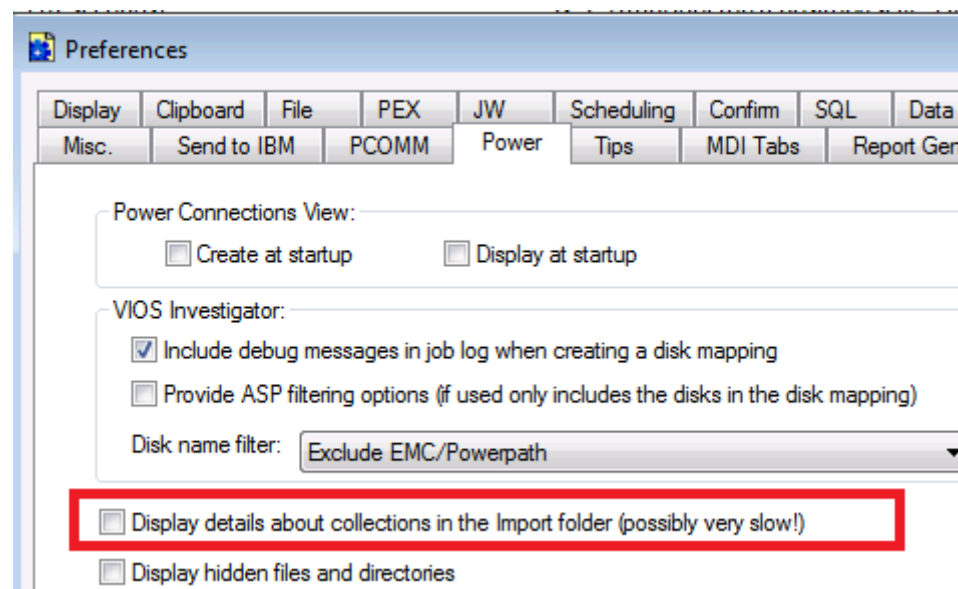


Name	Size (bytes)	Modified date	File type	Attributes	Owner	Symbolic link
cvha9e_idrsyscfg0.nmon	37	Jul 03 14:56	NMON	lrwxrwxrwx	root staff	tmp/idoctor/Ctcvha9e_idrsyscfg0.nmo
cvha9e_150417_0726.nmon	35	Jul 03 14:56	NMON	lrwxrwxrwx	root staff	tmp/nmon/Ctcvha9e_150417_0726.nmo

July 2018 (1322) – Power – Display details preference changed

- In Preferences -> Power, renamed the preference
 "Display details about collections in the Import folder while connected to the IFS (very slow)" to
 "Display details about collections in the Import folder (possibly very slow!)"

This option applies to nmon, npiv, sea import folders when connected to a VIOS or when connected to an IBM i. If there are thousands of files to list then this option can mean the difference between seeing results in a few seconds vs a few minutes!



July 2018 (1321) – CSI workload capping delay rankings SQL error

- In CSI fixed an SQL error on TL.JBPOOL column in the graph "Workload capping delay rankings for <XYZ> by thread"
- Work around is replace TL.JBPOOL with JBPOOL in the SQL statement.

Q178000102/Workload capping delay for <<SWGNAME>> by job: From 08:50:05 am to 08:55:00 am - #1

QUERY FAILED! UNABLE TO EXECUTE THE FOLLOWING SQL STATEMENT(S):

```
> SELECT CASE WHEN TRIM(STRIP(CHAR(OBJNAME), t, X'00')) = " THEN 'System tasks' Else OBJNAME END AS O
```

[SQL0205] Column JBPOOL not in table QAIDRCSTL_Q178000102 in PMR37084AA.

Cause : A column with the name JBPOOL does not exist in table or view QAIDRCSTL_Q178000102 in schema

Recovery : Do one of the following and try the request again: -- Make certain that the column names, table names, and any qualifiers are specified correctly. A column specified in a join USING clause cannot be qualified in the statement. -- If the column is not qualified, the column JBPOOL is no longer in table QAIDRCSTL_Q178000102. It was originally found in table QAIDRCSTL_Q178000102, but it no longer exists. If the column is now available in a different table and is referenced by this statement, a precompile may be necessary. -- If more than one table is referenced in a SQL statement, the column name should be qualified. -- If this is a CREATE TABLE statement and column JBPOOL is specified in a partitioning key or constraint for the table being created, add a column definition for column JBPOOL or remove it from the constraint or partitioning key. -- For a recursive common table expression, the SET sequence column name and the USING column name cannot be referenced in the fullselect that defines the common table expression.

X-axis (Labels)

job name/user/

Primary Y-axis (

Flyover Fields

Workload capping

Job runtime in t

Minimum inter

Job current user

Total contributi

Available Fields

June 2018 (1320) – CSI workload capping delay rankings prompt

- If drilling down in CSI from the Collection Overview to "Workload capping delay rankings for <XYZ> by thread" the user will be prompted for the value of <<SWGNAME>>.
- Added the following text on the Change SQL Parameters window (that this is the):
 - "Workload capping group name from file QAPMSYSWLC"

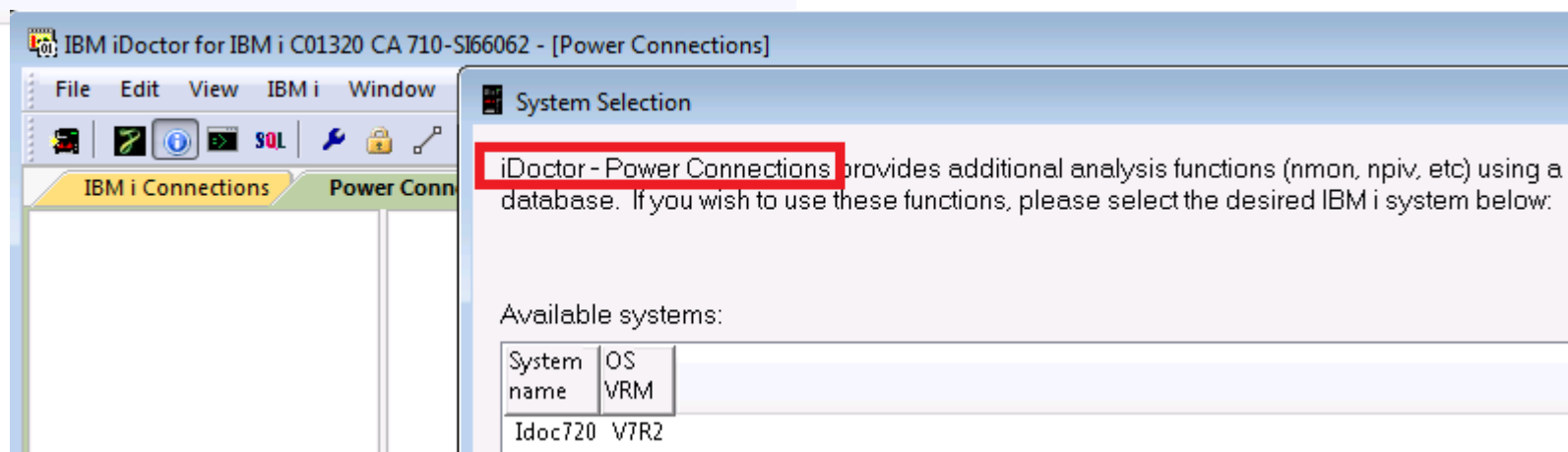
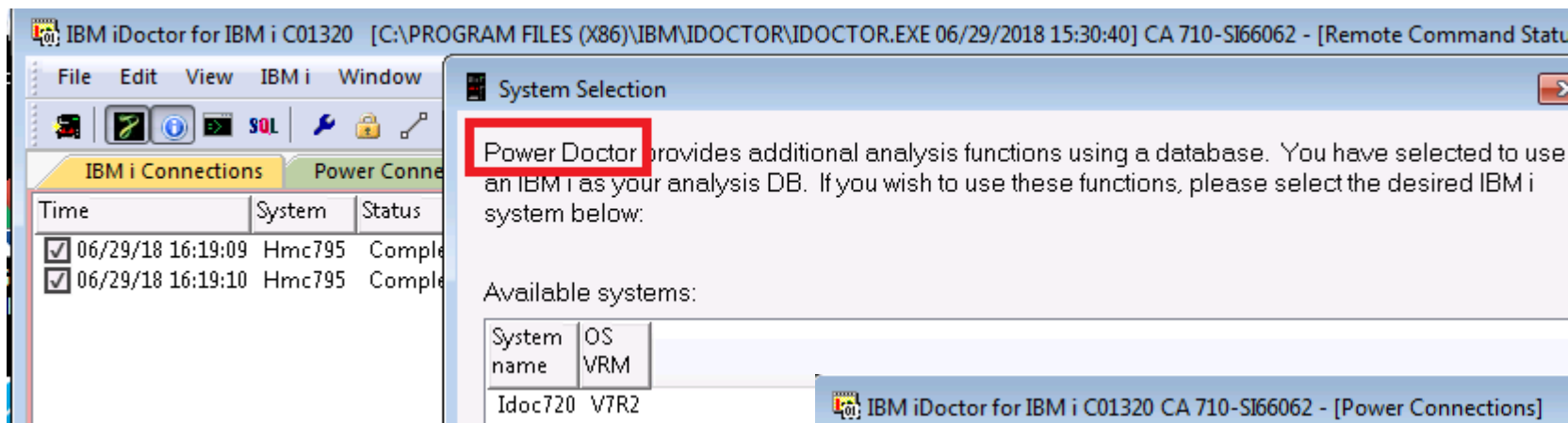
June 2018 (1320) – Configure Collection Services cycle time

- Fixed some bugs when using the Configure Collection Services window. The cycle time could not be edited without an error message "The parameter is incorrect" being shown.

Also the cycle time when loaded from the saved value on the system into the interface was not being shown correctly.

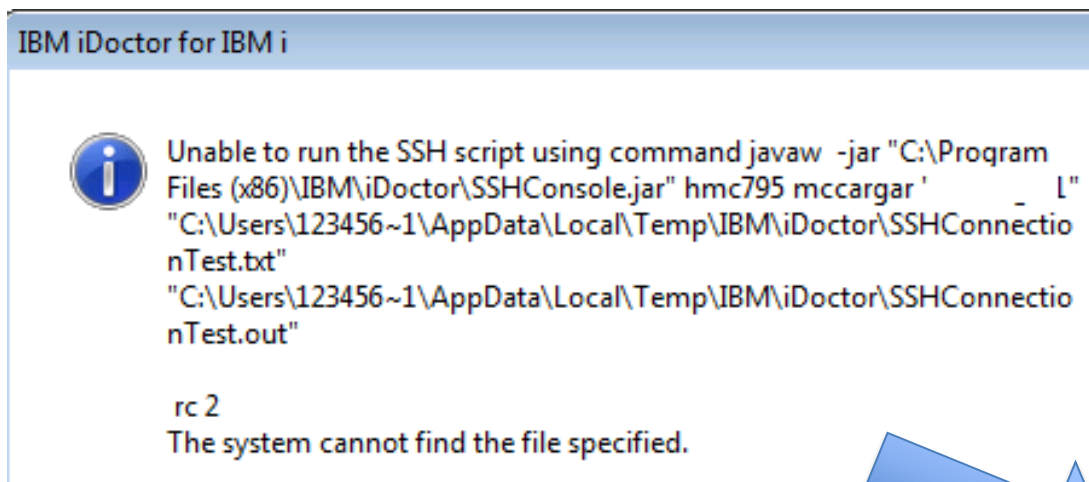
June 2018 (1320) – Select analysis system window text change

- Changed the message text when selecting an analysis DB (IBM i) on the System Selection window that appears on a PC when first using Power Connections (since “Power Doctor” is really “Power Connections” now)



