IBM iDoctor for IBM i Plan Cache Analyzer

IBM iDoctor for IBM i Development Team

25 February 2022

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Abstract

Provides in-depth coverage of all major GUI functions for all components at 7.2 and higher. This document covers the Plan Cache Analyzer component.

Changes

25 Feb 2022 – updated for 2022. This is client 1530 or higher.

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1 Introduction

Plan Cache Analyzer provides the ability to collect and analyze snapshots of the system's SQL Plan Cache. It is designed to complement the features already available in IBM i Navigator for analyzing the Plan Cache by providing several graphs and drill-down options not available there.

The <u>plan cache</u> is a repository that contains the access plans for queries that were optimized by SQE.

Note: Plan Cache Analyzer is included with a Job Watcher license.

2 Starting Plan Cache Analyzer

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

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

| or IBM i Components | | | | | _ | | \times |
|---|---|---|--|--|---|---------|---|
| is interface to work with the IBM iDoctor for IBM s codes to your system that were given to you Connected to system Ctcprf73 with user MC | I i components by IBM service CARGAR | on your e to autho | system. You rize use to a | may also apply component | Cha | ange Us | ser |
| Component list for system Ctcprf73: | Build Date | Expires | Status | | | | ^ |
| Job Watcher | 01/19/22 01/19/22 | Never Never | Available Available | | | | |
| Plan Cache Analyzer | 01/19/22 01/19/22 01/19/22 | Never Never | Available Available Available | | | | I |
| Mex-Analyzer 앞 IBM i Explorer 많 Data Explorer | 01/19/22 01/19/22 01/19/22 | Never | Available Available Available | | | | |
| Check for new server builds | | | | ✓ Close window after clicking Launch | | Launch | |
| To authorize use for a component, enter the Access code: | e access code | below: | System se Processor group: | rial: 0665FER Refresh | | Close | |
| | ar IBM i Components is interface to work with the IBM iDoctor for IBM s codes to your system that were given to you Connected to system Ctcprf73 with user MC Component list for system Ctcprf73: Component list for system Ctcprf73: Component Job Watcher Job Watcher Job Watcher Disk Watcher PEX-Analyzer Imp Storage Analyzer PEX-Analyzer IBM i Explorer Data Explorer Check for new server builds To authorize use for a component, enter the Access code: | or IBM i Components is interface to work with the IBM iDoctor for IBM i components is codes to your system that were given to you by IBM service Connected to system Ctcprf73 with user MCCARGAR Component list for system Ctcprf73: Component list for system Ctcprf73: Component list for system Ctcprf73: Component Date Job Watcher 01/19/22 Job Watcher 01/19/22 Disk Watcher 01/19/22 PEX-Analyzer 01/19/22 PEX-Analyzer 01/19/22 BM i Explorer 01/19/22 Data Explorer 01/19/22 Check for new server builds To authorize use for a component, enter the access code Access code: Access code | is interface to work with the IBM iDoctor for IBM i components on your as a codes to your system that were given to you by IBM service to author connected to system Ctcprf73 with user MCCARGAR Component list for system Ctcprf73: Component list for system Ctcprf73: Component Build Expires Date Job Watcher 01/19/22 Never Job Watcher 01/19/22 Never Disk Watcher 01/19/22 Never Disk Watcher 01/19/22 Never Femp Storage Analyzer 01/19/22 Never Femp Storage A | or IBM i Components is interface to work with the IBM iDoctor for IBM i components on your system. You is codes to your system that were given to you by IBM service to authorize use to a Connected to system Ctcprf73 with user MCCARGAR Component list for system Ctcprf73: Component Build Expires Status Date Component 01/19/22 Never Available Collection Services Investigator 01/19/22 Never Available Disk Watcher 01/19/22 Never Available Check for new server builds To authorize use for a component, enter the access code below: Access code: Apply Processor group: | is interface to work with the IBM iDoctor for IBM i components on your system. You may also apply is codes to your system that were given to you by IBM service to authorize use to a component. Connected to system Ctcprf73 with user MCCARGAR Component list for system Ctcprf73: Component Build Expires Status Date Expires Status Collection Services Investigator 01/19/22 Never Available Collection Services Investigator 01/19/22 Never Available Plan Cache Analyzer 01/19/22 Never Available PEX-Analyzer 01/19/22 Never Available PEX-Analyzer 01/19/22 Never Available PEX-Analyzer 01/19/22 Never Available Data Explorer 01/19/22 Never Available Check for new server builds Check for new server builds Collection a component, enter the access code below. Access code: Apply Processor Processor Processor Processor Processor Processor | | or IBM i Components – – – – – – – – – – – – – – – – – – – |

iDoctor IBM i Components Window

Note: Collection Services Investigator, Plan Cache Analyzer and Disk Watcher will only be available if Job Watcher is installed correctly and a valid access code for Job Watcher has been applied. These components are included with the Job Watcher license.

3 Plan Cache Analyzer Component View

The Plan Cache Analyzer view is the interface used to create SQL plan cache snapshots or work with and analyze existing data.

| IBM i Connections Ctcprf73: Pla | an Cache Analyzer - #1 🛛 🗙 | | | |
|---------------------------------|----------------------------|--|--|--|
| 🖃 📆 Plan Cache Analyzer | Function | Description | | |
| 🗄 🛄 System plan cache | System plan cache | Graphs and reports over the system's currently active plan cache. | | |
| 🗄 🜗 Plan cache snapshots | Plan cache snapshots | A list of all Plan Cache Analyzer snapshots on the system | | |
| 🗄 📲 DBMONs | DBMONs | Contains all DBMON data found on the current system | | |
| 🗄 📲 Monitors | Monitors | Work with iDoctor monitors | | |
| General functions | General functions | Work with Power performance data (non IBM i), jobs, disks, SQL functions and more. | | |

Plan Cache Analyzer Component View

The 'Plan Cache Analyzer' folder contains a list of folders, each providing different features available.

Use the **System plan cache** folder to view reports over the system's active plan cache without taking a snapshot (if desired.)

The snapshots are displayed under the Plan cache snapshots folder.

3.1 Root Folder Menu Options

The following Plan Cache Analyzer specific menu options are available by right clicking on the **Plan Cache Analyzer** folder in the component view:



Plan Cache Analyzer popup-menu

| Menu Item | Description |
|---|--|
| Filter Libraries | This option allows you to filter the libraries shown in the Plan cache snapshots folder by a generic library name or library owner. This is useful for speeding up the display of the list if the system contains many libraries containing performance data. |
| Create Plan Cache Snapshot | Use this option to create a new plan cache snapshot. |
| Change Plan Cache Size Threshold -> Default | This option changes the maximum amount of storage used by the plan cache to the default setting using the <u>CHANGE_PLAN_CACHE_SIZE</u> stored procedure. |
| Change Plan Cache Size Threshold -> Specific Value… | This option changes the maximum amount of storage used by the plan cache to value provided by the user with the <u>CHANGE_PLAN_CACHE_SIZE</u> stored procedure. |
| Clear Plan Cache | This option will <u>clear all plans</u> from the SQL plan cache on the system. |
| View Plan Cache Properties | Use this option to display details about the current state of the plan cache. |
| | |
| Open New Data Viewer | Opens a new Data Viewer window. This window is used to display tables and graphs on the system. You can open iDoctor-defined reports into this window or you can also open any database file or SQL table and display the results in graph or table form. |
| <u>Set User-Defined</u> <u>Reports Database</u> | This option allows the user to view/modify the currently used user-defined reports database. The database can either be an MS Access file or a library on an IBM i. The database stores the information needed to build the user-defined tables and graphs shown in iDoctor. |
| <u>Clear GUI cache</u> | This option clears everything loaded in the GUI's cache (like menus, graph definitions, query definitions, stored procedure versions installed, etc) |
| Properties | Use this menu to display version information for the current component installed on the system. The build level of the GUI is also displayed here. |

3.2 Create Plan Cache Snapshot

This option is used to create a new plan cache snapshot on the system using <u>DUMP_PLAN_CACHE</u>.

A window is displayed where the user can specify the library and table to create the new plan cache snapshot into.

| 🖸 Create Plan Cache Snapshot 🛛 🕹 | | | | | | | | |
|---|-----------|--|--|--|--|--|--|--|
| This option allows you to create a plan cache snapshot, saving the results into the desired database table. If the table already exists, it will be replaced. Your results will be visible under the Plan Cache Snapshots folder. | | | | | | | | |
| Library: | MCCARGAR | | | | | | | |
| Table: | NEWPC | | | | | | | |
| | OK Cancel | | | | | | | |

Create Plan Cache Snapshot Window

After pressing OK, the snapshot is created which will take a few moments.

| IBM i Connections / Ctcprf73: Plan Cache Analyzer - #1 🗵 | | | | | | | | |
|---|--|--|--|--|--|--|--|--|
| f 🖃 📆 Plan Cache Analyzer | Function | Description | | | | | | |
| 🖶 🛄 System plan cache | System plan cache | Graphs and reports over the system's currently active plan cache. | | | | | | |
| 🗄 📗 Plan cache snapshots | Plan cache snapshots | A list of all Plan Cache Analyzer snapshots on the system | | | | | | |
| DBMONs | DBMONs | Contains all DBMON data found on the current system | | | | | | |
| Monitors | Monitors | Work with iDoctor monitors | | | | | | |
| General functions | General functions | Work with Power performance data (non IBM i), jobs, disks, SQL functions and more. | | | | | | |
| | | | | | | | | |
| Remote SQL Statement Status 🛛 | | | | | | | | |
| Time System Sta | tus SQL Statement | | | | | | | |
| 🛛 🖾 02/28/22 13:26:58 Ctcprf73 Ru | /22 13:26:58 Ctcprf73 Running CALL QSYS2/DUMP_PLAN_CACHE('MCCARGAR', 'QIDR655980') | | | | | | | |
| Z 02/28/22 13:26:58 Ctcprf73 Waiting update qusrsys/qaugdbpmd2 set DATA_00001 = (SELECT MAX(QQSYS) FROM MCCARGAR/QIDR655980), DATE_00001 = (SEL | | | | | | | | |
| | | | | | | | | |

DUMP_PLAN_CACHE in progress in the Remote SQL Statement Status View

After it has been created the Plan cache snapshots folder can be refreshed to display the new snapshot.

| IBM i Connections Idoc7 | 30: Plan Cache Analyzer - #1 🛛 | | | | | | |
|-----------------------------|--------------------------------|------------|------------|-----------|----------|----------------------------|-------------|
| 🖃 🐻 Plan Cache Analyzer | Snapshot | Library | Table | System | Created | Date created | Start time |
| 🗈 🔜 System plan cache | | | | collected | by | | |
| 🗄 🕒 Plan cache snapsho | | | | on | | | |
| B- SOL performance n | MCCARGAR NEWPC 0222040416 | MCCARGAR | NEWPC | IDOC730 | MCCARGAR | 2022-02-22-04.04.16.896000 | 2022-01-18- |
| H Monitors | QIBMDBTSTGQMGPCSNAP11217104920 | QIBMDBTSTG | QMGPCSNAP1 | | ADAMB | 2022-02-18-15.41.54.137000 | 2020-05-13- |
| General functions | MYSNAP | ADAMB | QZG0000023 | | ADAMB | 2021-12-16-21.39.51.955000 | 2021-12-16- |
| E 111 General functions | 🖾 SnapAug10 | ADAMB | QZG0000022 | IDOC730 | ADAMB | 2021-08-11-08.13.18.627000 | 2021-07-30- |
| | O TMPMON MCCARGAR AGU1WXJSLR | OGPL | OZG0000020 | | MCCARGAR | 2021-06-15-11.42.47.215000 | 2021-06-15- |
| Plan cache snapshots folder | | | | | | | |

3.3 View Plan Cache Properties

This option runs a stored procedure <u>DUMP_PLAN_CACHE_PROPERTIES</u> that displays information about the system's plan cache.

| | /Plan Cache Properties for system Idoc730 - #1 | x | |
|----|--|---|--|
| He | ading | | |

| Heading | Value | | | | |
|---|----------------------------|--|--|--|--|
| (HEADING) | (VALUE) | | | | |
| Time Of Summary | 2022-02-22-04.07.51.767530 | | | | |
| Plan Cache Creation Time | 2021-12-20-20.15.22.971265 | | | | |
| Active Query Summary | | | | | |
| Number of Currently Active Queries | 50 | | | | |
| Number of Queries Run Since Start | 1387332 | | | | |
| Number of Query Full Opens Since Start | 649113 | | | | |
| Plan Usage Summary | | | | | |
| Current Number of Plans in Cache | 1239 | | | | |
| Total Number of Plans Built Since Start | 162675 | | | | |
| Total Number of SMP Plans Built Since Start | 0 | | | | |
| Total Number of Unique Queries Since Start | 123490 | | | | |
| Current Plan Cache Size | 501 MB | | | | |
| Current Plan Cache Size Threshold | *AUTO MB | | | | |
| Maximum Plan Cache Size For AutoSizing | *DEFAULT (16024) MB | | | | |
| Current Plan Cache Hit Ratio | 72 % | | | | |
| Target Plan Cache AutoSize Hit Ratio | *DEFAULT (90) % | | | | |
| Total Number of Plan Cache Autosizing Adjustments | 44 | | | | |
| Last Plan Cache AutoSizing Adjustment | 2022-02-22-03.56.18.754715 | | | | |
| Last Autosizing Limited Due to Temporary Storage | 2022-02-22-03.00.00.123162 | | | | |
| Current Number of Job Scoped (QTEMP) Plans | 5 | | | | |
| Total Number of Job Scoped (QTEMP) Plans Built Since Start | 253 | | | | |
| Total Number of Unique Queries With Job Scoped (QTEMP) References Since Start | 63 | | | | |
| Total Times Plans Used from Cache | 353705 | | | | |
| Total Plans Removed | 31790 | | | | |
| Total Plans Pruned | 96724 | | | | |
| Number of Times Plan Cache Pruned | 88 | | | | |
| Time Dan Carba was Last Druned Dian Carba Dranartian Danart | 2022-02-22-03 00 00 123157 | | | | |
| Tan Gache Fropenies Report | | | | | |

4 System plan cache

This folder contains reports and graphs over the SQL plan cache. These options allow you to view the current plan cache without needing to create a snapshot.

Note: All options within this folder utilize the ANALYZE_PLAN_CACHE (undocumented) stored procedure.

These options can be accessed by either expanding the subfolders or right-click the System plan cache folder.

| IBM i Connections | Ctcprf73: Pla | an Cache Analyzer - | #1 | x | |
|---|---------------|---------------------|----|-----|--|
| 🖃 🐻 Plan Cache Ana | lyzer | Function | | | Description |
| t ⊕- <mark></mark> System pla Plan cache | Explore | | | ots | Graphs and reports over the system's currently active plan cach A list of all Plan Cache Analyzer snapshots on the system |
| DBMONs | SQL statem | ients | > | | Longest running SQL statements |
| 🗄 📄 Monitors | QRO hash, | SQL statement | > | | Top 100 longest running SQL statements |
| 🗄 🛄 General fu | Generate R | Reports | | | Top 100 longest running SQL statements with indexes advised |
| · · | | | | | Longest running SQL statements that contain text << SQLSEARCH>> |
| | | | | | Longest running SQL statements for user < <curuser>></curuser> |
| | | | | | Last 100 statements executed |
| | | | | | Currently running SQL statements |

System plan cache popup-menu

4.1 SQL statements

This folder contains a set of reports that return information about the SQL statements found in the SQL plan cache.

Tip: These reports are rebuilt on each refresh. Different results may appear over time.

| IBM i Connections Ctcprf73: Pla | n Cache Analyzer - #1 🗵 |
|---|---|
| IBM i Connections Ctcprf73: Pla □ □ | Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Report folder Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 Image: Carche Analyzer - #1 |
| General functions | Last 100 statements executed Currently running SQL statements |

System plan cache -> SQL statements folder

4.1.1 Longest running SQL statements

This report returns the SQL statements found in the plan cache showing the worst performing ones first.

🚓 ADVANCED - iDoctor Data Viewer - #1 - [/Longest running SQL statements - #1]

File Edit View Window Help

| /Longes | cruming sqc statements - #1 | | | | | • | 4 |
|--------------------------------|----------------------------------|--------------------------|----------------------------------|--------------------------------|------------------------------|---|---|
| Total run time (seconds) | Last run time (LAST_TIME_RUN) | QRO hash (QROHASH) | Average run time (seconds) | Worst run time (seconds) | Total runs (TOTALRUNS) | SQL statement (SQLSTMT) | |
| (RUNTIME) | | | (AVG_PROCESSING_TIME) | (WORSTTIME2) | | | |
| 54.8741 | 2022-02-17-13.29.57.001955 | 69A53EF3 | 27.4370 | 27.4558 | 2 | WITH TIMES AS (SELECT ? AS LIBNAME, ? AS MBRNAME, A.* FROM QTEMP/qapyj | |
| 45.4335 | 2022-02-18-05.11.16.858259 | EF7EA46 | 45.4335 | 45.4335 | 1 | WITH CPUALL AS (SELECT SUM(CPUAVAIL) AS CPUAVAIL FROM (SELECT ? AS LIBN. | |
| 41.8629 | 2022-02-17-13.11.24.856866 | 6FAECB4F | 20.9314 | 28.5507 | 2 | WITH TIMES AS (SELECT ? AS LIBNAME, ? AS MBRNAME, A.* FROM QTEMP/qapyj | |
| 40.8596 | 2022-02-17-14.23.27.903473 | 7488E10A | 40.8596 | 40.8596 | 1 | WITH CPUALL AS (SELECT SUM(CPUAVAIL) AS CPUAVAIL FROM (SELECT ? AS LIBN. | |
| 36.2882 | 2022-02-17-12.45.47.201453 | E51E6610 | 36.2882 | 36.2882 | 1 | CREATE TABLE QTEMP/QAIDRJWSUMWT_BCHMON185 AS (SELECT INTERVAL, SUM | |
| 31.0246 | 2022-02-18-05.55.52.869124 | 6F602FDF | 31.0246 | 31.0246 | 1 | SELECT CASE WHEN ITASKCOUNT IS NULL THEN ? ELSE TRIM(SUBSTR(TDEJOBNA | |
| 31.0181 | 2022-02-18-09.43.39.634520 | 1527A9E4 | 31.0181 | 31.0181 | 1 | The WITH portion is used to build an interval file that has accurate start and en | |
| 29.3461 | 2022-02-18-08.39.28.760348 | 9EFA0606 | 29.3461 | 29.3461 | 1 | The WITH portion is used to build an interval file that has accurate start and en | |
| 29.1656 | 2022-02-18-05.55.52.869124 | 7F9EAFB7 | 29.1656 | 29.1656 | 1 | SELECT * FROM (SELECT CASE WHEN MAX(TDEJOBNAME) IS NULL THEN ? CH4 | |
| 29.0531 | 2022-02-17-13.23.15.344565 | F6DBE573 | 29.0531 | 29.0531 | 1 | WITH TIMES AS (SELECT ? AS LIBNAME, ? AS MBRNAME, A.* FROM QTEMP/qapyj | |
| 28.9295 | 2022-02-18-05.55.52.869124 | 22982E17 | 28.9295 | 28.9295 | 1 | SELECT CASE WHEN MAX(TDEJOBNAME) IS NULL THEN ? CHAR(MAX(GAP.TASK | |
| 28.8195 | 2022-02-17-13.14.25.749903 | C646789E | 28.8195 | 28.8195 | 1 | WITH TIMES AS (SELECT ? AS LIBNAME, ? AS MBRNAME, A.* FROM QTEMP/qapyj | |
| 28.5605 | 2022-02-17-13.15.57.514676 | 40EA4ED6 | 28.5605 | 28.5605 | 1 | WITH TIMES AS (SELECT ? AS LIBNAME, ? AS MBRNAME, A.* FROM QTEMP/qapyj | |
| 28.0091 | 2022-02-17-13.23.48.901160 | AA6B3D82 | 28.0091 | 28.0091 | 1 | WITH TIMES AS (SELECT ? AS LIBNAME, ? AS MBRNAME, A.* FROM QTEMP/qapyj | |
| 28.0000 | 2022-02-17-12.53.01.134667 | C646789E | 28.0000 | 28.0000 | 1 | WITH TIMES AS (SELECT ? AS LIBNAME, ? AS MBRNAME, A.* FROM QTEMP/qapyj | |
| 27.9452 | 2022-02-17-13.19.02.611717 | F9E5BEB | 27.9452 | 27.9452 | 1 | WITH TIMES AS (SELECT ? AS LIBNAME, ? AS MBRNAME, A.* FROM QTEMP/qapyj | |
| 27.7178 | 2022-02-17-13.29.04.569642 | 50A531FE | 27.7178 | 27.7178 | 1 | WITH TIMES AS (SELECT ? AS LIBNAME, ? AS MBRNAME, A.* FROM QTEMP/qapyj | |
| 27.0575 | 2022-02-17-13.24.35.041507 | 7DC13BB4 | 27.0575 | 27.0575 | 1 | WITH TIMES AS (SELECT ? AS LIBNAME, ? AS MBRNAME, A.* FROM QTEMP/qapyj | |
| 27 0447 < | 2022-02-17-13 26 29 360210 | 7DC13RR4 | 27 0447 | 27 0447 | 1 | WITH TIMES ΔS (SEI FCT ? ΔS I IRNΔME ? ΔS MRRNΔME Δ * FROM OTEMP/nanvi > | |
| iDocPC.mdb C | AIDRSQL table SUM DTL 5 | | | | | 1 - 19 of 1275 | |

Longest running SQL statements

4.1.2 Top 100 longest running SQL statements

This report is the same as the previous except limits the result to the top 100 statements.