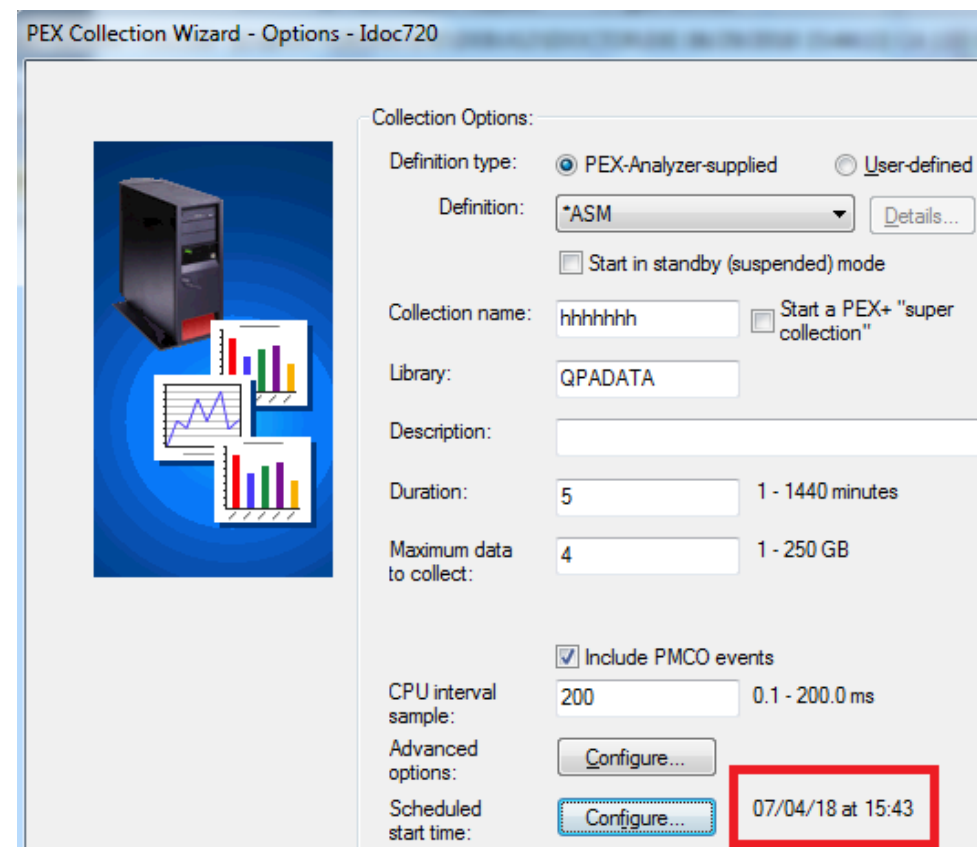
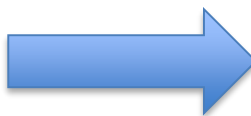
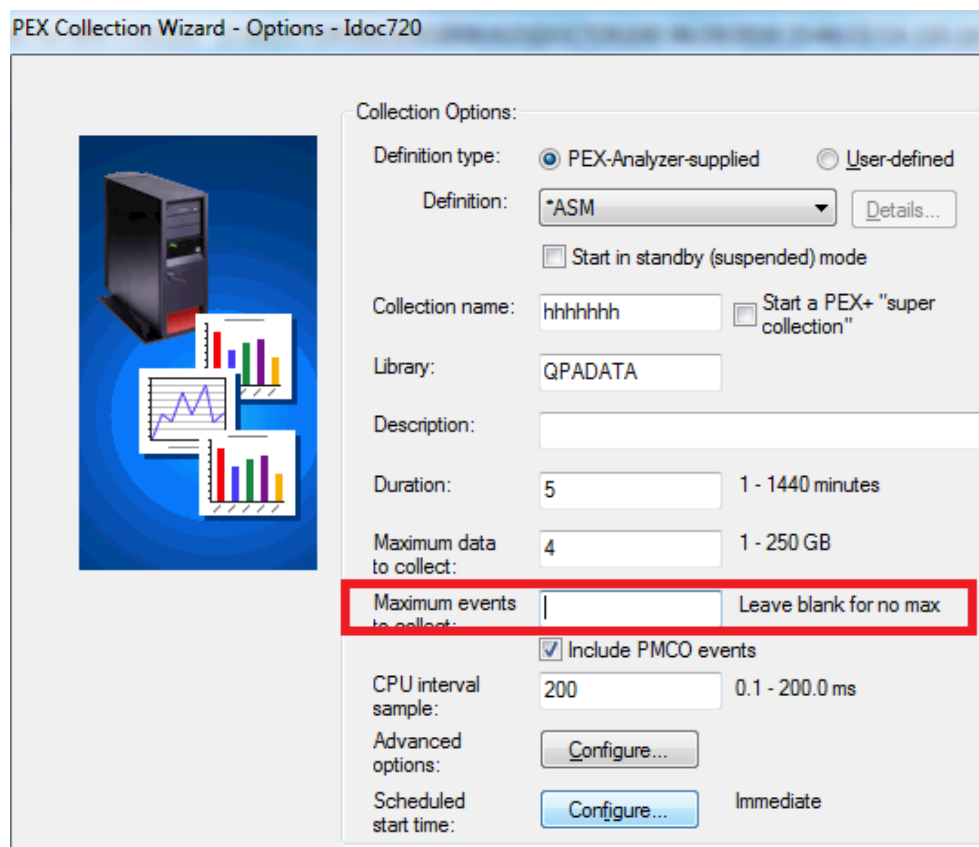
June 2018 (1320) – Connection fails when using SSH due to no Java

- If connecting to a non-IBM i system (HMC/VIOS/etc) using SSH but Java is not installed or could not be found in the user's path, improved the error message shown to make the resolution more clear.
- Also the user's password is no longer returned in the error message window.



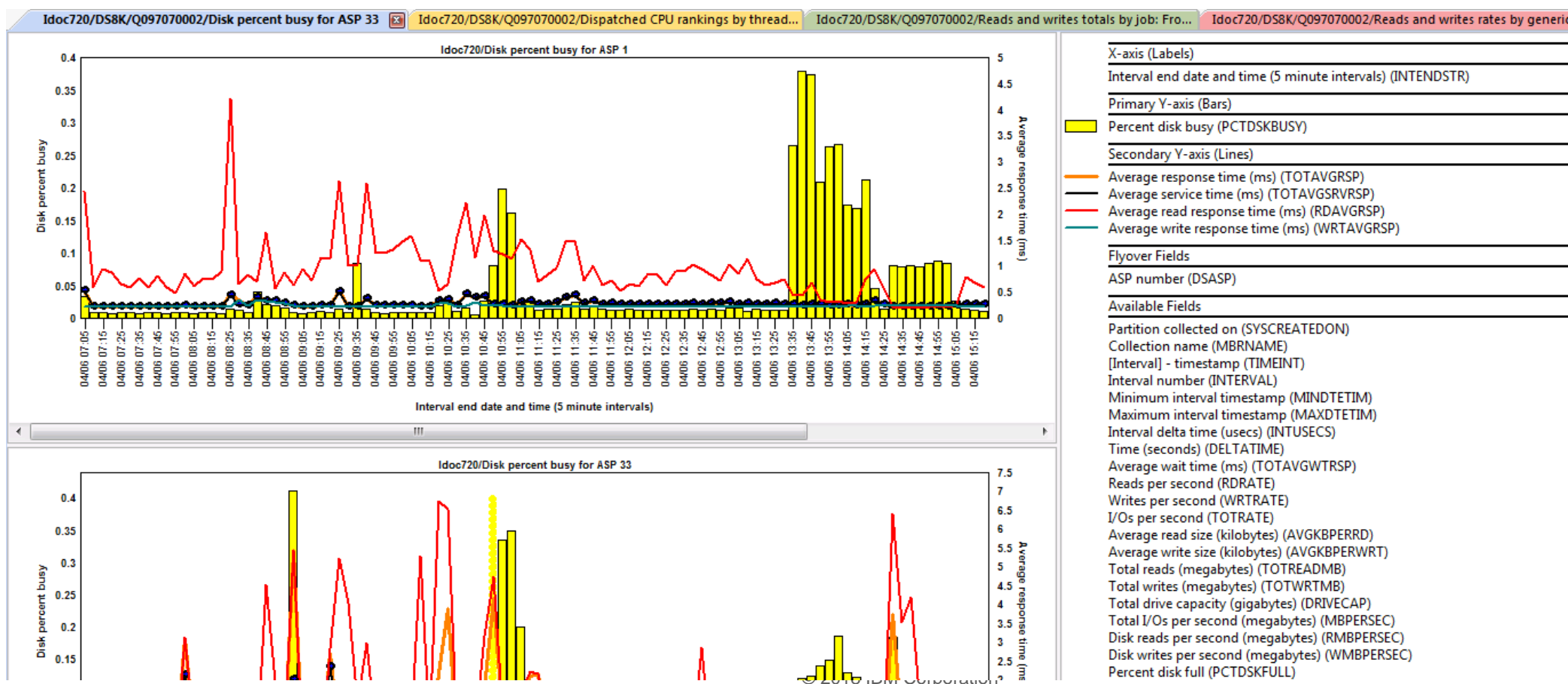
June 2018 (1320) – PEX Col Wizard – events option hidden if scheduling

- In the PEX Collection Wizard in the Basic Options screen the “Maximum events to collect” option is now hidden if a scheduled collection start time is set.
- **Note:** This option does not apply to scheduled PEX collections.



June 2018 (1320) – GUI crash if drilling down from comparison graphs

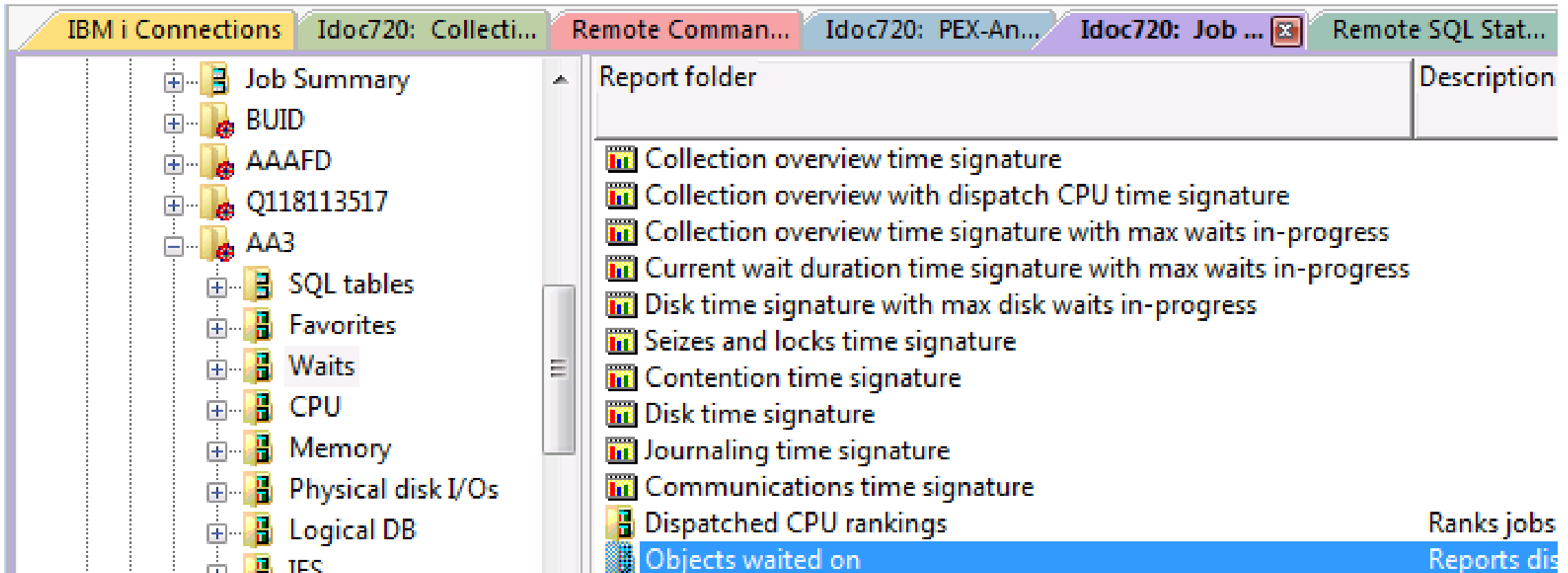
- The iDoctor GUI will crash if you produce a comparison graph (i.e. such as a CSI Disk graphs comparison of ASP 1 vs ASP 33) then trying to drill down from there into another graph.



June 2018 (1320) – Job Watcher objects waited on reports

- In Job Watcher under the Wait graphs -> Objects waited on folder made the following updates:

The folder will now appear even if the collection summary analysis has NOT be ran.



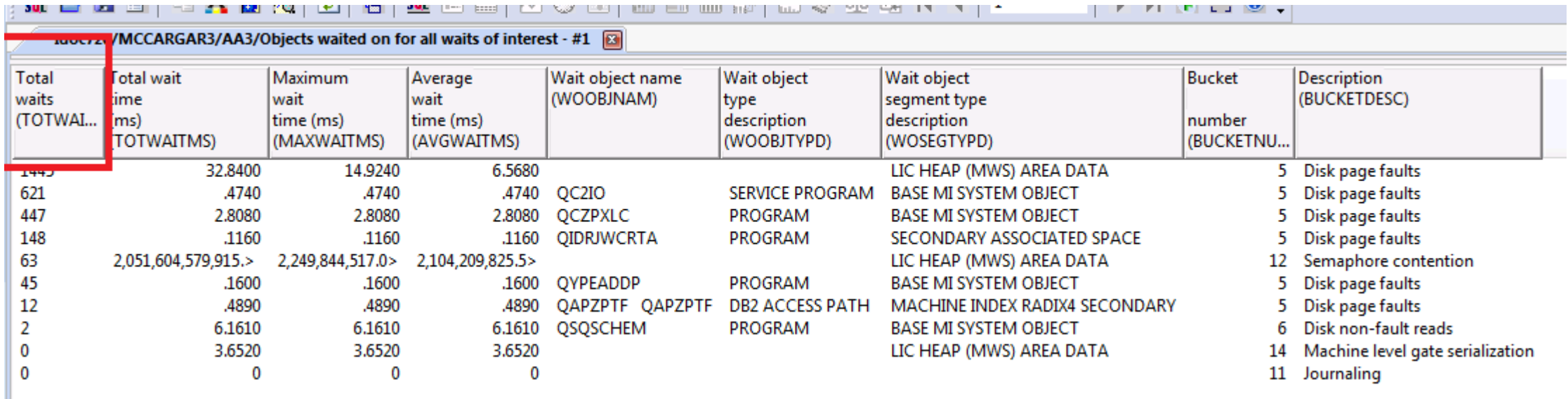
The screenshot shows the IBM i Job Watcher interface. The left pane displays a tree view of folders under 'Wait graphs'. The 'Objects waited on' folder is expanded, showing a list of report folders in the right pane. The 'Objects waited on' folder is highlighted in blue.