4.1.3 Top 100 longest running SQL statements with indexes advised

This report is the same as the previous except limits the result to the top 100 statements with indexes advised.

Tip: The specific indexes advised are not available here. Dump the plan cache using <u>Create Plan Cache</u> <u>snapshot</u> to see more information about indexes advised.

4.1.4 Longest running SQL statements that contain text <<SQLSEARCH>>

This option will search the SQL statements text looking for a specific value provided by the user.

Note: This is a case-sensitive search.

When this option is taken the Change SQL Parameters window is shown:

| 🔁 Change SQL Parameters | | | × |
|---|-----------------------|---|---|
| This interface allows you to modify the current SQL statement by changing | the parameters shown. | | |
| SQL statement search value (< <sqlsearch>>)</sqlsearch> | UALL |] | |

Change SQL Parameters

After pressing OK, the results are shown:

| | /Longes | /Longest running SQL statements that contain text << SQLSEARCH>> - #1 🖪 | | | | | | | | | | |
|---|----------|---|-----------|-----------------------|--------------|-------------|--|-----|--|--|--|--|
| 1 | otal run | Last run time | QRO | Average run | Worst run | Total | SQL statement | ^ | | | | |
| t | ime | (LAST_TIME_RUN) | hash | time | time | runs | (SQLSTMT) | | | | | |
| (| seconds) | | (QROHASH) | (seconds) | (seconds) | (TOTALRUNS) | | | | | | |
| (| RUNTIME) | | | (AVG_PROCESSING_TIME) | (WORSTTIME2) | | | | | | | |
| Γ | 45.4335 | 2022-02-18-05.11.16.858259 | EF7EA46 | 45.4335 | 45.4335 | 1 | WITH CPUALL AS (SELECT SUM(CPUAVAIL) AS CPUAVAIL FROM (SELECT ? AS LIBN | i - | | | | |
| Ŀ | 40.8596 | 2022-02-17-14.23.27.903473 | 7488E10A | 40.8596 | 40.8596 | 1 | WITH CPUALL AS (SELECT SUM(CPUAVAIL) AS CPUAVAIL FROM (SELECT ? AS LIBN | L | | | | |
| L | 16.0904 | 2022-02-18-06.10.30.604647 | 8E8689A8 | 16.0904 | 16.0904 | 1 | WITH CPUALL AS (SELECT SUM(CPUAVAIL) AS CPUAVAIL FROM (SELECT ? AS LIBN | L | | | | |
| L | 15.8071 | 2022-02-18-06.11.25.134524 | 232D9FA7 | 15.8071 | 15.8071 | 1 | WITH CPUALL AS (SELECT SUM(CPUAVAIL) AS CPUAVAIL FROM (SELECT ? AS LIBN | L | | | | |
| L | 15.7009 | 2022-02-18-06.06.31.513477 | 370F6293 | 15.7009 | 15.7009 | 1 | WITH CPUALL AS (SELECT SUM(CPUAVAIL) AS CPUAVAIL FROM (SELECT ? AS LIBN | L | | | | |
| L | 15.3563 | 2022-02-18-05.17.05.778281 | D65604DC | 15.3563 | 15.3563 | 1 | WITH CPUALL AS (SELECT SUM(CPUAVAIL) AS CPUAVAIL FROM (SELECT ? AS LIBN | L | | | | |
| L | 13.7688 | 2022-02-18-06.08.59.372473 | 8E8689A8 | 13.7688 | 13.7688 | 1 | WITH CPUALL AS (SELECT SUM(CPUAVAIL) AS CPUAVAIL FROM (SELECT ? AS LIBN | L | | | | |
| | | | 500500 to | | | | WITH ONLY A SECTOR CONTRACTOR OF CONTRACTOR OF CONTRACTOR OF CONTRACTOR | | | | | |

Longest running SQL statements that contain text <<SQLSEARCH>>

4.1.5 Longest running SQL statements for user <<CURUSER>>

This option is used to filter the results by a specific user ID.

Note: An exact match must be used and should be provided in upper-case.

| 🖻 Change SQL Parameters | _ | | × |
|--|-----------|---|---|
| This interface allows you to modify the current SQL statement by changing the paramete | rs shown. | | |
| SQL plan user profile (< <curuser>>) MCCARGAR</curuser> | |] | |

Change SQL Parameters

4.1.6 Last 100 statements executed

This option shows the last 100 SQL Statements executed regardless of how they performed.

| /Last 10 | 0 statements executed - #1 🛛 🛛 | | | | | ▼ |
|--------------|--------------------------------|-----------|-----------------------|--------------|-------------|---|
| Total run | Last run time | QRO | Average run | Worst run | Total | SQL statement |
| time | (LAST_TIME_RUN) | hash | time | time | runs | (SQLSTMT) |
| (seconds) | | (QROHASH) | (seconds) | (seconds) | (TOTALRUNS) | |
| (RUNTIME) | | | (AVG_PROCESSING_TIME) | (WORSTTIME2) | | |
| 0 | 2022-02-22-04.34.55.835350 | C20F6A50 | .0001 | 0 | 1 | CALL QSYS2/ANALYZE_PLAN_CACHE('020000000011','QTEMP','T103954106', VARB |
| .9864 | 2022-02-22-04.34.50.592123 | 220EC389 | .0001 | .0020 | 24,184 | DELETE FROM QUSRBRM.QA1ANET2 WHERE RMTSYS NOT IN (SELECT R1MSYS FI |
| .7072 | 2022-02-22-04.34.50.592123 | 6EA4707B | .0001 | 0 | 24,190 | INSERT INTO QUSRBRM.QA1A2NET SELECT DISTINCT RMTSYS AS N2RMT , RMTR |
| 1.6615 | 2022-02-22-04.34.50.592123 | 39464313 | .0001 | 0 | 24,185 | SELECT RDNAME, RSSYSNAME, RSNETID, RSNODEPCY, RDRPTPCY, RDSNDERR, R |
| .5096 | 2022-02-22-04.34.50.592123 | 92565B44 | .0001 | 0 | 19,521 | DELETE FROM QUSRBRM.QA1A2NET WITH NC |
| .5967 | 2022-02-22-04.34.50.592123 | D83CAC2 | .0001 | 0 | 19,519 | SELECT * FROM QUSRBRM.QA1ANET2 WHERE (OBJ = ?) FOR READ ONLY |
| .0007 | 2022-02-22-04.34.26.473265 | E53A1FEE | .0007 | .0007 | 1 | SELECT TOTAL_PROCESSING_TIME AS RUNTIME, LAST_TIME_RUN, QROHASH, AVC |
| 0 | 2022-02-22-04.34.26.473265 | F5F9685 | .0001 | 0 | 1 | SELECT TOTAL_PROCESSING_TIME AS RUNTIME, LAST_TIME_RUN, QROHASH, AVC |
| 0 | 2022-02-22-04.34.18.084097 | C30DB064 | .0001 | 0 | 2 | SELECT CURRENT TIMESTAMP FROM SYSIBM.SYSDUMMY1 |
| .0029 | 2022-02-22-04.33.59.732583 | 39D3D154 | .0029 | .0029 | 1 | Non SQL Query QPFRDATA/QAPMJOBL.R052180002 |
| .3423 | 2022-02-22-04.33.50.819099 | 39464313 | .0001 | 0 | 4,916 | SELECT RDNAME, RSSYSNAME, RSNETID, RSNODEPCY, RDRPTPCY, RDSNDERR, R |
| .2024 | 2022-02-22-04.33.50.294773 | 220EC389 | .0001 | 0 | 4,921 | DELETE FROM QUSRBRM.QA1ANET2 WHERE RMTSYS NOT IN (SELECT R1MSYS FI |
| .1451 | 2022-02-22-04.33.50.294773 | 6EA4707B | .0001 | 0 | 4,919 | INSERT INTO QUSRBRM.QA1A2NET SELECT DISTINCT RMTSYS AS N2RMT , RMTR |
| 0 | 2022-02-22-04.33.41.905623 | AEA1DC4A | .0001 | 0 | 1 | CALL QSYS2/ANALYZE_PLAN_CACHE('020000000011','QTEMP','T103837862', VARB |
| 0 | 2022-02-22-04.33.41.905623 | 372B181C | .0001 | 0 | 1 | select count(*) FROM (SELECT TOTAL_PROCESSING_TIME AS RUNTIME, LAST_TIME |
| 0 | 2022-02-22-04.33.36.662396 | 755C3B57 | .0001 | 0 | 1 | CALL QSYS2/ANALYZE_PLAN_CACHE('020000000011','QTEMP','T210383888', VARB |
| 0 | 2022-02-22-04.33.36.662396 | 981C6057 | .0001 | 0 | 1 | select count(*) FROM (SELECT TOTAL_PROCESSING_TIME AS RUNTIME, LAST_TIME |
| .0028 | 2022-02-22-04.32.59.959797 | 8E3A30C6 | .0028 | .0028 | 1 | Non SQL Query QPFRDATA/QAPMJOBL.R052180002 |
| 0 | 2022-02-22-04 32 58 911157 | 183C5D10 | 0001 | 0 | 1 | CALL OSVS2/ANIALVZE PLAN CACHE('020000000011' 'OTEMP' 'T103727959' VARE * |
| < | | | | | | > |
| iDocPC.mdb Q | AIDRSQL table SUM DTL 10 | | | | | 1 - 19 of 100 |

Last 100 statements executed

4.1.7 Currently running SQL statements

This option may be used to show the SQL statements currently executing at the time this option was taken.

| ļ | /Current | ly running SQL statements - #1 🚦 | 3 | | | | |
|---|---|----------------------------------|--------------------------|---|--|------------------------------|---|
| | Total run time (seconds) (RUNTIME) | Last run time (LAST_TIME_RUN) | QRO hash (QROHASH) | Average run time (seconds) (AVG_PROCESSING_TIME) | Worst run time (seconds) (WORSTTIME2) | Total runs (TOTALRUNS) | SQL statement (SQLSTMT) |
| | .0053 | 2022-02-22-04.13.10.266485 | 654FA752 | .0026 | .0046 | 2 | SELECT COUNT(*) FROM (SELECT LIB, OBJTEXT AS DESC, OBJOWNER |
| | .0015 | 2022-02-22-04.13.10.266485 | CF51957 | .0007 | .0007 | 2 | SELECT LIB, OBJTEXT AS DESC, OBJOWNER AS OWNER, OBJDEFINER |
| | .0012 | 2022-02-22-04.22.43.352484 | FFC37EDE | .0012 | .0012 | 1 | SELECT TOTAL_PROCESSING_TIME AS RUNTIME, LAST_TIME_RUN, Q |
| | .0006 | 2022-02-22-04.13.10.266485 | EDC0733F | .0003 | .0005 | 2 | SELECT MAX(SNAPSHOT) AS SNAPSHOT, MAX(LONG_COMMENT) AS |
| | .0003 | 2022-02-22-04.13.10.266485 | 609B011B | .0001 | .0003 | 2 | SELECT COUNT(*) FROM (SELECT MAX(SNAPSHOT) AS SNAPSHOT, N |
| | 0 | 2022-02-22-04.18.11.752997 | 4085A416 | .0001 | 0 | 2 | select count(*) FROM (SELECT TOTAL_PROCESSING_TIME AS RUNTIN |
| | | | | | | | |

Currently running SQL statements

4.2 QRO hash, SQL statement

This folder contains a set of graphs that provide performance information about the QRO hash, SQL statements found in the SQL plan cache.