Report folder	Description
Collection overview time signature	
Collection overview with dispatch CPU time signature	
Collection overview time signature with max waits in-progress	
Current wait duration time signature with max waits in-progress	
Disk time signature with max disk waits in-progress	
Seizes and locks time signature	
Contention time signature	
Disk time signature	
Journaling time signature	
Communications time signature	
Dispatched CPU rankings	Ranks jobs
Objects waited on	Reports dis

June 2018 (1320) – Job Watcher objects waited on reports

- In Job Watcher under the Wait graphs -> Objects waited on folder (or Detail reports -> Objects waited on) made the following updates:

The reports that show "all waits of interest" will now show "Total waits" in the 1st column instead of incorrectly labeling these as "Total page faults".



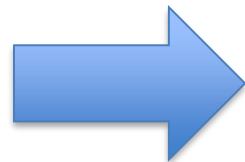
Total waits (TOTWAL...)	Total wait time (ms) (TOTWAITMS)	Maximum wait time (ms) (MAXWAITMS)	Average wait time (ms) (AVGWAITMS)	Wait object name (WOBJNAM)	Wait object type description (WOBJTYPD)	Wait object segment type description (WOSEGTPD)	Bucket number (BUCKETNU...)	Description (BUCKETDESC)
1449	32.8400	14.9240	6.5680			LIC HEAP (MWS) AREA DATA	5	Disk page faults
621	.4740	.4740	.4740	QC2IO	SERVICE PROGRAM	BASE MI SYSTEM OBJECT	5	Disk page faults
447	2.8080	2.8080	2.8080	QCZPXC	PROGRAM	BASE MI SYSTEM OBJECT	5	Disk page faults
148	.1160	.1160	.1160	QIDRJWCRTA	PROGRAM	SECONDARY ASSOCIATED SPACE	5	Disk page faults
63	2,051,604,579,915.>	2,249,844,517.0>	2,104,209,825.5>			LIC HEAP (MWS) AREA DATA	12	Semaphore contention
45	.1600	.1600	.1600	QYPEADDP	PROGRAM	BASE MI SYSTEM OBJECT	5	Disk page faults
12	.4890	.4890	.4890	QAPZPTF QAPZPTF	DB2 ACCESS PATH	MACHINE INDEX RADIX4 SECONDARY	5	Disk page faults
2	6.1610	6.1610	6.1610	QSQSCHM	PROGRAM	BASE MI SYSTEM OBJECT	6	Disk non-fault reads
0	3.6520	3.6520	3.6520			LIC HEAP (MWS) AREA DATA	14	Machine level gate serialization
0	0	0	0				11	Journaling

June 2018 (1320) – Job Watcher objects waited on reports

- In Job Watcher under the Wait graphs -> Objects waited on folder (or Detail reports -> Objects waited on) made the following updates:

The reports that showed total page faults in the 1st column reported incorrect results. The value before was the total records in the QAPYJWTDE file matching the current selection.

Idoc720/MCCARGAR3/AA3/Collection overview time signature				Idoc720/MCCARGAR3/AA3/Objects waited on due to p		
Total page faults	Total wait time (ms)	Maximum wait time (ms)	Average wait time (ms)	Wait object name	Wait object type description	Wait object segment type description
5	32.8400	14.9240	6.5680			LIC HEAP (MWS) AREA DATA
1	2.8080	2.8080	2.8080	QCZPXC	PROGRAM	BASE MI SYSTEM OBJECT
1	.4890	.4890	.4890	QAPZPTF QAPZPTF	DB2 ACCESS PATH	MACHINE INDEX RADIX4 SECONDARY
1	.4740	.4740	.4740	QC2IO	SERVICE PROGRAM	BASE MI SYSTEM OBJECT
1	.1600	.1600	.1600	QYPEADDP	PROGRAM	
1	.1160	.1160	.1160	QIDRJWCRTA	PROGRAM	



Idoc720/MCCARGAR3/AA3/Objects waited on due to page faulting - #1						
Total page faults (FLTS)	Total wait time (ms) (TOTWAIT...)	Maximum wait time (ms) (MAXWAIT...)	Average wait time (ms) (AVGWAIT...)	Wait object name (WOBJNAM)	Wait object type description (WOBJTYPD)	Wait object segment type description (WOSEGTYPD)
1445	32.8400	14.9240	6.5680			LIC HEAP (MWS) AREA DATA
621	.4740	.4740	.4740	QC2IO	SERVICE PROGRAM	BASE MI SYSTEM OBJECT
447	2.8080	2.8080	2.8080	QCZPXC	PROGRAM	BASE MI SYSTEM OBJECT
148	.1160	.1160	.1160	QIDRJWCRTA	PROGRAM	SECONDARY ASSOCIATED SPACE
45	.1600	.1600	.1600	QYPEADDP	PROGRAM	BASE MI SYSTEM OBJECT
12	.4890	.4890	.4890	QAPZPTF QAPZPTF	DB2 ACCESS PATH	MACHINE INDEX RADIX4 SECONDARY

June 2018 (1320) – Job Summary analysis broken at 6.1

- In CSI/JW the Job Summary analysis did not work on release 6.1 and has been fixed.

June 2018 (1320) – PEX Definition Wizard – Add Jobs updates

- The subsystem field is no longer case sensitive.

PEX Definition Wizard - Add Jobs

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





Job Information:

Name: User: Number:

Subsystem: Thread IDs: 8 characters each (0000000100000002, etc)

Current user filter:

Active jobs matching job information:

Subsystem	Job Name	User	Number	CPU utilization (%)	CPU time total (ms)	Status	Function	Current User	Entered System (
 QINTER	QINTER	QSYS	361480	0	789	DEQW		QSYS	2018-06-08-19.1
 QINTER	QPADEV0001	MCCARGAR	380088	0	6	DSPW	CMD-WRKJOB	MCCARGAR	2018-06-26-15.4
 QINTER	QPADEV0003	MCCARGAR	380848	0	25	DSPW	CMD-WRKJOBQ	MCCARGAR	2018-06-28-10.3
 QINTER	QPADEV0002	ADAMB	380873	0	222	DSPW	MNU-PERFORM	ADAMB	2018-06-28-11.5

June 2018 (1320) – PEX Definition Wizard – Add Jobs updates

- The list will now show “No rows found” if no results were found when during a search.

PEX Definition Wizard - Add Jobs

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

Job Information:

Name: User: Number:

Subsystem: Thread IDs: 8 characters each (0000000100000002, etc)

Current user filter:

Active jobs matching job information:

Subsystem	Job Name	User	Num...	CPU utilization (%)	CPU time total (ms)	Status	Function	Current User	Entered System On
No rows found.									

June 2018 (1320) – CSI HTTP graph fixes

- In CSI under the Communication graphs -> HTTP (Apache) folder, made the following updates:
 1. The rates were calculated incorrectly in some cases.
 2. Fixed a potential divide by zero error in the SQL statements.
 3. The Y2 axis is now always labeled from 0 to 100%. In some cases no line was drawn at all if all values were zero.
 4. Instead of hiding time intervals where no HTTP requests were sent/received these blank intervals will now be shown. This behavior is consistent with the rest of the time-based graphs in CSI.

June 2018 (1319) – JW Job Summary drill down menu fixes

- In Job Watcher made the following fixes and improvements to the menu options that show up under the Job Summary analysis reports:

The "Selected Thread" option appeared twice (as "Selected Thread" and "Selected thread").

Collection name	Library name	Collection description	Duration of job in hours	Elapsed seconds	Start of job included 1-Yes, 0-No	End of job included 1-Yes, 0-No	Start of thread included 1-Yes, 0-No	End of thread included 1-Yes, 0-No
Q302142829	MCCARGAR	10 second intervals, Call stacks	1.000	3,610	0	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	0	10	0	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	.017	117	0	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	1.000	3,610	0	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	.983	3,550	0	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	1.000	3,600	0	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	.933	3,389	0	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	1.000	3,610	0	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	1.000	3,610	0	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	.033	3,610	0	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	.267	3,610	0	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	1.000	3,610	0	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	1.000	3,610	0	0	0	0

- Selected Threads ▶
- Selected thread ▶
- Rankings filtered by selected Thread ▶

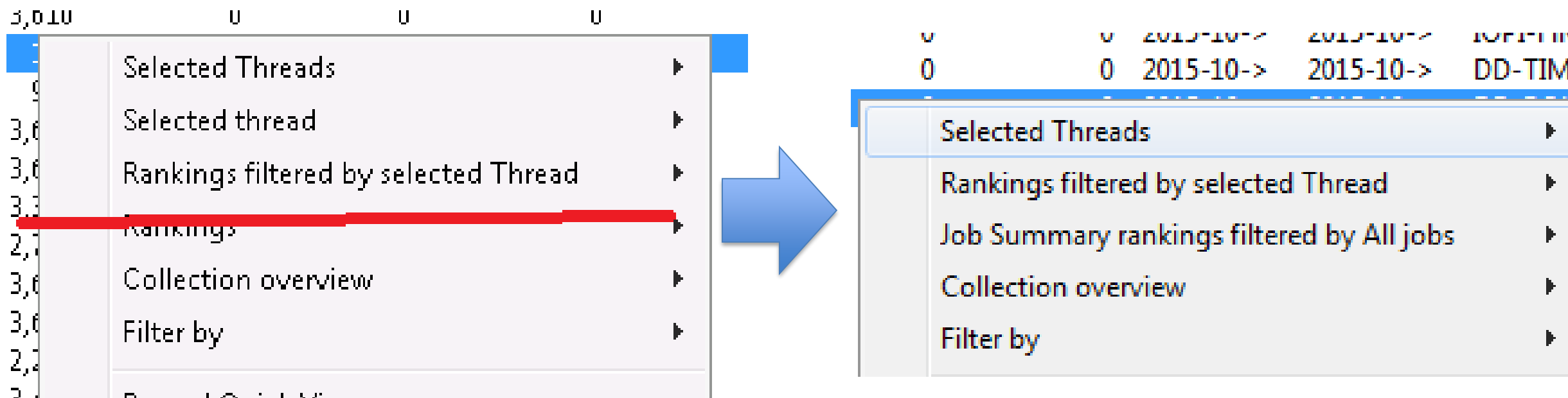


of job ded s, 0-No START	End of job included 1-Yes, 0-No (JOBEND)	Start of thread included 1-Yes, 0-No (THDSTART)	End of thread included 1-Yes, 0-No (THDEND)	Start timestamp (STARTTI...	End timestan (ENDTIME)	Fully qualified job name or task name (TDEJOBNA...	Thread ID (THREADI...	Current user profile (CURRU...
0	0	0	0	2015-10->	2015-10->	RMTMSAFE>	0000000>	
0	0	0	0	2015-10->	2015-10->	LIDMGR-TA>	0000000>	
0	0	0	0	2015-10->	2015-10->	SMIORESTSK	0000000>	
0	0	0	0	2015-10->	2015-10->	IOPI-HRI-PE>	0000000>	
0	0	0	0	2015-10->	2015-10->	DD-TIMER	0000000>	
0	0	0	0	2015-10->	2015-10->			
0	0	0	0	2015-10->	2015-10->			
0	0	0	0	2015-10->	2015-10->			
0	0	0	0	2015-10->	2015-10->			
0	0	0	0	2015-10->	2015-10->			
0	0	0	0	2015-10->	2015-10->			

- Selected Threads ▶
- Rankings filtered by selected Thread ▶
- Job Summary rankings filtered by All jobs ▶
- Collection overview ▶
- Waits ▶
- CPU ▶
- Job counts ▶
- Temp storage ▶

June 2018 (1319) – JW Job Summary drill down menu fixes

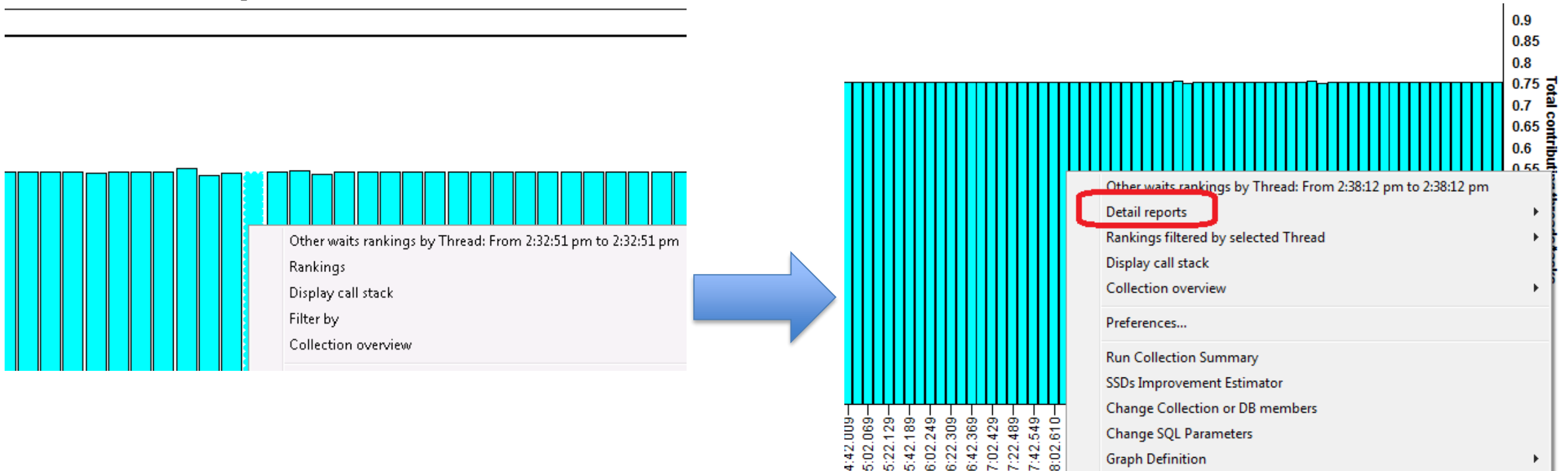
- A 2nd "Rankings" folder appeared in the list but was redundant with the other options (Rankings filtered by selected thread and Collection overview) and has been removed. It also contained non ranking graphs so was unintuitive the way it was.