Dumping the plan cache using the Create Plan Cache snapshot option will provide additional details about the data shown in these graphs.

Tip: These reports are rebuilt on each refresh. Different results may appear over time.



System plan cache -> QRO hash, SQL statement folder

Note: The SQL statement can be viewed in the graph flyover for any of these graphs by placing the mouse over the desired bar.

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4.2.1 Total run time rankings

This graph shows the QRO hash, SQL statement combinations that had the **worst total run times (in seconds**.)





4.2.2 Worst run time rankings

This graph shows the QRO hash, SQL statement combinations that had the **worst single run times (in seconds.)**



Worst run time rankings

4.2.3 Total runs rankings

This graph shows the QRO hash, SQL statement combinations that had the most runs.



Total runs rankings

4.2.4 Average run time rankings

This graph shows the QRO hash, SQL statement combinations that had the **worst average run times (in seconds**.)



Average run time rankings

4.2.5 Temp storage rankings

This graph shows the QRO hash, SQL statement combinations that had the **highest temp storage usage in megabytes**.



4.2.6 Average rows fetched rankings

This graph shows the QRO hash, SQL statement combinations that had the **highest average rows fetched**.



Average rows fetched rankings

5 Plan Cache Snapshots

This folder contains the list of Plan Cache Snapshots found on the system. A similar list can also be found in the IBM i Navigator interface. Both lists are built from the same repository.

Each snapshot contains a detailed set of reports.

| IBM i Connections Ctcprf73: | Plan Cache Analyzer - #1 / Idoc730: Plan Cache | Analyzer - #1 🛛 🔀 | | | |
|--|---|--|---|-------------------------------|---|
| Plan Cache Analyzer System plan cache Plan cache snapshots | Name | Library | Table | System collected on | Created by |
| DBMONs Monitors General functions | MCCARGAR QIDR3131180228104819 QIBMDBTSTGQMGPCSNAP11217104920 MCCARGAR NEWPC 0222040416 MYSNAP SnapAug10 Kristie QGPL SNAPSHOT1 0427074225 | MCCARGAR QIBMDBTSTG MCCARGAR ADAMB ADAMB KEDWARDS QGPL | QIDR313118 QMGPCSNAP1 NEWPC QZG0000023 QZG0000022 QZG000003 SNAPSHOT1 | IDOC730 IDOC730 IDOC730 | MCCARGAR ADAMB MCCARGAR ADAMB MCCARGAR KEDWARDS ADAMB |

Plan cache snapshots folder

5.1 Menu Options

The following Plan Cache Analyzer menu options are available by right clicking on a snapshot.

| | Explore | |
|---|-------------------------|---|
| | Record Quick View | |
| | QRO hash, SQL statement | > |
| 1 | QRO hash | > |
| 1 | Plans | > |
| 1 | Index advice by table | > |
| | Stats advice by table | > |
| | Detail reports | > |
| | Search | |
| | Generate Reports | |
| | Fix Summary Record | |
| | Link Job Watcher | |
| | Split | |
| | Delete | |
| | Properties | |

Snapshot popup-menu

| Menu Item | Description |
|-------------------|--|
| Explore | Show the contents of the collection. |
| Record Quick View | Displays the columns in the selected row(s) vertically. |
| QRO hash, SQL | Graphs over the snapshot data with 1 bar for each QRO hash and SQL statement |
| statement | combination. |
| QRO hash | Graphs over the snapshot data with 1 bar for each QRO hash. |
| <u>Plans</u> | Graphs over the snapshot data with 1 bar for each Plan ID. |
| Index advice by | These graphs summarize the data only where indexes have been advised by table. |
| table | |
| Stats advice by | Graphs summarizing statistics only where stats are advised. |
| table | See the QDBFSTCCOL system value for more information. |
| Detail reports | These are various table views over the plan cache snapshot data intended for |
| | advanced users. |
| Search | Use this option to search the snapshot for something specific. |
| <u>Generate</u> | This option can be used to build a report of the desired set of tables and graphs. The |
| Reports | report consists of a screenshot of each graph along with its title and collection |
| | information. The reports are built into a HTML page and displayed in the web |
| | browser when completed. |
| Fix Summary | This menu option is used to set the system name and timestamps properly within the |
| Record | repository that identifies the snapshots on the IBM i. |
| Link Job Watcher | This option will link a Job Watcher collection to the selected snapshot to allow the |
| | Job Watcher graphs to be visible within Plan Cache Analyzer. |
| <u>Split</u> | This opens the Split function which allows a plan cache snapshot to be divided into a |
| | smaller one by QRO hash, or other possible filters. |
| Delete | Removes the selected plan cache snapshots from the system. |
| Properties | Displays more information about the plan cache snapshot. |

5.2 Fix Summary Record

This menu option is used to set the system name and timestamps properly within the repository that identifies the snapshots on the IBM i.

When this option is taken, the following window is shown to prompt the user:



Fix Summary Record? Prompt

If accepted then an SQL update query is issued for each snapshot selected to update the table in QUSRSYS/QAUGDBPMD2.

Tip: This is a required step if linking the snapshot to Job Watcher is desired.

5.3 Link Job Watcher

This option will link a Job Watcher collection to the selected snapshot to allow the Job Watcher graphs to be visible within Plan Cache Analyzer.

Note: This requires the following are all true:

The system names are the same
 The time periods overlap

An example of this interface is:

| Eink Job Watche | r collection | C 13. | | | | | | | | × |
|-----------------------|-----------------------------|-----------|------------------|--------------|-------------------------------|-----------|--------------------|------------------|----------------------------|--------------|
| Use this option t | o find and select the | appropri | ate Job Watch | er collectio | n that matches up with the se | elected o | lata collect | tion. | | |
| Name: C | QIDR956370_MCCAR | RGAR | s | ystem: | IDOC730 | Table | : M | ICCARGAR/QIDF | R956370 | |
| Start time: 2 | 2022-02-24-20.55.00.0 | 000000 | E | nd time: | 2022-03-02-05.25.38.0000 | 00 | | | | |
| Library: | MCCARGAR | ~ | Refresh | | | | | | | |
| Collections mate | ching system and tim | ne period | : | | | | | | | |
| Collection | Using Collection Summary | Status | | | Description | | Collection type | Ending reason | Collection size (MB) | DB fi VRM |
| | T No | Ready · | Missing: SQL, | AIGP, IJVM | 5 second intervals, Call sta | cks, Sql | Default | Ended by user | 19.36 | 7.3 |
| Q 059094558 | 8 No | Ready · | Missing: AIGP, | IJVM | | | Default | Size limit | 1000.25 | 7.3 |
| U@ Q057045145 | > No | Ready - | • Missing: AIGP, | IJVM | 1 second intervals, Call sta | cks, Sql | Default | Size limit | 1000.12 | 7.3 |
| < | | | | | | | | | | > |
| Matching QRO hash: | | | | | | | | Check QRO hash | Brow | se |
| | | | | | | | | ОК | Can | cel |

Link Job Watcher collection window

Note: The options to check QRO hash match between the snapshot and JW collection is recommended, but **optional.**

After using this option the list of snapshots will now identify the linked Job Watcher collection for the snapshot picked.

| IBM i Connections / Idoc730: Plan Cache Analyzer - #1 🗵 | | | | | | | | | | | |
|---|---------------------|----------|------------|-----------|----------|----------------------------|------------------------|--|--|--|--|
| 🖃 📆 Plan Cache Analyzer | Name | Library | Table | System | Created | Date created | Job Watcher Collection | | | | |
| System plan cache | | | | collected | by | | | | | | |
| | | | | on | | | | | | | |
| | QIDR956370_MCCARGAR | MCCARGAR | QIDR956370 | IDOC730 | MCCARGAR | 2022-03-02-14.38.17.659000 | MCCARGAR/DBMONTEST | | | | |
| □ | QIDR313118_MCCARGAR | MCCARGAR | QIDR313118 | IDOC730 | MCCARGAR | 2022-02-28-10.48.19.191000 | | | | | |
| 🖶 🔂 QIDR956370_MCCARGAR | NEWPC_MCCARGAR | MCCARGAR | NEWPC | IDOC730 | MCCARGAR | 2022-02-22-04.04.16.896000 | | | | | |
| 🗈 🖆 QIDR313118_MCCARGAR | | | | | | | | | | | |
| E INEWPC_MCCARGAR | | | | | | | | | | | |
| Snapshot with a linked Job | Watcher collection | | | | | | | | | | |

Within the snapshot a folder exists to access the normal features of the Job Watcher collection.

| 🖃 👼 Plan Cache Analyzer | Report folder | Description | | | | | | | |
|------------------------------|----------------------------|---|--|--|--|--|--|--|--|
| 🖶 🛄 System plan cache | 🔒 QRO hash, SQL statement | Graphs summarizing the plan cache statistics per QRO hash, SQL statement | | | | | | | |
| | 🔒 QRO hash | Graphs summarizing the plan cache statistics per QRO hash | | | | | | | |
| 📲 QRO hash, SQL statement | 🔒 Plans | Graphs summarizing the plan cache statistics per plan ID | | | | | | | |
| 🖃 🔡 Plan cache snapshots: M* | 🖥 Index advice by table | Graphs summarizing the plan cache statistics only where indexes have been advised by table | | | | | | | |
| QIDR956370 MCCARGAR | 🔒 Stats advice by table | Graphs summarizing statistics only where stats are advised (see QDBFSTCCOL system value) | | | | | | | |
| | 🔒 Detail reports | Reports over the system's SQL plan cache | | | | | | | |
| | DBMONTEST | Linked Job Watcher collection | | | | | | | |
| INEWPC_MICCARGAR | 📙 Server-side output files | Plan Cache Analyzer output files | | | | | | | |
| | 🔋 User-defined reports | Reports defined previously in repository C:\Users\mccar\AppData\Roaming\IBM\iDoctor\MyNewDB_2.mdb | | | | | | | |

Job Watcher collection subfolder within a Plan Cache snapshot.