June 2018 (1319) – JW Job Summary drill down menu fixes

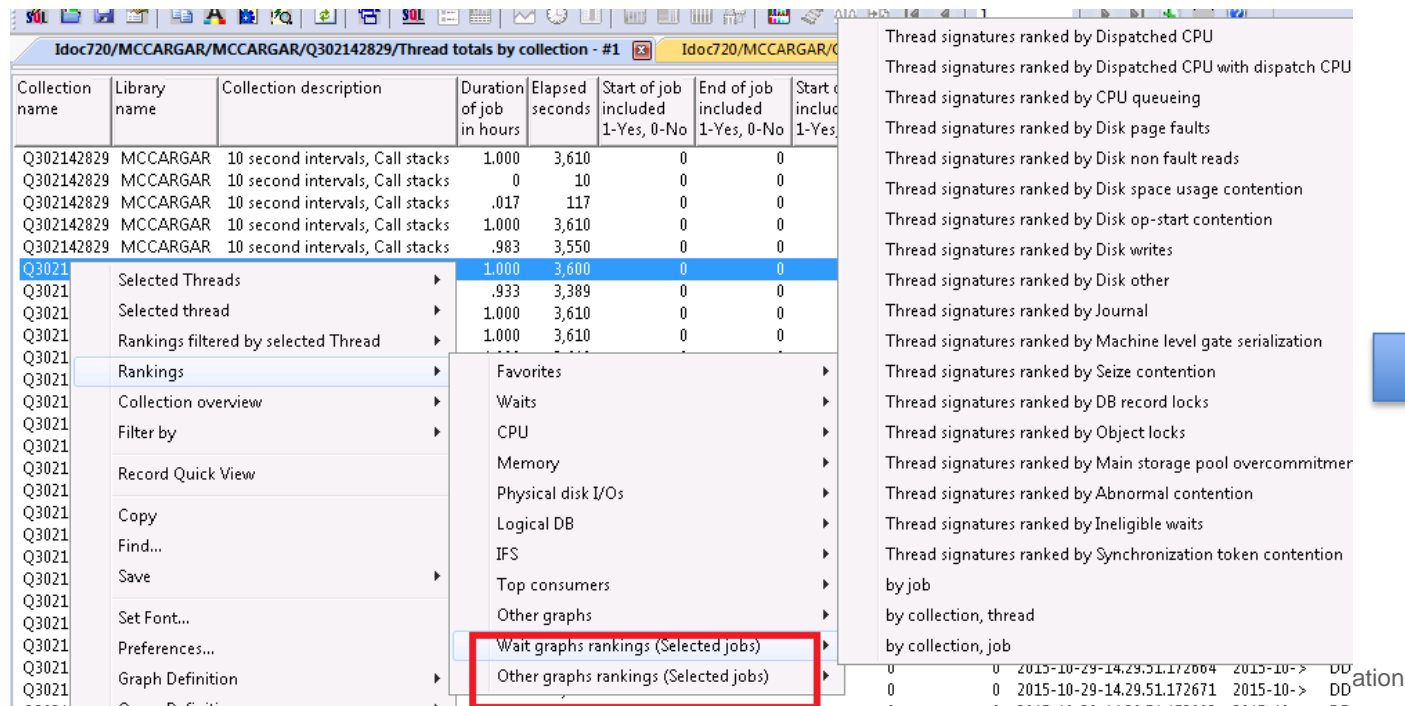
- After drilling down to the Thread signature for a specific job/thread, the "Detail reports" drill down menu option did not appear like it should have, but has been fixed.

Idoc720/Thread wait time signature for SMPO0001: 1182

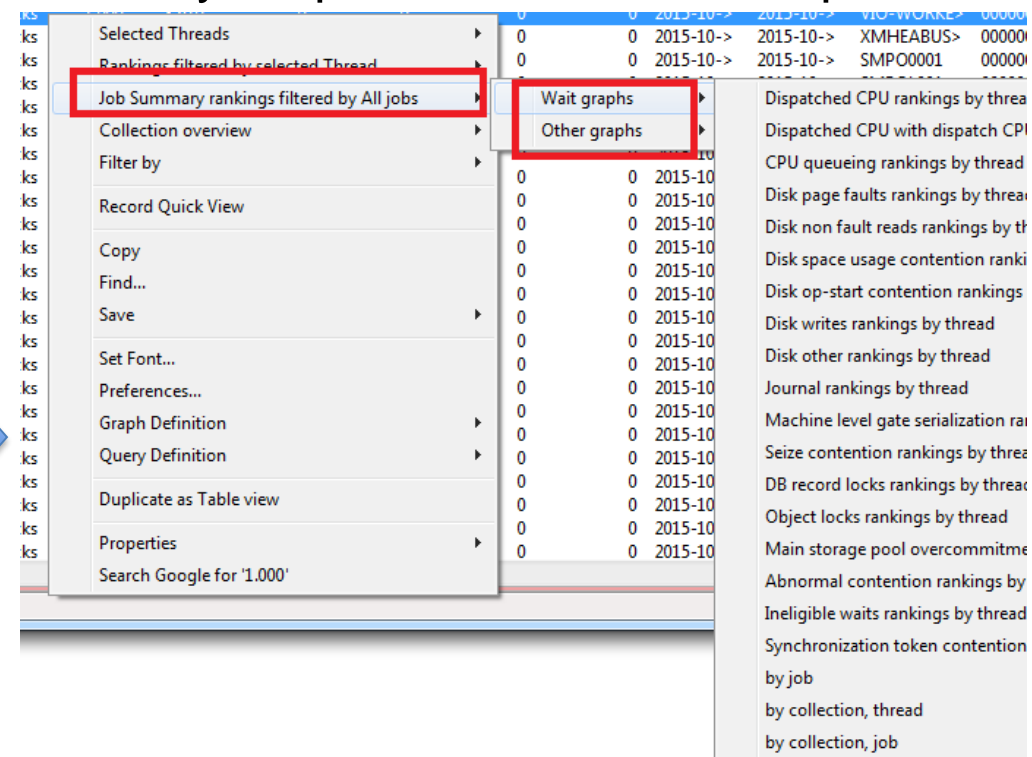


June 2018 (1319) – JW Job Summary drill down menu fixes

- Moved the menu options that are specific to the Job Summary analysis (SQL results over the job summary sql tables instead of the collection data) from "Rankings -> Wait graph rankings <type>" menu to "Job Summary rankings filtered by <type>".
 - Also renamed these graphs so they match the current naming convention for the wait bucket ranking graphs. (Example: from "Thread signatures ranked by Dispatched CPU" to "Dispatched CPU rankings by thread".)



Collection name	Library name	Collection description	Duration of job in hours	Elapsed seconds	Start of job included 1-Yes, 0-No	End of job included 1-Yes, 0-No	Start of job included 1-Yes, 0-No
Q302142829	MCCARGAR	10 second intervals, Call stacks	1.000	3,610	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	0	10	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	.017	117	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	1.000	3,610	0	0	0
Q302142829	MCCARGAR	10 second intervals, Call stacks	.983	3,550	0	0	0
Q3021		Selected Threads	1.000	3,600	0	0	0
Q3021		Selected thread	.933	3,389	0	0	0
Q3021		Rankings filtered by selected Thread	1.000	3,610	0	0	0
Q3021		Rankings					
Q3021		Collection overview					
Q3021		Filter by					
Q3021		Record Quick View					
Q3021		Copy					
Q3021		Find...					
Q3021		Save					
Q3021		Set Font...					
Q3021		Preferences...					
Q3021		Graph Definition					
Q3021		Other graphs					
Q3021		Wait graphs rankings (Selected jobs)					
Q3021		Other graphs rankings (Selected jobs)					

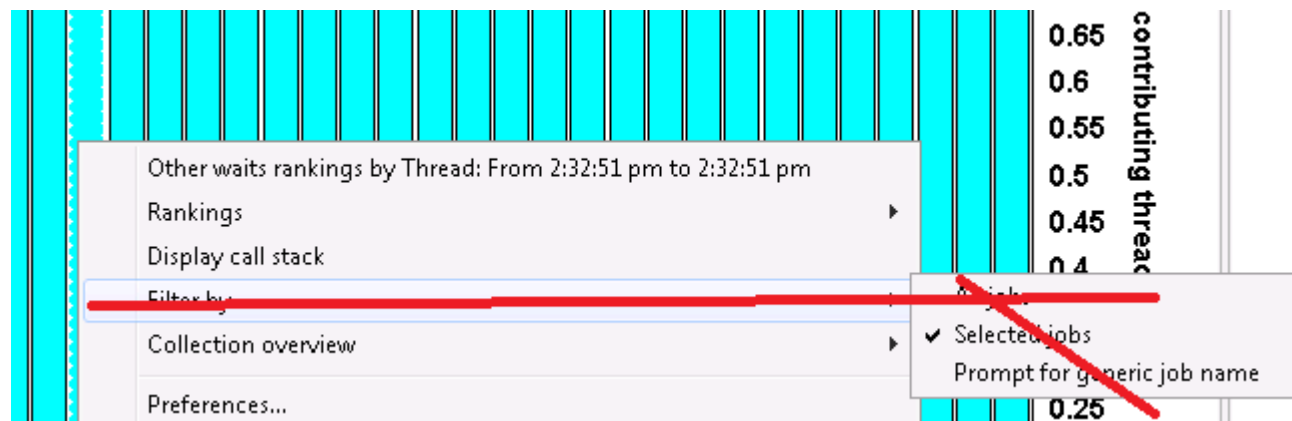
- Selected Threads
- Rankings filtered by selected Thread
- Job Summary rankings filtered by All jobs**
- Collection overview
- Filter by
- Record Quick View
- Copy
- Find...
- Save
- Set Font...
- Preferences...
- Graph Definition
- Query Definition
- Duplicate as Table view
- Properties
- Search Google for '1.000'

- Wait graphs
- Other graphs

- Dispatched CPU rankings by thread
- Dispatched CPU with dispatch CPU
- CPU queueing rankings by thread
- Disk page faults rankings by thread
- Disk non fault reads rankings by thread
- Disk space usage contention rankings by thread
- Disk op-start contention rankings by thread
- Disk writes rankings by thread
- Disk other rankings by thread
- Journal rankings by thread
- Machine level gate serialization rankings by thread
- Seize contention rankings by thread
- DB record locks rankings by thread
- Object locks rankings by thread
- Main storage pool overcommitment rankings by thread
- Abnormal contention rankings by thread
- Ineligible waits rankings by thread
- Synchronization token contention rankings by thread
- by job
- by collection, thread
- by collection, job

June 2018 (1319) – JW Job Summary drill down menu fixes

- In some of the drill down graphs from Job Summary analysis the "Filter by" (All jobs, selected job, prompt for generic job) option appeared in the menu where it did not work and should not have appeared.
 - This feature is only intended to apply to the initial SQL table reports in the analysis.
 - It is linked to the Job Summary rankings filtered by <type> option ONLY.



June 2018 (1319) – JW Job Summary drill down menu fixes

- Support to drill down from one of the **generic job totals** SQL tables was NOT implemented properly (user would get SQL errors). Added by generic job options.