5.4 Split function

From a snapshot's popup menu, or any of the QRO hash or plan graphs you can select a desired QRO hash or plan ID and right-click and use the Split... menu option to extract just the data for that selection into a new snapshot.

This new snapshot can be used within IBM i Navigator's Visual Explain for performance tuning and optimization of the query. Tip: These snapshots can also be linked to Job Watcher for the same system and time period.

×

| An example of the | e Split Snapshot window is as follow | VS: | | |
|------------------------|---|----------------|----------|---------|
| 🛛 Split Snapshot for M | CCARGAR/QIDR956370 | | | |
| Use this interface to | create a new plan cache snapshot using data | from the curre | ent one. | |
| Library name: | MCCARGAR | | | |
| Table name: | 1220472619 | | | |
| Snapshot name | | | | |
| Filters (pick one ty | pe only, separate multiple values with a comm | ia): | | |
| QRO hash | 21F48555, 50C0F504, 3E0DD9A1 | | Browse | Link JW |
| | | | | |
| ◯ Job name | | | | |
| ⊖ Job number | | | | |
| ⊖ Plan user | | | | |
| ○ Plan identifier | | | | |
| | | | ОК | Cancel |

- .. -. Α

Split Snapshot Window

Tip: Use the Browse... button to see the possible values for each filter type. All filter types all multiple selections.

| Option | Description |
|----------------------------|--|
| Library name | The name of the library to store the snapshot data |
| Table name | The table name that will contain the new snapshot data. |
| Snapshot name | This is the snapshot name or description for the new snapshot to be created. |
| Filters -> QRO hash | This can contain 1 or more QRO hash to filter the results by. |
| | Tip: Use the <u>Link JW</u> button to tie this new snapshot with a Job Watcher collection that exists in the same time period and system. This allows the JW collection to be visible under the Plan Cache Analyzer's snaphot. |
| Filters -> Job name | This should be an exact job name match (1 or more) to filter results by. |
| Filters -> Job number | This should be an exact job number match (1 or more) to filter results by. |
| Filters -> Current user | This should be an exact current user name match (1 or more) to filter results by. |
| Filters -> Plan Identifier | This should be an exact plan identifier match (1 or more) to filter results by. |

5.5 Report Folders

The **Plan cache snapshots** folder contains a series of subfolders containing graphs and reports.

Tip: You can also access these reports by right clicking the collection and picking the appropriate menu.

| IBM i Connections Idoc730: Plan Cache Analyzer | - #1 🗙 | |
|--|----------------------------|--|
| 🖃 📆 Plan Cache Analyzer | Report folder | Description |
| System plan cache | 🖥 QRO hash, SQL statement | Graphs summarizing the plan cache statistics per QRO hash, SQL statement |
| | 🖥 QRO hash | Graphs summarizing the plan cache statistics per QRO hash |
| 📲 QRO hash, SQL statement | 🖥 Plans | Graphs summarizing the plan cache statistics per plan ID |
| 🖃 🔡 Plan cache snapshots | 🔒 Index advice by table | Graphs summarizing the plan cache statistics only where indexes have been advised by table |
| MCCARGAR NEWPC 0222040416 | 🔒 Stats advice by table | Graphs summarizing statistics only where stats are advised (see QDBFSTCCOL system value) |
| OIBMDBTSTGOMGPCSNAP1121710492 | 📙 Detail reports | Reports over the system's SQL plan cache |
| | 🔒 Server-side output files | Plan Cache Analyzer output files |
| | 🖪 User-defined reports | Reports defined previously in repository C:\Users\mccar\AppData\Roaming\IBM\iDoctor\MyNe |



Most of these graphs in these folders will have several <u>alternate views</u> available. This allows you to quickly toggle between one graph and a different one.

Note: Unlike the other components, Plan Cache Analyzer does not contain time interval graphs.

5.6 QRO hash, SQL statement

These graphs show various metrics in the snapshot sorted in several different ways. These graphs show 1 bar for each QRO hash and SQL statement combination.

Note: Although the grouping is on both QRO hash and SQL statement, only the QRO hash is listed on the X-axis label. Use the graph flyover to see the SQL statement.



QRO hash, SQL statement folder

5.6.1 QRO Hash/Statement summary by total run time

For each QRO hash, SQL statement, this graph shows the total run time, total CPU time, worst run time on the Y1-axis. The secondary (Y2) axis includes total faults, total I/Os, total full opens and total runs.

Note: The next 7 graphs are identical to this one and only vary in how the data is sorted which is indicated in the graph's title.



QRO hash/statement summary by total run time

5.6.2 QRO Hash/Statement total I/Os rankings

For each QRO hash, SQL statement, this graph shows the **asynchronous database reads**, **synchronous database reads**, **and total page faults** on the Y1-axis. The secondary (Y2) axis show the total CPU time.

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QRO hash/Statement total I/Os rankings

5.6.3 QRO Hash/Statement full opens rankings

This graph indicates which QRO hash, SQL statement combinations caused the most full opens.



QRO hash/Statement full opens rankings

5.6.4 QRO Hash/Statement temp storage rankings

This graph indicates which QRO hash, SQL statement combinations used the most **temporary storage** (in megabytes.)

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QRO hash/Statement temp storage rankings

5.6.5 QRO Hash/Statement total result rows rankings

This graph indicates which QRO hash, SQL statement combinations caused the most result rows.



QRO hash/Statement result rows rankings

5.6.6 QRO Hash/Statement average result rows rankings

This graph indicates which QRO hash, SQL statement combinations had the highest **average result rows** per run.

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QRO hash/Statement average result rows rankings

5.6.7 QRO Hash/Statement average run time rankings

This graph indicates which QRO hash, SQL statement combinations had the highest average run time per run.



QRO hash/Statement average run time rankings

5.7 QRO hash

These graphs show various metrics in the snapshot sorted in several different ways. These graphs show 1 bar for each QRO hash.



QRO hash folder

These graphs are identical to the <u>QRO Hash</u>, <u>SQL Statement</u> graphs except for these differences:

- 1. Data is grouped by QRO hash only.
- 2. If multiple SQL statements exist in a single QRO hash, then the SQL statement will not be listed in the flyover.

An example follows:



QRO hash summary by total run time

5.8 Selected QRO hash drill down

From any of the QRO hash and QRO, SQL statement graphs you can right-click the desired QRO hash and perform a drill down option to see the Plans associated with the selected QRO hash.





Opening one of these drill down options will open one of the Plan graphs but only for the selected QRO hash.

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5.9 Plans

These graphs show various metrics in the snapshot sorted in several different ways. These graphs show 1 bar for each Plan ID. Additional subfolder options exist to show plans with or without indexes advised.



Plans folder

These graphs are identical to the <u>QRO Hash, SQL Statement</u> graphs except the data is grouped by Plan ID which is shown on the X-axis label instead of QRO hash.

An example follows:



Plans summary by total run count

5.10 Index advice by table

These graphs show tables with indexes advised. The same various metrics shown in the previous graphs are available here.

Tip: These graphs show 1 bar for each library, file and member. You can right-click and drill down from these graphs to see the various plans but filtered for only a single table.





Note: Index advice table size rankings only includes tables that have table scan records in the plan cache snapshot and not all tables with indexes advised.

These graphs are identical to the <u>QRO Hash</u>, <u>SQL Statement</u> graphs except the data is grouped by library, file, member and the table information which is shown on the X-axis label instead of QRO hash.

An example follows:



Index advice summary by total run time

5.11 Stats advice by table

These graphs show tables where stats creation is advised. The same various metrics shown in the previous graphs are available here.

Tip: These graphs show 1 bar for each library, file and member. You can right-click and drill down to see the columns where stats are advised in the selected table.

| 🖃 🐻 Plan Cache Analyzer | Report folder [|
|----------------------------------|---|
| 🗉 🛄 System plan cache | |
| 🖃 🜗 Plan cache snapshots | Stats advice summary by total run time |
| 🖻 🖆 MCCARGAR QIDR419933022811454 | Stats advice summary by worst run time |
| | Stats advice summary by total run count |
| | Stats advice summary by total full opens |
| 🖃 🔒 Plans | Stats advice summary by total I/Os |
| | Stats advice summary by total faults |
| Without indexes advised | Stats advice summary by total CPU time |
| Index advice by table | Ctats advice total I/Os rankings |
| Stats advice by table | Stats advice full opens rankings |
| Detail reports | Stats advice temp storage rankings |
| Server-side output files | Stats advice total result rows rankings |
| | Stats advice average run time rankings |
| | Stats advice table size rankings (for table scans only) |

Stats advice by table folder

Note: Stats advice table size rankings only includes tables that have table scan records in the plan cache snapshot and not all tables with stats advised. These graphs are identical to the <u>QRO Hash</u>, <u>SQL Statement</u> graphs except the data is grouped by library, file, member and the table information which is shown on the X-axis label instead of QRO hash. An example follows:



5.12 Detail reports

This folder contains several table views designed for advanced users.

Tip: The Detail reports -> Advanced subfolder contains the same SQL statements documented on IBM.com for the various database monitor views.

| I | 🖃 📆 Plan Cache Analyzer | Report folder | Description | Tree |
|---|--------------------------|---------------------------------------|--|-------|
| I | 🗐 🛄 System plan cache | | | table |
| I | 🖃 🜗 Plan cache snapshots | III Snapshot properties | | |
| I | MCCARGAR NEWPC 0222040 | III Snapshot summary by day | | |
| I | | Snapshot summary by hour | | |
| I | GRO hash | 🖽 Snapshot summary by job | | |
| I | I Plans | Snapshot summary by QRO hash | | |
| I | Index advice by table | III Snapshot summary by plan | | |
| I | State advice by table | I Snapshot summary by user | | |
| I | | III Snapshot summary by SQL statement | | |
| I | | III Index advice by table | | |
| I | 🗄 👘 🛱 Advanced | | | |
| I | Server-side output files | I Stats advice details | | |
| l | 🗄 📑 User-defined reports | a Advanced | Reports over raw plan cache snapshot data for the various record types | |
| | | | | |

Detail reports folder

5.12.1 Snapshot properties

This report shows the Snapshot properties in a table view.

IBM iDoctor for IBM i

| Idoc730/MCCARGAR/MCCARGAR | NEWPC 0222040416/Snapshot properties - #1 | X |
|---------------------------------|---|---|
| Description | Value | |
| (DESC) | (VAL) | |
| Plan cache creation time | 2022-02-22-04.04.16.924678 | |
| System | IDOC730 | |
| Relational DB name | *LOCAL | |
| VRM | V7R3M0 | |
| Group PTF | SF99703 27 | |
| STRDBMON or Filter criteria | RE | |
| Monitored Job Type | Р | |
| Start time | 2022-01-18-12.05.30.494933 | |
| End time | 2022-02-22-04.04.37.724490 | |
| Currently Active Queries | 50 | |
| Queries Run | 1387301 | |
| Full Opens | 649082 | |
| Full Optimizations | 162664 | |
| Optimizations with Valid Plans | 37357 | |
| AQP Interrogations | 120 | |
| AQP Plans Replaced | 0 | |
| Psuedo Open Queries Hard Closed | 1712 | |
| Plans in Cache | 1228 | |
| Plan Cache Size | 499 MB | |
| Plan Cache Size Threshold | 512 MB | |
| Plans Built | 162664 | |
| Times Plans Used from Cache | 486419 | |
| Temp Indexes Created | 2289 | |
| Current Temp Indexes | 13 | |
| Temp Objects Size | 15742 MB | |
| Plan Cache No Matches | 162664 | |
| | | |

Snapshot properties

5.12.2 Snapshot summary by day

This report summarizes the statistics found in the snapshot by day since the plan cache was last cleared.

Note: This report and the next 6 reports are experimental. Graphs may be added for these in the future, if there is a demand for it.

IBM iDoctor for IBM i

| Idoc730/MCCARGAR/MCCA | RGAR NEWPC | 0222040416/Snapsho | t properties - #1 | Idoc730/MCCARGAR/MCCARGAR NEWPC 0222040416/Snapshot summary by day - #1 🗵 | | | | | | | |
|---------------------------------------|-------------------------------------|---|--------------------------------|---|----------------------------------|---|----------------------------|--|--|---|------------------------------------|
| Interval end timestamp (INTENDSTR) | Total CPU (seconds) (CPUSECS) | Total QRO hash (TOTALQRO_HASH) | Total Plans (TOTALPLANS) | Total Users (TOTALUSERS) | Last run time (LAST_RUN_TIME) | Total run time (seconds) (RUNTIME) | Total I/Os (TOTALIO) | Synchronous DB reads (SYNC_DB_READ) | Synchronous DB writes (SYNC_DB_WRITE) | Async DB reads (ASYNC_DB_READ) | Async DB writes (ASYNC_DB |
| 2022-01-18-00.00.00.000000 | 5.684 | 2 | 2 | 1 | 2022-01-18-12.16.05.45206 | 2 12.174 | 0 | 0 | 0 | 0 | |
| 2022-01-20-00.00.00.000000 | 38.338 | 32 | 39 | 1 | 2022-01-20-10.20.21.52938 | 4 72.269 | 1,346 | 461 | 0 | 885 | |
| 2022-01-21-00.00.00.000000 | 1.347 | 3 | 3 | 1 | 2022-01-21-05.49.04.31722 | 8 2.480 | 13 | 13 | 0 | 0 | |
| 2022-01-23-00.00.00.000000 | .083 | 2 | 2 | 1 | 2022-01-23-07.09.37.58392 | 7 18.105 | 0 | 0 | 0 | 0 | |
| 2022-01-24-00.00.00.000000 | 2.602 | 23 | 24 | 1 | 2022-01-24-07.25.40.62152 | 8 11.767 | 2 | 2 | 0 | 0 | |
| 2022-01-25-00.00.00.000000 | .175 | 174 | 175 | 1 | 2022-01-25-07.11.35.51787 | 8.175 | 0 | 0 | 0 | 0 | |
| 2022-02-03-00.00.00.000000 | .057 | 1 | 1 | 1 | 2022-02-03-07.04.57.29228 | 4 5.655 | 746 | 733 | 0 | 13 | |
| 2022-02-13-00.00.00.000000 | .017 | 10 | 10 | 1 | 2022-02-13-18.00.36.39323 | 3 .034 | 0 | 0 | 0 | 0 | |
| 2022-02-14-00.00.00.000000 | .075 | 7 | 7 | 1 | 2022-02-14-18.00.37.65107 | 7.137 | 0 | 0 | 0 | 0 | |
| 2022-02-15-00.00.00.000000 | .209 | 13 | 13 | 1 | 2022-02-15-18.00.35.86625 | 7 .386 | 0 | 0 | 0 | 0 | |
| 2022-02-16-00.00.00.000000 | .592 | 66 | 66 | 1 | 2022-02-16-18.02.14.18029 | 9 1.097 | 0 | 0 | 0 | 0 | |
| 2022-02-17-00.00.00.000000 | 300.758 | 80 | 83 | 2 | 2022-02-17-18.00.48.50324 | 6 582.164 | 111,048 | 54 | 0 | 110,994 | |
| 2022-02-18-00.00.00.000000 | 520.933 | 163 | 174 | 2 | 2022-02-18-18.00.45.39225 | 3 979.896 | 130,552 | 474 | 0 | 130,078 | |
| 2022-02-19-00.00.00.000000 | 1.252 | 62 | 62 | 2 | 2022-02-19-18.00.43.97589 | 8 2.297 | 0 | 0 | 0 | 0 | |
| 2022-02-20-00.00.00.000000 | .010 | 1 | 1 | 1 | 2022-02-20-07.06.38.14174 | 4 .465 | 560 | 20 | 0 | 540 | |
| 2022-02-21-00.00.00.000000 | 5.813 | 262 | 393 | 1 | 2022-02-21-18.02.27.53697 | 8 10.570 | 110 | 3 | 0 | 107 | |
| 2022-02-22-00.00.00.000000 | 5.285 | 133 | 148 | 3 | 2022-02-22-04.03.59.69867 | 1 9.893 | 311 | 41 | 0 | 270 | |

Snapshot summary by day

5.12.3 Snapshot summary by hour

This report is the same as the previous one but with **1 hour groupings** instead.

| Idoc730/MCCARGAR/MCCARGAR NEWPC | | 0222040416/Snapshot p | properties Ido | c730/MCCARGAR/N | ICCARGAR NEWPC 0222040416 | mary b Id | oc730/MCCARGAR/M | CCARGAR NEWPC | 0222040416/Snapshot summ 🗵 | | |
|---------------------------------------|-------------------------------------|---|--------------------------------|--------------------------------|----------------------------------|---|----------------------------|--|--|---|-----------------------------------|
| Interval end timestamp (INTENDSTR) | Total CPU (seconds) (CPUSECS) | Total QRO hash (TOTALQRO_HASH) | Total Plans (TOTALPLANS) | Total Users (TOTALUSERS) | Last run time (LAST_RUN_TIME) | Total run time (seconds) (RUNTIME) | Total I/Os (TOTALIO) | Synchronous DB reads (SYNC_DB_READ) | Synchronous DB writes (SYNC_DB_WRITE) | Async DB reads (ASYNC_DB_READ) | Async DB writes (ASYNC_D |
| 2022-01-18-12.00.00.000000 | 5.684 | 2 | 2 | 1 | 2022-01-18-12.16.05.452062 | 12.174 | 0 | 0 | 0 | 0 | |
| 2022-01-20-06.00.00.000000 | 3.420 | 2 | 2 | 1 | 2022-01-20-06.46.53.045980 | 6.262 | 0 | 0 | 0 | 0 | |
| 2022-01-20-09.00.00.000000 | 34.451 | 30 | 36 | 1 | 2022-01-20-09.57.49.093788 | 65.162 | 1,346 | 461 | 0 | 885 | |
| 2022-01-20-10.00.00.000000 | .467 | 1 | 1 | 1 | 2022-01-20-10.20.21.529384 | .845 | 0 | 0 | 0 | 0 | |
| 2022-01-21-05.00.00.000000 | 1.347 | 3 | 3 | 1 | 2022-01-21-05.49.04.317228 | 2.480 | 13 | 13 | 0 | 0 | |
| 2022-01-23-07.00.00.000000 | .083 | 2 | 2 | 1 | 2022-01-23-07.09.37.583927 | 18.105 | 0 | 0 | 0 | 0 | |
| 2022-01-24-05.00.00.000000 | 2.551 | 21 | 22 | 1 | 2022-01-24-05.41.01.117511 | 11.675 | 2 | 2 | 0 | 0 | |
| 2022-01-24-07.00.00.000000 | .051 | 2 | 2 | 1 | 2022-01-24-07.25.40.621528 | .092 | 0 | 0 | 0 | 0 | |
| 2022-01-25-06.00.00.000000 | .057 | 57 | 57 | 1 | 2022-01-25-06.59.58.063317 | .057 | 0 | 0 | 0 | 0 | |
| 2022-01-25-07.00.00.000000 | .118 | 118 | 118 | 1 | 2022-01-25-07.11.35.517878 | .118 | 0 | 0 | 0 | 0 | |
| 2022-02-03-07.00.00.000000 | .057 | 1 | 1 | 1 | 2022-02-03-07.04.57.292284 | 5.655 | 746 | 733 | 0 | 13 | |
| 2022-02-13-18.00.00.000000 | .017 | 10 | 10 | 1 | 2022-02-13-18.00.36.393233 | .034 | 0 | 0 | 0 | 0 | |
| 2022-02-14-18.00.00.000000 | .075 | 7 | 7 | 1 | 2022-02-14-18.00.37.651077 | .137 | 0 | 0 | 0 | 0 | |
| 2022-02-15-18.00.00.000000 | .209 | 13 | 13 | 1 | 2022-02-15-18.00.35.866257 | .386 | 0 | 0 | 0 | 0 | |
| 2022-02-16-18.00.00.000000 | .592 | 66 | 66 | 1 | 2022-02-16-18.02.14.180299 | 1.097 | 0 | 0 | 0 | 0 | |
| 2022-02-17-10.00.00.000000 | 14.149 | 3 | 3 | 1 | 2022-02-17-10.58.42.970780 | 26.487 | 3,851 | 10 | 0 | 3,841 | |
| 2022-02-17-11.00.00.000000 | 2.316 | 3 | 3 | 1 | 2022-02-17-11.05.47.682878 | 4.274 | 16 | 7 | 0 | 9 | |
| 2022-02-17-12.00.00.000000 | 62.065 | 23 | 24 | 1 | 2022-02-17-12.53.01.134667 | 146.555 | 106,738 | 34 | 0 | 106,704 | |
| 2022 02 17 12 00 00 000000 | 104 640 | 11 | | 4 | 2022 02 17 12 50 22 547072 | 754 547 | 4.40 | n | 0 | 4.40 | |
| | | | | | | | | | | | - |

iDocPC.mdb QAIDRSQL table SUM RPT 169

Sel Row: 6 Average: 2.32 Count: 10 Sum: 23.19

1 - 19 of 36

Snapshot summary by hour

5.12.4 Snapshot summary by job

This report summarizes the statistics found in the snapshot by job.