Collection description	Duration of job in hours	Elapsed seconds	Start of job included 1-Yes, 0-No	End of job included 1-Yes, 0-No	Start timestamp	End timestamp	CPU time (microseconds)	Job CPU microseconds	Synchronous database reads	Synchronous non database reads	Synchronous database writes	...
RGAR 10 second intervals, Call stacks	1.000	3,611	0	0	2015-10-29-14.28.30.228847	2015-10-29-15.28.41.259000	171,901	103,850	0	0	0	
RGAR 10 second intervals, Call stacks, J9	.533				2015-11-02-15.07.42.027000		95,978	53,964	0	0	0	
RGAR 10 second intervals, Call stacks	1.000				2015-10-29-15.28.41.259000		634,214	641,483	0	7	0	
RGAR 10 second intervals, Call stacks, J9	.533				2015-11-02-15.07.42.027000		1,118,436	1,121,465	0	4	0	
RGAR 10 second intervals, Call stacks	1.000				2015-10-29-15.28.41.258000		146,376	147,227	0	6	0	
RGAR 10 second intervals, Call stacks, J9	.533						20	2,010,616	0	3	0	
RGAR 10 second intervals, Call stacks	1.000						09	251,086	0	14	0	
RGAR 10 second intervals, Call stacks, J9	.533						90	1,106,950	0	7	0	
RGAR 10 second intervals, Call stacks	1.000						71	893,639	0	20	0	
RGAR 10 second intervals, Call stacks, J9	.533						58	1,507,545	0	53	0	
RGAR 10 second intervals, Call stacks	1.000						67	527,544	0	33	0	
RGAR 10 second intervals, Call stacks, J9	.533						39	682,691	0	2	0	
RGAR 10 second intervals, Call stacks	1.000						52	0	0	6	0	
RGAR 10 second intervals, Call stacks, J9	.533						97	0	0	0	0	
RGAR 10 second intervals, Call stacks	1.000						66	0	0	0	0	
RGAR 10 second intervals, Call stacks, J9	.51						06	150,408	45	28	515	
RGAR 10 second intervals, Call stacks	.75						56	73,457	1	0	250	
RGAR 10 second intervals, Call stacks, J9	.25											
RGAR 10 second intervals, Call stacks	1.000											
RGAR 10 second intervals, Call stacks, J9	.533											
RGAR 10 second intervals, Call stacks	.75											
RGAR 10 second intervals, Call stacks, J9	.50											

(RUNIT...)	(JOBSTART)	(JOBEND)	stamp	End timestamp	CPU time (microseconds)	Job CPU microseconds	Synchronous database reads			
ARGAR	10 second intervals, Call stacks	1.000	3,611	0	0	2015-10-29-14.28.30.228847	2015-10->	171,901	103,850	
ARGAR	10 second intervals, Call stacks, J9	.533	1,945	0	0	2015-11-02-14.35.16.236621	2015-11->	95,978	53,964	
ARGAR	10 second intervals, Call stacks	1.000	3,611	0	0	2015-10-29-14.28.29.986493	2015-10->	634,214	641,483	
ARGAR	10 second intervals, Call stacks, J9	.533	1,945	0	0	2015-11-02-14.35.16.227095	2015-11->	1,118,436	1,121,465	
ARGAR	10 second intervals, Call stacks	1.000	3,611	0	0	2015-10-29-14.28.30.085468	2015-10->	146,376	147,227	
ARGAR	Selected Generic jobs			0	0	2015-11-02-14.35.16.233296	2015-11->	2,008,620	2,010,616	
ARGAR	Rankings filtered by selected Generic job			0	0	2015-10-29-14.28.29.986959	2015-10->	249,709	251,086	
ARGAR	Job Summary rankings filtered by Selected jobs									
ARGAR	Collection overview									

Wait graphs	Other graphs	by generic job	by collection, generic job	Dispatched CPU rankings by generic job	Dispatched CPU with dispatch CPU bra

June 2018 (1319) – JW Job Summary analysis

- The value shown in the Job Summary graph drilldowns for Contributing collections (MBRCOUNT) was wrong in some cases depending on which SQL table you started from.
- All SQL tables now contain a MBRCOUNT column.

June 2018 (1319) – CSI Job Summary analysis

- Made updates / fixes to CSI Job Summary analysis so the drill down options are consistent with these recent updates to JW Job Summary.
- Added support for new columns JBHSQLSTMT, JBTICC, JBTICU, JBTTMBU and JBPICC to be included in the job summary results in CSI at 7.2 and higher.

June 2018 (1319) – Dispatched CPU waiting vs sharing

- In wait bucket graphs, renamed the column:
"Dispatched CPU sharing/waiting" to "Dispatched CPU sharing"

In tables, renamed the column

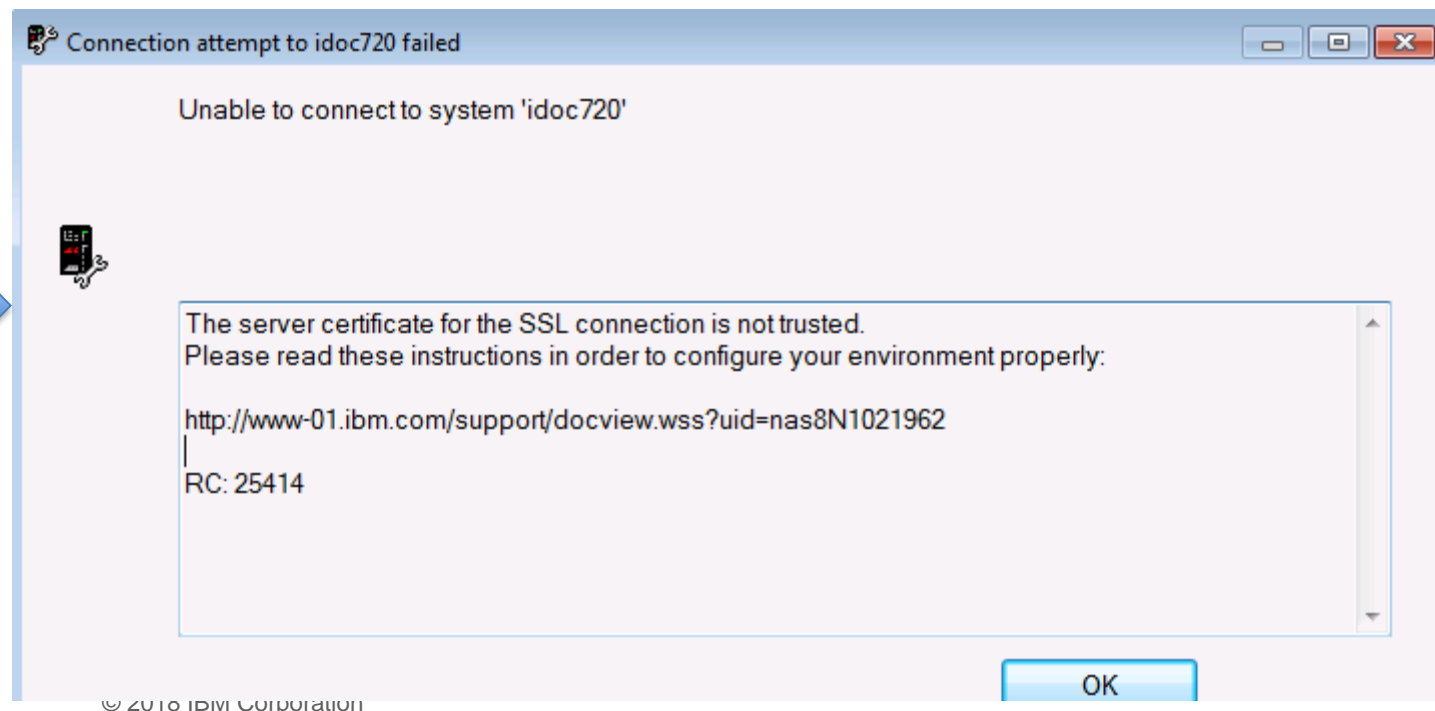
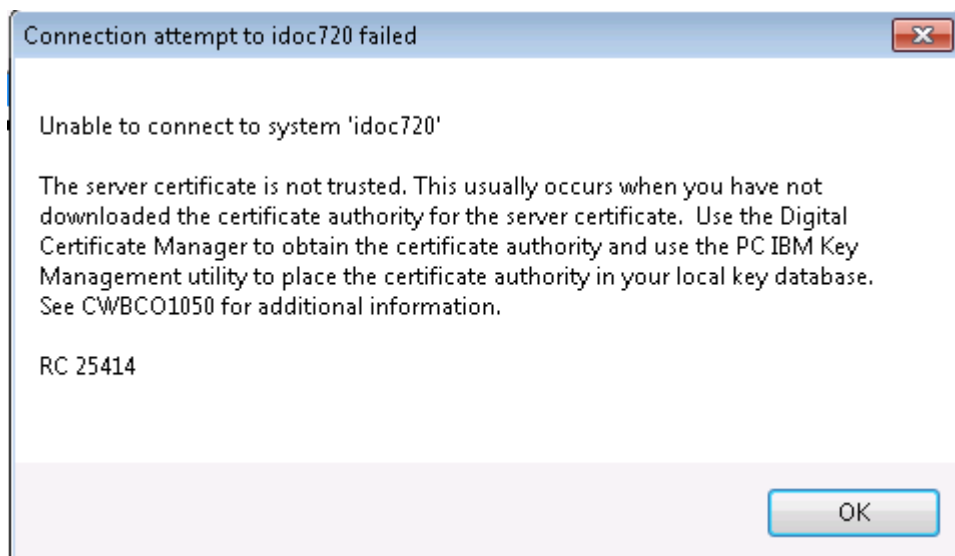
"Dispatched CPU waiting" to "Dispatched CPU sharing"

- **Note:** I was not aware "Dispatched CPU waiting" still existed in iDoctor (I thought we had renamed this years ago), but it still remained in table views and there was a CPS about this topic.

June 2018 (1319) – IBM i connection error message window change

- When connecting to an IBM i and there is a connection failure changed the window shown from a message box to a window that allows copy and paste of the information shown.

Also improved the contents of the messages shown for some of the most common errors.



June 2018 (1318) – Table search now includes # of columns

- The table search function will now include the (number of) columns in the results shown.

IBM iDoctor for IBM i C01318 [C:\IDOCTOR\W81\EXE\DEBUG2\IDOCTOR.EXE 06/25/2018 11:10:28] CA 110-14 - [IDOC720: iDoctor FTP GUI Library: MCCARGAR Collectio

File Edit View IBM i Window Help

System (IBM i): IDOC720 Search... Open a new results window

Library name: MCCARGAR File/table name: QAIDR*

Include: SQL tables Physical files Logical files Aliases Views

IBM i Connections IDOC720: TABLES Results Library: MCCARGAR File: QAIDR*

File	Table	Library	Type	Description	Rows	Rows o...	Changed date/time	Owner	Data size (MBs)	Variable length size (MBs)	Column stats size (MBs)	MTI size (MBs)	Columns
Qaidr00036	QAIDRJWAJ4SUM_1	MCCARGAR	TABLE	Job totals	87	0	2018-06-25-08.35.43.000000	MCCARGAR	.1884	0	0		206
Qaidr00035	QAIDRJWAJ3SUM_1	MCCARGAR	TABLE	Thread totals	578	0	2018-06-25-08.35.42.000000	MCCARGAR	1.1059	0	0		210
Qaidr00033	QAIDRJWAJ2SUM_1	MCCARGAR	TABLE	Job totals by collect>	152	0	2018-06-25-08.35.42.000000	MCCARGAR	.5775	0	.2580		207
Qaidr00032	QAIDRJWAJ1SUM_1	MCCARGAR	TABLE	Thread totals by col>	850	0	2018-06-25-08.35.41.000000	MCCARGAR	1.8514	0	.2048	.159	210
Qaidr00001	QAIDRJWAJ5SUM_1	MCCARGAR	TABLE	Collection informat>	2	0	2018-06-25-08.35.36.000000	MCCARGAR	.0246	0	.0123	.167	3
Qaidr00031	QAIDRJWCLTSUM_Q306143515	MCCARGAR	TABLE	Client and worker i>	0	0	2018-06-25-08.35.35.000000	MCCARGAR	.0328	0	0		216
Qaidr00011	QAIDRJWANL_DTL_Q306143515	MCCARGAR	TABLE	Situational analysis >	0	0	2018-06-25-08.35.33.000000	MCCARGAR	.0123	0	0	.163	4
Qaidr00010	QAIDRJWTL_Q306143515	MCCARGAR	TABLE	List of identified tas>	1,541	0	2018-06-25-08.35.32.000000	MCCARGAR	.2867	0	.1352		9

May 2018 (1317) – CSI disk graph labels for bucket mappings

- In CSI, in the disk graphs at 7.1+, the collection's QAPMCONF response times given in fields G1-GA are now used to provide the labels shown on any of the graphs that show disk response time buckets.