| - 1 | | | 1 1 | | | | | | | | | | |
|-----|-----------------------------------|-------------------------------------|---|--|--------------------------------|----------------------|----------------------|---|----------------------------|--|--|--|--|
| | Idoc730/MCCARGAR/MCCARGA | AR NEWPC | 0222040416/Snapshot s | 222040416/Snapshot summary by job - #1 🛛 | | | | | | | | | |
| | Job name/user/number (JOBINFO) | Total CPU (seconds) (CPUSECS) | Total QRO hash (TOTALQRO_HASH) | Total Plans (TOTALPLANS) | Total Users (TOTALUSERS) | Last run (LAST_RI | time JN_TIME) | Total run time (seconds) (RUNTIME) | Total I/Os (TOTALIO) | Synchronous DB reads (SYNC_DB_READ) | Synchronous DB writes (SYNC_DB_WRITE) | | |
| | QZDASOINIT / QUSER / 220773 | 271.531 | 67 | 71 | 1 | 2022-02 | -18-06.59.08.479249 | 498.218 | 285 | 269 | 0 | | |
| | QZDASOINIT / QUSER / 220840 | 235.378 | 54 | 61 | 1 | 2022-02 | 2-19-04.54.56.999398 | 455.147 | 129,518 | 202 | 0 | | |
| | QZDASOINIT / QUSER / 220771 | 168.111 | 16 | 17 | 1 | 2022-02 | 2-17-14.07.30.454561 | 306.158 | 0 | 0 | 0 | | |
| | QZDASOINIT / QUSER / 220762 | 46.662 | 20 | 21 | 1 | 2022-02 | 2-17-12.47.13.787702 | 118.515 | 106,737 | 33 | 0 | | |
| | QZDASOINIT / QUSER / 220750 | 38.493 | 4 | 6 | 1 | 2022-02 | 2-18-05.28.08.009690 | 70.057 | 1 | 1 | 0 | | |
| | QZDASOINIT / QUSER / 218354 | 38.016 | 33 | 39 | 1 | 2022-01 | -21-05.46.18.622695 | 71.707 | 1,359 | 474 | 0 | | |
| | QZDASOINIT / QUSER / 220835 | 21.537 | 5 | 5 | 1 | 2022-02 | 2-18-07.28.25.002492 | 39.414 | 116 | 3 | 0 | | |
| | QZDASOINIT / QUSER / 220619 | 16.465 | 6 | 6 | 1 | 2022-02 | 2-17-11.05.47.682878 | 30.761 | 3,867 | 17 | 0 | | |
| | QZDASOINIT / QUSER / 220777 | 13.931 | 6 | 6 | 1 | 2022-02 | -18-05.12.32.108673 | 25.567 | 633 | 0 | 0 | | |
| | QZDASOINIT / QUSER / 220836 | 5.360 | 2 | 2 | 1 | 2022-02 | 2-18-08.48.38.779944 | 9.722 | 0 | 0 | 0 | | |
| 1 | Q1ACPDST / QBRMS / 214651 | 5.135 | 5 | 20 | 1 | 2022-02 | 2-22-04.03.46.066292 | 9.370 | 1 | 1 | 0 | | |

Snapshot summary by job

5.12.5 Snapshot summary by QRO hash

This report summarizes the statistics found in the snapshot by **QRO hash.**

| ldoc730/l | MCCARGAR/M | 0222040416/Snapshot summary by QRO hash | | | | | | | | |
|------------|------------|---|--------------|--------------|----------------------------|-----------|-----------|----------------|-----------------|---|
| QRO | Total CPU | Total | Total | Total | Last run time | Total run | Total | Synchronous | Synchronous | F |
| hash | (seconds) | Jobs | Plans | Users | (LAST_RUN_TIME) | time | I/Os | DB | DB | E |
| (PLANHASH) | (CPUSECS) | (TOTAL JOBS) | (TOTALPLANS) | (TOTALUSERS) | | (seconds) | (TOTALIO) | reads | writes | r |
| | | | | | | (RUNTIME) | | (SYNC_DB_READ) | (SYNC_DB_WRITE) | (|
| C646789E | 31.209 | 2 | 2 | 1 | 2022-02-17-13.14.25.749903 | 56.819 | 1 | 1 | 0 | |
| 69A53EF3 | 30.102 | 1 | 1 | 1 | 2022-02-17-13.29.57.001955 | 54.874 | 0 | 0 | 0 | |
| 7DC13BB4 | 29.695 | 1 | 2 | 1 | 2022-02-17-13.26.29.360210 | 54.101 | 0 | 0 | 0 | |
| EF7EA46 | 24.909 | 1 | 1 | 1 | 2022-02-18-05.11.16.858259 | 45.433 | 0 | 0 | 0 | |
| 6FAECB4F | 23.005 | 1 | 1 | 1 | 2022-02-17-13.11.24.856866 | 41.862 | 0 | 0 | 0 | |
| 1527A9E4 | 22.872 | 1 | 2 | 1 | 2022-02-18-09.53.35.271807 | 41.211 | 0 | 0 | 0 | |
| 7488E10A | 22.422 | 1 | 1 | 1 | 2022-02-17-14.23.27.903473 | 40.859 | 0 | 0 | 0 | |
| E51E6610 | 19.847 | 1 | 1 | 1 | 2022-02-17-12.45.47.201453 | 36.288 | 1,060 | 23 | 0 | |

Snapshot summary by QRO hash

5.12.6 Snapshot summary by plan

This report summarizes the statistics found in the snapshot by plan ID.

| | Idoc730/MCCA | RGAR/MCCAR | GAR NEWPC 0222040416/Snaps | hot summ | doc730/MCCA | RGAR/MCCARGAR N | EWPC 0222040416/S | napshot summ Idoc7 |
|---|-----------------|------------|----------------------------|-----------|-------------|-----------------|-------------------|--------------------|
| ſ | Plan Identifier | Total CPU | Last run time | Total run | Total | Synchronous | Synchronous | Async A |
| | (PLANID) | (seconds) | (LAST_RUN_TIME) | time | I/Os | DB | DB | DB E |
| | | (CPUSECS) | | (seconds) | (TOTALIO) | reads | writes | reads v |
| | | | | (RUNTIME) | | (SYNC_DB_READ) | (SYNC_DB_WRITE) | (ASYNC_DB_READ) (|
| | 220771151392 | 30.102 | 2022-02-17-13.29.57.001955 | 54.874 | 0 | 0 | 0 | 0 |
| | 220773153279 | 24.909 | 2022-02-18-05.11.16.858259 | 45.433 | 0 | 0 | 0 | 0 |
| | 220750151296 | 23.005 | 2022-02-17-13.11.24.856866 | 41.862 | 0 | 0 | 0 | 0 |
| | 220773151533 | 22.422 | 2022-02-17-14.23.27.903473 | 40.859 | 0 | 0 | 0 | 0 |
| | 220762151251 | 19.847 | 2022-02-17-12.45.47.201453 | 36.288 | 1,060 | 23 | 0 | 1,037 |
| | 220840153864 | 17.205 | 2022-02-18-09.43.39.634520 | 31.018 | 0 | 0 | 0 | 0 |

Snapshot summary by plan

5.12.7 Snapshot summary by user

This report summarizes the statistics found in the snapshot by plan creation user name.

| | | | 1 1 | 1 | 1 1 | | 1 | | _ |
|---------------|-------------|--------------|-------------------|----------------|----------------------------|-------------|------------|----------------|----|
| Idoc730/MCC | CARGAR/MCCA | RGAR NEWPC | 0222040 Idoc730/M | CCARGAR/MCCARG | 5AR NEWPC 0222040 1doc73 | 0/MCCARGAR/ | MCCARGAR N | IEWPC 0222040 | ld |
| Plan creation | Total CPU | Total | Total | Total | Last run time | Total run | Total | Synchronous | s |
| user | (seconds) | Jobs | QRO | Plans | (LAST_RUN_TIME) | time | I/Os | DB | |
| name | (CPUSECS) | (TOTAL JOBS) | hash | (TOTALPLANS) | | (seconds) | (TOTALIO) | reads | W |
| (PLANUSER) | | | (TOTALQRO_HASH) | | | (RUNTIME) | | (SYNC_DB_READ) | (|
| MCCARGAR | 869.312 | 22 | 428 | 453 | 2022-02-22-03.57.13.861747 | 1,683.923 | 244,267 | 1,757 | |
| QSYS | 8.783 | 14 | 548 | 730 | 2022-02-22-04.03.59.698671 | 16.271 | 420 | 43 | |
| QBRMS | 5.135 | 1 | 5 | 20 | 2022-02-22-04.03.46.066292 | 9.370 | 1 | 1 | |
| | | | | | | | | | |

Snapshot summary by user

5.12.8 Snapshot summary by SQL statement

This report summarizes the statistics found in the snapshot by SQL statement.