Note: The default graphs do not use the B1-B5 mapping at all (because the categorized fields in QAPMDISK do not break down reads vs writes and the ones in QAPMDISKRB do)

Instead the default graphs use a combination of buckets from the advanced mapping to determine the "simplified" bucket mappings shown in the default disk graphs. For example

Bucket 1 = advanced buckets 1-3 (< 1 ms)

Bucket 2 = advanced buckets 4-6 (> 1-16 ms)

Bucket 3 = advanced bucket 7 (> 16-64 ms)

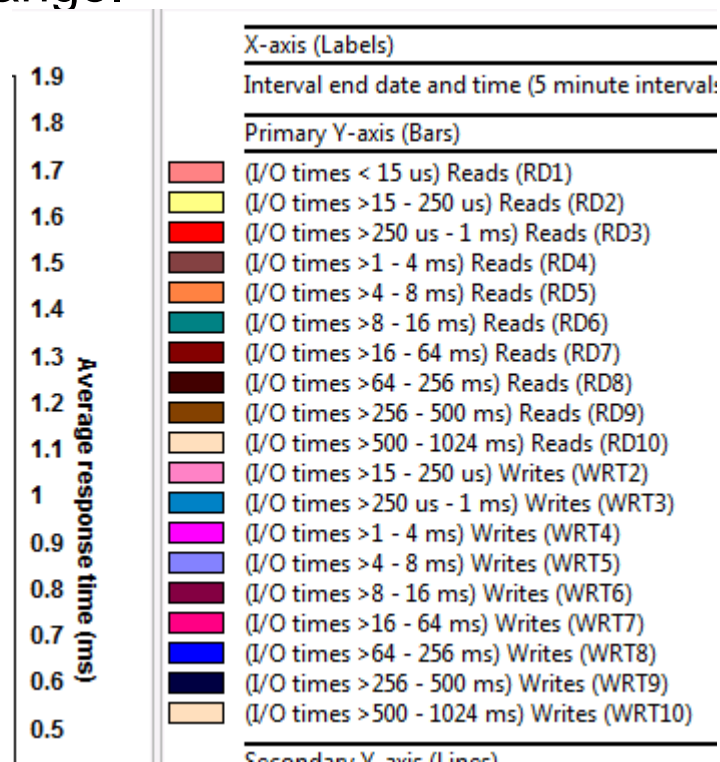
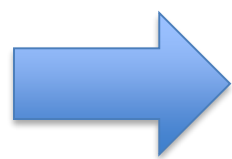
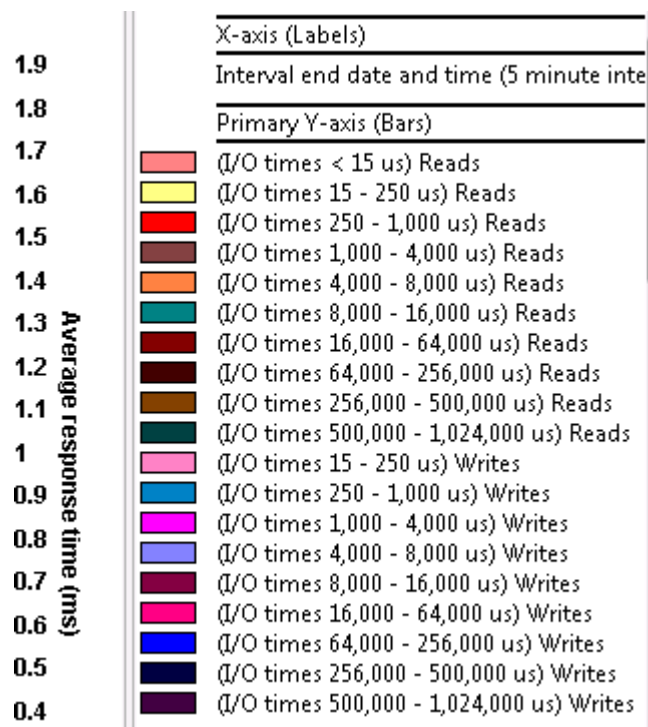
Bucket 4 = advanced bucket 8 (> 64-256 ms)

Bucket 5 = advanced bucket 9 + 10 (> 256 -1024ms)

Bucket 6 = advanced bucket 11(> 1024 ms)

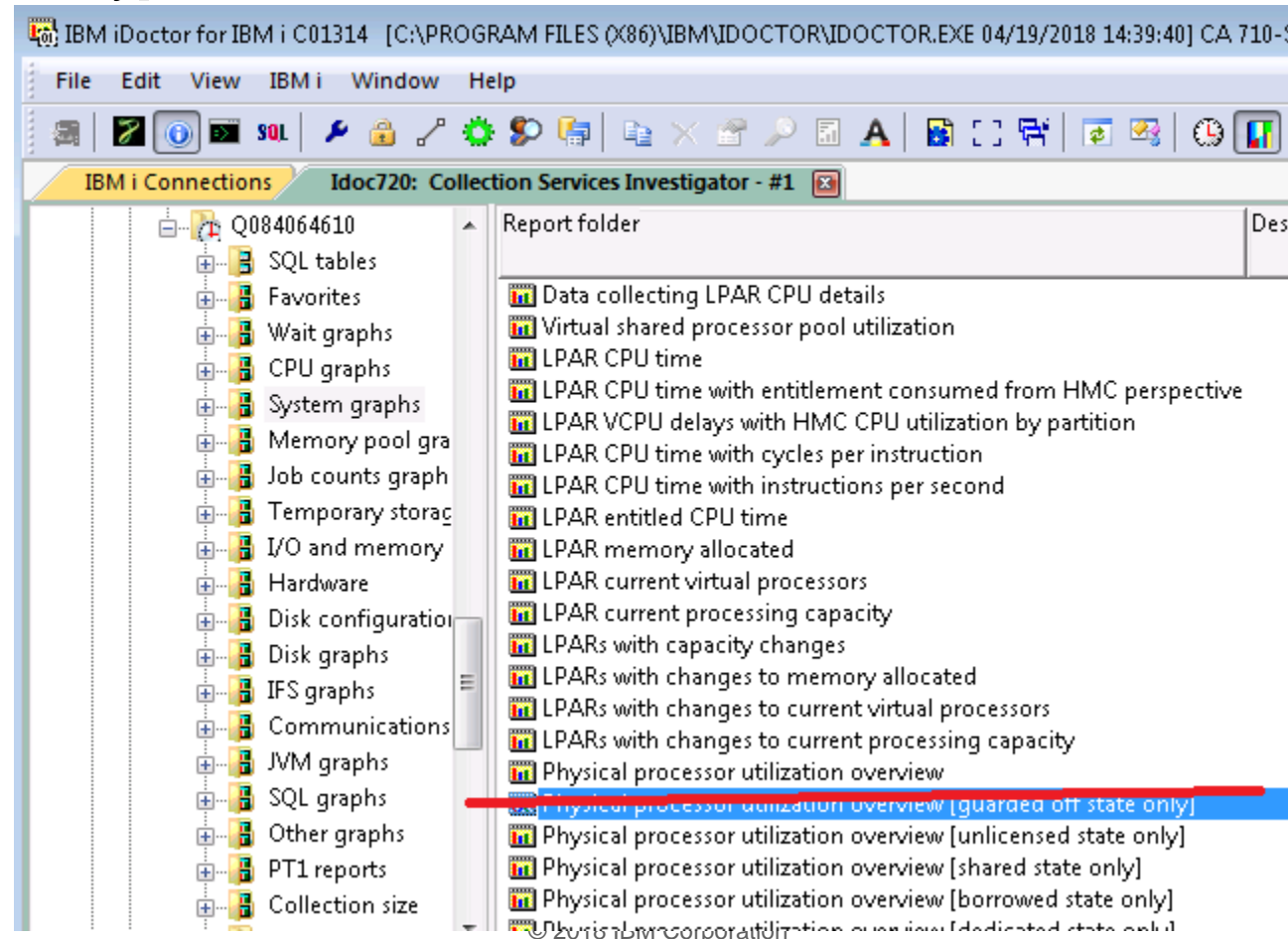
May 2018 (1317) – CSI disk graph labels for bucket mappings

- The primary difference you will notice in the advanced graphs legend, the metrics are no longer all in microseconds.
- In the default graphs there is no noticeable change.



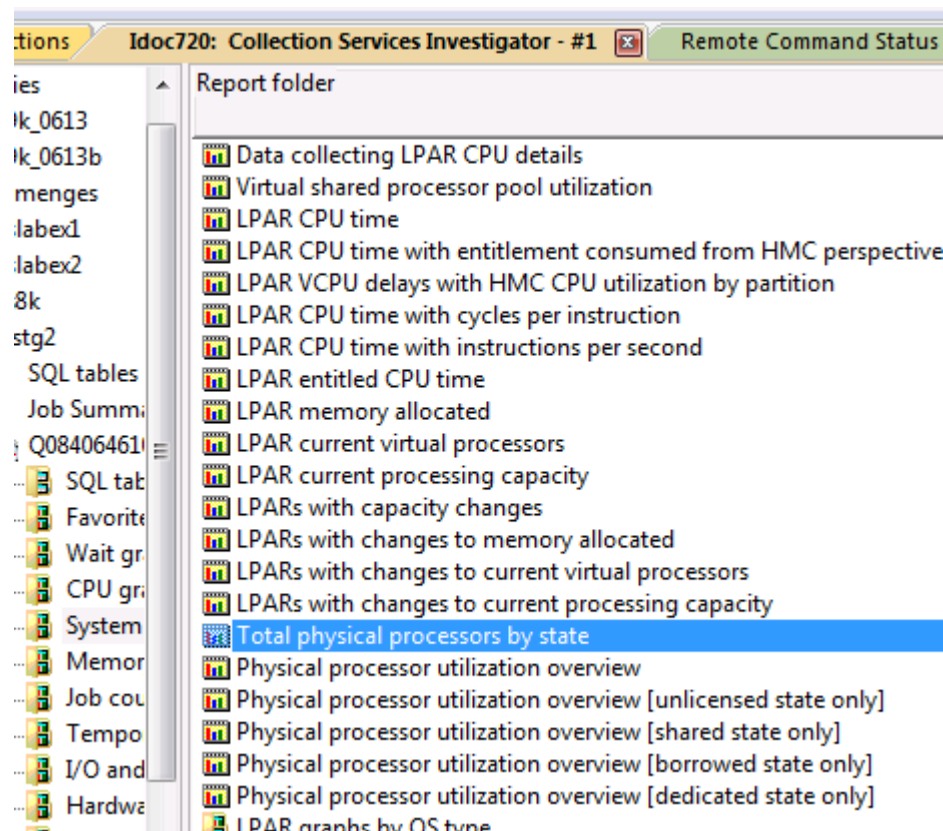
May 2018 (1317) – CSI system graph updates

- In CSI under the System graphs folder the graph "Physical processor utilization overview [guarded off state only]" has been removed since it would never return any data.



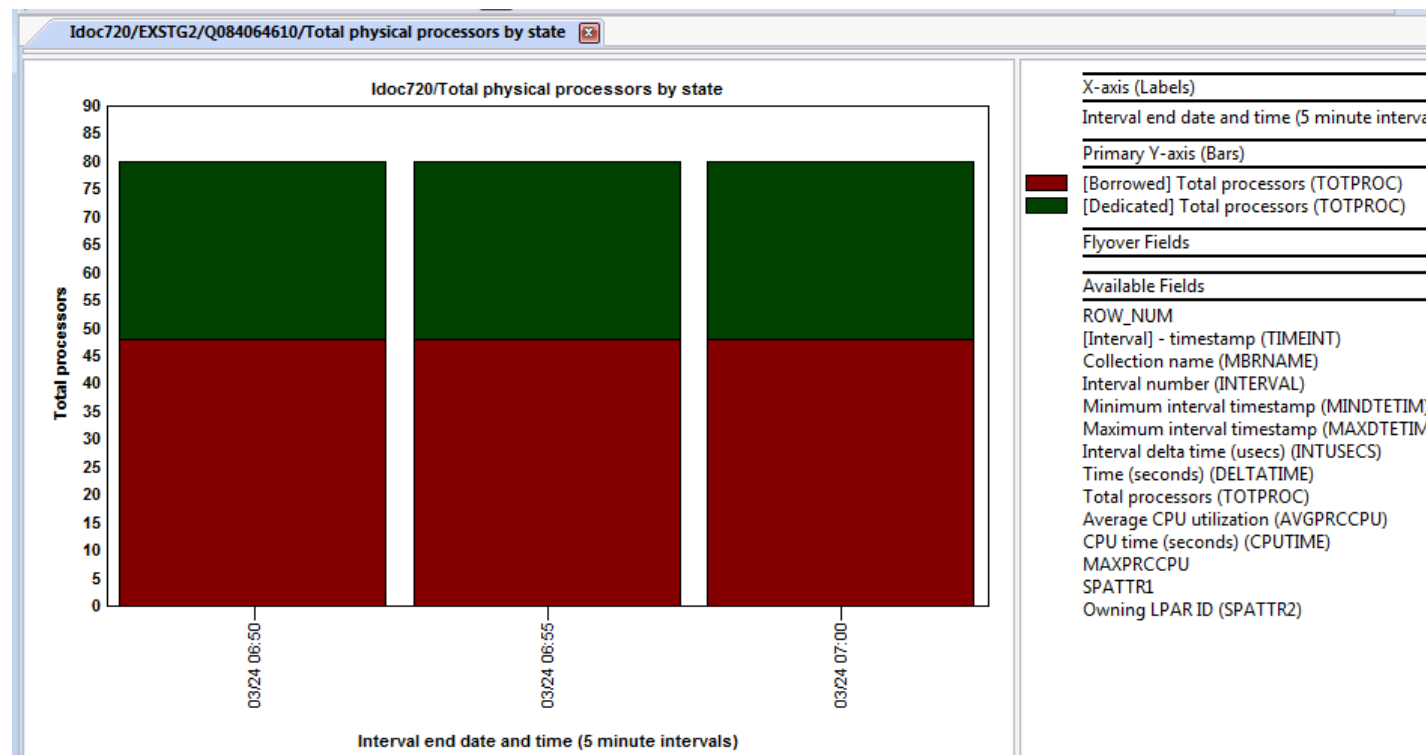
May 2018 (1317) – CSI system graph updates

- In CSI under the System graphs folder added a new graph "Total physical processors by state" that simply breaks down the total processors for each state occurring over time.



Report folder

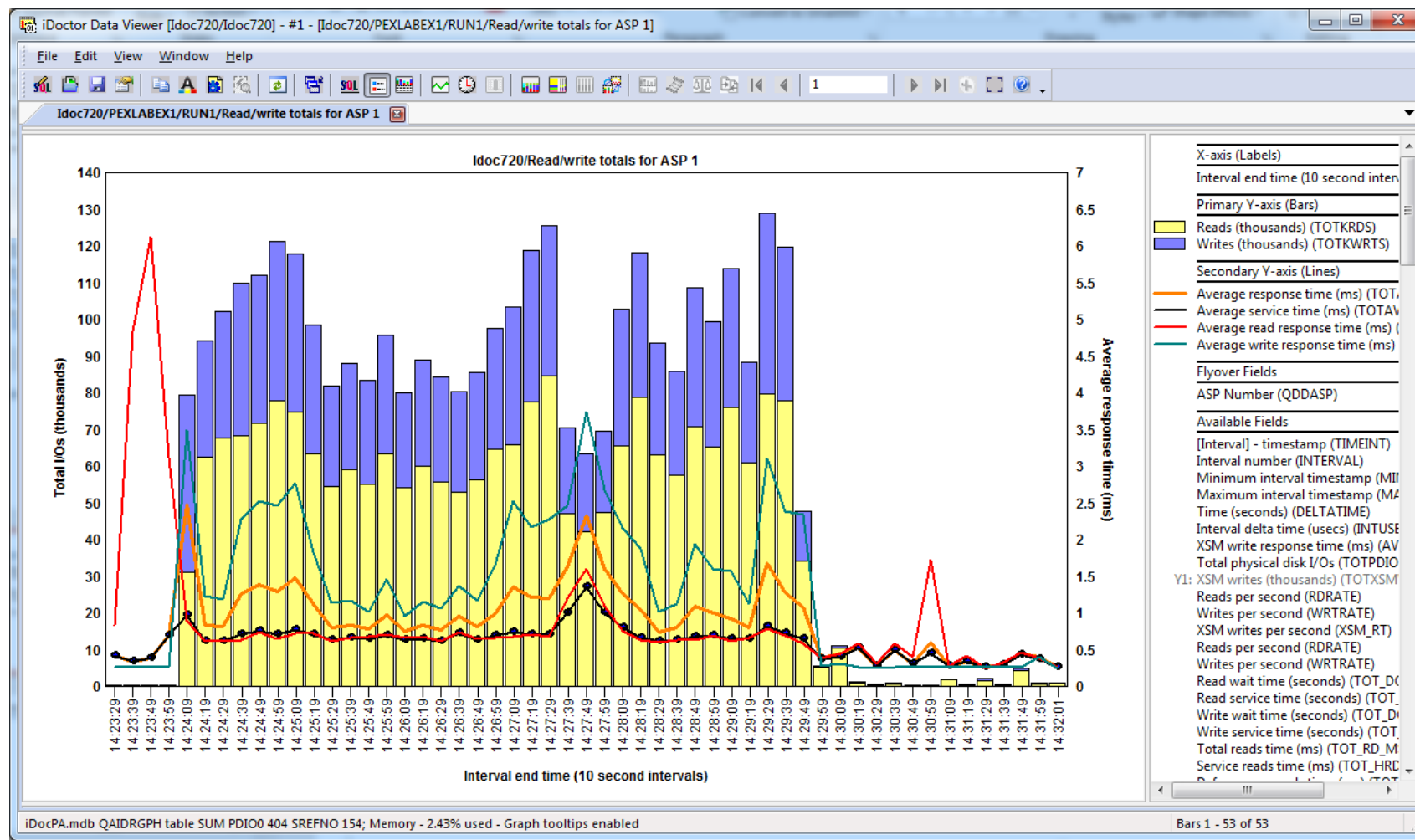
- Data collecting LPAR CPU details
- Virtual shared processor pool utilization
- LPAR CPU time
- LPAR CPU time with entitlement consumed from HMC perspective
- LPAR VCPU delays with HMC CPU utilization by partition
- LPAR CPU time with cycles per instruction
- LPAR CPU time with instructions per second
- LPAR entitled CPU time
- LPAR memory allocated
- LPAR current virtual processors
- LPAR current processing capacity
- LPARs with capacity changes
- LPARs with changes to memory allocated
- LPARs with changes to current virtual processors
- LPARs with changes to current processing capacity
- Total physical processors by state**
- Physical processor utilization overview
- Physical processor utilization overview [unlicensed state only]
- Physical processor utilization overview [shared state only]
- Physical processor utilization overview [borrowed state only]
- Physical processor utilization overview [dedicated state only]
- LPAR graphs by OS type



May 2018 (1316) – PEX Physical Disk I/O graphs redesigned

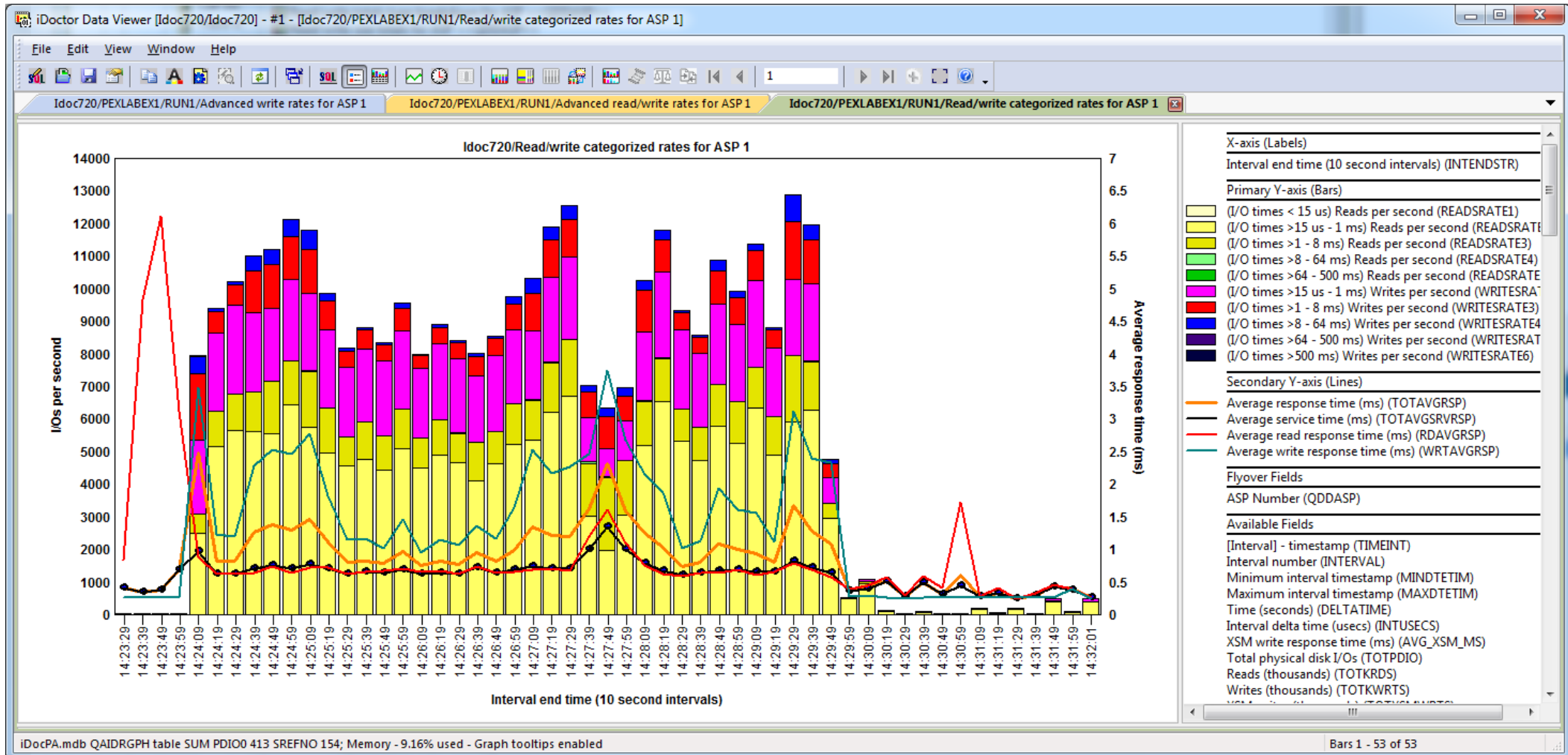
- We (Brad/Kristie and Ron) decided to make these graphs look and feel much more like CSI disk graphs.
 - We corrected inconsistencies with the graph names, column names, colors, etc.
 - Drill down mechanism looks more consistent as well.
- You can now define your own response time buckets (advanced or default/basic) if you want to.
 - This could be useful if working with newer hardware with very small response times.
 - Existing mapping used in CS at 7.1-7.3 is becoming obsolete. (> 1 second response times useless?!)
 - SQL statements all changed so response time bucket mapping is no longer “hard coded.”

May 2018 (1316) – PEX Physical Disk I/O graph example



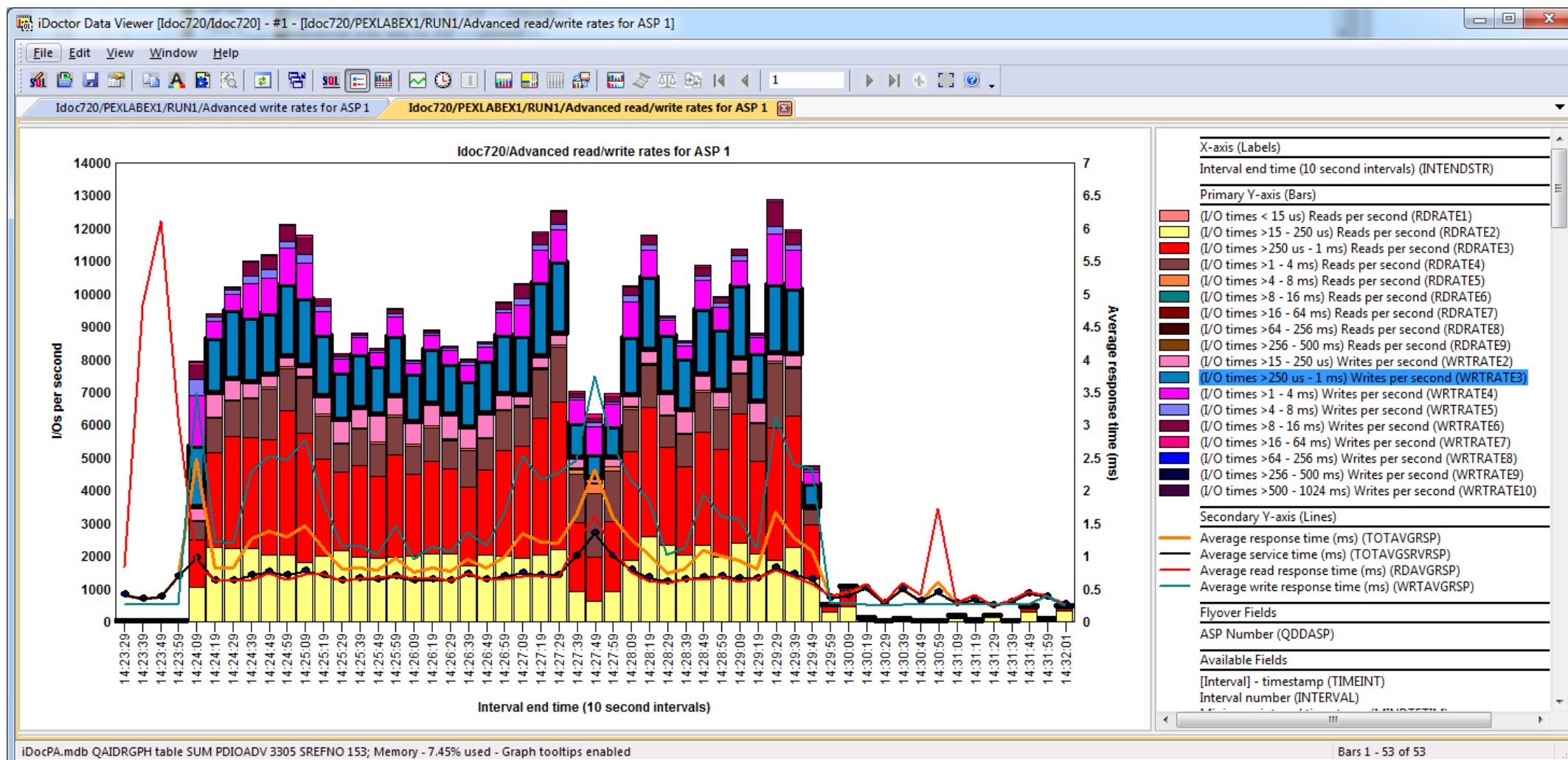
May 2018 (1316) – PEX Physical Disk I/O example

- 6 read buckets, 6 write buckets



May 2018 (1316) – PEX Physical Disk I/O advanced example

- 11 read buckets, 11 write buckets



May 2018 (1315) – Disk response time mapping changes (default)

- The disk response time default mapping used in Collection Services is changing in the next IBM i release (7.4). These are identified in file QAPMCONF and cannot be changed.
- QAPMDISK response time fields are not used, these will likely be removed at 7.4 (set to reserved.)
- Changes necessary since disks are getting faster!

Bucket	7.1-7.3 mapping	7.4 mapping
1	0 to <= 1 ms	0 to <= 8 us
2	> 1 to 16 ms	> 8 to 64 us
3	> 16 to 64 ms	> 64 to 256 us
4	> 64 to 255 ms	> 256 us to 1 ms
5	> 256 to 1024 ms	> 1 to 16 ms
6	> 1024 ms	> 16 ms

Note: The 7.4 mapping is subject to change but will apply to CS at 7.4 or optionally in PEX/DW at 7.1+ if using the iDoctor mapping V740. **IBM Confidential**

May 2018 (1315) – Disk response time mapping changes (advanced)

- The advanced mapping applies to file QAPMDISKRB (in CS) or used by iDoctor in PEX or DW.