| Idoc730/MCCARGAR/MCCARGAR NEWP | Idoc730/MCCARGAR/MCCARGAR NEWP | Idoc730/MCCARGAR/MCCARGAR NEWP | Idoc730/MCCARGA | R/MCCARGAR NEV | VP Idoc730/MCCAR | RGAR/MCCARG/ |
|--------------------------------------|-----------------------------------|--|-----------------|----------------|------------------|--------------|
| SQL statement | | | Total CPU | Total | Total | Total |
| (SQLSTMT) | | | (seconds) | Jobs | QRO | Plans |
| | | | (CPUSECS) | (TOTAL JOBS) | hash | (TOTALPLANS |
| | | | | | (TOTALQRO_HASH) | |
| WITH TIMES AS (SELECT ? AS LIBNAME, | ? AS MBRNAME, A.* FROM QTEMP/qapy | yjwinti_MCCARGAR7_BCHMON185 A), IN | TI A 91.160 |) 1 | 4 | |
| WITH TIMES AS (SELECT ? AS LIBNAME, | ? AS MBRNAME, A.* FROM QTEMP/qapy | yjwinti_MCCARGAR7_BCHMON185 A), IN | TI A 54.214 | 2 | 2 | |
| WITH TIMES AS (SELECT ? AS LIBNAME, | ? AS MBRNAME, A.* FROM QTEMP/qapy | yjwinti_MCCARGAR7_BCHMON185 A), IN | TI A 31.054 | 4 1 | 2 | |
| WITH TIMES AS (SELECT ? AS LIBNAME, | ? AS MBRNAME, A.* FROM QTEMP/qapy | yjwinti_MCCARGAR7_BCHMON185 A), IN | TI A 29.868 | 8 1 | 2 | |
| WITH TIMES AS (SELECT ? AS LIBNAME, | ? AS MBRNAME, A.* FROM QTEMP/qapy | yjwinti_MCCARGAR_ALL A), INTI AS (sele | ct A 26.584 | 2 | 13 | 1 |
| | | ··· | | | - | |

Snapshot summary by SQL statement

5.12.9 Index advice by table

This report summarizes the statistics in the snapshot for tables with index advice.

| Idoc730/MCCARGAR/MCCARGAR NEWP | Idoc730/MCCARGAR/M | CCARGAR NEWI | P Idoc730/MCC | ARGAR/MCCAF | RGAR NEWP | Idoc730/MCCAF | GAR/MCCARGAR NEV |
|--------------------------------------|--|------------------------|-----------------------|---|-----------|------------------------------|---|
| Table with index advice (PCTBLIA) | Index advice count (IDX_ADV_COUNT) | Table size (MBs) | Number of plans | Total CPU Total run (seconds) time (CPUSECS) (seconds) (RUNTIME) | | Total runs (TOTALRUNS) | Worst run To time I/ (seconds) (T |
| QDWDATA/QAPYDWHDWR (Q008172331) | 177 | .0301 | 175 | .175 | .175 | 214 | .017749 |
| QDWDATA/QAIDRDWTSUM_Q008172331 | 177 | 3.7981 | 175 | .175 | .175 | 214 | .017749 |
| QDWDATA/QAIDRDWINTI_Q008172331 | 175 | .0260 | 175 | .175 | .175 | 214 | .017749 |
| QPFRTEMP/QAPMJOBMI (Q051180002) | 102 | 15.6157 | 35 | .516 | .931 | 386 | .315399 |
| QPFRTEMP/QAPMDISK (Q046180002) | 99 | .1005 | 25 | .064 | .122 | 528 | .015875 |
| QPFRTEMP/QAPMJOBMI (Q048180002) | 93 | 16.7648 | 32 | .457 | .837 | 386 | .243076 |
| QPFRTEMP/QAPMJOBMI (Q050180002) | 90 | 16.0844 | 31 | .476 | .856 | 385 | .245023 |
| QPFRTEMP/QAPMDISK (Q042180002) | 87 | .1005 | 22 | .072 | .143 | 525 | .012001 |

Index advice by table

5.12.10 Stats advice by table

This report summarizes the statistics in the snapshot for tables with stats advice.

| able with stats advice PCTBLSA) | Stats advice count (STATS ADV COUNT) | Table size (MBs) | Columns with stats advised | Number of plans | Total CPU (seconds) (CPUSECS) | Tota time (sec |
|-------------------------------------|--|------------------------|----------------------------------|-----------------------|-------------------------------------|----------------------|
| | | (TABLE_SIZE) | (STATS_COLUMNS) | (PLAN_COUNT) | (, | (RUI |
| MCCARGAR7/QAPYJWTDE (SPLT) | 43 | 40.0461 | 43 | 43 | 84.922 | |
| QPFRTEMP/QAPMDISKRB (Q043180002) | 40 | .0623 | 22 | 40 | .160 | |
| QPFRTEMP/QAPMDISKRB (Q042180002) | 40 | .0623 | 22 | 40 | .149 | |
| QPFRTEMP/QAPMDISKRB (Q036180002) | 40 | .0623 | 22 | 40 | .160 | |
| ODEDTENAD (OADNADISKOD (OOAA100002) | 40 | 0622 | 20 | 40 | 160 | |
| State advice by table | | | | | | |

Stats advice by table

5.12.11 Stats advice details

This report provides more details about tables with stats advice.

| System Name (SYSTEM_NAME) | Job Name (JOB_NAME) | Job User (JOB_USER) | Job Number (JOB_NUMBER) | Thread ID (THREAD_ID) | Library of Table Queried (SYSTEM_TABLE_SCHEMA) | Name of Table Queried (SYSTEM_TABLE_NAME) | Member of Table Queried (MEMBER_NAME) | STATISTIC_STATUS (STATISTIC_STATUS) | STATISTIC_IMPORTA (STATISTIC_IMPORT/ |
|---------------------------------|------------------------|---------------------------|-------------------------------|-----------------------------|---|--|--|--|---|
| IDOC730 | QZDASOINIT | QUSER | 218354 | 12 | MCCARGAR | QAIDR00011 | QAIDR00011 | N | |
| IDOC730 | QZDASOINIT | QUSER | 218354 | 12 | MCCARGAR | QAIDR00011 | QAIDR00011 | N | |
| IDOC730 | QZDASOINIT | QUSER | 218354 | 12 | MCCARGAR | QAIDR00009 | QAIDR00009 | N | |
| IDOC730 | QZDASOINIT | QUSER | 218354 | 12 | MCCARGAR | QAIDR00009 | QAIDR00009 | N | |
| IDOC730 | QZDASOINIT | QUSER | 218522 | 36 | QPFRDATA | QAIDR00009 | QAIDR00009 | Ν | |
| IDOC730 | QZDASOINIT | QUSER | 218522 | 36 | QPFRDATA | QAIDR00009 | QAIDR00009 | Ν | |
| IDOC730 | QZDASOINIT | QUSER | 218522 | 36 | QPFRDATA | QAPMSYSTEM | SPLIT | Ν | |
| IDOC730 | QZDASOINIT | QUSER | 218522 | 36 | QUSRSYS | QAIDRCNC1 | QAIDRCNC1 | S | |

Stats advice by table

5.12.12 Advanced

The advanced subfolder provides many database monitor views over the snapshot data. These are copy/pasted SQL statements from <u>the IBM i documentation</u> and applied to the current snapshot.

IBM iDoctor for IBM i



Detail reports -> Advanced

5.13 Server-side output files

This folder contains access to the raw data behind the plan cache snapshot in table form.



Server-side output files folder

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IBM iDoctor for IBM i

| Idoc73 | 0/MCCARGAR Idoc730/MCCARC | SAR Idoc730/MCCARGAR Idoc | 730/MCCA | RGAR Idoo | 730/MCCAR | SAR Idoc730/ | MCCARGAR | Idoc730/MC | CARGAR Id | oc730/MCCARGA | R Idoc730, |
|-------------------------|----------------------------|---------------------------|----------|--|---------------------------|---------------------|-------------------------|---------------------------|----------------------------------|------------------------------------|--------------------------------|
| Record ID (QQRID) | Created Time (QQTIME) | Join Column (QQJFLD) | | Relational Database Name (QQRDBN) | System Name (QQSYS) | Job name (QQJOB) | Job user (QQUSER) | Job number (QQJNUM) | Unique identifier (QQUCNT) | User Defined Column (QQUDEF) | Statement Number (QQSTN) |
| 3018 | 2022-02-22-04.04.16.924678 | IDOC730 QZDASOINITQUSER | 221119 | *LOCAL | IDOC730 | QZDASOINIT | QUSER | 221119 | 0 | | |
| 3010 | 2022-01-18-12.05.30.494933 | IDOC730 QZDASOINITQUSER | 2169 | F007B660 | IDOC730 | QZDASOINIT | QUSER | 216934 | 69,068 | | |
| 1000 | 2022-01-18-12.05.30.494933 | IDOC730 QZDASOINITQUSER | 2169 | F007B660 | IDOC730 | QZDASOINIT | QUSER | 216934 | 69,068 | | 69,068 |
| 5005 | 2022-01-18-12.05.30.494933 | IDOC730 QZDASOINITQUSER | 2169 | F007B660 | IDOC730 | QZDASOINIT | QUSER | 216934 | 69,068 | | |
| 3006 | 2022-01-18-12.05.30.494933 | IDOC730 QZDASOINITQUSER | 2169 | F007B660 | IDOC730 | QZDASOINIT | QUSER | 216934 | 69,068 | | |
| 3000 | 2022-01-18-12.05.30.494933 | IDOC730 QZDASOINITQUSER | 2169 | F007B660 | IDOC730 | QZDASOINIT | QUSER | 216934 | 69,068 | | |
| 3003 | 2022-01-18-12.05.30.494933 | IDOC730 QZDASOINITQUSER | 2169 | F007B660 | IDOC730 | QZDASOINIT | QUSER | 216934 | 69,068 | | |
| 3004 | 2022-01-18-12.05.30.494933 | IDOC730 QZDASOINITQUSER | 2169 | F007B660 | IDOC730 | QZDASOINIT | QUSER | 216934 | 69,068 | | |
| 3014 | 2022-01-18-12.05.30.494933 | IDOC730 QZDASOINITQUSER | 2169 | F007B660 | IDOC730 | QZDASOINIT | QUSER | 216934 | 69,068 | | |
| 5002 | 2022-01-18-12.05.30.494933 | IDOC730 QZDASOINITQUSER | 2169 | F007B660 | IDOC730 | QZDASOINIT | QUSER | 216934 | 69,068 | | |
| 3019 | 2022-01-18-12.05.30.494933 | IDOC730 QZDASOINITQUSER | 2169 | F007B660 | IDOC730 | QZDASOINIT | QUSER | 216934 | 69,068 | | |
| 3010 | 2022-01-18-12.16.05.452062 | IDOC730 QZDASOINITQUSER | 2169 | F007B660 | IDOC730 | QZDASOINIT | QUSER | 216976 | 69,081 | | |

Plan cache snapshot table

6 Library QPLANCACHE

Library **QPLANCACHE** contains several now obsolete programs and commands which likely will be removed from a future version of iDoctor.

This library originally included commands and programs related to Plan Cache dumps which are no longer used and have been replaced with Plan Cache snapshots.

7 OS Support for the SQL Plan Cache

Stored procedures are available to create SQL Plan Cache Snapshots or work with the output. Some of these are used under the covers by Plan Cache Analyzer.

For more information on using these yourself, visit the section called <u>Accessing the SQL plan cache with</u> <u>SQL stored procedures</u> in the IBM i Documentation.