Bucket	7.1-7.3 mapping	7.4 mapping
1	0 to <= 15 us	0 to <= 8 us
2	> 15 to 250 us	> 8 to 16 us
3	> 250 us to 1 ms	> 16 to 64 us
4	> 1 to 4 ms	> 64 to 128 us
5	> 4 to 8 ms	> 128 to 256 us
6	> 8 to 16 ms	> 256 to 512 us
7	> 16 to 64 ms	> 512 us to 1 ms
8	> 64 to 256 ms	> 1 to 8 ms
9	> 256 to 500 ms	> 8 to 16 ms
10	> 500 to 1024 ms	> 16 to 64 ms
11	> 1024 ms	> 64 ms

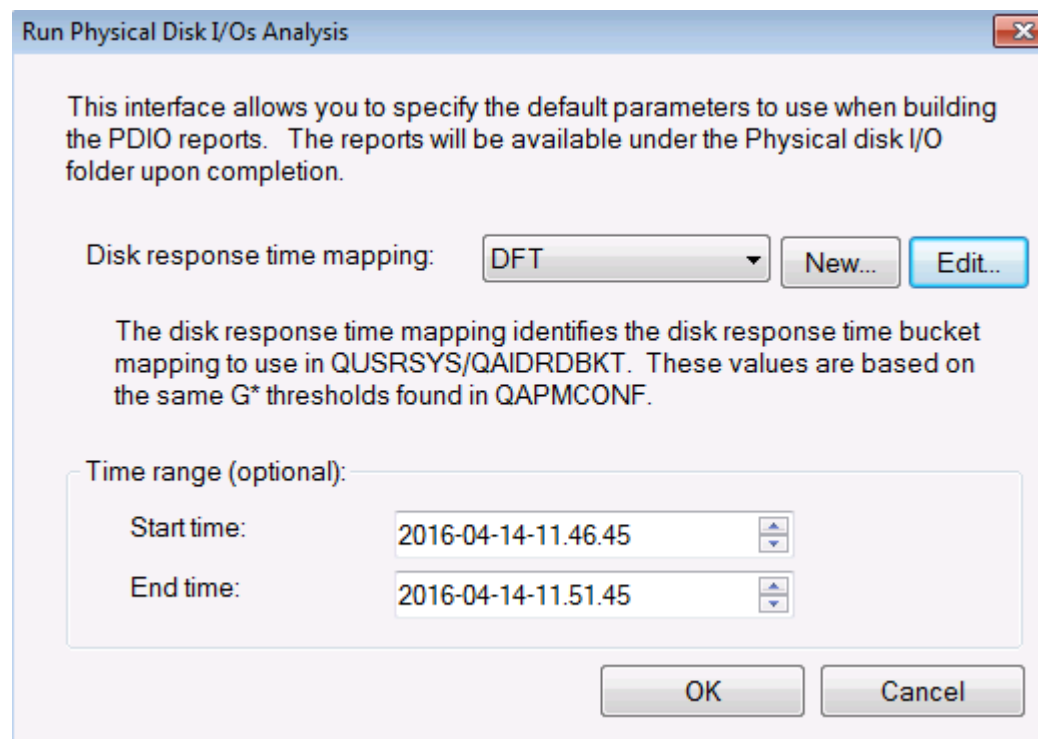
Note: The 7.4 mapping is subject to change but will apply to CS at 7.4 or optionally in PEX/DW at 7.1+ if using the iDoctor mapping V740. **IBM Confidential**

May 2018 (1315) – Disk response time mapping file

- iDoctor has added a file QUSRSYS/QAIDRDBKT to keep track of these disk response time mappings.
- This applies to PEX currently only to allow you to choose the mapping to use when analyzing data.
- This could apply to Disk Watcher as well, but will NOT apply in Collection Services.
 - No mechanism exists to change the mapping in CS.
- Run the PEX analysis “Rebuild the disk response times mapping” to create this file (if desired.)
 - Otherwise iDoctor will create it when needed.

May 2018 (1315) – PEX Physical Disk I/O analysis prompt

- When running PEX PDIO you will be prompted for the disk response time mapping to use.
- You can use an existing iDoctor defined mapping or create a new one.



Run Physical Disk I/Os Analysis

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

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

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

Time range (optional):

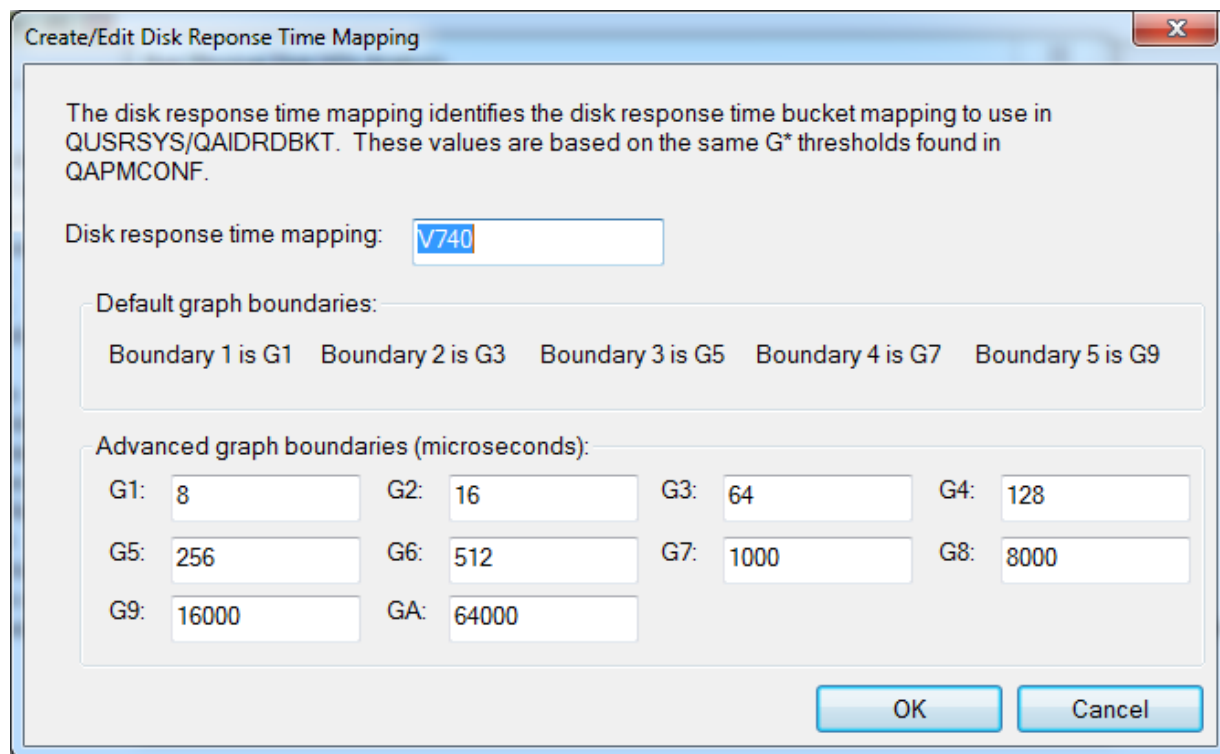
Start time: 2016-04-14-11.46.45

End time: 2016-04-14-11.51.45

OK Cancel

May 2018 (1315) – Disk response time mapping example 1

- For example these boundaries results in the following **default** 6 bucket graph mapping:



Create/Edit Disk Response Time Mapping

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

Disk response time mapping:

Default graph boundaries:
Boundary 1 is G1 Boundary 2 is G3 Boundary 3 is G5 Boundary 4 is G7 Boundary 5 is G9

Advanced graph boundaries (microseconds):

G1: 8	G2: 16	G3: 64	G4: 128
G5: 256	G6: 512	G7: 1000	G8: 8000
G9: 16000	GA: 64000		

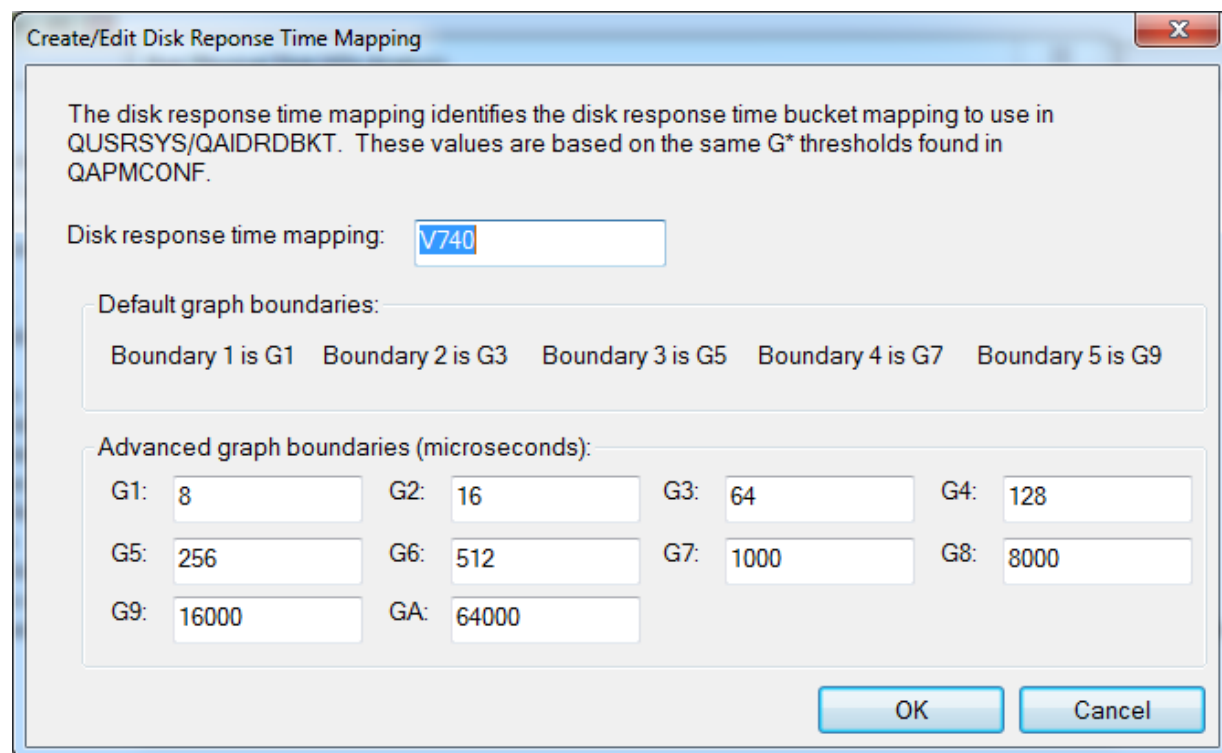
OK Cancel

- 1: 0 to \leq 8 microseconds
- 2: $>$ 8 to 64 microseconds
- 3: $>$ 64 to 256 microseconds
- 4: $>$ 256 microseconds to 1 millisecond
- 5: $>$ 1 millisecond to 16 milliseconds
- 6: $>$ 16 milliseconds

Note: The 7.4 mapping is subject to change but will apply to CS at 7.4 or optionally in PEX/DW at 7.1+ if using the iDoctor mapping V740. **IBM Confidential**

May 2018 (1315) – Disk response time mapping example 2

- Or these for the **advanced** 11 bucket graph mapping:



Create/Edit Disk Response Time Mapping

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

Disk response time mapping:

Default graph boundaries:
Boundary 1 is G1 Boundary 2 is G3 Boundary 3 is G5 Boundary 4 is G7 Boundary 5 is G9

Advanced graph boundaries (microseconds):

G1: <input type="text" value="8"/>	G2: <input type="text" value="16"/>	G3: <input type="text" value="64"/>	G4: <input type="text" value="128"/>
G5: <input type="text" value="256"/>	G6: <input type="text" value="512"/>	G7: <input type="text" value="1000"/>	G8: <input type="text" value="8000"/>
G9: <input type="text" value="16000"/>	GA: <input type="text" value="64000"/>		

OK Cancel

- 1: 0 to <= 8 microseconds
- 2: > 8 to 16 microseconds
- 3: > 16 to 64 microseconds
- 4: > 64 microseconds to 128 microseconds
- 5: > 128 microseconds to 256 microseconds
- 6: > 256 microseconds to 512 microseconds
- 7: > 512 microseconds to 1 millisecond
- 8: > 1 millisecond to 8 milliseconds
- 9: > 8 milliseconds to 16 milliseconds
- 10: > 16 milliseconds to 64 milliseconds
- 11: > 64 milliseconds

Note: The 7.4 mapping is subject to change but will apply to CS at 7.4 or optionally in PEX/DW at 7.1+ if using the iDoctor mapping V740. **IBM Confidential**

April 2018 (1314) – Create Indexes analysis added in CSI/JW

- **Note: These were already added externally in client 1314, but leaving here for reference.**
- To speed up some of the graphs you can now run the Create indexes analysis.
 - Run the Collection Summary analysis first before using this.
 - It does NOT run automatically as a “default” analysis.
- Do NOT use this on actively running collections.
- It primarily speeds up the SQL for several flavors of rankings graphs.
- You can delete these indexes under the SQL Tables -> Create Indexes folder (right-click -> Delete... menu)